

Dental Claim Review Guidelines

(Comprehensive & Limited Plans)

Guideline Number: DRG042.18
Effective Date: January 1, 2025

Table of Contents	Page
• Instructions for Use	1
• Documentation Requirements	1
• Diagnostic	2
• Restorative	3
• Endodontics	11
• Periodontics	12
• Removable Prosthodontics	14
• Implant	18
• Fixed Prosthodontics	23
• Oral and Maxillofacial Surgery	26
• Orthodontics	27
• Adjunctive General Services	28
• EmblemHealth NY Medicare Exclusion and Limitations 30	
• EmblemHealth ConnectiCare Medicare PPO Exclusion and Limitations 40	
• Summary of all Coverage Criteria/ Dental Policies	59

Instructions for Use

This Utilization Review Guideline is designed to provide guidance for the adjudication of claims for Healthplex standard and Limited Dental Plans, and includes only the CDT codes for which clinical documentation is required with related links to the policies and coverage guidelines approved by the Dental Clinical Policy and Technology Committee. Before using this guideline, check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Utilization Review Guideline is provided for informational purposes. It does not constitute medical advice.

Notes:

- Dental Clinical Policies and Dental Coverage Guidelines are embedded at the end of this document starting at page 59. These specific policies are listed in alphabetically. You may use the Table of Contents link to access “Summary of all Coverage Criteria/ Dental Policies”.
- For further CDT code description and information, refer to the most current version of the CDT Dental Procedures Codes released by the American Dental Association (ADA).

Documentation Requirements

A comprehensive, detailed medical record is key to promoting quality care and improving patient safety. For the services outlined in the grid below, specific documentation that is needed in order to make a determination on coverage is listed in the *Documentation Requirements* column. Submit this information with your request for coverage.

To ensure the best health outcomes for our members, we may periodically require providers to submit documentation for services that do not have specific documentation requirements listed below.

Diagnostic

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
Diagnostic Imaging: Image Capture with Interpretation			
D0364	Cone beam CT capture and interpretation with limited field of view - less than one whole jaw	<ul style="list-style-type: none"> Narrative of necessity including planned procedure 	<ul style="list-style-type: none"> Cone Beam Computed Tomography
D0365	Cone beam CT capture and interpretation with field of view of one full dental arch - mandible	<ul style="list-style-type: none"> Narrative of necessity including planned procedure 	<ul style="list-style-type: none"> Cone Beam Computed Tomography
D0366	Cone beam CT capture and interpretation with field of view of one full dental arch - maxilla, with or without cranium	<ul style="list-style-type: none"> Narrative of necessity including planned procedure 	<ul style="list-style-type: none"> Cone Beam Computed Tomography
D0367	Cone beam CT capture and interpretation with field of view of both jaws; with or without cranium	<ul style="list-style-type: none"> Narrative of necessity including planned procedure 	<ul style="list-style-type: none"> Cone Beam Computed Tomography
D0368	Cone beam CT capture and interpretation for TMJ series including two or more exposures	<ul style="list-style-type: none"> Narrative of necessity including planned procedure 	<ul style="list-style-type: none"> Cone Beam Computed Tomography
D0380	Cone beam CT image capture with limited field of view - less than one whole jaw	<ul style="list-style-type: none"> Narrative of necessity including planned procedure 	<ul style="list-style-type: none"> Cone Beam Computed Tomography
Diagnostic Imaging: Image Capture Only			
D0381	Cone beam CT image capture with field of view of one full dental arch - mandible	<ul style="list-style-type: none"> Narrative of necessity including planned procedure 	<ul style="list-style-type: none"> Cone Beam Computed Tomography
D0382	Cone beam CT image capture with field of view of one full dental arch - maxilla, with or without cranium	<ul style="list-style-type: none"> Narrative of necessity including planned procedure 	<ul style="list-style-type: none"> Cone Beam Computed Tomography
D0383	Cone beam CT image capture with field of view of both jaws; with or without cranium	<ul style="list-style-type: none"> Narrative of necessity including planned procedure 	<ul style="list-style-type: none"> Cone Beam Computed Tomography
Diagnostic Imaging: Image Capture Only			
D0384	Cone beam CT image capture for TMJ series including two or more exposures	<ul style="list-style-type: none"> Narrative of necessity including planned procedure 	<ul style="list-style-type: none"> Cone Beam Computed Tomography
Diagnostic Imaging: Interpretation and Report Only			
D0391	Interpretation of diagnostic image by a practitioner not associated with capture of the image, including report	<ul style="list-style-type: none"> Narrative of necessity including planned procedure 	N/A

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
Diagnostic Imaging: Post Processing of Image or Image Sets			
D0393	Virtual treatment simulation using 3D image volume or surface scan	<ul style="list-style-type: none"> Narrative of necessity including planned procedure 	N/A
D0394	Digital subtraction of two or more images or image volumes of the same modality;	<ul style="list-style-type: none"> Narrative of necessity including planned procedure 	N/A
D0395	Fusion of two or more 3D image volumes of one or more modalities	<ul style="list-style-type: none"> Narrative of necessity including planned procedure 	N/A

Restorative

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
Amalgam Restorations (Including Polishing)			
D2140	Amalgam - one surface, primary or permanent	<ul style="list-style-type: none"> If tooth has existing crown: narrative of necessity for filling 	<ul style="list-style-type: none"> Single Tooth Direct Restorations
D2150	Amalgam - two surfaces, primary or permanent	<ul style="list-style-type: none"> If tooth has existing crown: narrative of necessity for filling 	<ul style="list-style-type: none"> Single Tooth Direct Restorations
D2160	Amalgam - three surfaces, primary or permanent	<ul style="list-style-type: none"> If tooth has existing crown: narrative of necessity for filling 	<ul style="list-style-type: none"> Single Tooth Direct Restorations
D2161	Amalgam - four or more surfaces, primary or permanent	<ul style="list-style-type: none"> If tooth has existing crown: narrative of necessity for filling 	<ul style="list-style-type: none"> Single Tooth Direct Restorations
Resin-Based Composite Restorations – Direct			
D2330	Resin-based composite - one surface, anterior	<ul style="list-style-type: none"> If tooth has existing crown: narrative of necessity for filling 	<ul style="list-style-type: none"> Single Tooth Direct Restorations Labial Veneers
D2331	Resin-based composite - two surfaces, anterior	<ul style="list-style-type: none"> If tooth has existing crown: narrative of necessity for filling 	<ul style="list-style-type: none"> Single Tooth Direct Restorations Labial Veneers
D2332	Resin-based composite - three surfaces, anterior	<ul style="list-style-type: none"> If tooth has existing crown: narrative of necessity for filling 	<ul style="list-style-type: none"> Single Tooth Direct Restorations Labial Veneers
Resin-Based Composite Restorations – Direct			
D2335	Resin-based composite - four or more surfaces or involving incisal angle (anterior)	<ul style="list-style-type: none"> If tooth has existing crown: narrative of necessity for filling 	<ul style="list-style-type: none"> Single Tooth Direct Restorations Labial Veneers
D2390	Resin-based composite crown, anterior	<ul style="list-style-type: none"> Current dated pre-operative radiographs of teeth Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs or patient is too young for radiographs 	<ul style="list-style-type: none"> Single Tooth Direct Restorations
D2391	Resin-based composite - one surface, posterior	<ul style="list-style-type: none"> If tooth has existing crown: narrative of necessity for filling 	<ul style="list-style-type: none"> Single Tooth Direct Restorations
D2392	Resin-based composite - two surfaces, posterior	<ul style="list-style-type: none"> If tooth has existing crown: narrative of necessity for filling 	<ul style="list-style-type: none"> Single Tooth Direct Restorations

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
Inlay/Onlay Restorations			
D2393	Resin-based composite - three surfaces, posterior	<ul style="list-style-type: none"> If tooth has existing crown: narrative of necessity for filling 	<ul style="list-style-type: none"> Single Tooth Direct Restorations
D2394	Resin-based composite - four or more surfaces, posterior	<ul style="list-style-type: none"> If tooth has existing crown: narrative of necessity for filling 	<ul style="list-style-type: none"> Single Tooth Direct Restorations
D2542	Onlay - metallic - two surfaces	<ul style="list-style-type: none"> Current dated pre-operative bitewing radiographs of teeth Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> Single Tooth Indirect Restorations
D2543	Onlay - metallic - three surfaces	<ul style="list-style-type: none"> Current dated pre-operative bitewing radiographs of teeth Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> Single Tooth Indirect Restorations
D2544	Onlay - metallic - four or more surfaces	<ul style="list-style-type: none"> Current dated pre-operative bitewing radiographs of teeth Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> Single Tooth Indirect Restorations
Inlay/Onlay Restorations			
D2642	Onlay - porcelain/ceramic - two surfaces	<ul style="list-style-type: none"> Current dated pre-operative bitewing radiographs of teeth Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> Single Tooth Indirect Restorations
D2643	Onlay - porcelain/ceramic - three surfaces	<ul style="list-style-type: none"> Current dated pre-operative bitewing radiographs of teeth Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> Single Tooth Indirect Restorations

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D2644	Onlay - porcelain/ceramic - four or more surfaces	<ul style="list-style-type: none"> • Current dated pre-operative bitewing radiographs of teeth • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations
Inlay/Onlay Restorations: Resin-Based Composite Inlays/Onlays Must Utilize Indirect Technique			
D2662	Onlay - resin-based composite - two surfaces	<ul style="list-style-type: none"> • Current dated pre-operative bitewing radiographs of teeth • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations
D2663	Onlay - resin-based composite - three surfaces	<ul style="list-style-type: none"> • Current dated pre-operative bitewing radiographs of teeth • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations
D2664	Onlay - resin-based composite - four or more surfaces	<ul style="list-style-type: none"> • Current dated pre-operative bitewing radiographs of teeth • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations
Crowns – Single Restorations Only			
D2710	Crown - resin-based composite (indirect)	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Date of prior placement of existing crowns and the rationale for replacement, if applicable • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D2712	Crown - 3/4 resin-based composite (indirect)	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Date of prior placement of existing crowns and the rationale for replacement, if applicable • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations
D2720	Crown - resin with high noble metal	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Date of prior placement of existing crowns and the rationale for replacement, if applicable • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations
D2721	Crown - resin with predominantly base metal	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Date of prior placement of existing crowns and the rationale for replacement, if applicable • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations
Crowns – Single Restorations Only			
D2722	Crown - resin with noble metal	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Date of prior placement of existing crowns and the rationale for replacement, if applicable • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D2740	Crown - porcelain/ceramic	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Date of prior placement of existing crowns and the rationale for replacement, if applicable • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations
D2750	Crown - porcelain fused to high noble metal	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Date of prior placement of existing crowns and the rationale for replacement, if applicable • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations
D2751	Crown - porcelain fused to predominantly base metal	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Date of prior placement of existing crowns and the rationale for replacement, if applicable • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations
Crowns – Single Restorations Only			
D2752	Crown - porcelain fused to noble metal	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Date of prior placement of existing crowns and the rationale for replacement, if applicable • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D2753	Crown – porcelain fused to titanium and titanium alloys	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Date of prior placement of existing crowns and the rationale for replacement, if applicable • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations
D2780	Crown - 3/4 cast high noble metal	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Date of prior placement of existing crowns and the rationale for replacement, if applicable • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations
D2781	Crown - 3/4 cast predominantly base metal	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Date of prior placement of existing crowns and the rationale for replacement, if applicable • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations
Crowns – Single Restorations Only			
D2782	Crown - 3/4 cast noble metal	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Date of prior placement of existing crowns and the rationale for replacement, if applicable • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D2783	Crown - 3/4 porcelain/ceramic	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Date of prior placement of existing crowns and the rationale for replacement, if applicable • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations
D2790	Crown - full cast high noble metal	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Date of prior placement of existing crowns and the rationale for replacement, if applicable • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations
D2791	Crown - full cast predominantly base metal	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Date of prior placement of existing crowns and the rationale for replacement, if applicable • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations
Crowns – Single Restorations Only			
D2792	Crown - full cast noble metal	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Date of prior placement of existing crowns and the rationale for replacement, if applicable • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D2794	Crown - titanium and titanium alloys	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Date of prior placement of existing crowns and the rationale for replacement, if applicable • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs; if diagnosis is cracked tooth syndrome, specific diagnostic tests performed 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations
D2799	Interim crown-further treatment or completion of diagnosis necessary prior to final impression	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Narrative that states what further treatment or diagnosis is medically necessary 	<ul style="list-style-type: none"> • Single Tooth Indirect Restorations
Other Restorative Services			
D2949	Restorative foundation for an indirect restoration	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs 	<ul style="list-style-type: none"> • Core Buildup, Post and Core, and Pin Retention
D2950	Core buildup, including any pins when required	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs 	<ul style="list-style-type: none"> • Core Buildup, Post and Core, and Pin Retention
D2952	Post and core in addition to crown, indirectly fabricated	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Narrative indicating completed root canal therapy • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs 	<ul style="list-style-type: none"> • Core Buildup, Post and Core, and Pin Retention
Other Restorative Services			
D2953	Each additional indirectly fabricated post - same tooth	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Narrative indicating completed root canal therapy • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs 	<ul style="list-style-type: none"> • Core Buildup, Post and Core, and Pin Retention
D2954	Prefabricated post and core in addition to crown	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of teeth • Narrative indicating completed root canal therapy • Narrative of necessity and/or treatment records when decay is not evident on submitted radiographs 	<ul style="list-style-type: none"> • Core Buildup, Post and Core, and Pin Retention

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D2960	Labial veneer (resin laminate) - direct	<ul style="list-style-type: none"> • Current dated pre-operative radiographs or intraoral photographs of teeth • Date of prior placement of existing veneer and the rationale for replacement, if applicable 	<ul style="list-style-type: none"> • Labial Veneers
D2961	Labial veneer (resin laminate) - indirect	<ul style="list-style-type: none"> • Current dated pre-operative radiographs or intraoral photographs of teeth • Date of prior placement of existing veneer and the rationale for replacement, if applicable 	<ul style="list-style-type: none"> • Labial Veneers
D2962	Labial veneer (porcelain laminate) - indirect	<ul style="list-style-type: none"> • Current dated pre-operative radiographs or intraoral photographs of teeth • Date of prior placement of existing veneer and the rationale for replacement, if applicable 	<ul style="list-style-type: none"> • Labial Veneers

Endodontics

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
Endodontic Retreatment			
D3346	Retreatment of previous root canal therapy - anterior	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of tooth • Narrative of necessity 	<ul style="list-style-type: none"> • Non-Surgical Endodontics
D3347	Retreatment of previous root canal therapy - premolar	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of tooth • Narrative of necessity 	<ul style="list-style-type: none"> • Non-Surgical Endodontics
D3348	Retreatment of previous root canal therapy - molar	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of tooth • Narrative of necessity 	<ul style="list-style-type: none"> • Non-Surgical Endodontics
Apicoectomy/Periradicular Services			
D3410	Apicoectomy - anterior	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of tooth • Narrative of necessity including history of root canal therapy 	<ul style="list-style-type: none"> • Surgical Endodontics
D3421	Apicoectomy - premolar (first root)	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of tooth • Narrative of necessity including history of root canal therapy 	<ul style="list-style-type: none"> • Surgical Endodontics
D3425	Apicoectomy - molar (first root)	<ul style="list-style-type: none"> • Current dated radiographs of tooth • Narrative of necessity including history of root canal therapy 	<ul style="list-style-type: none"> • Surgical Endodontics
D3426	Apicoectomy (each additional root)	<ul style="list-style-type: none"> • Current dated radiographs of tooth • Narrative of necessity including history of root canal therapy 	<ul style="list-style-type: none"> • Surgical Endodontics
D3450	Root amputation - per root	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of tooth • Narrative of necessity 	<ul style="list-style-type: none"> • Surgical Endodontics

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D3471	Surgical repair of root resorption - anterior	<ul style="list-style-type: none"> Narrative indicating history of root canal therapy 	<ul style="list-style-type: none"> Surgical Endodontics
D3472	Surgical repair of root resorption - premolar	<ul style="list-style-type: none"> Narrative indicating history of root canal therapy 	<ul style="list-style-type: none"> Surgical Endodontics
D3473	Surgical repair of root resorption - molar	<ul style="list-style-type: none"> Narrative indicating history of root canal therapy 	<ul style="list-style-type: none"> Surgical Endodontics
Other Endodontic Procedures			
D3920	Hemisection (including any root removal), not including root canal therapy	<ul style="list-style-type: none"> Current dated pre-operative radiographs of tooth Narrative of necessity 	<ul style="list-style-type: none"> Surgical Endodontics

Periodontics

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
Surgical Services (Including Usual Postoperative Care)			
D4249	Clinical crown lengthening – hard tissue	<ul style="list-style-type: none"> Current dated pre-operative radiographs of tooth/area of problem Complete 6-point periodontal charting Narrative of necessity 	<ul style="list-style-type: none"> Surgical Periodontics: Resective Procedures
D4260	Osseous surgery (including elevation of a full thickness flap and closure) - four or more contiguous teeth or tooth bounded spaces per quadrant	<ul style="list-style-type: none"> Current dated pre-operative radiographs of tooth/area of problem Complete 6-point periodontal charting Narrative of necessity 	<ul style="list-style-type: none"> Surgical Periodontics: Resective Procedures
Surgical Services (Including Usual Postoperative Care)			
D4261	Osseous surgery (including elevation of a full thickness flap and closure) - one to three contiguous teeth or tooth bounded spaces per quadrant	<ul style="list-style-type: none"> Current dated pre-operative radiographs of tooth/area of problem Complete 6-point periodontal charting Narrative of necessity 	<ul style="list-style-type: none"> Surgical Periodontics: Resective Procedures
D4263	Bone replacement graft - retained natural tooth - first site in quadrant	<ul style="list-style-type: none"> Current dated pre-operative radiographs of tooth/area of problem Complete 6-point periodontal charting 	<ul style="list-style-type: none"> Biologic Materials for Soft and Hard Tissue Regeneration Bone Replacement Grafts Dental Care Services in an Operating Room or Ambulatory Surgery Center
D4264	Bone replacement graft - retained natural tooth - each additional site in quadrant	<ul style="list-style-type: none"> Current dated pre-operative radiographs of tooth/area of problem Complete 6-point periodontal charting 	<ul style="list-style-type: none"> Biologic Materials for Soft and Hard Tissue Regeneration Bone Replacement Grafts Dental Care Services in an Operating Room or Ambulatory Surgery Center
D4266	Guided tissue regeneration, natural teeth - resorbable barrier, per site	<ul style="list-style-type: none"> Current dated pre-operative radiographs of tooth/area of problem Complete 6-point periodontal charting Narrative of necessity 	<ul style="list-style-type: none"> Dental Barrier Membrane Guided Tissue Regeneration

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D4267	Guided tissue regeneration, natural teeth - non-resorbable barrier, per site	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of tooth/area of problem • Complete 6-point periodontal charting • Narrative of necessity 	<ul style="list-style-type: none"> • Dental Barrier Membrane Guided Tissue Regeneration
D4268	Surgical revision procedure, per tooth	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of tooth/area of problem • Complete 6-point periodontal charting • Narrative of necessity 	<ul style="list-style-type: none"> • Dental Care Services in an Operating Room or Ambulatory Surgery Center • Surgical Periodontics: Mucogingival Procedures
D4270	Pedicle soft tissue graft procedure	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of tooth/area of problem • Complete 6-point periodontal charting • Narrative of necessity 	<ul style="list-style-type: none"> • Surgical Periodontics: Mucogingival Procedures
D4273	Autogenous connective tissue graft procedure (including donor and recipient surgical sites) first tooth, implant, or edentulous tooth position in graft	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of tooth/area of problem • Complete 6-point periodontal charting • Narrative of necessity 	<ul style="list-style-type: none"> • Surgical Periodontics: Mucogingival Procedures
Surgical Services (Including Usual Postoperative Care)			
D4274	Mesial/distal wedge procedure, single tooth (when not performed in conjunction with surgical procedures in the same anatomical area)	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of tooth/area of problem • Complete 6-point periodontal charting • Narrative of necessity 	<ul style="list-style-type: none"> • Surgical Periodontics: Resective Procedures
D4275	Non-autogenous connective tissue graft (including recipient site and donor material) first tooth, implant, or edentulous tooth position in graft	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of tooth/area of problem • Complete 6-point periodontal charting • Narrative of necessity 	<ul style="list-style-type: none"> • Surgical Periodontics: Mucogingival Procedures
D4276	Combined connective tissue and pedicle graft, per tooth	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of tooth/area of problem • Complete 6-point periodontal charting • Narrative of necessity 	<ul style="list-style-type: none"> • Surgical Periodontics: Mucogingival Procedures
D4277	Free soft tissue graft procedure (including recipient and donor surgical sites) first tooth, implant or edentulous tooth position in graft	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of tooth/area of problem • Complete 6-point periodontal charting • Narrative of necessity 	<ul style="list-style-type: none"> • Surgical Periodontics: Mucogingival Procedures

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D4278	Free soft tissue graft procedure (including donor site surgery), each additional contiguous tooth or edentulous tooth position in same graft site	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of tooth/area of problem • Complete 6-point periodontal charting • Narrative of necessity 	<ul style="list-style-type: none"> • Surgical Periodontics: Mucogingival Procedures
D4283	Autogenous connective tissue graft procedure (including donor and recipient surgical sites) - each additional contiguous tooth, implant or edentulous tooth position in same graft site	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of tooth/area of problem • Complete 6-point periodontal charting • Narrative of necessity 	<ul style="list-style-type: none"> • Surgical Periodontics: Mucogingival Procedures
D4285	Non-autogenous connective tissue graft procedure (including recipient surgical site and donor material) - each additional contiguous tooth, implant or edentulous tooth position in same graft site	<ul style="list-style-type: none"> • Current dated pre-operative radiographs of tooth/area of problem • Complete 6-point periodontal charting • Narrative of necessity 	<ul style="list-style-type: none"> • Surgical Periodontics: Mucogingival Procedures
Non-Surgical Periodontal Service			
D4341	Periodontal scaling and root planing - four or more teeth per quadrant	<ul style="list-style-type: none"> • Panoramic radiograph or full series • Complete 6-point periodontal charting 	<ul style="list-style-type: none"> • Non-Surgical Periodontal Therapy
D4342	Periodontal scaling and root planing - one to three teeth per quadrant	<ul style="list-style-type: none"> • Panoramic radiograph or full series • Complete 6-point periodontal charting 	<ul style="list-style-type: none"> • Non-Surgical Periodontal Therapy
D4381	Localized delivery of antimicrobial agents via a controlled release vehicle into diseased crevicular tissue, per tooth	<ul style="list-style-type: none"> • Panoramic radiograph or full series • Complete 6-point periodontal charting • Dates of previous scaling and root planing 	<ul style="list-style-type: none"> • Non-Surgical Periodontal Therapy
Other Periodontal Services			
D4910	Periodontal maintenance	<ul style="list-style-type: none"> • Narrative specifying dates of previous scaling and root planing or osseous surgery 	<ul style="list-style-type: none"> • Non-Surgical Periodontal Therapy

Removable Prosthodontics

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
Partial Dentures (Including Routine Post-Delivery Care)			
D5211	Maxillary partial denture - resin base (including any conventional clasps, rests and teeth)	<ul style="list-style-type: none"> • Panoramic radiograph or full series • Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> • Removable Prosthodontics

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D5212	Mandibular partial denture - resin base (including any conventional clasps, rests and teeth)	<ul style="list-style-type: none"> • Panoramic radiograph or full series • Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> • Removable Prosthodontics
D5213	Maxillary partial denture - cast metal framework with resin denture bases (including retentive/clasping materials, rests and teeth)	<ul style="list-style-type: none"> • Panoramic radiograph or full series • Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> • Removable Prosthodontics
D5214	Mandibular partial denture - cast metal framework with resin denture bases (including retentive/clasping materials, rests and teeth)	<ul style="list-style-type: none"> • Panoramic radiograph or full series • Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> • Removable Prosthodontics
D5221	Immediate maxillary partial denture - resin base (including retentive/clasping materials, rests and teeth)	<ul style="list-style-type: none"> • Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> • Removable Prosthodontics
Partial Dentures (Including Routine Post-Delivery Care)			
D5222	Immediate mandibular partial denture - resin base (including retentive/clasping materials, rests and teeth)	<ul style="list-style-type: none"> • Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> • Removable Prosthodontics
D5223	Immediate maxillary partial denture – cast metal framework with resin denture bases (including retentive/clasping materials, rests and teeth)	<ul style="list-style-type: none"> • Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> • Removable Prosthodontics
D5224	Immediate mandibular partial denture – cast metal framework with resin denture bases (including retentive/clasping materials, rests and teeth)	<ul style="list-style-type: none"> • Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> • Removable Prosthodontics
D5225	Maxillary partial denture - flexible base (including retentive/clasping materials, rests, and teeth)	<ul style="list-style-type: none"> • Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> • Removable Prosthodontics

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D5226	Mandibular partial denture - flexible base (including retentive/clasping materials, rests, and teeth)	<ul style="list-style-type: none"> Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> Removable Prosthodontics
D5227	Immediate maxillary partial denture – flexible base (including any clasps, rests and teeth)	<ul style="list-style-type: none"> Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> Removable Prosthodontics
D5228	Immediate mandibular partial denture – flexible base (including any clasps, rests and teeth)	<ul style="list-style-type: none"> Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> Removable Prosthodontics
D5282	Removable unilateral partial denture - one piece cast metal (including retentive/clasping materials, rests, and teeth)	<ul style="list-style-type: none"> Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> Removable Prosthodontics
Partial Dentures (Including Routine Post-Delivery Care)			
D5283	Removable unilateral partial denture - one piece cast metal (including retentive/clasping materials, rests, and teeth)	<ul style="list-style-type: none"> Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> Removable Prosthodontics
D5284	Removable unilateral partial denture - one piece flexible base (including retentive/clasping materials, rests, and teeth)	<ul style="list-style-type: none"> Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> Removable Prosthodontics
D5286	Removable unilateral partial denture – one piece resin (including retentive/ clasping materials, rests, and teeth) – per quadrant	<ul style="list-style-type: none"> Panoramic radiograph or full series Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> Removable Prosthodontics
Denture Rebase Procedures			
D5710	Rebase complete maxillary denture	<ul style="list-style-type: none"> Date of initial denture delivery 	<ul style="list-style-type: none"> Removable Prosthodontics
D5711	Rebase complete mandibular denture	<ul style="list-style-type: none"> Date of initial denture delivery 	<ul style="list-style-type: none"> Removable Prosthodontics
D5720	Rebase maxillary partial denture	<ul style="list-style-type: none"> Date of initial denture delivery 	<ul style="list-style-type: none"> Removable Prosthodontics
D5721	Rebase mandibular partial denture	<ul style="list-style-type: none"> Date of initial denture delivery 	<ul style="list-style-type: none"> Removable Prosthodontics
D5725	Rebase hybrid prosthesis	<ul style="list-style-type: none"> Date of initial denture delivery 	<ul style="list-style-type: none"> Removable Prosthodontics
Denture Reline Procedures			
D5730	Reline complete maxillary denture (direct)	<ul style="list-style-type: none"> Date of initial denture delivery 	<ul style="list-style-type: none"> Removable Prosthodontics

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D5731	Reline complete mandibular denture (direct)	<ul style="list-style-type: none"> Date of initial denture delivery 	<ul style="list-style-type: none"> Removable Prosthodontics
D5740	Reline maxillary partial denture (direct)	<ul style="list-style-type: none"> Date of initial denture delivery 	<ul style="list-style-type: none"> Removable Prosthodontics
D5741	Reline mandibular partial denture (direct)	<ul style="list-style-type: none"> Date of initial denture delivery 	<ul style="list-style-type: none"> Removable Prosthodontics
D5750	Reline complete maxillary denture (indirect)	<ul style="list-style-type: none"> Date of initial denture delivery 	<ul style="list-style-type: none"> Removable Prosthodontics
D5751	Reline complete mandibular denture (indirect)	<ul style="list-style-type: none"> Date of initial denture delivery 	<ul style="list-style-type: none"> Removable Prosthodontics
D5760	Reline maxillary partial denture (indirect)	<ul style="list-style-type: none"> Date of initial denture delivery 	<ul style="list-style-type: none"> Removable Prosthodontics
Denture Reline Procedures			
D5761	Reline mandibular partial denture (indirect)	<ul style="list-style-type: none"> Date of initial denture delivery 	<ul style="list-style-type: none"> Removable Prosthodontics
D5765	Soft liner for complete or partial removable denture - indirect	<ul style="list-style-type: none"> Date of initial denture delivery 	<ul style="list-style-type: none"> Removable Prosthodontics
Interim Prosthesis			
D5810	Interim complete denture (maxillary)	<ul style="list-style-type: none"> Date of initial denture delivery 	<ul style="list-style-type: none"> Removable Prosthodontics
D5811	Interim complete denture (mandibular)	<ul style="list-style-type: none"> Date of initial denture delivery 	<ul style="list-style-type: none"> Removable Prosthodontics
D5820	Interim partial denture (including retentive/clasping materials, rests, and teeth), maxillary; Includes any necessary clasps and rests.	<ul style="list-style-type: none"> Narrative of medical necessary If extractions have not yet been performed: dates of planned extractions 	<ul style="list-style-type: none"> Removable Prosthodontics
D5821	Interim partial denture (including retentive/clasping materials, rests, and teeth), mandibular	<ul style="list-style-type: none"> Narrative of medical necessary If extractions have not yet been performed: dates of planned extractions 	<ul style="list-style-type: none"> Removable Prosthodontics
Other Removable Prosthetic Services			
D5863	Overdenture - complete maxillary	<ul style="list-style-type: none"> Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> Removable Prosthodontics
D5864	Overdenture - partial maxillary	<ul style="list-style-type: none"> Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> Removable Prosthodontics
D5865	Overdenture - complete mandibular	<ul style="list-style-type: none"> Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> Removable Prosthodontics
D5866	Overdenture - partial mandibular	<ul style="list-style-type: none"> Documentation of all missing teeth and teeth planned for extraction 	<ul style="list-style-type: none"> Removable Prosthodontics

Implant

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
Pre-Surgical Services			
D6190	Radiographic/surgical implant index, by report	<ul style="list-style-type: none"> Current dated pre-operative radiographs Narrative of necessity 	<ul style="list-style-type: none"> Dental Implant Placement and Treatment of Peri-Implant/Defects Disease
Surgical Services			
D6010	Surgical placement of implant body: endosteal implant	<ul style="list-style-type: none"> Panoramic radiograph or full mouth series 	<ul style="list-style-type: none"> Dental Implant Placement and Treatment of Peri-Implant/Defects Disease
D6012	Surgical placement of interim implant body for transitional prosthesis: endosteal implant	<ul style="list-style-type: none"> Panoramic radiograph or full mouth series 	<ul style="list-style-type: none"> Dental Implant Placement and Treatment of Peri-Implant/Defects Disease
Surgical Services			
D6013	Surgical placement of mini implant	<ul style="list-style-type: none"> Panoramic radiograph or full mouth series 	<ul style="list-style-type: none"> Dental Implant Placement and Treatment of Peri-Implant/Defects Disease
D6040	Surgical placement: eposteal implant	<ul style="list-style-type: none"> Panoramic radiograph or full mouth series 	<ul style="list-style-type: none"> Dental Implant Placement and Treatment of Peri-Implant/Defects Disease
D6102	Debridement of osseous contouring of a periimplant defect; includes surface cleaning of exposed implant surfaces and flap entry and closure	<ul style="list-style-type: none"> Radiographs of area Complete 6-point periodontal charting Narrative of necessity 	<ul style="list-style-type: none"> Dental Implant Placement and Treatment of Peri-Implant/Defects Disease
D6104	Bone graft at time of implant placement	<ul style="list-style-type: none"> Radiographs of area Narrative of necessity 	<ul style="list-style-type: none"> Dental Implant Placement and Treatment of Peri-Implant/Defects Disease
D6106	Guided tissue regeneration – resorbable barrier, per implant	<ul style="list-style-type: none"> Current pre-operative radiographs of area Narrative of necessity 	<ul style="list-style-type: none"> Dental Implant Placement and Treatment of Peri-Implant/Defects Disease
D6107	Guided tissue regeneration – non-resorbable barrier, per implant	<ul style="list-style-type: none"> Current pre-operative radiographs of area Narrative of necessity 	<ul style="list-style-type: none"> Dental Implant Placement and Treatment of Peri-Implant/Defects Disease
Implant Supported Prosthetics: Supporting Structures			
D6051	Placement of interim implant abutment	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) Narrative of medical necessity 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6192	Semi-precision attachment - placement	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6055	Connecting bar – implant supported or abutment supported	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6056	Prefabricated abutment - includes modification and placement	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6057	Custom abutment – includes placement	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
Implant Supported Prosthetics: Implant/Abutment Supported Removable Dentures			
D6110	Implant /abutment supported removable denture for edentulous arch – maxillary	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
Implant Supported Prosthetics: Implant/Abutment Supported Removable Dentures			
D6111	Implant /abutment supported removable denture for edentulous arch-mandibular	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6112	Implant /abutment supported removable denture for partially edentulous arch - maxillary	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6113	Implant /abutment supported removable denture for partially	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
Implant Supported Prosthetics: Implant/Abutment Supported Fixed Dentures (Hybrid Prosthesis)			
D6114	Implant /abutment supported fixed denture for edentulous arch – maxillary	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6115	Implant /abutment supported fixed denture for edentulous arch – mandibular	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6116	Implant /abutment supported fixed denture for partially edentulous arch - maxillary	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6117	Implant /abutment supported fixed denture for partially edentulous arch - mandibular	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
Implant Supported Prosthetics: Single Crowns, Abutment Supported			
D6058	Abutment supported porcelain/ceramic crown	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6059	Abutment supported porcelain fused to metal crown (high noble metal)	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6060	Abutment supported porcelain fused to metal crown (predominantly base metal)	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6061	Abutment supported porcelain fused to metal crown (noble metal)	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6062	Abutment supported cast metal crown (high noble metal)	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
Implant Supported Prosthetics: Single Crowns, Abutment Supported			
D6063	Abutment supported cast metal crown (predominantly base metal)	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6064	Abutment supported cast metal crown (noble metal)	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6094	Abutment supported crown - titanium and titanium alloys	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6097	Abutment supported crown - porcelain fused to titanium and titanium alloys	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6065	Implant supported porcelain/ceramic crown	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6066	Implant supported porcelain fused to metal crown (titanium, titanium alloy, high noble metal)	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6067	Implant supported metal crown (titanium, titanium alloy, high noble metal)	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6082	Implant supported crown – porcelain fused to predominantly	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6083	Implant supported crown - porcelain fused to noble alloys	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6084	Implant supported crown - porcelain fused to noble alloys	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6086	Implant supported crown - predominantly base alloys	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6087	Implant supported crown - noble alloys	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6088	Implant supported crown - titanium and titanium alloys	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
Implant Supported Prosthetics: Fixed Partial Denture Retainer, Abutment Supported			
D6068	Abutment supported retainer for porcelain/ceramic FPD	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D6069	Abutment supported retainer for porcelain fused to metal FPD (high noble metal)	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6070	Abutment supported retainer for porcelain fused to metal FPD (predominantly base metal)	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6071	Abutment supported retainer for porcelain fused to metal FPD (noble metal)	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6072	Abutment supported retainer for cast metal FPD (high noble metal)	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6073	Abutment supported retainer for cast metal FPD (predominantly base metal)	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6074	Abutment supported retainer for cast metal FPD (noble metal)	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6194	Abutment supported retainer crown for FPD – (titanium)	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6195	Abutment supported retainer – porcelain fused to titanium	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6075	Implant supported retainer for ceramic FPD	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6076	Implant supported retainer for FPD - porcelain fused to high noble alloys	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6077	Implant supported retainer for metal FPD - high noble alloys	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6098	Implant supported retainer – porcelain fused to predominantly base alloys	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
Implant Supported Prosthetics: Fixed Partial Denture Retainer, Implant Supported			
D6099	Implant supported retainer for FPD - porcelain fused to noble alloys	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6121	Implant supported retainer for metal FPD - predominantly base alloys	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D6122	Implant supported retainer for metal FPD - noble alloys	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6123	Implant supported retainer for metal FPD - titanium and titanium alloys	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
Other Implant Services			
D6080	Implant maintenance procedures when a full arch fixed hybrid prosthesis is removed and reinserted, including cleansing of prosthesis and abutments	<ul style="list-style-type: none"> Narrative of the nature of the maintenance procedure required 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6081	Scaling and debridement of a single implant in the presence of mucositis, including inflammation, bleeding upon probing and increased pocket depths; includes cleaning of the implant surfaces, without flap entry and closure	<ul style="list-style-type: none"> Radiographs of area Complete 6-point periodontal charting Narrative of necessity 	<ul style="list-style-type: none"> Dental Implant Placement and Treatment of Peri-Implant Defects/Disease
D6085	Interim implant crown	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) Narrative of medical necessity 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6091	Replacement of replaceable part of semi-precision or precision attachment of implant/abutment supported prosthesis, per attachment	<ul style="list-style-type: none"> Narrative of necessity 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6092	Re-cement or re-bond implant/abutment supported crown	<ul style="list-style-type: none"> Narrative of necessity 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
Other Implant Services			
D6093	Re-cement or re-bond implant/abutment supported fixed partial denture	<ul style="list-style-type: none"> Narrative of necessity 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6096	Remove broken implant retaining screw	<ul style="list-style-type: none"> Narrative of necessity 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6118	Implant/abutment supported interim fixed denture for edentulous arch – mandibular	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) Narrative of medical necessity 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D6119	Implant/abutment supported interim fixed denture for edentulous arch – maxillary	<ul style="list-style-type: none"> Radiographs of implant in place (post-service) or projected date of implant placement (pre-service) Narrative of medical necessity 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6198	Remove interim implant component	<ul style="list-style-type: none"> Current dated pre-operative radiograph of area Narrative of necessity 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses
D6199	Unspecified implant procedure, by report	<ul style="list-style-type: none"> Radiographs of area Narrative of necessity 	<ul style="list-style-type: none"> Dental Implant Supported Prostheses Dental Implant Placement and Treatment of Peri-Implant Defects/Disease

Fixed Prosthodontics

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
Fixed Partial Denture Pontics			
D6205	Pontic – indirect resin based composite	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth 	<ul style="list-style-type: none"> Fixed Prosthodontics
D6210	Pontic – cast high noble metal	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth 	<ul style="list-style-type: none"> Fixed Prosthodontics
D6211	Pontic – cast predominantly base metal	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth 	<ul style="list-style-type: none"> Fixed Prosthodontics
D6212	Pontic – cast noble metal	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth 	<ul style="list-style-type: none"> Fixed Prosthodontics
D6214	Pontic – titanium	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth 	<ul style="list-style-type: none"> Fixed Prosthodontics
D6240	Pontic – porcelain fused to high noble metal	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth 	<ul style="list-style-type: none"> Fixed Prosthodontics
D6241	Pontic – porcelain fused to predominantly base metal	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth 	<ul style="list-style-type: none"> Fixed Prosthodontics
D6242	Pontic – porcelain fused to noble metal	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth 	<ul style="list-style-type: none"> Fixed Prosthodontics
Fixed Partial Denture Pontics			
D6243	Pontic – porcelain fused to titanium and titanium alloys	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth 	<ul style="list-style-type: none"> Fixed Prosthodontics
D6245	Pontic – porcelain/ceramic	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth 	<ul style="list-style-type: none"> Fixed Prosthodontics
D6250	Pontic – resin with high noble metal	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth 	<ul style="list-style-type: none"> Fixed Prosthodontics
D6251	Pontic – resin with predominantly base metal	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth 	<ul style="list-style-type: none"> Fixed Prosthodontics
D6252	Pontic – resin with noble metal	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth 	<ul style="list-style-type: none"> Fixed Prosthodontics

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D6253	Provisional pontic – further treatment of completion of diagnosis necessary prior to final impression	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth • Narrative of necessity that states what further treatment or diagnosis is medically necessary 	<ul style="list-style-type: none"> • Fixed Prosthodontics
Fixed Partial Denture Retainers- Inlays/Onlays			
D6545	Retainer – cast metal for resin bonded fixed prosthesis	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6548	Retainer – porcelain/ceramic for resin bonded fixed prosthesis	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6549	Resin retainer – for resin bonded fixed prosthesis	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6600	Retainer Inlay – porcelain/ceramic, two surfaces	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6601	Retainer Inlay – porcelain/ceramic, three or more surfaces	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6602	Retainer Inlay – cast high noble metal, two surfaces	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6603	Retainer Inlay – cast high noble metal, three or more surfaces	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6604	Retainer Inlay – cast predominantly base metal, two surfaces	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6605	Retainer Inlay – cast predominantly base metal, three or more surfaces	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
Fixed Partial Denture Retainers- Inlays/Onlays			
D6606	Retainer Inlay – cast noble metal, two surfaces	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6607	Retainer Inlay – cast noble metal, three or more surfaces	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6608	Retainer Onlay – porcelain/ceramic, two surfaces	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6609	Retainer Onlay – porcelain/ceramic, three or more surfaces	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6610	Retainer onlay - cast high noble metal, two surfaces	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6611	Retainer onlay - cast high noble metal, three or more surfaces	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D6612	Retainer onlay - cast predominantly base metal, two surfaces	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6613	Retainer onlay - cast predominantly base metal, three or more surfaces	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6614	Retainer onlay - cast noble metal, two surfaces	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6615	Retainer onlay - cast noble metal, three or more surfaces	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6634	Retainer Onlay – titanium	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
Fixed Partial Denture Retainers- Crowns			
D6710	Retainer crown - indirect resin based composite	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6720	Retainer crown - resin with high noble metal	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6721	Retainer crown - resin with predominantly base metal	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6722	Retainer crown - resin with noble metal	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6740	Retainer crown - porcelain/ceramic	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6750	Retainer crown - porcelain fused to high noble metal	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
Fixed Partial Denture Retainers- Crowns			
D6751	Retainer crown - porcelain fused to predominantly base metal	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6752	Retainer crown - porcelain fused to noble metal	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6753	Retainer crown - porcelain fused to titanium and titanium alloys	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6780	Retainer crown - 3/4 cast high noble metal	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6781	Retainer crown - 3/4 cast predominantly base metal	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics
D6782	Retainer crown - 3/4 cast noble metal	<ul style="list-style-type: none"> • Full arch radiographs • Dental charting indicating missing teeth 	<ul style="list-style-type: none"> • Fixed Prosthodontics

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D6783	Retainer crown - 3/4 porcelain/ceramic	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth 	<ul style="list-style-type: none"> Fixed Prosthodontics
D6784	Retainer crown 3/4 - titanium and titanium alloys	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth 	<ul style="list-style-type: none"> Fixed Prosthodontics
D6790	Retainer crown - full cast high noble metal	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth 	<ul style="list-style-type: none"> Fixed Prosthodontics
D6791	Retainer crown - full cast predominantly base metal	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth 	<ul style="list-style-type: none"> Fixed Prosthodontics
D6792	Retainer crown - full cast noble metal	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth 	<ul style="list-style-type: none"> Fixed Prosthodontics
D6793	Interim retainer crown - further treatment or completion of diagnosis necessary prior to final impression	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth Narrative of necessity 	<ul style="list-style-type: none"> Fixed Prosthodontics
D6794	Retainer crown - titanium and titanium alloys	<ul style="list-style-type: none"> Full arch radiographs Dental charting indicating missing teeth 	<ul style="list-style-type: none"> Fixed Prosthodontics
Other Fixed Partial Denture Services			
D6980	Fixed partial denture repair necessitated by restorative material failure	<ul style="list-style-type: none"> Narrative of necessity 	<ul style="list-style-type: none"> Fixed Prosthodontics

Oral and Maxillofacial Surgery

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
Extractions (Includes Local Anesthesia, Suturing if Needed, and Routine Postoperative Care)			
D7220	Removal of impacted tooth – soft tissue	<ul style="list-style-type: none"> Panoramic radiograph Narrative of necessity 	<ul style="list-style-type: none"> Surgical Extraction of Impacted Teeth
D7230	Removal of impacted tooth – partially bony	<ul style="list-style-type: none"> Panoramic radiograph Narrative of necessity 	<ul style="list-style-type: none"> Surgical Extraction of Impacted Teeth
D7240	Removal of impacted tooth – completely bony	<ul style="list-style-type: none"> Panoramic radiograph Narrative of necessity 	<ul style="list-style-type: none"> Surgical Extraction of Impacted Teeth
D7241	Removal of impacted tooth – completely bony, with unusual surgical complications	<ul style="list-style-type: none"> Panoramic radiograph Narrative of necessity 	<ul style="list-style-type: none"> Surgical Extraction of Impacted Teeth
Other Surgical Procedures			
D7261	Primary closure of a sinus perforation	<ul style="list-style-type: none"> Panoramic radiograph Narrative of necessity 	<ul style="list-style-type: none"> Oral Surgery: Miscellaneous Surgical Procedures
Other Repair Procedures			
D7953	Bone replacement graft for ridge preservation – per site	<ul style="list-style-type: none"> Current dated radiograph of the tooth to be extracted Narrative of necessity or chart notes indicating the type of prosthesis placed or type of prosthesis treatment planned and anticipated date of placement 	<ul style="list-style-type: none"> Oral Surgery: Miscellaneous Surgical Procedures

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D7956	Guided tissue regeneration, edentulous area - resorbable barrier, per site	<ul style="list-style-type: none"> Current pre-operative radiograph of area Narrative of necessity 	<ul style="list-style-type: none"> Dental Barrier Membrane Guided Tissue Regeneration
D7957	Guided tissue regeneration, edentulous area - non-resorbable barrier, per site	<ul style="list-style-type: none"> Current pre-operative radiograph of area Narrative of necessity 	<ul style="list-style-type: none"> Dental Barrier Membrane Guided Tissue Regeneration
D7961	Buccal/labial frenectomy (frenulectomy)	<ul style="list-style-type: none"> Narrative of necessity 	<ul style="list-style-type: none"> Oral Surgery: Non-Pathologic Excisional Procedures
D7962	Lingual frenectomy (frenulectomy)	<ul style="list-style-type: none"> Narrative of necessity 	<ul style="list-style-type: none"> Oral Surgery: Non-Pathologic Excisional Procedures
D7963	Frenuloplasty	<ul style="list-style-type: none"> Narrative of necessity 	<ul style="list-style-type: none"> Oral Surgery: Non-Pathologic Excisional Procedures
D7972	Surgical reduction of fibrous tuberosity	<ul style="list-style-type: none"> Radiographs of area Narrative of necessity 	<ul style="list-style-type: none"> Oral Surgery: Non-Pathologic Excisional Procedures
D7993	Surgical placement of craniofacial implant - extra oral	<ul style="list-style-type: none"> Diagnosis Previous anticipated surgical or nonsurgical treatment Narrative explaining need for procedure 	N/A
D7994	Surgical placement: zygomatic implant	<ul style="list-style-type: none"> Diagnosis Previous anticipated surgical or nonsurgical treatment Narrative explaining need for procedure 	N/A

Orthodontics

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
Limited Orthodontic Treatment			
D8010	Limited orthodontic treatment of the primary dentition	<ul style="list-style-type: none"> EHB exception requests only: please follow state-specific documentation requirements 	<ul style="list-style-type: none"> Medically Necessary Orthodontic Treatment
D8020	Limited orthodontic treatment of the transitional dentition	<ul style="list-style-type: none"> EHB exception requests only: please follow state-specific documentation requirements 	<ul style="list-style-type: none"> Medically Necessary Orthodontic Treatment
D8030	Limited orthodontic treatment of the adolescent dentition	<ul style="list-style-type: none"> EHB exception requests only: please follow state-specific documentation requirements 	<ul style="list-style-type: none"> Medically Necessary Orthodontic Treatment
D8040	Limited orthodontic treatment of the adult dentition	<ul style="list-style-type: none"> EHB exception requests only: please follow state-specific documentation requirements 	<ul style="list-style-type: none"> Medically Necessary Orthodontic Treatment
Comprehensive Orthodontic Treatment			
D8070	Comprehensive orthodontic treatment of the transitional dentition	<ul style="list-style-type: none"> EHB exception requests only: please follow state-specific documentation requirements 	<ul style="list-style-type: none"> Medically Necessary Orthodontic Treatment
D8080	Comprehensive orthodontic treatment of the adolescent dentition	<ul style="list-style-type: none"> EHB exception requests only: please follow state-specific documentation requirements 	<ul style="list-style-type: none"> Medically Necessary Orthodontic Treatment
D8090	Comprehensive orthodontic treatment of the adult dentition	<ul style="list-style-type: none"> EHB exception requests only: please follow state-specific documentation requirements 	<ul style="list-style-type: none"> Medically Necessary Orthodontic Treatment

Adjunctive General Services

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
Anesthesia			
D9222	Deep sedation/general anesthesia – first 15 minutes	<ul style="list-style-type: none"> Anesthesia/Sedation Record including start time and stop time Narrative of necessity 	<ul style="list-style-type: none"> General Anesthesia and Conscious Sedation Services
D9223	Deep sedation/general anesthesia – each 15 minute increment	<ul style="list-style-type: none"> Anesthesia/Sedation Record including start time and stop time Narrative of necessity 	<ul style="list-style-type: none"> General Anesthesia and Conscious Sedation Services
D9230	Inhalation of nitrous oxide/anoxiolysis, analgesia	<ul style="list-style-type: none"> Anesthesia/Sedation Record including start time and stop time Narrative of necessity 	<ul style="list-style-type: none"> General Anesthesia and Conscious Sedation Services
D9239	Intravenous moderate (conscious) sedation/anesthesia – first 15 minutes	<ul style="list-style-type: none"> Anesthesia/Sedation Record including start time and stop time Narrative of necessity 	<ul style="list-style-type: none"> General Anesthesia and Conscious Sedation Services
Anesthesia			
D9243	Intravenous moderate (conscious) sedation/analgesia – each 15 minute increment	<ul style="list-style-type: none"> Anesthesia/Sedation Record including start time and stop time Narrative of necessity 	<ul style="list-style-type: none"> General Anesthesia and Conscious Sedation Services
D9248	Non-intravenous conscious sedation	<ul style="list-style-type: none"> Narrative of necessity 	<ul style="list-style-type: none"> General Anesthesia and Conscious Sedation Services
Drugs			
D9610	Therapeutic parenteral drug, single administration	<ul style="list-style-type: none"> Narrative of necessity Name of medication used and route of administration 	<ul style="list-style-type: none"> In-Office Drug Administration and Dispensing of Medications
D9612	Therapeutic parenteral drugs, two or more administrations, different medications	<ul style="list-style-type: none"> Narrative of necessity Name of medication used and route of administration 	<ul style="list-style-type: none"> In-Office Drug Administration and Dispensing of Medications
D9613	Infiltration of sustained release therapeutic drug – single or	<ul style="list-style-type: none"> Narrative of necessity 	<ul style="list-style-type: none"> In-Office Drug Administration and Dispensing of Medications
Miscellaneous Services			
D9932	Cleaning and inspection of removable complete denture, maxillary	<ul style="list-style-type: none"> Narrative of necessity 	N/A
D9933	Cleaning and inspection of removable complete denture, mandibular	<ul style="list-style-type: none"> Narrative of necessity 	N/A
D9934	Cleaning and inspection of removable partial denture, maxillary	<ul style="list-style-type: none"> Narrative of necessity 	N/A
D9935	Cleaning and inspection of removable partial denture, mandibular	<ul style="list-style-type: none"> Narrative of necessity 	N/A
D9944	Occlusal guard - hard appliance, full arch	<ul style="list-style-type: none"> Panoramic radiograph or full series Narrative of necessity 	<ul style="list-style-type: none"> Occlusal Guards
D9945	Occlusal guard - soft appliance, full arch	<ul style="list-style-type: none"> Panoramic radiograph or full series Narrative of necessity 	<ul style="list-style-type: none"> Occlusal Guards

CDT Code	Code Description	Documentation Requirements	Coverage Criteria/Related Dental Policy
D9946	Occlusal guard - hard appliance, partial arch	<ul style="list-style-type: none"><li>• Panoramic radiograph or full series<li>• Narrative of necessity	<ul style="list-style-type: none"><li>• Occlusal Guards

CDT® is a registered trademark of the American Dental Association



Dental Exclusions and Limitations

Applicable ONLY to EmblemHealth Medicare Plans in NY

1. Experimental or investigational procedures, techniques, and services as determined by the Plan are not covered.
2. Procedures to alter vertical dimension (bite height based on the resting jaw position) including but not limited to, occlusal (bite) guards and any procedures to alter vertical dimension such as periodontal splinting appliances (appliances used to splint or adhere multiple teeth together), and restorations (filings, crowns, bridges, etc.,) are not covered.
3. Services or supplies in connection with any duplicate or replacement prosthesis or appliance are not covered.
4. Restorations which are primarily cosmetic in nature, including, but not limited to laminate veneers are not covered.
5. Restoration of tooth structure lost due to attrition or abrasion is not covered.
6. Teeth whitening is not covered.
7. Bone grafts are not covered.
8. Personalized or precision attachment dentures or bridges, or specialized techniques, including the use of fixed bridgework, where a conventional clasp designed removable partial denture would restore the arch are not covered.
9. Anesthesia other than deep sedation or intravenous moderate sedation are not covered. Inhalation of nitrous oxide and non-intravenous conscious sedation (including, but not limited to, oral and IM sedation) are not covered.
10. Duplicate charges are not covered.
11. Services incurred prior to the effective date of coverage are not covered.
12. Services incurred after cancellation or termination of coverage are not covered.
13. Services or supplies that are not dentally necessary according to accepted standards of dental practice are not covered.
14. Services that are incomplete or are not delivered to the patient are not covered.
15. Services such as trauma which are customarily provided under medical-surgical coverage or services necessary as a result of a motor vehicle accident or property liability accident are not covered.
16. Services where a less expensive and clinically equivalent procedure exists are not covered. However, the benefits payable hereunder will be made only for the applicable percentage of the least costly, commonly performed course of treatment, with the balance of the treatment cost remaining the payment responsibility of the Eligible Member. This exclusion does not apply to crowns, dentures and fixed partial dentures.
17. More than one clinical oral evaluation every six (6) months are not covered.
18. More than one prophylaxis (cleaning) or periodontal maintenance procedure every six (6) months are not covered. A periodontal maintenance procedure and a prophylaxis are not allowed within the same six-month period. In the absence of a paid claim history for comprehensive periodontal therapy, periodontal maintenance procedures are not covered.
19. More than one full mouth x-ray series every thirty-six (36) months are not covered.
20. More than one bitewing x-ray series every six (6) months are not covered.
21. More than one fluoride treatment every six (6) months are not covered.
22. Adjustments or repairs to dentures performed within six (6) months of the installation of the denture are included in the service.
23. More than one denture repair per arch every twelve (12) months are not covered.
24. Services or supplies in connection with periodontal splinting (adhering multiple teeth together) are not

covered.

25. Expenses for the replacement of an existing denture which can be repaired or adjusted are not covered.
26. Additional expenses for a temporary or interim denture or other temporary or interim services (such as fillings, crowns, etc.) may be considered inclusive in other covered procedures or not covered.
27. Expenses for the replacement of prosthetics, such as a denture, crown, inlay/onlay or bridge within sixty (60) months from the date the original benefit are not covered.
28. **Dental implants, implant crowns and all associated services are not covered.** Associated services include, but are not limited to all pre-surgical services, surgical services, implant supported prosthetics, and other implant services.
29. Training in plaque control or oral hygiene, or for dietary instruction are not covered.
30. Expenses for completion of claim forms are not covered.
31. Charges for missed appointments are not covered.
32. Charges for services or supplies which are not necessary for treatment or are not recommended and approved by the attending Dentist, are not covered. The Plan will determine medical necessity based on documentation submitted by the attending Dentist.
33. Osseous and other periodontal surgical procedures more than once per quadrant every sixty (60) months are not covered.
34. More than one periodontal scaling and root planning (cleaning of the surface below the gum line) per quadrant every thirty-six (36) months are not covered.
35. Services for any condition covered by worker's compensation law, no-fault or by any other similar legislation are not covered.
36. Claims submitted more than 365 days following the date of service are not covered.
37. Services to correct or in conjunction with congenital or developmental malformations of teeth (congenitally missing teeth, supernumerary teeth, enamel and dental dysplasia, etc.) present prior to the effective date of coverage are not covered.
38. Any service or supply furnished along with, in preparation for, or as a result of a noncovered service are not covered.
39. Any service to treat myofascial pain or disorders of the joints of the jaw (temporomandibular joints; TMJ; TMD) are not covered.
40. Orthodontic services are not covered.

	Description of Service	Administrative Guidelines (2, 3, 4, 5, 9)	Covered Under Preventive Plans	Coverage Under Comprehensive Plans	Tooth/Quad/Arch Requirements	Documentation Required
Diagnostic (Exams or Preventive Oral Exams)						
D0120	Periodic oral evaluation	One (D0120, D0140, D0150, D0160, D0170, or D0180) every 6 months	Yes	Yes	None	Not Applicable
D0140	Limited oral evaluation	One (D0120, D0140, D0150, D0160, D0170, or D0180) every 6 months	Yes	Yes	None	Not Applicable
D0150	Comprehensive oral exam	One (D0120, D0140, D0150, D0160, D0170, or D0180) every 6 months	Yes	Yes	None	Not Applicable
D0160	Extensive oral exam	One (D0120, D0140, D0150, D0160, D0170, or D0180) every 6 months	Yes	Yes	None	Not Applicable
D0170	Re-evaluation - limited problem focused	One (D0120, D0140, D0150, D0160, D0170, or D0180) every 6 months	Yes	Yes	None	Not Applicable
D0180	Comprehensive periodontal evaluation	One (D0120, D0140, D0150, D0160, D0170, or D0180) every 6 months	Yes	Yes	None	Not Applicable
Radiographs (Dental X-rays)						
D0210	Intraoral - comprehensive series of radiographic images	One (D0210, D0330, or D0271) every 36 months	Yes	Yes	None	Not Applicable
D0220	Intraoral periapical - 1st radiographic image		Yes	Yes	None	Not Applicable
D0230	Intraoral periapical - each additional radiographic image		Yes	Yes	None	Not Applicable
D0240	Intraoral - occlusal radiographic image	One every six months, per arch	Yes	Yes	Arch - U/L	Not Applicable
D0270	Bitewing - single radiographic image	One (D0270, D0272, D0273, or D0274) every 6 months	Yes	Yes	None	Not Applicable
D0272	Bitewings - two radiographic images	One (D0270, D0272, D0273, or D0274) every 6 months	Yes	Yes	None	Not Applicable
D0273	Bitewings - three radiographic images	One (D0270, D0272, D0273, or D0274) every 6 months	Yes	Yes	None	Not Applicable
D0274	Bitewings - four radiographic images	One (D0270, D0272, D0273, or D0274) every 6 months	Yes	Yes	None	Not Applicable
D0277	Vertical bitewings - 7 to 8 radiographic images	One (D0210, D0330, or D0271) every 36 months	Yes	Yes	None	Not Applicable
D0330	Panoramic radiographic image	One (D0210, D0330, or D0271) every 36 months	Yes	Yes	None	Not Applicable
D0425	Caries Susceptibility Tests	Considered inclusive in all procedures. Patient cannot be charged.	Inclusive	Inclusive	None	Not Applicable
D0460	Pulp Vitality Test	Considered inclusive in all procedures. Patient cannot be charged.	Inclusive	Inclusive	Tooth - 1-32, A-I	Not Applicable
D0470	Diagnostic casts	Considered inclusive in all procedures. Patient cannot be charged.	Inclusive	Inclusive	None	Not Applicable
D0601	Caries Risk Assessment And Documentation, With a Finding of Low Risk	Considered inclusive in all procedures. Patient cannot be charged.	Inclusive	Inclusive	None	Not Applicable
D0602	Caries Risk Assessment And Documentation, With a Finding of Moderate Risk	Considered inclusive in all procedures. Patient cannot be charged.	Inclusive	Inclusive	None	Not Applicable
D0603	Caries Risk Assessment And Documentation, With a Finding of High Risk	Considered inclusive in all procedures. Patient cannot be charged.	Inclusive	Inclusive	None	Not Applicable
Preventive (Cleanings)						
D1110	Prophylaxis adult	One every 6 months	Yes	Yes	None	Not Applicable
Fluoride						
D1206	Topical application of fluoride varnish	One (D1206 or D1208) every 6 months up to age 19	Yes	Yes	None	Not Applicable
D1208	Topical application of fluoride	One (D1206 or D1208) every 6 months up to age 19	Yes	Yes	None	Not Applicable
D1330	Oral Hygiene Instruction	Considered inclusive in all procedures. Patient cannot be charged.	Inclusive	Inclusive	None	Not Applicable
D1959	Unspecified preventive procedures, by report	By Report	By Report	By Report	None	Not Applicable
Basic Restorative (Silver Fillings)						
D2140	Amalgam - one surface, primary or permanent	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, or D2394) per tooth, per surface in 24 months	No	Yes	Tooth - 1-32, A-T; Surface(s)	Not Applicable
D2150	Amalgam - two surfaces, primary or permanent	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, or D2394) per tooth, per surface in 24 months	No	Yes	Tooth - 1-32, A-T; Surface(s)	Not Applicable
D2160	Amalgam - three surfaces, primary or permanent teeth	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, or D2394) per tooth, per surface in 24 months	No	Yes	Tooth - 1-32, A-T; Surface(s)	Not Applicable
D2161	Amalgam - four or more surfaces, primary or permanent	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, or D2394) per tooth, per surface in 24 months	No	Yes	Tooth - 1-32, A-T; Surface(s)	Not Applicable
Resin Restorative (White Fillings)						
D2330	Resin based composite - 1 surface, anterior	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, or D2394) per tooth, per surface in 24 months	No	Yes	Tooth - 6-11, 22-27, C-H, M-R; Surface(s)	Not Applicable
D2331	Resin based composite - 2 surfaces, anterior	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, or D2394) per tooth, per surface in 24 months	No	Yes	Tooth - 6-11, 22-27, C-H, M-R; Surface(s)	Not Applicable
D2332	Resin based composite - 3 surfaces, anterior	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, or D2394) per tooth, per surface in 24 months	No	Yes	Tooth - 6-11, 22-27, C-H, M-R; Surface(s)	Not Applicable
D2335	Resin based composite - 4+ surfaces or involving incisal angle	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, or D2394) per tooth, per surface in 24 months	No	Yes	Tooth - 6-11, 22-27, C-H, M-R; Surface(s)	Not Applicable
D2390	Resin based composite crown, anterior	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, or D2394) per tooth, per surface in 24 months	No	Yes	Tooth - 6-11, 22-27, C-H, M-R; Surface(s)	Not Applicable
D2391	Resin based composite - 1 surface, posterior	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, or D2394) per tooth, per surface in 24 months	No	Yes	Tooth - 1-5, 12-21, 28-32, A, B, I-L, S, T; Surface(s)	Not Applicable
D2392	Resin based composite - 2 surfaces, posterior	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, or D2394) per tooth, per surface in 24 months	No	Yes	Tooth - 1-5, 12-21, 28-32, A, B, I-L, S, T; Surface(s)	Not Applicable
D2393	Resin based composite - 3 surfaces, posterior	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, or D2394) per tooth, per surface in 24 months	No	Yes	Tooth - 1-5, 12-21, 28-32, A, B, I-L, S, T; Surface(s)	Not Applicable
D2394	Resin based composite - 4+ surfaces, posterior	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, or D2394) per tooth, per surface in 24 months	No	Yes	Tooth - 1-5, 12-21, 28-32, A, B, I-L, S, T; Surface(s)	Not Applicable
Inlay/Onlay Restorations						
D2510	Inlay - metallic - one surface	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D2620, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6243, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32; Surface(s)	Not Applicable
D2520	Inlay - metallic - two surfaces	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D2620, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6243, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32; Surface(s)	Not Applicable
D2530	Inlay - metallic - three or more surfaces	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D2620, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6243, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32; Surface(s)	pre-operative periapical radiograph
D2542	Onlay - metallic - two surfaces	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D2620, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6243, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32; Surface(s)	pre-operative periapical radiograph
D2543	Onlay - metallic - three surfaces	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D2620, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6243, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32; Surface(s)	pre-operative periapical radiograph
D2544	Onlay - metallic - four or more surfaces	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D2620, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6243, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32; Surface(s)	pre-operative periapical radiograph
D2610	Inlay - porcelain/ceramic - one surface	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D2620, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6243, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32; Surface(s)	pre-operative periapical radiograph

D2940	Protective restoration-direct placement of a restorative material to protect the tooth and/or tissue form. This procedure may also be used to relieve pain, promote healing or prevent further deterioration.	By Report. Not to be used as an endodontic access closure or as a base or liner under a restoration	By Report	By Report	Tooth - 1-32, A-T	Not Applicable
D2950	Core build-up, including any pins when required	One (D2950, D2952, or D2954) per tooth per 60 months	No	Yes	Tooth - 1-32	Not Applicable
D2951	Pin retention-per tooth, in addition to restoration	Once per lifetime per tooth	No	Yes	Tooth - 1-32	Not Applicable
D2952	Post and core in addition to crown, indirectly fabricated	One (D2950, D2952, or D2954) per tooth per 60 months	No	Yes	Tooth - 1-32	Not Applicable
D2953	Each additional post, same tooth, indirectly fabricated	Only allowed in conjunction with D2952 on the same day of service	No	Yes	Tooth - 1-32	Not Applicable
D2954	prefabricated post and core in addition to crown	One (D2950, D2952, or D2954) per tooth per 60 months	No	Yes	Tooth - 1-32	Not Applicable
D2980	Crown repair necessitated by restorative material failure, by report	By Report	By Report	By Report	Tooth - 1-32	Not Applicable
D2990	Resin infiltration of incipient smooth surface lesion	By Report	No	No		Not Applicable
D2999	Unspecified restorative procedure, by report	By Report	By Report	By Report	Tooth - 1-32, A-T	narrative of medical necessity and description of service
Pulpotomy						
D3220	Therapeutic pulpotomy primary and permanent teeth (excluding final restoration)	One (D3220 or D3221) per tooth, per lifetime	No	Yes	Tooth - 1-32, A-T	Not Applicable
D3221	Gross pulpal debridement primary and permanent teeth (excluding final restoration)	One (D3220 or D3221) per tooth, per lifetime	No	Yes	Tooth - 1-32, A-T	Not Applicable
Root Canal Therapy						
D3310	Endodontic therapy (root canal), anterior	Once per permanent tooth per lifetime	No	Yes	Tooth - 6-11, 22-27	Not Applicable
D3320	Endodontic therapy (root canal), bicuspid	Once per permanent tooth per lifetime	No	Yes	Tooth - 4, 5, 12, 13, 20, 21, 28, 29	Not Applicable
D3330	Endodontic therapy (root canal), molar	Once per permanent tooth per lifetime	No	Yes	Tooth - 1-3, 14-19, 30-32	Not Applicable
D3331	Treatment of root canal obstruction; non-surgical access	Not payable as a separate procedure. Inclusive in coverage for all endodontic procedures. Patient may not be charged.	No	Inclusive	Tooth - 1-32	Not Applicable
D3346	Retreatment of previous root canal therapy, anterior	Once per tooth after 24 months of original root canal therapy. Not allowed by original treating provider	No	Yes	Tooth - 6-11, 22-27	Not Applicable
D3347	Retreatment of previous root canal therapy, bicuspid	Once per tooth after 24 months of original root canal therapy. Not allowed by original treating provider	No	Yes	Tooth - 4, 5, 12, 13, 20, 21, 28, 29	Not Applicable
D3348	Retreatment of previous root canal therapy, molar	Once per tooth after 24 months of original root canal therapy. Not allowed by original treating provider	No	Yes	Tooth - 1-3, 14-19, 30-32	Not Applicable
Apicoectomy/Periradicular Services						
D3410	Apicoectomy/periradicular surgery, anterior	Once per permanent tooth	No	Yes	Tooth - 6-11, 22-27	Not Applicable
D3421	Apicoectomy/periradicular surgery, bicuspid (first root)	Once per permanent tooth	No	Yes	Tooth - 4, 5, 12, 13, 20, 21, 28, 29	Not Applicable
D3425	Apicoectomy/periradicular surgery, molar (first root)	Once per permanent tooth	No	Yes	Tooth - 1-3, 14-19, 30-32	Not Applicable
D3426	Apicoectomy/periradicular surgery (each additional root)	One per bicuspid and two per permanent molar	No	Yes	Tooth - 1-5, 12-21, 28-32	Not Applicable
D3430	Retrograde filling - per root	A maximum allowance for one retrograde filling per root	No	Yes	Tooth - 1-32	Not Applicable
D3911	Intraorifice barrier (not to be used as a final restoration)	Not payable as a separate procedure. Inclusive in coverage for all endodontic procedures. Patient may not be charged.	No	Inclusive	Tooth; Surface	Not Applicable
D3999	Unspecified endodontic procedures, by report	By Report	By Report	By Report	None	narrative of medical necessity and description of service
Periodontal Surgical Services (including usual postoperative services)						
D4210	Gingivectomy or gingivoplasty four or more contiguous diseased teeth or bounded teeth spaces per quadrant	One (D4210 or D4211) per quadrant per 36 months	No	Yes	Quadrant (LL, LR, UL, UR)	radiographs, perio charting and photographs
D4211	Gingivectomy or gingivoplasty one to three contiguous diseased teeth or tooth bounded spaces per quadrant	One (D4210 or D4211) per quadrant per 36 months	No	Yes	Quadrant (LL, LR, UL, UR)	radiographs, perio charting and photographs
D4240	Gingival flap procedure, including root planning four or more contiguous diseased teeth or tooth bounded spaces per quadrant	One (D4240 or D4241) per quadrant per 36 months	No	Yes	Quadrant (LL, LR, UL, UR)	radiographs and perio charting
D4241	Gingival flap procedure, including root planning one to three contiguous diseased teeth or tooth bounded spaces per quadrant	One (D4240 or D4241) per quadrant per 36 months	No	Yes	Quadrant (LL, LR, UL, UR)	radiographs and perio charting
D4249	Clinical crown lengthening - hard tissue	Once per tooth per lifetime	No	Yes	Tooth - 1-32	radiographs and perio charting
D4260	Osseous surgery (including flap entry and closure) four or more contiguous diseased teeth or tooth bounded spaces per quadrant	One (D4260 or D4261) per quadrant per 60 months	No	Yes	Quadrant (LL, LR, UL, UR)	radiographs and perio charting
D4261	Osseous surgery (including flap entry and closure) one to three contiguous diseased teeth or bounded teeth spaces per quadrant	One (D4260 or D4261) per quadrant per 60 months	No	Yes	Quadrant (LL, LR, UL, UR)	radiographs and perio charting
Adjunctive Periodontal Services						
D4341	Periodontal scaling and root planning four or more diseased teeth per quadrant	One (D4341 or D4342) per quadrant per 36 months	No	Yes	Quadrant (LL, LR, UL, UR)	radiographs and perio charting
D4342	Periodontal scaling and root planing one to three diseased teeth per quadrant	One (D4341 or D4342) per quadrant per 36 months	No	Yes	Quadrant (LL, LR, UL, UR)	radiographs and perio charting
D4346	Scaling in presence of generalized moderate or severe gingival inflammation - full mouth, after oral evaluation	Two (D1110, D4346, D4910) every calendar year	No	Yes	None	Not Applicable
D4355	Full mouth debridement to enable comprehensive evaluation and diagnosis	One every 36 months	No	Yes	None	Not Applicable
Other Periodontal Services						
D4910	Periodontal maintenance procedures (following active therapy)	Once per three months when a patient has completed active periodontal therapy in the past 36 months	No	Yes	None	Not Applicable
D4999	Unspecified periodontal procedure, by report	By Report	By Report	By Report	None	narrative of medical necessity and description of service
Complete Dentures						
D5110	Complete denture - maxillary	One (D5110 or D5130) per arch per 60 months	No	Yes	Upper Arch (implied)	narrative of medical necessity and description of service
D5120	Complete denture - mandibular	One (D5120 or D5140) per arch per 60 months	No	Yes	Lower Arch (implied)	pre-operative radiographs
D5130	Immediate denture - maxillary	Once per lifetime	No	Yes	Upper Arch (implied)	pre-operative radiographs
D5140	Immediate denture - mandibular	Once per lifetime	No	Yes	Lower Arch (implied)	pre-operative radiographs
Partial Dentures						
D5211	Maxillary partial denture - resin base (including any conventional clasps, rests and teeth)	One (D5110, D5130, D5211, D5213, D5221, D5223, D5225, D5227, D5863, or D5864) every 60 months	No	Yes	Upper Arch (implied)	pre-operative radiographs
D5212	Mandibular partial denture - resin base	One (D5120, D5140, D5212, D5214, D5222, D5224, D5226, D5228, D5865, or D5866) every 60 months	No	Yes	Lower Arch (implied)	pre-operative radiographs
D5213	Maxillary part denture - cast metal framework with resin bases	One (D5110, D5130, D5211, D5213, D5221, D5223, D5225, D5227, D5863, or D5864) every 60 months	No	Yes	Upper Arch (implied)	pre-operative radiographs
D5214	Mandibular part denture - cast metal framework with resin bases	One (D5120, D5140, D5212, D5214, D5222, D5224, D5226, D5228, D5865, or D5866) every 60 months	No	Yes	Lower Arch (implied)	pre-operative radiographs
D5221	Immediate maxillary partial denture - resin base	One (D5110, D5130, D5211, D5213, D5221, D5223, D5225, D5227, D5863, or D5864) every 60 months	No	Yes	Upper Arch (implied)	pre-operative radiographs
D5222	Immediate mandibular partial denture - resin base	One (D5120, D5140, D5212, D5214, D5222, D5224, D5226, D5228, D5865, or D5866) every 60 months	No	Yes	Lower Arch (implied)	pre-operative radiographs
D5223	Immediate maxillary partial denture - cast metal framework with resin denture bases	One (D5110, D5130, D5211, D5213, D5221, D5223, D5225, D5227, D5863, or D5864) every 60 months	No	Yes	Upper Arch (implied)	pre-operative radiographs
D5224	Immediate mandibular partial denture - cast metal framework with resin denture bases	One (D5120, D5140, D5212, D5214, D5222, D5224, D5226, D5228, D5865, or D5866) every 60 months	No	Yes	Lower Arch (implied)	pre-operative radiographs
D5225	Maxillary partial denture - flexible base	One (D5110, D5130, D5211, D5213, D5221, D5223, D5225, D5227, D5863, or D5864) every 60 months	No	Yes	Upper Arch (implied)	pre-operative radiographs
D5226	Mandibular partial denture - flexible base	One (D5120, D5140, D5212, D5214, D5222, D5224, D5226, D5228, D5865, or D5866) every 60 months	No	Yes	Lower Arch (implied)	pre-operative radiographs
D5227	Immediate maxillary partial denture-flexible base (including any clasps, rests and teeth)	One (D5110, D5130, D5211, D5213, D5221, D5223, D5225, D5227, D5863, or D5864) every 60 months	No	Yes	None	pre-operative radiographs
D5228	Immediate mandibular partial denture-flexible base (including any clasps, rests and teeth)	One (D5120, D5140, D5212, D5214, D5222, D5224, D5226, D5228, D5865, or D5866) every 60 months	No	Yes	None	pre-operative radiographs
Adjustments of Removable Prosthesis						
D5410	Adjust complete denture - maxillary	Two adjustments per denture per 12 months (after 6 months from initial placement)	No	Yes	Upper Arch (implied)	Not Applicable
D5411	Adjust complete denture - mandibular	Two adjustments per denture per 12 months (after 6 months from initial placement)	No	Yes	Lower Arch (implied)	Not Applicable
D5421	Adjust partial denture - maxillary	Two adjustments per denture per 12 months (after 6 months from initial placement)	No	Yes	Upper Arch (implied)	Not Applicable
D5422	Adjust partial denture - mandibular	Two adjustments per denture per 12 months (after 6 months from initial placement)	No	Yes	Lower Arch (implied)	Not Applicable
Repairs to Complete Dentures						
D5511	Repair broken complete denture base, mandibular	Once per arch per 12 months (after 12 months from initial placement)	No	Yes	Lower Arch (implied)	Not Applicable
D5512	Repair broken complete denture base, maxillary	Once per arch per 12 months (after 12 months from initial placement)	No	Yes	Upper Arch (implied)	Not Applicable
D5520	Replace missing or broken teeth - complete denture (each tooth)	Once per tooth per 12 months (after 12 months from initial placement)	No	Yes	Tooth - 1-32	Not Applicable
D5611	Repair resin denture base, mandibular	Once per arch per 12 months	No	Yes	Lower Arch (implied)	Not Applicable
D5612	Repair resin denture base, maxillary	Once per arch per 12 months	No	Yes	Upper Arch (implied)	Not Applicable
D5621	Repair cast framework, mandibular	Once per arch per 12 months	No	Yes	Lower Arch (implied)	Not Applicable
D5622	Repair cast framework, maxillary	Once per arch per 12 months	No	Yes	Upper Arch (implied)	Not Applicable
D5630	Repair or replace broken clasp - per tooth	Once per tooth per 12 months	No	Yes	Tooth - 1-32	Not Applicable
D5640	Replace broken teeth - per tooth	Once per tooth per 12 months	No	Yes	Tooth - 1-32	Not Applicable
D5650	Add tooth to existing partial denture	Once per tooth per 12 months	No	Yes	Tooth - 1-32	Not Applicable
D5660	Add clasp to existing partial denture - per tooth	Once per tooth per 12 months	No	Yes	Tooth - 1-32	Not Applicable
Denture Rebase Procedures						

D5710	Rebase complete maxillary denture	One (D5710, D5725, D5730, or D5750) per 36 months (after 6 months from initial placement)	No	Yes	Upper Arch (implied)	Not Applicable
D5711	Rebase complete mandibular denture	One (D5711, D5725, D5731, or D5751) per 36 months (after 6 months from initial placement)	No	Yes	Lower Arch (implied)	Not Applicable
D5720	Rebase maxillary partial denture	One (D5720, D5725, D5740, or D5760) per 36 months (after 6 months from initial placement)	No	Yes	Upper Arch (implied)	Not Applicable
D5721	Rebase mandibular partial denture	One (D5721, D5725, D5741, or D5761) per 36 months (after 6 months from initial placement)	No	Yes	Lower Arch (implied)	Not Applicable
D5725	Rebase hybrid prosthesis	One (D5721, D5725, D5741, or D5761) per 36 months (after 6 months from initial placement)	No	Yes	None	Not Applicable
Denture Reline Procedures						
D5730	Reline complete maxillary denture (chairside)	One (D5710, D5725, D5730, or D5750) per 36 months (after 6 months from initial placement)	No	Yes	Upper Arch (implied)	Not Applicable
D5731	Reline complete mandibular denture (chairside)	One (D5711, D5725, D5731, or D5751) per 36 months (after 6 months from initial placement)	No	Yes	Lower Arch (implied)	Not Applicable
D5740	Reline maxillary partial denture (chairside)	One (D5720, D5725, D5740, or D5760) per 36 months (after 6 months from initial placement)	No	Yes	Upper Arch (implied)	Not Applicable
D5741	Reline mandibular partial denture (chairside)	One (D5721, D5741, D5761, or D5765) per 36 months (after 6 months from initial placement)	No	Yes	Lower Arch (implied)	Not Applicable
D5750	Reline complete maxillary denture (laboratory)	One (D5710, D5730, D5750, or D5765) per 36 months (after 6 months from initial placement)	No	Yes	Upper Arch (implied)	Not Applicable
D5751	Reline complete mandibular denture (laboratory)	One (D5711, D5731, D5751, or D5765) per 36 months (after 6 months from initial placement)	No	Yes	Lower Arch (implied)	Not Applicable
D5760	Reline maxillary partial denture (laboratory)	One (D5720, D5740, D5760, D5765) per 36 months (after 6 months from initial placement)	No	Yes	Upper Arch (implied)	Not Applicable
D5761	Reline mandibular partial denture (laboratory)	One (D5721, D5741, D5761, or D5765) per 36 months (after 6 months from initial placement)	No	Yes	Lower Arch (implied)	Not Applicable
D5765	Soft liner for complete or partial removable denture - indirect	One (D5721, D5741, D5761, or D5765) per 36 months (after 6 months from initial placement)	No	Yes	None	Not Applicable
Other Removable Prosthetic Services						
D5850	Tissue conditioning maxillary	Twice per denture per 36 months after 6 months from initial insertion	No	Yes	Upper Arch (implied)	Not Applicable
D5851	Tissue conditioning mandibular	Twice per denture per 36 months after 6 months from initial insertion	No	Yes	Lower Arch (implied)	Not Applicable
D5863	Overdenture - complete maxillary	One (D5110, D5130, D5211, D5213, D5221, D5223, D5225, D5227, D5863, or D5864) every 60 months	No	Yes	Upper Arch (implied)	pre-operative radiographs and narrative
D5864	Overdenture - partial maxillary	One (D5110, D5130, D5211, D5213, D5221, D5223, D5225, D5227, D5863, or D5864) every 60 months	No	Yes	Upper Arch (implied)	pre-operative radiographs and narrative
D5865	Overdenture - complete mandibular	One (D5120, D5140, D5212, D5214, D5222, D5224, D5226, D5228, D5865, or D5866) every 60 months	No	Yes	Lower Arch (implied)	pre-operative radiographs and narrative
D5866	Overdenture - partial mandibular	One (D5120, D5140, D5212, D5222, D5224, D5226, D5228, D5865, or D5866) every 60 months	No	Yes	Lower Arch (implied)	pre-operative radiographs and narrative
D5876	Add metal substructure to acrylic full denture (per arch)	Only allowed on the same date of service as D5110, D5120, D5130, or D5140	No	Yes	Arch - U/L	pre-operative radiographs
D5889	Unspecified removable prosthodontic procedures, by report	By Report	By Report	By Report	None	narrative of medical necessity and description of service
D5999	Unspecified maxillofacial prosthesis, by report	By Report	By Report	By Report	None	narrative of medical necessity and description of service
Fixed Partial Denture Pontics						
D6205	Pontic - indirect resin based composite	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32	pre-operative radiographs
D6210	Pontic - cast high noble metal	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32	pre-operative radiographs
D6211	Pontic - cast predominately base metal	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32	pre-operative radiographs
D6212	Pontic - cast noble metal	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32	pre-operative radiographs
D6214	Pontic - titanium	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32	pre-operative radiographs
D6240	Pontic - porcelain fused-high noble	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32	pre-operative radiographs
D6241	Pontic - porcelain fused metal	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32	pre-operative radiographs
D6242	Pontic - porcelain fused-noble metal	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32	pre-operative radiographs
D6245	Pontic - porcelain ceramic substrate	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32	pre-operative radiographs

D6751	Retainer crown - porcelain fused to metal	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D26205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32	pre-operative radiographs	
D6752	Retainer crown - porcelain fused noble metal	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D26205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32	pre-operative radiographs	
D6780	Retainer crown - 3/4 cast high noble	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D26205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32	pre-operative radiographs	
D6781	Retainer crown - 3/4 cast predominately base metal	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D26205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32	pre-operative radiographs	
D6782	Retainer crown - 3/4 cast noble metal	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D26205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32	pre-operative radiographs	
D6790	Retainer crown - full cast high noble	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D26205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32	pre-operative radiographs	
D6791	Retainer crown - full cast base metal	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D26205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32	pre-operative radiographs	
D6792	Retainer crown - full cast noble metal	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D26205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32	pre-operative radiographs	
D6793	Provisional retainer crown	Should be inclusive in final restoration. Patient cannot be charged.	No	Inclusive	Tooth - 1-32	pre-operative radiographs	
D6794	Retainer crown - titanium	One inlay, onlay, crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D26205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, or D6794) per tooth per 60 months	No	Yes	Tooth - 1-32	pre-operative radiographs	
Other Fixed Partial Denture Services							
D6930	Re-cement fixed partial denture	Limited to two (2) occurrences per year per tooth (after 6 months from placement)	No	Yes	Tooth - 1-32	Not Applicable	
D6980	Fixed partial denture repair, by report	By Report	By Report	By Report	Tooth - 1-32	Not Applicable	
D6999	Unspecified fixed prosthodontics procedures, by report	By Report	By Report	By Report	None	narrative of medical necessity and description of service	
Oral and Maxillofacial Surgery (Oral Surgery or Extractions)							
D7140	Extraction - erupted tooth or exposed root	Once per tooth per lifetime	No	Yes	Tooth - 1-32, 51-82, A-T, AS-TS	Not Applicable	
D7210	Surgical removal of erupted tooth requiring removal of bone and/or section of tooth	Once per tooth per lifetime	No	Yes	Tooth - 1-32, 51-82, A-T, AS-TS	pre-operative radiographs	
D7220	Removal impacted tooth - soft tissue	Once per tooth per lifetime	No	Yes	Tooth - 1-32, 51-82, A-T, AS-TS	pre-operative radiographs	
D7230	Removal of impacted tooth - partially bony	Once per tooth per lifetime	No	Yes	Tooth - 1-32, 51-82, A-T, AS-TS	pre-operative radiographs	
D7240	Removal of impact tooth - completely bony	Once per tooth per lifetime	No	Yes	Tooth - 1-32, 51-82, A-T, AS-TS	pre-operative radiographs	
D7241	Removal of impacted tooth - completely bony, with unusual surgical complications	Once per tooth per lifetime	No	Yes	Tooth - 1-32, 51-82, A-T, AS-TS	pre-operative radiographs	
D7250	Surgical removal of residual roots	Once per tooth per lifetime. Not allowed by original treating provider.	No	Yes	Tooth - 1-32, 51-82, A-T, AS-TS	pre-operative radiographs	
D7251	Coronectomy	Once per tooth per lifetime	No	Yes	Tooth - 1-32, 51-82, A-T, AS-TS	pre-operative radiographs	
Other Surgical Procedures							
D7260	Oral/intral fistula closure	One (D7260 or D7261) per lifetime	No	Yes	Tooth - 1-32	Not Applicable	
D7261	Primary closure of a sinus perforation	One (D7260 or D7261) per lifetime	No	Yes	Quadrant - L/LR/U/LUR	Not Applicable	
D7285	Incisional biopsy of oral tissue-hard (bone, tooth)		No	Yes	Tooth	Not Applicable	
D7286	Incisional biopsy of oral tissue-soft		No	Yes	Tooth	Not Applicable	
Vestibuloplasty							
D7310	Alveoloplasty with extractions four or more teeth or tooth spaces per quadrant	One (D7310 or D7311) per quadrant per lifetime	No	Yes	Quadrant - L/LR/U/LUR	pre-operative radiographs	
D7311	Alveoloplasty in conjunction with extractions one to three teeth or tooth spaces per quadrant	One (D7310 or D7311) per quadrant per lifetime	No	Yes	Quadrant - L/LR/U/LUR	pre-operative radiographs	
D7320	Alveoloplasty not in conjunction with extractions four or more teeth or tooth spaces per quadrant	One (D7320 or D7321) per quadrant per lifetime	No	Yes	Quadrant - L/LR/U/LUR	pre-operative radiographs	
D7321	Alveoloplasty not in conjunction with extractions one to three teeth or tooth spaces per quadrant	One (D7320 or D7321) per quadrant per lifetime	No	Yes	Quadrant - L/LR/U/LUR	pre-operative radiographs	
Vestibuloplasty							
D7340	Vestibuloplasty - ridge extension (secondary epithelialization)	One (D7340 or D7350) per arch per lifetime	No	Yes	Arch - U/L	Not Applicable	
D7350	Vestibuloplasty - ridge extension (including soft tissue grafts, muscle re-attachment, revision of soft tissue attachment and management of hypertrophied and hyperplastic tissue)	One (D7340 or D7350) per arch per lifetime	No	Yes	Arch - U/L	Not Applicable	
Surgical Excision of Reactive Inflammatory Lesions							
D7410	Excision of benign lesion of up 1.25 cm		No	Yes	None	narrative of medical necessity and description of service	
D7411	Excision of benign lesion greater than 1.25 cm		No	Yes	Tooth - 1-32	narrative of medical necessity and description of service	

D7440	Excision of malignant tumor - lesion diameter up to 1.25 cm	Submit pathology report to medical. Procedure is not covered within the scope of the den plan.	No	No	None	narrative of medical necessity and description of service
D7441	Excision of malignant tumor - lesion diameter greater than 1.25 cm	Submit pathology report to medical. Procedure is not covered within the scope of the den plan.	No	No	None	narrative of medical necessity and description of service
D7450	Removal of benign odontogenic cyst or tumor - lesion diameter up to 1.25 cm		No	Yes	Tooth - 1-32	narrative of medical necessity and description of service
D7451	Removal of benign odontogenic cyst or tumor - lesion diameter greater than 1.25 cm		No	Yes	None	narrative of medical necessity and description of service
D7460	Removal of benign nonodontogenic cyst or tumor - lesion diameter up to 1.25 cm		No	Yes	Quadrant - LL/LR/UL/UR	narrative of medical necessity and description of service
D7461	Removal of benign nonodontogenic cyst or tumor - lesion diameter greater than 1.25 cm		No	Yes	Quadrant - LL/LR/UL/UR	narrative of medical necessity and description of service
D7471	Removal of lateral exostosis (maxilla or mandible)	Once per arch per 60 months	No	Yes	Arch - U/L	narrative of medical necessity and description of service
D7472	Removal of torus palatinus	Once per 60 months	No	Yes	None	narrative of medical necessity and description of service
D7473	Removal of torus mandibularis	Once per quadrant per 60 months	No	Yes	None	narrative of medical necessity and description of service
D7485	Surgical reduction of osseous tuberosity	2 per lifetime, regardless of provider	No	Yes	None	narrative of medical necessity and description of service
Surgical Incision						
D7509	Marsupialization	Once per site per lifetime per patient	No	Yes	None	narrative of medical necessity and description of service
D7510	Incision and drainage of abscess - intraoral soft tissue	Not payable on the same date of service as root canal or associated surgical procedure	No	Yes	Tooth - 1-32, 51-82, A-T, AS-TS	Not Applicable
D7511	Incision and drainage of abscess - intraoral soft tissue - complicated (includes drainage of multiple fascial spaces)	By Report	No	By Report	Tooth - 1-32	narrative of medical necessity and description of service
D7520	Incision and drainage of abscess - extraoral soft tissue	Not payable on the same date of service as root canal or associated surgical procedure	No	Yes	None	Not Applicable
D7521	Incision and drainage of abscess - extraoral soft tissue - complicated (includes drainage of multiple fascial spaces)	Not payable on the same date of service as root canal or associated surgical procedure	No	Yes	None	Not Applicable
Other Repair Procedures						
D7963	Frenuloplasty	One (D7963 or D7960) per arch per lifetime	No	Yes	None	narrative and photographs
D7970	Excision of hyperplastic tissue - per arch	By Report	By Report	By Report	Arch - U/L	narrative, radiographs and photographs
D7971	Excision of pericoronal gingiva	By Report	By Report	By Report	Tooth - 1-32	narrative, radiographs and photographs
D7999	Unspecified oral surgery procedure, by report	By Report	By Report	By Report	None	narrative of medical necessity and description of service
Adjunctive General Services ("Emergency Services")						
D9110	Palliative (emergency) treatment of dental pain - minor procedure	Limited to two (2) per provider per incident. Not allowed with any other services other than radiographs	No	Yes	None	Not Applicable
Anesthesia						
D9210	Local anesthesia not in conjunction with operative or surgical procedure	Considered inclusive in all procedures. Patient cannot be charged	No	Inclusive	None	Not Applicable
D9211	Regional block anesthesia	Considered inclusive in all procedures. Patient cannot be charged	No	Inclusive	None	Not Applicable
D9212	Trigeminal division block anesthesia	Considered inclusive in all procedures. Patient cannot be charged	No	Inclusive	None	Not Applicable
D9215	Local anesthesia	Considered inclusive in all procedures. Patient cannot be charged	No	Inclusive	None	Not Applicable
D9222	Deep Sedation/general anesthesia - first 15 minutes	Two (2) D9222 per 1 week(s); a benefit only when administered by a properly licensed dentist in a dental office and in conjunction with removal of impacted teeth	No	Yes	None	narrative treatment record (including anesthesia records)
D9223	Deep Sedation/general anesthesia - each subsequent 15 minute increment	Four (4) D9223 per day(s) per patient. Limit up to one (1) hour or four (4) 15-minute increments; a benefit only when administered by a properly licensed dentist in a dental office and in conjunction with removal of impacted teeth	No	Yes	None	narrative treatment record (including anesthesia records)
D9230	Inhalation of nitrous oxide/analgesia, anxiolysis	One per member per date of service. Not allowed with another anesthesia service (D9222, D9223, D9239, D9243, or D9248) on the same day	No	Yes	None	narrative treatment record (including anesthesia records)
D9239	Intravenous moderate (conscious) - first 15 minutes	Two (2) D9239 per 1 week(s) per patient; a benefit only when administered by a properly licensed dentist in a dental office and in conjunction with removal of impacted teeth	No	Yes	None	narrative treatment record (including anesthesia records)
D9243	Intravenous moderate (conscious) - each subsequent 15 minute increment	Four (4) D9243 per day(s) per patient. Limit up to one (1) hour or four (4) 15-minute increments; a benefit only when administered by a properly licensed dentist in a dental office and in conjunction with removal of impacted teeth	No	Yes	None	narrative treatment record (including anesthesia records)
D9248	Non-intravenous moderate (conscious) sedation	One per member per date of service. Not allowed with (D9222, D9223, D9230, D9239, or D9243) on the same day	No	Yes	None	narrative treatment record (including anesthesia records)
Professional Consultation						
D9310	Consultation - diagnostic service provided by dentist or physician other than requesting dentist or physician	Once every three months and not payable within 90 days of any exam by the same provider, office or associated dentists	No	Yes	None	Not Applicable
Professional Visits						
D9430	Office visit for observation (during regularly scheduled hours) - no other services performed	Once every three months	Yes	Yes	None	Not Applicable
Miscellaneous Services						
D9951	Occlusal adjustment - limited	Not payable on same date of service as related services. Procedure considered "included" in other related services. When this occurs, patient cannot be billed for service. If payable one per 60 months, per patient	No	Yes	Tooth - 1-32	narrative of medical necessity and description of service
D9952	Occlusal adjustment - complete	One per 60 months, per patient. By Report. Not payable on same date of service as related services	By Report	By Report	None	narrative of medical necessity and description of service
D9995	Telodentistry - synchronous; real time encounter	Considered inclusive in all procedures. Patient cannot be charged	Inclusive	Inclusive	None	Not Applicable

ANY PROCEDURE CODES NOT LISTED, WILL NOT BE COVERED UNDER EITHER THE PREVENTIVE OR COMPREHENSIVE PLANS.

COVERAGE DECISIONS ARE GOVERNED BY ADMINISTRATIVE GUIDELINES.

ALL COVERAGE GUIDELINES ARE SUBJECT TO PROFESSIONAL (MEDICAL/DENTAL) REVIEW.

SEE YOUR PLANS "DENTAL EXCLUSIONS AND LIMITATIONS"

ALL PROCEDURES INDICATED AS "BY REPORT" WILL BE INDIVIDUALLY EVALUATED BASED ON SUBMISSION OF NECESSARY SUPPORTING DOCUMENTATION (e.g. narrative of

medical necessity, pre-op x-ray(s), etc.). COVERAGE IS NOT GUARANTEED.

PRE-AUTHORIZATION IS RECOMMENDED FOR SERVICES. FREQUENCIES AND OTHER LIMITATIONS MAY APPLY.



Dental Exclusions and Limitations

Applicable **ONLY** to ConnectiCare Medicare PPO Plans (NOT Indemnity Plans)

1. Experimental or investigational procedures, techniques, and services as determined by the Plan are not covered.
2. Procedures to alter vertical dimension (bite height based on the resting jaw position) including but not limited to, occlusal (bite) guards and any procedures to alter vertical dimension such as periodontal splinting appliances (appliances used to splint or adhere multiple teeth together), and restorations (filings, crowns, bridges, etc.,) are not covered.
3. Services or supplies in connection with any duplicate or replacement prosthesis or appliance are not covered.
4. Restorations which are primarily cosmetic in nature, including, but not limited to laminate veneers are not covered.
5. Restoration of tooth structure lost due to attrition or abrasion is not covered.
6. Teeth whitening is not covered.
7. Bone grafts are not covered
8. Personalized or precision attachment dentures or bridges, or specialized techniques, including the use of fixed bridgework, where a conventional clasp designed removable partial denture would restore the arch are not covered.
9. Duplicate charges are not covered.
10. Services incurred prior to the effective date of coverage are not covered.
11. Services incurred after cancellation or termination of coverage are not covered.
12. Services or supplies that are not dentally necessary according to accepted standards of dental practice are not covered.
13. Services that are incomplete or are not delivered to the patient are not covered.
14. Services such as trauma which are customarily provided under medical-surgical coverage or services necessary as a result of a motor vehicle accident or property liability accident are not covered.
15. Services where a less expensive and clinically equivalent procedure exists are not covered. However, the benefits payable hereunder will be made only for the applicable percentage of the least costly, commonly performed course of treatment, with the balance of the treatment cost remaining the payment responsibility of the Eligible Member. This exclusion does not apply to crowns, dentures and fixed partial dentures.
16. Clinical oral evaluations are covered, but frequency is limited by the type of evaluation. Please review the list of covered procedure codes.
17. More than one prophylaxis (cleaning) or periodontal maintenance procedures every six (6) months are not covered. A periodontal maintenance procedure and a prophylaxis are not allowed within the same six-month period. In the absence of a paid claim history for comprehensive periodontal therapy, periodontal maintenance procedures are not covered.
18. More than one full mouth x-ray series every thirty-six (36) months are not covered.
19. More than one bitewing x-ray series every six (6) months are not covered.
20. More than one fluoride treatment every six (6) months are not covered.
21. Adjustments or repairs to dentures performed within six (6) months of the installation of the denture are included in the service.
22. More than one denture repair per arch every twelve (12) months are not covered.
23. Services or supplies in connection with periodontal splinting (adhering multiple teeth together) are not covered.

24. Expenses for the replacement of an existing denture which can be repaired or adjusted are not covered.
25. Additional expenses for a temporary or interim denture or other temporary or interim services (fillings, crowns, etc.) may be considered inclusive in other covered procedures or not covered.
26. Expenses for the replacement of prosthetics, such as a denture, crown, inlay/onlay, implant and implant-related services, or bridge within sixty (60) months from the date the original benefit are not covered.
27. Training in plaque control or oral hygiene, or for dietary instruction are not covered.
28. Services incurred in excess of the benefit year maximum are not covered.
29. Expenses for completion of claim forms are not covered.
30. Charges for missed appointments are not covered.
31. Charges for services or supplies which are not necessary for treatment or are not recommended and approved by the attending Dentist, are not covered. The Plan will determine medical necessity based on documentation submitted by the attending Dentist.
32. Osseous and other periodontal surgical procedures more than once per quadrant every thirty-six (36) months are not covered.
33. More than one periodontal scaling and root planning (cleaning of the surface below the gum line) per quadrant every thirty-six (36) months is not covered.
34. Services for any condition covered by worker's compensation law, no-fault or by any other similar legislation are not covered.
35. Claims submitted more than 365 days following the date of service are not covered.
36. Services to correct or in conjunction with congenital or developmental malformations of teeth (congenitally missing teeth, supernumerary teeth, enamel and dental dysplasia, etc.) present prior to the effective date of coverage are not covered.
37. Any service or supply furnished along with, in preparation for, or as a result of a noncovered service are not covered.
38. Any service to treat myofascial pain or disorders of the joints of the jaw (temporomandibular joints; TMJ; TMD) are not covered.
39. Orthodontic services are not covered.

Code (#)	Description of Service	Administrative Guidelines (2,3,4,5,9)	Covered Under Preventive Plans	Coverage Under Comprehensive Plans	Tooth/Quad/Arch Requirements	Documentation Required
	Diagnostic (Exams or Preventive Oral Exams)					
D0120	Periodic oral evaluation - established patient	One (D0120, D0160 or D0170) every 6 months	Yes	Yes	None	Not Applicable
D0140	Limited oral evaluation - problem focused	3 every 12 months. Not allowed with routine services	Yes	Yes	None	Not Applicable
D0150	Comprehensive oral evaluation - new or established patient	One (D0150 or D0180) every 36 months, per provider or location; Two (D0120, D0150, D0180) every 12 months per provider or location	Yes	Yes	None	Not Applicable
D0160	Detailed and extensive oral evaluation - problem focused, by report	Two (D0120, D0160, D0170) every 12 months	Yes	Yes	None	Not Applicable
D0170	Re-evaluation, limited problem focused	Two (D0120, D0160, D0170) every 12 months	Yes	Yes	None	Not Applicable
D0180	Comprehensive periodontal evaluation - new or established patient	One (D0150 or D0180) every 36 months, per provider or location; Two (D0120, D0150, D0180) every 12 months per provider or location	Yes	Yes	None	Not Applicable
	Radiographs (Dental-X-rays)					
D0210	Intraoral - comprehensive series of radiographic images	One (D0210, D0330 or D0277) every 36 months	Yes	Yes	None	Not Applicable
D0220	Intraoral - periapical first radiographic image		Yes	Yes	None	Not Applicable
D0230	Intraoral - periapical each additional radiographic image		Yes	Yes	None	Not Applicable
D0240	Intraoral - occlusal radiographic image	One every six months, per arch	Yes	Yes	Arch - U/L	Not Applicable
D0270	Bitewing - single radiographic image	One (D0270, D0272, D0273 or D0274) every 12 months	Yes	Yes	None	Not Applicable
D0272	Bitewings - two radiographic images	One (D0270, D0272, D0273 or D0274) every 12 months	Yes	Yes	None	Not Applicable
D0273	Bitewings - three radiographic images	One (D0270, D0272, D0273 or D0274) every 12 months	Yes	Yes	None	Not Applicable
D0274	Bitewings - four radiographic images	One (D0270, D0272, D0273 or D0274) every 12 months	Yes	Yes	None	Not Applicable
D0277	Vertical bitewings - 7 to 8 films	One (D0270, D0330 or D0277) every 36 months	Yes	Yes	None	Not Applicable
D0330	Panoramic radiographic image	One (D0210, D0330 or D0277) every 36 months	Yes	Yes	None	Not Applicable
D0425	Caries susceptibility tests	Considered inclusive in all procedures. Patient cannot be charged	Inclusive	Inclusive	None	Not Applicable
D0460	Pulp Vitality Test	Considered inclusive in all procedures. Patient cannot be charged	Inclusive	Inclusive	Tooth - 1-32	Not Applicable
D0470	Diagnostic casts	Considered inclusive in all procedures. Patient cannot be charged	Inclusive	Inclusive	None	Not Applicable
D0601	Caries Risk Assessment And Documentation, With a Finding of Low Risk	Considered inclusive in all procedures. Patient cannot be charged	Inclusive	Inclusive	None	Not Applicable
D0602	Caries Risk Assessment And Documentation, With a Finding of Moderate Risk	Considered inclusive in all procedures. Patient cannot be charged	Inclusive	Inclusive	None	Not Applicable
D0603	Caries Risk Assessment And Documentation, With a Finding of High Risk	Considered inclusive in all procedures. Patient cannot be charged	Inclusive	Inclusive	None	Not Applicable
	Preventive (Cleanings)					
D1110	Prophylaxis - adult	One (D1110, D4346 or D4910) every six months	Yes	Yes	None	Not Applicable
	Fluoride					
D1206	Topical application of fluoride varnish	One (D1206 or D1208) every 6 months up to age 19	Yes	Yes	None	Not Applicable
D1208	Topical application of fluoride	One (D1206 or D1208) every 6 months up to age 19	Yes	Yes	None	Not Applicable
D1330	Oral Hygiene Instruction	Considered inclusive in all procedures. Patient cannot be charged	No	Inclusive	None	Not Applicable
D1999	Unspecified preventive procedures, by report	By Report	No	By Report	None	Not Applicable
	Basic Restorative (Silver Fillings)					
D2140	Amalgam - one surface, primary or permanent	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, D2394 or D2990) per tooth, per surface, in 12 months. Codes D2140, D2150, D2160, D2161, D2330, D2331, D2332 and D2335 are not allowed once D2390 or other crown service paid	No	Yes	Tooth - 1-32, A-T; Surface(s)	Not Applicable
D2150	Amalgam - two surfaces, primary or permanent	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, D2394 or D2990) per tooth, per surface, in 12 months. Codes D2140, D2150, D2160, D2161, D2330, D2331, D2332 and D2335 are not allowed once D2390 or other crown service paid	No	Yes	Tooth - 1-32, A-T; Surface(s)	Not Applicable
D2160	Amalgam - three surfaces, primary or permanent	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, D2394 or D2990) per tooth, per surface, in 12 months. Codes D2140, D2150, D2160, D2161, D2330, D2331, D2332 and D2335 are not allowed once D2390 or other crown service paid	No	Yes	Tooth - 1-32, A-T; Surface(s)	Not Applicable
D2161	Amalgam - four or more surfaces, primary or permanent	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, D2394 or D2990) per tooth, per surface, in 12 months. Codes D2140, D2150, D2160, D2161, D2330, D2331, D2332 and D2335 are not allowed once D2390 or other crown service paid	No	Yes	Tooth - 1-32, A-T; Surface(s)	Not Applicable
	Resin Restorative (White Fillings)					
D2330	Resin-based composite - one surface, anterior	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, D2394 or D2990) per tooth, per surface, in 12 months. Codes D2140, D2150, D2160, D2161, D2330, D2331, D2332 and D2335 are not allowed once D2390 or other crown service paid	No	Yes	Tooth - 6-11, 22-27, C-H, M-R; Surface(s)	Not Applicable
D2331	Resin-based composite - two surfaces, anterior	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, D2394 or D2990) per tooth, per surface, in 12 months. Codes D2140, D2150, D2160, D2161, D2330, D2331, D2332 and D2335 are not allowed once D2390 or other crown service paid	No	Yes	Tooth - 6-11, 22-27, C-H, M-R; Surface(s)	Not Applicable
D2332	Resin-based composite - three surfaces, anterior	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, D2394 or D2990) per tooth, per surface, in 12 months. Codes D2140, D2150, D2160, D2161, D2330, D2331, D2332 and D2335 are not allowed once D2390 or other crown service paid	No	Yes	Tooth - 6-11, 22-27, C-H, M-R; Surface(s)	Not Applicable
D2335	Resin-based composite - four or more surfaces or involving incisal angle (anterior)	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, D2394 or D2990) per tooth, per surface, in 12 months. Codes D2140, D2150, D2160, D2161, D2330, D2331, D2332 and D2335 are not allowed once D2390 or other crown service paid	No	Yes	Tooth - 6-11, 22-27, C-H, M-R; Surface(s)	Not Applicable
D2390	Resin-based composite crown, anterior	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, D2394 or D2990) per tooth, per surface, in 12 months. Codes D2140, D2150, D2160, D2161, D2330, D2331, D2332 and D2335 are not allowed once D2390 or other crown service paid	No	Yes	Tooth - 6-11, 22-27, C-H, M-R; Surface(s)	Not Applicable
D2391	Resin-based composite - one surface, posterior	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, D2394 or D2990) per tooth, per surface, in 12 months. Codes D2140, D2150, D2160, D2161, D2330, D2331, D2332 and D2335 are not allowed once D2390 or other crown service paid	No	Yes	Tooth - 1-5, 12-21, 28-32, A, B, I-L, S, T; Surface(s)	Not Applicable
D2392	Resin-based composite - two surfaces, posterior	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, D2394 or D2990) per tooth, per surface, in 12 months. Codes D2140, D2150, D2160, D2161, D2330, D2331, D2332 and D2335 are not allowed once D2390 or other crown service paid	No	Yes	Tooth - 1-5, 12-21, 28-32, A, B, I-L, S, T; Surface(s)	Not Applicable
D2393	Resin-based composite - three surfaces, posterior	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, D2394 or D2990) per tooth, per surface, in 12 months. Codes D2140, D2150, D2160, D2161, D2330, D2331, D2332 and D2335 are not allowed once D2390 or other crown service paid	No	Yes	Tooth - 1-5, 12-21, 28-32, A, B, I-L, S, T; Surface(s)	Not Applicable
D2394	Resin-based composite - four or more surfaces, posterior	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, D2394 or D2990) per tooth, per surface, in 12 months. Codes D2140, D2150, D2160, D2161, D2330, D2331, D2332 and D2335 are not allowed once D2390 or other crown service paid	No	Yes	Tooth - 1-5, 12-21, 28-32, A, B, I-L, S, T; Surface(s)	Not Applicable

D2780	Crown - ¾ cast high noble metal	One inlay, onlay, standard crown, implant crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2650, D2651, D2652, D2662, D2663, D2664, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6058, D6059, D6060, D6061, D6062, D6063, D6064, D6065, D6066, D6067, D6068, D6069, D6070, D6071, D6072, D6073, D6074, D6075, D6076, D6077, D6094, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, D6793, or D6794) every 60 months per tooth	No	Yes	Tooth - 1-32	pre-operative periapical radiograph
D2781	Crown - ¾ cast predominantly base metal	One inlay, onlay, standard crown, implant crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2650, D2651, D2652, D2662, D2663, D2664, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6058, D6059, D6060, D6061, D6062, D6063, D6064, D6065, D6066, D6067, D6068, D6069, D6070, D6071, D6072, D6073, D6074, D6075, D6076, D6077, D6094, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, D6793, or D6794) every 60 months per tooth	No	Yes	Tooth - 1-32	pre-operative periapical radiograph
D2782	Crown - ¾ cast noble metal	One inlay, onlay, standard crown, implant crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2650, D2651, D2652, D2662, D2663, D2664, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6058, D6059, D6060, D6061, D6062, D6063, D6064, D6065, D6066, D6067, D6068, D6069, D6070, D6071, D6072, D6073, D6074, D6075, D6076, D6077, D6094, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, D6793, or D6794) every 60 months per tooth	No	Yes	Tooth - 1-32	pre-operative periapical radiograph
D2783	Crown - ¾ porcelain/ceramic	One inlay, onlay, standard crown, implant crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2650, D2651, D2652, D2662, D2663, D2664, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6058, D6059, D6060, D6061, D6062, D6063, D6064, D6065, D6066, D6067, D6068, D6069, D6070, D6071, D6072, D6073, D6074, D6075, D6076, D6077, D6094, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, D6793, or D6794) every 60 months per tooth	No	Yes	Tooth - 1-32	pre-operative periapical radiograph
D2790	Crown - full cast high noble metal	One inlay, onlay, standard crown, implant crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2650, D2651, D2652, D2662, D2663, D2664, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6058, D6059, D6060, D6061, D6062, D6063, D6064, D6065, D6066, D6067, D6068, D6069, D6070, D6071, D6072, D6073, D6074, D6075, D6076, D6077, D6094, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, D6793, or D6794) every 60 months per tooth	No	Yes	Tooth - 1-32	pre-operative periapical radiograph
D2791	Crown - full cast predominantly base metal	One inlay, onlay, standard crown, implant crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2650, D2651, D2652, D2662, D2663, D2664, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6058, D6059, D6060, D6061, D6062, D6063, D6064, D6065, D6066, D6067, D6068, D6069, D6070, D6071, D6072, D6073, D6074, D6075, D6076, D6077, D6094, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, D6793, or D6794) every 60 months per tooth	No	Yes	Tooth - 1-32	pre-operative periapical radiograph
D2792	Crown - full cast noble metal	One inlay, onlay, standard crown, implant crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2650, D2651, D2652, D2662, D2663, D2664, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6058, D6059, D6060, D6061, D6062, D6063, D6064, D6065, D6066, D6067, D6068, D6069, D6070, D6071, D6072, D6073, D6074, D6075, D6076, D6077, D6094, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, D6793, or D6794) every 60 months per tooth	No	Yes	Tooth - 1-32	pre-operative periapical radiograph
D2794	Crown - titanium	One inlay, onlay, standard crown, implant crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2650, D2651, D2652, D2662, D2663, D2664, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6058, D6059, D6060, D6061, D6062, D6063, D6064, D6065, D6066, D6067, D6068, D6069, D6070, D6071, D6072, D6073, D6074, D6075, D6076, D6077, D6094, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, D6793, or D6794) every 60 months per tooth	No	Yes	Tooth - 1-32	pre-operative periapical radiograph
Major Restoratives (Crowns means Prosthodontics)						
D2910	Re-cement or re-bond inlay, onlay, veneer or partial coverage restoration	Once per tooth per 6 months only after 6 months from initial placement	No	Yes	Tooth - 1-32	Not Applicable
D2916	Re-cement or re-bond indirectly fabricated or prefabricated post and core	Once per tooth per 6 months only after 6 months from initial placement	No	Yes	Tooth - 1-32	Not Applicable
D2920	Re-cement or re-bond crown	Once per tooth per 6 months only after 6 months from initial placement	No	Yes	Tooth - 1-32, A-1	Not Applicable
D2931	Prefabricated stainless steel crown - permanent tooth	Once per tooth per lifetime. Not to be used as a temporary restoration	No	Yes	Tooth	Not Applicable
D2940	Protective restoration	Once per tooth per lifetime	No	Yes	Tooth - 1-32, A-1	Not Applicable
D2950	Core buildup, including any pins when required	One (D2950, D2952 or D2954) per tooth every 60 months. Not covered when billed with resin or amalgam restoration	No	Yes	Tooth - 1-32	Not Applicable
D2951	Pin retention - per tooth, in addition to restoration	One D2951 per tooth every 60 months when billed with resin or amalgam restoration. If billed separately, D2951 is inclusive with the allowance for D2950, D2952 or D2954.	No	Yes	Tooth - 1-32	Not Applicable
D2952	Cast post and core in addition to crown	One (D2950, D2952 or D2954) per tooth every 60 months. Not covered when billed with resin or amalgam restoration	No	Yes	Tooth - 1-32	Not Applicable
D2953	Each additional cast post - same tooth	One every 80 months per tooth when billed with D2952	No	Yes	Tooth - 1-32	Not Applicable

D2954	Prefabricated post and core in addition to crown	One (D2950, D2952 or D2954) per tooth every 60 months. Not covered when billed with resin or amalgam restoration	No	Yes	Tooth - 1-32	Not Applicable
D2980	Crown repair, by report	Once per tooth per 2 years only after 6 months from initial placement. By Report	No	By Report	Tooth - 1-32	Not Applicable
D2990	Resin infiltration of incipient smooth surface lesions	One restoration (D2140, D2150, D2160, D2161, D2330, D2331, D2332, D2335, D2390, D2391, D2392, D2393, D2394 or D2990) per tooth, per surface, in 12 months	No	Yes		Not Applicable
D2999	Unspecified restorative procedure, by report	By Report	No	By Report	Tooth - 1-32, A-T	narrative of medical necessity and description of service
Pulpotomy						
D3220	Therapeutic pulpotomy	One (D3220 or D3221) per tooth, per lifetime. Not allowed in conjunction with root canal therapy by same provider/location within 90 days	No	Yes	Tooth - 1-32, A-T	Not Applicable
D3221	Pulpal debridement, primary and permanent teeth	One (D3220 or D3221) per tooth, per lifetime. Not allowed in conjunction with root canal therapy by same provider/location within 90 days	No	Yes	Tooth - 1-32, A-T	Not Applicable
Root Canal Therapy						
D3310	Endodontic therapy, (root canal) anterior tooth	Once per permanent tooth per lifetime	No	Yes	tooth - 6-11, 22-27	Not Applicable
D3320	Endodontic therapy, (root canal) bicuspid	Once per permanent tooth per lifetime	No	Yes	tooth - 4, 5, 12, 13, 20, 21, 28, 29	Not Applicable
D3330	Endodontic therapy, (root canal), molar	Once per permanent tooth per lifetime	No	Yes	tooth - 1-3, 14-19, 30-32	Not Applicable
D3331	Treatment of root canal obstruction; non-surgical access	Not payable as a separate procedure. Inclusive in coverage for all endodontic procedures. Patient may not be charged	No	Inclusive	Tooth - 1-32	Not Applicable
D3346	Retreatment of previous root canal therapy-anterior	Once per permanent tooth per lifetime	No	Yes	tooth - 6-11, 22-27	Not Applicable
D3347	Retreatment of previous root canal therapy - bicuspid	Once per permanent tooth per lifetime	No	Yes	Tooth - 4, 5, 12, 13, 20, 21, 28, 29	Not Applicable
D3348	Retreatment of previous root canal therapy-molar	Once per permanent tooth per lifetime	No	Yes	tooth - 1-3, 14-19, 30-32	Not Applicable
Apicoectomy/Periradicular Services						
D3410	Apicoectomy - anterior	Once per permanent tooth per lifetime	No	Yes	tooth - 6-11, 22-27	Not Applicable
D3421	Apicoectomy - bicuspid (first root)	Once per permanent tooth per lifetime	No	Yes	tooth - 4, 5, 12, 13, 20, 21, 28, 29	Not Applicable
D3425	Apicoectomy - molar (first root)	Once per permanent tooth per lifetime	No	Yes	tooth - 1-3, 14-19, 30-32	Not Applicable
D3426	Apicoectomy (each additional root)	Once per permanent tooth per lifetime	No	Yes	tooth - 1-5, 12-21, 28-32	Not Applicable
D3430	Retrograde filling - per root	Once per permanent tooth per lifetime	No	Yes	Tooth - 1-32	Not Applicable
D3911	Intraoffice barrier (not to be used as a final restoration)	Not payable as a separate procedure. Inclusive in coverage for all endodontic procedures. Patient may not be charged	No	Inclusive	Tooth, Surface	Not Applicable
D3999	Unspecified endodontic procedure, by report	By Report	No	By Report	None	narrative of medical necessity and description of service
Periodontal Surgical Services (including usual postoperative services)						
D4210	Gingivectomy or gingivoplasty - four or more contiguous teeth or tooth bounded spaces per quadrant	One (D4210 or D4211) per quadrant per 36 months	No	Yes	Quadrant (LL, LR, UL, UR)	radiographs, perio charting and photographs
D4211	Gingivectomy or gingivoplasty - one to three contiguous teeth or tooth bounded spaces per quadrant	One (D4210 or D4211) per quadrant per 36 months	No	Yes	Quadrant (LL, LR, UL, UR)	radiographs, perio charting and photographs
D4240	Gingival flap procedure, including root planing - four or more contiguous teeth or tooth bounded spaces per quadrant	One (D4240 or D4241) per quadrant per 36 months	No	Yes	Quadrant (LL, LR, UL, UR)	radiographs and perio charting
D4241	Gingival flap procedure, including root planing - one to three contiguous teeth or tooth bounded spaces per quadrant	One (D4240 or D4241) per quadrant per 36 months	No	Yes	Quadrant (LL, LR, UL, UR)	radiographs and perio charting
D4249	Clinical crown lengthening - hard tissue	Once per permanent tooth per lifetime	No	Yes	Tooth - 1-32	radiographs and perio charting
D4260	Osseous surgery (including elevation of a full thickness flap and closure) - four or more contiguous teeth or tooth bounded spaces per quadrant	One (D4260 or D4261) per quadrant per 36 months	No	Yes	Quadrant (LL, LR, UL, UR)	radiographs and perio charting
D4261	Osseous surgery (including elevation of a full thickness flap and closure) - one to three contiguous teeth or tooth bounded spaces per quadrant	One (D4260 or D4261) per quadrant per 36 months	No	Yes	Quadrant (LL, LR, UL, UR)	radiographs and perio charting
Adjunctive Periodontal Services						
D4341	Periodontal scaling and root planing - four or more teeth per quadrant	One (D4341 or D4342) per quadrant per 36 months	No	Yes	Quadrant (LL, LR, UL, UR)	radiographs and perio charting
D4342	Periodontal scaling and root planing - one to three teeth per quadrant	One (D4341 or D4342) per quadrant per 36 months	No	Yes	Quadrant (LL, LR, UL, UR)	radiographs and perio charting
D4346	Scaling in presence of generalized moderate or severe gingival inflammation - full mouth, after oral evaluation	Two (D1110, D4346, D4910) every calendar year	No	Yes	None	Not Applicable
D4355	Full mouth debridement to enable a comprehensive oral evaluation and diagnosis on a subsequent visit	One per 36 months	No	Yes	None	Not Applicable
Other Periodontal Services						
D4910	Periodontal maintenance procedures	One D4910 every 6 months; Two (D1110, D4346, D4910) every calendar year	No	Yes	None	Not Applicable
D4999	Unspecified periodontal procedure, by report	By Report	No	By Report	None	narrative of medical necessity and description of service
Complete Dentures						
D5110	Complete denture - maxillary	One upper denture (D5110, D5130, D5211, D5213, D5221, D5223, D5225, D5227, D5863 or D5864) every 60 months	No	Yes	Upper Arch (implied)	narrative of medical necessity and description of service
D5120	Complete denture - mandibular	One lower denture (D5120, D5140, D5212, D5214, D5222, D5224, D5226, D5228, D5865, D5866) every 60 months	No	Yes	Lower Arch (implied)	pre-operative radiographs
D5130	Immediate denture - maxillary	Once per lifetime	No	Yes	Upper Arch (implied)	pre-operative radiographs
D5140	Immediate denture - mandibular	Once per lifetime	No	Yes	Lower Arch (implied)	pre-operative radiographs
Partial Dentures						
D5211	Maxillary partial denture - resin base (including any conventional clasps, rests and teeth)	One upper denture (D5110, D5130, D5211, D5213, D5221, D5223, D5225, D5227, D5863 or D5864) every 60 months	No	Yes	Upper Arch (implied)	pre-operative radiographs
D5212	Mandibular partial denture - resin base	One lower denture (D5120, D5140, D5212, D5214, D5222, D5224, D5226, D5228, D5865, D5866) every 60 months	No	Yes	Lower Arch (implied)	pre-operative radiographs
D5213	Maxillary partial denture - cast metal framework with resin denture bases	One upper denture (D5110, D5130, D5211, D5213, D5221, D5223, D5225, D5227, D5863 or D5864) every 60 months	No	Yes	Upper Arch (implied)	pre-operative radiographs
D5214	Mandibular partial denture - cast metal framework with resin denture bases	One lower denture (D5120, D5140, D5212, D5214, D5222, D5224, D5226, D5228, D5865, D5866) every 60 months	No	Yes	Lower Arch (implied)	pre-operative radiographs
D5221	Immediate maxillary partial denture - resin base	One upper denture (D5110, D5130, D5211, D5213, D5221, D5223, D5225, D5227, D5863 or D5864) every 60 months	No	Yes	Upper Arch (implied)	pre-operative radiographs
D5222	Immediate mandibular partial denture - resin base	One lower denture (D5120, D5140, D5212, D5214, D5222, D5224, D5226, D5228, D5865, D5866) every 60 months	No	Yes	Lower Arch (implied)	pre-operative radiographs
D5223	Immediate maxillary partial denture - cast metal framework with resin denture bases	One upper denture (D5110, D5130, D5211, D5213, D5221, D5223, D5225, D5227, D5863 or D5864) every 60 months	No	Yes	Upper Arch (implied)	pre-operative radiographs
D5224	Immediate mandibular partial denture - cast metal framework with resin denture bases	One lower denture (D5120, D5140, D5212, D5214, D5222, D5224, D5226, D5228, D5865, D5866) every 60 months	No	Yes	Lower Arch (implied)	pre-operative radiographs
D5225	Maxillary partial denture - flexible base (including any clasps, rests and teeth)	One upper denture (D5110, D5130, D5211, D5213, D5221, D5223, D5225, D5227, D5863 or D5864) every 60 months	No	Yes	Upper Arch (implied)	pre-operative radiographs
D5226	Mandibular partial denture - flexible base (including any clasps, rests and teeth)	One lower denture (D5120, D5140, D5212, D5214, D5222, D5224, D5226, D5228, D5865, D5866) every 60 months	No	Yes	Lower Arch (implied)	pre-operative radiographs
D5227	Immediate maxillary partial denture - flexible base (including any clasps, rests and teeth)	One upper denture (D5110, D5130, D5211, D5213, D5221, D5223, D5225, D5227, D5863 or D5864) every 60 months	No	Yes	None	pre-operative radiographs
D5228	Immediate mandibular partial denture - flexible base (including any clasps, rests and teeth)	One lower denture (D5120, D5140, D5212, D5214, D5222, D5224, D5226, D5228, D5865, D5866) every 60 months	No	Yes	None	pre-operative radiographs
Adjustments of Removable Prosthesis						
D5410	Adjust complete denture - maxillary	One adjustment per arch per 12 months (after 6 months from initial placement)	No	Yes	Upper Arch (implied)	Not Applicable
D5411	Adjust complete denture - mandibular	One adjustment per arch per 12 months (after 6 months from initial placement)	No	Yes	Lower Arch (implied)	Not Applicable
D5421	Adjust partial denture - maxillary	One adjustment per arch per 12 months (after 6 months from initial placement)	No	Yes	Upper Arch (implied)	Not Applicable
D5422	Adjust partial denture - mandibular	One adjustment per arch per 12 months (after 6 months from initial placement)	No	Yes	Lower Arch (implied)	Not Applicable
Repairs to Complete Dentures						
D5511	Repair broken complete denture base, mandibular	Once per arch per 12 months (after 12 months from initial placement)	No	Yes	Lower Arch (implied)	Not Applicable
D5512	Repair broken complete denture base, maxillary	Once per arch per 12 months (after 12 months from initial placement)	No	Yes	Upper Arch (implied)	Not Applicable

D5520	replace missing or broken teeth - complete denture (each tooth)	Once per tooth per 12 months (after 12 months from initial placement)	No	Yes	Tooth - 1-32	Not Applicable
D5811	Repair resin denture base, mandibular	Once per arch per 12 months	No	Yes	Lower Arch (implied)	Not Applicable
D5812	Repair resin denture base, maxillary	Once per arch per 12 months	No	Yes	Upper Arch (implied)	Not Applicable
D5821	Repair cast framework, mandibular	Once per arch per 12 months	No	Yes	Lower Arch (implied)	Not Applicable
D5822	Repair cast framework, maxillary	Once per arch per 12 months	No	Yes	Upper Arch (implied)	Not Applicable
D5830	Repair or replace broken clasp - per tooth	Once per tooth per 12 months	No	Yes	Tooth - 1-32	Not Applicable
D5840	Replace broken teeth - per tooth	Once per tooth per 12 months	No	Yes	Tooth - 1-32	Not Applicable
D5850	Add tooth to existing partial denture	Once per tooth per 12 months	No	Yes	Tooth - 1-32	Not Applicable
D5860	Add clasp to existing partial denture - per tooth	Once per tooth per 12 months	No	Yes	Tooth - 1-32	Not Applicable
Denture Rebase Procedures						
D5710	Rebase complete maxillary denture	One upper rebase or reline (D5710, D5725, D5730 or D5750) per 36 months (after 6 months from initial placement)	No	Yes	Upper Arch (implied)	Not Applicable
D5711	Rebase complete mandibular denture	One lower rebase or reline (D5711, D5725, D5731, or D5751) per 36 months (after 6 months from initial placement)	No	Yes	Lower Arch (implied)	Not Applicable
D5720	Rebase maxillary partial denture	One upper rebase or reline (D5720, D5725, D5740, or D5760) per 36 months (after 6 months from initial placement)	No	Yes	Upper Arch (implied)	Not Applicable
D5721	Rebase mandibular partial denture	One lower rebase or reline (D5721, D5725, D5741, or D5761) per 36 months (after 6 months from initial placement)	No	Yes	Lower Arch (implied)	Not Applicable
D5725	Rebase hybrid prosthesis	One rebase or reline (D5721, D5725, D5741, D5761) per 36 months (after 6 months from initial placement)	No	Yes	None	Not Applicable
Denture Reline Procedures						
D5730	Reline complete maxillary denture (chairside)	One upper rebase or reline (D5710, D5730, D5750, or D5765) per 36 months (after 6 months from initial placement)	No	Yes	Upper Arch (implied)	Not Applicable
D5731	Reline complete mandibular denture (chairside)	One lower rebase or reline (D5711, D5731, D5751, or D5765) per 36 months (after 6 months from initial placement)	No	Yes	Lower Arch (implied)	Not Applicable
D5740	Reline maxillary partial denture (chairside)	One upper rebase or reline (D5720, D5740, D5760, or D5765) per 36 months (after 6 months from initial placement)	No	Yes	Upper Arch (implied)	Not Applicable
D5741	Reline mandibular partial denture (chairside)	One lower rebase or reline (D5721, D5741, D5761, or D5765) per 36 months (after 6 months from initial placement)	No	Yes	Lower Arch (implied)	Not Applicable
D5750	Reline complete maxillary denture (laboratory)	One upper rebase or reline (D5710, D5730, D5750, D5765) per 36 months (after 6 months from initial placement)	No	Yes	Upper Arch (implied)	Not Applicable
D5751	Reline complete mandibular denture (laboratory)	One lower rebase or reline (D5711, D5731, D5751, D5765) per 36 months (after 6 months from initial placement)	No	Yes	Lower Arch (implied)	Not Applicable
D5760	Reline maxillary partial denture (laboratory)	One upper rebase or reline (D5720, D5740, D5760, D5765) per 36 months (after 6 months from initial placement)	No	Yes	Upper Arch (implied)	Not Applicable
D5761	Reline mandibular partial denture (laboratory)	One lower rebase or reline (D5721, D5741, D5761, D5765) per 36 months (after 6 months from initial placement)	No	Yes	Lower Arch (implied)	Not Applicable
D5765	Soft liner for complete or partial removable denture - indirect	One rebase or reline (D5721, D5741, D5761, D5765) per 36 months (after 6 months from initial placement)	No	Yes	None	Not Applicable
Other Removable Prosthetic Services						
D5850	Tissue conditioning, maxillary	Only allowed in conjunction with fabrication of new denture. Not allowed for 5 years from delivery of a new denture	No	Yes	Upper Arch (implied)	Not Applicable
D5851	Tissue conditioning, mandibular	Only allowed in conjunction with fabrication of new denture. Not allowed for 5 years from delivery of a new denture	No	Yes	Lower Arch (implied)	Not Applicable
D5863	Overdenture - complete maxillary	One upper denture (D5110, D5130, D5211, D5213, D5221, D5223, D5225, D5227, D5863, or D5864) every 60 months	No	Yes	Upper Arch (implied)	pre-operative radiographs and narrative
D5864	Overdenture - partial maxillary	One upper denture (D5110, D5130, D5211, D5213, D5221, D5223, D5225, D5227, D5863, or D5864) every 60 months	No	Yes	Upper Arch (implied)	pre-operative radiographs and narrative
D5865	Overdenture - complete mandibular	One lower denture (D5120, D5140, D5212, D5214, D5222, D5224, D5226, D5228, D5865, or D5866) every 60 months	No	Yes	Lower Arch (implied)	pre-operative radiographs and narrative
D5866	Overdenture - partial mandibular	One lower denture (D5120, D5140, D5212, D5214, D5222, D5224, D5226, D5228, D5865, or D5866) every 60 months	No	Yes	Lower Arch (implied)	pre-operative radiographs and narrative
D5876	Add metal substructure to acrylic full denture (per arch)	Only allowed on the same date of service as D5110, D5120, D5130, or D5140	No	Yes	Arch - U/L	pre-operative radiographs
D5899	Unspecified removable prosthodontic procedure, by report	By Report	No	By Report	None	narrative of medical necessity and description of service
D5999	Unspecified maxillofacial prosthesis, by report	By Report	No	By Report	None	narrative of medical necessity and description of service
Dental Implant Services						
D6010	Surgical placement of implant body: endosteal implant	One implant (D6010 or D6013) every 60 months per tooth	No	Yes	Tooth - 1-32	full mouth x-rays
D6013	Surgical placement of mini implant	One implant (D6010 or D6013) every 60 months per tooth	No	Yes	Tooth - 1-32	full mouth x-rays
D6058	Abutment supported porcelain/ceramic crown	One inlay, onlay, standard crown, implant crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2650, D2651, D2652, D2662, D2663, D2664, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6058, D6059, D6060, D6061, D6062, D6063, D6064, D6065, D6066, D6067, D6068, D6069, D6070, D6071, D6072, D6073, D6074, D6075, D6076, D6077, D6094, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, D6793, or D6794) every 60 months per tooth	No	Yes	Tooth - 1-32	full mouth x-rays
D6059	Abutment supported porcelain fused to metal crown (high noble metal)	One inlay, onlay, standard crown, implant crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2650, D2651, D2652, D2662, D2663, D2664, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6058, D6059, D6060, D6061, D6062, D6063, D6064, D6065, D6066, D6067, D6068, D6069, D6070, D6071, D6072, D6073, D6074, D6075, D6076, D6077, D6094, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, D6793, or D6794) every 60 months per tooth	No	Yes	Tooth - 1-32	full mouth x-rays
D6060	Abutment supported porcelain fused to metal crown (predominantly base metal)	One inlay, onlay, standard crown, implant crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2650, D2651, D2652, D2662, D2663, D2664, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6058, D6059, D6060, D6061, D6062, D6063, D6064, D6065, D6066, D6067, D6068, D6069, D6070, D6071, D6072, D6073, D6074, D6075, D6076, D6077, D6094, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, D6793, or D6794) every 60 months per tooth	No	Yes	Tooth - 1-32	full mouth x-rays
D6061	Abutment supported porcelain fused to metal crown (noble metal)	One inlay, onlay, standard crown, implant crown, bridge abutment or pontic (D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2650, D2651, D2652, D2662, D2663, D2664, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6058, D6059, D6060, D6061, D6062, D6063, D6064, D6065, D6066, D6067, D6068, D6069, D6070, D6071, D6072, D6073, D6074, D6075, D6076, D6077, D6094, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, D6793, or D6794) every 60 months per tooth	No	Yes	Tooth - 1-32	full mouth x-rays

D6793	Provisional retainer crown	One inlay, onlay, standard crown, implant crown, bridge abutment or pontic D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2650, D2651, D2652, D2662, D2663, D2664, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6058, D6059, D6060, D6061, D6062, D6063, D6064, D6065, D6066, D6067, D6068, D6069, D6070, D6071, D6072, D6073, D6074, D6075, D6076, D6077, D6094, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, D6793, or D6794) every 60 months per tooth	No	Yes	Tooth - 1-32	pre-operative radiographs
D6794	Retainer crown - titanium	One inlay, onlay, standard crown, implant crown, bridge abutment or pontic D2510, D2520, D2530, D2542, D2543, D2544, D2610, D2620, D2630, D2642, D2643, D2644, D2650, D2651, D2652, D2662, D2663, D2664, D2710, D2712, D2720, D2721, D2722, D2740, D2750, D2751, D2752, D2780, D2781, D2782, D2783, D2790, D2791, D2792, D2794, D6058, D6059, D6060, D6061, D6062, D6063, D6064, D6065, D6066, D6067, D6068, D6069, D6070, D6071, D6072, D6073, D6074, D6075, D6076, D6077, D6094, D6205, D6210, D6211, D6212, D6214, D6240, D6241, D6242, D6245, D6250, D6251, D6252, D6545, D6548, D6549, D6602, D6603, D6604, D6605, D6606, D6607, D6608, D6609, D6610, D6611, D6612, D6613, D6614, D6615, D6624, D6634, D6710, D6720, D6721, D6722, D6740, D6750, D6751, D6752, D6780, D6781, D6782, D6790, D6791, D6792, D6793, or D6794) every 60 months per tooth	No	Yes	Tooth - 1-32	pre-operative radiographs
Other Fixed Partial Denture Services						
D6930	Re-cement or re-bond fixed partial denture	Once per 6 months per tooth (after 6 months from placement)	No	Yes	Tooth - 1-32	Not Applicable
D6980	Fixed partial denture repair	Once per 6 months per tooth (after 6 months from placement)	No	Yes	Tooth - 1-32	Not Applicable
D6999	Fixed prosthodontic procedure, by report	By Report	No	By Report	None	narrative of medical necessity and description of service
Oral and Maxillofacial Surgery (Oral Surgery or Extractions)						
D7140	Extraction, erupted tooth or exposed root	Once per tooth per lifetime	No	Yes	Tooth - 1-32, 51-82, A-1, AS-1S	Not Applicable
D7210	Surgical removal of erupted tooth requiring removal of bone and/or sectioning of tooth	Once per tooth per lifetime	No	Yes	Tooth - 1-32, 51-82, A-T, AS-TS	pre-operative radiographs
D7220	Removal of impacted tooth-soft tissue	Once per tooth per lifetime	No	Yes	Tooth - 1-32, 51-82, A-1, AS-1S	pre-operative radiographs
D7230	Removal of impacted tooth-partially bony	Once per tooth per lifetime	No	Yes	Tooth - 1-32, 51-82, A-1, AS-1S	pre-operative radiographs
D7240	Removal of impacted tooth-completely bony	Once per tooth per lifetime	No	Yes	Tooth - 1-32, 51-82, A-1, AS-1S	pre-operative radiographs
D7241	Removal of impacted tooth-completely bony, with unusual surgical complications	Once per tooth per lifetime	No	Yes	Tooth - 1-32, 51-82, A-T, AS-TS	pre-operative radiographs
D7250	Surgical removal of residual tooth roots (cutting procedure)	Once per tooth per lifetime. Not allowed by original treating provider	No	Yes	Tooth - 1-32, 51-82, A-T, AS-TS	pre-operative radiographs
D7251	Coronectomy	Once per tooth per lifetime	No	Yes	Tooth - 1-32, 51-82, A-1, AS-1S	pre-operative radiographs
Other Surgical Procedures						
D7260	Oroantral fistula closure	One (D7260 or D7261) per lifetime	No	Yes	Tooth - 1-32	Not Applicable
D7261	Primary closure of a sinus perforation	One (D7260 or D7261) per lifetime	No	Yes	Quadrant - LL/LR/UL/UR	Not Applicable
D7285	Incisional biopsy of oral tissue-hard (bone, tooth)		No	Yes	Tooth - 1-32	Not Applicable
D7286	Incisional biopsy of oral tissue-soft		No	Yes	Tooth - 1-32	Not Applicable
Alveoloplasty - Surgical Preparation of Ridge for Dentures						
D7310	Alveoloplasty in conjunction with extractions - four or more teeth or tooth spaces, per quadrant	One (D7310 or D7311) per quadrant per lifetime	No	Yes	Quadrant - LL/LR/UL/UR	pre-operative radiographs
D7311	Alveoloplasty in conjunction with extractions - one to three teeth or tooth spaces, per quadrant	One (D7310 or D7311) per quadrant per lifetime	No	Yes	Quadrant - LL/LR/UL/UR	pre-operative radiographs
D7320	Alveoloplasty not in conjunction with extractions - four or more teeth or tooth spaces, per quadrant	One (D7320 or D7321) per quadrant per lifetime	No	Yes	Quadrant - LL/LR/UL/UR	pre-operative radiographs
D7321	Alveoloplasty not in conjunction with extractions - one to three teeth or tooth spaces, per quadrant	One (D7320 or D7321) per quadrant per lifetime	No	Yes	Quadrant - LL/LR/UL/UR	pre-operative radiographs
Vestibuloplasty						
D7340	Vestibuloplasty - ridge extension (secondary epithelialization)	One (D7340 or D7350) per arch per lifetime	No	Yes	Arch - U/L	Not Applicable
D7350	Vestibuloplasty - ridge extension (including soft tissue grafts, muscle-attachment, revision of soft tissue attachment and management of hypertrophied and hyperplastic tissue)	One (D7340 or D7350) per arch per lifetime	No	Yes	Arch - U/L	Not Applicable
Surgical Excision of Reactive Inflammatory Lesions						
D7410	Excision of benign lesion diameter up to 1.25cm		No	Yes	None	narrative of medical necessity and description of service
D7411	Excision of benign lesion greater than 1.25 cm		No	Yes	Tooth - 1-32	narrative of medical necessity and description of service
D7440	Excision of malignant tumor - lesion diameter up to 1.25cm	Submit pathology report to medical. Procedure is not covered within the scope of the dental plan.	No	No	None	narrative of medical necessity and description of service
D7441	Excision of malignant tumor - lesion diameter greater than 1.25cm	Submit pathology report to medical. Procedure is not covered within the scope of the dental plan.	No	No	None	narrative of medical necessity and description of service
D7450	Removal of benign odontogenic cyst or tumor - lesion diameter up to 1.25cm		No	Yes	Tooth - 1-32	narrative of medical necessity and description of service
D7451	Removal of benign odontogenic cyst or tumor - lesion greater than 1.25cm		No	Yes	None	narrative of medical necessity and description of service
D7460	Removal of benign nonodontogenic cyst or tumor - lesion diameter up to 1.25cm		No	Yes	Quadrant - LL/LR/UL/UR	narrative of medical necessity and description of service
D7461	Removal of benign nonodontogenic cyst or tumor - lesion greater than 1.25cm		No	Yes	Quadrant - LL/LR/UL/UR	narrative of medical necessity and description of service
D7471	Removal of lateral exostosis - per site	2 per arch per lifetime, regardless of the provider	No	Yes	Arch - U/L	narrative of medical necessity and description of service
D7472	Removal of torus palatinus	Once per lifetime, regardless of provider	No	Yes	None	narrative of medical necessity and description of service
D7473	Removal of torus mandibularis	2 per lifetime, regardless of provider	No	Yes	None	narrative of medical necessity and description of service
D7485	Surgical reduction of osseous tuberosity	2 per lifetime, regardless of provider	No	Yes	None	narrative of medical necessity and description of service
Surgical Incision						
D7509	Marsupialization	Once per site per lifetime	No	Yes	None	narrative of medical necessity and description of service
D7510	Incision and drainage of abscess - intraoral soft tissue	Not payable on the same date of service as root canal or associated surgical procedure	No	Yes	Tooth - 1-32, 51-82, A-T, AS-TS	Not Applicable
D7511	Incision and drainage of abscess - intraoral soft tissue - complicated (includes drainage of multiple fascial spaces)	By Report	No	By Report	Tooth - 1-32	narrative of medical necessity and description of service
D7520	Incision and drainage of abscess - extraoral soft tissue	Not payable on the same date of service as root canal or associated surgical procedure	No	Yes	None	Not Applicable
D7521	Incision and drainage of abscess - extraoral soft tissue - complicated (includes drainage of multiple fascial spaces)	Not payable on the same date of service as root canal or associated surgical procedure	No	Yes	None	Not Applicable
Other Repair Procedures						
D7963	Frenuloplasty	One (D7963 or D7960) per arch per lifetime	No	Yes	None	narrative and photographs

D7970	Excision of hyperplastic tissue - per arch	Once per arch per lifetime	No	Yes	Per Arch (01, 02, LA, UA)	narrative, radiographs and photographs
D7971	Excision of pericoronal gingiva	Once per tooth per lifetime	No	Yes	Tooth - 1-32	narrative, radiographs and photographs
D7999	Unspecified oral surgery procedure, by report	By Report	No	By Report	None	narrative of medical necessity and description of service
Adjunctive General Services ("Emergency Services")						
D9110	Palliative (emergency) treatment of dental pain - minor procedure	Limited to two (2) per provider per incident. Not allowed with any other services other than radiographs	No	Yes	None	Not Applicable
Anesthesia						
D9210	Local anesthesia not in conjunction with operative or surgical procedure	Considered inclusive in all procedures. Patient cannot be charged	No	Inclusive	None	Not Applicable
D9211	Regional block anesthesia	considered inclusive in all procedures. Patient cannot be charged	No	Inclusive	None	Not Applicable
D9212	Inferior division block anesthesia	considered inclusive in all procedures. Patient cannot be charged	No	Inclusive	None	Not Applicable
D9215	Local anesthesia	considered inclusive in all procedures. Patient cannot be charged	No	Inclusive	None	Not Applicable
D9222	Deep Sedation/general anesthesia-first 15 minutes	One per date of service. Not allowed with another type of anesthesia (D9239, D9243) on the same day	No	Yes	None	narrative treatment record (including anesthesia records)
D9223	Deep sedation/general anesthesia - each subsequent 15 minute increment	3 per date of service. Not allowed with another type of anesthesia (D9239, D9243) on the same day	No	Yes	None	narrative treatment record (including anesthesia records)
D9230	Inhalation of nitrous oxide/analgesia, anxiolysis	One per date of service. Not allowed with another type of anesthesia (D9222, D9223, D9239, D9243, D9248) on the same day	No	Yes	None	narrative treatment record (including anesthesia records)
D9239	Intravenous moderate (conscious)	One per date of service. Not allowed with (D9222, D9223) on the same day	No	Yes	None	narrative treatment record (including anesthesia records)
D9243	Intravenous moderate (conscious) sedation/analgesia	3 per date of service. Not allowed with another type of anesthesia (D9222, D9223) on the same day	No	Yes	None	narrative treatment record (including anesthesia records)
D9248	Non-intravenous moderate (conscious) sedation	One per date of service. Not allowed with another type of anesthesia (D9222, D9223, D9230, D9239, D9243) on the same day	No	Yes	None	narrative treatment record (including anesthesia records)
Professional Consultation						
D9310	Consultation - diagnostic service provided by dentist or physician other than requesting dentist or physician	One per provider or location per year. Not allowed with another exam (D0120, D0140, D0150, D0160, D0170, or D0180) by same provider or location	No	Yes	None	Not Applicable
Professional Visits						
D9430	Office visit for observation (during regularly scheduled hours) - no other services performed	Once every three months	Yes	Yes	None	Not Applicable
Miscellaneous Services						
D9951	Occlusal adjustment - limited	Not payable on same date of service as related services. Procedure considered "inclusive" in other related services. When this occurs, patient cannot be billed for service. If payable, one per 60 months	No	Yes	Tooth - 1-32	narrative of medical necessity and description of service
D9952	Occlusal adjustment - complete	One of (D9950 or D9952) per 60 months. By Report. Not payable on same date of service as related services.	No	By Report	None	narrative of medical necessity and description of service
D9995	Teledentistry - synchronous; real time encounter	considered inclusive in all procedures. Patient cannot be charged.	Inclusive	Inclusive	None	Not Applicable

1 ANY PROCEDURE CODES NOT LISTED, WILL NOT BE COVERED UNDER EITHER THE PREVENTIVE OR COMPREHENSIVE PLANS.
2 COVERAGE DECISIONS ARE GOVERNED BY ADMINISTRATIVE GUIDELINES.
3 ALL COVERAGE GUIDELINES ARE SUBJECT TO PROFESSIONAL (MEDICAL/DENTAL) REVIEW.
4 SEE YOUR PLANS "DENTAL EXCLUSIONS AND LIMITATIONS"
5 ALL PROCEDURES INDICATED AS "BY REPORT" WILL BE INDIVIDUALLY EVALUATED BASED ON SUBMISSION OF NECESSARY SUPPORTING DOCUMENTATION (e.g. narrative of medical necessity, pre-op x-ray(s), etc.). COVERAGE IS NOT GUARANTEED.
6 PRE-AUTHORIZATION IS RECOMMENDED FOR SERVICES. FREQUENCIES AND OTHER LIMITATIONS MAY APPLY.

Coverage Criteria / Dental Policies



Healthplex
Clinical Policy

Application of Desensitizing Medicaments and Resins

Policy Number: DCP034.12
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
• Coverage Rationale	59
• Applicable Codes	59
• Description of Services	59
• Clinical Evidence	60
• U.S. Food and Drug Administration	61
• References	62
• Policy History/Revision Information	62
• Instructions for Use	62

Related Dental Policy

- Topical Medicaments for Caries Prevention or Remineralization

Coverage Rationale

Application of Desensitizing Medicament or Resin

Application of desensitizing medicaments or resins is indicated for teeth with sensitivity that does not resolve with an over the counter desensitizing dentifrice.

Application of desensitizing medicaments or resins is not indicated for teeth with asymptomatic erosion, recession, cervical abrasion, abfraction, or as a base or liner prior to restoration placement.

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D1206	Topical application of fluoride varnish
D9910	Application of desensitizing medicament
D9911	Application of desensitizing resin for cervical and/or root surface, per tooth

CDT® is a registered trademark of the American Dental Association

Description of Services

Many individuals experience tooth sensitivity that is not due to decay or tooth injury. It may be localized to select teeth, or involve the entire dentition, and may be caused by gingival recession, erosion of tooth enamel, craze lines, abrasion and

abfraction from toothbrushing and traumatic occlusion, as well as systemic factors. Often cases of hypersensitivity respond favorably to over the counter desensitizing products, however when sensitivity persists there is a variety of treatment options available by prescription, or in office application. Lasers, alone or in combination with desensitizing agents, are emerging as another treatment for hypersensitivity.

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

Clinical Evidence

Application of Desensitizing Medicament or Resin

In a 2022 randomized clinical trial, Tolentino et al., evaluated the efficacy of low power lasers and desensitizing agents for treatment of dentin hypersensitivity. Fifty-four patients (303 teeth) were randomly assigned to three treatment groups, G1- 3% potassium nitrate gel, G2- photobiomodulation (PBM) with low level infrared laser, and G3- both potassium nitrate and PBM. Three treatments were provided at 72 hour intervals, and re-evaluations were performed immediately after each treatment and at 1 week and 1 and 3 months after treatment. The patients' response to air spray stimulation was rated via the visual analog scale (VAS). The results showed decreased sensitivity in all treatment groups after the three sessions with no significant differences. The authors concluded that all three methods applied in three sessions are effective for reducing sensitivity.

Jain et al. (2020) conducted a randomized split mouth trial to evaluate the effectiveness of fluoride varnish (sodium fluoride [NaF]), diode laser, and the combination of NaF and diode laser in the treatment of dentin hypersensitivity. Sixty patients aged 20-60 years suffering from dentin hypersensitivity to air-blast, cold, and tactile stimulation corresponding to 4 cm and above on the Visual Analog Scale (VAS) in three quadrants with at least two hypersensitive teeth per quadrant were selected. Hypersensitive teeth were allotted to Group 1 - 5% NaF varnish application alone, Group 2 - 810-nm gallium-aluminum-arsenide laser (GaAlAs) diode laser (0.5 W) irradiation alone, and Group 3 - NaF varnish application, followed by diode laser irradiation. VAS score was recorded at baseline, 1 week, 2 weeks, 1 month, 3 months, and 6 months. A statistically significant reduction in dentin hypersensitivity was observed in all the three groups, from the baseline to the 1st-, 3rd-, and 6th-month follow-ups ($p < 0.05$). Group 2 and Group 3 demonstrated a significantly higher reduction ($p < 0.05$) in dentin hypersensitivity for all the stimuli as opposed to Group 1 at all follow-up intervals. However, no statistically significant difference ($p > 0.05$) was present between Group 2 and Group 3 at all follow-ups. The authors concluded that Diode laser is significantly more effective than fluoride varnish alone in the treatment of dentin hypersensitivity over a period of 6 months.

In a split-mouth, triple-blind, randomized clinical trial, Galvão et al. (2019) evaluated the long-term clinical efficacy of experimental potassium oxalate in relieving dentin hypersensitivity (DH). Thirty-one subjects were enrolled in the study and 5% and 10% potassium oxalate gels were randomly applied at four different sessions per protocol. DH levels were evaluated at 1 week, 1 month, 3, 6, 9 and 12 months for each participant. The results showed that regardless of the potassium oxalate concentration, the desensitizing effect was maintained until the 6 month follow-up evaluation. However, the group that received the 10% concentration showed better desensitizing effects for both 9 and 12 month time periods when compared with the 5% concentration. No complications were noted for the participants. Limitations of the study included the small sample size. The authors concluded both concentrations of potassium oxalate (5 and 10%) proved to be effective on DH reduction for up to six months. This study provides primary clinical evidence, suggesting that multiple application sessions and higher concentrations of potassium oxalate may result in maintenance of the desensitizing effect for more extended periods.

Usai et al. (2019) conducted a an interventional, randomized, single-center clinical trial to compare the 24-week effectiveness of Teethmate Desensitizer (TD), a pure tetracalcium phosphate (TTCP) and dicalcium phosphate dihydrate (DCPD) powder/water, to that of Dentin Desensitizer (DD), and Bite & White ExSense (BWE) on Dentin Hypersensitivity (DH). A total of 105 subjects were selected. A random table was utilized to form three groups of 35 subjects. DH was evaluated using the evaporative sensitivity, tactile sensitivity tests, and the visual analogue scale (VAS) of pain. Response was recorded before the application of the materials (Pre-1), immediately after (Post-0), at 1 week (Post-1), 4 weeks (Post-2), 12 weeks (Post-3) and 24 weeks (Post-4). The results showed that all the materials decreased DH after 24 weeks, however, the TTCP/DCPD cement showed the greatest statistical efficiency. The authors concluded that the significant decrease of (visual analog scale) VAS pain scores produced by TD in the long term suggest the material is reliable in the clinical relief of DH.

Ravishankar et al. (2018) conducted a randomized, split mouth clinical trial testing the effect of three different desensitizing agents on reduction of pain due to hypersensitive cervical dentin lesions. 28 individuals were selected with

84 teeth diagnosed with cervical dentin hypersensitivity (DH) in at least one tooth. Patients exhibiting pain scores of two or more on the visual analog scale (VAS) were included in the study. Random assignment was performed to one of the three treatment groups based on computer-generated random number. The desensitizing agents used were Profluorid Varnish (Voco: Cuxhaven Germany), Admira Protect (Voco: Cuxhaven Germany), and PRG-Barrier Coat (Shofu: Japan). One operator recorded the baseline sensitivity scores. A second operator who was not aware of the baseline values applied the desensitizing agents and recorded the sensitivity scores. VAS scores for both the stimuli were noted immediately after application, 1 week, and after 1 month. The data were analyzed using repeated measure ANOVA and post hoc Tukey's multiple comparison tests. There was a significant reduction in VAS scores from baseline in all the three groups at all the time intervals. Admira Protect showed significant reduction of hypersensitivity scores at 1 month compared to the other groups. It was concluded Admira Protect was proved to be better in reducing pain due to DH than PRG-Barrier Coat and Profluorid Varnish after 1 month of application.

In a randomized, double-blind, split-mouth clinical trial, Madruga et al. (2017) performed a comparison of the desensitizing efficacy of resin-modified glass ionomer cement (GIC) Clinpro™ XT and the conventional GIC Vidrion R. Subjects were required to have at least two teeth with dentin hypersensitivity. Teeth were divided at random into 2 groups, one group received Clinpro XT and the other conventional GIC Vidrion R. Treatments were assessed by tactile and air blast tests using Visual Analogue Scale (VAS) at baseline, after 20 minutes, and at 7, 15, 21, 30, 90 and 180 days post-treatment. Twenty subjects (152 teeth) were included. Both tests (tactile and air blast) showed a significant reduction of dentin hypersensitivity immediately after the application of Vidrion R and Clinpro XT (20 min). VAS scores obtained along the 6-month follow-up were statistically lower when compared to initial rates ($p < 0.05$). Both GIC were able to reduce dentin hypersensitivity up to 6-month post-treatment period without statistically significant differences among them ($p > 0.05$). Both cements provided satisfactory results in long-term dental sensitivity reduction.

In a randomized clinical trial, Han et al. (2017) evaluated the clinical efficacy of five commercially available desensitizing agents with different mechanisms applied to hypersensitive teeth. The study included 64 individuals that met the criteria and each was randomly assigned to five commercially available desensitizing agents, and applied according to the manufacturers' instructions. Before and after application of desensitizing agents, subjects were evaluated with the Visual Analogue Scale (VAS) at baseline, 1 week, 1 month and 3 months; no statistically significant differences between the products was shown. Desensitizing agents used in this clinical trial relieved dentin hypersensitivity up to 3 months. The authors concluded the five tested desensitizing agents with different mechanisms were clinically effective in relieving dentin hypersensitivity up to 3 months and showed statistically significant pain reduction when compared to baseline scores.

Ding et al. (2014) This short-term (4-week) randomized, double-blind, placebo-controlled, split-mouth study evaluated the effect of Clinpro XT Varnish (VXT) paste-liquid, resin-modified glass-ionomer and the resinous dentin desensitizing varnish and Gluma Dentin Desensitizer (Gluma) in treating dentin hypersensitivity (DH). A total of 119 teeth from 31 individuals were randomized into three groups: VXT, Gluma, and placebo (warm water). Dentin sensitivity was evaluated by subjects' perception of DH determined by pretreatment tooth sensitivity score (TSS) measured on a 0-10 visual analogue scale (VAS) after tactile (probe) or thermal/evaporative (blast of air) stimuli. TSS was scored at baseline, immediately after treatment (Day 0), after 1 week and after 4 weeks. For both stimuli, mean TSS was significantly decreased in the VXT and Gluma groups at all time points compared with baseline. Regarding comparisons of TSS between treatment groups, the VXT group had significantly lower mean TSS compared with the Gluma group and placebo control group at all time points after treatment regardless of stimuli.

Castillo et al. (2011) conducted a multi-center, randomized clinical trial to assess the effectiveness and safety of topical diamine silver fluoride on tooth sensitivity. From two sites, 126 adults with at least one tooth sensitive to compressed air were randomly assigned to either the topical silver diamine fluoride or sterile water, and pain was assessed by means of a 100-mm visual analogue scale at 24 hours and 7 days. The diamine silver fluoride reduced pain at 7 days at both sites. No tissue ulceration, white changes, or argyria was observed. A small number of participants in the silver fluoride group experienced a mild but transient increase in erythema in the gingiva near the tooth. No changes were observed in the gingival Index. The authors concluded that diamine silver fluoride is a clinically effective and safe tooth desensitizer.

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

Fluoride varnish currently has FDA approval as a cavity liner and desensitizer. There are extensive manufacturers of fluoride varnish. Refer to the following website for more information and search by specific product name: <http://www.fda.gov/MedicalDevices/default.htm>. (Accessed August 19, 2024)

There are numerous products for in office application that have FDA clearance for reducing dental hypersensitivity. Refer to the following website and search for product specific name:

<http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm>. (Accessed August 19, 2024)

References

American Dental Association (ADA). Glossary of Dental Clinical and Administrative Terms.

American Dental Association (ADA) CDT Codebook 2024.

Castillo JL, Rivera S, Aparicio T, et al. The short-term effects of diamine silver fluoride on tooth sensitivity: a randomized controlled trial. *J Dent Res*. 2011 Feb; 90(2):203-8.

Ding YJ, Yao H, Wang GH, et al. A randomized double-blind placebo-controlled study of the efficacy of Clinpro XT varnish and Gluma dentin desensitizer on dentin hypersensitivity. *Am J Dent*. 2014 Apr; 27(2):79-83.

Galvão ADM, Zeola LF, Moura GF, et al. A long-term evaluation of experimental potassium oxalate concentrations on dentin hypersensitivity reduction: A triple-blind randomized clinical trial. *J Dent*. 2019 Aug 12:103180.

Han KH, Hong JH, Shin JH, et al. Effects of desensitizing agents for cervical dentin hypersensitivity: A randomized clinical trial. *Am J Dent*. 2017 Apr; 30(2):84-88.

Jain A, Rao J, Pal N, Singh A. Effectiveness of fluoride varnish, diode laser, and their combination in treatment of dentin hypersensitivity: A randomized split-mouth clinical trial. *J Indian Soc Periodontol*. 2020 Jul-Aug; 24(4):369-374.

Madrugá MM, Silva AF, Rosa WL, et al. Evaluation of dentin hypersensitivity treatment with glass ionomer cements: A randomized clinical trial. *Braz Oral Res*. 2017 Jan 5; 31:e3.

Ravishankar P, Viswanath V, Archana D, et al. The effect of three desensitizing agents on dentin hypersensitivity: A randomized, split-mouth clinical trial. *Indian J Dent Res*. 2018 Jan-Feb;29(1):51-55.

Tolentino AB, Zeola LF, Fernandes MRU, et al. Photobiomodulation therapy and 3% potassium nitrate gel as treatment of cervical dentin hypersensitivity: a randomized clinical trial. *Clin Oral Investig*. 2022 Dec;26(12):6985-6993.

Usai P, Campanella V, Sotgiu G, et al. Effectiveness of Calcium Phosphate Desensitising Agents in Dental Hypersensitivity Over 24 Weeks of Clinical Evaluation. *Nanomaterials (Basel)*. 2019;9(12):1748. Published 2019 Dec 9.

Policy History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting Healthplex Comprehensive and Limited dental plans . When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.

Bacterial, Viral, and Fungal Testing of Oral Infections

Guideline Number: DCG039.10

Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
1. Coverage Rationale	63
2. Applicable Codes	63
3. Description of Services	64
4. References	64
5. Guideline History/Revision Information	64
6. Instructions for Use	64

Related Dental Policies
None

Coverage Rationale

Collection of Microorganisms for Culture and Sensitivity

Collection of microorganisms for culture and sensitivity is indicated for the following:

- For infections of the oral cavity that do not respond to antibiotic therapy and/or incision and drainage in a timely manner
- For infections of the oral cavity in patients with the following:
 - Individuals with an unmanaged medical condition; these conditions include but are not limited to metabolic, cardiovascular, and autoimmune/inflammatory, as well as genetic conditions that affect collagen synthesis
 - Individuals taking medications that negatively affects the healing response; these include but are not limited to immunosuppressive agents, corticosteroids, anticoagulants, NSAIDS, and nicotine
 - Individuals with a compromised immune system; conditions/procedures include but are not limited to HIV/AIDS, solid organ and stem cell transplant, cancer, chemotherapy, select blood dyscrasias, chronic kidney disease, or dialysis
- For patients with severe or prolonged infection

Collection of microorganisms for culture and sensitivity is not indicated for the following:

- As a routine procedure for all infections
- If infection is small and limited to localized area
- If infection is draining on its own with no evidence of spread of infection
- For fungal infections unless there has been no response to antifungal treatment

Viral Culture

Viral culturing is indicated for the presence of oral and perioral vesicles and ruptured vesicles.

Viral culturing is not indicated for suspected cytomegalovirus (CMV) oral lesions.

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D0414	Laboratory processing of microbial specimen to include culture and sensitivity studies, preparation and transmission of written report
D0415	Collection of microorganisms for culture and sensitivity
D0416	Viral culture

CDT® is a registered trademark of the American Dental Association

Description of Services

There are many diagnostic tests available for bacterial and viral infections presenting in the oral cavity. Viral testing includes but is not limited to varicella-zoster, herpes simplex, hand-foot-and-mouth disease, herpangina and measles (rubeola). Bacterial infections may involve individual teeth and surrounding tissues or affect the oral mucosa. Bacterial testing isolates specific pathogens, and the results can be used to guide treatment decisions. This is particularly true when infections have been resistant to previous treatment, or the infection is serious or prolonged. Testing for fungal infections does not typically provide useful information, as candida albicans is a part of the normal oral flora, and the clinical presentation of most types is itself diagnostic. However definitive testing may be appropriate for immunocompromised patients, or if there is no response to antifungal treatment.

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

References

Bagheri, S. Clinical Review of Oral and Maxillofacial Surgery, 2nd ed. St. Louis: Mosby c2014. Chapter 4, Oral and Maxillofacial Infections; p. 95-118.

Blijlevens N, van der Velden, W. Mandell. Douglas and Bennett's Principles and Practice of Infectious Diseases, 9th ed. Elsevier c2020. Chapter 305 Infections in the Immunocompromised Host: General Principles; p.3617.

Cohen-Poradosu R, Kasper, D. Mandell. Douglas and Bennett's Principles and Practice of Infectious Diseases, 9th ed. Elsevier c2020. Chapter 242 Anaerobic Infections: General Concepts; p.2930.

Kerr A, Miller C, Nelson R. Little and Falace's Dental Management of the Medically Compromised Patient, 10th ed. St. Louis: Elsevier c2024. Chapter 1, Patient Evaluation, Risk Assessment and the Diagnostic Process; p. 1-17.

Rajendra Santosh AB, Muddana K, Bakki SR. Fungal infections of oral cavity: diagnosis, management, and association with COVID-19. SN Compr Clin Med. 2021;3(6):1373-1384. doi: 10.1007/s42399-021-00873-9.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Biologic Materials for Soft and Hard Tissue Regeneration

Policy Number: DCP047.03
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
7. Coverage Rationale	65
8. Definitions	65
9. Applicable Codes	66
10. Description of Services	66
11. Clinical Evidence	66
12. U.S. Food and Drug Administration	77
13. References	78
14. Policy History/Revision Information	80
15. Instructions for Use	80

Related Dental Policies

- Dental Barrier Membrane Guided Tissue Regeneration
- Surgical Extraction of Erupted Teeth and Retained Roots
- Surgical Extraction of Impacted Teeth
- Non-Surgical Extractions

Coverage Rationale

Biologic Materials for Soft and Osseous Tissue Regeneration

The following [Biological Materials](#) may be indicated to aid regeneration:

- [Enamel Matrix Derivative](#)
 - [Bioactive Glass](#)

Biological Materials to aid in soft and osseous tissue regeneration are not indicated for the following due to insufficient evidence of efficacy:

- In conjunction with [Periradicular](#) surgery
- For treating [Mucogingival Deformities](#)

All other Biological Materials, including but not limited to bone morphogenic protein, amniotic membranes, and stem cells, are not indicated for regeneration due to insufficient evidence of efficacy.

Collection and Application of Autologous Blood Concentrate Product

Collection and application of [Autologous Blood Concentrate](#) products are not indicated due to insufficient evidence of efficacy.

Definitions

Autologous Blood Concentrates: Blood products made using the patient's own blood and include Platelet-rich fibrin (PRF) and platelet-rich plasma. (PRP)

Bioactive Glass: A group of biocompatible bioceramic materials that are similar to bone hydroxyapatite in terms of calcium and phosphate contents. They dissolve when they are exposed to body fluids, and by forming the apatite crystals on their surface, they gain the ability to chemically bond with the apatite crystals which are present in bone and tooth tissues. (Jafari 2022)

Biologic Materials/Biologic Response Modifiers: Agents that alter wound healing or host-tumor interaction. Such materials can include cytokines, growth factor, or vaccines, but do not include any actual hard or soft tissue graft material.

These agents are added to graft material or used alone to effect acceleration of healing or regeneration in hard and soft tissue surgical procedures. (ADA)

Enamel Matrix Derivative: A porcine-derived tooth enamel matrix product. (Fan 2023)

Mucogingival Deformity: A departure from the normal dimension and morphology of, and/or interrelationship between gingiva and alveolar mucosa; the abnormality may be associated with a deformity of the underlying alveolar bone. (AAP)

Periradicular: Surrounding the root. (AAE)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D4265	Biologic materials to aid in soft and osseous tissue regeneration, per site
D4999	Unspecified periodontal procedure, by report
D7921	Collection and application of autologous blood concentrate product

CDT® is a registered trademark of the American Dental Association

Description of Services

Regenerative materials seek to facilitate the regeneration of bone and soft tissue lost due to disease, injury, or defect. These materials are typically used in combination with each other, or surgical procedures which can make definitive determination of efficacy challenging. The development of various regenerative technologies in medicine and dentistry is rapidly advancing and the technologies outlined in this policy are not all inclusive.

Clinical Evidence

Autologous Platelet Concentrates

In a 2023 systematic review, Malcangi et al. evaluated the potential of autologous platelet concentrates/concentrated growth factors (CGF) combined with bone graft for maxillary sinus augmentation. Twenty two articles were included. The results showed histologically enhanced vascularization and new bone formation when using growth factors. The influence of PRF combined with bone grafting takes advantage of the body's natural ability to form new bone cells, and promote healing, and PRP provides statistically significant implant related primary stability. When compared, sinus elevation using CGF alone results in bony changes similar to a demineralized bovine bone matrix. This systematic review is limited by the heterogeneity of the included studies with regard to combinations of products, and more research is needed to validate these findings.

Csifó-Nagy et al. (2021) conducted a blinded, randomized clinical trial to evaluate the healing of intrabony periodontal defects after treatment with a new generation of platelet-rich fibrin (A-PRF+) which is a platelet rich fibrin concentration obtained by lower speed centrifugation, compared to enamel matrix derivative (EMD). Thirty intrabony defects in eighteen patients that met the following criteria were selected: no systemic disease, nonsmokers, good oral hygiene, a minimum of one or more 2,3 or combined 2,3 wall intrabony defect with a defect angle of 20-40 degrees, with a minimum probing depth of 6mm with the intrabony component having a minimum of 4mm. Clinical parameters measured at baseline and 6 months after surgery were pocket depth (PD), gingival recession (GR) and clinical attachment level (CAL). Fifteen patients received A-PRF+ (test) and fifteen received EMD (control). The results showed after 6 months, the mean PD decreased 4.47mm in both groups, the mean GR increase was 3.93 in the test group and 3.33 in the control group, and the mean CAL gain was 2.33 in the test group and 2.60 in the control. The authors concluded that A-PRF+ seems to be at least as clinically effective as EMD when treating intrabony periodontal defects. The authors acknowledge limitations of this study was a double arm and lacked a control group and isolated intrabony defects may fill without the addition of biologic materials. Larger randomized trials that include a control group, as well as histological evaluation of regeneration are needed to confirm these results.

Miron et al. (2021) conducted a systematic review and meta-analysis of 27 randomized controlled trials to compare the clinical outcomes of platelet rich fibrin (PRF) in the treatment of periodontal intrabony defects compared to other commonly used treatment modalities. Primary outcome measurements included decrease in probing depth (PD), increased clinical attachment level (CAL), and increased radiographic bone fill (RBF), the results of each modality compared to PRF are summarized below:

- Open flap debridement (OFD) alone versus OFD/PRF.
- 14 Studies evaluated OFD alone vs OFD with PRF. On average, the results showed statistically significant improvements by way of a reduction in PD of 1.26mm, CAL gain of 1.39 mm and statistically significant improved bone fill.
- OFD/bone graft (OFD/BG) versus OFD/PRF.
- Five studies evaluated the use of a bone graft with OFD vs PRF with OFD. The results showed no statistically significant differences between the two groups, and PRF leads to comparable outcomes to BG when used for intrabony defect repair/regeneration.
- OFD/BG versus OFD/BG/PRF.
- Six studies compared the use of a bone graft with OFD vs PRF + BG with OFD. Two of the six studies reported significant improvements in PD and CAL compared to BG alone while the other four reported no statistically significant difference. Meta-analysis showed approximately 1mm gain in CAL and improvements in RBF indicating some improvement is observed when PRF is added to a BG material.
- OFD/barrier membrane (BM), OFD/PRP, or OFD/enamel matrix derivative (EMD) versus OFD/PRF.
- Eight studies investigating PRF versus a collagen barrier membrane (BM) showed no statistically significant difference in terms of PD reduction, however improvements were observed for CAL and RBF in favor of PRF compared to BM.
- OFD/EMD versus OFD/EMD/PRF.
- No differences in any of the investigated parameters were found for single RCTs investigating PRP versus PRF EMD versus PRF or EMD versus EMD + PRF.

In a 2018 Cochrane database systematic review, Del Fabbro et al. sought to assess the effects of autologous platelet concentrates (APC) used as an adjunct to periodontal surgical therapies (open flap debridement (OFD), OFD combined with bone grafting (BG), guided tissue regeneration (GTR), OFD combined with enamel matrix derivative (EMD) for the treatment of infrabony defects. The primary outcomes assessed were change in probing pocket depth (PD), change in clinical attachment level (CAL), and change in radiographic bone defect filling (RBF). The authors included randomized controlled trials (RCTs) of both parallel and split-mouth design, involving patients with infrabony defects requiring surgical treatment. Studies had to compare treatment outcomes of a specific surgical technique combined with APC, with the same technique when used alone. Data was organized into four groups, each comparing a specific surgical technique when applied with the adjunct of APC or alone: 1. APC + OFD versus OFD, 2. APC + OFD + BG versus OFD + BG, 3. APC + GTR versus GTR, and 4. APC + EMD versus EMD. Based on very low-quality evidence, the results showed:

- APC + OFD versus OFD alone: Twelve studies were included in this comparison, with a total of 510 infrabony defects. There is evidence of an advantage in using APC globally from split-mouth and parallel studies for all three primary outcomes.
- APC + OFD + BG versus OFD + BG: Seventeen studies were included in this comparison, with a total of 569 infrabony defects. Considering all follow-ups, as well as 3 to 6 months and 9 to 12 months, there is evidence of an advantage in using APC from both split-mouth and parallel studies for all three primary outcomes.
- APC + GTR versus GTR alone: Seven studies were included in this comparison, with a total of 248 infrabony defects. Considering all follow-ups, there is probably a benefit for APC for both PD and CAL. However, given the wide confidence intervals, there might be a possibility of a slight benefit for the control. When considering a 3 to 6 months and a 9 to 12 months follow-up there were no benefits evidenced, except for CAL at 3 to 6 months. No RBF data were available.
- APC + EMD versus EMD: Two studies were included in this comparison, with a total of 75 infrabony defects. There is insufficient evidence of an overall advantage of using APC for all three primary outcomes.
- All studies in all groups reported a survival rate of 100% for the treated teeth. No complete pocket closure was reported.

The authors concluded that there is very low-quality evidence that the adjunct of APC to OFD or OFD + BG when treating infrabony defects may improve probing pocket depth, clinical attachment level, and radiographic bone defect filling. For GTR or EMD, insufficient evidence of an advantage in using APC was observed.

Patel et al. (2017-included in Miron 2021 systematic review and meta-analysis above) conducted a randomized controlled trial to assess the adjunctive use of platelet-rich fibrin (PRF) in regenerative management of intrabony defects in comparison with open flap debridement (OFD). Twenty-six bilateral defects (13 per group) in 13 patients were randomized as either PRF (test group) or OFD alone (control group) sites. Primary outcomes assessed were changes in PD, CAL, and

percentages of bone fill at 6, 9, and 12 months. Secondary outcome was assessment of wound healing using a wound healing index (WHI). The PRF group showed significant improvement in clinical parameters compared with the control group at 6, 9, and 12 months. The PRF group showed a bone fill of 45.18% \pm 7.57%, which was statistically significant compared with 21.6% \pm 9.3% seen in the control group at the end of the study period. The PRF group also showed significant soft tissue healing and reduction in PD. WHI also showed significant advantages for the PRF group. The authors concluded that the adjunctive use of PRF to conventional OFD may be potentially used in the treatment of intrabony defects.

Miron et al. (2017) conducted a systematic review with the goal of gathering the extensive number of articles published to date on platelet rich fibrin (PRF) in the dental field to better understand the clinical procedures where PRF may be utilized to enhance tissue/bone formation. Randomized clinical trials were searched systematically until May 2016 and separated into the following categories: intrabony and furcation defect regeneration, extraction socket management, sinus lifting procedures, gingival recession treatment, and guided bone regeneration (GBR) including horizontal/vertical bone augmentation procedures. In total, 35 articles were selected and divided accordingly. Overall, the use of PRF has been most investigated in periodontology for the treatment of periodontal intrabony defects and gingival recessions where the majority of studies have demonstrated favorable results in soft tissue management and repair. Little to no randomized clinical trials were found for extraction socket management, although PRF has been shown to significantly decrease dry sockets complications in third molar sites. Little to no data was available directly investigating the effects of PRF on new bone formation in GBR, horizontal/vertical bone augmentation procedures, treatment of peri-implantitis, and sinus lifting procedures. The authors concluded that investigation supports the use of PRF for periodontal and soft tissue repair. There remains a lack of well-conducted studies demonstrating convincingly the role of PRF during hard tissue bone regeneration. Future human randomized clinical studies evaluating the use of PRF on bone formation are necessary.

Ravi et al. (2017) completed a split-mouth randomized controlled clinical trial to assess the effect of plasma rich growth factor (PRGF) associated with guided tissue regeneration (GTR) versus GTR only in the treatment of intrabony defects (IBDs) in patients with chronic periodontitis (CP). Patients with CP with 42 contralateral 2- and 3-walled defects were randomly assigned to test (PRGF + GTR) and control (GTR alone) treatment groups. Clinical and radiographic assessments performed at baseline and after 6 months were: gingival index (GI), probing depth (PD), clinical attachment level (CAL), radiologic defect depth, and bone fill. The results demonstrated that the parameters measured at baseline and after 6 months showed mean PD reduction of 3.37 \pm 1.62 mm in the control group and 4.13 \pm 1.59 mm in the test group. There was a significant difference in mean change in CAL in the control group (5.42 \pm 1.99) and the test group (5.99 \pm 1.77). Mean change in GI was 1.89 \pm 0.32 and 1.68 \pm 0.58 in the control group and test group, respectively, and the difference was statistically significant. When compared between groups, clinical parameters did not show any statistically significant variations. Mean radiographic bone fill was 1.06 \pm 0.81 and 1.0 \pm 0.97 in the control group and test group, respectively. However, the difference was not statistically significant. The authors concluded that PRGF with GTR, as well as GTR alone, was effective in improving clinical and radiographic parameters of patients with CP at the 6-month follow-up. There was no additive effect of PRGF when used along with GTR in the treatment of IBDs in patients with CP in terms of both clinical and radiologic outcomes.

Cieplik et al. (2017) completed a 13-year follow-up of a randomized controlled clinical split-mouth study on the influence of autogenous platelet concentrate (APC) on combined guided tissue regeneration (GTR)/graft therapy in intrabony defects. In 25 patients, two deep contra-lateral intrabony defects were treated according to GTR using β -TCP and bio-resorbable membranes. In test defects, APC was applied additionally. After 13 years, clinical healing results were assessed and compared to results at baseline and after 1 year, and a tooth survival analysis completed. After 13 years, 22 patients were available for tooth survival analysis showing 81.8% of test and 86.4% of control teeth still in situ. Based on the 15 patients still available for split-mouth analysis, median CAL was 10.0 mm in test and 12.0 mm in control sites at baseline. After 1 year, both groups revealed significant CAL gains of 5.0 mm, followed by a new CAL loss of 1.0 mm in the following 12 years. There were no significant differences between test and control sites. The authors concluded that within the limits of this study, the data shows that most of the CAL gain following GTR can be maintained over 13 years. The additional use of APC had no positive influence on the long-term stability.

Galav et al. (2016) conducted a randomized controlled trial to compare the clinical efficacy of platelet-rich fibrin (PRF) with autogenous bone grafting (ABG) for the treatment of intra bony defects (IBD's) in chronic periodontitis. Twenty chronic periodontitis patients with IBDs were randomly treated by PRF or ABG. Probing pocket depth (PPD), relative attachment level (RAL), surgical reentry bone fills, and radiographic bone fill (RBF) were recorded at baseline, 3-, 6-, and 9-months post-surgery, respectively. Both PRF and ABG sites produced a significant improvement from baseline to 9 months for all the parameters. However, there was no significant difference between the two treatment modalities in the reduction of PPD and RAL gain at 9 months. In addition, ABG showed significantly greater RBF (30.34%) as compared to PRF (20.22%). Similar findings were supported by surgical reentry, where a surgical reentry of 65.31% at ABG sites and 43.64% at PRF sites was seen. The authors concluded that both ABG and PRF can be used predictably to reconstruct

lost periodontal structures as indicated by PPD reduction and RAL gain. However, in terms of osseous defect fill, ABG yields more definitive outcome than PRF.

Shah et al. (2014) conducted a systematic review and meta-analysis to determine the clinical and radiographic outcomes of using platelet-rich fibrin (PRF) for the treatment of periodontal intra-bony defects (IBD) compared with open flap debridement (OFD). Studies having a test group using PRF alone and a control group with OFD alone with a minimum follow up of six months were included. A total of 298 sites were treated using PRF either in combination with graft or as a monotherapy in comparison to traditional OFD procedure. The meta-analysis showed a standard mean difference of 0.95 mm in clinical attachment level (CAL) and 2.33 mm in IBD after treatment of IBD with PRF compared with OFD. The authors concluded that clinically significant improvements in periodontal parameters such as CAL, IBD, and reduction in probing depth were achieved when IBDs were treated with PRF alone when compared to OFD.

Nevins et al. (2013) provided results from a 36-month extension study of a multicenter, randomized, controlled clinical trial evaluating the effect and long-term stability of homodimer platelet derived growth factor (PDGF-BB) treatment in patients with localized severe periodontal osseous defects. A total of 135 participants were enrolled from six clinical centers for this trial, and eighty-three individuals completed the study at 36 months and were included in the analysis. The study investigated the local application of β -tricalcium phosphate scaffold matrix with or without two different dose levels of PDGF (0.3 or 1.0 mg/mL PDGF-BB) in patients possessing one localized periodontal osseous defect. Clinical and radiographic evidence of treatment success was defined as percentage of cases with clinical attachment level (CAL) \geq 2.7 mm and linear bone growth (LBG) \geq 1.1 mm. Although there were no significant increases in CAL and LBG at 36 months among all groups, there were continued increases in CAL gain, LBG, and percentage bone fill over time, suggesting overall stability of the regenerative response. The authors concluded that PDGF-BB in a synthetic scaffold matrix promotes long-term stable clinical and radiographic improvements in patients with localized severe periodontal osseous defects.

Enamel Matrix Derivative (EMD)

In a 2022 American Academy of Periodontology systematic review and network meta-analysis, Tavelli et al. evaluated the effect of various biologic agents on the regenerative outcomes in treating infrabony periodontal defects either as a monotherapy or combined with bone grafts (BG) and/or absorbable guided tissue regeneration membranes. For EMD, the results showed significant improvements in regenerative outcomes in infrabony defects, and it should be used in combination with bone grafts.

Estrin et al. (2022) conducted a systematic review and meta-analysis to assess the efficacy of enamel matrix derivative (EMD) using a minimally invasive surgical technique (MIST), or flapless approach for the treatment of periodontal probing depths greater than 5mm. 7 RCTs and 12 case series were included. The showed that EMD with MIST improved recession coverage (REC) and bone fill (BF) when compared to MIST without EMD. However, no difference in clinical attachment level (CAL) or pocket depth (PD) was observed between MIST + EMD vs MIST without EMD. No statistically significant advantage was found for employing the EMD via the flapless approach. The authors concluded that these findings suggest that MIST in combination with EMD led to improved clinical outcomes while EMD employed in nonsurgical flapless therapy yielded no clinical benefits when compared to nonsurgical therapy alone without EMD, and more research is needed to substantiate these findings.

In a prospective 2-year clinical study conducted at two centers, Seshima et al. (2017) evaluated the outcomes of periodontal regenerative therapy using EMD for the treatment of intrabony defects. Inclusion criteria was interproximal sites with probing depth (PD) \geq 6 mm, at least one interproximal intrabony defect \geq 3 mm in depth, and adequate level of plaque control. Participants must have received initial periodontal therapy. Baseline parameters of pocket depth (PD), gingival recession (GR), clinical attachment level (CAL), bleeding on probing (BOP) and tooth mobility (TM) were recorded and reevaluated at 1 and 2 years. Twenty-two patients completed the 2-year reevaluation and the results from baseline showed a significant improvement in CAL, PD (the contribution of GR to PD reduction was minimal), BOP and TM. The bone fill assessed showed improvements as well. The authors concluded that treating periodontal intrabony defects using EMD results in clinically significant gains in attachment. This study is limited by a small sample size and its single arm design.

Matarraso et al. (2015) conducted a systematic review and meta-analysis was to assess the clinical efficacy of regenerative periodontal surgery of intrabony defects using a combination of enamel matrix derivative (EMD) and bone graft compared with that of EMD alone. The primary outcome was gain of clinical attachment (CAL). Weighted means and forest plots were calculated for CAL gain, probing depth (PD), and gingival recession (REC). Twelve studies reporting on 434 patients and 548 intrabony defects were selected for the analysis. Mean CAL gain amounted to 3.76 ± 1.07 mm (median 3.63 95 % CI 3.51-3.75) following treatment with a combination of EMD and bone graft and to 3.32 ± 1.04 mm (median 3.40; 95 % CI 3.28-3.52) following treatment with EMD alone. Mean PD reduction measured 4.22 ± 1.20 mm

(median 4.10; 95 % CI 3.96-4.24) at sites treated with EMD and bone graft and yielded 4.12 ± 1.07 mm (median 4.00; 95 % CI 3.88-4.12) at sites treated with EMD alone. Mean REC increase amounted to 0.76 ± 0.42 mm (median 0.63; 95 % CI 0.58-0.68) at sites treated with EMD and bone graft and to 0.91 ± 0.26 mm (median 0.90; 95 % CI 0.87-0.93) at sites treated with EMD alone. The authors concluded results indicate that the combination of EMD and bone grafts may result in additional clinical improvements in terms of CAL gain and PD reduction compared with those obtained with EMD alone.

Koop et al. (2012) conducted a systematic review to give an updated answer to the question of whether the additional use of EMD in periodontal therapy is more effective compared with a control or other regenerative procedures. The use of EMD in treatment of intrabony defects, furcations, and recessions was evaluated. 27 randomized controlled trials (20 for intrabony defects, one for furcation, and six for recession) with ≥ 1 year of follow-up were included. The primary outcome variable for intrabony defects was the change in clinical attachment level (CAL), for furcations the change in horizontal furcation depth, and for recession complete root coverage. The primary outcome variable for intrabony defects was the change in clinical attachment level (CAL), for furcations the change in horizontal furcation depth, and for recession complete root coverage. The results showed the treatment of intrabony defects with EMD showed a significant additional gain in CAL of 1.30 mm compared with open-flap debridement, root conditioning, or placebo, but no significant difference compared with resorbable membranes was shown. The use of EMD in combination with a coronally advanced flap compared with a coronally advanced flap alone showed significantly more complete root coverage, but compared with a connective tissue graft, the result was not significantly different. The use of EMD in furcations (2.6 ± 1.8 mm) gave significantly more improvement in horizontal defect depth compared with resorbable membranes (1.9 ± 1.4 mm) as shown in one study. The authors concluded the following: for intrabony defects, the use of EMD is superior to control treatments but as effective as resorbable membranes; the additional use of EMD with a coronally advanced flap for recession coverage will give superior results compared with a control but is as effective as a connective tissue graft; and the use of EMD in furcations will give more reduction in horizontal furcation defect depth compared with resorbable membranes.

Bioactive Glass

A 2022 ECRI clinical evidence assessment entitled Bicera Bone Graft Substitute (Wiltrom Corp. Ltd.) for Filling Bone Defects reported on the safety and effectiveness of Bicera compared to bone grafts and other natural or synthetic bone substitutes. Bicera is a biocompatible ceramic composed of hydroxyapatite and beta-tricalcium. Evidence from one nonrandomized comparison study and two small case series is too limited in quantity and quality to determine how well Bicera works compared with autografts, allografts, or other bone graft materials bone fillers. Large well-designed studies are needed.

Naqvi et al. (2017) conducted a randomized controlled trial to compare the clinical effectiveness of the combination of PRF and bioactive glass putty and bioactive glass putty alone as regenerative techniques for intrabony defects in humans. Ten pairs of intrabony defects were surgically treated with PRF and bioactive glass putty (Test group) on one side or bioactive glass putty alone (Control group) on other side. The primary outcomes of the study included changes in probing depth; attachment level and bone fill of osseous defect. The clinical parameters were recorded at baseline, 3, 6, and 9 months. Radiographic assessment was done using standardized intraoral periapical radiographs. Differences between baseline and postoperative measurements between the control and test groups were calculated using independent t-test. Comparisons were made within each group between baseline, 3 months, 6 months and 9 months using the ANOVA test followed by Bonferroni test. The mean probing depth reduction was greater in the test group (bioactive glass putty and PRF) i.e., (3.2 ± 2.3 mm) than in the control group (bioactive glass putty alone) i.e., (3.15 ± 1.06 mm). The mean CAL gain was also greater in the test group (4.1 ± 1.73 mm) as compared to the control group (3.15 ± 1.06 mm), (p -value < 0.95). Furthermore, significantly greater mean bone fill was found in the test group (7.1 ± 1.37 mm) as compared to the control group (5.7 ± 1.64 mm), (p -value < 0.043). The results of this study showed both the groups bioactive glass putty alone (Control Group) and the combination of PRF and bioactive glass putty (Test Group) are effective in the treatment of intrabony defects. The bioactive glass putty appears to be a suitable vehicle to administer biologic substances like PRF and growth factors to induce the new bone regeneration.

Sohrabi et al. (2012) conducted a meta-analysis of randomized controlled clinical trials to evaluate bioactive glass in the treatment of intrabony and furcation defects. Criteria included publication in English, follow-up duration of ≥ 6 months, baseline and follow-up measures of probing depth (PD) and clinical attachment levels (CAL) with 95% confidence intervals (CIs), and an appropriate control arm. Twenty-five citations were identified, 15 of which were included in the final analysis. Pooled analyses showed that BG was superior to control for both measures. CAL heterogeneity appeared secondary to active controls versus open flap debridement (OFD) alone and to defect-type modifying BG treatment success. Per subgroup analyses, the benefit of BG over control treatment was highly significant only in studies comparing BG to OFD. The authors concluded that treatment of intrabony defects with BG imparts a significant improvement in both PD and CAL compared to both active controls and OFD.

Bone Morphogenic Protein

In a 2023 randomized controlled split mouth clinical trial, Garg et al. assessed the clinical and radiographic outcomes of recombinant human bone morphogenetic protein-2 (rhBMP-2) for the treatment of intraosseous abnormalities after periodontal flap surgery. A total of 14 patients with 28 intraosseous defects were included. The control group had open flap debridement with alloplast, and the treatment group underwent the same procedure with the addition of rhBMP-2. Plaque index (PI), gingival index (GI) probing pocket depth (PPD), clinical attachment level (Cal), and radiographic defect fill were collected at baseline and 3, 6 and 9 months. The results showed PPD, GI and PI showed significant improvement in both groups. At both 6 and 9 months, the control group has a significantly improved distance from the base of the defect to the alveolar crest. When measuring the distance from the cemento-enamel junction and the base of the defect, the treatment group also showed improvement at 6 and 9 months. Radiographically, both groups showed bone fill, however the treatment group's defect fill was noticeably better. The authors concluded that treating defects with and without rhBMP-2 both promote periodontal healing. This trial is limited by a small number of participants and further research with larger patient populations are needed to validate these findings.

Medikeri et al. (2019) conducted a systematic review to assess the amount of radiographic bone fill, clinical attachment level (CAL) gain, and reduction in pocket depth (PD) in patients with intrabony defects in periodontitis patients following the use of recombinant human bone morphogenetic protein-2 (rhBMP-2). Studies using rhBMP-2 to treat periodontal intrabony defects of the maxillary or mandibular region for the treatment of intrabony defects (1, 2, or 3-walled) for periodontal regeneration was compared to other surgical treatment utilizing growth factors, alloplastic, allogeneic grafts, and xenografts with follow-up period of at least 6 months were included. A total of 48 subjects in 2 studies met the inclusion criteria. The results found that rhBMP-2 showed statistically significant results with respect to radiographic defect resolution, CAL, and PD reduction at 9 months compared to open-flap debridement but showed statistically significant results only with respect to radiographic bone fill when compared with platelet-rich fibrin at 6 months. The authors concluded that rhBMP-2 may provide a promising alternative to traditional grafting procedures therapy that can enhance periodontal regeneration in patients having intrabony defects, however due to limited human studies, no definitive evidence exists to ascertain the effectiveness of rhBMP-2 in the treatment of intrabony defects in periodontal diseases.

In a 2016 systematic review, Kaur et al. reviewed the clinical data currently available on the use of bone morphogenetic proteins (BMPs) in various periodontal applications. BMPs have been shown in preclinical and clinical studies to enhance periodontal regeneration. BMPs have demonstrated beyond doubt their role as a superior alternative of autogenous bone graft. However, much of the data in BMP research has been derived from animal studies which are important as far as providing base line data for further clinical studies. The available data on use of rhBMP-2 and 7 in humans are promising in showing an osteoinductive potential in periodontal regeneration, but not conclusive in the predictability and consistency results to allow clinical use at this stage, other than in well-designed clinical trials. Since many other factors including smoking, age, steroid use, malnutrition, and disease severity play a role in determining the physiology of periodontal regeneration in humans, the true efficacy and safety of these agents for different scenarios must be established in carefully designed prospective randomized clinical trials before they are approved for use. Research should continue to focus on improving the use of BMPs in the current clinical applications.

Sasikumar et al. (2012) conducted a literature review regarding the application of bone morphogenetic proteins to periodontal and peri-implant tissue regeneration. Several studies showed significant regeneration of the periodontal tissues and it is important to understand the biologic processes of periodontal wound healing and the effects of these biologic processes on BMP activity. Further studies are needed for the development of delivery systems that have mechanical and surgical properties appropriate for controlled release of bone morphogenetic proteins and identifying optimal condition for the use of BMPs for periodontal regeneration.

Amniotic Membranes

In 2022, Law et al. conducted a narrative review of 16 articles to assess the properties of amniotic membranes (AM) and their potential role in periodontal regeneration. It was found that AM has antifibrotic, anti-inflammatory, microbial and scarring properties as well as mechanical strength and flexibility. Included studies show promising outcomes for root coverage procedures, use as a bone graft barrier and improve periodontal parameters including pocket depths and clinical attachment loss. One study showed AM may be effective for periodontal fibroblast growth. More research is needed before firm conclusions on efficacy can be drawn.

Gulameabasse et al. (2020) performed a systematic review of the clinical applications where chorion membrane (CM) and amnion/chorion membrane (ACM) were used for oral tissue regeneration procedures. Seven clinical applications of CM and ACM in oral and periodontal surgery were identified: gingival recession treatment, intrabony and furcation defect treatment, alveolar ridge preservation, keratinized gum width augmentation around dental implants, maxillary sinus

membrane repair, and large bone defect reconstruction. CM and ACM were compared to negative controls (conventional surgeries without membrane) or to the following materials: collagen membranes, dense polytetrafluoroethylene membranes, platelet-rich fibrin membranes, amnion membranes, and to a bone substitute. Several studies support the use of CM and ACM as an efficient alternative to current techniques for periodontal and oral soft tissue regeneration procedures. However, further studies are necessary to increase the level of evidence and to demonstrate their role for bone regeneration.

In a 2019 randomized clinical trial, Temraz et al. compared the clinical and radiographic outcomes of amnion chorion membrane (ACM) with demineralized bone matrix (DBM) in a putty form in management of periodontal intrabony defects. Twenty-two participants with severe chronic periodontitis and intrabony defects were randomly assigned in two equal parallel groups. Each group was treated with open flap debridement (OFD) and ACM or OFD and DBM putty. Plaque index, gingival index, pocket depth (PD), clinical attachment level (CAL) and radiographic measurement of bone defect area (BDA) were recorded at baseline, 3 and 6 months postoperatively. Both ACM and DBM putty demonstrated significant improvement in all clinical and radiographic outcomes at 6 months compared to baseline values. However, no significant difference was observed between the two treatment modalities when compared at different time intervals. Six months postoperatively, ACM showed 3.18 ± 0.85 mm, PD reduction and 2.25 ± 0.75 mm CAL gain, while DBM putty revealed 3.45 ± 1.08 mm PD reduction and 2.73 ± 0.85 mm CAL gain. Radiographic assessment showed that mean baseline BDA for ACM group was 10.39 ± 3.86 mm², which significantly reduced to 5.21 ± 2.38 after 6 months. Mean BDA mm² in DBM putty group also significantly improved after 6 months, 5.35 ± 3.63 mm² when compared to baseline values 9.80 ± 5.77 mm². Both ACM barrier and DBM putty allograft provided significant improvement in clinical and radiographic outcomes after 6 months, yet no significant differences were noticed between them. This trial implied that both biomaterials have a potential regenerative capacity in treating periodontal intrabony defects.

Mahajan et al. (2018) conducted a study to clinically compare the efficacy of placental membrane (Amnion) and collagen membrane (Healiguide) for the treatment of gingival recession. Twelve patients having isolated bilateral gingival recession defects were included in the study and were divided into two groups randomly. Group I were treated by coronally positioned flap and amnion membrane, and Group II were treated by coronally positioned flap and collagen membrane (Healiguide)[™]. Clinical parameters, including dental plaque index (PI), gingival index (GI), gingival recession depth, probing pocket depth, clinical attachment level, and gingival biotype, were recorded before surgery at baseline and then reevaluated at 3 and 6 months postoperatively. The results showed statistically no significant difference ($p > 0.05$) in dental PI improvement, GI and probing pocket depth for both groups. Significant reduction in gingival recession defects and gain in clinical attachment level was observed in both the groups. Intergroup comparison of gingival recession defects and clinical attachment level yielded nonsignificant differences. However, a statistically significant increase ($p < 0.05$) in gingival tissue thickness was observed in Group II as compared to Group I. The authors concluded that both membranes are equally efficacious in the treatment of gingival recession, with more gingival tissue thickness (gingival biotype) enhancement observed in sites treated with collagen membrane.

In a 2018 comprehensive systematic review, Fénelon et al. analyzed 17 articles including five areas of potential clinical application for human amniotic membrane (hAM): periodontal surgery, cleft palate and tumor reconstruction, prosthodontics, and peri-implant surgery. Overall, periodontal surgery was the only discipline to assess the efficacy of hAM with randomized clinical trials. The wide variability of preservation methods of hAM and the lack of objective measurements were observed in this study. There is weak clinical evidence demonstrating convincingly the benefit of hAM in oral surgery compared to standard surgery. Several studies now suggest the interest of hAM for periodontal tissue repair. Due to its biological and mechanical properties, hAM seems to be a promising treatment for wound healing in various areas of oral reconstruction. However, further randomized clinical trials are needed to confirm these preliminary results.

Other Biological Materials

Novello et al. (2020) conducted a systematic review and meta-analysis to evaluate the potential efficacy of mesenchymal stem cells (MSCs) in periodontal regeneration in humans on clinical attachment level (CAL), probing depth (PD), and gingival recession (GR). Double-blind randomized controlled trials (RCTs) evaluating MSCs in periodontal regeneration were included in a meta-analysis if they compared administration of MSCs vs application of stem cell-free therapy in the control group, in healthy patients with periodontal defects, with a minimum of three months of follow-up. Only two small RCTs at high risk of bias, with a total of 59 patients and 70 periodontal defects, were included in the meta-analysis. The results showed a small difference for CAL but not for PD or GR at three months. The authors concluded that low quality evidence indicates MSC based therapy may have a small impact on periodontal regeneration, but high-quality RCTs are needed before any clinical use can be recommended.

AlSarhan et al. (2019) performed a systematic review and meta-analysis of 4 randomized controlled trials to understand the efficacy of xenogeneic collagen matrix (CMX) compared to connective tissue grafts for the treatment of multiple,

adjacent gingival Miller Class I and II recessions. The results showed that while recession depth, complete root coverage and mean root coverage were significantly lower with CMX, there was no statistically significant difference in the recession width. CMX also showed significantly lower probing depth, however there was no significant difference in clinical attachment level and keratinized tissue width observed. The average percentage of mean root coverage for CMX and CTG was 65.8% and 84.5% respectively, indicating that CMX was not as effective as CTG in multiple adjacent areas of recession. Although CMX provided acceptable clinical outcomes, heterogeneity among the included studies make recommending firm conclusions cannot be drawn about using it as an alternative to CTG for root coverage, and further research is needed.

Chambone et al. (2018) also evaluated other root coverage procedures used for treating localized and multiple recession defects. Forty-five randomized controlled trials (RCTs) of at least 6 months duration, that treated Millers Class I or II \geq 3mm treated by root coverage periodontal plastic surgery procedures (RCPPS) were selected. The results showed there is insufficient evidence showing a reduction in gingival recession when using acellular dermal matrix grafts (ADMG) + coronally advanced flap (CAF) and subepithelial connective tissue graft (SCTG) + CAF or between enamel matrix protein (EMP) + CAF and SCTG + CAF. For clinical attachment levels, there was insufficient evidence of a difference between ADMG + CAF and SCTG + CAF, or between EMP + CAF and SCTG + CAF. Greater gains in the keratinized tissue were found for SCTG + CAF when compared to EMP + CAF and SCTG + CAF. There was insufficient evidence of a difference in keratinized tissue gain between ADMG + CAF and SCTG + CAF. The authors concluded that the available evidence base indicates that in cases where both root coverage and gain in the width of keratinized tissue are expected, the use of subepithelial connective tissue grafts shows a slight improvement in outcome, and low-quality evidence suggesting that acellular dermal matrix grafts may be the soft tissue substitute that may provide the most similar outcomes to those achieved by subepithelial connective tissue grafts. Further RCTs are necessary to identify possible factors associated with the prognosis of each RCPPS procedure.

Atieh et al (2016- included in AISarhan systematic review above). Several clinical trials describe the effectiveness of xenogeneic collagen matrix (XCM) as an alternative option to surgical mucogingival procedures for the treatment of marginal tissue recession and augmentation of insufficient zones of keratinized tissue (KT). The aim of this systematic review and meta-analysis was to evaluate the clinical and patient-centered outcomes of XCM compared to other mucogingival procedures. Applying guidelines of the Preferred Reporting Items for Systematic Reviews and Meta analyses statement, randomized controlled trials were searched for in electronic databases and complemented by hand searching. The risk of bias was assessed using the Cochrane Collaboration's Risk of Bias tool and data were analyzed using statistical software. A total of 645 studies were identified, of which, six trials were included with 487 mucogingival defects in 170 participants. Overall meta-analysis showed that connective tissue graft (CTG) in conjunction with the coronally advanced flap (CAF) had a significantly higher percentage of complete/mean root coverage and mean recession reduction than XCM. Insufficient evidence was found to determine any significant differences in width of KT between XCM and CTG. The XCM had a significantly higher mean root coverage, recession reduction and gain in KT compared to CAF alone. No significant differences in patient's aesthetic satisfaction were found between XCM and CTG, except for postoperative morbidity in favor of XCM. Operating time was significantly reduced with the use of XCM compared with CTG but not with CAF alone. There is no evidence to demonstrate the effectiveness of XCM in achieving greater root coverage, recession reduction and gain in KT compared to CTG plus CAF. Superior short-term results in treating root coverage compared with CAF alone are possible. The authors concluded that there is limited evidence that XCM may improve aesthetic satisfaction, reduce postoperative morbidity and shorten the operating time. Further long-term randomized controlled trials are required to endorse the advantages of XCM.

McGuire et al. (2014) conducted a study to compare the clinical parameters 5 years post operatively, of a previously reported split-mouth, randomized controlled trial. In that study, Miller Class II gingival recession defects were treated with either a connective tissue graft (CTG) (control) or recombinant human platelet-derived growth factor-BB + β -tricalcium phosphate (test), both in combination with a coronally advanced flap (CAF). Twenty of the original 30 patients were available for follow-up 5 years after the original surgery. Outcomes examined were recession depth, probing depth, clinical attachment level (CAL), height of keratinized tissue (wKT), and percentage of root coverage. Group results at 6 months and 5 years were compared with original baseline values. At 5 years, all parameters for both treatment protocols showed statistically significant improvements over baseline. The primary outcome parameter, change in recession depth at 5 years, demonstrated statistically significant improvements in recession over baseline, although intergroup comparisons favored the control group at both 6 months and 5 years. At 5 years, intergroup comparisons also favored the test group for percentage root coverage and change in wKT, whereas no statistically significant intergroup differences were seen for 100% root coverage and changes to CAL. The authors concluded that treatment with either test or control treatments for Miller Class II recession defects appear to lead to stable, clinically effective results, although CTG + CAF resulted in greater reductions in recession, greater percentage of root coverage, and increased wKT.

Rosetti et al. (2013, included in Cochrane above) completed a 30-month follow-up clinical trial to assess the long-term stability of the root coverage of subepithelial connective tissue graft (SCTG) and guided tissue regeneration combined with demineralized freeze-dried bone allograft (GTR-DFDBA). Twenty-four defects were treated in 12 patients who presented with canine or pre-molar Miller class I and/or II bilateral gingival recessions. GTR-DFDBA and SCTG treatments were performed in a randomized selection in a split-mouth design. The following clinical parameters were assessed at 6-, 18- and 30-months post-surgery: root coverage (RC), gingival recession (GR), probing depth (PD), clinical attachment level (CAL) and keratinized tissue width (KTW). The authors concluded that there were not significant differences in RC, GR, PD and CAL for both procedures, but the increase in KTW was significantly higher in the SCTG group than in the GTR-DFDBA group. The authors concluded that both procedures provide adequate root coverage over the long term, with the connective tissue graft procedure promoting a more favorable increase in keratinized tissue.

Moslemi et al. (2011) conducted a randomized clinical trial to compare the long-term results of subepithelial connective tissue graft (SCTG) versus acellular dermal matrix allograft (ADMA) in treatment of gingival recessions. There were 16 patients with bilateral Miller Class I/II gingival recessions selected. One side was treated with SCTG and the other side with ADMA. Clinical parameters of complete root coverage (CRC), reduction of recession depth (RD) and reduction of recession width (RW) were measured at baseline, 6 months, and at 5 years post-surgery. At 5 years, significant relapses were detected in CRC and reduction of RD and RW in both groups, with no statistically significant differences. Compared with baseline, the gingival width (GW) did not increase in ADMA-treated sites. The five-year results of SCTG and ADMA were similar in terms of CRC and reduction of RD and RW. (Both techniques showed a significant relapse associated with returning to horizontal toothbrushing habit). Increase of GW was stable in SCTG-treated sites but reached to pre-surgical values in ADMA-treated cases.

Mucogingival Defects

In a 2021 systematic review and meta-analysis, Meza-Mauricio et al. aimed to compare the clinical effects of enamel matrix derivative (EMD) when used with coronally advanced flap (CAF), or CAF + connective tissue graft (CTG) when compared with CAF alone or CAF + CTG for the treatment of Miller class I and II gingival recessions (GR) in maxillary teeth. Outcomes measured were reduction in amount of gingival recession (GR), gain in keratinized tissue width (KTW), and gain in clinical attachment level (CAL). Nine RCT's were identified and comprised 336 gingival recessions. The meta-analysis showed a statistically significant reduction in GR and CAL in CAF + EMD procedures, as well as CAF + CTG + EMD. The difference in KTW gain was not statistically significant in either group. The authors concluded that the results of this SR and meta-analysis provide moderate certainty evidence in favor of using EMD in addition to CAF and/or CTG surgeries to improve root coverage, but the differences in KTW gain were not statistically significant in both comparison groups. The studies analyzed did not show results beyond 6-12 months.

Mancini et al. (2021) conducted a systematic review and meta-analysis with the aim of investigating the efficacy of leukocyte-platelet-rich fibrin (L-PRF) in addition to coronally advanced flap surgery for treating single and multiple gingival recessions (GRs) compared to the CAF alone, and to the adjunct of a connective tissue graft (CTG). Outcomes measured included mean root coverage (mRC), recession reduction, keratinized tissue width gain (KTW), gingival thickness (GT) gain, and patient reported outcomes (PROs) such as pain perception and sensitivity reduction. Fourteen randomized controlled trials with a total of 275 patients with 611 surgical sites were included. The results from the SR showed that PRF may provide superior mRC, KTW gain, GT gain and healing score compared to CAF alone, however the meta-analysis confirmed statistically significantly better results for CAF + L-PRF over CAF alone for GT and CAL gain and mRC only. When compared to CTG for single gingival recessions, only the GT gain was statistically significant. Patient reported outcomes were better for L-PRF compared to CTG. This may be due to the fact that CTG requires a second surgical site for the harvesting, and the palatal wound that can also have complications during healing, as well as accelerated wound healing promoted by the release of growth factor from L-PRF. The authors acknowledge many of these studies have a moderate or high risk of bias, and moderate/large heterogeneity. Additionally, no studies reported more than 12 months follow up, so the long-term results are not known. Other limitations include non-standardized spin protocols and handling of materials, and the inclusion of patients who smoke which can affect outcomes. The authors recommend future research reduce risks of bias and standardize protocols and that CTG remains the gold standard for treating gingival recession.

In a 2020 systematic review and meta-analysis, Miron et al. (included in Mancini systematic review and meta-analysis above) compared the results of the use of platelet rich fibrin (PRF) with other common procedures in the treatment of Miller Class I or II gingival recessions including flap surgeries, connective tissue grafts, and the use of enamel matrix derivative, amnion membrane to enhance tissue regeneration. The results showed, when compared to coronally advanced flap surgery alone, when PRF was added, relative root coverage and clinical attachment levels had a statistically significant increases, with no change in keratinized mucosa width or probing depth. The authors concluded that the use of PRF in conjunction with flap surgery improves root coverage and clinical attachment levels and may be beneficial in cases in which adequate keratinized mucosal width is present. Connective tissue grafting may be preferred over PRF when this is limited.

Discepoli et al. (2019) conducted a systematic review and meta-analysis to evaluate if enamel matrix derivatives are able to improve the quality of keratinized gingival tissue around natural teeth in patients with recession defects following periodontal surgical procedures. Twelve RCTs that included medium-low quality evidence evaluating root coverage procedures in combination with EMD with at least 10 subjects and a minimum duration of six months, were included. In total 639 recessions were treated (334 tests and 305 control). The recessions defects were classified according to the classification of Miller (Class I, II, III, IV). Only one trial included Miller Class III recessions (7 in total). Enamel matrix derivatives were applied in conjunction with Coronally Advanced Flap (CAF), Coronally Advanced Flap + Sub Epithelial Connective Tissue Graft (CAF + CTG), Semilunar Flap (SF). For the group CAF vs CAF + EMD the mean difference between the keratinized tissue gain in the two procedures was 0.40 mm; for the comparison CAF + CTG + EMD vs. CAF + CTG the mean difference between the two groups resulted in \square 0.06 mm. The authors concluded that the application of Enamel Matrix Derivatives to surgical procedures aimed to cover gingival recessions does not add robust clinical benefit to conventional surgical procedures alone.

França-Grohmann et al. (2018) completed a clinical trial to evaluate the treatment of gingival recessions by semilunar coronally positioned flap plus enamel matrix derivative (SCPF + EMD). Thirty patients with class I localized gingival recession were included. They were randomly allocated in two groups: SCPF + EMD and SCPF. Recession height (RH), recession width (RW), width of keratinized tissue (WKT), thickness of keratinized tissue (TKT), probing depth (PD), and clinical attachment level (CAL) were measured at baseline, 6- and 12-months post-surgery. Patient/professional evaluation of esthetics and root sensitivity was also performed. The result showed that after 12 months, mean root coverage was 1.98 ± 0.33 mm for SCPF + EMD and 1.85 ± 0.41 mm for SCPF (the esthetic evaluation by the patient showed preference for SCPF + EMD. According to the professional evaluation (QCE), the use of EMD decreases the appearance of postoperative scar tissue line). There was a significant reduction in root hypersensitivity with no further complaints by the patients. The results showed that the addition of EMD provides significantly better esthetics to SCPF, according to patient and professional assessments. SCPF + EMD are effective but not superior to SCPF for root coverage, after 12 months.

Alexiou et al (2017) conducted a study to compare the clinical efficiency of enamel matrix derivative (EMD) placed under a coronally advanced flap (CAF; test group), to a connective tissue graft (CTG) placed under a CAF (control group), in patients with multiple recession defects. Twelve patients with multiple Miller's Class I or II gingival recessions in contralateral quadrants of the maxilla were selected. The primary outcome variable was the change in depth of the buccal recession (REC) at 6 months after surgery. The secondary outcome parameters included the clinical attachment level (CAL), the probing pocket depth (PPD), and the width of keratinized gingiva (WKT) apical to the recession. Recession defects were randomly divided to the test or control group by using a computer-generated randomization list. The results showed no statistically significant differences observed between test and control groups in regards with the depth of buccal recession with a mean REC of 1.82 mm (CTG) and 1.72 mm (EMD) respectively. Similarly, the mean PPD value was 1.3 mm for both groups, while the respective value for CAL was 1.7 mm (EMD) and 1.8 mm (CTG). Statistically significant differences were observed only for the WKT, which were 3.0 mm and 3.6 mm for the test and control groups respectively. The authors concluded that the use of EMD in conjunction with a CAF resulted in similar results as compared to the CTG plus CAF.

Moraschini et al. (2016- included in 2021 Mancini systematic review and meta- analysis above) conducted a systematic review and meta- analysis to evaluate the effects of platelet-rich fibrin (PRF) membranes on the outcomes of clinical treatments in patients with gingival recession. The eligibility criteria comprised randomized controlled trials (RCTs) and prospective controlled trials with follow-up periods of ≥ 6 months that compared the performance of PRF to other biomaterials in the treatment of Miller Class I or II gingival recessions. Six RCTs and one prospective clinical trial are included in this review. The estimates of the intervention effects were expressed as the mean differences in percentages or millimeters. The results showed root coverage (RC) and clinical attachment level (CAL) did not differ significantly between the analyzed subgroups, and the keratinized mucosa width (KMW) gain was significantly greater in the subgroup that was treated with connective tissue grafts. The author's conclusion suggests that the use of PRF membranes did not improve the RC, KMW, or CAL of Miller Class I and II gingival recessions compared with the other treatment modalities.

Keceli et al. (2016- included in 2021 Mancini systematic review and meta- analysis above) Platelet-rich fibrin (PRF) is an autologous preparation that has encouraging effects in healing and regeneration. The aim of this randomized, parallel group-controlled trial was to evaluate the effectiveness of coronally advanced flap (CAF) + connective tissue graft (CTG) + PRF in Miller Class I and II recession treatment compared to CAF + CTG. Forty patients were treated surgically with either CAF + CTG + PRF (test group) or CAF + CTG (control group). Clinical parameters of plaque index, gingival index, vertical recession (VR), probing depth, clinical attachment level (CAL), keratinized tissue width (KTW), horizontal recession (HR), mucogingival junction localization, and tissue thickness (TT) were recorded at baseline and 3 and 6 months after surgery. Root coverage (RC), complete RC (CRC), attachment gain (AG), and keratinized tissue change (KTC) were also calculated. All individuals completed the entire study period. At baseline, mean VR, HR, CAL, KTW, and TT values were

similar. In both groups, all parameters showed significant improvement after treatment except TT. No intergroup difference was observed at 6 months after surgery. The amount of RC and AG, but not KTC and CRC, was higher in the PRF-applied group. According to the results, the addition of PRF did not further develop the outcomes of CAF + CTG treatment except increasing the TT. However, this single trial is not sufficient to advocate the true clinical effect of PRF on recession treatment with CAF + CTG, and additional trials are needed.

Periradicular Surgery

Yahata et al. (2023) conducted a multicenter randomized clinical trial to evaluate the effects of concentrated growth factor (CGF), a new-generation autologous platelet concentrate, on bone healing in combination with apical microsurgery. 24 participants undergoing apical microsurgery were randomly assigned 1:1, with the treatment group receiving CGF following root end filling, and the control group microsurgery only. The results showed no significant differences in success between the two groups; however lesion volume reduction was reduced in the treatment group. The authors concluded that CGF is a promising treatment option to stimulate healing following apical microsurgery. Further well designed research is needed to validate these findings.

Deng et al (2016) conducted a systematic review and meta-analysis to evaluate the effect of regeneration techniques (RTs) on the outcome of periapical surgery with different protocols for different lesion types. Clinical evidence indicates that most of the repair or regeneration of the bone defect takes place during the first year after the procedure and that very few changes occur later, therefore this study only extracted data collected at 1 year after periapical surgery. PubMed, the Cochrane Library, and Embase were searched through December 30, 2014. Studies that met the inclusion criteria were systematically evaluated, and a meta-analysis was performed. Eight randomized controlled trials met the inclusion criteria. A significantly better outcome was found in the combination group (membranes plus bone replacement analogues) and bone replacement analogue-only group whereas no significant beneficial effect was found in the membrane-only group. The results of this meta-analysis showed that use of RTs in periapical surgery yielded better outcomes than traditional periapical surgery, which was inconsistent with a previous meta-analysis (Tsisis et al 2011). The use of RTs favorably affected the outcome of periapical through-and-through lesions and large lesions (≥ 10 mm). There was no significant benefit of using RTs for 4-wall lesions. Both the isolated use of bone replacement analogues and the combination of membranes and bone replacement analogues can improve the outcome of periapical surgery, whereas using membranes alone does not have significantly favorable effects. The use of RTs for through-and-through and large lesions should be recommended.

Dhiman et al. (2015) conducted a prospective randomized controlled trial to evaluate the healing outcomes of platelet-rich fibrin (PRF) in periapical surgeries involving apicomarginal defects and to compare these results with surgeries not using any guided tissue regeneration techniques. Thirty patients with suppurative chronic apical periodontitis and apicomarginal communication were randomly assigned to either the PRF or the control group. Clinical and radiographic parameters including pocket depth (PD), clinical attachment level, gingival marginal position, size of periapical lesion, and percentage reduction of the periapical radiolucency were recorded at baseline and at an interval of 3 months for a period of 12 months. The results showed an overall success rate of 83.33%, with a success rate of 86.66% (13 of 15 teeth) for PRF group and 80% (12 of 15 teeth) for control group. Both the groups exhibited a significant reduction in PD, clinical attachment level, gingival marginal position, and size of periapical lesion at 12-month period. No significant differences were observed between the 2 groups for these parameters except PD, which showed a statistically significant reduction in the PRF group. The authors concluded that the adjunctive use of regenerative techniques may not promote healing of apicomarginal defects of endodontic origin.

von Arx et al. (2011) conducted a literature review of the current clinical and experimental studies to evaluate the outcome of regenerative techniques (RT) in conjunction with apical surgery with regard to type of periapical lesions. A literature search with PubMed and Cochrane databases was conducted in April 2010 and a total of 11 clinical and 10 experimental studies fulfilled the inclusion criteria and included the following: The assessed outcome had to be periapical healing based on radiographic and clinical parameters for clinical studies, or periapical healing based on radiographic, histologic or histomorphometric parameters for experimental studies. The studies had to have a minimum of 10 teeth with a minimum follow-up period of 6 months for clinical studies and of 8 weeks for experimental studies. One clinical and one experimental study of those included differentiated between different types of lesions. The current literature studies do not contain strong evidence demonstrating the need for more research. However, based on the current literature, the authors concluded that the reviewed clinical and experimental studies show no or only minimal benefits of using RT in apical surgery for the treatment of osseous defects limited to the periapical area, (as unimpeded new bone formation can take place) and that the use of RT in apical surgery for treatment of lesions limited to the apical area is not warranted. None of the tested regenerative techniques or materials resulted in a better outcome when comparing test and control sites, except for Expanded Polytetrafluoroethylene Membranes (ePTFE) in two studies, however this material has also been associated with an increased risk of wound dehiscence and site infection in several other studies.

Clinical Practice Guidelines

American Academy of Periodontology (AAP)

In a 2022 best evidence consensus statement (Avila-Ortiz et al.), the APP makes the following recommendations regarding the use of biologics in clinical practice:

- Root Coverage and Gingival Augmentation Therapy
- Autogenous subepithelial connective tissue graft (SCTG) remains the gold standard in bilaminar root coverage procedures.
- The adjunctive use of biologics enhances initial postoperative healing after root coverage and gingival augmentation therapy.
- Infrabony Defects
- Biologics are effective for the treatment of periodontal infrabony defects and show added benefits when combined with biocompatible/biodegradable scaffolds (e.g., xenografts, allografts).
 - Recombinant human platelet-derived growth factor BB (rhPDGF-BB) and platelet-rich fibrin (PRF) are associated with superior clinical and radiographic outcomes compared to enamel matrix derivative (EMD) and platelet-rich plasma (PRP).
 - Xenogeneic bone grafts with rhPDGF-BB or PRF are the best combination therapy to maintain the stability of the gingival margin following regenerative treatment of periodontal infrabony defects.
- Alveolar Ridge Preservation (ARP)/Alveolar Ridge Reconstruction (ARR) and Implant Site Development (ISD).
- There is limited evidence to support that the use of biologics either as a monotherapy or in combination with graft materials results in superior clinical and radiographic outcomes when compared with conventional interventions.

Based on this limited evidence, the AAP states that clinicians should consider the use of biologics for the following:

- Patients with the potential of compromised wound healing, or a shortened wound healing time is necessary.
- When defects present with lower predictability.
- When ideal soft tissue healing is desired (esthetic zone).
- Patients with a history of therapy failure or unsatisfactory results after conventional treatment.

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

Tissue grafting products from donated human skin are regulated by the FDA as human tissue for transplantation, as are products used for bone grafts and they are processed and marketed in accordance with the FDA's requirements for banked human tissue (21 CFR, Part 1270 and Part 1271) and Standards for Tissue Banking of the American Association of Tissue Banks (AATB). Information is available at:

<http://www.fda.gov/BiologicsBloodVaccines/TissueTissueProducts/default.htm>. (Accessed January 24, 2024)

There are a number of bioactive glass regenerative products cleared by the FDA under the 510(k) pathway. Refer to the following website and search using product code LYC:

<https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm>. (Accessed January 24, 2024)

In 1996 Emdogain™ (Straumann) received Premarket Approval. Refer to the following website for more information:

<https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpma/pma.cfm?id=P930021>. (Accessed January 24, 2024)

There are several devices cleared for marketing by FDA for point-of-care preparation of platelet-rich plasma (PRP) from a sample of a patient's blood (see listings under product code JQC for additional devices). Refer to the following website for more information: <http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm>. (Accessed January 24, 2024)

In April 2003, the FDA approved the use of the GPS™ Platelet Separation Kit. The GPS™ separation kit aids separation of the patient's own blood components by density through the use of the GPS™-Thermo International Equipment Company (IEC) centrifuge. The GPS separation kit permits platelet rich plasma to be rapidly prepared from a small volume of the patient's blood that is drawn at the time of treatment. The GPS Platelet Separation Kit is designed for use in the clinical laboratory or intraoperatively at point of care, for the safe and effective preparation of platelet poor plasma and platelet concentrate from a small sample (50-60 ml) of whole blood. Refer to the following website for more information:

<http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmn.cfm?ID=K030555>. (Accessed January 24, 2024)

References

- Alexiou A, Vouros I, Menexes G, et al. Comparison of enamel matrix derivative (Emdogain) and subepithelial connective tissue graft for root coverage in patients with multiple gingival recession defects: A randomized controlled clinical study. *Quintessence Int.* 2017; 48(5):381-389.
- AlSarhan MA, Al Jasser R, Tarish MA, et al. Xenogeneic collagen matrix versus connective tissue graft for the treatment of multiple gingival recessions: A systematic review and meta-analysis. *Clin Exp Dent Res.* 2019;5(5):566-579.
- American Academy of Periodontology. *Glossary of Periodontal Terms.* 2022.
- American Association of Endodontists (AAE). *Glossary of Endodontic Terms*, 9th edition. 2019.
- Atieh MA, Alsabeeha N, Tawse-Smith A, et al. Xenogeneic collagen matrix for periodontal plastic surgery procedures: a systematic review and meta-analysis. *J Periodontol Res.* 2016 Aug; 51(4):438-52.
- Avila-Ortiz G, Ambruster J, Barootchi S, et al. American Academy of Periodontology best evidence consensus statement on the use of biologics in clinical practice. *J Periodontol.* 2022 Dec;93(12):1763-1770.
- Cieplik F, Tabenski L, Hiller KA, et al. Influence of autogenous platelet concentrate on combined GTR/graft therapy in intrabony defects: a 13-year follow-up of a randomized controlled clinical split-mouth study. *J Clin Periodontol.* 2017 Dec 15.
- Csifó-Nagy BK, Sólyom E, Bognár VL, et al. Efficacy of a new-generation platelet-rich fibrin in the treatment of periodontal intrabony defects: a randomized clinical trial. *BMC Oral Health.* 2021 Nov 15;21(1):580.
- Del Fabbro M, Karanxha L, Panda S, et al. Autologous platelet concentrates for treating periodontal infrabony defects. *Cochrane Database Syst Rev.* 2018 Nov 26.
- Deng Y, Zhu X, Yang J, et al. The effect of regeneration techniques on periapical surgery with different protocols for different lesion types: a meta-analysis. *J Oral Maxillofac Surg.* 2016 Feb; 74(2):239-46.
- Dhiman M, Kumar S, Duhan J, et al. Effect of platelet-rich fibrin on healing of apicomarginal defects: a randomized controlled trial. *J Endod.* 2015 Jul; 41(7):985-91.
- Discepoli N, Mirra R, Ferrari M. Efficacy of enamel derivatives to improve keratinized tissue as adjunct to coverage of gingival recessions: A systematic review and meta-analysis. *Materials (Basel).* 2019 Aug 30;12(17):2790.
- ECRI Institute. *Bicera Bone Graft Substitute (Wiltrom Corp. Ltd.) for Filling Bone Defects.* April 2022.
- Estrin NE, Moraschini V, Zhang Y, et al. Use of enamel matrix derivative in minimally invasive/flapless approaches: a systematic review with meta-analysis. *Oral Health Prev Dent.* 2022 Jun 13;20(1):233-242.
- Fan L, Wu D. Enamel matrix derivatives for periodontal regeneration: recent developments and future perspectives. *J Healthc Eng.* 2022 Apr 11;2022:8661690.
- Fénelon M, Catros S, Fricain JC. What is the benefit of using amniotic membrane in oral surgery? A comprehensive review of clinical studies. *Clin Oral Investig.* 2018 Jun;22(5):1881-1891.
- França-Grohmann IL, Sangiorgio JM, Bueno MR, et al. Does enamel matrix derivative application improve clinical outcomes after semilunar flap surgery? A randomized clinical trial. *Clin Oral Investig.* 2018 Jun 12.
- Galav S, Chandrashekar KT, Mishra R, et al. Comparative evaluation of platelet-rich fibrin and autogenous bone graft for the treatment of infrabony defects in chronic periodontitis: Clinical, radiological, and surgical reentry. *Indian J Dent Res.* 2016 Sep-Oct; 27(5):502-507.
- Garg S, Kapoor R, Tyagi P, et al. Treatment of human intraosseous periodontal defects using recombinant human bone morphogenetic protein-2: a randomized controlled clinical trial. *Cureus.* 2023 Jun 14;15(6):e40395.
- Gulameabasse S, Gindraux F, Catros S, et al. Chorion and amnion/chorion membranes in oral and periodontal surgery: A systematic review. *J Biomed Mater Res B Appl Biomater.* 2020 Dec 22.
- Jafari, N., Habashi, M.S., Hashemi, A. et al. Application of bioactive glasses in various dental fields. *Biomater Res* 26, 31 (2022).
- Kaur S, Grover V, Kaur H, et al. Evaluation of bone morphogenic proteins in periodontal practice. *Indian J Dent.* 2016 Jan-Mar;7(1):28-37.
- Keceli HG, Kamak G, Erdemir EO, et al. The adjunctive effect of platelet-rich fibrin to connective tissue graft in the treatment of buccal recession defects: results of a randomized, parallel-group controlled trial. *J Periodontol.* 2015 Nov; 86.
- Koop R, Merheb J, Quiryren M. Periodontal regeneration with enamel matrix derivative in reconstructive periodontal therapy: a systematic review. *J Periodontol.* 2012 Jun;83(6):707-20.

Law EJ, Taib H, Berahim Z. Amniotic membrane: an approach to periodontal regeneration. *Cureus*. 2022 Aug 9;14(8):e27832.

Mahajan R, Khinda P, Shewale A, et al. Comparative efficacy of placental membrane and Healiguide™ in treatment of gingival recession using guided tissue regeneration. *J Indian Soc Periodontol*. 2018 Nov-Dec;22(6):513-522.

Malcangi G, Patano A, Palmieri G, et al. Maxillary Sinus Augmentation Using Autologous Platelet Concentrates (Platelet-Rich Plasma, Platelet-Rich Fibrin, and Concentrated Growth Factor) Combined with Bone Graft: A Systematic Review. *Cells*. 2023 Jul 6;12(13):1797.

Mancini L, Tarallo F, Quinzi V, et al. Platelet-rich fibrin in single and multiple coronally advanced flap for type 1 recession: an updated systematic review and meta-analysis. *Medicina (Kaunas)*. 2021 Feb 5;57(2):144.

McGuire MK, Scheyer ET, Snyder MB. Evaluation of recession defects treated with coronally advanced flaps and either recombinant human platelet-derived growth factor-BB plus β -tricalcium phosphate or connective tissue: comparison of clinical parameters at 5 years. *J Periodontol*. 2014 Oct; 85(10):1361-70.

Medikeri RS, Meharwade VV, Sinha KA. Effects of recombinant human bone morphogenetic protein-2 compared to other biomaterials in the treatment of intrabony defects in periodontitis patients: A systematic review. *J Indian Soc Periodontol*. 2019 Jul-Aug;23(4):311-315.

Meza Mauricio J, Furquim CP, Bustillos-Torrez W, et al. Does enamel matrix derivative application provide additional clinical benefits in the treatment of maxillary Miller class I and II gingival recession? A systematic review and meta-analysis. *Clin Oral Investig*. 2021 Apr;25(4):1613-1626.

Miron RJ, Moraschini V, Del Fabbro M, et al. Use of platelet-rich fibrin for the treatment of gingival recessions: a systematic review and meta-analysis. *Clin Oral Investig*. 2020 Aug;24(8):2543-2557.

Miron RJ, Moraschini V, Fujioka-Kobayashi M, et al. Use of platelet-rich fibrin for the treatment of periodontal intrabony defects: a systematic review and meta-analysis. *Clin Oral Investig*. 2021 May;25(5):2461-2478.

Miron RJ, Zucchelli G, Pikos MA, et al. Use of platelet-rich fibrin in regenerative dentistry: a systematic review. *Clin Oral Investig*. 2017 Jul; 21(6):1913-1927.

Moraschini V, Barboza Edos S. Use of platelet-rich fibrin membrane in the treatment of gingival recession: A systematic review and meta-analysis. *J Periodontol*. 2016 Mar; 87(3):281-90.

Moslemi N, Mousavi Jazi M, Haghhighati F, et al. Acellular dermal matrix allograft versus subepithelial connective tissue graft in treatment of gingival recessions: a 5-year randomized clinical study. *J Clin Periodontol*. 2011 Dec; 38(12):1122-9.

Nevins M, Kao RT, McGuire MK, et al. Platelet-derived growth factor promotes periodontal regeneration in localized osseous defects: 36-month extension results from a randomized, controlled, double-masked clinical trial. *J Periodontol*. 2013 Apr; 84(4):456-64.

Naqvi A, Gopalakrishnan D, Bhasin MT, et al. Comparative evaluation of bioactive glass putty and platelet rich fibrin in the treatment of human periodontal intrabony defects: a randomized control trial. *J Clin Diagn Res*. 2017 Jul; 11(7):ZC09-ZC13.

Novello S, Debouche A, Philippe M, et al. Clinical application of mesenchymal stem cells in periodontal regeneration: A systematic review and meta-analysis. *J Periodontol Res*. 2020 Jan;55(1):1-12.

Patel GK, Gaekwad SS, Gujjari SK, S C VK. Platelet-Rich Fibrin in Regeneration of Intrabony Defects: A Randomized Controlled Trial. *J Periodontol*. 2017 Nov;88(11):1192-1199.

Ravi S, Malaiappan S, Varghese S, et al. Additive effect of plasma rich in growth factors with guided tissue regeneration in treatment of intrabony defects in patients with chronic periodontitis: a split-mouth randomized controlled clinical trial. *J Periodontol*. 2017 Sep; 88(9):839-845.

Rignon-Bret C, Wulfman C, Valet F, et al. Radiographic evaluation of a bone substitute material in alveolar ridge preservation for maxillary removable immediate dentures: A randomized controlled trial. *J Prosthet Dent*. 2021 Apr 8:S0022-3913(21)00095-0.

Rosetti EP, Marcantonio E Jr, Zuza EP, et al. Root coverage stability of the subepithelial connective tissue graft and guided tissue regeneration: a 30-month follow-up clinical trial. *J Dent*. 2013 Feb; 41(2):114-20.

Seshima F, Aoki H, Takeuchi T, et al. Periodontal regenerative therapy with enamel matrix derivative in the treatment of intrabony defects: a prospective 2-year study. *BMC Res Notes*. 2017 Jul 6;10(1):256.

Shah M, Deshpande N, Bharwani A, et al. Effectiveness of autologous platelet-rich fibrin in the treatment of intra-bony defects: A systematic review and meta-analysis. *J Indian Soc Periodontol*. 2014 Nov-Dec; 18(6):698-704.

Sims T, Takei H. Carranza's Clinical Periodontology, 12th ed. St. Louis: Elsevier c2015 Chapter 62, Furcation; p.621-627.

Sohrabi K, Saraiya V, Laage TA, et al. An evaluation of bioactive glass in the treatment of periodontal defects: a meta-analysis of randomized controlled clinical trials. J Periodontol. 2012 Apr; 83(4):453-64.

Sasikumar KP, Elavarasu S, Gadagi JS. The application of bone morphogenetic proteins to periodontal and peri-implant tissue regeneration: A literature review. J Pharm Bioallied Sci. 2012 Aug; 4(Suppl 2):S427-30.

Temraz A, Ghallab NA, Hamdy R, et al. Clinical and radiographic evaluation of amnion chorion membrane and demineralized bone matrix putty allograft for management of periodontal intrabony defects: a randomized clinical trial. Cell Tissue Bank. 2019 Mar;20(1):117-128.

von Arx T, Alsaeed M. The use of regenerative techniques in apical surgery: A literature review. Saudi Dent J. 2011 Jul; 23(3):113-27.

Yahata Y, Handa K, Ohkura N, et al. Autologous concentrated growth factor mediated accelerated bone healing in root-end microsurgery: A multicenter randomized clinical trial. Regen Ther. 2023 Sep 6;24:377-384.

Policy History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.

Bone Replacement Grafts

Policy Number: DCP048.03
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
16. Coverage Rationale	81
17. Applicable Codes	81
18. Description of Services	82
19. Clinical Evidence	82
20. U.S. Food and Drug Administration	84
21. References	84
22. Policy History/Revision Information	85
23. Instructions for Use	85

Related Dental Policies
<ul style="list-style-type: none"> • Biological Materials for Soft and Hard Tissue Regeneration • Dental Barrier Membrane Guided Tissue Regeneration • Non-Surgical Extractions • Surgical Extraction of Erupted Teeth and Retained Roots • Surgical Extraction of Impacted Teeth

Coverage Rationale

Bone Replacement Grafts for Retained Natural Teeth

Bone replacement grafts for retained natural teeth are indicated for the following:

- Infrabony/intrabony vertical defects
- Class II furcation involvements

Bone replacement grafts for retained natural teeth are not indicated for the following:

- Non-vertical defects
- Individuals who have been non-compliant with previous periodontal therapies
- Individuals with poor oral hygiene
 - Teeth with a hopeless prognosis
 - In conjunction with periradicular surgery

Bone Replacement Graft for Ridge Preservation

Bone replacement grafting for ridge preservation following an extraction may be indicated for the following:

- A planned dental prosthesis in which loss of ridge volume would adversely affect fit and/or function
- To prepare a site for placement of an implant

Osseous, Osteoperiosteal or Cartilage Grafting

Osseous, osteoperiosteal, or cartilage grafting may be indicated to augment deficient alveolar bone needed to support a dental prosthesis or placement of implants.

These procedures may not be indicated for the following:

- Individuals with an unmanaged medical condition; these conditions include, but are not limited to, metabolic, cardiovascular, and autoimmune/inflammatory, as well as genetic conditions that affect collagen synthesis
- Individuals taking medications that negatively affects the healing response; these include, but are not limited to, immunosuppressive agents, corticosteroids, anticoagulants, NSAIDS, and nicotine

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered

health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D3428	Bone graft in conjunction with periradicular surgery – per tooth, single site
D3429	Bone graft in conjunction with periradicular surgery – each additional contiguous tooth in the same surgical site
D4263	Bone replacement graft – retained natural tooth – first site in quadrant
D4264	Bone replacement graft – retained natural tooth – each additional site in quadrant
D7950	Osseous, osteoperiosteal, or cartilage graft of the mandible or maxilla - autogenous or nonautogenous, by report
D7953	Bone replacement graft for ridge preservation-per site

CDT® is a registered trademark of the American Dental Association

Description of Services

Bone grafting is a well-established procedure that uses autologous or donor bone, xenografts, and alloplastic materials to augment bony defects due to tooth extraction or disease. This augmentation may be needed to prepare an extraction site for an implant, or other fixed or removable prosthetics, as well as replace the bone lost to periodontal disease. Bone grafts are typically used in conjunction with the application of biological materials and guided tissue membranes. Many surgical endodontic procedures are being performed less frequently, as the high success rate of dental implants makes them an accepted alternative. As a result, new evidence for these procedures is lacking.

Clinical Evidence

Bone Replacement Grafts

In a 2015 systematic review from the American Academy of Periodontology (AAP) Regeneration Workshop, Kao et al., updated the consensus reports by reviewing periodontal regeneration approaches developed for the correction of intrabony defects. Fifty-eight studies provided data on patient, tooth, and surgical-site considerations in the treatment of intrabony defects and forty-five controlled studies provided outcome analysis on the use of biologics for the treatment of intrabony defects. It was concluded that biologics (enamel matrix derivative and recombinant human platelet-derived growth factor-BB plus β -tricalcium phosphate) are generally comparable with demineralized freeze-dried bone allograft and guided tissue regeneration (GTR), and superior to open flap debridement procedures in improving clinical parameters in the treatment of intrabony defects. It was also reported that clinical outcomes are appreciably influenced by patient behaviors and surgical approach rather than by tooth and defect characteristics. Long-term studies show that these improvements are maintainable up to 10 years, even in severely compromised teeth.

Jambhekar et.al (2015) conducted a systematic review was to analyze the outcomes of a socket grafting procedures performed with flapless extraction of teeth with the primary outcome being to determine which graft material results in the least loss of socket dimensions, the maximum amount of vital bone, the least remnant graft material, and the least amount of connective tissue after a minimum of 12 weeks of healing. Secondary outcomes included the predictability of regenerating deficient buccal bone, necessity of barrier membranes, and coverage with autogenous soft tissue graft. 32 RCTs studying 1354 sockets were included. The results showed the mean loss of buccolingual width at the ridge crest was lowest for xenografts, followed by allografts, alloplasts and sockets without any socket grafting. 3 studies reported on loss of width at 3 mm below the ridge crest. The mean loss of buccal wall height from the ridge crest was lowest for xenografts and allografts followed by alloplasts and sockets without any grafting. The mean histologic outcomes at or beyond the 12-week period revealed the highest vital bone content for sockets grafted with alloplasts (45.53%), followed by sockets with no graft material (41.07%), xenografts (35.72%), and allografts (29.93%). The amount of remnant graft material was highest for sockets grafted with allografts (21.75%), followed by xenografts (19.3%) and alloplasts (13.67%). The highest connective tissue content at the time of reentry was seen for sockets with no grafting (52.53%), followed by allografts (51.03%), xenografts (44.42%), and alloplast (38.39%). The authors concluded that after flapless extraction of teeth, and using a minimum healing period of 12 weeks, xenografts and allografts resulted in the least loss of socket dimensions compared to alloplasts or sockets with no grafting. Histologic outcomes showed that sockets grafted with alloplasts had the maximum amount of vital bone and the least amount of remnant graft material and remnant connective tissue.

Reynolds et al. (2003) conducted a systematic review of randomized controlled studies to further clarify the efficacy of bone replacement grafts for the treatment of periodontal osseous defects compared to open flap debridement (OFD) alone. Primary endpoints included changes in bone level, clinical attachment level, probing depth, gingival recession, and crestal resorption. For purposes of meta-analysis, change in bone level (bone fill) was used as the primary outcome measure, measured upon surgical re-entry or transgingival probing (sounding). The results showed that bone grafts increase bone level, reduce crestal bone loss, increase clinical attachment level, and reduce probing depth compared to OFD alone, and there were no differences in clinical outcome measures between particulate bone allograft and calcium phosphate (hydroxyapatite) ceramic grafts. Furthermore, bone grafts in combination with barrier membranes increase clinical attachment level and reduce probing depth compared to graft alone. For the treatment of furcation defects, there was positive clinical benefits with the use of grafts in the treatment of Class II furcations. Histologically, 2 randomized controlled studies showed that demineralized freeze-dried bone allograft (DFDBA) supports the formation of a new attachment apparatus in intrabony defects, whereas OFD results in periodontal repair characterized primarily by the formation of a long junctional epithelial attachment. Multiple observational studies provide consistent histological evidence that autogenous and demineralized allogeneic bone grafts support the formation of new attachment. Limited data also suggest that xenogenic bone grafts can support the formation of a new attachment apparatus. All data indicates that alloplastic grafts support periodontal repair rather than regeneration. The authors concluded that the results of this systematic review indicate that bone replacement grafts provide demonstrable clinical improvements in periodontal osseous defects compared to surgical debridement alone.

Bone Replacement Grafts for Ridge Preservation

Rignon-Bret et al. (2021) conducted a single-blinded, randomized controlled clinical trial with 2 balanced parallel arms, to evaluate the efficacy of socket grafting with a xenogenic bone substitute on the preservation of the height and width of the bone ridge in the maxillary anterior region of 36 participants receiving maxillary immediate removable complete dentures. Participants had been without posterior teeth for at least 3 months. The results showed that of 36 participants, (3 were lost to follow-up), there was a decreased loss of height of the buccal crest, horizontal ridge width after 3 months, and 1 year of follow-up. The authors concluded that grafting DBBM-C into the extraction socket after removing anterior teeth for immediate removable denture therapy resulted in significantly less vertical buccal crest and horizontal ridge resorption as compared with spontaneous socket healing after 1 year of follow-up.

Avila-Ortiz et al. (2020) conducted a randomized controlled trial aimed at testing the efficacy of alveolar ridge preservation (ARP) compared with unassisted socket healing. A secondary objective was to evaluate the effect that local phenotypic factors play in the volumetric reduction of the alveolar bone. A total of 53 participants were randomized into either the control group, which involved only tooth extraction, or the experimental group, which received ARP using a combination of socket grafting with a particulate bone allograft and socket sealing with a nonabsorbable membrane (dPTFE). (ARP n = 26). A set of clinical, linear, volumetric, implant-related, and patient-reported outcomes were assessed during a 14-wk healing period. The results showed that all linear and volumetric bone assessments showed that ARP is superior to EXT. There were no significant differences in terms of soft tissue contour changes were observed. Additional bone augmentation to facilitate implant placement in a prosthetically acceptable position was deemed necessary in 48.1% of the EXT sites and only 11.5% of the ARP sites. Although some extent of alveolar ridge remodeling occurred in both groups, ARP therapy was superior to EXT as it was more efficacious in the maintenance of alveolar bone and reduced the estimated need for additional bone augmentation at the time of implant placement.

In 2019, Canellas et al. conducted a systematic review and meta-analysis of immediate implant placement or delayed placement with alveolar ridge preservation following tooth extraction. The primary outcomes were implant survival and esthetic outcome. Secondary outcomes were peri-implant bone resorption and implant complications at least one year after treatment. 16 studies that included 580 implant surgeries in 444 patients met the review criteria. The results showed a 3% risk of implant failure in the immediate implant protocol group, with no statistically significant differences in esthetic outcomes. The anterior region presented better results with immediate implants, while the molar region presented better results with delayed implants. The quantitative analysis showed no statistical difference in peri-implant bone resorption between the immediate and delayed implant protocols. The authors concluded that due to the lack of studies with a low risk of bias, further randomized controlled trials are needed before definitive conclusions can be made.

Periradicular Surgery

In a 2019 randomized prospective comparative study, Nakkeeran et al. compared and evaluated bone regeneration with and without combining platelet rich plasma (PRP), calcium sulfate (CS) and autogenous bone graft in periapical defects of jaw. The study included 20 participants assigned equally to the study and control groups. In the study group, the defect was filled with PRP, calcium sulfate and autologous bone graft. In the control group, the defect was allowed to heal without PRP, calcium sulfate and autogenous bone graft. The results were analyzed via orthopantomogram radiographs for bone density and regeneration using grey scale analysis, and residual bone defect calculation. The results showed the

mean bone density in the study group was significant at weeks 5, 13 and 20 week follow up when compared with the control, and the percentage bone formation analyzed using residual bone defect calculation revealed significantly higher size reduction in the study group than with the outcome obtained in the control group. The authors concluded that the combination of PRP, CS and autologous bone grafting is a novel osteoconductive treatment for periapical defects. This study is limited by a small number of participants, and larger studies are required to validate these findings.

Sreedevi et al. (2011) conducted a study to evaluate and compare the clinical and radiographic healing following periapical surgery with and without bone grafting. Twenty patients were selected and randomly divided into two groups: A and B. After periapical surgery, Group A patients had the bony defect filled with hydroxyapatite, while Group B did not. Radiographic angulations were standardized for subsequent follow-up during the period of the study, and only lesions with 0.5-2cm in dimension were selected. Following surgery all patients were assessed both clinically and radiographically for a period of nine months. Clinical parameters assessed included pain on percussion and palpation, mobility, swelling and vitality of adjacent teeth. Radiographically the graft was assessed by comparing it to surrounding bone (the margin between the bone and the graft, radiopacity of the graft in comparison with the surrounding bone, the presence of trabecular bone formation), and size of the lesion. On clinical evaluation the test group (Group A) did not show any significant immediate or delayed clinical symptoms. Radiographically, in the follow up period of 6 - 9 months the bone graft became indistinguishable from the surrounding bone which indicates complete bone regeneration. Group B showed incomplete bone fill at the end of the nine-month evaluation period. The authors concluded that bone regeneration following periapical surgery is effective and can be facilitated using an alloplastic bone graft. Randomized controlled studies with larger patient populations are required to validate these findings.

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

Tissue grafting products from donated human skin are regulated by the FDA as human tissue for transplantation, as are products used for bone grafts and they are processed and marketed in accordance with the FDA's requirements for banked human tissue (21 CFR, Part 1270, and Part 1271) and Standards for Tissue Banking of the American Association of Tissue Banks (AATB). Information is available at:

<http://www.fda.gov/BiologicsBloodVaccines/TissueTissueProducts/default.htm>. (Accessed December 29, 2022)

References

Avila-Ortiz G, Gubler M, Romero-Bustillos M, et al. Efficacy of alveolar ridge preservation: A randomized controlled trial. *J Dent Res*. 2020 Apr;99(4):402-409.

Beyene RT, Derryberry SL Jr, Barbul A. The Effect of Comorbidities on Wound Healing. *Surg Clin North Am*. 2020 Aug;100(4):695-705.

Canellas JVDS, Medeiros PJD, Figueredo CMDs, et al. Which is the best choice after tooth extraction, immediate implant placement or delayed placement with alveolar ridge preservation? A systematic review and meta-analysis. *J Craniomaxillofac Surg*. 2019 Nov;47(11):1793-1802.

Jambhekar S, Kernen F, Bidra AS. Clinical and histologic outcomes of socket grafting after flapless tooth extraction: a systematic review of randomized controlled clinical trials. *J Prosthet Dent*. 2015 May;113(5):371-82.

Kao RT, Nares S, Reynolds MA. Periodontal regeneration - intrabony defects: a systematic review from the AAP Regeneration Workshop. *J Periodontol*. 2015 Feb;86(2 Suppl): S77-104.

Kerr A, Miller C, Nelson R. Little and Falace's Dental Management of the Medically Compromised Patient, 10th ed. St. Louis: Elsevier c2024. Chapter 1, Patient Evaluation, Risk Assessment and the Diagnostic Process; p. 1-17.

Kumar P, Vinitha B, Fathima G. Bone grafts in dentistry. *J Pharm Bioallied Sci*. 2013 Jun;5(Suppl 1): S125-7.

Nakkeeran KP, Saravanan K, Babu P, John RR. Evaluation of bone regeneration in periapical osseous defects with and without platelet rich plasma, combined calcium sulfate and autologous bone graft - A comparative study. *J Stomatol Oral Maxillofac Surg*. 2019 Jun;120(3):196-202.

Kotsakis G, Chun-The L, Heinrichs J. Newman and Carranza's Clinical Periodontology and Implantology, 14th ed. St. Louis: Elsevier c2023. Chapter 5, Classification of Diseases and Conditions Affecting the Periodontium; p. 61-81.

Reynolds MA, Aichelmann-Reidy ME, Branch-Mays GL, et al. The efficacy of bone replacement grafts in the treatment of periodontal osseous defects. A systematic review. *Ann Periodontol*. 2003 Dec;8(1):227-65.

Rignon-Bret C, Wulfman C, Valet F, et al. Radiographic evaluation of a bone substitute material in alveolar ridge preservation for maxillary removable immediate dentures: A randomized controlled trial. J Prosthet Dent. 2021 Apr 8:S0022-3913(21)00095-0.

Policy History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.

Cone Beam Computed Tomography

Policy Number: DCP044.06
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
24. Coverage Rationale	86
25. Applicable Codes	86
26. Description of Services	87
27. Clinical Evidence	87
28. U.S. Food and Drug Administration	94
29. References	95
30. Policy History/Revision Information	96
31. Instructions for Use	96

Related Dental Policies
None

Coverage Rationale

Cone beam computed tomography (CBCT) is proven and medically necessary as adjunctive advanced imaging for complex clinical conditions when additional detail is needed to safely render treatment.

Cone beam computed tomography (CBCT) is unproven and not medically necessary for routine dental diagnosis and/or treatment planning due to insufficient evidence of efficacy and/or safety.

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D0364	Cone beam CT capture and interpretation with limited field of view - less than one whole jaw
D0365	Cone beam CT capture and interpretation with field of view of one full dental arch - mandible
D0366	Cone beam CT capture and interpretation with field of view of one full dental arch - maxilla, with or without cranium
D0367	Cone beam CT capture and interpretation with field of view of both jaws; with or without cranium
D0368	Cone beam CT capture and interpretation for TMJ series including two or more exposures
D0380	Cone beam CT image capture with limited field of view - less than one whole jaw
D0381	Cone beam CT image capture with field of view of one full dental arch - mandible
D0382	Cone beam CT image capture with field of view of one full dental arch - maxilla, with or without cranium
D0383	Cone beam CT image capture with field of view of both jaws; with or without cranium
D0384	Cone beam CT image capture for TMJ series including two or more exposures
D0391	Interpretation of diagnostic image by a practitioner not associated with capture of the image, including report
D0393	Treatment simulation using 3D image volume

CDT Code	Description
D0394	Digital subtraction of two or more images or image volumes of the same modality
D0395	Fusion of two or more 3D image volumes of one or more modalities

CDT® is a registered trademark of the American Dental Association

Description of Services

Cone-beam computed tomography (CBCT) is a variation of traditional computed tomography (CT). The CBCT systems used in dentistry rotate around the patient, capturing data using a cone-shaped X-ray beam. These data are used to reconstruct a three-dimensional (3D) image of the selected area. Dental CBCT is increasingly used for various clinical applications including dental implant planning, visualization of abnormal teeth, the position of teeth in relation to vital structures, endodontic (root canal) diagnoses, and dental trauma. These procedures may have a higher risk of complications without the level of detail CBCT imaging provides. The selected image field of view (FOV) should be no larger than necessary.

Although the radiation doses from dental CBCT exams are generally lower than other CT exams, dental CBCT exams deliver more radiation than conventional dental radiographic exams. Concerns about exposure are greater for younger patients as they are more sensitive to radiation. The FDA offers guidance on pediatric radiology and full information can be found here: <https://www.fda.gov/radiation-emitting-products/medical-imaging/pediatric-x-ray-imaging>. (Accessed February 21, 2023)

The International Atomic Energy Agency (IAEA) provides information on comparative radiation doses for dental imaging, and full information can be found here: <https://www.iaea.org/resources/rpop/health-professionals/dentistry/radiation-doses#:~:text=intraoral%20dental%20X%20ray%20imaging,100%20%CE%BCSv%20for%20large%20volumes>. (Accessed February 21, 2023)

Incidental findings (IF) are not uncommon. These are radiographic or tomographic images in which there is a discovery unrelated to the original purpose of the examination. These can range from anatomical variations to benign and malignant lesions. Therefore, dental CBCT images must always be read and interpreted by an appropriately trained professional (Edwards et al. 2013; Lopes et al. 2017).

Clinical Evidence

Endodontics

Chugal et al. (2024) conducted a review of patient data to examine the impact of applying the evidence-based AAE/AAOMR CBCT guidelines in endodontic diagnosis and treatment decisions in patients referred to a post graduate endodontic clinic during a consecutive 36 month period. Each case was examined for the ability of standard diagnostic modalities and when periapical diagnosis and provisional treatment plan could not be determined, CBCT imaging was requested. A total of 442 CBCT scans were prescribed to evaluate 526 teeth of which over 50% were molars. Less than 1% of scans were prescribed for outcome assessment. The results showed for periapical disease diagnosis, CBCT imaging resulted in a change in 21% of teeth, and for treatment decisions, imaging led to changes in approximately 62%. The authors concluded that these results validate appropriateness of the AAE/AAOMR guidelines and offer benefits in appropriately selected patients.

In a 2022 systematic review, Tay et al. evaluated how endodontic treatment plans change when CBCT imaging is used in decision making. Studies examining changes in clinicians' treatment plans with and without the use of CBCT were included. After searching, 16 studies met the inclusion criteria and were assessed. The results showed that 15 studies showed a change in treatment plan when CBCT was used. Studies were divided into 2 groups: the first group (5/16 studies) reported changes in treatment plan without reporting changes in treatment options, and the second group (11/16 studies) specified the changes in treatment options. In this second group, 9 studies recommended further intervention including surgical and non-surgical endodontic treatment and extractions after CBCT was used. Only 2 studies reported no change in treatment plan. There was an increased in recommended extraction reported in 6 out of 7 studies that included this as a treatment option, and 8 studies that included endodontic treatment and no treatment as possible treatment options, increases were reported in the recommendation for non-surgical or surgical endodontic treatment, and with decreases in 'no treatment' were described in 4 of these studies. Increases in the recommendation for endodontic retreatment options were observed in 2 studies that used CBCT to evaluate treatment outcome. CBCT imaging influences endodontic treatment decision-making towards further intervention in the following situations: high difficulty cases,

diagnosis of symptomatic teeth after failed root canal treatment, evaluation of periapical healing, pre-surgical treatment planning, and management of traumatized immature teeth and external cervical resorption.

Aminoshariae et al. (2018) conducted a systematic review that compared and quantified endodontic outcomes using cone-beam computed tomographic (CBCT) imaging with intraoral periapical radiography. Six articles met the inclusion criteria with low to moderate risk of bias. The odds of the CBCT imaging locating a lesion are twice as good as the odds of traditional radiography locating the same lesion. This may not be of concern for an obvious lesion, but when clinically challenged with a difficult diagnosis and/or decision making, CBCT imaging might provide a greater amount of information needed to establish an accurate diagnosis. Although CBCT imaging can overcome several limitations of 2-dimensional radiography, there are other issues to consider such as radiation, high levels of scatter and noise, variations in dose distribution within a volume of interest, and cost. For these reasons, CBCT imaging should be used when the history and clinical examination clearly show that the benefits outweigh the potential risks. In other words, not every patient should be unnecessarily exposed to unwarranted radiation and as always, the ALARA (As Low As Reasonably Achievable) principle should be used. The authors identified a limitation of a subgroup analyses not being included since the studies were somewhat consistent because of the overall low heterogeneity among the studies. Although intraoral radiographs are the imaging modality of choice, when 2-dimensional intraoral radiography is inconclusive, the authors found CBCT imaging was reported to have twice the odds of detecting a periapical lesion than traditional periapical radiography in endodontic outcome studies.

Al-Salehi and Horner (2016) evaluated the impact of limited volume CBCT upon diagnosis as part of endodontic management of posterior teeth. Eligible patients were all adults aged 18 years or over who were referred to a specialist endodontic unit. Inclusion criteria were cases that were either re-treatment or de novo root canal treatment where the anatomy was judged to be complex. Exclusion criteria included vulnerable groups and de novo endodontic treatment with uncomplicated root canal anatomy. For each patient, a full history and clinical examination was performed, a high-quality color photographic intraoral image, two paralleling technique periapical radiographs and limited volume CBCT examination were carried out. CBCT is being increasingly used in field of endodontics. The benefits gained from the use of CBCT must be carefully balanced against the increased radiation dosage. It was concluded that the routine use of CBCT could not be justified.

Rosen et al. (2015) evaluated the diagnostic efficacy of cone-beam computed tomographic (CBCT) imaging in endodontics based on a systematic search and analysis of the literature using an efficacy model. A systematic literature search identified 58 articles that met the inclusion criteria. 90% of the articles evaluated technical characteristics or the accuracy of CBCT imaging, which was defined in this model as low levels of efficacy. The author's identified only 6 articles that supported the practitioner's decision making, treatment planning and treatment outcome which was defined as higher levels of efficacy. The expected ultimate benefit of CBCT imaging to the endodontic patient as evaluated by its level of diagnostic efficacy is unclear and is mainly limited to its technical and diagnostic accuracy efficacies. The author's concluded that even for these low levels of efficacy, current knowledge is limited and therefore, a cautious and rational approach is advised when considering CBCT imaging for endodontic purposes.

Long et al. (2014) conducted a meta-analysis to determine the diagnostic accuracy of cone-beam computed tomography (CBCT) for tooth fractures in vivo. A total of 12 studies were included in the meta-analysis. The pooled sensitivity, specificity, positive likelihood ratio, negative likelihood ratio and summary receiver operating characteristic were 0.92, 0.85, 5.68, 0.13 and 0.94, respectively. The pooled prevalence of tooth fractures in patients with clinically-suspected but periapical-radiography-undetected tooth fractures was 91%. Positive and negative predictive values were 0.98 and 0.43. The authors concluded that CBCT has a high diagnostic accuracy for tooth fractures and could be used in clinical settings. The authors stated that they were very confident with positive test results, but negative test results should be interpreted cautiously, especially for endodontically treated teeth. The limitations of this meta-analysis were small sample sizes in some studies, no applying reference standard test for all patients in some studies, and unavailability of data for subgroup analysis for horizontal and oblique tooth fractures. Moreover, CBCT devices and exposure protocols differed among included studies. According to the authors, since image quality may vary among different CBCT devices and exposure protocols, the results in this meta-analysis should be interpreted with caution and may not be applied to all CBCT devices.

Implant Dentistry

Caetano et al. (2022) conducted a review of four studies to compare two-dimensional radiographs and cone beam computed tomography (CBCT) images for palatal mini-implant planning. The results showed that lateral imaging showed approximately the same measurements of bone quantity as CBCT, however determining suitability for interradicular mini-implants, the available space as underestimated. The authors concluded that lateral radiography is sufficient to quantify the available bone for planning mini-implants installed on the palate, in the median region of upper first premolars. As for interradicular mini-implant planning, CBCT assists in selecting the implantation site, and improves the success rate.

In a retrospective study, Özalp et al. (2018) studied and evaluated the correlations between measurements made using panoramic radiography and cone-beam computed tomography (CBCT) based on certain anatomical landmarks of the jaws with the goal of preventing complications due to inaccurate measurements in the pre-surgical planning phase of dental implant placement. 56 patients (30 male, 26 female) underwent panoramic radiography and a CBCT evaluation before dental implant surgery. Measurements were performed to identify the shortest vertical distance between the alveolar crest and neighboring anatomical structures, including the maxillary sinus, nasal floor, mandibular canal, and foramen mentale. The differences between the measurements on panoramic radiography and CBCT images were statistically analyzed. The statistically significant differences were observed between the measurements on panoramic radiography and CBCT for all anatomical structures. The author's conclusions supported the idea that panoramic radiography might provide sufficient information on bone height for preoperative implant planning in routine cases or when CBCT is unavailable. However, an additional CBCT evaluation might be helpful in cases where a safety margin cannot be respected due to insufficient bone height.

In a systematic review, Bornstein et al. (2014) reviewed, analyzed, and summarized the available evidence on the use of cross-sectional imaging, specifically maxillofacial cone beam computed tomography (CBCT) in pre- and postoperative dental implant therapy. According to the authors, on the basis of the data found in the literature, the following can be concluded:

- Most published national and international guidelines on implant dentistry do not offer evidence based action statements developed from a rigorous systematic review approach.
- Most publications on guidelines for CBCT use in implant dentistry provide recommendations that are consensus-based or derived from a limited methodological approach with only partial retrieval and/or analysis of the literature or contain even generalized or non-case-specific statements.
- Indications or contraindications reported for CBCT use in implant dentistry are based on nonrandomized clinical trials, either cohort or case-controlled studies.
- The reported indications for CBCT use in implant dentistry vary from preoperative analysis regarding specific anatomic considerations, site development using grafts, and computer-assisted treatment planning to postoperative evaluation focusing on complications due to damage of neurovascular structures.
- It will be difficult to prove a clear and statistically significant benefit of cross-sectional imaging (with special emphasis on CBCT) over conventional two dimensional imaging such as panoramic radiography with respect to damage of the IAN or other vital neurovascular structures in the arches resulting in dysesthesia or pain in comparative prospective studies due to the high number of cases needed for such an evaluation (power).

Shelley et al. (2014) completed a systematic review to determine if the pre-operative availability of cross-sectional imaging, such as cone beam CT, has a diagnostic impact, therapeutic impact or impact on patients' outcome when placing two dental implants in the anterior mandible to support an overdenture. Studies were considered eligible for inclusion if they compared the impact of conventional and cross-sectional imaging when placing dental implants in sites including the anterior mandible. An adapted quality assessment tool was used for the assessment of the risk of bias in included studies. Pooled quantitative analysis was not possible and, therefore, synthesis was qualitative. Of 2374 potentially eligible papers, 5 studies were included. The authors stated that little could be determined from a synthesis of these studies because of their small number, clinical diversity and high risks of bias. The authors concluded that there is no evidence to support any specific imaging modality when planning dental implant placement in any region of the mouth. Therefore, those who argue that cross-sectional imaging should be used for the assessment of all dental implant sites are unsupported by evidence.

Oral Surgery

Reia et al. (2021) conducted a study to verify whether the diagnostic accuracy of CBCT is superior to panoramic radiography (PR) in predicting inferior alveolar nerve (IAN) exposure during lower third molar extraction. Three studies that evaluated the accuracy (sensitivity, specificity, positive-predictive value, and negative predictive value) of both imaging methods were included. The gold standard was the visualization of the IAN exposure during the extraction of lower third molars. The results showed that the accuracy values for CBCT were 95.1% for sensitivity and 64.4% for specificity. For PR sensitivity and specificity, was 73.9% and 24.8% respectively. The authors concluded that while both exams are reliable, CBCT performed better for predicting IAN exposure during surgery.

In a randomized controlled multicenter trial Guerrero et al. (2014) compared the postoperative complications following surgical removal of impacted third molars using panoramic radiography (PAN) images- and cone-beam computed tomography (CBCT)-based surgeries for "moderate-risk" cases of impacted third mandibular molars. The secondary objective of the study was to compare the reliability of CBCT with that of PAN in preoperative radiographic determination of the position of the third molar, number of roots, and apical divergence. The sample consisted of impacted third molars from 256 patients with a close relation to the inferior alveolar nerve (IAN). Patients were divided into two groups: the

CBCT group (n = 126) and the PAN group (n = 130). The incidences of IAN sensory disturbance and other postoperative complications were recorded for each group at 7 days after surgery. Statistical analysis was used to compare the diagnoses of five trained dentomaxillofacial radiologists and to relate radiologic diagnoses to perioperative findings. Logistic regression was used to determine whether the imaging modality influenced occurrence of postoperative complications. Two extractions (1.5%) in the CBCT group and five (3.8%) in the PAN group resulted in IAN sensory disturbance. Logistic regression models did not show that CBCT modality decreased postoperative complications following surgical removal of impacted third molars. Yet, CBCT revealed the number of roots and apical divergence of the roots more reliably than panoramic radiographs however, the authors concluded that CBCT was not better than panoramic radiography in predicting postoperative complications for moderate-risk cases of impacted third mandibular molars.

Matzen et al. (2013a) assessed the influence of cone beam CT (CBCT) on treatment planning before surgical intervention of mandibular third molars and identified radiographic factors with an impact on deciding on coronectomy. A total of 186 mandibular third molars with an indication for surgical intervention underwent a radiographic examination with two methods: (1) panoramic imaging in combination with stereo-scanography and (2) CBCT. After the radiographic examination a treatment plan (TP) was established: either surgical removal (Sr) or coronectomy (Co). The first TP was based on the panoramic image and stereo-scanogram, while the second TP was established after CBCT was available. Logistic regression analyses were used to identify factors predisposing for Co after CBCT. Treatment was performed according to the second TP. Agreement between the first and second TP was seen in 164 cases (88%), while the TP changed for 22 teeth (12%) after CBCT. Direct contact between the third molar and the mandibular canal had the highest impact on deciding on Co. Direct contact was not a sufficient factor, however; thus, lumen narrowing of the canal and canal positioned in a bending or a groove in the root complex were additional canal-related factors for deciding on Co. The authors concluded that CBCT influenced the treatment plan for 12%. Direct contact in combination with narrowing of the canal lumen and canal positioned in a bending or a groove in the root complex observed in CBCT images were significant factors for deciding on coronectomy. The study did not confirm the utility of such findings in improving care and outcome of patients.

Matzen et al. (2013b) compared the diagnostic accuracy of panoramic imaging, stereo-scanography and cone beam computed tomography (CBCT) for assessment of mandibular third molars. One hundred and twelve patients (147 third molars) underwent radiographic examination by panoramic imaging, stereo-scanography and CBCT. There were no significant differences between the modalities regarding tooth angulation, root morphology and number of roots. However, CBCT was more accurate than stereo-scanography for determining root bending in the bucco-lingual plane. Moreover, sensitivity for direct contact to the mandibular canal was higher for CBCT than for panoramic images and specificity for no direct contact to the mandibular canal was higher for panoramic images and CBCT than for scanograms. The authors concluded that panoramic imaging, stereo-scanography and CBCT seem equally valuable for examination of tooth angulation and number and morphology of roots of mandibular third molars. However, CBCT was more accurate for assessment of root bending in the bucco-lingual plane and more accurate than panoramic images to identify direct contact to the mandibular canal. There is no evidence from this study that this information will affect patient management.

Orthodontics

Signorelli et al. (2016) studied radiation doses of different cone-beam computed tomography (CBCT) scan modes and compared them to conventional orthodontic radiographs (CORs) by means of phantom dosimetry. Thermoluminescent dosimeter (TLD) chips (3 × 1 × 1 mm) were used on adult male tissue-equivalent phantoms to record the distribution of the absorbed radiation dose. Three different scanning modes (i.e., portrait, normal landscape, and fast scan landscape) were compared to conventional orthodontic radiographs. Although one CBCT scan may replace all conventional orthodontic radiographs, one set of CORs still entails 2-4 times less radiation than one CBCT. Depending on the scan mode, the radiation dose of a CBCT is about 3-6 times that of a digital panoramic radiograph, 8-14 times a posteroanterior cephalograms, and 15-26 times a conventional lateral. The authors concluded CBCT should not be recommended for use in all orthodontic patients as a substitute for a conventional set of radiographs.

In a prospective study, Algerban et al. (2013) compared the impact of using two-dimensional (2D) panoramic radiographs and three-dimensional (3D) cone beam CT for the surgical treatment planning of impacted maxillary canines. The study included of 32 subjects (19 females, 13 males) with a mean age of 25 years, referred for surgical intervention of 39 maxillary impacted canines. Initial 2D panoramic radiography was available, and 3D cone beam CT imaging was obtained upon clinical indication. Both 2D and 3D pre-operative radiographic diagnostic sets were subsequently analyzed by six observers. Perioperative evaluations were conducted by the treating surgeon. McNemar tests, hierarchical logistic regression and linear mixed models were used to explore the differences in evaluations between imaging modalities. Significantly higher confidence levels were observed for 3D image-based treatment plans than for 2D image-based plans. The evaluations of canine crown position, contact relationship and lateral incisor root resorption were significantly different between the 2D and 3D images. By contrast, pre- and perioperative evaluations were not significantly different between

the two image modalities. The authors concluded that surgical treatment planning of impacted maxillary canines was not significantly different between panoramic and cone beam CT images.

Van Vlijmen et al. (2012) conducted a systematic review of (CBCT) applications in orthodontics and evaluated the level of evidence to determine whether the use of CBCT is justified in orthodontics. The authors identified 550 articles, and 50 met the inclusion criteria. The authors found no high-quality evidence regarding the benefits of CBCT use in orthodontics. Limited evidence shows that CBCT offers better diagnostic potential, leads to better treatment planning or results in better treatment outcome than do conventional imaging modalities. Only the results of studies on airway diagnostics provided sound scientific data suggesting that CBCT use has added value. The additional radiation exposure should be weighed against possible benefits of CBCT, which have not been supported in the literature. The authors suggested that future studies should evaluate the effects of CBCT on treatment procedures, progression and outcome quantitatively.

Rossini et al. (2012) analyzed the literature focused on cone- beam computed tomography (CBCT) diagnostic accuracy and efficacy in detecting impacted maxillary canines and evaluated the possible advantages in using CBCT technique compared with traditional radiographs. The literature search yielded 94 titles, of which 5 were included in the review. Three studies used CBCT technique to 3D localize maxillary impacted canines and assess root resorption of adjacent teeth. The other two publications compared traditional radiographs with CBCT images in the diagnosis of maxillary impacted canines. Only three studies presented the results using statistical analysis. The authors concluded that CBCT has a potential diagnostic effect and may influence the outcome of treatment when compared with traditional panoramic radiography for the assessment of impacted maxillary canines. According to the authors, there is a need of future studies performed according with high level methodological standards, investigating diagnostic accuracy and effectiveness of CBCT in the diagnosis of maxillary impacted teeth. The authors stated that the methodological differences among selected studies (i.e., study sample, materials and methods) revealed the lack of studies performed using methodological standards for diagnostic accuracy and effectiveness of CBCT in the diagnosis of maxillary impacted teeth.

Botticelli et al. (2011) evaluated whether there is any difference in the diagnostic information provided by conventional two-dimensional (2D) images or by three-dimensional (3D) cone beam computed tomography (CBCT) in subjects with unerupted maxillary canines. Twenty-seven patients (17 females and 10 males, mean age 11.8 years) undergoing orthodontic treatment with 39 impacted or retained maxillary canines were included. For each canine, two different digital image sets were obtained: (1) A 2D image set including a panoramic radiograph, a lateral cephalogram, and the available periapical radiographs with different projections and (2) A 3D image set obtained with CBCT. Both sets of images were submitted, in a single-blind randomized order, to eight dentists. A questionnaire was used to assess the position of the canine, the presence of root resorption, the difficulty of the case, treatment choice options, and the quality of the images. Data analysis was performed using the McNemar-Bowker test for paired data, Kappa statistics, and paired t-tests. The findings demonstrated a difference in the localization of the impacted canines between the two techniques, which can be explained by factors affecting the conventional 2D radiographs such as distortion, magnification, and superimposition of anatomical structures situated in different planes of space. According to the authors, the increased precision in the localization of the canines and the improved estimation of the space conditions in the arch obtained with CBCT resulted in a difference in diagnosis and treatment planning towards a more clinically orientated approach. The study did not confirm the utility of such findings in improving care and outcome of patients.

Periodontics

Yang et al. (2019) evaluated the performance of cone-beam computed tomography (CBCT) in assessment of periodontal bone loss. If effective, CBCT could potentially be a more comfortable and accurate way to evaluate this disease. One hundred and eighty tooth sites from 13 patients were included. Clinical attachment level (CAL) was measured, CBCT images were then acquired prior to periodontal surgery. The distance between the cemento-enamel junction and alveolar bone crest at the mesio-buccal, mid-buccal, distobuccal, mesio-lingual/palatal, mid-lingual/palatal, and disto-lingual/palatal sites were all measured and comparisons of the measurements were made by three methods. Statistically significant differences were found between CBCT and CAL + 2.04 mm, as well as intra-surgical evaluation. All sites showed differences in CBCT versus intra-surgical measurement and versus CAL + 2.04 comparisons, except the buccal sites. The authors found the results of CBCT do not agree with results of intra-surgical measurement and therefore CBCT should be used with caution and only when necessary, to avoid radiation hazards.

In this systematic review and meta-analysis, Haas et al. (2018) evaluated the diagnostic validity of cone beam computed tomography (CBCT) in measuring periodontal bone defects. Four databases were searched, and the studies were selected by two independent reviewers. The methodology of selected studies was assessed using the 14-item Quality Assessment Tool for Diagnostic Accuracy Studies. Using a selection process in two phases, 16 studies were identified and meta-analysis was performed in seven articles. The results from these meta-analyses showed that no difference between the measurements of CBCT and in situ for alveolar bone loss and demonstrated a concordance of 82.82% between CBCT and in situ for the classification of the degree of furcation involvement. The main limitations identified by

the authors were the heterogeneity between the examiners of the studies and the protocols for the acquisition of the 3D images. The authors concluded based on a moderate level of evidence, CBCT could be useful for furcation involvement periodontal cases, but it should only be used in cases where clinical evaluation and conventional radiographic imaging do not provide the information necessary for an adequate diagnosis and proper periodontal treatment planning.

Leonardi et al. (2016) conducted a systematic review and meta-analysis assessed the diagnostic accuracy of conventional radiography and cone-beam computed tomographic (CBCT) imaging on the discrimination of apical periodontitis (AP) from no lesion. A meta-analysis was conducted on 6 of the 9 articles. All the articles studied artificial AP with induced bone defects. Periapical radiographs (digital and conventional) reported good diagnostic accuracy on the discrimination of artificial AP from no lesions, whereas CBCT imaging showed excellent accuracy values.

Walter et al. (2009) investigated the use of cone beam computed tomography (CBCT) in assessing furcation involvement (FI) and concomitant treatment decisions in maxillary molars. Twelve patients with generalized chronic periodontitis were consecutively recruited and CBCT was performed in maxillary molars (n = 22) with clinical FI and increased probing pocket depths. CBCT images were analyzed and FI, root length supported by bone and anatomical features were evaluated. FI and treatment recommendations based on clinical examinations and periapical radiographs were compared with data derived from CBCT images. The estimated degree of FI based on clinical findings was confirmed in 27% of the sites, while 29% were overestimated and 44% revealed an underestimation according to CBCT analyses. Among degree I FI, 25% were underestimated, among degree II and II-III, the underestimation was as high as 75%, while all sites with degree III FI were confirmed in the CBCT. Discrepancies between clinically and CBCT-based therapeutic treatment approaches were found in 59-82% of the teeth, depending on whether the less invasive or the most invasive treatment recommendation was selected for comparison. The authors concluded that CBCT images of maxillary molars may provide detailed information of FI and a reliable basis for treatment decision. There is no evidence from this study that this information will affect patient management.

Grimard et al. (2009) compared the measurements from digital intraoral radiograph (IR) and cone-beam volumetric tomography (CBVT) images to direct surgical measurements for the evaluation of regenerative treatment outcomes. Digital IR and CBVT images were taken prior to initial bone grafting and at the 6-month reentry surgery for 35 intrabony defects. After defect debridement, direct bony defect measurements were made with a periodontal probe. These same measurements were made on the IR and CBVT images and then compared to the direct surgical values. CBVT correlated strongly with surgical measurements, whereas IRs correlated less favorably. IR measurements were significantly less accurate compared to CBVT for all parameters investigated and underestimated surgical measurements from 0.6 +/- 2.3 mm to 1.5 +/- 2.3 mm. No significant difference for the distance from the cemento-enamel junction (CEJ) to the alveolar crest, defect fill, or defect resolution was seen between CBVT and surgical measurements; however, there was a significant difference for the distance from the CEJ to the base of the defect, with CBVT measurements underestimating the surgical measurements by 0.5 +/- 1.1 mm for reentry and 0.9 +/- 0.8 mm for the initial measurement. The authors concluded that compared to direct surgical measurement, CBVT was significantly more precise and accurate than IRs. The study did not confirm the utility of such findings in improving care and outcome of patients.

Clinical Practice Guidelines

American Association of Endodontists (AAE) and American Academy of Oral and Maxillofacial Radiography (AAOMR)

In 2015, a joint position statement was prepared by the AAE Special Committee on Cone-Beam-Computed Tomography in conjunction with members of the AAOMR, and makes the following recommendations for the use cone-beam-computed tomography in endodontics:

- Diagnosis
- Recommendation 1: Intraoral radiographs should be considered the imaging modality of choice in the evaluation of the endodontic patient.
- Recommendation 2: Limited FOV CBCT should be considered the imaging modality of choice for diagnosis in patients who present with contradictory or nonspecific clinical signs and symptoms associated with untreated or previously endodontically treated teeth.
- **Initial Treatment**
- Preoperative
 - Recommendation 3: Limited FOV CBCT should be considered the imaging modality of choice for initial treatment of teeth with the potential for extra canals and suspected complex morphology, such as mandibular anterior teeth, and maxillary and mandibular premolars and molars, and dental anomalies.
- Intraoperative

- Recommendation 4: If a preoperative CBCT has not been taken, limited FOV CBCT should be considered as the imaging modality of choice for intra-appointment identification and localization of calcified canals.
- **Non-Surgical Retreatment**
- Recommendation 6: Limited FOV CBCT should be considered the imaging modality of choice if clinical examination and 2-D intraoral radiography are inconclusive in the detection of vertical root fracture.
- Recommendation 7: Limited FOV CBCT should be the imaging modality of choice when evaluating the nonhealing of previous endodontic treatment to help determine the need for further treatment, such as non-surgical, surgical or extraction.
- Recommendation 8: Limited FOV CBCT should be the imaging modality of choice for non-surgical retreatment to assess endodontic treatment complications, such as overextended root canal obturation material, separated endodontic instruments, and localization of perforations.
- **Surgical Retreatment**
- Recommendation 9: Limited FOV CBCT should be considered as the imaging modality of choice for presurgical treatment planning to localize root apex/apices and to evaluate the proximity to adjacent anatomical structures.
- **Special Conditions**
- Implant Placement
 - Recommendation 10: Limited FOV CBCT should be considered as the imaging modality of choice for surgical placement of implants.
- Traumatic Injuries
 - Recommendation 11: Limited FOV CBCT should be considered the imaging modality of choice for diagnosis and management of limited dento-alveolar trauma, root fractures, luxation, and/or displacement of teeth and localized alveolar fractures, in the absence of other maxillofacial or soft tissue injury that may require other advanced imaging modalities.
- Resorptive Defects
 - Recommendation 12: Limited FOV CBCT is the imaging modality of choice in the localization and differentiation of external and internal resorptive defects and the determination of appropriate treatment and prognosis.
- Outcome Assessment
 - Recommendation 13: In the absence of clinical signs or symptoms, intraoral radiographs should be considered the imaging modality of choice for the evaluation of healing following nonsurgical and surgical endodontic treatment.
 - Recommendation 14: In the absence of signs and symptoms, if limited FOV CBCT was the imaging modality of choice at the time of evaluation and treatment, it may be the modality of choice for follow-up evaluation. In the presence of signs and symptoms, refer to Recommendation #7.

American Academy of Periodontology (AAP)

In a 2017 best evidence review, the AAP states that cone beam computed tomography continues to be considered an advanced point-of-care imaging modality and should be used selectively as an adjunct to two-dimensional dental radiography. As with other ionizing radiation imaging modalities, CBCT imaging should be used only when the potential benefits to the patient outweigh the risks. Dental health care professionals should consider CBCT imaging only when they expect the diagnostic information yielded will lead to better patient care, enhanced patient safety, and ultimately facilitate a more predictable, optimal treatment outcome (Rios et al.; 2017).

American Academy of Oral and Maxillofacial Radiology (AAOMR)

A position statement developed by consensus agreement by a panel convened by the AAOMR summarized the potential benefits and risks of maxillofacial cone beam computed tomography (CBCT) use in orthodontic diagnosis, treatment and outcomes. The panel reviewed literature on the clinical efficacy of and radiation dose concepts associated with CBCT in all aspects of orthodontic practice and concluded that the use of CBCT in orthodontic treatment should be justified on an individual basis, based on clinical presentation. Despite the number of publications on the use of CBCT for specific orthodontic applications, most are observational studies of diagnostic performance and efficacy with wide ranging methodological soundness. According to the panel, few authors have presented higher levels of evidence and measured the impact of CBCT on orthodontic diagnosis and treatment planning decisions (AAOMR, 2013).

A Position Paper Subcommittee of the AAOMR reviewed the literature on selection criteria for radiology in dental implantology (Tyndall, 2012). All current planar modalities, including intraoral, panoramic, and cephalometric, as well as cone beam computed tomography (CBCT) are discussed, along with radiation dosimetry and anatomy considerations. The AAOMR made the following recommendations:

Do not use cross-sectional imaging, including CBCT, as an initial diagnostic imaging examination. CBCT should be considered as the imaging modality of choice for preoperative cross-sectional imaging of potential implant sites.

CBCT should be considered when clinical conditions indicate a need for augmentation procedures or site development before placement of dental implants: (1) sinus augmentation, (2) block or particulate bone grafting, (3) ramus or symphysis grafting, (4) assessment of impacted teeth in the field of interest, and (5) evaluation of prior traumatic injury.

CBCT imaging should be considered if bone reconstruction and augmentation procedures (e.g., ridge preservation or bone grafting) have been performed to treat bone volume deficiencies before implant placement.

Use cross-sectional imaging (particularly CBCT) immediately postoperatively only if the patient presents with implant mobility or altered sensation, especially if the fixture is in the posterior mandible.

Do not use CBCT imaging for periodic review of clinically asymptomatic implants.

Cross-sectional imaging, optimally CBCT, should be considered if implant retrieval is anticipated.

American College of Prosthodontists (ACP)

A 2019 ACP position statement makes the following recommendations based on current literature and existing guidelines on the role of diagnostic imaging:

Conventional panoramic and/or intraoral periapical imaging is recommended for initial diagnostic evaluation. CBCT is not recommended for routine initial examination.

Cross-sectional imaging (CBCT is preferable over CT due to its significantly lower radiation dose) is recommended for preoperative implant assessment.

The rationale for CBCT imaging must be justified based on clinical evaluation.

CBCT imaging should be used for the esthetic zone, pre- and post-bone grafting, sinus augmentation, pterygoid plate, and zygomatic implants.

The region of interest (ROI) should be imaged using a field of view (FOV) no larger than necessary.

CBCT is recommended to be used for the evaluation of postoperative complications such as postoperative neurosensory impairment, acute rhino-sinusitis, and implant mobility.

American Dental Association Council on Scientific Affairs (ADACSA)

In an advisory statement for the use of cone-beam computed tomography (CBCT) in dentistry, the ADACSA recommends that no radiographic examinations, including CBCT, should be performed for screening purposes and that CBCT should only be considered as an adjunct to standard oral imaging modalities. The ADACSA states that the clinician should prescribe traditional dental radiographs and CBCT scans only when he or she expects that the diagnostic yield will benefit patient care, enhance patient safety, and significantly improve clinical outcomes or all of these. The ADACSA also states that CBCT should be considered as an adjunct to standard oral imaging modalities and may supplement or replace conventional (two-dimensional or panoramic) dental radiography for the diagnosis, monitoring and treatment of oral disease or the management of oral conditions when, in the clinician's decision-making process, he or she determines that oral anatomical structures of interest may not be captured adequately by means of conventional radiography (ADACSA, 2012).

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

Devices used for computed tomography are classified under the following product codes:

- JAK (system, X-ray tomography, computed)
- MUH (system, X-ray, extraoral source, digital)
- OAS (X-ray, tomography, computed, dental)

There are many 510(k) approvals for these codes, not all of which are for cone-beam computed tomography devices or for devices used for craniofacial imaging. For information on a specific device or manufacturer, search the Center for Devices and Radiological Health (CDRH) 510(k) database by product and/or manufacturer name then check for the appropriate indication in the summary section of the results:

<http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm>.

(Accessed March 28, 2024)

In a document for radiation-emitting products: dental cone-beam computed tomography, the FDA states that dental CBCT should be performed only when necessary to provide clinical information that cannot be provided using other imaging modalities. Refer to the following for more information:

<http://www.fda.gov/Radiation-EmittingProducts/RadiationEmittingProductsandProcedures/MedicalImaging/MedicalX-Rays/ucm315011.htm>.

(Accessed March 24, 2024)

References

Alqerban A, Hedesiu M, Baciut M, et al.; SedentexCT Consortium, Willems G. Pre-surgical treatment planning of maxillary canine impactions using panoramic vs cone beam CT imaging. *Dentomaxillofac Radiol.* 013;42(9):20130157.

Al-Salehi SK, Horner K. Impact of cone beam computed tomography (CBCT) on diagnostic thinking in endodontics of posterior teeth: A before- after study. *J Dent.* 2016 Jul 25. pii: S0300-5712(16)30139-7.

American Academy of Oral and Maxillofacial Radiology (AAOMR). Clinical recommendations regarding use of cone beam computed tomography in orthodontics. Position statement by the American Academy of Oral and Maxillofacial Radiology. *Oral Surg Oral Med Oral Pathol Oral Radiol.* 2013 Aug;116(2):238-57.

American Association of Endodontists (AAE) and American Academy of Oral and Maxillofacial Radiology (AAOMR). Joint Position Statement. Use of cone-beam-computed tomography in endodontics. 2015 Update.

American College of Prosthodontics. Diagnostic Imaging in the Treatment Planning, Surgical, and Prosthodontic Aspects of Implant Dentistry. Position Statement of the American College of Prosthodontists. February 2019.

American Dental Association Council on Scientific Affairs (ADACSA). Use of cone-beam computed tomography in dentistry: An advisory statement from the American Dental Association Council on Scientific Affairs. *J Am Dent Assoc* 2012 Aug;143(8):899-902.

American Dental Association (ADA); CDT 2024 Dental Procedure Code Book.

Aminoshariae A, Kulild JC, Syed A. Cone-beam Computed Tomography Compared with Intraoral Radiographic Lesions in Endodontic Outcome Studies: A Systematic Review. *J Endod.* 2018 Nov;44(11):1626-1631.

Bornstein MM, Scarfe WC, Vaughn VM, et al. Cone beam computed tomography in implant dentistry: a systematic review focusing on guidelines, indications, and radiation dose risks. *Int J Oral Maxillofac Implants.* 2014;29 Suppl:55-77.

Botticelli S, Verna C, Cattaneo PM, et al. Two- versus three-dimensional imaging in subjects with unerupted maxillary canines. *Eur J Orthod.* 2011 Aug;33(4):344-9.

Caetano GR, Soares MQ, Oliveira LB, et al. Two-dimensional radiographs versus cone-beam computed tomography in planning mini-implant placement: A systematic review. *J Clin Exp Dent.* 2022 Aug 1;14(8): e669-e677. Edwards R, Altalibi M, Flores-Mir C. The frequency and nature of incidental findings in cone-beam computed tomographic scans of the head and neck region: a systematic review. *J Am Dent Assoc.* 2013 Feb;144(2):161-70.

Chugal N, Assad H, Markovic D, et al. Applying the American Association of Endodontists and American Academy of Oral and Maxillofacial Radiology guidelines for cone-beam computed tomography prescription: Impact on endodontic clinical decisions. *J Am Dent Assoc.* 2024 Jan;155(1):48-58.

Grimard BA, Hoidal MJ, Mills MP, et al. Comparison of clinical, periapical radiograph, and cone-beam volume tomography measurement techniques for assessing bone level changes following regenerative periodontal therapy. *J Periodontol.* 2009 Jan;80(1):48-55.

Guerrero ME, Botetano R, Beltran J, et al. Can preoperative imaging help to predict postoperative outcome after wisdom tooth removal? A randomized controlled trial using panoramic radiography versus cone-beam CT. *Clin Oral Investig.* 2014 Jan;18(1):335-42.

Haas LF, Zimmermann GS, De Luca Canto G, et al. Precision of cone beam CT to assess periodontal bone defects: a systematic review and meta-analysis. *Dentomaxillofac Radiol.* 2018 Feb;47(2):20170084.

Leonardi D, Dutra K, Haas L, Porporatti AL, et al. Diagnostic Accuracy of Cone-beam Computed Tomography and Conventional Radiography on Apical Periodontitis: A Systematic Review and Meta-analysis. *J Endod.* 2016 Mar;42(3):356-64.

Long H, Zhou Y, Ye N, et al. Diagnostic accuracy of CBCT for tooth fractures: a meta-analysis. *J Dent.* 2014 Mar;42(3):240-8.

Lopes IA, Tucunduva RM, Handem RH, et al. Study of the frequency and location of incidental findings of the maxillofacial region in different fields of view in CBCT scans. *Dentomaxillofac Radiol.* 2017 Jan;46(1):20160215.

Matzen L, Christensen J, Hintze H, et al. Diagnostic accuracy of panoramic radiography, stereo-scanography and cone beam CT for assessment of mandibular third molars before surgery. *Acta Odontol Scand*. 2013b Nov;71(6):1391-8.

Matzen LH, Christensen J, Hintze H, et al. Influence of cone beam CT on treatment plan before surgical intervention of mandibular third molars and impact of radiographic factors on deciding on coronectomy vs surgical removal. *Dentomaxillofac Radiol*. 2013a;42(1):98870341.

Özalp Ö, Tezerişener HA, Kocabalkan B, et al. Comparing the precision of panoramic radiography and cone-beam computed tomography in avoiding anatomical structures critical to dental implant surgery: A retrospective study. *Imaging Sci Dent*. 2018 Dec;48(4):269-275.

Petersson A, Axelsson S, Davidson T, et al. Radiological diagnosis of periapical bone tissue lesions in endodontics: a systematic review. *Int Endod J*. 2012 Sep;45(9):783-801.

Reia VCB, de Toledo Telles-Araujo G, Peralta-Mamani M, et al. Diagnostic accuracy of CBCT compared to panoramic radiography in predicting IAN exposure: a systematic review and meta-analysis. *Clin Oral Investig*. 2021 Aug;25(8):4721-4733.

Rios HF, Borgnakke WS, Benavides E. The Use of Cone-Beam Computed Tomography in Management of Patients Requiring Dental Implants: An American Academy of Periodontology Best Evidence Review. *J Periodontol*. 2017 Oct;88(10):946-959.

Rosen E, Taschieri S, Del Fabbro M, et al. The Diagnostic Efficacy of Cone-beam Computed Tomography in Endodontics: A Systematic Review and Analysis by a Hierarchical Model of Efficacy. *J Endod*. 2015 Jul;41(7):1008-14.

Rossini G, Cavallini C, Cassetta M, et al. Localization of impacted maxillary canines using cone beam computed tomography. Review of the literature. *Ann Stomatol (Roma)*. 2012 Jan;3(1):14-8.

Shelley AM, Glenny AM, Goodwin M, et al. Conventional radiography and cross-sectional imaging when planning dental implants in the anterior edentulous mandible to support an overdenture: a systematic review. *Dentomaxillofac Radiol*. 2014;43(2):20130321.

Signorelli L, Patcas R, Peltomäki T, et al. Radiation dose of cone-beam computed tomography compared to conventional radiographs in orthodontics. *J Orofac Orthop*. 2016 Jan;77(1):9-15.

Tay KX, Lim LZ, Goh BKC, et al. Influence of cone beam computed tomography on endodontic treatment planning: A systematic review. *J Dent*. 2022 Dec;127:104353.

Tyndall DA, Price JB, Tetradis S, et al. American Academy of Oral and Maxillofacial Radiology. Position statement of the American Academy of Oral and Maxillofacial Radiology on selection criteria for the use of radiology in dental implantology with emphasis on cone beam computed tomography. *Oral Surg Oral Med Oral Pathol Oral Radiol*. 2012 Jun;113(6):817-26.

van Vlijmen OJ, Kuijpers MA, Bergé SJ, et al. Evidence supporting the use of cone-beam computed tomography in orthodontics. *J Am Dent Assoc*. 2012 Mar;143(3):241-52.

Walter C, Kaner D, Berndt DC, et al. Three-dimensional imaging as a pre-operative tool in decision making for furcation surgery. *J Clin Periodontol*. 2009 Mar;36(3):250-7.

Yang J, Li X, Duan D, et al. Cone-beam computed tomography performance in measuring periodontal bone loss. *J Oral Sci*. 2019 Mar 28;61(1):61-66.

Policy History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.

Core Buildup, Post and Core, and Pin Retention

Guideline Number: DCG021.09
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
32. Coverage Rationale	97
33. Definitions	98
34. Applicable Codes	98
35. Description of Services	98
36. References	98
37. Guideline History/Revision Information	99
38. Instructions for Use	99

Related Dental Policies

- Fixed Prosthodontics
- Non-Surgical Endodontics
- Single Tooth Indirect Restorations

Coverage Rationale

Restorative Foundation for an Indirect Restoration

A restorative foundation for an [Indirect Restoration](#) is indicated as a filler to eliminate undercuts, voids, and other irregularities that have occurred during tooth preparation to create a more favorable tooth form for the retention of an Indirect Restoration.

Core Buildup (Including Any Pins When Required)

[Core Buildup](#) is indicated for teeth with significant loss of coronal tooth structure due to caries or trauma in which insufficient tooth structure remains to adequately retain an Indirect Restoration.

Core Buildup is not indicated for the following:

- As a filler to correct irregularities in preparation
- As a definitive composite or amalgam restoration
- For retention of intracoronal restorations

Post and Core

[Post](#) and core are indicated for the following:

- For teeth with significant loss of coronal tooth structure in endodontically treated teeth in which insufficient tooth structure remains to adequately retain an Indirect Restoration
- For Posts when there is inadequate remaining tooth structure to support a core

Post and core are not indicated for teeth with short roots.

A Post is not indicated when anatomic features are available to retain the core (e.g., when canals and pulp chamber can retain a core).

Pin Retention

[Pin](#) retention is indicated for teeth with significant loss of coronal tooth structure to allow retention of a direct restoration.

Pin retention is not indicated for the following:

- For restoration of teeth with significant malocclusion
- If the tooth cannot be properly restored with a direct restoration due to anatomic or functional considerations

Post Removal

Post removal is indicated for the following:

- When there has been loss of adequate retention
- In the case of fracture of tooth and/or Post and core
- When there is recurrent caries associated with Post and core
- When access is needed to root canal system for non-surgical endodontics
- When the tooth has a reasonable long-term prognosis for a new restoration

Definitions

Core Buildup: The replacement of a part or the entire crown of a tooth whose purpose is to provide a base for the retention of an indirectly fabricated crown. (ADA)

Indirect Restoration: A restoration fabricated outside the mouth. (ADA)

Pin: A small metal rod, cemented or driven into dentin to aid in retention of a restoration. (ADA)

Post: Rod-like component designed to be inserted into a prepared root canal space so as to provide structural support. This device can either be in the form of an alloy, carbon fiber or fiberglass, and Posts are usually secured with appropriate luting agents. (ADA)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D2949	Restorative foundation for an indirect restoration
D2950	Core buildup, including any pins when required
D2951	Pin retention – per tooth, in addition to restoration
D2952	Post and core in addition to crown, indirectly fabricated
D2953	Each additional indirectly fabricated post - same tooth
D2954	Prefabricated post and core in addition to crown
D2955	Post removal
D2957	Each additional prefabricated post – same tooth
D2999	Unspecified restorative procedure, by report

CDT® is a registered trademark of the American Dental Association

Description of Services

There are situations when a tooth does not have sufficient remaining tooth structure to support the planned restoration. In these cases, the anatomical crown may be “built up” using a restorative material foundation. Posts and cores (for endodontically treated teeth) and Pins may also be indicated to aid in retention. These procedures should be performed on teeth that have an overall favorable long-term prognosis.

References

American Association of Endodontists Guide to Clinical Endodontics; 6th edition. 2013.

American Dental Association (ADA) CDT Codebook 2024.

American Dental Association Glossary of Clinical and Administrative Terms.

Boushell L, Wilder A. Sturdevant's Art and Science of Operative Dentistry, 6th ed. St. Louis: Mosby c2013. Chapter 16, Complex Amalgam Restorations; p.429-30.

Rosenstiel S, Land M, Fujimoto J. Contemporary Fixed Prosthodontics, 5th ed. St. Louis: Mosby c2016. Part 1: Planning and Preparation, Chapter 3 Treatment Planning; p.77-85.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Coronal Splinting

Guideline Number: DCG011.12
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
39. Coverage Rationale	100
40. Definitions	100
41. Applicable Codes	100
42. Description of Services	100
43. References	101
44. Guideline History/Revision Information	101
45. Instructions for Use	101

Related Dental Policies

- Non-Surgical Periodontal Therapy
- Surgical Periodontics: Mucogingival Procedures
- Surgical Periodontics: Resective Procedures

Coverage Rationale

Intra and extra coronal Splinting of natural teeth or prosthetic crowns using the [codes](#) listed below is indicated for the following:

- Multiple teeth that have become mobile due to loss of alveolar bone loss and periodontium
- During surgical and healing phases of regenerative periodontal therapy

Intra and extra coronal Splinting of natural teeth or prosthetic crowns using the [codes](#) listed below is not indicated for the following:

- Tooth transplantation
- Trauma resulting in the reimplantation of completely avulsed tooth/teeth
- Trauma resulting in displacement or fracture of tooth/teeth

Definitions

Splint: A device used to support, protect, or immobilize oral structures that have been loosened, replanted, fractured, or traumatized. Also refers to devices used in the treatment of temporomandibular joint disorders. (ADA)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D4322	Splint-intra-coronal; natural teeth or prosthetic crowns
D4323	Splint-extra-coronal; natural teeth or prosthetic crowns

CDT® is a registered trademark of the American Dental Association

Description of Services

Splinting is provided to stabilize mobile natural teeth or those with prosthetic crowns due to loss of alveolar bone and periodontal tissues. It may be accomplished with a variety of materials and may be fixed or removable.

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

References

American Dental Association (ADA). Glossary of Dental Clinical and Administrative Terms.

American Dental Association (ADA) CDT Codebook 2025.

Kathariya R, et al. To splint or not to splint: The current status of periodontal splinting. J Int Acad Periodontol. 2016 Apr 8;18(2):45-56.

Parameter on occlusal traumatism in patients with chronic periodontitis. American Academy of Periodontology. J Periodontol. 2000 May;71(5 Suppl):873-5.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. . When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Dental Barrier Membrane Guided Tissue Regeneration

Policy Number: DCP045.08
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
46. Coverage Rationale	102
47. Definitions	102
48. Applicable Codes	103
49. Description of Services	104
50. Clinical Evidence	104
51. U.S. Food and Drug Administration	108
52. References	108
53. Policy History/Revision Information	109
54. Instructions for Use	109

Related Dental Policies
<ul style="list-style-type: none"> • Dental Implant Placement and Treatment of Peri-Implant Defects/Disease • Oral Surgery: Miscellaneous Surgical Procedures • Surgical Endodontics • Surgical Periodontics: Mucogingival Procedures

Coverage Rationale

Guided Tissue Regeneration – Resorbable and Non-Resorbable Barriers

Guided Tissue Regeneration is indicated for the following:

- Intrabony/infrabony vertical defects
- Class II furcation involvements
- In conjunction with bone grafting for:
 - Ridge Preservation
 - Ridge augmentation or reconstruction
 - Implant placement
 - Treatment of peri implant defects
- To enhance periodontal tissue regeneration and healing for mucogingival defects in conjunction with mucogingival surgeries

Guided Tissue Regeneration is not indicated for the following:

- Teeth with a poor or hopeless prognosis
- Individuals with an uncontrolled underlying medical condition; these conditions include, but are not limited to, metabolic, cardiovascular, and autoimmune/inflammatory, as well as genetic conditions that affect collagen synthesis
- Individuals taking medications that negatively affects the healing response; these include, but are not limited to, immunosuppressive agents, corticosteroids, anticoagulants, NSAIDS, and nicotine
- Individuals who have been non-compliant with previous therapies.
- Individuals with poor oral hygiene
- Osseous defects with less than two walls
- Crater defects
- Periapical lesions that are endodontic in origin

Definitions

Furcation: The anatomic area of a multirooted tooth where the roots diverge. A Furcation involvement refers to loss of periodontal support in a Furcation (ADA). The Glickman Classification of Tooth Furcation Grading (Sims, 2015):

- Grade I:
- Incipient

- Just barely detectable with examination hand instruments
- No horizontal component of the Furcation is evident on probing
- Grade II:
- Early bone loss
- Examination hand instrument goes partially into the Furcation, but not all the way through
- Furcation may be grade II on both sides of the tooth, but are not connected
- Grade III:
- Advanced bone loss
- Examination hand instrument goes all the way through Furcation, to other side of tooth
- Furcation is through-and-through
- Grade IV:
- Through-and-through, plus Furcation is clinically visible due to gingival recession

Guided Tissue Regeneration: A surgical procedure with the goal of achieving new bone, cementum, and PDL attachment to a periodontally diseased tooth, using barrier devices or membranes to provide space maintenance, epithelial exclusion, and wound stabilization. (AAP)

McGuire Classification of Tooth Prognosis: (Levi 2016)

- Good: Teeth with adequate periodontal support where the etiologic factors can be controlled, including systemic factors
- Fair: No more than 25% attachment loss with Grade 1 Furcation invasion which can be maintained. Plaque control and systemic factors can be maintained
- Poor: As much as 50% bone loss with Grade II Furcation invasions, poor crown: root ratio; Mobility greater than Miller Class I; systemic factors; poor patient participation in treatment
- Questionable: Teeth with greater than 50% attachment loss; Grade II or III Furcation involvements; the tooth is not easily maintained either with professional hygiene or by the patient
- Hopeless: Inadequate attachment to support the tooth; Class III or IV Furcation involvement; Miller Class III Mobility; the tooth cannot be maintained with adequate plaque control by the clinician or by the patient

Mobility: The movement of a tooth in its socket resulting from an applied force. (AAP) Miller Index of Tooth Mobility (Harpenau 2013):

- Class 0: Normal physiologic tooth movement
- Class I: First distinguishable signs of movement beyond normal
- Class II: Tooth movement up to 1mm in any direction
- Class III: Tooth can be moved more than 1mm in any direction and/or the tooth can be depressed into the socket

Ridge Preservation: A surgical procedure aimed at preventing ridge collapse and preserving ridge dimension after tooth extraction, typically done for purposes of implant site development. Involves the use of hard and/or soft tissue biomaterials and/or membranes. (AAP)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D6106	Guided tissue regeneration - resorbable barrier, per implant
D6107	Guided tissue regeneration - non-resorbable barrier, per implant
D3432	Guided tissue regeneration, resorbable barrier, per site, in conjunction with periradicular surgery
D4266	Guided tissue regeneration, natural teeth - resorbable barrier, per site
D4267	Guided tissue regeneration, natural teeth - non-resorbable barrier, per site
D4286	Removal of non-resorbable barrier
D7956	Guided tissue regeneration, edentulous area - resorbable barrier, per site

CDT Code	Description
D7957	Guided tissue regeneration, edentulous area - non-resorbable barrier, per site

CDT® is a registered trademark of the American Dental Association

Description of Services

A barrier membrane is used in oral and periodontal surgeries to prevent epithelial tissue from growing into an area in which bone is desired or when regeneration of periodontal tissues is the goal, to prevent epithelial and connective gingival tissue from forming on the surface of the root and bone (Siali et al. 2018) These include augmentation and reconstruction of alveolar ridge defects, improving bone healing around or to treat failing dental implants and improve bone grafting results. Membranes may be resorbable or non-resorbable. Resorbable membranes include natural membranes such as collagen; and synthetic membrane such as aliphatic polyesters. Non- resorbable membranes include expanded polytetrafluoroethylene (e-PTFE), and alginate.

Clinical Evidence

In a 2021 controlled clinical trial, Jung et al. reported on the clinical and radiographic outcomes of implants placed with resorbable and non-resorbable guided bone regeneration (GBR) membranes after 22-24 years. The original patient cohort included 72 patients with 265 individual implants, 39 patients and 147 implants were included in this study with a median time period of 23.5 years. Dehiscence defects were treated with GBR by either using resorbable collagen membranes or nonresorbable ePTFE membranes. Implants placed in pristine bone served as a control. Clinical parameters, marginal bone levels, and technical outcomes were evaluated following restoration placement and at this follow-up. A 3D radiographic analysis was conducted in order to assess buccal and oral bone dimensions, and implant survival was assessed. The results showed favorable implant survival rates ranging from 89.3% to 93.8% for augmented and nonaugmented sites with comparable bone levels between site with or without regeneration technique. Smoking was a factor that significantly had a negative effect on healing, bone loss, and long term implant survival rates. The authors concluded that implant treatment with and without GBR led to favorable long term implant survival rates, with smoking having the greatest impact on negative outcomes.

Nibali et al. (2021) conducted a systematic review on defect morphology and healing of infrabony defects following regenerative periodontal procedures. The main outcomes assessed were clinical attachment level (CAL) gain, periodontal pocket depth (PPD) reduction and radiographic bone gain. A total of fourteen studies were included. The results showed that deeper, narrower defects and defects with more walls are associated with improved CAL and radiographic outcomes 12 months post-regenerative surgery, and this appears to be irrespective of which type of Guided Tissue Regeneration is used. The authors concluded that more data and research is needed on other aspects of defect morphology, including when the defect extends to the buccal and/or lingual surfaces.

In a 2021 systematic review and meta-analysis, Swami et al. aimed to evaluate the efficacy of bone replacement graft (BRG) with Guided Tissue Regeneration (GTR) over BRG or open flap debridement (OFD) alone for the treatment of grade II Furcation defects. Outcome parameters included clinical attachment level (CAL) gain, changes in gingival marginal level (GML), vertical defect fill (VDF), horizontal defect fill (HDF) and reduction in defect volume. There were 9 randomized controlled trials (RCTs) comparing BRG + GTR vs BRG, while 3 compared BRG + GTR vs OFD. The results showed In the BRG + GTR vs BRG comparison group, 6 studies showed standardized mean difference (SMD) of 0.513 for VDF, 9 RCTs showed SMD of 0.83 for HDF and 2 RCTs showed SMD of 0.651 for CAL gain, and only 2 studies in the same group reported reduction in defect volume. Three studies of the BRG + GTR vs OFD group exhibited significant VDF and CAL gain with SMD of 2.002 and 1.161 respectively. No significant change was recorded for GML in both groups. The authors concluded that this systematic review indicates supplemental benefits of combination therapy of BRG + GTR over monotherapy in resolving grade II Furcation defects, and clinical situations warranting near-complete regeneration of the tissues in such defects are better suited for combination therapies.

Avila-Ortiz et al. (2019) conducted a systematic review of randomized clinical trials (RCTs) to critically analyze the available evidence on the effect of different modalities of alveolar Ridge Preservation (ARP) as compared to tooth extraction alone in function of relevant clinical, radiographic and patient-centered outcomes. Endpoints of interest included clinical, radiographic, and patient-reported outcome measures (PROMs). Interventions reported in the selected studies were clustered into ARP treatment modalities. All these different ARP modalities were compared to the control therapy (i.e. spontaneous socket healing) in each individual study after a 3- to 6-month healing period. Random effects meta-analyses were conducted if at least two studies within the same ARP treatment modality reported on the same outcome of interest. 22 RCTs were included in the final selection, from which 9 different ARP treatment modalities were identified:

- Bovine bone particles (BBP) + Socket sealing (SS)

- Construct made of 90% bovine bone granules and 10% porcine collagen (BBG/PC) + SS
- Cortico-cancellous porcine bone particles (CPBP) + SS
- Allograft particles (AG) + SS
- Alloplastic material (AP) with or without SS
- Autologous blood-derived products (ABDP)
- Cell therapy (CTh)
- Recombinant morphogenic protein-2 (rh-BMP2)
- SS alone

Quantitative analyses for different ARP modalities, all of which involved socket grafting with a bone substitute, were feasible for a subset of clinical and radiographic outcomes. The results of a pooled quantitative analysis revealed that ARP via socket grafting (ARP-SG), as compared to tooth extraction alone, prevents horizontal, vertical mid-buccal and vertical mid-lingual bone resorption. Whether there is a superior ARP or SS approach could not be determined on the basis of the selected evidence. However, the application of particulate xenogenic or allogenic materials covered with an absorbable collagen membrane, or a rapidly-absorbable collagen sponge was associated with the most favorable outcomes in terms of horizontal Ridge Preservation. A specific quantitative analysis showed that sites presenting a buccal bone thickness > 1.0 mm exhibited more favorable Ridge Preservation outcomes (difference between ARP [AG + SS] and control = 3.2 mm), as compared to sites with a thinner buccal wall (difference between ARP [AG + SS] and control = 1.29 mm). The authors concluded that ARP is an effective therapy to attenuate the dimensional reduction of the alveolar ridge that normally takes place after tooth extraction. Trobos et al. (2018) conducted a study to evaluate biofilm formation and barrier function against *Streptococcus oralis* of nonresorbable polytetrafluoroethylene (PTFE) guided bone regeneration membranes having expanded (e-PTFE) and dense (d-PTFE) microstructure. Three e-PTFE membranes of varying openness, one d-PTFE membrane, and commercially pure titanium discs were evaluated. All e-PTFE membranes consisted of PTFE nodes interconnected by fibrils. The d-PTFE membrane was fibril-free, with large evenly spaced indentations. The surfaces were challenged with *S. oralis* and incubated statically for 2-48h. bacterial colonization, viability, and penetration were evaluated.

The results showed *S. oralis* numbers increased over time on all surfaces, as observed using scanning electron microscopy, while cell viability decreased, as measured by colony forming unit (CFU) counting. At 24h and 48h, biofilms on d-PTFE were more mature and thicker (tower formations) than on e-PTFE, where fewer layers of cells were distributed mainly horizontally. Biofilms accumulated preferentially within d-PTFE membrane indentations. At 48h, greater biofilm biomass and number of viable *S. oralis* were found on d-PTFE compared to e-PTFE membranes. All membranes were impermeable to *S. oralis* cells. The authors concluded that all PTFE membranes were effective barriers against bacterial passage in vitro.

Bassir et al. (2018) conducted a systematic review and meta-analysis aimed to assess the efficacy of alveolar Ridge Preservation procedures in terms of hard tissue dimensional changes and to determine clinical factors affecting outcomes of these procedures. Studies comparing alveolar Ridge Preservation procedures with tooth extraction alone that reported quantitative outcomes for hard tissue dimensional changes were included. The primary outcome variable was horizontal dimensional changes of alveolar bone. Subgroup analyses evaluated effects of wound closure, flap elevation, type of grafting materials, use of barrier membranes, use of growth factors, socket morphology, and the position of teeth on outcomes of alveolar Ridge Preservation procedures. Twenty-one studies were included, and quantitative analyses were performed for seven outcome variables. Significant differences between alveolar Ridge Preservation and control sites were found for six outcome variables, all favoring alveolar Ridge Preservation procedures. The magnitude of effect for the primary outcome variable (horizontal dimensional changes of alveolar bone) was 1.86 mm. This magnitude of effect for the primary variable (as determined by subgroup analysis) was also significantly affected by type of wound closure, type of grafting materials, use of barrier membranes, use of growth factors, and socket morphology. Alveolar Ridge Preservation procedures are effective in minimizing postextraction hard tissue dimensional loss. The outcomes of these procedures are affected by morphology of extraction sockets, type of wound closure, type of grafting materials, use of barrier membranes, and use of growth factors.

In a 2018 meta-analysis, Wessing et al. sought to evaluate different methods for guided bone regeneration using collagen membranes and particulate grafting materials in implant dentistry. An electronic database and hand search were performed for all relevant articles dealing with guided bone regeneration in implant dentistry published between 1980 and 2014. Only randomized clinical trials and prospective controlled studies were included. The primary outcomes of interest were survival rates, membrane exposure rates, bone gain/defect reduction, and vertical bone loss at follow-up. A meta-analysis was performed to determine the effects of presence of membrane cross-linking, timing of implant placement, membrane fixation, and decortication. Twenty studies met the inclusion criteria. Implant survival rates were similar between simultaneous and subsequent implant placement. The membrane exposure rate of cross-linked membranes was approximately 30% higher than that of non-cross-linked membranes. The use of anorganic bovine bone mineral led to

sufficient newly regenerated bone and high implant survival rates. Membrane fixation was weakly associated with increased vertical bone gain, and decortication led to higher horizontal bone gain (defect depth). The authors concluded that guided bone regeneration with particulate graft materials and resorbable collagen membranes is an effective technique for lateral alveolar ridge augmentation.

MacBeth et al. (2017) conducted a systematic review to answer two focused questions: 1) What is the effect of alveolar Ridge Preservation (ARP) on linear and volumetric alveolar site dimensions, keratinized measurements, histological characteristics and patient-based outcomes when compared to unassisted socket healing? 2) What is the size effect of these outcomes in three different types of intervention (guided bone regeneration, socket grafting and socket seal). An electronic and hand-search was conducted up to June 2015. Randomized controlled trials (RCT) and controlled clinical trials (CCT); with unassisted socket healing as controls were eligible in the analysis for Q1. RCTs, CCTs and large prospective case series with or without an unassisted socket healing as control group were eligible in the analysis for Q2. The results showed for Q1: the standardized mean difference (SMD) in vertical mid-buccal bone height between ARP and a non-treated site was 0.739 mm. The SMD when proximal vertical bone height and horizontal bone width was compared was 0.796mm and 1.198 mm. Examination of ARP sites revealed significant variation in vital and trabecular bone percentages and keratinized tissue width and thickness. Adverse events were routinely reported, with three papers reporting a high level of complications in the test and control groups and two papers reporting greater risks associated with ARP. For Q2: A pooled effect reduction (PER) in mid-buccal alveolar ridge height of -0.467 mm was recorded for GBR procedures and -0.157 mm for socket grafting. A proximal vertical bone height reduction of -0.356 mm was recorded for GBR, with a horizontal dimensional reduction of -1.45 mm measured following GBR and -1.613 mm for socket grafting procedures. Five papers reported on histological findings after ARP. Two papers indicated an increase in the width of the keratinized tissue following GBR, with two papers reporting a reduction in the thickness of the keratinized tissue following GBR. Histological examination revealed extensive variations in the treatment protocols and biomaterials materials used to evaluate extraction socket healing. GBR studies reported a variation in total bone formation of $47.9 \pm 9.1\%$ to $24.67 \pm 15.92\%$. Post-operative complications were reported by 29 papers, with the most common findings soft tissue inflammation and infection. The authors concluded that ARP results in a significant reduction in the vertical bone dimensional change following tooth extraction when compared to unassisted socket healing. The reduction in horizontal alveolar bone dimensional change was found to be variable. No evidence was identified to clearly indicate the superior impact of a type of ARP intervention (GBR, socket filler and socket seal) on bone dimensional preservation, bone formation, keratinized tissue dimensions and patient complications.

In 2017, Soldatos et al. conducted a study to summarize the knowledge on different types of membranes available and currently used in GBR procedures in a staged approach or with simultaneous implant placement. The primary role of the membranes is to exclude epithelial and connective tissue cells from the wound area to be regenerated, and to create and maintain the space into which pluripotential and osteogenic cells are free to migrate. A selected number of studies were chosen in order to provide a review of the main characteristics, applications, and outcomes of the different types of membranes. Resorbable membranes are made of natural or synthetic polymers like collagen and aliphatic polyesters. Collagens are the most common type used. They have similar collagen composition to the periodontal connective tissue. Other materials available include human, porcine, and bovine pericardium membranes, human amnion and chorion tissue, and human acellular freeze-dried dermal matrix. Nonresorbable membranes used in GBR include dense-polytetrafluoroethylene (d-PTFE), expanded-polytetrafluoroethylene (e-PTFE), titanium mesh, and titanium-reinforced polytetrafluoroethylene. The authors concluded that the most common complication of nonresorbable membranes is exposure, which has detrimental effect on the final outcome with both types of membranes. For vertical bone augmentation procedures, the most appropriate membranes are the nonresorbable. For combination defects, both types result in a successful outcome.

In a 2017 systematic review, Troiano et al. sought to analyze evidence regarding potential benefits of alveolar ridge preservation (ARP) procedures performed with allogenic/xenogenic grafts in combination with resorbable membrane coverage in comparison to a spontaneous healing. Electronic databases were screened independently by two authors in order to select studies suitable for inclusion in this revision. Horizontal ridge width reduction (HRWR) and vertical ridge height reduction (VRHR) were investigated as primary outcomes and Volume Changes (VC) as secondary outcome. Meta-analysis was performed using the inverse of variance test with a random effect model. Adjustment for type I and II errors and analysis of the power of evidence was performed with trial sequential analysis (TSA). 7 studies met the inclusion criteria and were included in the quantitative synthesis. Meta-analysis revealed that the combination therapy resulted in a lower rate of resorption for both HRWR and VRHR. For VC no meta-analysis was performed due to insufficient data. Analysis of the power of the evidence performed with TSA, showed that the number of both studies and sockets analyzed is sufficient to validate such findings, despite the high rate of heterogeneity. The authors concluded that the use of bone graft covered by a resorbable membrane is able to decrease the rate of alveolar ridge horizontal and vertical resorption after tooth extraction.

Merli et al. (2016) completed a systematic review to evaluate the efficacy of the bone augmentation procedure at dehiscence or fenestration defects in one-stage implant insertion and to evaluate which is the most effective procedure. Only randomized controlled trials (RCTs) were included. Outcome variables considered were implant failure, complications, aesthetic and functional satisfaction, complete fill of the defect, clinical and radiological bone level variation, and vestibular peri-implant recession. Independent data extraction by two authors using predefined data fields, including study quality indicators, was completed. All pooled analyses were based on random effects models. A total of 65 full-text articles were examined in detail. Forty-six of the 65 articles did not meet the inclusion criteria. Nineteen articles involving 15 trials were identified for inclusion in the review. Only one study was considered to be at a low risk of bias. The included studies involved 396 patients and 535 implants. Comparing the test group using membranes with the control without membranes, a statistically significant difference was obtained for vertical variation of the peri-implant defect; the difference was 1.64 mm favoring the use of a membrane. Non-resorbable polytetrafluoroethylene (ePTFE) membranes obtained a complete clinical fill of defects more frequently than resorbable polylactide/polyglycolide (PLGA) membranes. The odds ratio was 0.04 to 0.64 mm, favoring the use of ePTFE membranes. No differences were observed comparing nonresorbable ePTFE membranes and resorbable collagen membranes. The authors concluded that overall, the evidence is not sufficiently robust to determine if any treatment is needed and which is the best treatment for dehiscence or fenestration defects at one-stage implant placement. Only 15 trials were included and the most are of limited sample size, have short follow-ups as well as having a high risk of bias. The use of a membrane can contribute to the regeneration of the hard tissue in horizontal one-stage augmentation. The complete fill of the defect was obtained more frequently when a non-resorbable ePTFE membrane was used compared to a resorbable PLGA membrane. No differences were observed comparing non-resorbable ePTFE membranes and resorbable collagen membranes. No substantial differences were obtained using different non-resorbable membranes and grafts, and the results were positive for the variables examined. A high result of heterogeneity was observed in studies dealing with cross-linked membranes.

In a 2016 systematic review of randomized controlled trials, Jonker et al. sought to determine the clinical value of membranes in bone augmentation procedures such as ridge augmentation with simultaneous (one-stage) and delayed (two-stage) implant placement, sinus augmentation surgery, ridge preservation and immediate implant placement. Randomized controlled trials that reported membranes in bone augmentation procedures with a minimum follow-up period of 6 months after implant loading or that described geometrical changes of the bone graft at re-entry were included. Membrane placement had to be the only variable in the procedure. Outcomes were implant failure, complications, horizontal bone gain and resorption, graft resorption, defect height reduction, marginal bone loss around implants, aesthetic results and patient satisfaction. The results were pooled using fixed-effect models with mean differences (MDs) for continuous outcomes and odds ratios (ORs) for dichotomous outcomes. Seventeen articles involving 10 trials were included in this review. These studies presented outcome data for 355 patients. Seven trials were considered to be at a high risk of bias, two at a low risk of bias and one at an unclear risk of bias. Insufficient evidence was found to determine whether there were differences in implant failure rates, marginal bone level changes, aesthetic results or patient satisfaction. For one-stage ridge augmentation (two trials; N = 52), there was evidence of more horizontal bone gain (MD: 0.84 mm, 95% CI: 0.46 to 1.21, P < 0.00001; two trials), defect height reduction (MD: 18.36%, 95% CI: 10.23 to 26.50, P < 0.00001; two trials), and prevention of graft resorption (P = 0.004; one trial) in favor of the membrane-covered group, although substantial heterogeneity was found for horizontal bone gain (Chi2; P = 0.05, I2 = 74%). There was insufficient evidence to determine whether any differences exist in two-stage ridge augmentation (three trials; N = 81), sinus augmentation (one trial; N = 104) and Ridge Preservation (one trial; N = 20). For immediate implant placement (three trials; N = 98), there was evidence of an increased defect height reduction in favor of the membrane-covered groups (MD: 6.25%, 95% CI: 1.67 to 10.82, P = 0.007; two trials), although with substantial heterogeneity (Chi2; P = 0.03, I2 = 79%). More complications were observed when a membrane was used (OR: 2.52, 95% CI: 1.07 to 5.93, P = 0.03; three trials). The authors concluded there is insufficient evidence regarding the effects of membranes on bone augmentation procedures to support any definitive conclusions. Only 10 studies were included; they had limited sample sizes and short follow-up periods, and the majority were at a high risk of bias. However, no difference in implant failure was found, and the possible clinical value is still unknown, as long-term clinical parameters such as marginal bone loss, aesthetic results and patient satisfaction have been insufficiently studied.

Lesions of Endodontic Origin

Parmar et al. (2019) conducted a randomized controlled trial to evaluate the effect of a resorbable collagen membrane on the healing of through and through lesions of endodontic origin. Thirty-two patients with periapical radiolucencies measuring at least 10 mm and with confirmed loss of buccal and lingual cortical plates were randomly divided into GTR and control groups. Periapical surgery was performed in both groups, using a resorbable collagen membrane in the GTR group only. Thirty patients were evaluated at 12 month follow-up, and the results showed both groups had a significant reduction in lesion size with no significant difference between the groups. The authors concluded that periapical surgery with or without GTR was a predictable and viable solution for through-and-through lesions of endodontic origin and there was no benefit in using a collagen membrane with regard to the outcome of periapical surgery.

Corbella et al (2016) conducted a comprehensive review of the published scientific literature of experimental and clinical studies to assess the efficacy and effectiveness of Guided Tissue Regeneration (GTR) in enhancing hard and soft tissue healing after endodontic surgery. The included articles are classified considering the anatomical characteristics of the lesion. Fourteen articles were included in the review after abstract and title selection. Eight articles were on studies on lesions affecting only the periapical region (three about through-and-through lesions) while six were about the treatment of apico-marginal lesions. On the basis of the currently available literature, there is a low scientific evidence of a benefit related to the use of guided bone regeneration procedure in endodontic surgery.

Tsesis et al. (2011) conducted a systematic review and meta-analysis to evaluate the influence of Guided Tissue Regeneration (GTR) on the outcome of surgical endodontic treatment. This systematic review included clinical studies that reported the use of Guided Tissue Regeneration in surgical endodontic treatment in patients with apical periodontitis in endodontically treated teeth. Search engines MEDLINE and EMBASE and MESH were utilized, and the methodologic quality of the selected studies was evaluated independently and in duplicate by two reviewers. The full texts of the studies were obtained and reviewed for suitability based on the inclusion and exclusion criteria. There were five articles included in the final meta-analysis and were subject to data extraction, methodologic quality assessment, and data synthesis and analysis. The review concluded that while there was a trend of better outcome when GTR was used compared to control cases and that GTR techniques may improve the outcome of bone regeneration after surgical endodontic treatments of teeth with certain lesions. Additional large-scale prospective clinical studies are needed to further evaluate possible benefits of GTR techniques in endodontic surgery.

Clinical Practice Guidelines

American Academy of Periodontology (AAP)

In a 2011 position statement on comprehensive periodontal therapy, the AAP states that periodontal regenerative procedures including bone replacement grafts, use of biologics, root biomodification, Guided Tissue Regeneration, and combinations of these procedures are appropriate for osseous, furcation, and gingival recession defects.

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

The FDA considers barrier membranes to be Class II devices and exempt from premarket notification requirements under the Food and Drug Administration Modernization Act of 1997 (FDAMA) or the 21st Century Cures Act of 2016 (Cures Act).

501(k) Premarket notification regarding individual products can be found using product code NPL at:

<https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm>.

(Accessed February 22, 2024)

References

American Academy of Periodontology Glossary of Periodontal Terms.

American Academy of Periodontology. Comprehensive Periodontal Therapy: A Statement by the American Academy of Periodontology 2011. Available at: <https://aap.onlinelibrary.wiley.com/doi/10.1902/jop.2011.117001>. Accessed January 23, 2024.

American Dental Association (ADA) CDT Codebook 2024.

American Dental Association Glossary of Clinical and Administrative Terms.

Avila-Ortiz G, Chambrone L, Vignoletti F. Effect of Alveolar Ridge Preservation Interventions Following Tooth Extraction: A Systematic Review and Meta-Analysis. *J Clin Periodontol*. 2019 Jan 9.

Bashutski J, Oh TJ, Chan HL, et al. Guided tissue Regeneration: a decision-making model. *J Int Acad Periodontol*. 2011 Jul;13(2):48-57.

Bassir SH, Alhareky M, Wangsrimongkol B, et al. Systematic Review and Meta-Analysis of Hard Tissue Outcomes of Alveolar Ridge Preservation. *Int J Oral Maxillofac Implants*. 2018 Sep/Oct; 33(5):979-994.

Beyene RT, Derryberry SL Jr, Barbul A. The Effect of Comorbidities on Wound Healing. *Surg Clin North Am*. 2020 Aug;100(4):695-705.

Corbella S, Taschieri S, Elkabbany A, et al. Guided Tissue Regeneration Using a Barrier Membrane in Endodontic Surgery. *Swiss Dent J*. 2016; 126(1):13-25.

Harpenau L, Hall W. Halls's Critical Decisions in Periodontology and Implantology, 5th ed. Shelton, CT: People's Medical Publishing House c2013 Chapter 11, Mobility ; p.28.

Jonker BP, Roeloffs MW, Wolvius EB, et al. The clinical value of membranes in bone augmentation procedures in oral implantology: A systematic review of randomized controlled trials. Eur J Oral Implantol. 2016;9(4):335-365.

Jung RE, Brügger LV, Bienz SP, et al. Clinical and radiographical performance of implants placed with simultaneous guided bone regeneration using resorbable and nonresorbable membranes after 22-24 years, a prospective, controlled clinical trial. Clin Oral Implants Res. 2021 Dec;32(12):1455-1465.

Kao R, Takei H, Cochrane D. Newman and Carranza's Clinical Periodontology, 13th ed. St. Louis: Saunders c2019. Chapter 63, Periodontal Regeneration and Reconstructive Surgery; p. 642-652.

Kerr A, Miller C, Nelson R. Little and Falace's Dental Management of the Medically Compromised Patient, 10th ed. St. Louis: Elsevier c2024. Chapter 1, Patient Evaluation, Risk Assessment and the Diagnostic Process; p. 1-17.

Kotsakis G, Chun-The L, Heinrichs J. Newman and Carranza's Clinical Periodontology and Implantology, 14th ed. St. Louis: Elsevier c2023. Chapter 5, Classification of Diseases and Conditions Affecting the Periodontium; p. 61-81.

Levi P, Rudy R, Jeong Y et al. Non- Surgical Control of Periodontal Diseases: A Comprehensive Handbook. Berlin, Heidelberg: Springer c2016. Chapter 1.6, Prognosis; p. 17.

MacBeth N, Trullenque-Eriksson A, Donos N, et al. Hard and soft tissue changes following alveolar Ridge Preservation: a systematic review. Clin Oral Implants Res. 2017 Aug; 28(8):982-1004.

Merli M, Merli I, Raffaelli E, et al. Bone augmentation at implant dehiscences and fenestrations. A systematic review of randomized controlled trials. Eur J Oral Implantol. 2016 Spring; 9(1):11-32.

Nibali L, Sultan D, Arena C, et al. Periodontal infrabony defects: Systematic review of healing by defect morphology following regenerative surgery. J Clin Periodontol. 2021 Jan;48(1):100-113.

Parmar PD, Dhamija R, Tewari S, et al. 2D and 3D radiographic outcome assessment of the effect of Guided Tissue Regeneration using resorbable collagen membrane in the healing of through-and-through periapical lesions - a randomized controlled trial. Int Endod J. 2019 Jul;52(7):935-948.

Soldatos NK, Stylianou P, Koidou VP, et al. Limitations and options using resorbable versus nonresorbable membranes for successful guided bone regeneration. Quintessence Int. 2017; 48(2):131-147.

Swami RK, Kolte AP, Bodhare GH, et al. Bone replacement grafts with guided tissue regeneration in treatment of grade II Furcation defects: a systematic review and meta-analysis. Clin Oral Investig. 2021 Mar;25(3):807-821.

Trobos M, Juhlin A, Shah FA, et al. In vitro evaluation of barrier function against oral bacteria of dense and expanded polytetrafluoroethylene (PTFE) membranes for guided bone regeneration. Clin Implant Dent Relat Res. 2018 Oct; 20(5):738-748.

Troiano G, Zhurakivska K, Lo Muzio L, et al. Combination of Bone Graft and Resorbable Membrane for Alveolar Ridge Preservation: a Systematic Review, Meta-analysis and Trial Sequential Analysis. J Periodontol. 2017 Sep 12:1-17.

Tsesis I, Rosen E, Tamse A, Taschieri S, Del Fabbro M. Effect of guided tissue regeneration on the outcome of surgical endodontic treatment: a systematic review and meta-analysis. J Endod. 2011 Aug; 37(8):1039-45.

Wessing B, Lettner S, Zechner W. Guided Bone Regeneration with Collagen Membranes and Particulate Graft Materials: A Systematic Review and Meta-Analysis. Int J Oral Maxillofac Implants. 2018 January/February; 33(1):87-100.

Policy History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.

Dental Care Services in an Operating Room or Ambulatory Surgery Center

Guideline Number: DCG043.13
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
55. Coverage Rationale	110
56. Definitions	110
57. Applicable Codes	111
58. Description of Services	115
59. Benefit Considerations	115
60. References	116
61. Guideline History/Revision Information	116
62. Instructions for Use	116

Related Dental Policy

- General Anesthesia and Conscious Sedation Services

Coverage Rationale

[See Benefit Considerations](#)

Note: This coverage guideline is intended to provide guidance for the appropriate selection of individuals that cannot be treated safely within a dental office. Refer to the member specific benefit plan document or applicable state mandates for information on coverage.

The provision of dental care under general anesthesia in a hospital operating room (OR) or ambulatory surgery center (ASC) is [Necessary](#) for select individuals.

Indications include consideration of the following:

- Compromising medical condition
- Age
- Behavior/cognitive impairment
- Complexity of care

Prior Authorization Documentation (for Plans that Require Authorization)

- Physician documentation (if indicated)
- Dental provider clinical documentation (including imaging if available)
- For plans that require scoring:
- A completed [Dental Care Services in an Operating Room or Ambulatory Surgery Center: Criteria Scoring](#) form showing a total score of 24 or greater

Definitions

Necessary: Dental services and supplies which are determined by us through case-by-case assessments of care based on accepted dental practices to be appropriate; and:

- Needed to meet your basic dental needs; and
- Rendered in the most cost-efficient manner and type of setting appropriate for the delivery of the dental service; and

- Consistent in type, frequency, and duration of treatment with scientifically based guidelines of national clinical, research, or health care coverage organizations or governmental agencies that are accepted by us; and
- Consistent with the diagnosis of the condition; and
- Required for reasons other than the convenience of you or your dental provider; and
- Demonstrated through prevailing peer-reviewed dental literature to be either:
- Safe and effective for treating or diagnosing the condition or sickness for which its use is proposed; or
- Safe with promising efficacy:
 - For treating a life-threatening dental disease or condition; and
 - In a clinically controlled research setting; and
 - Using a specific research protocol that meets standards equivalent to those defined by the National Institutes of Health

For the purpose of this definition, the term “life threatening” is used to describe dental diseases or sicknesses or conditions which are more likely than not to cause death within one year of the date of the request for treatment.

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
Diagnostic and Preventive	
D0120	Periodic oral evaluation - established patient
D0150	Comprehensive oral evaluation - new or established patient
D0180	Comprehensive periodontal evaluation - new or established patient
D0210	Intraoral - complete series of radiographic images
D0220	Periapical first radiographic image
D0230	Intraoral - periapical each additional radiographic image
D0240	Intraoral - occlusal radiographic image
D0270	Bitewing - single radiographic image
D0272	Bitewings - two radiographic images
D0273	Bitewings- three radiographic images
D0274	Bitewings- four radiographic images
D0350	2D oral/facial photographic image obtained intra-orally or extra-orally
D1110	Prophylaxis - adult
D1120	Prophylaxis - child
D1206	Topical application of fluoride varnish
D1351	Sealant - per tooth
D1352	Preventive resin restoration in a moderate to high caries risk patient - permanent tooth
D1353	Sealant repair - per tooth
D1354	Application of caries arresting medicament-per tooth
D1510	Space maintainer - fixed, unilateral – per quadrant
D1516	Space maintainer – fixed – bilateral, maxillary
D1517	Space maintainer – fixed – bilateral, mandibular
D1520	Space maintainer - removable, unilateral – per quadrant
D1526	Space maintainer – removable – bilateral, maxillary
D1527	Space maintainer – removable – bilateral, mandibular
D1552	Re-cement or re-bond bilateral space maintainer – mandibular

CDT Code	Description
D1553	Re-cement or re-bond unilateral space maintainer – per quadrant
D1556	Removal of fixed unilateral space maintainer – per quadrant
Diagnostic and Preventive	
D1557	Removal of fixed bilateral space maintainer – maxillary
D1558	Removal of fixed bilateral space maintainer – mandibular
D1575	Distal shoe space maintainer - fixed, unilateral – per quadrant
Restorative	
D2140	Amalgam - one surface, primary or permanent
D2150	Amalgam- two surfaces, primary or permanent
D2160	Amalgam- three surfaces, primary or permanent
D2161	Amalgam- four or more surfaces, primary or permanent
D2330	Resin-based composite - one surface, anterior
D2331	Resin-based composite - two surfaces, anterior
D2332	Resin-based composite - three surfaces, anterior
D2335	Resin-based composite - four or more surfaces (anterior)
D2390	Resin-based composite crown, anterior
D2391	Resin-based composite - one surface, posterior
D2392	Resin-based composite - two surfaces, posterior
D2393	Resin-based composite - three surfaces, posterior
D2394	Resin-based composite - four or more surfaces, posterior
D2930	Prefabricated stainless steel crown – primary tooth
D2931	Prefabricated stainless steel crown – permanent tooth
D2932	Prefabricated resin crown
D2933	Prefabricated stainless steel crown with resin window
D2934	Prefabricated esthetic coated stainless steel crown – Primary tooth
Endodontics	
D3110	Pulp cap - direct (excluding final restoration)
D3120	Pulp cap - indirect (excluding final restoration)
D3220	Therapeutic pulpotomy (excluding final restoration)
D3221	Pulpal debridement, primary and permanent teeth
D3222	Partial pulpotomy for apexogenesis - permanent tooth with incomplete root development
D3230	Pulpal therapy (resorbable filling) - anterior, primary tooth (excluding final restoration)
D3240	Pulpal therapy (resorbable filling) - posterior, primary tooth (excluding final restoration)
D3310	Endodontic therapy, anterior tooth (excluding final restoration)
D3320	Endodontic therapy, premolar tooth (excluding final restoration)
D3330	Endodontic therapy, molar tooth (excluding final restoration)
D3331	Treatment of root canal obstruction; non-surgical access
D3332	Incomplete endodontic therapy; inoperable, unrestorable or fractured tooth
D3333	Internal root repair of perforation defects
D3346	Retreatment of previous root canal therapy - anterior
D3347	Retreatment of previous root canal therapy - premolar
D3348	Retreatment of previous root canal therapy - molar
D3410	Apicoectomy - anterior
D3421	Apicoectomy - premolar (first root)
D3425	Apicoectomy - molar (first root)

CDT Code	Description
D3426	Apicoectomy (each additional root)
D3427	Periradicular surgery without apicoectomy
Endodontics	
D3428	Bone graft in conjunction with periradicular surgery - per tooth, single site
D3429	Bone graft in conjunction with periradicular surgery - each additional contiguous tooth in the same surgical site
D3430	Retrograde filling - per root
D3431	Biologic materials to aid in soft and osseous tissue regeneration in conjunction with periradicular surgery
D3432	Guided tissue regeneration, resorbable barrier, per site, in conjunction with periradicular surgery
D3450	Root amputation - per root
D3470	Intentional reimplantation (including necessary splinting)
D3910	Surgical procedure for isolation of tooth with rubber dam
D3920	Hemisection (including any root removal), not including root canal therapy
D3950	Canal preparation and fitting of preformed dowel or post
Periodontics	
D4210	Gingivectomy or gingivoplasty - four or more contiguous teeth or tooth bounded spaces per quadrant
D4211	Gingivectomy or gingivoplasty - one to three contiguous teeth or tooth bounded spaces per quadrant
D4212	Gingivectomy or gingivoplasty to allow access for restorative procedure, per tooth
D4230	Anatomical crown exposure - four or more contiguous teeth or bounded tooth spaces per quadrant
D4231	Anatomical crown exposure - one to three teeth or bounded tooth spaces per quadrant
D4240	Gingival flap procedure, including root planing - four or more contiguous teeth or tooth bounded spaces per quadrant
D4241	Gingival flap procedure, including root planing - one to three contiguous teeth or tooth bounded spaces per quadrant
D4245	Apically positioned flap
D4249	Clinical crown lengthening - hard tissue
D4260	Osseous surgery (including elevation of a full thickness flap and closure) - four or more contiguous teeth or tooth bounded spaces per quadrant
D4261	Osseous surgery (including elevation of a full thickness flap and closure) - one to three contiguous teeth or tooth bounded spaces per quadrant
D4263	Bone replacement graft - retained natural tooth - first site in quadrant
D4264	Bone replacement graft - retained natural tooth - each additional site in quadrant
D4265	Biologic materials to aid in soft and osseous tissue regeneration, per site
D4266	Guided tissue regeneration - resorbable barrier, per site
D4267	Guided tissue regeneration - nonresorbable barrier, per site
D4268	Surgical revision procedure, per tooth
D4270	Pedicle soft tissue graft procedure
D4273	Autogenous connective tissue graft procedure (including donor and recipient surgical sites) first tooth, implant, or edentulous tooth position in graft
D4274	Mesial/distal wedge procedure, single tooth (when not performed in conjunction with surgical procedures in the same anatomical area)
D4275	Non-autogenous connective tissue graft (including recipient site and donor material) first tooth, implant, or edentulous tooth position in graft
D4276	Combined connective tissue and double pedicle graft, per tooth

CDT Code	Description
D4277	Free soft tissue graft procedure (including recipient and donor surgical sites) first tooth, implant or edentulous tooth position in graft
Periodontics	
D4278	Free soft tissue graft procedure (including recipient and donor surgical sites) each additional contiguous tooth, implant or edentulous tooth position in same graft site
D4283	Autogenous connective tissue graft procedure (including donor and recipient surgical sites) - each additional contiguous tooth, implant or edentulous tooth position in same graft site
D4285	Non-autogenous connective tissue graft procedure (including recipient surgical site and donor material) - each additional contiguous tooth, implant or edentulous tooth position in same graft site
D4341	Periodontal scaling and root planing - four or more teeth per quadrant
D4342	Periodontal scaling and root planing - one to three teeth per quadrant
D4346	Scaling in presence of generalized moderate or severe gingival inflammation - full mouth, after oral evaluation
D4355	Full mouth debridement to enable a comprehensive oral evaluation and diagnosis on a subsequent visit
D4381	Localized delivery of antimicrobial agents via a controlled release vehicle into diseased crevicular tissue, per tooth
D4910	Periodontal maintenance
D4921	Gingival irrigation - per quadrant
Oral and Maxillofacial Surgery	
D7111	Extraction, coronal remnants - primary tooth
D7140	Extraction, erupted tooth or exposed root (elevation and/or forceps removal)
D7210	Extraction, erupted tooth requiring removal of bone and/or sectioning of tooth, and including elevation of mucoperiosteal flap if indicated
D7220	Removal of impacted tooth – soft tissue
D7230	Removal of impacted tooth – partially bony
D7240	Removal of impacted tooth – complete bony
D7241	Removal of impacted tooth – complete bony, with unusual surgical complications
D7250	Removal of residual tooth roots (cutting procedure)
D7251	Coronectomy – intentional partial tooth removal
D7260	Oroantral fistula closure
D7261	Primary closure of a sinus perforation
D7280	Exposure of an unerupted tooth
D7285	Incisional biopsy of oral tissue-hard (bone, tooth)
D7286	Incisional biopsy of oral tissue-soft
D7287	Exfoliative cytological sample collection
D7288	Brush biopsy - transepithelial sample collection
D7291	Transseptal fiberotomy/supra crestal fiberotomy, by report
D7295	Harvest of bone for use in autogenous grafting procedure
D7310	Alveoloplasty in conjunction with extractions – four or more teeth or tooth spaces, per quadrant
D7311	Alveoloplasty in conjunction with extractions – one to three teeth or tooth spaces, per quadrant
D7320	Alveoloplasty not in conjunction with extractions -four or more teeth or tooth spaces, per quadrant
D7321	Alveoloplasty not in conjunction with extractions – one to three teeth or tooth spaces, per quadrant
D7340	Vestibuloplasty – ridge extension (secondary epithelialization)
D7350	Vestibuloplasty – ridge extension (including soft tissue grafts, muscle reattachment, revision of soft tissue attachment and management of hypertrophied and hyperplastic tissue)
D7410	Excision of benign lesion up to 1.25 cm

CDT Code	Description
D7411	Excision of benign lesion greater than 1.25 cm
D7412	Excision of benign lesion, complicated
Oral and Maxillofacial Surgery	
D7413	Excision of malignant lesion up to 1.25 cm
D7414	Excision of malignant lesion greater than 1.25 cm
D7415	Excision of malignant lesion, complicated
D7440	Excision of malignant tumor - lesion diameter up to 1.25 cm
D7441	Excision of malignant tumor - lesion diameter greater than 1.25 cm
D7450	Removal of benign odontogenic cyst or tumor - lesion diameter up to 1.25 cm
D7451	Removal of benign odontogenic cyst or tumor - lesion diameter greater than 1.25 cm
D7460	Removal of benign nonodontogenic cyst or tumor - lesion diameter up to 1.25 cm
D7461	Removal of benign nonodontogenic cyst or tumor - lesion diameter greater than 1.25 cm
D7465	Destruction of lesion(s) by physical or chemical method, by report
D7471	Removal of lateral exostosis (maxilla or mandible)
D7472	Removal of torus palatinus
D7473	Removal of torus mandibularis
D7485	Reduction of osseous tuberosity
D7510	Incision and drainage of abscess - intraoral soft tissue
D7511	Incision and drainage of abscess - intraoral soft tissue - complicated (includes drainage of multiple fascial spaces)
D7520	Incision and drainage of abscess - extraoral soft tissue
D7521	Incision and drainage of abscess - extraoral soft tissue - complicated (includes drainage of multiple fascial spaces)
D7530	Removal of foreign body from mucosa, skin, or subcutaneous alveolar tissue
D7540	Removal of reaction producing foreign bodies
D7550	Partial ostectomy/sequestrectomy for removal of non-vital bone
D7560	Maxillary sinusotomy for removal of tooth fragment or foreign body
D7922	Placement of intra-socket biological dressing to aid in hemostasis or clot stabilization, per site
Adjunctive General Services	
D9120	Fixed partial denture sectioning
D9613	Infiltration of sustained release therapeutic drug – single or multiple sites
D9910	Application of desensitizing medicament
D9911	Application of desensitizing resin for cervical and/or root surface, per tooth
D9970	Enamel microabrasion
D9971	odontoplasty - per tooth

CDT® is a registered trademark of the American Dental Association

Description of Services

These guidelines encourage dental care at the appropriate site of service, based on individual member selection. This allows dentists to provide comprehensive dental care for members that cannot be safely treated in the dental office.

Benefit Considerations

These prior authorization requirements apply to Healthplex Comprehensive and Limited plans that require services to be Necessary, including being cost-effective. Refer to the member specific benefit plan document to determine if necessity applies.

References

American Dental Association (ADA) CDT Codebook 2024.

American Academy of Pediatric Dentistry Clinical Affairs Committee – Behavior Management Subcommittee. Guideline on Behavior Guidance for the Pediatric Dental Patient. 2015.

American Academy of Pediatric Dentistry Council on Clinical Affairs. Policy on Hospitalization and Operating Room Access for Oral Care of Infants, Children, Adolescents, and Individuals with Special Health Care Needs. 2015.

American Academy of Pediatric Dentistry Council on Clinical Affairs. Policy on Third-party Reimbursement of Medical Fees Related to Sedation/General Anesthesia for Delivery of Oral Health Services. 2016.

American Society of Anesthesiologists. Statement on Sedation & Anesthesia Administration in Dental Office-Based Settings. 2017.

Munhoz, Etiene. Dental Management of Special Needs Patients: A Literature Review. Global Journal of Oral Science. 2. 10.21616/2414-2050.2016.02.6.

Stigers JI. Nonpharmacologic Management of Children's Behaviors. McDonald and Avery's Dentistry for the Child and Adolescent. 10th ed. Maryland Heights, Mo: Mosby-Elsevier; 2016. Chapter 16; p286-302.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Dental Implant Placement and Treatment of Peri-Implant Defects/Disease

Guideline Number: DCG007.13

Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
63. Coverage Rationale	117
64. Definitions	118
65. Applicable Codes	118
66. Description of Services	119
67. References	119
68. Guideline History/Revision Information	120
69. Instructions for Use	120

Related Dental Policies
<ul style="list-style-type: none"> • Dental Barrier Membrane Guided Tissue Regeneration • Non-Surgical Periodontal Therapy • Surgical Endodontics • Surgical Periodontics: Mucogingival Procedures • Surgical Extraction of Erupted Teeth and Retained Roots

Coverage Rationale

The success of implants and related prostheses is highly dependent on site and individual patient selection.

Guidelines for [Dental Implant](#) placement:

- May be placed at time of extraction
- Implant site is free of infection
- Implant must be a minimum of 1.5 -2 mm from adjacent tooth roots

Individual factors to consider when treatment planning for implants:

- Patient is able and/or willing to actively participate (e.g., proper oral hygiene, routine dental care)
 - Occlusal load
 - Bone quality/quantity
 - History of or active periodontal disease
 - Adequate space exists to appropriately restore the implant
 - Patient age
 - The presence of conditions/treatment that may interfere with the normal healing response. Conditions include, but are not limited to:
 - Chemotherapy
 - Radiation therapy to the head and neck
 - Uncontrolled diabetes and hypertension
 - Recent heart attack or stroke
 - Anticoagulant therapy
 - Blood dyscrasias
 - IV bisphosphonate therapy
 - Estrogen deficiency
 - Significant psychiatric disorder or impairment
 - Intellectual disability
 - Lifestyle risk factors:
 - Smoking
 - Drug addiction
 - Alcoholism

Treatment of [Peri-Implant Defects/Disease](#) includes:

- Non-surgical periodontal therapy
- Surgical treatment including flap and closure that may include osseous contouring

Treatment of Peri-Implant Defects/Disease is not indicated if an implant is mobile.

Definitions

Dental Implant: A device specially designed to be placed surgically within or on the mandibular or maxillary bone as a means of providing for dental replacement prosthesis. (ADA)

Peri-Implant Defects/Disease: Inflammatory conditions affecting the soft and hard tissues around Dental Implants (AAP). Peri-Implant diseases are classified into two categories:

- Peri-Implant Mucositis: Inflammation is found only around the soft tissues.
- Peri-Implantitis: Inflammation is found around the soft tissue and there is deterioration in the bone supporting the Dental Implant.

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D6010	Surgical placement of implant body: endosteal implant
D6011	Surgical access to an implant body (second stage implant surgery)
D6012	Surgical placement of interim implant body for transitional prosthesis: endosteal implant
D6013	Surgical placement of mini-implant
D6040	Surgical placement: eposteal implant
D6050	Surgical placement: transosteal implant
D6051	Placement of interim implant abutment
D6080	Implant maintenance procedures when a full arch fixed hybrid prosthesis is removed and reinserted, including cleansing of prosthesis and abutments
D6081	Scaling and debridement of a single implant in the presence of mucositis, including inflammation, bleeding upon probing and increased pocket depths; includes cleaning of the implant surfaces, without flap entry and closure
D6089	Accessing and retorquing loose implant screw - per screw
D6100	Surgical Removal of implant body
D6101	Debridement of a peri-implant defect or defects surrounding a single implant, and surface cleaning of the exposed implant surfaces, including flap entry and closure
D6102	Debridement and osseous contouring of a peri-implant defect or defects surrounding a single implant and includes surface cleaning of the exposed implant surfaces, including flap entry and closure
D6103	Bone graft for repair of peri-implant defect – does not include flap entry and closure
D6104	Bone graft at time of implant placement
D6105	Removal of implant body not requiring bone removal or flap elevation
D6106	Guided tissue regeneration - resorbable barrier, per implant
D6107	Guided tissue regeneration - non-resorbable barrier, per implant
D6190	Radiographic/surgical implant index, by report
D6193	Replacement of an implant screw

CDT Code	Description
D6199	Unspecified implant procedure, by report

CDT® is a registered trademark of the American Dental Association

Description of Services

A Dental Implant is a titanium alloy prosthesis that replaces the roots of teeth lost due to injury or disease. Once integrated into bone (osseointegration), implants are restored with a crown for individual teeth, or as a retainer tooth for an implant supported bridge. Implants may also be used to prevent resorption of existing bone or aid in retention for full and partial removable dentures.

Peri-Implant disease can occur around implants in the same way as natural teeth, and prevention includes daily removal of plaque by brushing and flossing, as well as routine monitoring as part of preventive dental care. Risk factors include a history of periodontal disease, smoking, poor plaque control and diabetes, as well as individual patient considerations.

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

References

- ADA Code on Dental Procedures and Nomenclature (CDT). Glossary of Dental Clinical and Administrative Terms.
- Alfadda SA, Chvartzaid D, AlFarraj Aldosari A. Clinical outcomes of immediately loaded implant-supported overdentures: A long-term prospective clinical trial. *J Prosthet Dent.* 2019 Jun;121(6):911-915.
- American Academy of Periodontology Academy Report: Peri-Implant Mucositis and Peri-Implantitis: A Current Understanding of Their Diagnoses and Clinical Implications. <https://aap.onlinelibrary.wiley.com/doi/10.1902/jop.2013.134001>. Accessed August 20, 2024.
- American Academy of Periodontology (AAP). Peri-Implant Diseases. 2022.
- American Academy of Periodontology (AAP). Position Paper: Dental Implants in Periodontal Therapy (2000).
- American Academy of Periodontology (AAP). Position Paper: Guideline for Periodontal Therapy (2003).
- American Dental Association (ADA) CDT 2025 Dental Procedure Code Book.
- Chrcanovic B.R., Albrektsson T., Wennerberg A. Smoking and dental implants: A systematic review and meta-analysis. *J Dent.* 2015 May; 43(5):487-98.
- Chrcanovic BR, Albrektsson T, Wennerberg A. Diabetes and oral implant failure: a systematic review. *J Dent Res.* 2014 Sep;93(9):859-67.
- Esposito M., Grusovin M.G., Maghaireh H., et al. Interventions for replacing missing teeth: different times for loading dental implants. *Cochrane Database Syst Rev.* 2013 Mar 28; 3:CD003878.
- Esposito M.A., Koukouloupoulou A., Coulthard P., et al. Interventions for replacing missing teeth: Dental implants in fresh extraction sockets (immediate, immediate-delayed and delayed implants). *Cochrane Database Syst Rev.* 2006 Oct 18;(4):CD005968.
- Hwang D., Wang H.L. Medical contraindications to implant therapy: part I: absolute contraindications. *Implant Dent.* 2006 Dec; 15(4):353-60.
- Hwang D., Wang H.L. Medical contraindications to implant therapy: part II: relative contraindications. *Implant Dent.* 2007 Mar; 16(1):13-23.
- Jung R.E., Zembic A., Pjetursson B.E., et al. Systematic review of the survival rate and the incidence of biological, technical, and aesthetic complications of single crowns on implants reported in longitudinal studies with a mean follow-up of 5 years. *Clin Oral Implants Res.* 2012 Oct;23 Suppl 6:2-21.
- Kim HS, Cho HA, Kim YY, Shin H. Implant survival and patient satisfaction in completely edentulous patients with immediate placement of implants: a retrospective study. *BMC Oral Health.* 2018 Dec 18;18(1):219.
- Mumcu E, Dayan SÇ. Effect of Smoking and Locations of Dental Implants on Peri-Implant Parameters: 3-Year Follow-Up. *Med Sci Monit.* 2019 Aug 15;25:6104-6109.
- Ortega-Martínez J., Pérez-Pascual T., Mareque-Bueno S., et al. Immediate implants following tooth extraction. A systematic review. *Med Oral Patol Oral Cir Bucal.* 2012 Mar 1; 17(2):e251-61.

Romanos GE, Delgado-Ruiz R, Sculean A. Concepts for prevention of complications in implant therapy. *Periodontol* 2000. 2019 Oct;81(1):7-17.

Reichart PA, Schmidt-Westhausen AM, Khongkhunthian P, et al. Dental implants in patients with oral mucosal diseases- a systematic review. *J Oral Rehabil*. 2016 May;43(5):388-99.

Sanda M, Fueki K, Bari PR, et al. Comparison of immediate and conventional loading protocols with respect to marginal bone loss around implants supporting mandibular overdentures: A systematic review and meta-analysis. *Jpn Dent Sci Rev*. 2019 Nov;55(1):20-25.

Schropp L, Isidor F. Timing of implant placement relative to tooth extraction. *J Oral Rehabil*. 2008 Jan;35 Suppl 1:33-43.

Seigneur M, Hascoët E, Chaux AG, et al. Characteristics and management of dental implants displaced into the maxillary sinus: a systematic review. *Int J Oral Maxillofac Surg*. 2022 Jun 28:S0901-5027(22)00272-7.

Sommer M, Zimmermann J, Grize L, Stübinger S. Marginal bone loss one year after implantation: a systematic review of different loading protocols. *Int J Oral Maxillofac Surg*. 2019 Jun 26. pii: S0901-5027(19)31169-5.

Smith Nobrega A, Santiago JF Jr, de Faria Almeida DA, et al. Irradiated patients and survival rate of dental implants: A systematic review and meta-analysis. *J Prosthet Dent*. 2016 Dec;116(6):858-866.

Strietzel F.P., Reichart P.A., Kale A., et al. Smoking interferes with the prognosis of dental implant treatment: a systematic review and meta-analysis. *J Clin Periodontol*. 2007 Jun; 34(6):523-44.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.

Dental Implant Supported Prosthesis

Guideline Number: DCG046.03

Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
70. Coverage Rationale	121
71. Definitions	121
72. Applicable Codes	121
73. Description of Services	123
74. References	123
75. Guideline History/Revision Information	124
76. Instructions for Use	124

Related Dental Policy

- Dental Implant Placement and Treatment of Peri-Implant Defects/Disease

Coverage Rationale

Guidelines for Implant Supported Prosthesis

- The implant is fully [Osseointegrated](#)
- The implant body to crown ratio is appropriate for the site and anticipated occlusal load, not to exceed 2:1
- There is no evidence of infection
- The implant is not mobile

Fixed Prosthesis

- [Cantilever](#) construction should be avoided in posterior areas
- Combined implant and tooth supported prostheses may be appropriate following individual case consideration

Removable Prosthesis

- Implant may be used for support or retention

Complete Dentures (Implant Assisted or Implant Supported)

- Two or four implants provide greater stability and security when the maxillary ridge is severely resorbed and lacks resistance to lateral forces
- If the A-P spread is inadequate to provide support, a full-palatal-coverage overlay denture is recommended

Definitions

Cantilever Fixed Dental Prosthesis: A Fixed complete or partial denture in which the Pontic is cantilevered, (i.e., is retained and supported only on one end by one or more Abutments). (AP)

Osseointegration: The firm anchoring of a surgical implant by the growth of bone around it without fibrous tissue formation at the interface. (Merriam-Webster)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document

and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D6051	Placement of interim implant abutment
D6055	Connecting bar – implant supported or abutment supported
D6056	Prefabricated abutment – includes modification and placement
D6057	Custom fabricated abutment – includes placement
D6058	Abutment supported porcelain/ceramic crown
D6059	Abutment supported porcelain fused to metal crown (high noble metal)
D6060	Abutment supported porcelain fused to metal crown (predominantly base metal)
D6061	Abutment supported porcelain fused to metal crown (noble metal)
D6062	Abutment supported cast metal crown (high noble metal)
D6063	Abutment supported cast metal crown (predominantly base metal)
D6064	Abutment supported cast metal crown (noble metal)
D6065	Implant supported porcelain/ceramic crown
D6066	Implant supported porcelain fused to high noble alloys
D6067	Implant supported crown high noble alloys
D6068	Abutment supported retainer for porcelain/ceramic FPD
D6069	Abutment supported retainer for porcelain fused to metal FPD (high noble metal)
D6070	Abutment supported retainer for porcelain fused to metal FPD (predominantly base metal)
D6071	Abutment supported retainer for porcelain fused to metal FPD (noble metal)
D6072	Abutment supported retainer for cast metal FPD (high noble metal)
D6073	Abutment supported retainer for cast metal FPD (predominantly base metal)
D6074	Abutment supported retainer for cast metal FPD (noble metal)
D6075	Implant supported retainer for ceramic FPD
D6076	Implant supported retainer for FPD – porcelain fused to high noble alloys
D6077	Implant supported retainer for metal FPD - high noble alloys
D6080	Implant maintenance procedures when a full arch fixed hybrid prosthesis is removed and reinserted, including cleansing of prosthesis and abutments
D6082	implant supported crown – porcelain fused to predominantly base alloys
D6083	implant supported crown – porcelain fused to noble alloys
D6084	implant supported crown – porcelain fused to titanium and titanium alloys
D6085	Interim implant crown
D6086	Implant supported crown – predominantly base alloys
D6087	Implant supported crown – noble alloys
D6088	Implant supported crown – titanium and titanium alloys
D6090	Repair of implant/abutment supported prosthesis
D6091	Replacement of replaceable part of semi-precision or precision attachment of implant/abutment supported prosthesis, per attachment
D6092	Re-cement or re-bond implant/abutment supported crown
D6093	Re-cement or re-bond implant/abutment supported fixed partial denture
D6094	Abutment supported crown – titanium and titanium alloys
D6096	Remove broken implant retaining screw
D6097	Abutment supported crown – porcelain fused to titanium and titanium alloys
D6098	Implant supported retainer – porcelain fused to predominantly base alloys
D6099	Implant supported retainer for FPD – porcelain fused to noble alloys

CDT Code	Description
D6110	Implant/abutment supported removable denture for edentulous arch – maxillary
D6111	Implant/abutment supported removable denture for edentulous arch – mandibular
D6112	Implant/abutment supported removable denture for partially edentulous arch – maxillary
D6113	Implant/abutment supported removable denture for partially edentulous arch – mandibular
D6114	Implant/abutment supported fixed denture for edentulous arch – maxillary
D6115	Implant/abutment supported fixed denture for edentulous arch – mandibular
D6116	Implant/abutment supported fixed denture for partially edentulous arch – maxillary
D6117	Implant/abutment supported fixed denture for partially edentulous arch – mandibular
D6118	Implant/abutment supported interim fixed denture for edentulous arch – mandibular
D6119	Implant/abutment supported interim fixed denture for edentulous arch – maxillary
D6120	Implant supported retainer – porcelain fused to titanium and titanium alloys
D6121	Implant supported retainer for metal FPD – predominantly base alloys
D6122	Implant supported retainer for metal FPD – noble alloys
D6123	Implant supported retainer for metal FPD – titanium and titanium alloys
D6180	Implant maintenance procedures when a full arch fixed hybrid prosthesis is not removed, including cleansing of prosthesis and abutments
D6190	Radiographic/surgical implant index, by report
D6191	Semi-precision abutment – placement
D6192	Semi-precision attachment – placement
D6194	Abutment supported retainer crown for FPD – titanium and titanium alloys
D6195	Abutment supported retainer – porcelain fused to titanium and titanium alloys
D6197	Replacement of restorative material used to close an access opening of a screw-retained implant supported prosthesis, per implant
D6198	Remove interim implant component
D6199	Unspecified implant procedure, by report

CDT® is a registered trademark of the American Dental Association

Description of Services

Once integrated into bone (Osseointegration), implants are restored with a crown for individual teeth, or as a retainer tooth for an implant supported bridge. Implants may also be used to prevent resorption of existing bone or aid in retention for full and partial removable dentures. There is some controversy regarding connecting natural teeth to implants with fixed prostheses. During function, the natural tooth has slight movement due to the presence of the periodontal ligament, while the implant is completely integrated with bone, lacks a ligament, and does not move. This can create stress at the neck of the implant resulting in possible fracture, breakdown of Osseointegration and loosening of the implant and its components. This type of restoration may be the best option in some situations and the decision should be made based on individual patient needs (Al-Omiri).

References

Al-Omiri MK, Al-Masri M, Alhijawi MM, Lynch E. Combined Implant and Tooth Support: An Up-to-Date Comprehensive Overview. *Int J Dent*. 2017;2017:6024565.

Academy of Prosthodontists (AP). *The Glossary of Prosthodontic Terms*. Ninth Edition. 2017.

Blanes RJ: To what extent does the crown-implant ratio affect the survival and complications of implant-supported reconstructions? A systematic review. *Clin Oral Impl Re* 20:67-72, 2009.

Carr A, Brown D. *McCracken's Removable Partial Prosthodontics*, 13th ed. St. Louis: Elsevier c2016 Chapter 12, Considerations for the Use of Dental Implants with Removable Partial Dentures; p.146-153.

Meijer HJA, Boven C, Delli K, et al. Is there an effect of crown-to-implant ratio on implant treatment outcomes? A systematic review. *Clin Oral Implants Res*. 2018 Oct;29 Suppl 18:243-252.

“Osseointegration” *Merriam-Webster.com Medical Dictionary*, Merriam-Webster, <https://www.merriam-webster.com/medical/osseointegration>. Accessed October 3, 2024.

Schoenbaum T, Chung E, Chang T. Newman and Carranza's Clinical Periodontology, 13th ed. St. Louis: Elsevier c2019 Chapter 77, Prosthetic Considerations for Implant treatment; p.769-783.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Fixed Prosthodontics

Guideline Number: DCG017.11
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
77. Coverage Rationale	125
78. Definitions	126
79. Applicable Codes	126
80. Description of Services	128
81. References	128
82. Guideline History/Revision Information	129
83. Instructions for Use	129

Related Dental Policy

- Removable Prosthodontics

Coverage Rationale

Fixed Partial Dentures (FPD)

Fixed partial dentures may be indicated for the following:

- Replacement of missing permanent teeth in which the [Retainer/Abutment](#) teeth have a favorable long-term prognosis
- Replacement of one to two missing teeth in a [Tooth Bounded Space](#)

In addition to the above, the following applies:

- [Resin Bonded Appliances](#) (e.g., Maryland Bridge) are indicated for the replacement of one missing tooth and unrestored/undamaged Retainer/Abutment teeth

Fixed partial dentures are not indicated for the following:

- Members with rampant caries and/or poor oral hygiene
- When Retainer/Abutment teeth have untreated endodontic pathology or periodontal disease or an unfavorable crown root ratio
- When teeth intended as Retainers/Abutments have inadequate remaining tooth structure
- When a tooth to be used as a Retainer/Abutment has tipped or drifted into edentulous space
- Cantilever and Resin Bonded fixed partial dentures are not indicated for the following:
 - In an area with malocclusion, heavy occlusion, or parafunctional habits (e.g., nail biting, bruxism, clenching)
- A [Pontic](#) width discrepancy
- Additionally, Resin Bonded appliances are not indicated in the following situations:
 - Compromised enamel
 - Deep vertical overlap

Provisional Fixed Partial Dentures

Provisional fixed partial dentures may be indicated for the following:

- When a permanent fixed partial denture does not have a favorable long-term prognosis
- To replace a lost tooth in members with a [Mixed Dentition](#) to allow maturity of the dentition and jaws before constructing a definitive fixed prosthetic appliance
- When a systemic medical condition prohibits the placement of a definitive fixed prosthetic appliance

Fixed Partial Denture Repair (Necessitated by Restorative Material Failure)

Fixed partial denture repair may be indicated when the appliance to be repaired is functional and has a favorable long-term prognosis.

Precision Attachments

Precision Attachments may be indicated for the following:

- When aesthetics need to be considered
- For the redistribution of occlusal forces
- To minimize trauma to soft tissue
- Control of loading and rotational forces
- When it is not possible to prepare two Retainers/Abutments with a common path of placement

Connector Bar

Connector Bars may be indicated to brace individual Retainer/Abutment teeth with considerable coronal length for enhanced stabilization of removable partial dentures, complete dentures, and overdentures.

Stress Breaker (A Non-Rigid Connector)

Stress Breakers may be indicated for the following:

- When it is not possible to prepare two Retainers/Abutments with a common path of placement
- When the prognosis of a Retainer/Abutment is uncertain
- Control of loading and rotational forces
- Redistribution of occlusal forces

Definitions

Abutment: That part of a structure that directly receives thrust or pressure; an anchorage 2: a tooth, a portion of a tooth, or that portion of a dental implant that serves to support and/or retain prosthesis. (AP)

Cantilever Fixed Dental Prosthesis: A fixed complete or partial denture in which the Pontic is cantilevered, (i.e., is retained and supported only on one end by one or more Abutments). (AP)

Connector Bar: A device attached to fixed partial denture retainer or coping which serves to stabilize and anchor a removable overdenture prosthesis. (ADA)

Fixed Dental Prosthesis: The general term for any prosthesis that is securely fixed to a natural tooth or teeth, or to one or more dental implants/implant Abutments; it cannot be removed by the patient. (AP)

Mixed Dentition: From approximately age 6 to 13 when primary and permanent teeth are present in the Mouth (AAPD).

Pontic: An artificial tooth on a Fixed Dental Prosthesis that replaces a missing natural tooth, restores its function, and usually fills the space previously occupied by the clinical crown. (AP)

Precision Attachment: An interlocking device, one component of which is fixed to an Abutment or Abutments, and the other is integrated into a removable dental prosthesis in order to stabilize and/or retain it. (AP)

Resin-Bonded Prosthesis (e.g., Maryland Bridge): A Fixed Dental Prosthesis that is luted to tooth structures, primarily enamel, which has been etched to provide mechanical retention for the resin cement. (AP)

Retainers: Any type of device used for the stabilization or retention of prosthesis. (AP)

Stress Breaker: The part of a tooth-borne and/or tissue-borne prosthesis designed to relieve the Abutment teeth and their supporting tissues from harmful stresses. (ADA)

Tooth Bounded Space: A space created by one or more missing teeth that has a tooth on each side. (ADA)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document

and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D6205	Pontic – indirect resin-based composite
D6210	Pontic – cast high noble metal
D6211	Pontic – cast predominantly base metal
D6212	Pontic – cast noble metal
D6214	Pontic – titanium and titanium alloys
D6240	Pontic – porcelain fused to high noble metal
D6241	Pontic – porcelain fused to predominantly
D6242	Pontic – porcelain fused to noble metal
D6243	Pontic – porcelain fused to titanium and titanium alloys
D6245	Pontic – porcelain/ceramic
D6250	Pontic – resin with high noble metal
D6251	Pontic – resin with predominantly base metal
D6252	Pontic – resin with noble metal
D6253	Interim pontic- further treatment or completion of diagnosis necessary prior to final impression
D6545	Retainer – cast metal for resin bonded fixed prosthesis
D6548	Retainer – porcelain/ceramic for resin bonded fixed prosthesis
D6549	Resin retainer – for resin bonded fixed prosthesis
D6600	Retainer inlay – porcelain/ceramic, two surfaces
D6601	Retainer inlay – porcelain/ceramic, three or more surfaces
D6602	Retainer inlay – cast high noble metal, two surfaces
D6603	Retainer inlay – cast high noble metal, three or more surfaces
D6604	Retainer inlay – cast predominantly base metal, two surfaces
D6605	Retainer inlay – cast predominantly base metal, three or more surfaces
D6606	Retainer inlay – cast noble metal, two surfaces
D6607	Retainer inlay – cast noble metal, three or more surfaces
D6608	Retainer onlay – porcelain/ceramic, two surfaces
D6609	Retainer onlay – porcelain/ceramic, three or more surfaces
D6610	Retainer onlay – cast high noble metal, two surfaces
D6611	Retainer onlay – cast high noble metal, three or more surfaces
D6612	Retainer onlay – cast predominantly base metal, two surfaces
D6613	Retainer onlay – cast predominantly base metal, three or more surfaces
D6614	Retainer onlay – cast noble metal, two surfaces
D6615	Retainer onlay – cast noble metal, three or more surfaces
D6624	Retainer inlay – titanium
D6634	Retainer onlay – titanium
D6710	Retainer crown – indirect resin-based composite
D6720	Retainer crown – resin with high noble metal
D6721	Retainer crown – resin with predominantly base metal
D6722	Retainer crown – resin with noble metal
D6740	Retainer crown – porcelain/ceramic
D6750	Retainer crown – porcelain fused to high noble metal
D6751	Retainer crown – porcelain fused to predominantly base metal
D6752	Retainer crown – porcelain fused to noble metal

CDT Code	Description
D6753	Retainer crown – porcelain fused to titanium and titanium alloys
D6780	Retainer crown – 3/4 cast high noble metal
D6781	Retainer crown – 3/4 cast predominantly base metal
D6782	Retainer crown – 3/4 cast noble metal
D6783	Retainer crown – 3/4 porcelain/ceramic
D6784	Retainer crown – 3/4 titanium and titanium alloys
D6790	Retainer crown – full cast high noble metal
D6791	Retainer crown – full cast predominantly base metal
D6792	Retainer crown – full cast noble metal
D6793	Interim retainer crown- further treatment or completion of diagnosis necessary prior to final impression
D6794	Retainer crown – titanium and titanium alloys
D6920	Connector bar
D6930	Re-cement or re-bond fixed partial denture
D6940	Stress breaker
D6950	Precision attachment
D6980	Fixed partial denture repair necessitated by restorative material failure
D6985	Pediatric partial denture, fixed
D6999	Unspecified fixed prosthodontic procedure, by report

CDT® is a registered trademark of the American Dental Association

Description of Services

Fixed prosthodontics is the area of restorative dentistry that involves the replacement of missing teeth with custom made restorations that are permanently cemented and not removable. The term “fixed partial denture” is synonymous with “fixed bridge” or “bridgework.” The restoration used to replace a missing tooth is called a Pontic and the restorations placed on teeth on either side of it are called retainer restorations or Abutments and are typically an onlay or a crown. There is some controversy regarding connecting natural teeth to implants with fixed prostheses. During function, the natural tooth has slight movement due to the presence of the periodontal ligament, while the implant is completely osseointegrated and does not move. This can create stress at the neck of the implant result in possible fracture, breakdown of osseointegration, and loosening of the implant and its components (Yilmaz). This type of restoration may be the best option in some situations and the decision should be made based on individual patient needs. (Al-Omiri). Cantilever and Resin Bonded bridges consist of a Pontic that is bonded to an adjacent teeth/tooth that have not been restored with an indirect restoration.

References

Academy of Prosthodontists The Glossary of Prosthodontic Terms. Ninth Edition.

Alenezi A, Aloqayli S. Technical complications with tooth-supported fixed dental prostheses (FDPs) of different span lengths: an up to 15-year retrospective study. BMC Oral Health. 2023 Jun 15;23(1):393.

Al-Omiri MK, Al-Masri M, Alhijawi MM, et al. Combined Implant and Tooth Support: An Up-to-Date Comprehensive Overview. Int J Dent. 2017;2017.

American Academy of Pediatric Dentistry (AAPD). Management of the Developing Dentition and Occlusion in Pediatric Dentistry. 2021.

American College of Prosthodontists (ACP). Parameters of Care for the Specialty of Prosthodontics. Partial Edentulism Parameter. 2020., https://www.prosthodontics.org/assets/1/7/ACP_Parameters_of_Care_2020.pdf. Accessed October 2, 2024.

American Dental Association (ADA) CDT Codebook 2024.

American Dental Association (ADA) Glossary of Clinical and Administrative Terms.

Heyman H. Sturdevant's Art and Science of Operative Dentistry, 6th ed. St. Louis: Mosby c2013. Online Chapter 21, Bonded Splints and Bridges; p.e148.

Nesbit S, Kanjirath P, Stefanac S. Diagnosis and Treatment Planning in Dentistry, 4th ed. St. Louis: Elsevier c2024. Chapter 11, The Definitive Phase of Treatment; p.246-288.

Rosenstiel S, Land M, Fujimoto J. Contemporary Fixed Prosthodontics, 5th ed. St. Louis: Mosby c2016. Part 1: Planning and Preparation, Chapter 3 Treatment Planning; p.77-85.

Thompson V. Contemporary Fixed Prosthodontics, 5th ed. St. Louis: Mosby c2016. Part III: Laboratory Procedures, Chapter 26 Resin Bonded Fixed Dental Prostheses; p.694-702.

Yilmaz B, McGlumphy E. Contemporary Fixed Prosthodontics, 5th ed. St. Louis: Mosby c2016. Chapter 13, Implant Supported Fixed Prostheses; Connecting Implants to Natural Teeth; p359.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Full Mouth Debridement

Guideline Number: DCG001.11
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
84. Coverage Rationale	130
85. Definitions	130
86. Applicable Codes	130
87. Description of Services	130
88. References	131
89. Guideline History/Revision Information	131
90. Instructions for Use	131

Related Dental Policy

- Non-Surgical Periodontal Therapy

Coverage Rationale

Full mouth **Debridement** is indicated when, due to the amount of calculus, plaque, and debris, a comprehensive periodontal examination is not possible.

Definitions

Debridement: Removal of subgingival and/or supragingival plaque and calculus which obstructs the ability to perform an evaluation.

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D4355	Full mouth debridement to enable a comprehensive periodontal evaluation and diagnosis on a subsequent visit

CDT® is a registered trademark of the American Dental Association

Description of Services

Full mouth Debridement is a dental procedure that is indicated when the amount of deposits present is extensive and prevents a complete periodontal examination and diagnosis. The need for this procedure is typically seen in patients who have not received dental care in many years, have difficulty performing daily oral care, or for medical reasons. It is not considered therapeutic or preventive, and must be followed by definitive procedures such as prophylaxis or scaling and root planing.

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

References

American Dental Association (ADA); CDT 2024 Dental Procedure Code Book.

American Dental Association Glossary of Dental Clinical and Administrative Terms.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

General Anesthesia and Conscious Sedation Services

Guideline Number: DCG016.15
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
91. Coverage Rationale	132
92. Definitions	133
93. Applicable Codes	133
94. Description of Services	134
95. References	135
96. Guideline History/Revision Information	136
97. Instructions for Use	136

Related Dental Policies
None

Coverage Rationale

Note: This policy applies to services provided in a dental office. For anesthesia services provided in a hospital operating room or ambulatory surgery center; refer to the member specific benefit plan document and any applicable federal or state mandates.

Nitrous Oxide

Nitrous oxide may be indicated for the following:

- Extensive and/or complex procedures (e.g., serial extractions, periodontal surgeries)
- Individuals with physical, cognitive, or developmental disabilities
- Ineffective [Local Anesthesia](#)
- Management of a severe gag reflex
- Management of fear and anxiety

Nitrous oxide may be contraindicated for the following (this list is not all-inclusive):

- Claustrophobia
- Pregnancy
- Severe underlying medical conditions (e.g., critical illnesses, cardiac disease, pulmonary hypertension)
- Significant personality and behavioral disorders
- Upper respiratory tract infections or other respiratory conditions

Nitrous oxide is an absolute contraindication for the following:

- Methylenetetrahydrofolate reductase (MTHFR) deficiency
- Pulmonary hypertension
- Severe Chronic Obstructive Pulmonary Disease (COPD)
- Treatment with bleomycin sulfate
- Vitamin B12 deficiency
- Within 3 months vitreoretinal surgery

Intravenous Moderate/Conscious Sedation and Deep Sedation/General Anesthesia

Intravenous [Moderate/Conscious Sedation](#) and [Deep Sedation/General Anesthesia](#) may be indicated for the following:

- Allergy or sensitivity to local anesthetic agents
- Extensive and/or complex procedures (e.g., serial extractions, periodontal surgeries)
- Anxiety and fear when other techniques have proven inadequate

- Behavioral management when other techniques have proven inadequate
- Individuals that are medically compromised or those with special needs
- Management of severe gag reflex if nitrous oxide is ineffective or not indicated
- Pain control when other techniques have proven inadequate

Non-Intravenous Conscious Sedation

Non-Intravenous Sedation may be indicated for the following situations:

- Individuals with physical, cognitive, or developmental disabilities
- Mild to moderate apprehension and anxiety

All types of sedation and General Anesthesia may be contraindicated if there is an increased risk of adverse outcomes or complications. These include but are not limited to:

- Abnormalities of the major organ systems
- Previous adverse experience with sedation/analgesia
- Drug allergies
- Current medications and potential drug interactions
- Tobacco, alcohol, or substance use or abuse
- Time and nature of last oral intake

Definitions

Deep Sedation: A drug-induced depression of consciousness during which patients cannot be easily aroused but respond purposefully following repeated or painful stimulation. The ability to independently maintain ventilatory function may be impaired. Patients may require assistance in maintaining a patent airway, and spontaneous ventilation may be inadequate. Cardiovascular function is usually maintained. (ASA)

General Anesthesia: A drug-induced loss of consciousness during which patients are not arousable, even by painful stimulation. The ability to independently maintain ventilator function is often impaired. Patients often require assistance in maintaining a patent airway, and positive pressure ventilation may be required because of depressed spontaneous ventilation or drug-induced depression of neuromuscular function. Cardiovascular function may be impaired. (ASA)

Local Anesthesia: The elimination of sensation, especially pain, in one part of the body by the topical application or regional injection of a drug. (ADA)

Moderate Sedation (“Conscious Sedation”): A drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation. No interventions are required to maintain a patent airway, and spontaneous ventilation is adequate. Cardiovascular function is usually maintained. (ASA)

Non-Intravenous Sedation: Sedation medications that are delivered through the oral, intranasal, or transmucosal routes. (Thomas, 2015)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D9210	Local anesthesia not in conjunction with operative or surgical procedures
D9211	Regional block anesthesia
D9212	Trigeminal division block anesthesia
D9215	Local anesthesia in conjunction with operative or surgical procedures
D9219	Evaluation for moderate sedation, deep sedation or general anesthesia

CDT Code	Description
D9222	Deep sedation/general anesthesia – first 15 minutes
D9223	Deep sedation/general anesthesia – each subsequent 15 minute increment
D9230	Inhalation of nitrous oxide/analgesia, anxiolysis
D9239	Intravenous moderate (conscious) sedation/anesthesia – first 15 minutes
D9243	Intravenous moderate (conscious) sedation/analgesia – each subsequent 15 minute increment
D9248	Non-intravenous conscious sedation

CDT® is a registered trademark of the American Dental Association

Description of Services

The administration of local anesthetic is common and used for most routine dental procedures. For some patients, various levels of sedation and/or anesthesia may be necessary to safely provide dental care. These procedures generally are safe when administered by trained, certified providers in the appropriate setting, but are not without risk. According to the American Dental Association (ADA), dentists must comply with their state laws, rules and/or regulations when providing sedation and anesthesia and follow the educational and training requirements for the level of sedation intended. The ADA maintains clinical guidelines and educational/training requirements for all levels of sedation and includes specific information for the following:

- Patient history and evaluation.
- Personnel and equipment requirements.
- Monitoring and documentation (including consciousness, oxygenation, ventilation, and circulation).
- Recovery and discharge.
- Emergency management.

This guideline can be found at: https://www.ada.org/-/media/project/ada-organization/ada/ada-org/files/resources/research/ada_sedation_use_guidelines.pdf?rev=313932b4f5eb49e491926d4feac00a14&hash=C7C55D7182C639197569D4ED8EDCDDF6. (Accessed June 20, 2024)

According to the American Academy of Pediatric Dentistry (AAPD), the sedation of children is different from the sedation of adults, and the in-office use of Deep Sedation or General Anesthesia may be appropriate on select pediatric dental patients administered in appropriately equipped and staffed facilities. The *Guideline for Monitoring and Management of Pediatric Patients Before, During, and After Sedation for Diagnostic and Therapeutic Procedures* addresses pediatric specific considerations and was developed in conjunction with the American Academy of Pediatrics (AAP). The AAPD guideline highlights the higher risks of adverse outcomes associated with sedation of pediatric patients and emphasizes the steps and actions needed to minimize the risks. This guideline can be found at:

https://www.aapd.org/globalassets/media/policies_guidelines/bp_monitoringsedation.pdf. (Accessed June 20, 2024)

Additionally, the following are some of the recommendations from the American Society of Anesthesiologists focusing on appropriate patient selection, quality anesthesia care and patient safety in the dental office:

- Pediatric patients and adults with major medical problems (ASA Physical Status III and above) are at higher risk of adverse events than other patients. For these high-risk patients and younger pediatric patients, ASA recommends evaluation by a primary care physician or physician anesthesiologist prior to scheduling a procedure.
- Prolonged and extensive procedures with longer periods of sedation and anesthesia care are of concern in the office-based setting and qualified anesthesia providers, in consultation with such patients, should consider more suitable facilities for the procedure.
- Personnel with training in advanced resuscitative techniques (e.g., ACLS, PALS) should be immediately available until all patients are discharged home. A designated individual, other than the individual performing the procedure, should be present to monitor the patient throughout procedures performed with sedation. During Deep Sedation and/or General Anesthesia, this individual should have no other responsibilities.
- At a minimum, all facilities should have a reliable source of oxygen, suction, resuscitation equipment and emergency drugs.
- Ensure there is a protocol for accessing emergency medical services, managing life-threatening complications, and maintaining emergency life support/rescue services.

This guideline can be found at: <https://www.asahq.org/standards-and-practice-parameters/statement-on-sedation--anesthesia-administration-in-dental-officebased-settings>. (Accessed June 20, 2024)

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

References

- American Academy of Pediatric Dentistry (AAPD). Policy on the Use of Deep Sedation and General Anesthesia in the Pediatric Dental Office. Revised 2017.
- American Academy of Pediatric Dentistry. Use of nitrous oxide for pediatric dental patients. The Reference Manual of Pediatric Dentistry. Chicago, Ill.: American Academy of Pediatric Dentistry; 2021:338-43.
- American Dental Association (ADA) CDT 2024 Dental Procedure Code Book.
- American Dental Association Glossary of Clinical and Administrative Terms.
- American Dental Association. Guidelines for the Use of Sedation and General Anesthesia by Dentists. 2016.
- American Society of Anesthesiologists (ASA) Task Force on Sedation and Analgesia by Non-Anesthesiologists. Practice guidelines for sedation and analgesia by non-anesthesiologists. *Anesthesiology*. 2002 Apr;96(4):1004-17.
- American Society of Anesthesiologists (ASA). Continuum of Depth of Sedation: Definition of General Anesthesia and Levels of Sedation/Analgesia. Amended October 2019.
- American Society of Anesthesiologists (ASA). Statement on Sedation & Anesthesia Administration in Dental Office-Based Settings. 2017. Amended October 2022.
- Cohen D, Diaz L, Balzer J. Chapter 17 – Anesthesia for Infants and Children. *Smith's Anesthesia for Infants and Children*. Ninth ed. Elsevier Inc., 2017; pp 328-348, e6.
- Collado V, Faulks D, Nicolas E, Hennequin M. Conscious sedation procedures using intravenous midazolam for dental care in patients with different cognitive profiles: A prospective study of effectiveness and safety. *Glogauer M, ed. PLoS ONE*. 2013;8(8):e71240.
- Coté CJ, Wilson S; American Academy of Pediatrics; American Academy of Pediatric Dentistry. Guidelines for monitoring and management of pediatric patients before, during, and after sedation for diagnostic and therapeutic procedures. *Pediatrics*. 2019 Jun;143(6):e20191000.
- de Nova-García MJ, Gallardo López NE, Martín Sanjuán C, et al. Criteria for selecting children with special needs for dental treatment under general anesthesia. *Med Oral Patol Oral Cir Bucal*. 2007 Nov 1;12(7):E496-503.
- Fleming P, Walker PO, Priest JR. Bleomycin therapy: a contra- indication to the use of nitrous oxide-oxygen psychosedation in the dental office. *Pediatric Dentistry*. 1988; 10(4):345–6.
- Knuf K, Maani CV. Nitrous Oxide. [Updated 2023 Aug 28]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK532922/#:~:text=Thus%20nitrous%20oxide%20is%20contraindicated,and%20some%20avoid%20its%20use>. Accessed June 20, 2024.
- Malamed, Stanley. Sedation: A Guide to Patient Management, Sixth Edition. St. Louis, MO: Elsevier c2018. Chapter 21, Intravenous Moderate Sedation: Rationale; p.279-284.
- Malamed, Stanley. Sedation: A Guide to Patient Management, Sixth Edition. St. Louis, MO: Elsevier c2018. Chapter 12, Inhalation Sedation: Rationale; p.180-89.
- Malamed, Stanley. Sedation: A Guide to Patient Management, Sixth Edition. St. Louis, MO: Elsevier c2018. Chapter 30, Fundamentals of General Anesthesia; p.407-15.
- Malamed, Stanley. Sedation: A Guide to Patient Management, Sixth Edition. St. Louis, MO: Elsevier c2018. Chapter 35, The Pediatric Patient; p.497-519.
- Mohan R, Asir VD, Shanmugapriyan, Ebenezer V, Dakir A, Balakrishnan, Jacob J. Nitrous oxide as a conscious sedative in minor oral surgical procedure. *J Pharm Bioallied Sci*. 2015 Apr;7(Suppl 1):S248-50.
- Schulte-Sasse U, Hess W, Tarnow J. Pulmonary vascular responses to nitrous oxide in patients with normal and high pulmonary vascular resistance. *Anesthesiology*. 1982;57(1):9-13.
- Southerland JH, Brown LR. Conscious Intravenous Sedation in Dentistry: A Review of Current Therapy. *Dent Clin North Am*. 2016 Apr;60(2):309-46.
- Steinberg BJ, Hilton IV, Iida H, Samelson R. Oral health and dental care during pregnancy. *Dent Clin North Am*. 2013 Apr;57(2):195-210.

Takkar D, Rao A, Shenoy R, et al. Evaluation of nitrous oxide inhalation sedation during inferior alveolar block administration in children aged 7-10 years: a randomized control trial. J Indian Soc Pedod Prev Dent. 2015 Jul-Sep;33(3):239-44.

The Royal College of Ophthalmologists. Ophthalmic Safety Alert. Do not use nitrous oxide when there is gas in an operated eye. December 18, 2018. <https://www.rcophth.ac.uk/news-views/ophthalmic-safety-alert-do-not-use-nitrous-oxide-when-there-is-gas-in-an-operated-eye/>. Accessed June 20, 2024.

Thomas A, Miller JL, Couloures K, et al. Non-intravenous sedatives, and analgesics for procedural sedation for imaging procedures in pediatric patients. J Pediatr Pharmacol Ther. 2015 Nov-Dec;20(6):418-30.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Genetic Testing for Oral Disease

Policy Number: DCP036.09
Effective Date: January 1, 2025

[➔ Instructions for Use](#)

Table of Contents	Page
98. Coverage Rationale	137
99. Applicable Codes	137
100. Description of Services	137
101. Clinical Evidence	138
102. U.S. Food and Drug Administration	140
103. References	141
104. Policy History/Revision Information	141
105. Instructions for Use	141

Related Dental Policies

None

Coverage Rationale

Collection and Preparation of Genetic Sample Material for Laboratory Analysis and Report

The collection, preparation, and testing of genetic sample material, including oral Human Papillomavirus (HPV), is not indicated due to insufficient evidence of efficacy.

Genetic Test for Susceptibility to Diseases – Specimen Analysis

Genetic testing for susceptibility to oral disease, including oral HPV related cancer, is not indicated due to insufficient evidence of efficacy.

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D0422	Collection and preparation of genetic sample material for laboratory analysis and report
D0423	Genetic test for susceptibility to diseases – specimen analysis

CDT® is a registered trademark of the American Dental Association

Description of Services

Genetic testing is available for assessing the risk for developing diseases for a wide array of medical conditions. Periodontal disease and caries are both complex diseases, and individual patient behaviors, lifestyles, and overall health affect the risk of developing these oral diseases, regardless of the genetic profile and the clinical utility of these tests has not been established (ADA 2021). Chronic infection with high-risk HPV can cause cancer in parts of the body where HPV infects cells, including the oropharynx. Oropharyngeal cancer is now the most common cancer caused by HPV in the United States. Specific genotypes of HPV are considered independent risk factors for developing oral cancers, namely HPV16 and HPV18. Genetic tests specific for identifying these genotypes may help to establish risks for developing oral

cancer (NCI). It is unclear if having HPV alone is enough to cause oropharyngeal cancers, or if other factors (such as smoking or chewing tobacco) interact with HPV to cause these cancers. HPV is not known to cause other head and neck cancers, including those in the mouth, larynx, lip, nose, or salivary glands (CDC).

Clinical Evidence

Periodontal Disease

Al-Rawi et al. (2020) conducted a pilot study to validate 4 MicroRNAs (miRNAs) in saliva as potential predictive biomarkers of periodontal disease in patients with and without periodontal disease. The Human microRNA Disease Database (HMDD) and FANTOM5 (Functional ANnotation of the Mammalian genome) databases were searched and miRNA and disease associations and further filtered to include those specific to immune and epithelial cells specific to periodontal diseases and diabetes mellitus only. The resultant miRNA targeted genes were searched for the cell/tissue/organ specificity using Enricher gene list enrichment analysis tool, which identified four miRNAs (146a and b, 155, and 203) as promising biomarkers for periodontal diseases and diabetes. These are also enriched in immune related pathways and related to immune response. The authors concluded that evidence of these levels of salivary miRNAs could be considered biomarkers for periodontal disease progression in non diabetics, and diabetic related periodontitis. This study is limited by a small number of participants and a lack of randomization.

Fujimori et al. (2019) conducted a cross-sectional pilot study was to find salivary microRNAs (miRNAs) reflecting periodontal condition in chronic periodontitis. One hundred and twenty patients with chronic periodontitis participated and unstimulated whole saliva was collected. A multiphase study was conducted to explore salivary miRNAs as biomarkers of periodontitis. First, a polymerase chain reaction (PCR) array was performed to compare salivary miRNAs profiles in no and mild (no/mild) and severe periodontitis patients. Then, the relative expression of salivary miRNAs on individual samples was assessed by real-time reverse transcription-PCR. The numbers of patients were 26 (21.6%, no/mild), 58 (48.3%, moderate) and 36 (30.0%, severe), respectively. Among 84 miRNAs, only the relative expression of hsa-miR-381-3p in the severe periodontitis group was significantly higher than that of the no/mild periodontitis group ($p < 0.05$). Among the 120 patients, there was also a significant correlation between the relative expression of hsa-miR-381-3p and the mean probing pocket depth (PPD) ($r = 0.181$, $p < 0.05$). The authors concluded that the salivary hsa-miR-381-3p correlated with periodontitis in chronic periodontitis patients.

In a 2019 literature review, Toy et al. sought to clarify the possible role of genetic polymorphisms in periodontal diseases. The authors searched PubMed for studies published from 1997 to June 2018 and obtained data from original studies, meta analyses, and systematic reviews. They included only case-control studies with large study populations. Several genes with a possible relationship to periodontal disease were analyzed, and the authors concluded that gene polymorphisms may cause phenotypic differences in inflammatory response, which is important in the individual's sensitivity to disease, in the progression of disease, or in the response to treatment. The incidence of genetic polymorphisms may differ according to ethnicity, so a potential association between a genetic polymorphism and disease for a population may not be valid for others.

de Coo et al. (2018) conducted a systematic review to evaluate the various genotyping tools and study strategies employed to define genetic susceptibility to periodontitis. Following data base searches, 25 studies satisfied the established inclusion criteria and were processed for data extraction. The review revealed marked heterogeneity between studies, caused in part by the lack of a universally accepted definition for periodontitis phenotypes and by the variety of genotyping tools available. The most commonly used technique was genotyping candidate genes. The authors concluded that the few rigorous studies that have been published on genetic susceptibility to periodontitis are subject to severe methodological bias due to their design and the genotyping tools employed. Despite their limitations, candidate gene studies continue to be the predominant methodological approach, rather than genome-wide association studies. Further studies must be designed using a universally accepted, validated diagnostic criterion for periodontitis, analyzing multiple genes and polymorphisms in combination with rare variants. There is need for much more comprehensive studies including thousands of individuals to identify the effects of polymorphisms accurately with regard to statistical power. The findings demonstrate a possible association between the FcγRIIIb, IL1B, VDR, IL1RN, and TLR4 polymorphisms and aggressive periodontitis; and between the TLR4, IL6, IL1B, MMP1, IL10, VDR, CD14, and IL1RN polymorphisms and chronic periodontitis susceptibility in specific populations.

Diehl et al (2015) conducted a reanalysis of a large scale study that proposed to show that the PST and PerioPredict genetic tests that are based on polymorphisms in interleukin 1 (IL-1) genes identify a subset of patients who experience fewer tooth extractions if provided with 2 annual preventive visits (see reference directly below, Giannobile et al). Economic analyses indicate rationing preventive care to only "high-risk" genotypes, smokers, patients with diabetes, or combinations of these risk factors would reduce the cost of dental care by \$4.8 billion annually in the United States. The

data presented in the original study that claimed clinical utility for the PST and PerioPredict tests were obtained for reanalysis using logistic regression to assess whether the PST genetic test, smoking, diabetes, or number of preventive visits were risk factors for tooth extraction during a span of 16 years. Data in the original article on risk factors for tooth extraction and patient stratification were insufficient to perform an independent reanalysis. Specifically, patients who have diabetes and/or were smokers—2 well established risk factors for tooth loss—were pooled together within “high-risk groups” that also included patients who were classified as “high risk” based solely on their PST genotype test. Consequently, it was not possible to evaluate whether the PST genetic test itself had any effect on the clinical outcomes independent of smoking and/or diabetes. Consistency of risk classification by the PST (version 1) and PerioPredict (version 2) genetic tests was evaluated in different ethnic groups from the 1000 Genomes database. Multivariate analyses revealed association of tooth extraction with diabetes ($p < .0001$), smoking ($p < .0001$), and number of preventive visits ($p = .004$), but no support for the PST genetic test ($p = .96$) nor indication that the benefit of 2 preventive visits was affected by this genetic test ($p = .58$). Classification of risk was highly inconsistent between the PST (version 1) and PerioPredict (version 2) genetic tests. The authors concluded that this reanalysis indicates two annual preventive visits were supported as beneficial for all patients, and there was no evidence that the IL-1 PST genetic test has any effect on tooth extraction risk or influences the benefits of 2 annual preventive visits. Neither IL-1 PST nor PerioPredict genetic tests are useful for rationing preventive dental care. Further research is needed to identify genetic biomarkers with robust clinical validity and clinical utility to effectively personalize the practice of dentistry.

Yücel et al (2013). The immune mechanisms and genetic variations that regulate genetic expression, production and biological activity of IL-1beta, are thought to play an important role in the pathogenesis of periodontal disease. The aims of his controlled study were to analyze interleukin (IL)-1beta (+3954) genotype and allele frequency in both chronic and aggressive periodontitis patients, and also to investigate whether this polymorphism is associated with gingival crevicular fluid (GCF) IL-1beta levels, periodontal disease severity and clinical parameters in subjects of Turkish origin. A total of 147 individuals were enrolled in the study including 56 aggressive periodontitis (AP), 44 chronic periodontitis (CP) patients and 47 healthy controls (C). Single nucleotide polymorphism at IL-1beta (+3954) is analyzed by polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP). GCF samples were analyzed for IL-1beta, using enzyme linked immunosorbent assay (ELISA). The distributions of genotypes and allele frequencies for IL-1beta (+3954) were similar among the groups, in spite of a trend toward a higher frequency of allele 2 in the patient groups. The genotype distribution and allele frequencies were also not different after stratification of subjects according to the clinical attachment level (CAL < 4 mm and CAL > 4mm). No differences were found between the GCF IL-1beta levels of the different genotypes. Allele 2 was associated with increased bleeding on probing (BOP) sites in chronic periodontitis patients. The results of this study do not support that genetic polymorphism in the IL-1beta (+3954) could be identified as susceptibility or severity factor in aggressive periodontitis, in the present population. The association of allele 2 frequency and higher percentage of BOP sites in chronic periodontitis suggest that IL-1beta (+3954) potentially play a significant but not major role in the clinical outcome.

Human Papillomavirus (HPV)

The relationship between oropharyngeal cancer and HPV is well established, however there is a paucity of published evidence demonstrating that genetic testing for the risk of developing these cancers impacts potential disease management or clinical outcomes. Furthermore, there are no guidelines, clinical trials in progress or FDA approved genetic tests of oral HPV infection for oropharyngeal cancer risk.

D’Souza et al. (2017) conducted an analysis of the data from 13,089 people ages 20–69 years old who participated in National Health and Nutrition Examination Survey (NHANES) between 2009 and 2014 and had oral HPV DNA testing of exfoliated cells collected from an oral rinse and gargle sample using PCR amplification using PGMY 09/11 consensus primers and line blot for the detection of 37 specific HPV types. Also analyzed were data related to smoking history and number of oral sex partners. The purpose was to gain understanding of how common HPV16, oncogenic HPV and HPV oropharyngeal cancer (OPC) are in groups of people with different risk factor profiles. The results showed that the prevalence of oncogenic HPV was higher in men than women across all age groups (6% vs 1.1% respectively), and while oncogenic oral HPV is detected in 3.5% of all adults age 20–69, the lifetime risk of OPC is low (37 per 10,000). The authors concluded that with the increase in oropharyngeal cancer incidence, there is a need to identify those that might be at risk. Women across all categories of risk factors have low prevalence of infection and low risk of OPC and therefore benefits of screening are unlikely to outweigh harms in this group. Even among men, the majority do not have prevalent oncogenic oral HPV, and screening based upon oncogenic oral HPV infection will not be useful.

Professional Societies

College of American Pathologists (CAP)

In the 2017 evidence based clinical practice guidelines, the CAP make the following recommendations regarding HPV testing in head and neck carcinomas:

- Pathologists should perform high-risk human papillomavirus (HR-HPV) testing on all patients with newly diagnosed oropharyngeal squamous cell carcinoma (OPSCC), including all histologic subtypes (Strong Recommendation)
- For oropharyngeal tissue specimens (i.e., noncytology), pathologists should perform HR-HPV testing by surrogate marker p16 immunohistochemistry (IHC). Additional HPV-specific testing may be done at the discretion of the pathologist and/or treating clinician, or in the context of a clinical trial (Recommendation)
- Pathologists should not routinely perform HR-HPV testing on patients with nonsquamous carcinomas of the oropharynx (Expert Consensus)
- Pathologists should not routinely perform HR-HPV testing on patients with nonoropharyngeal primary tumors of the head and neck (Recommendation)
- Pathologists should routinely perform HR-HPV testing on patients with metastatic squamous cell carcinoma (SCC) of unknown primary in a cervical upper or mid jugular chain lymph node (Recommendation)
- Pathologists should not routinely perform low-risk HPV testing on patients with head and neck carcinomas

National Cancer Care Network (NCCN)

Tumor human papillomavirus (HPV) testing by p16 immunohistochemistry (IHC) is required for the work up of cancers of the oropharynx (base of tongue, tonsil, posterior pharyngeal wall, and soft palate). A small proportion of tumors at non-oropharyngeal sites are HPV related, however routine testing for these sites is not recommended.

American Dental Association (ADA) Council on Scientific Affairs

Genetics and Oral Health

Predictive tests for dental caries or for periodontal disease do not currently exist. These are both complex diseases with multiple gene and environmental risk factors, and quantifying risk requires a multifaceted assessment. Similar to cardiovascular disease, environmental factors affect one's risk, regardless of genetic profile, and no gene to date has been identified that has as large an impact on periodontal disease as do environmental influences, such as smoking or diabetes. While genetic testing holds potential for clinical application in the future, clinical measurements remain the best approach for the assessment of caries and periodontal disease risk (ADA 2017; Updated October 2023).

ADA Science and Research Institute

Early Detection and Prevention of Oral and Oropharyngeal Cancer

In a 2022 policy update, the ADA recognizes that early diagnosis can potentially impact treatment decisions and outcomes and supports routine visual and tactile examinations for all patients. Furthermore, the ADA recommends clinicians gather medical and social histories and immediately conduct or refer for a biopsy on any suspicious lesions.

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

Products for genetic testing for oral disease include, but are not limited to the following:

- MyPerioID® (OralDNA Labs)
- OraRisk® HPV
- Complete genotyping (OralDNA Labs)

Laboratories that perform genetic tests are regulated under the Clinical Laboratory Improvement Amendments (CLIA) Act of 1988. More information is available at: <https://www.cms.gov/clia/>. (Accessed April 8, 2024)

Information regarding regulation of Laboratory Developed Tests may be found here:

<https://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures/InVitroDiagnostics/LaboratoryDevelopedTests/default.htm>. (Accessed April 8, 2024)

References

- Agalliu I, Gapstur S, Chen Z, et al. Associations of Oral α -, β -, and γ -Human Papillomavirus Types With Risk of Incident Head and Neck Cancer. *JAMA Oncol*. 2016 May 1;2(5):599-606.
- Al-Rawi NH, Al-Marzooq F, Al-Nuaimi AS, et al. Salivary microRNA 155, 146a/b and 203: A pilot study for potentially non-invasive diagnostic biomarkers of periodontitis and diabetes mellitus. *PLoS One*. 2020 Aug 5;15(8):e0237004.
- American Dental Association (ADA) CDT Codebook 2023.
- American Dental Association Center for Scientific Information, ADA Science Institute. Oral Health Topics. Genetics and Oral Health September 2017. Updated October 2023. <https://www.ada.org/en/member-center/oral-health-topics/genetics-and-oral-health>. Accessed March 25, 2024.
- American Dental Association Science and Research Institute. ADA policy on early detection and prevention of oral and oropharyngeal cancer. 2019. Updated September 2022. Available at: <https://www.ada.org/resources/research/science-and-research-institute/oral-health-topics/cancer-head-and-neck>. Accessed March 25, 2024.
- Centers for Disease Control (CDC). HPV and Oropharyngeal Cancer. October 2022.
- College of American Pathologists (CAP). Human Papillomavirus Testing in Head and Neck Carcinomas Guidelines. 2017. Available at: <https://documents.cap.org/documents/2017-hpv-testing-head-neck-carcinomas-recommendations.pdf>. Accessed March 25, 2024.
- D'Souza G, McNeel TS, Fakhry C. Understanding personal risk of oropharyngeal cancer: risk-groups for oncogenic oral HPV infection and oropharyngeal cancer. *Ann Oncol*. 2017 Dec 1;28(12):3065-3069.
- de Coo A, Quintela I, Blanco J, et al. Assessment of genotyping tools applied in genetic susceptibility studies of periodontal disease: A systematic review. *Arch Oral Biol*. 2018 Aug; 92:38-50.
- de Lima CL, Acevedo AC, Grisl DC, et al. Host-derived salivary biomarkers in diagnosing periodontal disease: systematic review and meta-analysis. *J Clin Periodontol* 2016; 43(6): 492-502.
- Diehl SR, Kuo F et al. Interleukin 1 genetic tests provide no support for reduction of preventive dental care. *J Am Dent Assoc*. 2015 Mar; 146(3):164-173. Fujimori K, Yoneda T, Tomofuji T, et al. Detection of salivary miRNAs reflecting chronic periodontitis: A pilot study. *Molecules*. 2019 Mar 15;24(6):1034.
- National Cancer Institute (NCI). HPV and Cancer. 2023. Available at: <https://www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents/hpv-and-cancer>. Accessed March 25, 2024.
- National Cancer Care Network (NCCN) Clinical Practice Guidelines in Oncology. Head and Neck Cancers. Version 3.2024. February 29, 2024.
- Tanaka H, Suzuki M, Takemoto N, et al. Performance of oral HPV DNA, oral HPV mRNA and circulating tumor HPV DNA in the detection of HPV-related oropharyngeal cancer and cancer of unknown primary. *Int J Cancer*. 2022 Jan 1;150(1):174-186.
- Toy VE, Uslu MO. Do genetic polymorphisms affect susceptibility to periodontal disease? A literature review. *Niger J Clin Pract*. 2019 Apr; 22(4):445-453.
- Yücel OO, Berker E, Mescil L, et al. Association of interleukin-1 beta (+3954) gene polymorphism and gingival crevicular fluid levels in patients with aggressive and chronic periodontitis. *Genet Couns*. 2013; 24(1):21-35.

Policy History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.

In-Office Drug Administration and Dispensing of Medications

Policy Number: DCP033.11
Effective Date: January 1, 2025

[➔ Instructions for Use](#)

Table of Contents	Page
Coverage Rationale	142
Definitions	142
Applicable Codes	142
Description of Services	143
Clinical Evidence	143
U.S. Food and Drug Administration	147
References	147
Policy History/Revision Information	148
Instructions for Use	148

Related Dental Policy

General Anesthesia and Conscious Sedation Services

Coverage Rationale

Therapeutic Parenteral Drug Administration (Single or Two or More Administrations)
Therapeutic Parenteral drug administration may be indicated to enhance healing of surgical procedures, manage post procedure nausea and vomiting, or reduce pain and/or risk of infection. Medications include antibiotics, steroids, anti-inflammatory drugs, or antiemetics.

Infiltration of Sustained Release Therapeutic Drug (Single or Multiple Sites)
Infiltration of sustained release therapeutic drug (e.g., Exparel®) is not indicated due to insufficient evidence of efficacy and/or safety.

Drugs or Medicaments Dispensed in the Office for Home Use
Dispensing of drugs may be indicated to enhance healing of surgical procedures, reduce pain and/or risk of infection, and reduce caries risk. These include, but are not limited to oral antibiotics, oral analgesics, and topical fluoride.

Definitions

Parenteral: A technique of administration in which the drug bypasses the gastrointestinal (GI) tract [i.e., intramuscular (IM), intravenous (IV), intranasal (IN), submucosal (SM), subcutaneous (SC), intraosseous (IO)].

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
• D9610	Therapeutic parenteral drug, single administration

CDT Code	Description
• D9612	Therapeutic parenteral drugs, two or more administrations, different medications
• D9613	Infiltration of sustained release therapeutic drug, per quadrant
• D9630	Drugs or medicaments dispensed in the office for home use

CDT® is a registered trademark of the American Dental Association

Description of Services

Parenteral administration of drugs is any technique in which the route of administration bypasses the gastrointestinal tract. These routes include, but are not limited to, intravenous administration, intramuscular and subcutaneous injections and the use of medication patches and nasal sprays. There are many medicaments that may be given to a patient in the dental office for use at home and these include prescription strength toothpastes and mouth rinses, as well as antibiotics and pain medication.

Exparel® (Pacira Pharmaceuticals, Inc) is a sustained release, long-acting local injection that encapsulates bupivacaine in multivesicular liposomes. The liposomes gradually release bupivacaine as the lipid membranes are absorbed, resulting in sustained release and prolonged analgesia. It is purported to reduce or eliminate the need for opioids in the treatment of post-surgical pain; however, the clinical significance of opioid reduction has not been established (Noviasky).

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

Clinical Evidence

Gorecki et al. (2018) conducted a prospective, randomized, double-blind, placebo-controlled, parallel-group phase II single-center (ClinicalTrials.gov NCT01706588) to evaluate the efficacy, safety, and local tolerability of diclofenac HPβCD administered as a local submucosal injection prior to lower third molar surgery. Seventy-five patients requiring mandibular third molar surgery were randomized into 1 of 5 groups: 5 mg/1 mL diclofenac HPβCD, 12.5 mg/1 mL diclofenac HPβCD, 25 mg/1 mL diclofenac HPβCD, 50 mg/1 mL diclofenac HPβCD, or 1 mL placebo. The study drug was injected into the mucosal tissue surrounding the surgical site prior to surgery following achievement of local anesthesia. The primary outcome measure was the area under the curve (AUC) of cumulative pain scores from end of surgery to 6 h post-surgery. This demonstrated a global treatment effect between the active groups and placebo, hence confirming the study drug's efficacy ($p = 0.0126$). Secondary outcome measures included the time until onset of pain and the time until patients required rescue medication, both showing statistical significance of the study drug compared to placebo. The time until rescue medication ranged between 7.8 h (for 25 mg/1 mL diclofenac HPβCD) and 16 h (for 50 mg/1 mL diclofenac HPβCD). The 5-mg/1-mL solution appeared superior to the 12.5-mg/1-mL and 25-mg/1-mL solutions (time until rescue medication = 12.44 h). A total of 14% of patients experienced minor adverse drug reactions (ADRs), of which 2 cases demonstrated flap necrosis. These resolved without further intervention. The authors concluded that these results overall indicate efficacy, safety, and relative tolerability of diclofenac HPβCD used locally as a submucosal injection prior to third molar surgery.

Al-Dajani (2017) conducted a triple-blinded split-mouth randomized controlled clinical trial of 32 patients who underwent randomized bilateral extractions of impacted mandibular third molars during 2 consecutive sessions. Each patient was given a single-dose intramuscular injection of dexamethasone (0.1 mg/kg) preoperatively in 1 session and a placebo in the other session. Data were collected daily for 7 postoperative days, and 14 patient-centered outcomes were interpreted. The results showed that when administered dexamethasone, patients reported less pain, took fewer analgesics, reported less swelling, had less difficulty in eating and in enjoying food, had less difficulty in speech, and had less trismus. Additionally, they were absent less from school or work, and had less disruption of daily activities. The differences between the 2 conditions in bleeding, malaise, and sleep disturbance were not significant. The author concluded that prophylactic dexamethasone administered intramuscularly before third molar surgery can be recommended as a safe and effective strategy for decreasing pain and discomfort and enhancing oral functions and daily activities, unless contraindicated.

Arora et al. (2014) conducted a prospective randomized double-blind placebo-controlled clinical trial to evaluate whether postoperative combined amoxicillin and clavulanic acid in mandibular third molar extraction is effective in preventing inflammatory complications. Two bilaterally similar impacted mandibular third molars per head in 48 patients were randomly assigned to two treatment groups (Group I and Group II). Each patient served as his/her own control. Each patient received 625 mg of combined amoxicillin and clavulanic acid 1 h before surgery. In the case of third molars

belonging to Group I, 625 mg of combined amoxicillin and clavulanic acid TDS was continued for 3 days; in Group II, placebo was continued for 3 days. The patients were evaluated on the third and seventh postoperative days for signs of clinical infection and for microbial load evaluation. The data between the two groups were then statistically analyzed by the two-tailed Fisher's exact test, with a 95% confidence interval. The results showed no statistically significant differences between the test group and the control group with regard to erythema, dehiscence, swelling, pain, trismus, and infection based on microbial load. The data were statistically significant for alveolar osteitis, with the occurrence of alveolar osteitis (14.58%) in the placebo group. The authors concluded postoperative antibiotics are recommended only for patients undergoing contaminated, long-duration surgery.

Chugh et al. (2017) conducted a randomized controlled trial to compare the effects of the preoperative submucosal administration of equivalent doses of two commonly used steroids on the known postoperative sequelae following third molar extractions: pain, swelling, and trismus. There were 60 subjects requiring the removal of impacted mandibular third molars with a similar difficulty index. The participants were allocated randomly to three groups: the placebo group received normal saline injection (control), while the 8mg dexamethasone group and 40mg methylprednisolone group received submucosal injections of these steroids preoperatively. Each participant was assessed for postoperative pain, swelling, and trismus, along with a subjective assessment of quality of life (QOL) through a structured questionnaire. The results showed that the participants administered dexamethasone showed significant reductions in pain and trismus compared to the control group. Submucosal injection of dexamethasone was found to be superior to methylprednisolone only in terms of the reduction in swelling. QOL was minimally affected in patients administered dexamethasone as compared to methylprednisolone and control subjects. The authors concluded that within this small patient population, the preoperative submucosal use of steroids can be considered an effective, safe, and simple therapeutic strategy to reduce swelling, pain, and trismus after the surgical removal of impacted mandibular third molars.

Arteagoitia et al (2016) Prophylactic use of amoxicillin and amoxicillin/clavulanic acid, although controversial, is common in routine clinical practice in third molar surgery. The authors conducted a systematic review and meta-analysis including double-blind placebo-controlled randomized clinical trials published up to June 2015 to investigate the efficacy of amoxicillin with or without clavulanic acid on the incidence of the in the prevention of infection and dry socket after third molar extraction. There were 10 papers included in the review. The results of this review showed that the prophylactic use of amoxicillin does not significantly reduce the risk of infection and/or dry socket after third molar extraction, however with amoxicillin/clavulanic acid, the risk decreases significantly. The authors concluded however, that considering the number needed to treat, low prevalence of infection, potential adverse reactions to antibiotics and lack of serious complications in placebo groups, the routine prescription of amoxicillin with or without clavulanic acid is not justified.

Dietrich et al (2014). Diclofenac is an effective and well-tolerated nonsteroidal anti-inflammatory drug (NSAID) frequently used in the treatment of acute pain. Marketed formulations for parenteral administration usually contain 75 mg/3 mL of diclofenac sodium, which provide limited dosing flexibility, and are usually given intramuscularly. The authors conducted a randomized double-blind trial to investigate the safety and efficacy of low dose subcutaneous (SC) diclofenac containing hydroxypropyl- β -cyclodextrin (HP β CD) as a solubility enhancer for the management of acute pain. In this study, patients developing moderate-to-severe pain after third molar extraction under local anesthesia were randomized to one of the 4 SC injections: 25, 50, or 75 mg diclofenac, or placebo. The pain intensity differences were measured at 1.5 hours post dose and showed was higher in all diclofenac-treated groups than the placebo group. The authors concluded that this SC delivery of diclofenac containing (HP β CD) is effective at 25 and 50 mg levels for relieving moderate to severe pain following third molar extraction.

Mohan et al (2014) conducted a randomized, controlled clinical study to evaluate the role of antibiotics to prevent postoperative complications after routine periodontal surgery and also to determine whether their administration improved the surgical outcome. Forty-five systemically healthy patients with moderate to severe chronic periodontitis requiring flap surgery were enrolled in the study. They were randomly allocated to Amoxicillin, Doxycycline, and control groups. Surgical procedures were carried out with complete asepsis as per the protocol. Postoperative assessment of patient variables like swelling, pain, temperature, infection, ulceration, necrosis, and trismus was performed at intervals of 24 h, 48 h, 1 week, and 3 months. Changes in clinical parameters such as gingival index, plaque index, probing pocket depth, and clinical attachment level were also recorded. There was no incidence of postoperative infection in any of the patients. Patient variables were comparable in all the three groups. Though there was significant improvement in the periodontal parameters in all the groups, no statistically significant result was observed for any group over the others. The results of this study showed that when periodontal surgical procedures were performed following strict asepsis, the incidence of clinical infection was not significant among all the three groups, and also that antibiotic administration did not influence the outcome of surgery. Therefore, prophylactic antibiotics for patients who are otherwise healthy administered following routine periodontal surgery to prevent postoperative infection are unnecessary and have no demonstrable additional benefits.

Herrera-Briones FJ et al (2013) conducted a systematic literature review on the use of corticosteroids in third molar surgery. A systematic search of the literature was carried out in PubMed, Scopus, MEDLINE, and Cochrane using steroid and third molar as key words. 27 Randomized controlled trials and 1 meta-analysis were selected from among 72 articles identified and included RCTs that compared perioperative steroids given in any formulation, dose, or route with either placebo or no treatment, and included patients of any age requiring the removal of one or more impacted third molars under local anesthesia, intravenous (IV) sedation, or general anesthesia. Articles were not restricted as a function of the method used to measure pain. The authors of this review concluded the evidence shows that the administration of corticosteroids improves the postoperative experience of patients and has a significant impact on trismus and inflammation. Greater effects appear to be achieved by using the parenteral route and by administering the corticosteroid before the surgery.

Ataoglu et al (2008) conducted a study to evaluate the efficacy of antibiotic prophylaxis during removal of impacted third molars. 150 patients with impacted mandibular or maxillary third molars were divided randomly into three groups. The first was given amoxicillin 2g combined with clavulanic acid, orally daily for 5 days postoperatively; starting at the end of the operation. The second group was given the same drugs but the regimen started 5 days before the operation. The third was given no antibiotics. Pain, infection, swelling, alveolar osteitis, and interincisal mouth opening (mm) were evaluated. There were no significant differences among the groups in the incidence of these complications. The authors concluded that routine prophylactic use of oral antibiotics in third molar surgery is not recommended.

Exparel (Liposomal Bupivacaine)

The evidence regarding the safety and efficacy of Exparel in oral and maxillofacial surgery is limited. Further research is needed to determine the superior benefits of liposomal bupivacaine over standard bupivacaine administration.

James et al., (2023) conducted a parallel-arm randomized clinical trial to determine if liposomal bupivacaine infiltration (LBI) following uncomplicated extraction of bilateral, mandibular third molars significantly reduces postoperative pain when compared to standard bupivacaine. Twenty four patients were included and equally randomized to receive LBI or standard bupivacaine (control group). Following extractions under deep sedation, both groups were prescribed the same postoperative analgesic regimen of 800 mg of ibuprofen every 8 hours and oxycodone/acetaminophen 5/ 325 mg every 4-6 hours as needed. Chlorohexidine mouth rinse was also prescribed. Patients were contacted via phone at 48 hours postoperatively and asked about pain levels and narcotic medication use. Patients were seen for one week follow up and overall pain, current pain level and how much pain medication was needed up to that point. The results showed at the 48 hour follow up phone call, there were no significant differences in narcotic frequency. At the one week follow up, the results showed that patients in both groups indicated they had returned to normal activities and no longer required narcotic medication for pain. The authors concluded that LBI does not significantly reduce the need for postoperative pain control for uncomplicated third molar extractions. More research for oral surgery indications with larger patient sample sizes is needed to assess the clinical utility of LBI over standard bupivacaine administration.

In a 2021 systematic review of randomized clinical trials, Ji et al. assessed the efficacy of liposomal bupivacaine compared to placebo or other non-bupivacaine agent in postoperative pain management and opioid consumption. 63 studies with a total of 6770 subjects met inclusion criteria. Studies were categorized into the following surgical specialties: 33 orthopedic-related procedures, ten general surgery and associated subspecialty procedures, nine obstetric/gynecology (OBGYN) procedures, four oral and maxillofacial surgery procedures, and seven others. By pooling the data of all categories, overall, the results showed that in over 74% of the trials, liposomal bupivacaine did not result in significant pain relief, nor did it demonstrate a reduction in opioid consumption in almost 86%. When compared to standard bupivacaine or other active agents, there was no reduction in opioid use in 83% and 100% respectively. The authors concluded that the efficacy of liposomal bupivacaine for providing superior postoperative pain control relative to placebo or another active agent is not supported by a majority of RCTs due to low quality and a very high risk of bias. Furthermore, nearly half of the completed RCTs either did not publish their results or make them publicly available. The use of liposomal bupivacaine as an adjunct to reduce postoperative opioid consumption warrants further high-quality research. Iero et al. (2018) conducted a randomized, open-label trial to determine the efficacy and safety of an opioid-sparing postsurgical pain management protocol with or without local infiltration of liposomal bupivacaine for full-arch implant surgery (four or more implants to the maxilla and/or mandible to serve as anchors for dental prostheses). Patients scheduled to undergo full-arch implant surgery were randomly assigned to receive an opioid-sparing postsurgical pain management protocol with or without liposomal bupivacaine 266 mg at the end of surgery. All patients received infiltration with \leq 40 mL lidocaine 2% with epinephrine at the beginning of surgery and bupivacaine 0.5% with epinephrine near the end of surgery and oral opioid or nonopioid analgesics (oxycodone 5 mg tablets or ibuprofen 600 mg), as needed, post surgically. Pain severity at the surgical site was assessed using a verbal 0 to 10 numeric rating scale (0 [no pain] to 10 [worst pain imaginable]). Patients separately assessed pain in their mandible and maxilla. Reports of treatment-emergent adverse events were collected. Sixty-nine patients were randomized to the liposomal bupivacaine 266 mg (n = 34) or control group (n = 35). At all-time points post-surgery for both the mandible and the maxilla, the liposomal bupivacaine

group reported significantly less cumulative pain than the control group. At the conclusion of the 7-day follow-up, patients in the liposomal bupivacaine group experienced one-third less cumulative postsurgical pain than patients in the control group. Seventy-seven percent of patients in the liposomal bupivacaine group and 80% in the control group experienced a treatment-emergent adverse event. A higher percentage of patients in the liposomal bupivacaine versus control group reported itching (15% vs 9%) and constipation (38% vs 23%). The authors concluded that patients receiving an opioid-sparing postsurgical pain management protocol with liposomal bupivacaine 266 mg experienced a statistically significant reduction of postsurgical pain and clinically relevant reduction in opioid consumption.

In a 2017 Cochrane Systematic Review, Hamilton et al. conducted a review of randomized, double-blind, placebo or active-controlled clinical trials in people aged 18 years or over undergoing elective surgery, at any surgical site, if they compared liposomal bupivacaine infiltration at the surgical site with placebo or other type of analgesia. The authors had planned a comparison meta-analysis however there were insufficient data to ensure a clinically meaningful answer. The findings were instead presented as two 'Summary of Findings' narratives. The authors concluded that liposomal bupivacaine at the surgical site does appear to reduce postoperative pain compared to placebo; however, the limited evidence does not demonstrate superiority to bupivacaine hydrochloride. The authors acknowledge the sparseness of data for outcomes of interest, and a number of studies with a high risk of bias are limitations of this systematic review and limit the confidence in the effect estimates.

Lieblich et al. (2017, included in Ji systematic review) conducted a meta-analysis of this randomized, placebo-controlled study, which is the first formal evaluation of liposomal bupivacaine in the setting of dental surgery. The Infiltration Trial in Third Molar Extraction Observing the Analgesic Effect of EXPAREL (INNOVATE), U.S. National Institutes of Health clinical trials identifier NCT02517905 to assess the efficacy, safety, and tolerability of a single administration of liposomal bupivacaine in subjects undergoing bilateral third molar extraction. The results showed that EXPAREL was well tolerated but was not associated with a significant improvement compared with placebo on any of the outcome measures assessed in the primary efficacy analysis. When the study data were analyzed with subjects representing protocol violations removed, treatment with liposomal bupivacaine resulted in lower least-squares mean cumulative NRS pain intensity scores during the first 48 hours after surgery (primary efficacy measure) compared with placebo. Least-squares mean scores remained significantly lower compared with placebo through 96 hours after surgery, without negatively impacting opioid consumption or subjects' satisfaction with postsurgical pain control. It is likely that the observed results were confounded by the unexpectedly large number of protocol violations that occurred during the study. The authors concluded that while the results from this study of liposomal bupivacaine for postsurgical analgesia in subjects undergoing bilateral impacted third molar extraction are encouraging, additional investigation in prospective, randomized studies that incorporate clearly defined administration technique, rigorous data collection and protocol compliance will be necessary.

Glenn et al. (2016, included in Ji systematic review) conducted a prospective, randomized, double-blind trial to compare an infiltration of bupivacaine with liposomal bupivacaine (EXPAREL, Pacira Pharmaceuticals, San Diego, CA) for postoperative numbness and pain in symptomatic patients diagnosed with pulpal necrosis experiencing moderate to severe preoperative pain. One hundred patients randomly received a 4.0-mL buccal infiltration of either bupivacaine or liposomal bupivacaine after endodontic debridement. For postoperative pain, patients were given ibuprofen/acetaminophen, and they could receive narcotic pain medication if necessary. Patients recorded their level of numbness, pain, and medication use the night of the appointment and over the next 5 days. Success was measured as no or mild postoperative pain and no narcotic use. The results showed the success rate was 29% for the liposomal group and 22% for the bupivacaine group, with no significant difference between the groups. The authors concluded that for these patients, a 4.0-mL infiltration of liposomal bupivacaine did not result in a statistically significant increase in postoperative success compared with an infiltration of 4.0 mL bupivacaine and did not result in less need for narcotic/opioid pain medication.

Bultema et al. (2016, included in Ji systematic review) conducted a study to compare an infiltration of liposomal bupivacaine versus bupivacaine for pain control in untreated, symptomatic irreversible pulpitis. Ninety-five emergency patients received 2% lidocaine with 1:100,000 epinephrine via infiltration or an inferior alveolar nerve block to relieve their initial presenting pain. Patients then randomly received either 4 mL liposomal bupivacaine (13.3 mg/mL) or 4 mL 0.5% bupivacaine with 1:200,000 epinephrine by infiltration. Patients received a diary for the day of the appointment and 3 days post injection to record soft tissue numbness, pain levels, and analgesic (non-narcotic and narcotic) use. The results showed no significant differences ($p < .05$) between the 2 anesthetic formulations for pain or the use of pain medications. A statistically higher level of soft tissue numbness was found on days 1 to 3 for the liposomal bupivacaine group. The authors concluded that although liposomal bupivacaine had some effect on soft tissue anesthesia, it did not reduce pain to manageable clinical levels in patients presenting with untreated, symptomatic irreversible pulpitis.

Clinical Guidelines

American Association of Oral and Maxillofacial Surgeons (AAOMS)

In a 2020 white paper, revised in 2023, entitled “Opioid Prescribing: Acute and Postoperative Pain Management,” the AAOMS provides the following considerations for the management of acute and postoperative pain. While oral and maxillofacial surgeons should ultimately make all final prescribing decisions, the recommendations in this AAOMS White Paper are intended to provide direction and serve as a supportive resource.

A nonsteroidal anti-inflammatory drug administered pre-emptively may decrease the severity of postoperative pain.

A perioperative corticosteroid (dexamethasone) may limit swelling and decrease postoperative discomfort after third-molar extractions.

A long-acting local anesthetic (e.g., bupivacaine, etidocaine, liposomal bupivacaine) may delay onset and severity of postoperative pain.

The oral and maxillofacial surgeon should avoid starting treatment with long-acting or extended-release opioid analgesics. Providers should prescribe non-steroidal anti-inflammatory drugs (NSAIDs) as first-line analgesic therapy, unless contraindicated. If NSAIDs are contraindicated, providers should prescribe acetaminophen as first-line analgesic therapy.

NSAIDs and acetaminophen, taken simultaneously, work synergistically to rival opioids in their analgesic effect, but dosage levels and times of administration should be carefully documented to prevent overdosage.

When indicated for acute breakthrough pain, consider short-acting opioid analgesics. If opioid analgesics are considered, start with the lowest possible effective dose and the shortest duration possible.

When prescribing opioids, state law may require prescribers to access the state prescription drug monitoring program (PDMP). If there is any suspicion of patient drug misuse, abuse and/or addiction, the OMS should access the PDMP.

To assess for opioid misuse or addiction, use targeted history or validated screening tools.

All instructions for patient analgesia and analgesic prescriptions should be carefully documented.

When deviating from these prescribing recommendations – or those required by state laws or institutions – the oral and maxillofacial surgeon should document the justification for doing so.

Educate patients on the expectations of postoperative pain management and the anticipated levels of relief.

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

For all drugs refer to the following website and search by drug name:

<https://www.accessdata.fda.gov/scripts/cder/daf/index.cfm>. (Accessed March 25, 2024)

References

Al-Dajani M. Can Preoperative Intramuscular Single-Dose Dexamethasone Improve Patient-Centered Outcomes Following Third Molar Surgery? *J Oral Maxillofac Surg*. 2017 Aug; 75(8):1616-1626.

American Association of Oral and Maxillofacial Surgeons White Paper, Opioid Prescribing: Acute and Postoperative Pain Management 2020. Revised 2023.

https://www.aaoms.org/docs/govt_affairs/advocacy_white_papers/opioid_prescribing.pdf Accessed March 25, 2024.

American Dental Association CDT Codebook 2024.

Arora A, Roychoudhury A, Bhutia O, et al. Antibiotics in third molar extraction; are they really necessary: A non-inferiority randomized controlled trial. *Natl J Maxillofac Surg*. 2014 Jul-Dec; 5(2):166-71.

Arteagoitia MI, Barbier L, Santamaría J, et al. Efficacy of amoxicillin and amoxicillin/clavulanic acid in the prevention of infection and dry socket after third molar extraction. A systematic review and meta-analysis. *Med Oral Patol Oral Cir Bucal*. 2016 Jul 1;21(4):e494-504.

Ataoğlu H, Oz GY, Candirli C, et al. Routine antibiotic prophylaxis is not necessary during operations to remove third molars. *Br J Oral Maxillofac Surg*. 2008 Mar; 46(2):133-5.

Balocco AL, Van Zundert PGE, Gan SS, et al. Extended release bupivacaine formulations for postoperative analgesia: an update. *Curr Opin Anaesthesiol*. 2018 Jul 31.

James J, Benton B, Faigen A, et al. Pain levels did not differ following uncomplicated third molar extractions utilizing liposomal bupivacaine versus standard bupivacaine. *J Oral Maxillofac Surg*. 2023 Feb;81(2):206-212.

Bultema K, Fowler S, Drum M, et al. Pain Reduction in Untreated Symptomatic Irreversible Pulpitis Using Liposomal Bupivacaine (Exparel): A Prospective, Randomized, Double-blind Trial. *J Endod*. 2016 Dec;42(12):1707-1712.

Chugh A, Singh S, Mittal Y, et al. Submucosal injection of dexamethasone and methylprednisolone for the control of postoperative sequelae after third molar surgery: randomized controlled trial. *Int J Oral Maxillofac Surg*. 2017 Aug 12.

Dietrich T, Leeson R, Gugliotta B, et al. Efficacy and safety of low dose subcutaneous diclofenac in the management of acute pain: a randomized double-blind trial. *Pain Pract*. 2014 Apr;14(4):315-23.

Glenn B, Drum M, Reader A, et al. Does Liposomal Bupivacaine (Exparel) Significantly Reduce Postoperative Pain/Numbness in Symptomatic Teeth with a Diagnosis of Necrosis? A Prospective, Randomized Double-blind Trial. *J Endod*. 2016 Sep;42(9):1301-6.

Gorecki P, Rainsford KD, Taneja P, et al. Submucosal Diclofenac for Acute Postoperative Pain in Third Molar Surgery: A Randomized, Controlled Clinical Trial. *J Dent Res*. 2018 Apr; 97(4):381-387.

Graziani F, D'Aiuto F, Arduino PG, et al. Perioperative dexamethasone reduces post-surgical sequelae of wisdom tooth removal. A split-mouth randomized double-masked clinical trial. *Int J Oral Maxillofac Surg*. 2006 Mar; 35(3):241-6.

Hamilton TW, Athanassoglou V, Mellon S, et al. Liposomal bupivacaine infiltration at the surgical site for the management of postoperative pain. *Cochrane Database Syst Rev*. 2017 Feb1;2:CD011419.

Herrera-Briones FJ, Prados Sánchez E, Reyes Botella C, et al. Update on the use of corticosteroids in third molar surgery: systematic review of the literature. *Oral Surg Oral Med Oral Pathol Oral Radiol*. 2013 Nov; 116(5):e342-51.

Iero PT, Mulherin DR, Jensen O, et al. A Prospective, Randomized, Open-Label Study Comparing an Opioid-Sparing Postsurgical Pain Management Protocol With and Without Liposomal Bupivacaine for Full-Arch Implant Surgery. *Int J Oral Maxillofac Implants*. 2018 Sep/Oct; 33(5):1155-1164.

Ji YD, Harris JA, Gibson LE, et al. The efficacy of liposomal bupivacaine for opioid and pain reduction: a systematic review of randomized clinical trials. *J Surg Res*. 2021 Aug;264:510-533.

Lieblich SE, Danesi H. Liposomal Bupivacaine Use in Third Molar Impaction Surgery: INNOVATE Study. *Anesth Prog*. Fall 2017;64(3):127-135. doi:10.2344/anpr-64-02-03.

Malamed, Stanley DDS. *Intravenous Sedation: Complications Sedation: A Guide to Patient Management*, Sixth Edition Chapter 9, 125-133; Chapter 27, 380-398.

Mohan RR, Doraswamy DC, Hussain AM, et al. Evaluation of the role of antibiotics in preventing postoperative complication after routine periodontal surgery: A comparative clinical study. *J Indian Soc Periodontol*. 2014 Mar; 18(2):205-12.

Noviasky J, Pierce DP, Whalen K, et al. Bupivacaine liposomal versus bupivacaine: comparative review. *Hosp Pharm*. 2014 Jun;49(6):539-43.

Policy History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.

Labial Veneers

Guideline Number: DCG025.11

Effective Date: January 1, 2025

[➔ Instructions for Use](#)

Table of Contents	Page
106. Coverage Rationale	149
107. Definitions	149
108. Applicable Codes	149
109. Description of Services	149
110. References	150
111. Guideline History/Revision Information	150
112. Instructions for Use	150

Related Dental Policy

- Single Tooth Direct Restorations

Coverage Rationale

Labial [Veneers](#) are indicated for the following:

- For coverage of enamel only fractures that cannot be adequately repaired with a direct restoration
- Teeth with enamel defects, including but not limited to, enamel hypoplasia, severe decalcification, enamel hypocalcification and fluorosis

Definitions

Laminate Veneer: A thin covering of the facial surface of a tooth usually constructed of tooth colored material used to restore discolored, damaged, misshapen, or misaligned teeth. (ADA)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D2960	Labial veneer (resin laminate) - direct
D2961	Labial veneer (resin laminate) - indirect
D2962	Labial veneer (porcelain laminate) - indirect

CDT® is a registered trademark of the American Dental Association

Description of Services

Veneers are thin partial coverage restorations made of composite resin or porcelain, covering part or all of the facial surfaces of anterior teeth. For plans that include coverage, veneers may be indicated for fractures or teeth with enamel defects, although they are typically used for cosmetic purposes. They may be constructed in a laboratory or chairside via computer assisted design (CAD) and computer aided manufacturing (CAM) technology.

References

American Dental Association (ADA) CDT 2024 Dental Procedure Code Book.

American Dental Association Glossary of Clinical and Administrative Terms.

Rosenstiel S, Land M, Fujimoto J. Contemporary Fixed Prosthodontics, 5th ed. St. Louis: Mosby c2016. Part II: Laboratory Procedures, Chapter 11 Tooth Preparation for All Ceramic Restorations; Porcelain Laminate Veneers; p.271.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Medically Necessary Orthodontic Treatment

Guideline Number: DCG003.14

Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
113. Coverage Rationale	151
114. Definitions	151
115. Applicable Codes	152
116. Description of Services	153
117. References	153
118. Guideline History/Revision Information	153
119. Instructions for Use	153

Related Dental Policy
None

Coverage Rationale

Orthodontic treatment is medically necessary when the following criteria have been met:

- The member is under the age 19 (through age 18, unless the member specific benefit plan document indicates a different age); and
- Services are related to the treatment of a severe craniofacial deformity that results in a physically [Handicapping Malocclusion](#), including but not limited to the following:
 - [Cleft Lip](#) and/or [Cleft Palate](#)
 - [Crouzon Syndrome/Craniofacial Dysostosis](#)
 - [Hemifacial Hypertrophy/Congenital Hemifacial Hyperplasia](#)
 - [Parry-Romberg Syndrome/Progressive Hemifacial Atrophy](#)
 - [Pierre-Robin Syndrome](#)
 - [Treacher-Collins Syndrome/Mandibulofacial Dysostosis](#)

Removal of Fixed Orthodontics Appliances for Reasons Other Than Completion of Treatment

Removal of fixed orthodontics appliances for reasons other than completion of treatment is a decision to be made by the treating provider based on an individual patient basis. Reasons include, but are not limited to:

- Patient non-compliance (AAOMS)
- Military deployment (Department of the Army)
- Prior to radiation therapy to the head or neck if the appliances will be in the radiation field (NIH, AAPD)
- Prior to highly stomatotic chemotherapy (NIH, AAPD)
- Complications related to IV bisphosphonates and other medical conditions (AAOMS)

Definitions

Cleft Lip: A congenital facial defect of the lip due to failure of fusion of the medial and lateral nasal prominences and maxillary prominence. (American Cleft Palate-Craniofacial Association)

Cleft Palate: A congenital fissure in the medial line of the palate. (American Cleft Palate-Craniofacial Association)

Crouzon Syndrome/Craniofacial Dysostosis: One of a large group of facial birth defects in which there is abnormal craniofacial fusion. This fusion does not allow the bones to grow normally, affecting the shape of the head, appearance of the face and the relationship of the teeth. (American Cleft Palate-Craniofacial Association)

Handicap (as related to Handicapping Malocclusion): A physical, mental, or emotional condition that interferes with one's normal functioning. (Farlex Partner Medical Dictionary)

Hemifacial Hypertrophy/Congenital Hemifacial Hyperplasia: A rare developmental anomaly characterized by asymmetric overgrowth. Hemihyperplasia can be an isolated finding, but it also may be associated with a variety of malformation syndromes. (Neville 2016)

Malocclusion (as related to Handicapping Malocclusion): A deviation in intramaxillary and/or intermaxillary relations of teeth from normal occlusion. Often associated with other dentofacial deformities. (AAO)

Parry-Romberg Syndrome/Progressive Hemifacial Atrophy: A rare disorder characterized by slowly progressive deterioration (atrophy) of the skin and soft tissues of half of the face (hemifacial atrophy), usually the left side. (National Institutes of Health)

Pierre-Robin Syndrome: A complex of congenital anomalies including micrognathia and abnormal smallness of the tongue, often with Cleft Palate, severe myopia, congenital glaucoma, and retinal detachment. (American Cleft Palate-Craniofacial Association)

Treacher-Collins Syndrome/Mandibulofacial Dysostosis: The name given to a birth defect which may affect the size and shape of the ears, eyelids, cheek bones, and upper and lower jaws. The extent of facial deformity varies from one affected individual to another. (American Cleft Palate-Craniofacial Association)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D8010	Limited orthodontic treatment of the primary dentition
D8020	Limited orthodontic treatment of the transitional dentition
D8030	Limited orthodontic treatment of the adolescent dentition
D8040	Limited orthodontic treatment of the adult dentition
D8070	Comprehensive orthodontic treatment of the transitional dentition
D8080	Comprehensive orthodontic treatment of the adolescent dentition
D8090	Comprehensive orthodontic treatment of the adult dentition
D8091	Comprehensive orthodontic treatment with orthognathic surgery
D8220	Fixed appliance therapy
D8660	Pre-orthodontic treatment examination to monitor growth and development
D8670	Periodic orthodontic treatment visit
D8671	Periodic orthodontic treatment visit associated with orthognathic surgery
D8680	Orthodontic retention [removal of appliances, construction and placement of retainer(s)]
D8695	Removal of fixed orthodontic appliances for reasons other than completion of treatment
D8696	Repair of orthodontic appliance – maxillary
D8697	Repair of orthodontic appliance – mandibular
D8698	Re-cement or re-bond fixed retainer – maxillary
D8699	Re-cement or re-bond fixed retainer – mandibular
D8701	Repair of fixed retainer, includes reattachment – maxillary
D8702	Repair of fixed retainer, includes reattachment – mandibular
D8703	Replacement of lost or broken retainer – maxillary
D8704	Replacement of lost or broken retainer – mandibular
D8999	Unspecified orthodontic procedure, by report

Description of Services

Medically necessary orthodontic treatment involves the correction of the dental component of a craniofacial abnormality that results in a Handicapping Malocclusion and is intended to restore a functional dentition. It is not for orthodontic services for crowded dentitions (crooked teeth), excessive spacing between teeth, temporomandibular joint (TMJ) conditions, and/or horizontal/vertical discrepancies (overjet/overbite).

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

References

American Dental Association (ADA); CDT 2025 Dental Procedure Code Book.

American Academy of Pediatric Dentistry Guideline on Dental Management of Pediatric Patients Receiving Chemotherapy, Hematopoietic Cell Transplantation, and/or Radiation Therapy. Revised 2022.

American Association of Orthodontists Clinical Practice Guidelines for Orthodontics and Dentofacial Orthopedics 2014.

American Association of Orthodontists Glossary 2024.

American Cleft Palate Craniofacial Association.

Department of the Army. U.S. Army Dental Command Policy 07-08, Orthodontic Care Policy. 2007.

Information on Essential Health Benefits (EHB) Benchmark Plans (links to States plans). Available at: <https://www.cms.gov/ccio/resources/data-resources/ehb.html>. Accessed August 21, 2024.

National Institutes of Health, National Institute of Neurological Disorders and Stroke. Parry-Romberg Information Page. 2017.

Neville B, Damm D, Allen C et al. Oral and Maxillofacial Pathology, 4th ed. St. Louis, MO: Elsevier c2016. Chapter 1, Developmental Defects of the Oral and Maxillofacial Region; p. 1-48.

U.S. Department of Health and Human Services, National Institutes of Health, National Institute of Dental and Craniofacial Research. Oral Complications of Cancer Treatment: What the Dental Team Can Do. 2009.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Miscellaneous Diagnostic Procedures

Policy Number: DCP040.10
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
120. Coverage Rationale	154
121. Definitions	155
122. Applicable Codes	155
123. Description of Services	155
124. Clinical Evidence	156
125. U.S. Food and Drug Administration	161
126. References	161
127. Policy History/Revision Information	163
128. Instructions for Use	163

Related Dental Policy
<ul style="list-style-type: none"> Salivary Testing

Coverage Rationale

In-Office HbA1c and Blood Glucose Level Tests

For the purposes of diagnosing pre-diabetes and diabetes, using [HbA1c](#) and blood glucose level tests in the dental office setting are not indicated due to insufficient evidence of efficacy or improved health outcomes.

Caries Susceptibility Tests

Caries susceptibility tests are not indicated due to insufficient evidence of efficacy.

Adjunctive Pre-Diagnostic Tests That Aid in the Detection of Mucosal Abnormalities Including Premalignant and Malignant Lesions

These procedures are not indicated due to insufficient evidence of efficacy.

Brush Biopsy

Brush biopsies are not indicated due to insufficient evidence of efficacy.

Pulp Vitality Tests

Pulp vitality tests are indicated for the following:

- For traumatic injuries to teeth
- Teeth with deep [Caries](#) or defective restorations

Pulp vitality tests are not indicated for the following:

- Sensitivity of exposed dentin without evidence of Pulp pathosis
- As part of routine dental examinations

Diagnostic Casts

Diagnostic Casts may be indicated for a more thorough evaluation of the following:

- Tooth interdigitation
- Functional occlusion, and any occlusal abnormalities
- Wear facets and defective restorations, coronal contours, proximal contacts, and embrasure spaces between teeth

Antigen and Antibody, and Molecular Testing

Antigen and Antibody testing for public health related pathogens is out of scope for dental providers within the dental office. Refer to the [Description of Services](#) section.

Definitions

Antibody: A substance produced by B lymphocytes in response to a unique Antigen.

Antigen: Any substance capable of eliciting an immune response or of binding with an Antibody.

Caries: Commonly used term for tooth decay.

Diagnostic Cast: A replica of teeth and adjoining tissues created digitally or by a casting process (e.g., plaster into an impression). “Study model” is another term used for such a replica.

HbA1c/A1C: A blood test measures average blood glucose (blood sugar) control for the past 2 to 3 months.

Pulp: Connective tissue that contains blood vessels and nerve tissue which occupies the Pulp cavity of a tooth.

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D0411	HbA1c in-office point of service testing
D0412	Blood glucose level test – in-office using a glucose meter
D0425	Caries susceptibility tests
D0431	Adjunctive pre-diagnostic test that aids in detection of mucosal abnormalities including premalignant and malignant lesions, not to include cytology or biopsy procedures
D0460	Pulp vitality tests
D0470	Diagnostic casts
D0604	Antigen testing for a public health related pathogen, including coronavirus
D0605	Antibody testing for a public health related pathogen, including coronavirus
D0606	Molecular testing for a public health related pathogen, including coronavirus
D7288	Brush biopsy - transepithelial sample collection

CDT® is a registered trademark of the American Dental Association

Description of Services

Pulp vitality testing involves thermal or electrical stimulation of a tooth to aid in the diagnosis of pulpal pathology, indicating the need for endodontic therapy.

Diagnostic Casts or study models are stone models made from impressions of the dentition. They are inclusive in most restorative, prosthodontic and orthodontic treatment planning, however they can have use in select cases for complex treatment planning.

Caries susceptibility testing can be done with a variety of diagnostic tools. Products include testing for bacteria levels, buffering capacity of saliva, and a device called CariScreen (Oral Biotech) that screens plaque samples for bacteriologic activity using adenosine triphosphate (ATP) driven bioluminescence.

There are several adjunctive tests to aid in the detection of mucosal abnormalities using lights, dye, and brush biopsy devices. There is a lack of evidence to support or refute the efficacy of these devices and a traditional physical and tactile

examination, with histopathological examination of suspicious lesions via surgical biopsy remains the “gold standard” for detecting oral cancer (Rethman et al. 2010). Additionally, concern has been raised about the delay of a cancer diagnosis for positive and negative results, as all lesions require a scalpel biopsy for a definitive diagnosis.

Many patients visit their dentist more often than their primary care providers, and as periodontal disease is associated with diabetes, the clinical utility of chairside dental office screening with subsequent referral to primary care has been explored as a means to improve the diagnosis of prediabetes and diabetes and reducing associated comorbidities. Blood glucose level testing may be indicated as a presurgical screening procedure in certain surgical situations, or when patients exhibit symptoms of hyperglycemia, and all dental offices should have a protocol for managing hypoglycemic episodes in conscious and unconscious patients.

Coronaviruses are a group of viruses that are known to cause respiratory illnesses ranging from the common cold to more severe disease. In late 2019, the World Health Organization was notified of a rapidly growing outbreak of a severe lower respiratory tract disease. In February 2020, the International Committee on Taxonomy of Viruses named this new virus Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2). On March 11, 2020 it was declared a pandemic by the World Health Organization. In 2020, the American Dental Association (ADA) supported the use dentists who chose to participate in diagnostic testing, vaccine administration and other ancillary procedures to expand national efforts during declared local, state, or federal public health emergencies. On May 11, 2023, the federal Public Health Emergency (PHE) for COVID-19, declared under Section 319 of the Public Health Service (PHS) Act expired.

Clinical Evidence

HbA1c Testing and Blood Glucose Level Testing

In a 2020 systematic review and meta-analysis, Chinnasamy et al. summarized the data on the prevalence of undiagnosed type 2 diabetes mellitus (T2DM) and prediabetes amongst dental patients and further explore the effectiveness of the point of care (PoC) screening and its implication for use in the dental setting. Studies were eligible for inclusion if they were cross-sectional in design and used PoC screening for undiagnosed DM or hyperglycemia in the dental setting via (HbA1c), and the results of the PoC screening test were confirmed with official testing not in the dental setting. Nine studies met the authors inclusion criteria. The results showed the prevalence of T2DM and prediabetes in the dental setting to be 11.23% and 47.38% respectively, and the authors concluded that targeted PoC screening in the dental setting is a novel approach that could potentially help reduce undiagnosed disease, however more research is needed before the utility can be demonstrated.

Mataftsi et al (2019) conducted a study to implement a chairside diabetes screening strategy for the identification of undiagnosed hyperglycaemia in periodontal patients. Measurement of HbA1c was performed in 139 patients diagnosed with periodontal disease to determine possible unknown hyperglycaemia. Patients fulfilled the criteria for screening according to the questionnaire by the Centers for Disease Control and Prevention (CDC). The Cobas® b101 in vitro diagnostic system was used for the measurement of glycosylated haemoglobin (HbA1c) in capillary blood. Body mass index (BMI) and waist circumference were also measured to determine splanchnic obesity. Periodontal parameters were assessed with an automated probe and included probing depth, clinical attachment loss, bleeding on probing and presence/absence of plaque. Most patients had moderate periodontitis, and the results showed that almost 25% of the subjects tested were found to have unknown hyperglycaemia while 80.5% of them had splanchnic (abdominal) obesity. A significant association was found between HbA1c and BMI (Mann-Whitney test; $p = 0.0021$) as well as between HbA1c and waist circumference (Spearman rho test; $p = 0.0007$). No differences were observed regarding periodontal parameters between subjects exhibiting $HbA1c \geq 5.7\%$ and those with $HbA1c < 5.7\%$ (Mann-Whitney test; $p > 0.05$) although those with $HbA1c \geq 5.7\%$ displayed higher proportions of sites with clinical attachment loss > 5 mm (z test with Bonferroni corrections; $p < 0.05$). The authors concluded that periodontal patients, especially those with a bigger than normal BMI and waist circumference, may be target group worth screening for diabetes.

Teeuw et al. (2017) conducted a study on the use of diabetic screening on patients with diagnosed periodontal disease. A total of 313 individuals from a university dental clinic participated. From 126 patients with mild/moderate periodontitis, 78 patients with severe periodontitis and 109 subjects without periodontitis, HbA1c values were obtained by the analysis of dry blood spots. Differences in mean HbA1c values and the prevalence of (pre)diabetes between the groups were analyzed. The mild/moderate and severe periodontitis groups showed significantly higher HbA1c values ($6.1\% \pm 1.4\%$ (43 mmol/mol ± 15 mmol/mol) and $6.3\% \pm 1.3\%$ (45 mmol/mol ± 15 mmol/mol), respectively) compared with the control group ($5.7\% \pm 0.7\%$ (39 mmol/mol ± 8 mmol/mol), $p = 0.003$). In addition, according to the American Diabetes Association (ADA) guidelines for diagnosis, there was a significant overrepresentation of subjects with suspected diabetes (23% and 14%) and pre-diabetes (47% and 46%) in the severe periodontitis group and mild/moderate periodontitis groups, respectively, compared with the control group (10% and 37%, $p = 0.010$). Notably, 18.1% of patients with suspected new diabetes were

found among subjects with severe periodontitis compared with 9.9% and 8.5% among subjects with mild/moderate periodontitis and controls, respectively ($p = 0.024$). Conclusions: The dental office, with particular focus on patients with severe periodontitis, proved to be a suitable location for screening for (pre)diabetes; a considerable number of suspected new diabetes cases were identified. The early diagnosis and treatment of (pre)diabetes help to prevent more severe complications and benefit the treatment of periodontitis.

Lalla et al. (2015) conducted a randomized clinical trial to assess an approach to improving behavioral and glycaemic outcomes in dental patients who present with diabetes risk factors and previously unrecognized hyperglycaemia. The authors randomized 101 individuals identified with potential diabetes or pre-diabetes into two interventions. In the basic/control intervention, participants were informed about their diabetes risk factors and blood test result and advised to see a physician. In the enhanced/test intervention, patients received a detailed explanation of findings and their implications, a written report for the physician, and were contacted at 2 and 4 months to inquire whether medical follow-up had occurred. At a 6-month re-evaluation, outcome measures included visit to physician, positive lifestyle changes and reduction in HbA1c. 73 subjects returned for the 6-month reevaluation, and the results showed that the two intervention groups did not significantly differ in any of the outcome variables. Eighty-four percent of subjects reported having visited a physician post-randomization, and 49% reported at least one positive lifestyle change as a result of our intervention. In subjects identified with potential diabetes (baseline HbA1c $\geq 6.5\%$), HbA1c was reduced $1.46 \pm 0.28\%$ compared to baseline ($p < 0.01$). The authors' concluded that diabetes risk assessment and education by dental professionals of affected individuals unaware of their status may contribute to improved patient outcomes. This study is limited to a small amount of participants.

In a 2014 field study, Genco et al. sought to assess the feasibility of screening for diabetes and prediabetes in dental practices, and in a community health center. Dental patients 45 years and older who were not aware of their diabetic status underwent evaluation for diabetes risk with an American Diabetes Association Diabetes Risk Test and with hemoglobin (Hb) A1C measurement. (Participants with an HbA1c level of 5.7 percent or greater were referred to their physicians for diagnosis). Of the 1,022 patients screened, 416 (40.7 percent) had an HbA1c blood level of 5.7 percent or greater and were referred for diagnosis. The HbA1c and the American Diabetes Association Diabetes Risk Test were correlated. Of the 416 participants who were referred, 35.1 percent received a diagnosis from their physicians within one year; 78.8 percent of these patients were seen in the community health center and 21.4 percent were seen in private dental offices. The diagnoses were diabetes (12.3 percent of patients), high risk of developing diabetes (that is, prediabetes) (23.3 percent) and no diabetes (64.4 percent). The study results show that screening for prediabetes and diabetes is feasible in a dental office, with acceptance by the dentist and dental office staff members, patients' physicians, and patients. Patients from the community health center demonstrated good compliance with referrals to physicians; however, compliance was poor among those in the private dental offices.

Caries Susceptibility Tests

Rechmann et al. (2019) conducted a study to evaluate if readings using an adenosine triphosphate bioluminescence (ATP-B) meter (CariScreen Testing Meter, Oral BioTech) are significantly different for patients with low, moderate, and high caries risk assessed by the Caries Management by Risk Assessment Practice-Based Research Network study. Twenty practice-based research network dentists enrolled 460 patients; 271 returned for 2 or more semiannual follow-up visits over 2 years. Dentists were trained and calibrated to perform ATP-B testing and caries risk assessment (CRA) using established protocols. ATP-B readings were compared via CRA category (low, moderate, high). The results showed median ATP-B readings did not differ statistically significantly by clinician-assessed caries risk level. The authors concluded that ATP-B is poorly predictive of caries risk and future outcomes. CRA incorporates multiple risk factors, disease indicators and protective measures, and has superior predictive performance.

Gilbert et al (2014) Mutans streptococci (MS) are one of the major microbiological determinants of dental caries. The objectives of this study are to identify distinct MS and Non-MS Streptococci strains that are located at various sites and non-cariogenic enamel surfaces in children with severe early childhood caries (S-ECC), and assess if cariogenic MS and non-cariogenic streptococci might independently exist as primary bacterial strains on distinct sites within the dentition of individual children. Dental plaque from 20 children aged 3-6 with S-ECC was collected from carious lesions (CLs), white spot lesions (WSLs) and non-cariogenic enamel surfaces. Streptococcal isolates from each site were subjected to polymerase chain reaction (PCR) to identify MS, and arbitrarily primed-PCR for assignment of genetic strains. Primary strains were identified as $\geq 50\%$ of the total isolates surveyed at any site. In several cases, strains were characterized for acidity using ATP-driven bioluminescence and subjected to PCR-determination of potential MS virulence products. Identification of non-MS was determined by 16S rRNA gene sequencing. The results showed 64 independent MS or non-MS streptococcal strains identified. All children contained 1-6 strains. In 11 patients, single primary MS strains were identified throughout the dentition. In 4 patients, primary MS strains were identified within CLs that were distinct from primary strains found on enamel. Streptococcus gordonii strains were identified as primary strains on enamel or WSLs in four children, and in general were less acidic than MS strains. The authors concluded that many children with S-ECC

contained only a single primary MS strain that was present in both carious and non-carious sites. In some cases, MS, and non-cariogenic *S. gordonii* strains were found to independently exist as dominant strains at different locations within the dentition of individual children, and the acidic potential (using ATP-driven bioluminescence) of these strains may influence susceptibility in the development of CLs.

Hallett et al (2013) Conducted a study to evaluate a chairside caries risk assessment protocol utilizing a caries prediction instrument, adenosine triphosphate (ATP) activity in dental plaque, mutans streptococci (MS) culture, and routine dental examination in five- to 10-year-old children at two regional Australian schools with high caries experience. Clinical indicators for future caries were assessed at baseline examination using a standardized prediction instrument. Plaque ATP activity was measured directly in relative light units (RLU) using a bioluminescence meter, and MS culture data were recorded. Each child's dentition was examined clinically and radiographically, and caries experience was recorded using enamel white spot lesions and decayed, missing, and filled surfaces for primary and permanent teeth indices. Univariate one-way analysis of variance between selected clinical indicators, ATP activity, MS count at baseline, and future new caries activity was performed, and a generalized linear model for prediction of new caries activity at 24 months was constructed. The results showed future new caries activity was significantly associated with the presence of visible cavitations, reduced saliva flow, and orthodontic appliances at baseline ($R^2 = 0.2$, $p < .001$), but baseline plaque adenosine triphosphate activity and mutans streptococci counts were not significantly associated with caries activity at 24 months.

Fazilat et al (2010) The authors conducted a cross-sectional study to demonstrate the use of adenosine triphosphate (ATP) driven bioluminescence as an innovative tool for the rapid chairside enumeration of oral bacteria (including plaque streptococci) and assessment of oral hygiene and caries risk. Thirty-three pediatric patients (7- to 12-year-old males and females) were examined, and plaque specimens, in addition to stimulated saliva, were collected from representative teeth within each quadrant. Oral specimens ($n = 150$ specimens) were assessed by plating on enriched and selective agars, to enumerate total bacteria and streptococci, and subjected to adenosine triphosphate- (ATP-) driven bioluminescence determinations using a luciferase-based assay system. Statistical correlations, linking ATP values to numbers of total bacteria, oral streptococci and mutans streptococci, yielded highly significant r values of 0.854, 0.840, and 0.796, respectively. The authors concluded that ATP measurements have a strong statistical association with bacterial number in plaque and saliva specimens, including numbers for oral streptococci, and may be used as a potential assessment tool for oral hygiene and caries risk in children.

Adjunctive Pre-Diagnostic Testing

In a 2021 Cochrane Database Systematic Review, Walsh et al. conducted an extensive literature search to evaluate the diagnostic accuracy of tests for the detection of oral cancer and oral potentially malignant disorders (OPMD) in patients that present with clinically evident and innocuous lesions. The also sought to estimate the relative accuracy of the different tests. Testing evaluated included vital staining, oral cytology, light-based detection and oral spectroscopy, and blood or saliva analysis (that test for the biomarkers in blood or saliva). Sixty-three studies of 7,942 lesions were included, however no eligible diagnostic accuracy studies evaluating blood or salivary sample analysis were identified. All studies used a reference test of biopsy and histopathological examination. The results showed the following:

- 20 studies of vital staining (rinsing and use of a dye impregnated swab) : sensitivity (low certainty evidence) 0.86; specificity (very low certainty evidence) 0.68.
- 20 studies of oral cytology (use of a brush and scraping): sensitivity (moderate certainty evidence) 0.90; specificity (moderate certainty evidence) 0.94.
- 23 studies of light- based devices (autofluorescence, tissue reflectance and electric scattering spectroscopy): sensitivity (low-certainty evidence) 0.87; (very low-certainty evidence) specificity 0.50.
- 9 studies of combined tests (vital staining with light-based detection, vital staining with brush cytology, and a staining method combining wheat germ agglutinin fluorescein isothiocyanate: sensitivity (very low certainty evidence) 0.78; (very low certainty evidence) specificity 0.71.

The authors concluded that none of the adjunctive tests can be recommended as a replacement for the currently used standard of a surgical biopsy and histological assessment. Oral cytology has relatively high sensitivity and specificity and offers the most potential. Combined adjunctive tests involving cytology, and salivary and blood biomarkers warrant further research.

Nagi et al. (2016). In a systematic review, the authors evaluated the effectiveness of devices that utilize the principles of chemiluminescence and tissue autofluorescence as adjuncts in the detection of oral squamous cell carcinoma (OSCC) and oral potentially malignant disorders (OPMD). Relevant articles were found in PubMed [MEDLINE] and Science direct and were limited to articles published in English or with an English abstract, from January 2005 to April 2014. Clinical trials utilized ViziLite, Microlux TM/DL and Visual Enhanced Light scope (VELscope) for early detection of OPMD and OSCC.

Twenty primary studies published satisfied the criteria for selection, and 10 utilized chemiluminescence and 10 tissue autofluorescence. Sensitivity of ViziLite for detecting OSCC and OPMD ranged from 77.1 % to 100% and specificity was low and ranged from 0% to 27.8%. Most showed that chemiluminescence increases the brightness and margins of oral mucosal white lesions and thus assists in identification of mucosal lesions not considered under conventional visual examination. However, it preferentially detects leukoplakia and may fail to spot red patches. Clinical trials demonstrated that sensitivity of VELscope in detecting malignancy and OPMD ranged from 22 % to 100 % and specificity ranged from 16 % to 100%. Most studies concluded that VELscope can help the experienced clinician to find oral precursor malignant lesions. But it could not differentiate between dysplasia and benign inflammatory conditions. The authors concluded that while both devices are simple, non-invasive test of the oral mucosa, they are best suited for clinicians with sufficient experience and training. More clinical trials in future should be conducted to establish optical imaging as an efficacious adjunct tool in early diagnosis of OSCC and OPMD.

Chainani-Wu et al. (2015) conducted a cross-sectional, observational study to evaluate the assessment methods that predict the presence of higher-risk oral premalignant lesions or higher-risk areas within lesions. Patients diagnosed with oral leukoplakia, erythroleukoplakia, or erythroplakia were selected and visual oral examination, ViziLite[®] examination, toluidine blue staining (TBlue[®]), and a biopsy were completed in a single clinic visit. There were 77 of 100 examined lesions in 43 patients biopsied. Sensitivity, specificity, and positive and negative predictive values were computed for visual examination, ViziLite, and TBlue using biopsy results as the gold standard. The results showed the sensitivity of TBlue in detecting high-risk lesions (carcinoma in situ or carcinoma) was 94 (71-100, $p < 0.0003$) and specificity 45 (32-58, $p < 0.53$), while for carcinoma, sensitivity was 100 (54-100, $p < 0.032$) and specificity 39 (28-52, $p < 0.097$). The results of ViziLite[®] testing either by itself or in combination with the information from toluidine blue testing revealed low sensitivity for the detection of high-risk lesions. The authors concluded that clinical examination of leukoplakia, erythroplakia, or erythroleukoplakia lesions combined with toluidine blue staining may aid in the identification of severe dysplasia (carcinoma in situ) or carcinoma. This may help in determining whether, when, and where (the site within a lesion) a biopsy should be taken.

Chhabra et al. (2015) conducted an extensive literature review of the various diagnostic modalities available at for the detection of squamous cell carcinomas and oral epithelial dysplasias. An advanced PUBMED search from 1972 to present was conducted and selected based on the desired criteria of being non-invasive, highly specific, and sensitive, economically viable, having a scope to be used for mass screening, easy to process, having low inter examiner variability and possibly not requiring high expertise to conduct and interpret the results. After reviewing various diagnostic modalities, the authors concluded that toluidine blue staining emerges as a valuable adjunct to incisional biopsy in detection of oral cancer but may not substitute it except in certain circumstances when its results are carefully correlated with the patient history and clinical characteristics of the mucosal disorder (considering the fact that incisional biopsy has been reported to cause dissemination of cancer cells in the circulation there by increasing the possibility of metastasis). The authors emphasize that toluidine blue is a screening modality and not a diagnostic procedure like biopsy and hence cannot replace a confirmatory biopsy as a whole, and that more detailed studies with large study samples are needed to investigate the reliability of toluidine blue staining and other screening methods in detection of oral cancer.

To evaluate the effectiveness of devices that utilize the principles of chemiluminescence and tissue autofluorescence as adjuncts in the detection of oral cancer and oral potentially malignant disorders (OPMDs), Rashid et al. (2015) conducted a systematic review of the published literature to evaluate the effectiveness of the ViziLite and ViziLite Plus with toluidine blue, MicroLux[™]/DL and the VELscope[™]. Twenty-five primary studies published between 2004 and 2013 satisfied the criteria for selection - 13 utilized chemiluminescence and 12 tissue autofluorescence, and several had utilized both study methods on the same population. The results showed chemiluminescence shows good sensitivity at detecting any OPMDs and oral cancer. However, it preferentially detects leukoplakia and may fail to spot red patches. The additive use of toluidine blue may improve specificity. Tissue autofluorescence is sensitive at detecting white, red, and white and red patches, and the area of fluorescence visualization loss (FVL) often extends beyond the clinically visible lesion. However, in addition to OPMDs, VELScope may detect erythematous lesions of benign inflammation resulting in false-positive test results. The authors concluded that there is limited evidence for the use of these devices as a primary diagnostic tool. Additionally, they may be better suited to use by specialists in clinics in which there is a higher prevalence of disease, and where experienced clinicians may better discriminate between benign and malignant lesions.

Brush Biopsy

Datta et al. (2019) conducted a systematic review to assess the role of DNA-ICM (Image Cytometry) using samples from oral lesion brushing as an adjunct screening tool to differentiate high risk OPMLs from benign conditions and identify dysplasias at an increased risk of progression to malignancy. A total of 11 articles met the criteria. The studies were conducted in specialist hospitals or clinics based on community referrals for suspicious lesions in the mouth. None of the studies looked at the effectiveness of DNA-ICM as an adjunct screening tool in a community screening setting. None of the studies addressed whether DNA aneuploid OPMLs were more likely to show malignant transformation over time, and

none were longitudinal in design nor studied the lesions over time. The majority of the studies looked at the effectiveness of DNA-ICM in screening high risk OPMLs or differentiating malignant lesions from low risk or benign lesions. There was a wide variety of sensitivity and specificity when differentiating between high-risk and low-risk lesions which can be attributed to a lack of standardized DNA-ICM protocols, and definitions of high and low risk lesions and poor study designs. The authors concluded that due to significant limitations, there is poor evidence that these adjunctive tools are successful as an oral cancer screening tool. Studies with large sample sizes that follow established DNA quantification protocols for oral brushings are required before these adjuncts can be incorporated for routine use.

Kujan et al. (2019) conducted a study to investigate the feasibility of using oral liquid-based brush cytology (OLBC) coupled with immunocytochemistry as a minimally invasive approach to stratify the cancer risk in patients with oral leukoplakia. Fifty-five patients diagnosed with either oral leukoplakia (OLK) or oral squamous cell carcinomas (OSCC) were recruited. All patients underwent oral brush biopsy followed by surgical biopsy. 275 liquid-based cytology preparations were made. Pap-stained OLBC slides were assessed using the modified 2014 Bethesda Cytology system. The expression of CDK4, CDK6, cyclin D1, and Notch 1 was immunocytochemically analyzed and compared against the histopathological diagnosis. A combined index score of OLBC grading and protein expression was calculated. The results showed a significant association between the definitive histopathological diagnosis and the cytological interpretation ($p = 0.0005$). The index scores of CDK4, CDK6, and cyclin D1 were significantly associated with the development of disease from non-dysplastic epithelium to OSCC. No significant association was observed between the Notch 1 index score and disease stage. The diagnostic accuracy of OLBC showed the highest values of sensitivity, specificity, positive predictive value, negative predictive value, and accuracy: 84.6%, 70.4%, 73.3%, 82.6%, and 78.8%, respectively, compared with the cumulative protein index, CDK4/6 index, and the combined OLBC grading and CDK4/6 index. This study has also demonstrated the efficacy of the use of OLBC in the detection of OED and OSCC, and showed that the use of CDK4, CDK6, cyclin D1, and Notch 1 immunocytochemistry failed to improve the diagnostic accuracy of OLBC suggesting they are not useful in the early detection of OSCC.

H Alsarraf et al. (2018) conducted a systematic review to analyze the published evidence for the use of oral brush cytology for the early detection of oral cancer and oral potentially malignant disorders (OPMDs). The inclusion criteria involved studies assessing the utility of oral brush cytology on human tissues and its applications in the diagnosis, screening, or surveillance of oral cancer or OPMDs. 36 studies met the inclusion criteria, and a total of 4302 samples from OPMDs, oral squamous cell carcinoma, and healthy controls were investigated. Baby toothbrush, cytobrush, OralCDx[®], and Orcellex[®] are the brushes that were used to obtain transepithelial mucosal samples for conventional and liquid-based cytology evaluation. Findings from this study indicate that meaningful evidence-based recommendations for the implementation of a minimally invasive technique to be utilized as an adjunctive tool for screening and early detection of oral cancer and OPMDs are complicated from the reported studies in the literature. The authors concluded there is need for well-designed clinical studies to assess the accuracy of oral brush cytology utilizing validated cytological assessment criteria for the diagnosis and prediction of OPMDs.

Clinical Practice Guidelines

American Dental Association (ADA)

In a 2020 policy on Public Health Emergencies, the ADA supported the temporary expansion of scope of practice for dentists who choose to participate for the following during declared local, state, or federal public health emergencies:

- Administering critical vaccines.
- Perform FDA-authorized diagnostic tests to screen patients for infectious diseases.
- Taking patient medical histories and triaging medical patients.
- Perform other ancillary medical procedures and activities, as requested by medical personnel, to expand the nation's surge capacity.

The 2017 Evidence-Based Clinical Practice Guideline for the Evaluation of Potentially Malignant Disorders in the Oral Cavity states that no available adjuncts demonstrated sufficient diagnostic test accuracy to support their routine use as triage tools during the evaluation of lesions in the oral cavity. For patients seeking care for suspicious lesions, immediate performance of a biopsy or referral to a specialist remains the single most important recommendation for clinical practice. In exceptional cases, when patients decline a biopsy or live in rural areas with limited access to care, the panel suggested that cytologic testing may be used to initiate the diagnostic process until a biopsy can be performed.

- The panel does not recommend autofluorescence, tissue reflectance, or vital staining adjuncts for the evaluation of potentially malignant disorders among adult patients with clinically evident, seemingly innocuous, or suspicious lesions.
- The panel does not recommend cytologic adjuncts for the evaluation of potentially malignant disorders among adult patients with clinically evident, seemingly innocuous, or suspicious lesions. Should a patient decline the

clinician's recommendation for performing a biopsy of the lesion or referral to a specialist, the clinician can use a cytologic adjunct to provide additional lesion assessment.

- A positive or atypical cytologic test result reinforces the need for a biopsy or referral.
- A negative cytologic test result indicates the need for periodic follow-up of the patient. If the clinician detects persistence or progression of the lesion, immediately performing a biopsy of the lesion or referral to a specialist is indicated.
- The panel does not recommend autofluorescence, tissue reflectance, or vital staining adjuncts for the evaluation of potentially malignant disorders among adult patients with clinically evident, seemingly innocuous, or suspicious lesions.
- The panel suggests that for adult patients with no clinically evident lesions or symptoms, no further action is necessary at that time.
- The panel does not recommend commercially available salivary adjuncts for the evaluation of potentially malignant disorders among adult patients with or without clinically evident, seemingly innocuous, or suspicious lesions and their use should be considered only in the context of research.

American Diabetes Association (ADA)

American Diabetes Association Standards of Medical Care in Diabetes 2024:

- Because periodontal disease is associated with diabetes, the utility of chairside screening and referral to primary care as a means to improve the diagnosis of prediabetes and diabetes has been explored, with one study estimating that 30% of patients 30 years of age and older seen in general dental practices had dysglycemia. Further research is needed to demonstrate the feasibility, effectiveness, and cost-effectiveness of screening in this setting.
- Components of the comprehensive diabetes medical evaluation should include screening for the presence of dental diseases and referrals to a dentist for comprehensive dental and periodontal examination.

National Comprehensive Cancer Network (NCCN)

In the 2024 practice guideline for head and neck cancers, the NCCN recommends biopsy for initial diagnosis and staging. Brush biopsies are not mentioned.

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

There are a number of caries detection devices that use fluorescence. Refer to the following website and search by product name or product code NBL: <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmnmn.cfm>. (Accessed October 28, 2024)

For testing of microorganisms, according to the Office of In Vitro Diagnostics and Radiological Health (OIR), non-selective and differential culture media testing devices are considered to be Class I devices, and are exempted from the premarket notification requirement, and do not require FDA clearance before marketing in the U.S.; however, these manufacturers are required to register their establishment. Refer to the following website for additional information:

<https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpcd/classification.cfm?id=jsh>.

(Accessed October 28, 2024)

Examples of adjunctive diagnostic devices used to detect mucosal abnormalities include Vizilite®, VELscope®, and Identafi®. Refer to the following website and search for additional products using Product Code EAZ:

<https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmnmn.cfm>. (Accessed October 28, 2024)

Orcellex® and OralCDX® are examples of brush biopsy devices. These are Class I devices and exempt from premarket notification requirement and do not require FDA clearance before marketing in the U.S.; however, these manufacturers are required to register their establishment. Refer to the following website and search for Product Code GEE:

<https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfRL/rl.cfm>. (Accessed October 28, 2024)

References

American Academy of Pediatric Dentistry Guideline on Caries-risk Assessment and Management for Infants, Children, and Adolescents Council on Clinical Affairs Committee. Adopted 2002. Revised 2022.

American Dental Association (ADA). Evaluation of Potentially Malignant Disorders of the Oral Cavity Clinical Practice Guideline. 2017.

American Dental Association (ADA). Public Health Emergencies. 2020. Available at: <https://www.ada.org/about/governance/current-policies#publichealthemergencies>. Accessed October 28, 2024.

American Dental Association (ADA) Glossary of Clinical and Administrative Terms.

American Diabetes Association Standards of Medical Care in Diabetes 2024.

American Diabetes Association Classification and Diagnosis of Diabetes. Standards of Medical Care in Diabetes. 2022.

Berman L, Rotstein I. Cohen's Pathways of the Pulp, 11th ed. St. Louis: Elsevier c2016. Chapter 1, Diagnosis; p. 2-32.

Chainani-Wu N, Madden E, Cox D, et al. Toluidine blue aids in detection of dysplasia and carcinoma in suspicious oral lesions. Oral Dis. 2015 Oct; 21(7):879-85.

Chhabra N, Chhabra S, Sapra N. Diagnostic modalities for squamous cell carcinoma: an extensive review of literature-considering toluidine blue as a useful adjunct. J Maxillofac Oral Surg. 2015 Jun;14(2):188-200.

Chinnasamy A, Moodie M. Prevalence of undiagnosed diabetes and prediabetes in the dental setting: A systematic review and meta-analysis. Int J Dent. 2020 Aug 25;2020:2964020.

Datta M, Laronde D, Palcic B, et al. The role of DNA image cytometry in screening oral potentially malignant lesions using brushings: A systematic review. Oral Oncol. 2019 Sep;96:51-59.

Eidson S, Shugars D. Sturdevant's Art and Science of Operative Dentistry, 6th ed. St. Louis: Mosby c2013. Chapter 3, Patient Assessment, Examination and Diagnosis, and Treatment Planning; p.104.

Fazilat S, Sauerwein R, McLeod J, et al. Application of adenosine triphosphate-driven bioluminescence for quantification of plaque bacteria and assessment of oral hygiene in children. Pediatr Dent. 2010 May-Jun; 32(3):195-204.

Genco RJ, Schifferle RE, Dunford RG, et al. Screening for diabetes mellitus in dental practices: a field trial. J Am Dent Assoc. 2014 Jan; 145(1):57-64.

Gilbert K, Joseph R, Vo A, et al. Children with severe early childhood caries: streptococci genetic strains within carious and white spot lesions. J Oral Microbiol. 2014 Oct 29. Hallett KB, O'Rourke PK. Baseline dental plaque activity, mutans streptococci culture, and future caries experience in children. Pediatr Dent. 2013; 35(7):523-8.

H Alsarraf A, Kujan O, Farah CS. The utility of oral brush cytology in the early detection of oral cancer and oral potentially malignant disorders: A systematic review. J Oral Pathol Med. 2018 Feb;47(2):104-116.

Kujan O, Huang G, Ravindran A, et al. CDK4, CDK6, cyclin D1 and Notch1 immunocytochemical expression of oral brush liquid-based cytology for the diagnosis of oral leukoplakia and oral cancer. J Oral Pathol Med. 2019 Jun 7.

Lalla E, Cheng B, Kunzel C, et al. Six-month outcomes in dental patients identified with hyperglycaemia: a randomized clinical trial. J Clin Periodontol. 2015 Mar; 42(3):228-35.

Mataftsi M, Koukos G, Sakellari D. Prevalence of undiagnosed diabetes and pre-diabetes in chronic periodontitis patients assessed by an HbA1c chairside screening protocol. Clin Oral Investig. 2019 Apr 9.

National Comprehensive Cancer Network (NCCN) Clinical Practice Guidelines in Oncology: Head and Neck Cancers. Version 5. 2024. October 24, 2024.

Nagi R, Reddy-Kantharaj YB, Rakesh N, et al. Efficacy of light based detection systems for early detection of oral cancer and oral potentially malignant disorders: Systematic review. Med Oral Patol Oral Cir Bucal. 2016 Jul 1; 21(4).D72.

Rashid A, Warnakulasuriya S. The use of light-based (optical) detection systems as adjuncts in the detection of oral cancer and oral potentially malignant disorders: a systematic review. J Oral Pathol Med. 2015 May; 44(5):307-28.

Rechmann P, Chaffee BW, Rechmann BMT, et al. Efficacy of an adenosine triphosphate meter for evaluating caries risk in clinical dental practice. J Am Dent Assoc. 2019 Oct;150(10):873-882.

Rethman MP, Carpenter W, Cohen EE, et al; American Dental Association Council on Scientific Affairs Expert Panel on Screening for Oral Squamous Cell Carcinomas. Evidence-based clinical recommendations regarding screening for oral squamous cell carcinomas. J Am Dent Assoc. 2010 May; 141(5):509-20.

Teeuw WJ, Kosho MX, Poland DC, et al. Periodontitis as a possible early sign of diabetes mellitus. BMJ Open Diabetes Res Care. 2017 Jan 19; 5(1):e000326.

U.S. Department of Health and Human Services. Fact Sheet: End of the COVID-19 Public Health Emergency. May 9, 2023. Available at: <https://www.hhs.gov/about/news/2023/05/09/fact-sheet-end-of-the-covid-19-public-health-emergency.html#:~:text=At%20the%20end%20of%20the%20COVID%2D19%20PHE%20on%20May,19%20Vaccination%20Program%20Provider%20Agreement.> Accessed October 28, 2024.

Walsh T, Macey R, Kerr AR, et al. Diagnostic tests for oral cancer and potentially malignant disorders in patients presenting with clinically evident lesions. Cochrane Database Syst Rev. 2021 Jul 20;7(7):CD010276.

World Health Organization. (2020). Naming the coronavirus disease (COVID-19) and the virus that causes it. [https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-\(covid-2019\)-and-the-virus-that-causes-it](https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/naming-the-coronavirus-disease-(covid-2019)-and-the-virus-that-causes-it). Accessed October 28, 2024.

Policy History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.

Non-Ionizing Diagnostic Procedures

Policy Number: DCP041.10
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
129. Coverage Rationale	164
130. Applicable Codes	164
131. Description of Services	164
132. Clinical Evidence	164
133. U.S. Food and Drug Administration	166
134. References	166
135. Policy History/Revision Information	167
136. Instructions for Use	167

Related Dental Policies
None

Coverage Rationale

Non-ionizing diagnostic procedures using any device are not indicated for definitive caries diagnosis due to insufficient evidence of efficacy.

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D0600	Non-ionizing diagnostic procedure capable of quantifying, monitoring, and recording changes in structure of enamel, dentin, and cementum

CDT® is a registered trademark of the American Dental Association

Description of Services

Non-ionizing diagnostic procedures refer to the use of devices to record changes in tooth structures to detect caries before it can be diagnosed clinically or radiographically. There are several such devices currently on the market for use by dental practitioners. These include lasers that cause fluorescence of the mineral structure of the tooth, transillumination to see through the enamel, and near -infrared devices. These may be used as an adjunctive tool by the dental provider to identify high caries risk areas and develop prevention strategies, as well as create non-invasive treatment plans for remineralization before caries begins. Visual, tactile, and radiographic examinations remain the standard diagnostic methods for diagnosing active caries.

Clinical Evidence

Shaan, (2023) conducted a study to compare the diagnostic accuracy of the DIAGNOdent laser fluorescence device (KaVo USA) to the International Caries Detection and Assessment System-II (ICDAS-II) in the detection of facial, smooth surface noncavitated carious lesions. Sixty patients with non cavitated, white spot lesions and 32 sound teeth were included. All areas were examined by 2 calibrated examiners separately. The results showed that the DIAGNOdent had

an overall accuracy of 84.45% on teeth with an ICDAS score of 0. When the ICDAS score was 1 (first visual change in enamel) the DIAGNOdent had an accuracy of 74.15%, and accuracy was 100% when there were distinct visual changes in enamel. The authors concluded that DIAGNOdent shows overall equivalence to visual examination and could be used as an adjunct for caries detection.

In a 2021 systematic review and meta-analysis, Foros et al. appraised the evidence of 51 studies regarding the performance of various means of detection of incipient caries in permanent and primary teeth. For permanent teeth, when histologic examination was considered as the reference for occlusal surfaces, the sensitivity (Se) range appeared high for the DIAGNOdent Pen (DD Pen) at 0.81-0.89, followed by The International Caries Detection and Assessment System (ICDAS-II) at 0.62-1, DIAGNOdent (DD) at 0.48-1, and bitewing radiography (BW) at 0-0.29. The corresponding specificity (Sp) range was: DD Pen 0.71-0.8, ICDAS-II 0.5-0.84, DD 0.54-1, and BW 0.96-1. When operative intervention served as the reference for occlusal surfaces, again, the DD means valued the most promising results on Se: DD 0.7-0.96 and DD Pen 0.55-0.90, followed by ICDAS-II 0.25-0.93, and BW 0-0.83. The Sp range was: DD 0.54-1, DD Pen 0.71-1, ICDAS-II 0.44-1, and BW 0.6-1. For interproximal surfaces, the Se was: BW 0.75-0.83, DD Pen 0.6, and ICDAS-II 0.54; the Sp was: BW 0.6-0.9, DD Pen 0.2, and ICDAS-II 1. For primary teeth, under the reference of histologic assessment, the Se range for occlusal surfaces was: DD 0.55-1, DD Pen 0.63-1, ICDAS-II 0.42-1, and BW 0.31-0.96; the respective Sp was: DD 0.5-1, DD Pen 0.44-1, ICDAS-II 0.61-1, and BW 0.79-0.98. For approximal surfaces, the Se range was: DD Pen 0.58-0.63, ICDAS-II 0.42-0.55, and BW 0.14-0.71. The corresponding Sp range was: DD Pen 0.85-0.87, ICDAS-II 0.73-0.93, and BW 0.79-0.98. Se and Sp values varied, due to the heterogeneity regarding the setting of individual studies. The authors concluded that robust conclusions cannot be drawn, and different diagnostic means should be used as adjuncts to clinical examination. In permanent teeth, visual examination may be enhanced by DD on occlusal surfaces and BW on interproximal surfaces. In primary teeth, DD Pen may serve as a supplementary tool across all surfaces.

Jaafar et al. (2020) evaluated and compared the diagnostic performance of the DIAGNOdent Pen (DP) and The Canary System (CS) for the assessment and monitoring of occlusal enamel caries under fissure sealants placed on young permanent teeth. A total of 90 permanent teeth were examined using a visual examination method (ICDAS), a quantitative light-induced fluorescence (DP), and a photothermal radiometry (CS). Teeth were randomly divided into two groups based on the type of fissure sealants: a resin sealant and a glass-ionomer sealant. Sealants were placed over the study sites, and caries assessment was performed with each caries detection method at 3- and 6-month recall appointments. The results showed that the CS and DP were able to distinguish between sound and carious tissue beneath fully and partially retained sealants at 6-month follow-up with an accuracy of 46.7% and 33.4%, respectively. The authors concluded that the diagnostic performance of the CS and DP are acceptable and can be considered as useful adjunct tools in the clinical evaluation and monitoring the changes in enamel due to lesion progression under fissure sealants. However, in the clinical setting, sensitivity and specificity of these devices may be influenced by the sealant type, thickness, retention, and the differences in the lesion characteristics over time.

Makhija et al. (2018) evaluated whether using a device changed the percentage of suspicious occlusal carious lesions (SOCLs) that were opened surgically and, among those SOCLs that were opened, the proportion that had penetrated into dentin. Eighty-two dentists participated with a total of 1,500 SOCLs. Phase 1 of the study included dentists that obtained patient consent and recorded information about the lesion, treatment or treatments, and depth (if opened). The dentists were then randomly assigned to one of three groups: no device, DIAGNOdent (KaVo), and Spectra (Air Techniques). In phase 2 of the study, dentists enrolled approximately twenty additional patients and recorded the same phase 1 information while using the assigned device to help make their treatment decisions. After randomization, a mixed-model logistic regression was used to determine any differences in the proportion of lesions opened and, if opened, the proportion of lesions that penetrated into dentin. The authors concluded there was no statistically significant difference found in the change in proportion of lesions receiving invasive treatment from phase 1 to phase 2 across the 3 groups ($P = .33$) or in the change in proportion of percentage of opened lesions that extended into dentin ($P = .31$). It was determined the caries-detecting devices tested may not improve dentists' clinical decision making for SOCLs. Limitations included real world clinical practice and therefore no attempt was made to standardize or calibrate the diagnosis or treatment. Additional limitations were years since graduation for dentists and age of the patients.

Mansour et al (2016) compared the results of screening for coronal dental caries in a general dental practice using clinical observations, radiographs, laser fluorescence (DIAGNOdent™) (LF), and optical coherence tomography (OCT). Forty patients with > 1 coronal carious lesion as determined by prescreening using clinical examination and radiographs were enrolled in this study. Subjects with gross caries were excluded. Subsequently each patient underwent a full detailed dental examination by an experienced clinician, using visual examination and radiographs according to standard clinical practice. The coronal surfaces of a total of 932 teeth were examined and charted. Teeth were then photographed, re-diagnosed using the LF system, and imaged using OCT. Two blinded pre-standardized examiners reviewed radiographic and OCT images and assigned caries status. The findings support the usefulness of LF for primary caries detection, and the clinical utility of OCT for early caries detection and monitoring under dental resin restorations and sealants.

Bahrololoomi et al (2015) compared the efficacy of three diagnostic methods, bitewing radiography, laser fluorescence (DIAGNOdent), and visual examination in diagnosing incipient occlusal caries of permanent first molars. In this diagnostic cross-sectional study, 109 permanent first molar teeth of 31 patients aged 7-13 years were examined visually, on bitewing radiographs, and using DIAGNOdent. Scoring of visual and radiographic examinations was based on Ekstrand's classification. Visual examination after pit and fissure opening served as the gold standard. The results identified visual examination as the first choice for diagnosis of incipient caries. In suspicious cases, radiography, and laser DIAGNOdent can be used as adjunct procedures.

Herzog et al (2015) assessed the feasibility and ease of use of the Canary System in approximal carious lesion detection in primary molars in this study. Forty healthy five- to 12-year-olds, who presented to the Center for Pediatric Dentistry in Seattle, Wash., U.S.A., for initial or recall exams, were enrolled. Participants had one to two primary molars, with or without approximal radiographic radiolucency's. Four Canary System scans were performed at the approximal area of each study tooth. The maximum Canary number of the four scans was compared to bitewing radiographs. Seventy-five teeth were included in the final analysis. The overall sensitivity and specificity of the Canary System, when compared to bitewing radiographs, was 81 percent and 35 percent, respectively. Among teeth without radiographic radiolucency's, the Canary System identified 65 percent (31 of 48) of study teeth as having carious lesions. It was concluded the Canary System is a safe approximal caries detection device in five- to 12-year-olds. When compared to bitewing radiographs, the specificity of the Canary System for approximal carious lesion detection in primary molars was low. However, this could indicate that the Canary System is detecting lesions earlier than radiographs.

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

Laser Fluorescence Technology

A laser fluorescence caries detection device is a laser, a fluorescence detector housed in a dental handpiece, and a control console that performs device calibration, as well as variable tone emitting and fluorescence measurement functions. The intended use of the device is to aid in the detection of tooth decay by measuring increased laser induced fluorescence.

Examples of laser fluorescence technology include, but are not limited to the following:

- DIAGNOdent®
- DIAGNOdent 2190 with Periodontal Probe®
- The Canary System®
- CarieScan PRO

Transillumination Technology

Transillumination uses non-ionizing radiation and is thought to be more sensitive to early demineralization than dental radiography.

Examples of transillumination technology include, but are not limited to the following:

- Dexis CariVu™
- Ti2200 Transillumination Cable
- DIAGNOcam 2170
- D-Carie

Information regarding non- ionizing diagnostic devices can be found by searching by device name or Product Code NBL at: <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm>. (Accessed October 29, 2024)

References

American Dental Association (ADA) CDT 2025 Dental Procedure Code Book.

Ari T, Ari N. The Performance of ICDAS-II Using Low-Powered Magnification with Light-Emitting Diode Headlight and Alternating Current Impedance Spectroscopy Device for Detection of Occlusal Caries on Primary Molars. ISRN Dent. 2013 Jul14; 2013:276070.

Bahrololoomi Z, Ezoddini F, Halvani N. Comparison of Radiography, Laser Fluorescence and Visual Examination for Diagnosing Incipient Occlusal Caries of Permanent First Molars. J Dent (Tehran). 2015 May; 12(5):324-32.

Foros P, Oikonomou E, Koletsi D, Rahiotis C. Detection Methods for Early Caries Diagnosis: A Systematic Review and Meta-Analysis. Caries Res. 2021;55(4):247-259.

Herzog K, D'Elia M, Kim A, et al. Pilot Study of the Canary System Use in the Diagnosis of Approximal Carious Lesions in Primary Molars. Pediatr Dent. 2015 Nov-Dec;37(7):525-9.

Jaafar N, Ragab H, Abedrahman A, et al. An In Vivo Investigation of Diagnostic Performance of DIAGNOdent Pen and the Canary System for Assessment and Monitoring Enamel Caries under Fissure Sealants. J Int Soc Prev Community Dent. 2020 Jun 15;10(3):246-254.

Makhija SK, Bader JD, Shugars DA, et al.; National Dental Practice-Based Research Network (PBRN) Collaborative Group. Influence of 2 caries-detecting devices on clinical decision making and lesion depth for suspicious occlusal lesions: A randomized trial from The National Dental Practice-Based Research Network. J Am Dent Assoc. 2018 Apr;149(4):299-307.e1.

Mansour S, Ajdaharian J, Nabelsi T, et al. Comparison of caries diagnostic modalities: A clinical study in 40 subjects. Lasers Surg Med. 2016 Mar 21.

Shaalan OO. DIAGNOdent versus International Caries Detection and Assessment System in detection of incipient carious lesions: A diagnostic accuracy study. J Conserv Dent. 2023 Mar-Apr;26(2):199-206.

Policy History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.

Non-Surgical Endodontics

Guideline Number: DCG009.11
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
137. Coverage Rationale	168
138. Definitions	170
139. Applicable Codes	170
140. Description of Services	171
141. References	171
142. Guideline History/Revision Information	172
143. Instructions for Use	172

Related Dental Policy

- Surgical Endodontics

Coverage Rationale

Vital Pulp Therapy

Direct Pulp Cap

Direct Pulp Capping is indicated for permanent teeth for the following:

- Tooth has a vital pulp or been diagnosed with reversible pulpitis
- All caries has been removed
- Mechanical exposure of a clinically vital and asymptomatic pulp occurs
- If bleeding can be controlled at the site of exposure

Indirect Pulp Cap

Indirect Pulp Capping is indicated for primary teeth or permanent teeth with immature apices for the following:

- Tooth has a vital pulp or been diagnosed with reversible pulpitis
- Tooth has a deep carious lesion that is considered likely to result in pulp exposure during excavation

Therapeutic Pulpotomy

Therapeutic Pulpotomy is indicated for the following:

- Exposed vital pulps or irreversible pulpitis of primary teeth where there is a reasonable period of retention expected (approximately one year)
- As an emergency procedure in permanent teeth until root canal treatment can be accomplished
- As an interim procedure for permanent teeth with immature root formation to allow continued root development

Therapeutic Pulpotomy is not indicated for the following:

- Primary teeth with insufficient root structure, internal resorption, furcal Perforation or periradicular pathosis that may jeopardize the permanent successor
- Removal of pulp apical to the dentinocemental junction

Partial Pulpotomy for Apexogenesis

A partial pulpotomy for Apexogenesis is indicated for the following:

- In a young permanent tooth for a carious pulp exposure
- A vital tooth, with a diagnosis of normal pulp or reversible pulpitis

Apexification/Recalcification

Apexification/Recalcification is indicated for the following:

- Incomplete apical closure in a permanent tooth root
- External root resorption or when the possibility of external root resorption exists
- Necrotic pulp, irreversible pulpitis, or periapical lesion
- For prevention or arrest of resorption
- Perforations or root fractures that do not communicate with oral cavity

Apexification/Recalcification is not indicated for the following:

- Tooth with a completely closed apex
- If patient compliance or long term follow up may be questionable

Regenerative Endodontics

Pulpal Regeneration is indicated for the following:

- Permanent tooth with immature apex
- Necrotic pulp

Pulpal Regeneration is not indicated for the following:

- If the pulp space would be needed for final restoration
- When the tooth is not restorable

Non-Vital Pulp Therapy

Pulpal Debridement (Pulpectomy)

Pulpal Debridement (Pulpectomy) is indicated for the following:

- A restorable permanent tooth with irreversible pulpitis or a necrotic pulp in which the root is apexified
- The relief of acute pain prior to complete root canal therapy
- A primary tooth, where there is a reasonable period of retention expected (approximately one year)

Pulpal Debridement (Pulpectomy) is not indicated as definitive endodontic therapy.

Pulpal Therapy (Resorbable Filling) – Primary Teeth

Pulpal therapy for primary teeth is indicated for the following:

- A restorable primary tooth with irreversible pulpitis or a necrotic pulp in which the root is apexified
- The prognosis for keeping the tooth is up to one year and the tooth root lies in at least 25% bone

Endodontic Therapy

Endodontic therapy is indicated for the following:

- A restorable, mature, completely developed permanent or primary tooth with irreversible pulpitis, necrotic pulp, or frank vital pulpal exposure
- Teeth with radiographic periapical pathology
- Primary teeth without a permanent successor
- When needed for prosthetic rehabilitation

Endodontic therapy is not indicated for the following:

- Teeth with a poor long-term prognosis
- Teeth with inadequate bone support or advanced or untreated periodontal disease
- Teeth with incompletely formed root apices

Treatment of Root Canal Obstruction: Non-Surgical Access

Treatment of a root canal obstruction is indicated for the following:

- Biological obstructions
- Iatrogenic ledges
- Separated files or other instruments
- Complete calcification of 50% or more of root length

Incomplete Endodontic Therapy

The inability to complete endodontic therapy may occur if, during treatment, it becomes apparent that access is not possible, the tooth will not be able to be restored, or the tooth fractures.

Internal Root Repair of Perforation Defects

Internal root repair of Perforation defects is indicated for the following:

- There is a root Perforation caused by pathology such as resorption or decay
- A communication exists between the pulp space and external root surface as a result of internal root resorption

Internal root repair of Perforation defects is not indicated for the following:

- Teeth that are considered non-restorable
- Teeth with inadequate bone support or advanced untreated periodontal disease

Retreatment of Previous Root Canal Therapy

Retreatment of previous root canal therapy is indicated for the following:

- Canal fill appears to extend to a point shorter than 2millimeters from the apex, or extends significantly beyond the apex
- Fill appears to be incomplete
- Tooth is sensitive to pressure and percussion or other subjective symptoms
- Placement of a post has the potential to compromise the existing obturation or apical seal of the canal system

Definitions

Apexogenesis: The vital pulp therapy performed to encourage continued physiological formation and development of the tooth root. (ADA)

Direct Pulp Cap: A procedure in which the exposed vital pulp is treated with a therapeutic material, followed with a base and restoration, to promote healing and maintain pulp vitality. (ADA)

Endodontics: The branch of dentistry which is concerned with the morphology, physiology, and pathology of the human dental pulp and periradicular tissues. Its study and practice encompass the basic and clinical sciences including biology of the normal pulp, the etiology, diagnosis, prevention and treatment of diseases and injuries of the pulp and associated periradicular conditions. (ADA)

Indirect Pulp Cap: A procedure in which the nearly exposed pulp is covered with a protective dressing to protect the pulp from additional injury and to promote healing and repair via formation of secondary dentin. (ADA)

Perforation: The mechanical or pathologic communication between the root canal system and the external tooth surface. (AAE)

Pulpal Debridement (Pulpectomy): The complete removal of vital and non-vital pulp tissue from the root canal space. (ADA)

Regenerative Endodontics: Biologically based procedures designed to physiologically replace damaged tooth structures, including dentin and root structures, as well as cells of the pulp-dentin complex. (AAE)

Recalcification: A procedure used to encourage biologic root repair of external and internal resorption defects. (ADA)

(Therapeutic) Pulpotomy: The removal of a portion of the pulp, including the diseased aspect, with the intent of maintaining the vitality of the remaining pulpal tissue by means of a therapeutic dressing. (ADA)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D3110	Pulp cap – direct (excluding final restoration)

CDT Code	Description
D3120	Pulp cap – indirect (excluding final restoration)
D3220	Therapeutic pulpotomy (excluding final restoration) – removal of pulp coronal to the dentinocemental junction and application of medicament
D3221	Pulpal debridement, primary and permanent teeth
D3222	Partial pulpotomy for apexogenesis – permanent tooth with incomplete root development
D3230	Pulpal therapy (resorbable filling) – anterior, primary tooth (excluding final restoration)
D3240	Pulpal therapy (resorbable filling) – posterior, primary tooth (excluding final restoration)
D3310	Endodontic therapy, anterior tooth (excluding final restoration)
D3320	Endodontic therapy, premolar tooth (excluding final restoration)
D3330	Endodontic therapy, molar tooth (excluding final restoration)
D3331	Treatment of root canal obstruction; non-surgical access
D3332	Incomplete endodontic therapy; inoperable, unrestorable or fractured tooth
D3333	Internal root repair of perforation defects
D3346	Retreatment of previous root canal therapy – anterior
D3347	Retreatment of previous root canal therapy – premolar
D3348	Retreatment of previous root canal therapy – molar
D3351	Apexification/recalcification – initial visit (apical closure/calcific repair of perforations, root resorption, etc.)
D3352	Apexification/recalcification – interim medication visit (apical closure/calcific repair of perforations, root resorption, pulp space disinfection, etc.)
D3353	Apexification/recalcification – final visit (includes completed root canal therapy – apical closure/calcific repair of perforations, root resorption, etc.)
D3355	Pulpal regeneration – initial visit
D3356	Pulpal regeneration – interim medicament replacement
D3357	Pulpal regeneration – completion of treatment
D3911	Intraorofice barrier
D3921	Decoronation or submergence of an erupted tooth

CDT® is a registered trademark of the American Dental Association

Description of Services

Non-surgical endodontic treatment is the use of biologically acceptable chemical and mechanical treatments of the root canal system to promote healing and repair of the periradicular tissues. Additional surgical procedures may be required to remove posts and manage canal obstructions, radicular defects, aberrant canal morphology, ledges, or perforations. Intra-operative radiographs, intraorofice barriers, decoronation and submergence of endodontically treated teeth, and all appointments necessary to complete an endodontic procedure are inclusive.

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

References

- American Academy on Pediatric Dentistry Council on Clinical Affairs. Guideline on pulp therapy for primary and immature permanent teeth. 2014. Revised 2020.
- American Association of Endodontists Glossary of Endodontic Terms, 9th edition, 2019.
- American Association of Endodontists Guide to Clinical Endodontics, 6th edition, updated 2013.
- American Association of Endodontists. Endodontics Colleagues for Excellence, Spring 2013b.
- American Dental Association (ADA) CDT Codebook 2024.
- American Dental Association (ADA) Glossary of Clinical and Administrative Terms.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Non-Surgical Extractions

Guideline Number: DCG022.11
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
144. Coverage Rationale	173
145. Definitions	173
146. Applicable Codes	173
147. Description of Services	174
148. References	174
149. Guideline History/Revision Information	174
150. Instructions for Use	174

Related Dental Policies

- Surgical Extraction of Erupted Teeth and Retained Roots
- Surgical Extraction of Impacted Teeth

Coverage Rationale

Non-Surgical Extractions

Non-surgical **Extractions** are indicated for the following:

- For non-restorable teeth
- Failed endodontics
- For teeth with a poor prognosis
- Supernumerary teeth
- Crowding/nonfunctional teeth
- Orthodontic considerations
- For primary teeth that are interfering with the eruption of permanent teeth
- When a tooth is interfering with planned prosthodontics

Definitions

Extraction: The process or act of removing a tooth or tooth parts. (ADA)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D7111	Extraction, coronal remnants – primary tooth
D7140	Extraction, erupted tooth or exposed root (elevation and/or forceps removal)

CDT® is a registered trademark of the American Dental Association

Description of Services

Non-surgical Extractions are performed for erupted teeth. Instruments are used to separate the periodontium from the tooth to remove it from its position in the jaw. This procedure includes routine removal of tooth structure, minor smoothing of the socket, and sutures if indicated.

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

References

American Dental Association (ADA) CDT Codebook 2025.

American Dental Association (ADA). Glossary of Dental Clinical and Administration Terms.

Clinical Affairs Committee, American Academy of Pediatric Dentistry. Guideline on Management Considerations for Pediatric Oral Surgery and Oral Pathology. *Pediatric Dentistry* 2015 Sep-Oct; 37(5):85-94.

Uppgaard R. Atlas of Oral and Maxillofacial Surgery, Second Edition. Philadelphia: Elsevier c2023. Chapter 10, Routine Extraction of Teeth; p. 85-93.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Non-Surgical Periodontal Therapy

Policy Number: DCP004.12
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
151. Coverage Rationale	175
152. Definitions	176
153. Applicable Codes	178
154. Description of Services	178
155. Clinical Evidence	178
156. U.S. Food and Drug Administration	180
157. References	180
158. Policy History/Revision Information	181
159. Instructions for Use	181

Related Dental Policies
<ul style="list-style-type: none"> • Full Mouth Debridement • Surgical Periodontics: Mucogingival Procedures • Surgical Periodontics: Resective Procedures

Coverage Rationale

Scaling and Root Planing

Scaling and Root Planing is indicated for the treatment of the following:

- [Stage II-Stage IV](#) Periodontitis with [Grade B or Grade C Progression](#)
- Periodontal abscess

Scaling and Root Planing is not indicated for the following:

- For the removal of heavy deposits of calculus and plaque in the absence of clinical attachment loss
- Gingivitis as defined by inflammation of the gingival tissue without clinical attachment loss

Localized Delivery of Antimicrobial Agents

Localized Delivery of Antimicrobial Agents is indicated as an adjunct to Scaling and Root Planing in patients with pocket depths \geq 5mm.

Periodontal Maintenance

Periodontal Maintenance is indicated for the following:

- To maintain the results of surgical and non-surgical periodontal therapy
- As an extension of active periodontal therapy at selected intervals

Periodontal Maintenance is not indicated for the following:

- If there is no previous history of Scaling and Root Planing (SRP) or surgical periodontal therapy
- Gingivitis

Scaling in Presence of Generalized Moderate or Severe Gingival Inflammation – Full Mouth

Scaling in presence of generalized moderate or severe gingival inflammation is indicated for the removal of plaque, calculus, and stains from supra- and sub-gingival tooth surfaces when there is generalized moderate or severe gingival inflammation in the absence of increased sulcus depth due to loss of attachment and alveolar bone.

Gingival Irrigation

Gingival Irrigation is not indicated due to insufficient evidence of efficacy.

Definitions

Staging and Grading Periodontitis (AAP):

- Stage I
 - 1-2 mm clinical attachment loss (CAL)
 - Radiographic bone loss (RBL) of < 15%
 - No tooth loss
- Complexity
 - Maximum probing depth ≤ 4mm
 - Mostly horizontal bone loss
- Stage II
 - 3-4 mm interdental CAL
 - RBL of 15-33%
 - No tooth loss
- Complexity
 - Maximum probing depth ≤ 5 mm
 - Mostly horizontal bone loss
- Stage III
 - ≥ 5 mm CAL
 - RBL extends to middle third of root and beyond
 - Loss of ≤ 4 teeth
- Complexity includes all of criteria for Stage II as well as:
 - Probing depths ≥ 6 mm
 - Vertical bone loss ≥ 3 mm
 - Class II or III furcation involvement
 - Moderate ridge defects
- Stage IV
 - ≥ 5mm CAL
 - RBL extends to middle third of root and beyond
 - Loss of ≥ 5 teeth
- Complexity includes all of criteria for Stage III as well as:
 - The need for complex rehabilitation due to:
 - Masticatory dysfunction
 - Secondary occlusal trauma (tooth mobility ≥ 2)
 - Severe ridge defects
 - Bite collapse, drifting and/or flaring
 - < 20 remaining teeth (10 opposing pairs)
- The extent and distribution for each stage is described as:
 - Localized (< 30% of teeth involved)
 - Generalized; or
 - Molar/incisor pattern
- Grading indicates the rate of disease progression, the response to standard therapy and the potential impact on systemic health. (Clinicians should initially assume moderate disease grading (B) and seek specific evidence to shift to slow (A) or rapid (C) grading)
- Progression:
 - Grade A (Slow):
 - No bone or CAL loss over 5 years
 - Indirect evidence of progression
 - < 0.25 % bone loss/age
 - Heavy biofilm deposits with low levels of destruction
 - Risk factor modifiers
 - Non-smoker
 - Not diabetic

- Grade B (Moderate):
 - Direct evidence of progression
 - < 2 mm bone or CAL over 5 years
 - Indirect evidence of progression
 - 0.25 to 1.0% bone loss/age
 - Destruction commensurate with biofilm deposits
 - Risk factor modifiers
 - < 10 cigarettes/day
 - HbA1C < 7 in diabetics
- Grade C (Rapid):
 - Direct evidence of progression
 - ≥ 2 mm bone or CAL over 5 years
 - Indirect evidence of progression
 - > 1.0 % bone loss/age
 - Destruction exceeds expectations given biofilm deposits
 - Specific clinical patterns suggestive of periods of rapid progression and/or early onset disease
 - Risk factor modifiers
 - > 10 cigarettes/day
 - HbA1C ≥ 7 in diabetics

Furcation: The anatomic area of a multirrooted tooth where the roots diverge. A Furcation involvement refers to loss of periodontal support in a Furcation (ADA, 2016). The Glickman Classification of Tooth Furcation Grading (Sims, 2015):

- Grade I
- Incipient
- Just barely detectable with examination hand instruments
- No horizontal component of the Furcation is evident on probing
- Grade II
- Early bone loss
- Examination hand instrument goes partially into the Furcation, but not all the way through
- Furcation may be grade II on both sides of the tooth, but are not connected
- Grade III
- Advanced bone loss
- Examination hand instrument goes all the way through Furcation, to other side of tooth
- Furcation is through-and-through
- Grade IV
- Through-and-through, plus Furcation is clinically visible due to gingival recession

Gingival Irrigation: Irrigation of gingival pockets with a medicinal agent. Not to be used to report use of mouth rinses or non-invasive chemical debridement. (ADA)

Gingivitis: Inflammation of gingival tissue without loss of connective tissue. (ADA)

Localized Delivery of Antimicrobial Agents: FDA approved subgingival delivery devices containing antimicrobial medication(s) that are inserted into periodontal pockets to suppress the pathogenic microbiota. These devices slowly release the pharmacological agents so they can remain at the intended site of action in a therapeutic concentration for a sufficient length of time. (ADA)

Periodontitis/Periodontal Disease: Inflammatory process of the gingival tissues and/or periodontal membrane of the teeth, resulting in an abnormally deep gingival sulcus, possibly producing periodontal pockets and loss of supporting alveolar bone (ADA).

Periodontal Maintenance: This procedure is instituted following periodontal therapy and continues at varying intervals, determined by the clinical evaluation of the dentist, for the life of the dentition or any implant replacements. It includes removal of the bacterial plaque and calculus from supragingival and subgingival regions, site specific Scaling and Root Planing where indicated and polishing the teeth. If new or recurring Periodontal Disease appears, additional diagnostic and treatment procedures must be considered. (ADA)

Root Planing: A definitive treatment procedure designed to remove cementum and/or dentin that is rough, may be permeated by calculus, or contaminated with toxins or microorganisms. (ADA)

Scaling: Removal of plaque, calculus, and stain from teeth. (ADA)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D4341	Periodontal scaling and root planing – four or more teeth per quadrant
D4342	Periodontal scaling and root planing – one to three teeth per quadrant
D4346	Scaling in presence of generalized moderate or severe gingival inflammation – full mouth, after oral evaluation
D4381	Localized delivery of antimicrobial agents via a controlled release vehicle into diseased crevicular tissue, per tooth
D4910	Periodontal maintenance
D4921	Gingival irrigation with a medicinal agent - per quadrant

CDT® is a registered trademark of the American Dental Association

Description of Services

The American Academy of Periodontology (AAP) guidelines stress that periodontal health should be achieved in the least invasive manner. With non-surgical periodontal therapy, many patients can be treated and maintained without the need for surgical intervention, however patients with advanced and aggressive forms of disease may require periodontal surgery. Non-surgical periodontal therapy includes localized or generalized Scaling and Root Planing, the use of antimicrobials and ongoing Periodontal Maintenance.

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

Clinical Evidence

Arnett et al. (2023) conducted a randomized controlled trial on the effects of SRP vs SRP plus minocycline hydrochloride microspheres (MM) on periodontal pathogens and the clinical outcomes in Stage II-Stage IV Grade B periodontitis. Seventy participants were randomized 1:1 to receive SRP or SRP+MM. Saliva and clinical outcomes were collected for both groups at before SRP, 1 month reevaluation, and at 3 and 6 month periodontal maintenance visits. MM was delivered to pockets ≥ 5 mm immediately after SRP and immediately after the 3-month periodontal maintenance in the SRP+MM group. The results showed significant reduction in several pathogens at one month follow up and at 6 month follow up following reapplication at 3 months. Furthermore, there were significant clinical improvements in pocket depth reduction at all follow up points as well as gains in clinical attachment loss seen at the 6 month point.

Killeen et al. (2018) conducted a two-year randomized clinical trial of the role of adjunctive minocycline microspheres in periodontal maintenance. The authors evaluated the effects of repeated scaling and root planing (SRP), with or without locally-delivered minocycline microspheres (MM) on residual pockets in patients undergoing periodontal maintenance (PMT). Patients on PMT were randomized into two groups for treatment of one posterior interproximal inflamed pocket (≥ 5 mm) with a history of bleeding on probing every 6 months: SRP plus MM (n = 30) or exclusively SRP (n = 30). Baseline and 24-month measurements included radiographic interproximal alveolar bone height, probing depths (PD), clinical attachment level (CAL), bleeding on probing (BOP), gingival crevicular fluid (GCF), and salivary interleukin (IL) - 1 β , (24 month only). Results were analyzed for baseline data or change in measurements after 24 months of treatment between different treatment groups, as well as whether significant changes occurred after 24 months of treatment for each treatment group individually. The results showed alveolar bone height and GCF IL-1 β remained stable over the 24 months. The SRP + MM and SRP groups each demonstrated reduced PD, CAL, and BOP. However, there were no

differences between groups over the 24-month study period. The authors concluded that SRP alone, of moderately inflamed periodontal pockets at 6-month intervals, produced stable interproximal alveolar bone height as well as sustained improvements in probing depths, clinical attachment level, bleeding on probing over 24 months, and minocycline microspheres were not shown to enhance these results.

The American Dental Association Council on Scientific Affairs (2015) published the results of a 4 year systematic review and meta-analysis on the nonsurgical periodontal treatment for patients with chronic periodontitis via scaling and root planing (SRP) with and/or without adjunctive services. The group included 72 articles gained from a search on PubMed/Medline. The authors approached the review for evidence showing the results of patients treated with scaling and root planing (SRP) resulted in greater improvement in clinical attachment levels (CAL) compared to no treatment, prophylaxis, and debridement and if the use of local antimicrobials/antibiotics resulted in better improvement in periodontal condition. Full Mouth Debridement (D4355) was not considered “active treatment” for the purposes of this systematic review, as the procedure does not focus on removal of rough cementum or dentin imbedded with biotoxins. Additionally, the research panel excluded studies that did not specifically include the term “root planing.” This review concluded that while studies showed improvement in CAL following SRP procedures, there is little evidence to support the efficacy of localized antimicrobial delivery. Only one delivery system, PerioChip® showed a moderate benefit in this regard. The other 2 FDA approved localized delivery medicaments, Arestin® and Atridox® showed unclear benefits due to small number of studies as well as the unclear risk of bias.

Matesanz et al. (2013) conducted a systematic review to update the existing scientific evidence on the efficacy of local antimicrobials as adjuncts to subgingival debridement in the treatment of chronic periodontitis. Fifty-six papers were selected, reporting data from 52 different investigations. All the studies reported changes in probing pocket depth (PPD) and clinical attachment level (CAL) and most in plaque index (PI) and/or bleeding on probing (BOP). Meta-analyses were performed with the data retrieved from the studies fulfilling the inclusion criteria. Subgingival application of tetracycline fibers, sustained released doxycycline and minocycline demonstrated a significant benefit in PPD reduction. The local application of chlorhexidine and metronidazole showed a minimal effect when compared with placebo. This systematic review showed that the scientific evidence supports the adjunctive use of local antimicrobials mostly when using vehicles with proven sustained release.

Sadaf et al. (2012) conducted a controlled clinical study to compare the efficacy of scaling and root planing (SRP) alone versus tetracycline fiber therapy used adjunctively in the treatment of chronic periodontitis sites in maintenance patients. A total of 30 patients with a diagnosis of chronic periodontitis were selected. None of these patients had received any surgical or non-surgical periodontal therapy and had sites of periodontal pockets measuring 4—7 millimeters clinically and demonstrated radiographic evidence of moderate bone loss. Plaque indexes (PI) and Gingival-bleeding index (GBI) were measured at baseline and 15th, 30th, 60th, and 90th day. Clinical pocket depth (PD) and microbial analysis (MA) were analyzed at baseline and 90th day. At 3 months adjunctive tetracycline fiber therapy was significantly better in reducing PI, GBI than SRP alone. In comparison, the reduction in the PD was non-significant. The microbial analysis showed significant reduction in *Porphyromonas gingivalis* and *Prevotella* subgingival flora. The researchers concluded that the results indicate that fiber therapy significantly enhanced the effectiveness of SRP in the management of chronic periodontitis due to the reduction of colonized subgingival bacterial flora.

Bland et al. (2010) conducted a multicenter, single blind randomized study to investigate the association between the antimicrobial and clinical efficacy of minocycline hydrochloride microspheres when used adjunctively with scaling and root planing. 127 subjects with moderate-to-advanced chronic periodontitis were randomly assigned to receive minocycline microspheres plus scaling and root planing or scaling and root planing alone in each periodontal pocket \geq 5mm. Clinical data was obtained at baseline and 30 days after treatment. End points included changes in the mean sum of red complex bacteria, pocket depth, number of deep pockets, bleeding on probing, and clinical attachment level from baseline to day 30. This study showed minocycline microspheres plus scaling and root planing reduced pocket depth, the number of deep pockets and bleeding on probing, and increased clinical attachment level significantly more than scaling and root planing alone. Additionally, the pocket depth reduction correlated significantly with a decrease in the numbers and proportions of red complex bacteria. Minocycline microspheres significantly improved all clinical parameters compared to scaling and root planing alone. The authors concluded that the addition of minocycline microspheres to scaling and root planing led to a greater reduction in the proportions and numbers of red complex bacteria.

The American Academy of Periodontology (2005) conducted a systemic review of the published literature regarding supra and subgingival oral irrigation for the treatment of periodontal disease. Studies from 1960-1994 were reviewed and the results published in their Academy Report in 2005. The treatments were reviewed as mono- therapy as well as an adjunct to conventional therapy within each category. Supragingival irrigation with water, water and antimicrobial, and placebo alone and in conjunction with tooth brushing showed no significant evidence in improved outcomes in treating and managing periodontal disease or gingivitis. Subgingival irrigation showed overall reduction but not elimination of

pathogens, and the subgingival microflora returned to pretreatment levels within 1-8 weeks. There is overall scant evidence to support the efficacy of a single episode or multiple in office irrigation appointments. The available studies show the greatest problem with irrigation as an adjunctive therapy is that the antimicrobials are quickly eliminated and localized delivery via a controlled release device will allow slow release of medicaments.

In a 2001 randomized controlled trial, Williams et al. assessed the safety and clinical outcomes of minocycline microspheres. Seven hundred and forty eight patients with moderate to advanced periodontitis were randomized into 3 treatment arms: SRP alone (250), SRP plus vehicle (249), and SRP plus minocycline microspheres (249). Minocycline microspheres or vehicle was administered to all sites with probing depths ≥ 5 mm. The results showed that after 1 month, patients receiving SRP plus minocycline microspheres had a significantly greater mean reduction in pocket depths of 1-2mm when compared with the vehicle and control groups. At 9 month endpoint, this reduction in pocket depths was greater in patients with more advanced disease (≥ 7 mm). The authors concluded that SRP plus minocycline microspheres provides significantly greater probing depth reduction than SRP alone and should be incorporated as part of non-surgical therapeutic treatment.

Jeffcoat et al. (2000) expounded on previous multi-center trials that demonstrated the efficacy of a biodegradable chlorhexidine-gelatin chip (CHX) in reducing probing depth in patients with periodontitis. This study utilized a subset of the subjects from the previous studies to determine if the CHX chip was effective in maintaining alveolar bone over a 9-month period. Forty-five subjects with at least four 5 to 8 millimeters pockets were enrolled in this double-blind controlled, placebo-controlled trial. Control groups received either placebo chip plus scaling and root planing (SRP) or SRP alone. Test group subjects received active CHX chip or SRP alone. Standardized radiographs were taken for quantitative digital subtraction radiography at baseline and 9 months. At the 9 month assessment, 15% of SRP treated subjects experienced loss of bone in 1 or more sites, and none of the subjects treated with the active CHX chip combined with SRP lost bone. Also noted were significant differences in the change in probing depth and clinical attachment levels in the subjects treated with both SRP and the CHX chip. The researchers concluded that the data indicates that the CHX chip, when used as an adjunct to scaling and root planing, significantly reduces loss of alveolar bone.

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

In 2001, Arestin®(OraPharma, Inc.) received FDA approval. Arestin is 1 mg minocycline hydrochloride microspheres to be used as an adjunct to scaling and root planing procedures for the reduction of pocket depths in patients with adult periodontitis. Refer to the following website for more information:

<https://www.accessdata.fda.gov/scripts/cder/daf/index.cfm?event=overview.process&ApplNo=050781>. Accessed March 18, 2024.

References

- American Academy of Periodontology (AAP). Staging and Grading Periodontitis. 2018. Available at: <https://www.perio.org/wp-content/uploads/2019/08/Staging-and-Grading-Periodontitis.pdf>. Accessed September 8, 2023.
- American Academy of Periodontology Parameter on chronic periodontitis with slight to moderate loss of periodontal support. 2000.
- American Academy of Periodontology Statement on Local Delivery of Sustained or Controlled Release Antimicrobials as Adjunctive Therapy in the Treatment of Periodontitis. 2006.
- American Academy of Periodontology Task Force Report on the Update to the 1999 Classification of Periodontal Diseases and Conditions. J Periodontol. 2015 Jul; 86 (7):835-8. doi: 10.1902/jop.2015.157001. Epub 2015 May 27.
- American Academy of Periodontology. Parameter on "Refractory" Periodontitis 2000.
- American Academy of Periodontology. Parameter on Acute Periodontal Diseases. 2000.
- American Academy of Periodontology. Parameter on Comprehensive Periodontal Examination. 2000.
- American Academy of Periodontology. Parameter on Periodontal Maintenance. 2000.
- American Dental Association Glossary of Clinical and Administrative Terms.
- American Dental Association CDT 2024 Dental Procedure Codes.

Arnett MC, Chanthavisouk P, Costalonga M, et al. Effect of scaling and root planing with and without minocycline HCl microspheres on periodontal pathogens and clinical outcomes: A randomized clinical trial. *J Periodontol.* 2023 Sep;94(9):1133-1145.

Bland PS, Goodson JM, Gunsolley JC, et al. Association of antimicrobial and clinical efficacy: periodontitis therapy with minocycline microspheres. *J Int Acad Periodontol.* 2010 Jan; 12(1):11-9.

Carranza F, Camargo P, Takei H. Newman and Carranza's Clinical Periodontology, 13th ed. St. Louis: Elsevier c2019 Chapter 24, Bone Loss and Patterns of Bone Destruction; p.316-327.

Caton JG, Armitage G, Berglundh T, et al. A new classification scheme for periodontal and peri-implant diseases and conditions - Introduction and key changes from the 1999 classification. *J Periodontol.* 2018;89 Suppl 1:S1-S8.

Greenstein G; Research, Science and Therapy Committee of the American Academy of Periodontology. Position paper: The role of supra- and subgingival irrigation in the treatment of periodontal diseases. *J Periodontol.* 2005 Nov; 76 (11):2015-27.

Jeffcoat MK, Palcanis KG, Weatherford TW et al. Use of a biodegradable chlorhexidine chip in the treatment of adult periodontitis: clinical and radiographic findings. *J Periodontol.* 2000 Feb; 71 (2):256-62.

Killeen AC, Harn JA, Jensen J, Yu F, Custer S, Reinhardt RA. Two-Year Randomized Clinical Trial of Adjunctive Minocycline Microspheres in Periodontal Maintenance. *J Dent Hyg.* 2018;92(4):51-58.

Matesanz-Pérez P, García-Gargallo M, Figuero E et al. A systematic review on the effects of local antimicrobials as adjuncts to subgingival debridement, compared with subgingival debridement alone, in the treatment of chronic periodontitis. *J Clin Periodontol.* 2013 Mar; 40 (3):227-41.

Sadaf N, Bhushan A, Dakshina B. Evaluation of efficacy of tetracycline fibers in conjunction with scaling and root planing in patients with chronic periodontitis. *J Indian Soc Periodontol.* 2012 Jul-Sep; 16 (3): 392–397.

Sims T, Takei H. Newman and Carranza's Clinical Periodontology, 13th ed. St. Louis: Elsevier c2019 Chapter 64, Furcation: Involvement and Treatment; p.653-659.

Smiley CJ, Tracy SL, Abt E, et al. Systematic review and meta-analysis on the nonsurgical treatment of chronic periodontitis by means of scaling and root planing with or without adjuncts. *J Am Dent Assoc.* 2015 Jul;146(7):508-24. July 2015.

Williams RC, Paquette DW, Offenbacher S, et al. Treatment of periodontitis by local administration of minocycline microspheres: a controlled trial. *J Periodontol.* 2001 Nov;72(11):1535-44.

Policy History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.

Occlusal Guards

Guideline Number: DCG019.10
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
160. Coverage Rationale	182
161. Definitions	182
162. Applicable Codes	182
163. Description of Services	183
164. References	183
165. Guideline History/Revision Information	183
166. Instructions for Use	183

Related Dental Policy
<ul style="list-style-type: none"> None

Coverage Rationale

This Coverage Guideline addresses Occlusal guards for the protection of the dentition. Occlusal guards intended to relieve symptoms of temporomandibular joint disorders, as well as Occlusal orthotic devices, are addressed in the related Medical Policy titled [Treatment of Temporomandibular Joint Disorders](#).

Occlusal Guards

Occlusal guards are indicated for the following:

- [Bruxism](#) or clenching, either as a nocturnal parasomnia or during waking hours, resulting in excessive wear or fractures of natural teeth or restorations
- To protect natural teeth when the opposing dentition has the potential to cause enamel wear such as the presence of porcelain or ceramic restorations

Occlusal guards are not indicated for the following:

- As an appliance intended for orthodontic tooth movement
- For treatment of temporomandibular disorders
- For treating headaches or other pain disorders of the craniofacial region
- As a mouthguard to protect the dentition during sports

Definitions

Bruxism: Repetitive jaw muscle activity characterized by clenching or grinding of the teeth and/or by bracing or thrusting of the mandible. (Principles and Practice of Sleep Medicine, sixth edition)

Occlusal: Pertaining to the biting surfaces of the premolar and molar teeth or contacting surfaces of opposing teeth or opposing occlusion rims. (ADA)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D9942	Repair and/or reline of occlusal guard
D9943	Occlusal guard adjustment
D9944	Occlusal guard – hard appliance, full arch
D9945	Occlusal guard – soft appliance, full arch
D9946	Occlusal guard – hard appliance, partial arch

CDT® is a registered trademark of the American Dental Association

Description of Services

Occlusal guards are fabricated from rigid or semi rigid/soft materials to cover teeth to protect them from Bruxism and clenching of teeth. They may be constructed in the dental office or by an outside laboratory. They are not for the treatment of, or therapy for diagnosed temporomandibular disorders.

References

American Dental Association (ADA) CDT Codebook 2024.

American Dental Association. Glossary of Dental Clinical and Administrative Terms.

Lobbezoo F., Koyano K., Paesani D., Manfredini D. Principles and Practice of Sleep Medicine. Sixth edition. Elsevier c2017. Chapter 145, Sleep Bruxism: Diagnostic Considerations; 1427-1434.e4.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Oral Surgery: Alveoloplasty and Vestibuloplasty

Guideline Number: DCG028.10

Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
167. Coverage Rationale	184
168. Definitions	185
169. Applicable Codes	185
170. Description of Services	185
171. References	185
172. Guideline History/Revision Information	186
173. Instructions for Use	186

Related Dental Policies
<ul style="list-style-type: none"> • Oral Surgery: Miscellaneous Surgical Procedures • Oral Surgery: Non-Pathologic Excisional Procedures

Coverage Rationale

Alveoloplasty

Alveoloplasty is indicated for the following:

- For bone recontouring and smoothing as part of the tooth extraction process
- For bone recontouring and smoothing as a standalone procedure prior to fixed or removable prosthetic construction
- To provide stability for implant placement
- For debulking procedures for pathologic conditions of the bone

Alveoloplasty may not be indicated for the following:

- When removing bone would harm vital structures
- When there is diminished volume or atypical architecture of bone
- For individuals who have undergone radiation therapy to the head and neck
- Individuals with an unmanaged medical condition; these conditions include, but are not limited to, metabolic, cardiovascular, and autoimmune/inflammatory, as well as genetic conditions that affect collagen synthesis
- Individuals taking medications that negatively affects the healing response; these include, but are not limited to, immunosuppressive agents, corticosteroids, anticoagulants, NSAIDS, and nicotine

Vestibuloplasty

Vestibuloplasty is indicated for the following:

- Ridge extension, or lowering or altering submucous displacing attachments prior to prosthetic construction
- To complement and complete osseous procedure when reconstructing edentulous bone
- To correct inadequate or inappropriate soft tissue drape where a resection has been previously performed and prosthetic restoration requires improvement
- For overall stability of a dental implant and the maintenance of bone health around an implant

Vestibuloplasty may not be indicated for the following:

- Individuals with an unmanaged medical condition; these conditions include, but are not limited to, metabolic, cardiovascular, and autoimmune/inflammatory, as well as genetic conditions that affect collagen synthesis
- Individuals taking medications that negatively affects the healing response; these include, but are not limited to, immunosuppressive agents, corticosteroids, anticoagulants, NSAIDS, and nicotine
- When there is minimal alveolar ridge height
- For individuals who have undergone radiation therapy to the head and neck

Definitions

Alveoloplasty: Surgical procedure for recontouring supporting bone, sometimes in preparation for a prosthesis. (ADA)

Vestibuloplasty: Any of a series of surgical procedures designed to increase relative alveolar ridge height. (ADA)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D7310	Alveoloplasty in conjunction with extractions – four or more teeth or tooth spaces, per quadrant
D7311	Alveoloplasty in conjunction with extractions – one to three teeth or tooth spaces, per quadrant
D7320	Alveoloplasty not in conjunction with extractions -four or more teeth or tooth spaces, per quadrant
D7321	Alveoloplasty not in conjunction with extractions – one to three teeth or tooth spaces, per quadrant
D7340	Vestibuloplasty – ridge extension (secondary epithelialization)
D7350	Vestibuloplasty – ridge extension (including soft tissue grafts, muscle reattachment, revision of soft tissue attachment and management of hypertrophied and hyperplastic tissue)

CDT® is a registered trademark of the American Dental Association

Description of Services

Alveoloplasty is a surgical procedure to recontour and/or smooth out the alveolar bone. This is usually done in areas where teeth have been extracted and there is uneven or sharp edges, to facilitate an optimal foundation for tooth replacement procedures such as removable and fixed prostheses, and implants.

Vestibuloplasty is a surgical procedure designed to restore alveolar ridge height by lowering muscles attaching to the alveolar bone. It is most often seen when preparing the mouth for dentures or an implant.

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

References

American Dental Association (ADA) CDT Codebook 2024.

American Dental Association (ADA). Glossary of Dental Clinical and Administrative Terms.

Drew, Stephanie Joy. Atlas of Oral and Maxillofacial Surgery. Elsevier, Inc. 2016. Chapter 13, Alveoloplasty; p. 113-119.

Kerr A, Miller C, Nelson R. Little and Falace's Dental Management of the Medically Compromised Patient, 10th ed. St. Louis: Elsevier c2024. Chapter 1, Patient Evaluation, Risk Assessment, and the Diagnostic Process; p. 1-17.

Murdoch-Kinch CA, Zwetchkenbaum S. Dental management of the head & neck cancer patient treated with radiation therapy. Today's FDA. 2011 Sep-Oct;23(6):40-3.

National Institute of Dental and Craniofacial Research. Oral Complications of Cancer Treatment: What the Dental Team Can Do.

Perciaccante, Vincent J. and Farish, Sam E. Atlas of Oral and Maxillofacial Surgery. Elsevier, Inc. 2016. Chapter 18, Vestibuloplasty; p. 153-169.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Oral Surgery: Miscellaneous Surgical Procedures

Policy Number: DCP027.13
Effective Date: January 1, 2025

[➔ Instructions for Use](#)

Table of Contents	Page
174. Coverage Rationale	187
175. Definitions	188
176. Applicable Codes	188
177. Description of Services	189
178. Clinical Evidence	189
179. References	190
180. Policy History/Revision Information	190
181. Instructions for Use	190

Related Dental Policies
<ul style="list-style-type: none"> • Biologic Materials for Soft and Hard Tissue Regeneration • Bone Replacement Grafts • Dental Barrier Membrane Guided Tissue Regeneration • Dental Implant Placement and Treatment of Peri-Implant Defects/Disease • Fixed Prosthodontics • Oral Surgery: Alveoloplasty and Vestibuloplasty • Oral Surgery: Non-Pathologic Excisional Procedures • Removable Prosthodontics

Coverage Rationale

Oroantral Fistula Closure

An [Oroantral Fistula](#) will not heal spontaneously and must be surgically repaired.

Primary Closure of a Sinus Perforation

Primary closure of a sinus perforation is indicated for large (≥ 2mm) defects resulting from routine tooth extraction, retrieval of root tips, or implant placement.

Tooth Reimplantation and/or Stabilization of Accidentally Evulsed or Displaced Tooth

Tooth reimplantation and/or stabilization of accidentally evulsed or displaced tooth are indicated for the following:

- [Subluxation](#) injuries to permanent teeth
- [Lateral Luxation](#) injuries of primary and permanent teeth
- [Extrusion](#) injuries of < 3mm in an immature developing primary tooth
- Avulsion of permanent teeth

Tooth reimplantation and/or stabilization of an accidentally evulsed or displaced tooth are not indicated for the following, and extraction is recommended:

- Primary teeth if injury is severe or tooth is near exfoliation
- [Intrusion](#) injuries to primary teeth when the apex is displaced toward the permanent tooth germ
- [Extrusion](#) injuries of a primary tooth that is fully formed, mobile, and near exfoliation, or the child is unable to cope with an emergency situation
- When a tooth has been out of the oral cavity for 60 minutes or more
- Lack of alveolar integrity

- Risk of ankylosis

Surgical Repositioning of Teeth

Surgical repositioning of teeth is indicated for the following:

- The treatment of displacement injuries to permanent teeth
- Extrusion of teeth with crown/root fractures to prepare for restoration of permanent teeth

Sinus Augmentation Procedures

[Sinus Augmentation](#) may be indicated when there is poor bone quality/quantity that would contraindicate implant placement.

Sinus Augmentation is not indicated when conditions blocking the ventilation and clearance of the maxillary sinus are present.

Salivary Gland and Duct Procedures

Procedures include the removal of sialoliths, surgical excision of portions of, or the entire gland, repair of salivary fistulas and defects of salivary ducts, and may be completed intraorally or extraorally.

The procedures above may not be indicated for the following:

- Individuals with an unmanaged medical condition; these conditions include, but are not limited to metabolic, cardiovascular, and autoimmune/inflammatory, as well as genetic conditions that affect collagen synthesis.
- Individuals taking medications that negatively affects the healing response; these include, but are not limited to immunosuppressive agents, corticosteroids, anticoagulants, NSAIDS, and nicotine.

Definitions

Avulsion: Complete displacement of the tooth out of socket; the periodontal ligament is severed, and fracture of the alveolus may occur. (AAPD)

Extrusion: Partial displacement of the tooth axially from the socket; partial Avulsion. The periodontal ligament is usually torn. (AAPD)

Intrusion: Apical displacement of tooth into the alveolar bone. The tooth is driven into the socket, compressing the periodontal ligament and commonly causes a crushing fracture of the alveolar socket. (AAPD)

Lateral Luxation: Displacement of the tooth in a direction other than axially. The periodontal ligament is torn, and contusion or fracture of the supporting alveolar bone occurs. (AAPD)

Oroantral Fistula: An open connection between the maxillary sinus usually caused by extraction of maxillary posterior teeth. (Visscher 2010)

Sinus Augmentation (Sinus Lift Surgery; Sinus Floor Elevation): A surgical procedure in the maxilla when there has been bone loss. The floor of the sinus is elevated, and bone grafts are placed, allowing adequate bone development for the placement of dental implants, or the repair of defects. (Bathla)

Subluxation: Injury to tooth-supporting structures with abnormal loosening but without tooth displacement. (AAPD)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D7260	Oroantral fistula closure

CDT Code	Description
D7261	Primary closure of a sinus perforation
D7270	Tooth reimplantation and/or stabilization of accidentally evulsed or displaced tooth
D7272	Tooth transplantation (includes reimplantation from one site to another and splinting and/or stabilization)
D7290	Surgical repositioning of teeth
D7295	Harvest of bone for use in autogenous grafting procedure
D7951	Sinus augmentation with bone or bone substitutes via a lateral open approach
D7952	Sinus augmentation via a vertical approach
D7979	Surgical sialolithotomy
D7980	Surgical sialolithotomy
D7981	Excision of salivary gland, by report
D7982	Sialodochoplasty
D7983	Closure of salivary fistula
D7999	Unspecified oral surgery procedure, by report

CDT® is a registered trademark of the American Dental Association

CPT Code	Description
21210	Graft, bone; nasal, maxillary or malar areas (includes obtaining graft)
21215	Graft, bone; mandible (includes obtaining graft)
30580	Repair fistula; oromaxillary (combine with 31030 if antrotomy is included)
41899	Unlisted procedure, dentoalveolar structures
42699	Unlisted procedure, salivary glands or ducts

CPT® is a registered trademark of the American Medical Association

Description of Services

These procedures involve the treatment of conditions that may be inherent, or related to infections, radiation therapy, trauma, or tooth extractions. Some procedures may be covered under the member's medical benefit when determined to be medical in nature. Refer to the member's Certificate of Coverage and/or health plan documentation for specific coverage guidelines.

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

Clinical Evidence

Sinus Augmentation Procedures

Raghoobar et al. (2019) conducted a systematic review and meta-analysis on the long-term effectiveness (≥ 5 years) of maxillary sinus floor augmentation (MSFA) procedures applying the lateral window technique and to determine possible differences in outcome between simultaneous and delayed implant placement, partially and fully edentulous patients and grafting procedures. Eleven studies met the Inclusion criteria of prospective studies with follow-up ≥ 5 years and a residual bone height ≤ 6 mm. Outcome measures were implant loss, peri-implant bone level change, suprastructure survival, patient-reported outcome measures and overall complications. The results showed the overall 5-year survival rate of implants ranged from 88.6% to 100% and there was no significant difference between fully or partially edentulous patients, or between one or two stage surgery. The authors concluded that MSFA leads to high implant survival rates in both partially and fully edentulous patients irrespective of the grafting materials used and shows high implant survival, limited peri-implant marginal bone loss and few overall complications. The studies used various healing periods prior to the start of prosthetic loading, and this makes generalization of results not feasible. However, considering the more favorable survival rates after longer graft healing times, a prolonged healing period before implant placement seems advisable if BS or a mixture of BS and AB is used.

Clinical Practice Guidelines

International Association of Dental Traumatology (IADT)

In the 2020 evidence-based treatment guidelines, endorsed by the American Academy of Pediatric Dentistry, the IADT (Bourguignon et al.) makes the following recommendations:

- Subluxation injuries:
 - Normally no treatment is needed. If there is excessive mobility or tenderness, a flexible, passive splint may be used for up to 2 weeks.
 - Follow up at 2 and 12 weeks and after 6 months and one year.
- Extrusive luxation injuries:
 - Reposition the tooth and stabilize for 2 weeks using a flexible, passive splint. If there is breakdown or fracture of marginal bone, splint for an additional 4 weeks.
 - Monitor pulp.
 - Follow up at 2,4,8,12 weeks, 6 months and one year, and annually for at least 5 years.
- Displacement into the alveolar bone:
 - Teeth with incomplete root formation:
 - Allow re-eruption with no intervention. If no re-eruption within 4 weeks, initiate orthodontic repositioning.
 - Monitor pulp.
 - Teeth with complete root formation:
 - If intrusion is less than 3 mm, allow re-eruption without intervention. If no re-eruption within 8 weeks, surgically reposition and splint using a flexible, passive splint for 4 weeks or reposition orthodontically.
 - If intrusion is 3-7mm, reposition surgically or orthodontically.
 - If intrusion is beyond 7mm, reposition surgically.
 - For both conditions, follow up after 2 ,4, 8, 12 weeks and 6 months and one year, and annually for at least 5 years.

References

American Academy of Pediatric Dentistry (AAPD). Guideline on Management of Acute Dental Trauma. Revised 2010.

American Association of Orthodontists (AAO) AAO Glossary.

American Dental Association (ADA) CDT Codebook 2024.

Bathla SC, Fry RR, Majumdar K. Maxillary sinus augmentation. *J Indian Soc Periodontol*. 2018;22(6):468-473.

Bourguignon C, Cohenca N, Lauridsen E, et al. International Association of Dental Traumatology guidelines for the management of traumatic dental injuries: 1. Fractures and luxations. *Dent Traumatol* 2020;36(4):314-330. Available at: https://www.aapd.org/media/policies_guidelines/e_fractures.pdf. Accessed March 25, 2024.

Chambers M, Chung W. Operative Otolaryngology Head and Neck Surgery, 3rd ed. Elsevier c2018. Chapter 105, Oroantral Fistulas; p700-704.

Louis P. Atlas of Oral and Maxillofacial Surgery, 2nd ed. St. Louis: Mosby c2023. Chapter 27, The Maxillary Sinus Lift; p. 253-63.

Raghoobar GM, Onclin P, Boven GC, et al. Long-term effectiveness of maxillary sinus floor augmentation: A systematic review and meta-analysis. *J Clin Periodontol*. 2019 Jun;46 Suppl 21:307-318.

Visscher SH, van Minnen B, Bos RR. Closure of oroantral communications: a review of the literature. *J Oral Maxillofac Surg*. 2010 Jun; 68(6):1384-91.

Policy History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or

state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.

Oral Surgery: Non-Pathologic Excisional Procedures

Guideline Number: DCG029.11

Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
182. Coverage Rationale	192
183. Definitions	193
184. Applicable Codes	193
185. Description of Services	194
186. References	194
187. Guideline History/Revision Information	194
188. Instructions for Use	194

Related Dental Policies
<ul style="list-style-type: none"> • Fixed Prosthodontics • Medically Necessary Orthodontic Treatment • Oral Surgery: Alveoloplasty and Vestibuloplasty • Oral Surgery: Miscellaneous Surgical Procedures • Removable Prosthodontics

Coverage Rationale

Frenulectomy/Frenuloplasty

Frenulectomy and Frenuloplasty are indicated for the following:

- When attachment of the [Frenum](#) is coronal to the mucogingival junction, within the free gingiva, or in the papilla causing a diastema, gingival recession, or stripping
- When the position attachment of the Frenum is interfering with proper oral hygiene
- Prior to the construction of a removable denture replacing teeth in the area of aberrant frenal attachment
- When there is a functional disturbance, including, but not limited to mastication, swallowing, and speech
- For [Ankyloglossia](#) or papillary penetrating attachment of maxillary labial Frenum in newborns when there is interference with feeding

Excision of Hyperplastic Tissue and Surgical Reduction of Fibrous Tuberosity

Excision of [Hyperplastic](#) tissue and surgical reduction of a fibrous [Tuberosity](#) is indicated when the presence of excess tissue interferes with the fit of a partial or complete denture (existing or new).

Excision of Pericoronal Gingiva

Excision of [pericoronal gingiva](#) is indicated for the following:

- For recurrent infections of the operculum around impacted or partially erupted lower third molars
- When an erupted maxillary third molar is traumatizing soft tissue around opposing tooth
- When the presence interferes with the fit of a partial or complete denture

Transseptal Fiberotomy/Supra Crestal Fiberotomy (by Report)

Transseptal fiberotomy/supra crestal fiberotomy is indicated to reduce rotational relapse of individual teeth following orthodontic treatment.

Removal of Lateral Exostosis (Maxilla or Mandible), Torus Palatinus, and Torus Mandibularis

Removal of lateral [Exostoses](#), [Torus Palatinus](#), and [Torus Mandibularis](#) is indicated for the following:

- If a partial or complete denture cannot be adapted successfully
- When causing soft tissue trauma with existing removable appliances
- For unusually large protuberances that are prone to recurrent traumatic injury
- When there is a functional disturbance, including, but not limited to mastication, swallowing and speech

Excisional procedures may not be indicated for the following:

- Individuals with an unmanaged medical condition; these conditions include, but are not limited to, metabolic, cardiovascular, and autoimmune/inflammatory, as well as genetic conditions that affect collagen synthesis
- Individuals taking medications that negatively affects the healing response; these include, but are not limited to, immunosuppressive agents, corticosteroids, anticoagulants, NSAIDS, and nicotine

Definitions

Ankyloglossia: Partial or complete fusion of the tongue with the floor of the mouth or the lingual gingiva due to an abnormally short, mid-line lingual Frenulum, resulting in restricted tongue movement (also known as tongue-tie). (AAP)

Exostosis/Exostoses: A benign, bony growth projecting outward from the surface of a bone. (AAP)

Frenum/Frenulum: A fold of mucous membrane tissue that attaches the lips and cheeks to the alveolar mucosa (and/or gingiva) and underlying periosteum. (AAP)

The Placek's Classification of Labial Frenal Attachments (Devishree et. al):

- Mucosal: When the frenal fibres are attached up to the mucogingival junction
- Gingival: When the fibres are inserted within the attached gingiva
- Papillary: When the fibres are extending into the interdental papilla
- Papilla Penetrating: When the frenal fibres cross the alveolar process and extend up to the palatine papilla

Hyperplastic: The increase in the size of a structure due to an increase in the number of cells. (AAP)

Torus Mandibularis: A bony Exostosis on the lingual aspect of the mandible, generally in the premolarmolar region; commonly bilateral. (AAP)

Torus Palatinus: A bony protuberance occurring at the midline of the hard palate. (AAP)

Tuberosity: An osseous projection or protuberance. (AAP)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D7291	Transseptal fiberotomy/supra crestal fiberotomy, by report
D7471	Removal of lateral exostosis (maxilla or mandible)
D7472	Removal of torus palatinus
D7473	Removal of torus mandibularis
D7961	Buccal / labial frenectomy (frenulectomy)
D7962	Lingual frenectomy (frenulectomy)
D7963	Frenuloplasty
D7970	Excision of hyperplastic tissue – per arch
D7971	Excision of pericoronal gingiva
D7972	Surgical reduction of fibrous tuberosity
D7999	Unspecified oral surgery procedure, by report

CDT® is a registered trademark of the American Dental Association

Description of Services

Oral surgery excisional procedures involve the removal and/or alteration of hard and soft oral tissues to achieve normal physiologic function or allow the proper fit of removable appliances.

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

References

- Akylacin S, Kapadia H, English J. Mosby's Orthodontic Review, 2nd ed. St. Louis: Mosby c2015. Chapter 23, Retention and Relapse in Orthodontics; p. 297.
- American Academy of Pediatric Dentistry Guideline on Management Considerations for Pediatric Oral Surgery and Oral Pathology. Adopted 2005. Revised 2020.
- American Academy of Periodontology (AAP) Glossary of Periodontal Terms.
- American Dental Association (ADA) CDT Codebook 2024.
- American Dental Association Glossary of Clinical and Administrative Terms.
- Carr A, Brown D. McCracken's Removable Partial Prosthodontics, 13th ed. St. Louis: Mosby c2016. Chapter 14, Preparation of the Mouth for Removable Partial Dentures; p. 190-191.
- Devishree, Gujjari SK, Shubhashini PV. Frenectomy: a review with the reports of surgical techniques. J Clin Diagn Res. 2012 Nov; 6(9):1587-92.
- Kerr A, Miller C, Nelson R. Little and Falace's Dental Management of the Medically Compromised Patient, 10th ed. St. Louis: Elsevier c2024. Chapter 1, Patient Evaluation, Risk Assessment, and the Diagnostic Process; p. 1-17.
- Ness G. Atlas of Oral and Maxillofacial Surgery, 1st ed. St. Louis: Mosby c2016. Chapter 14, Palatal and Lingual Torus Removal; p.120-26.
- Shenoy S, Boaz K, Caroline Rodriguez Pena, et al. Textbook of Oral Medicine, Oral Diagnosis and Oral Radiology, 2nd ed. India: Mosby c2013. Section II- Oral and Maxillofacial Disturbances, Chapter 2, Developmental Disturbances; p.19-21.
- Takei E, Scheyer T, Azzi R, et al. Newman and Carranza's Clinical Periodontology, 13th ed. St. Louis: Mosby c2019. Chapter 65, Periodontal Plastic and Esthetic Surgery; p. 660-663.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Oral Surgery: Orthodontic Related Procedures

Policy Number: DCP032.13
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
189. Coverage Rationale	195
190. Definitions	196
191. Applicable Codes	196
192. Description of Services	197
193. Clinical Evidence	197
194. U.S. Food and Drug Administration	200
195. References	200
196. Policy History/Revision Information	201
197. Instructions for Use	202

Related Dental Policy
<ul style="list-style-type: none"> Medically Necessary Orthodontic Treatment

Coverage Rationale

Surgical Placement of Temporary Anchorage Device (Not Related to Distraction Osteogenesis or Orthognathic Surgery)

The surgical placement of temporary [Anchorage](#) devices are used in conjunction with orthodontic treatment and are indicated for individuals age 12 and over for the following:

- [Intrusion](#) of maxillary teeth
- Molar [Distalization](#)
- Canine [Retraction](#) and Intrusion Retraction mechanics
- Correction of anterior [Open Bite](#) and deep [Overbite](#)
- Correction of a canted [Occlusal Plane](#)

The surgical placement of a temporary Anchorage device may not be indicated for individuals with any of the following:

- Known allergy to titanium alloy
- History of heavy tobacco use
- Advanced osteoporosis
- Uncontrolled immune or metabolic bone disorders
- Individuals with an unmanaged medical condition; these conditions include, but are not limited to, metabolic, cardiovascular, and autoimmune/inflammatory, as well as genetic conditions that affect collagen synthesis
- Individuals taking medications that negatively affects the healing response; these include, but are not limited to, immunosuppressive agents, corticosteroids, anticoagulants, NSAIDS, and nicotine
- Poor oral hygiene
- Poor quality cortical bone density and volume
- [Ankylosed](#) teeth

Surgical Access of Unerupted Tooth

Surgical access of unerupted tooth is indicated for the following:

- When a normally developing permanent tooth is unable to erupt into a functional position
- For labially impacted teeth if there will be 2-3 mm of gingival cuff present after eruption

Surgical access of unerupted tooth may not be indicated for the following:

- For supernumerary teeth and third molars

- When surgical access of impacted tooth would threaten vital structures
- Individuals with an unmanaged medical condition; these conditions include, but are not limited to, metabolic, cardiovascular, and autoimmune/inflammatory, as well as genetic conditions that affect collagen synthesis
- Individuals taking medications that negatively affects the healing response; these include, but are not limited to, immunosuppressive agents, corticosteroids, anticoagulants, NSAIDS, and nicotine

Placement of Device to Facilitate Eruption of Impacted Tooth

This is the placement of an orthodontic bracket, band or other device and attached with a chain, on an unerupted tooth, after surgical exposure, to aid in its eruption. This procedure is done following the surgical access of an unerupted tooth.

Corticotomy (Not Related to Distraction Osteogenesis or Orthognathic Surgery)

Corticotomy [also known as **periodontally accelerated osteogenic orthodontics (PAOO)** or **surgically assisted osteogenic orthodontics (SAOO)**] is unproven due to insufficient evidence of efficacy and/or safety.

Mobilization of Erupted or Malpositioned Tooth to Aid Eruption

Mobilization of erupted or malpositioned tooth to aid eruption is indicated for the treatment of ankylosed permanent teeth.

Definitions

Anchorage: Resistance to force. Anchorage may come from any of the following sources: intraoral (teeth, bone, soft tissue, implants), or extraoral (cervical, occipital, cranial) (AAO).

Ankylosis: Abnormal immobility, union, or fusion. It may occur between two bones at their articulation (e.g., TMJ) or between teeth and alveolar bone (AAO).

Corticotomy: A surgical procedure that intentionally inflicts mechanical damage on the cortical bone to increase bone remodeling, accelerate the repair, and shorten orthodontic treatment time (Fernández-Ferrer).

Distalization: A common descriptor for the biomechanics involved in moving maxillary first and second molars distally and into a Class I molar relationship (AAO).

Intrusion: A translational form of tooth movement directed apically and parallel to the long axis of a tooth (AAO).

Occlusal Plane: The imaginary surface on which upper and lower teeth meet in occlusion. It is actually a compound curved surface but is commonly approximated by a plane (straight line in the lateral view) based on specific reference points within the dental arches (AAO).

Open Bite: Lack of tooth contact in an occluding position (also called apertognathia) (AAO).

Orthognathic Surgery: Orthognathic Surgery is the surgical correction of abnormalities of the mandible, maxilla, or both. The underlying abnormality may be present at birth or may become evident as the patient grows and develops or may be the result of traumatic injuries. The severity of these deformities precludes adequate treatment through dental treatment alone (AAOMS).

Overbite: Vertical overlap of maxillary teeth over mandibular anterior teeth, usually measured perpendicular to the Occlusal Plane (AAO).

Retraction: Pertaining to desired posteriorly directed, orthodontic or orthopedic displacements of teeth or of bones of the face (AAO).

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D7280	Exposure of an unerupted tooth
D7282	Mobilization of erupted or malpositioned tooth to aid eruption
D7283	Placement of device to facilitate eruption of impacted tooth
D7292	Placement of temporary anchorage device (screw retained plate)requiring flap
D7293	Placement of temporary anchorage device requiring flap
D7294	Placement of temporary anchorage device without flap
D7296	Corticotomy – one to three teeth or tooth spaces, per quadrant
D7297	Corticotomy – four or more teeth or tooth spaces, per quadrant
D7298	Removal of temporary anchorage device [screw retained plate], requiring flap
D7299	Removal of temporary anchorage device, requiring flap
D7300	Removal of temporary anchorage device without flap
D7997	Appliance removal (not by dentist who placed appliance), includes removal of archbar

CDT® is a registered trademark of the American Dental Association

Description of Services

Temporary Anchorage devices (TADs) are used to improve Anchorage during routine orthodontic therapy. They are gaining popularity and can allow better Anchorage than extraoral headgear which relies on significant patient compliance for success (TADs may also be used for distraction osteogenesis of the mandible and this use is medical in nature and typically covered under the member's medical plan). Impacted teeth are those that are not expected to erupt into their normal position within the dental arch. The most common impactions occur with third molars and maxillary canine teeth but may involve any teeth. If impacted teeth (other than third molars, primary or supernumerary teeth) are exposed early and there is no tooth size or arch length discrepancies, these teeth will often erupt on their own. However, these teeth may require surgery to expose the tooth and place a bracket, band, or other device on the unerupted tooth, after its exposure, to aid eruption. Corticotomy in this context is a relatively new surgical procedure that involves creating cuts in, or removal of alveolar bone for the purpose of accelerating orthodontic treatment.

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

Clinical Evidence

Temporary Anchorage Devices (TADs)

Antoszewska-Smith et al (2017) conducted a systematic review and meta- analysis to compare the effectiveness of orthodontic miniscrew implants-temporary intraoral skeletal anchorage devices (TISADs)-in anchorage reinforcement during en-masse retraction in relation to conventional methods of anchorage. A search of PubMed, Embase, Cochrane Central Register of Controlled Trials and Web of Science were performed. Relevant articles were assessed for quality according to Cochrane guidelines and the data extracted for statistical analysis. A meta-analysis of raw mean differences concerning anchorage loss, tipping of molars, retraction of incisors, tipping of incisors, and treatment duration was carried out. 14 articles including 616 patients were selected as meeting criteria for detailed analysis, and the quality of the studies was assessed as moderate. Meta-analysis showed that use of TISADs facilitates better anchorage reinforcement compared with conventional methods. On average, TISADs enabled 1.86 mm more anchorage preservation than did conventional methods. The authors concluded that TISADs are more effective than conventional methods of anchorage reinforcement. The average difference of almost 2 mm seems not only statistically but also clinically significant. However, the results should be interpreted with caution because of the moderate quality of the included studies. More high-quality studies on this issue are necessary to enable drawing more reliable conclusions.

Heravi et al (2016) conducted a study evaluating the movement of impacted canines away from the roots of neighboring teeth before full-mouth bracket placement, performed by means of TADs to decrease undesired side effects on adjacent teeth. The study sample consisted of 34 palatally impacted canines, 19 in the experimental group and 15 in the control group. In the experimental group, before placement of brackets, the impacted canine had erupted by means of miniscrews. In the control group, after initiation of comprehensive orthodontics, canine disimpaction was performed by means of a cantilever spring soldered to a palatal bar. At the end of treatment, volume of lateral incisors and canine root

resorption were measured and compared by means of a CBCT-derived tridimensional model. Visual Analogue Scale (VAS) score, bleeding on probing (BOP) and gingival index (GI) were recorded. Clinical success rate was also calculated. The volume of root resorption of lateral teeth in the control group was significantly greater than in the experimental group ($p < 0.001$). At the end of treatment, VAS score, GI and BOP were not significantly different between the two groups. From this study, the authors concluded that disimpaction of canines and moving them to the arch can be done successfully carried out with minimal side effects by means of skeletal anchorage.

Manni et al (2016) conducted a study with the aim of evaluating the effectiveness of the treatment of skeletal Class II malocclusions with an acrylic splint Herbst appliance anchored to miniscrews with 2 types of ligation. Sixty patients (mean age, 11.6 years; SD, 1.9) with a bilateral Angle Class II Division 1 malocclusion were retrospectively selected and divided into 3 homogeneous and balanced groups on the basis of the Herbst anchorage used: without anchorage, miniscrews with elastic chains, and miniscrews with metallic ligatures. A cephalometric sagittal occlusion analysis merged with mandibular incisor proclination and skeletal divergence was carried out before and after treatment. To compare the absolute variations within and among the groups, we performed the 1-sample t test for repeated measures and 1-way analysis of variance, respectively. The results showed overjet was reduced similarly in all groups, the mandibular bone base length increased in the group with elastic chains only, and the change in the distance between Point A and pogonion showed the most reduction in the group with elastic chains ($p < 0.05$). Incisive flaring was more pronounced in the group with no anchorage than in the group with elastic chains ($p < 0.001$) and the group with metallic ligatures ($p = 0.003$). The authors concluded that anchorage to miniscrews with elastic chains increases the orthopedic effect of the acrylic splint Herbst appliance and confirmed that skeletal anchorage reduces incisor flaring.

Turkkahraman et al (2016) conducted a controlled study to evaluate the effects of temporary anchorage devices (TADs) in the treatment of skeletal open bites and to compare the results with untreated controls. A total of forty patients with skeletal anterior open bites were assigned to two groups of twenty each. Titanium miniplates fixed bilaterally to the infrazygomatic crest area were used as TADs and intrusive forces were applied to the posterior teeth with Ni-Ti coil springs. The treatment and normal growth changes were evaluated using 24 measurements (2 angular, 22 linear) with statistically significant differences found between the groups in several of them. In the treatment group, statistically significant upper molar intrusion, posterior rotation of the occlusal plane, anterior rotation of the mandible, and resultant overbite improvement were found. The authors concluded that mild to moderate skeletal anterior open bites could easily be treated with TADs without orthognathic surgery. With the rigid anchorage of miniplates, true molar intrusion of up to 4 mm was achieved. With molar intrusion, anterior rotation of the mandible and a significant reduction in anterior face height were determined.

Lee et al (2015) conducted a clinical study to compare the treatment duration and dentoskeletal changes between two different anchorage systems used to treat maxillary dentoalveolar protrusion and to examine the effectiveness of en-masse retraction using two miniscrews placed in the midpalatal suture. Fifty-seven patients were divided into two groups according to the method of maxillary posterior anchorage reinforcement: midpalatal miniscrews (25 patients, mean age 22 years) and conventional anchorage (32 patients, mean age 19 years). The en-masse retraction period, overall treatment duration, pre-treatment effective ANB angle, and change in the effective ANB angle were compared with an independent-samples t-test. Compared to the headgear group, the duration of en-masse retraction was longer by approximately 4 months in the miniscrew group ($p < 0.001$). However, we found no significant difference in the total treatment duration between the groups. Moreover, a greater change in the effective ANB angle was observed in patients treated with miniscrews than in those treated with the conventional method ($p < 0.05$). The authors concluded that treatment using miniscrews placed in the midpalatal area will allow orthodontists more time to control the anterior teeth during en-masse retraction, without increasing the total treatment duration. Furthermore, it achieves better dentoskeletal control than does the conventional anchorage method, thereby improving the quality of the treatment results.

Bechtold et al (2013) conducted a study to determine the effects of linear force vector(s) from interradicular miniscrews on the distalization pattern of the maxillary arch in adult Class II patients. Twenty-five adult patients with mild to moderate Class II dentition and minimal crowding were collected. Either single (group A) or dual (group B) miniscrews were inserted on the posterior interradicular area to deliver a distalizing force to the main archwire. The displacement patterns of maxillary incisors and molars were measured and compared. Significant distalization in the molars and incisors was shown in both groups. Significantly greater distalization and intrusion of the first molar and intrusive displacement of the incisor, together with significant reduction of the mandibular plane, were noted in group B, in contrast to the rotation of the occlusal plane in group A. The authors concluded that interradicular miniscrews predictably induced total arch distalization, leading to the correction of Class II. Additional miniscrews in the premolar area appear to facilitate intrusion and distalization of the entire arch according to the position of the force vectors.

Xun et al (2013) The aim of this retrospective study was to quantitatively evaluate the treatment effects of intrusion of over erupted maxillary molars using miniscrew implant anchorage and to investigate the apical root resorption after molar

intrusion. The subjects included 30 patients whose average ages were 35.5 ± 9.0 years. All patients had received intrusion treatments for over erupted maxillary molars with miniscrew anchorage. There were 38 maxillary first molars and 26 maxillary second molars to be intruded. Two miniscrews were inserted in the buccal and palatal alveolar bone mesial to the over erupted molar. Force of 100-150 g was applied by the elastic chains between screw head and attachment on each side. Lateral cephalograms and panoramic radiographs taken before and after intrusion were used to evaluate dental changes and root resorption of molars. Only 6 of the 128 miniscrews failed. The first and second molars were significantly intruded by averages of 3.4 mm and 3.1 mm respectively ($p < 0.001$). The average intrusion time was more than 6 months. The crown of the molars mesially tilted by averages of 3.1 degrees and 3.3 degrees ($p < 0.001$) for first and second molars. The amounts of root resorption were 0.2-0.4 mm on average. The intrusion treatment of over erupted molars with miniscrew anchorages could be used as an efficient and reliable method to recover lost restoration space for prosthesis. Radiographically speaking, root resorption of molars was not clinically significant after application of intrusive forces of 200 to 300 g.

Corticotomy

A corticotomy performed on the maxilla or mandible is a relatively new procedure designed to decrease orthodontic treatment time. While the overall body of evidence is large, there is a lack of well-designed studies with larger numbers of participants that demonstrate patient selection criteria and the clinical utility of this procedure, as well as the long term effects

In a 2021 systematic review, DE Stefani et al. sought to evaluate corticotomy assisted orthodontic treatment (CAOT) as a treatment for expanding narrow arches in adult orthodontic patients. Six studies met the review criteria. The results showed inconsistent results among studies, and that while CAOT can have better results than conventional palatal expansion, it cannot be considered alternative treatment for severe posterior cross bite. Additionally, greater predictability is achieved if CAOT is done in conjunction with bone grafting. The authors concluded that the evidence of corticotomy as a treatment for palatal expansion in adult orthodontic treatment has not been well described in literature and only few published reports are available. Further testing is necessary to confirm the validity of this technique.

Apilaomva et al. (2020) conducted a systematic review to evaluate corticotomies effects on the acceleration or facilitation of tooth movements in different orthodontic treatments. Seven randomized controlled clinical trials and two controlled clinical trials were included in the review. In the selected studies the effectiveness of conventional orthodontic treatment was compared with orthodontics assisted by corticotomy or piezocisión. The effect of bone grafts was also evaluated. Variables such as tooth movement, treatment time, bone density and root resorption were studied as well. The methodological quality and evidence of the selected studies was low. Most of the studies observed a statistically significant increase in the rate of dental movement, when performing alveolar corticotomies as an aid in orthodontic treatment; either with the conventional technique or with piezocision. The effect of combining corticotomy with bone grafts was assessed. Corticotomy procedures performed even with conventional methods or piezocision involve a rate increase in dental movement and acceleration during the first months, subsequently returning to baseline values. Bone density may increase as a result of concurrent placement of bone grafting materials during corticotomy procedure. High heterogeneity among studies made it difficult to draw clear conclusions. However, within the limitations of this review, the corticotomy procedures were able to statistically and clinically produce significant temporary decrease in orthodontic tooth movement rate. The available literature about orthodontics facilitated by corticotomy techniques provides low quality evidence, which is why more research is needed. A research with less risk of bias would allow greater comparisons and more significant conclusions.

In a 2018 systematic review, Gil et al. aimed to provide scientific support to validate alveolar corticotomies as a reliable approach to accelerated orthodontics. Three randomized clinical trials, 2 prospective randomized clinical trials, 6 case series and 1 randomized controlled split-mouth study were included. No clinical trials were retrieved. The results showed the mean total treatment time in corticotomy-facilitated orthodontic cases was 8.85 months; control groups treatment duration was 16.4 months. Complications such as pain, swelling, and dentin hypersensitivity were reported. Few studies mentioned patient/clinician satisfaction. The faster and less invasive procedures appeared to be well tolerated. However, the methodological quality of the selected studies was low, with only low to moderate scientific evidence. The authors concluded that corticotomy-facilitated orthodontics resulted in decreased treatment time. Few complications and low morbidity were found. More solid evidence-based research is required to support these results.

Ji et al. (2017) conducted a study to summarize published systematic reviews (SRs) that assess the effects of adjunctive interventions on the acceleration of orthodontic tooth movement (OTM). Electronic and manual searches were performed up to August 2016. Systematic reviews investigating the impact of adjunctive techniques on the promotion of OTM were included. A total of 11 SRs were included in this study. The results showed the quality of evidence ranged from very low to low. The short-term (1-3 months) effects of low-level laser therapy and corticotomy were supported by low-quality evidence. The evidence regarding the efficacy of photo biomodulation, pulsed electromagnetic field, interseptal bone

reduction, two vibrational devices (Tooth Masseur and Orthoaccel) and electrical current was of very low quality. Relaxin injections and extracorporeal shock waves were reported to have no impact on OTM according to low- and very low-quality evidence, respectively. Based on currently available information, the authors conclude that low-quality evidence indicates that LLLT and corticotomy are effective to promote OTM in the short term. Future high-quality trials are required to determine the optimal protocols, as well as the long-term effects of LLLT and corticotomy, before warranting recommendations for orthodontics clinics.

Patterson et al. (2016) conducted a systematic review and meta-analysis to examine the evidence for the effectiveness and safety of corticotomy-facilitated orthodontics. Electronic databases were searched for articles that examined the rate of corticotomy-facilitated orthodontic tooth movement and its effects on the periodontium, root resorption, and tooth vitality. Unpublished literature was searched electronically through ClinicalTrials.gov and the ISRCTN registry. Relevant orthodontic journals and reference lists also were checked for eligible studies. Randomized clinical trials (RCTs) and controlled clinical trials (CCTs) were considered. Two article reviewers independently assessed the search results, screened the relevant articles, performed data extraction, and evaluated the methodologic quality of the studies. Fourteen eligible articles (6 RCTs and 8 CCTs) were included in this review. The results showed that there was a statistically meaningful increase in the rate of tooth movement compared with controls for all corticotomy techniques assessed. Some studies reported that acceleration in tooth movement was only temporary (lasting a few months). Corticotomy procedures did not seem to produce unwanted adverse effects on the periodontium, root resorption, and tooth vitality. The quality of the body of evidence was regarded as low owing to the presence of multiple methodologic issues, high risks of bias, and heterogeneity in the included articles. The authors concluded that corticotomy procedures can produce statistically and clinically meaningful temporary increases in the rate of orthodontic tooth movement with minimal side-effects. Additional high-quality randomized clinical trials are needed to allow more definitive conclusions.

Professional Societies

American Association of Oral and Maxillofacial Surgeons (AAOMS)

In a 2017 Parameter of Care, AAOMS indicates that due to the added advantages of lower costs and morbidity, fast recovery, and decreased duration of orthodontic therapy and decompensation, surgically assisted osteogenic orthodontics (SAOO) may be considered as a treatment option when clinically indicated for pediatric patients requiring distraction osteogenesis orthognathic surgery.

In the same parameter of care, the AAOMS states that mandibular retrusion and maxillary protraction utilizing temporary anchorage devices (TAD) such as screw retained plating systems and miniscrews may be considered as a more conservative, cost efficient, and less morbid treatment alternative to more complex orthognathic surgery for developing skeletal class III malocclusion in pre-and early adolescents.

American Association of Orthodontists (AAO)

In a 2017 clinical practice guideline for orthodontic and dentofacial orthopedics, the AAO states that maxillary and mandibular/dentoalveolar hyper and hypoplasia may require adjunctive anchorage procedures including but not limited to osseointegrated implants, mini-screw implants, miniplates and other temporary anchorage devices.

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

Temporary anchorage devices are FDA approved for use in patients aged 12 years and older. There are an extensive number of manufacturers of these devices. Refer to the following website for more information and search by specific product name: <http://www.fda.gov/MedicalDevices/default.htm>. (Accessed July 18, 2022)

References

American Association of Oral and Maxillofacial Surgeons 2017 Parameters of Care: Clinical Practice Guidelines for Oral and Maxillofacial Surgery. Surgical Correction of Maxillofacial Skeletal Deformities. Available at: https://www.aaoms.org/images/uploads/pdfs/parcare_assessment.pdf. Accessed June 29, 2024.

American Association of Oral and Maxillofacial Surgeons Criteria for Orthognathic Surgery. 2020. Available at: https://www.aaoms.org/docs/practice_resources/clinical_resources/ortho_criteria.pdf. Accessed June 29, 2024.

American Association of Orthodontists Clinical Practice Guidelines for Orthodontic and Dentofacial Orthopedics. 2017.

American Association of Orthodontists AAO Glossary, 2012.

American Dental Association CDT Codebook 2024.

Antoszevska-Smith J, Sarul M, Łyczek J, et al. Effectiveness of orthodontic miniscrew implants in anchorage reinforcement during en-masse retraction: A systematic review and meta-analysis. *Am J Orthod Dentofacial Orthop.* 2017 Mar;151(3):440-455.

Apalimova A, Roselló À, Jané-Salas E, Arranz-Obispo C, Marí-Roig A, López-López J. Corticotomy in orthodontic treatment: systematic review. *Heliyon.* 2020;6(5):e04013. Published 2020 May 27. doi:10.1016/j.heliyon.2020.e04013.

Beadnell, S. *Current Therapy in Oral and Maxillofacial Surgery*, 1st ed. St. Louis: Mosby 2012. Chapter 16, Management of the Impacted Canine; p.135-145.

Bechtold TE, Kim JW, Choi TH, et al. Distalization pattern of the maxillary arch depending on the number of orthodontic miniscrews. *Angle Orthod.* 2013 Mar;83(2):266-73.

DE Stefani A, Bruno G, Irlandese G, et al. Is the corticotomy assisted orthodontic treatment efficient in the expansion of narrow arches in adult patients? *Minerva Dent Oral Sci.* 2021 Feb;70(1):44-48.

Digman S, Hayes S, Niel JL. *Oral and Maxillofacial Surgery*, 2nd ed. St. Louis: Mosby 2009. Chapter 10, Pediatric Dentoalveolar Surgery; p.165-184.

Fernández-Ferrer L, Montiel-Company JM, Candel-Martí E, et al. Corticotomies as a surgical procedure to accelerate tooth movement during orthodontic treatment: A systematic review. *Med Oral Patol Oral Cir Bucal.* 2016 Nov.

Gil APS, Haas OL Jr, Méndez-Manjón I, et al. Alveolar corticotomies for accelerated orthodontics: A systematic review. *J Craniomaxillofac Surg.* 2018 Mar;46(3):438-445.

Heravi F, Shafae H, Forouzanfar A, et al. The effect of canine disimpaction performed with temporary anchorage devices (TADs) before comprehensive orthodontic treatment to avoid root resorption of adjacent teeth. *Dental Press J Orthod.* 2016 Mar-Apr;21(2):65-72.

Kerr A, Miller C, Nelson R. *Little and Falace's Dental Management of the Medically Compromised Patient*, 10th ed. St. Louis: Elsevier c2024. Chapter 1, Patient Evaluation, Risk Assessment, and the Diagnostic Process; p. 1-17.

Lee, J. *Current Therapy in Oral and Maxillofacial Surgery*, 1st ed. St. Louis: Mosby 2012. Chapter 17, Implants for Orthodontic Anchorage; p.147.

Lee J, Miyazawa K, Tabuchi M, Sato T, et al. Effectiveness of en-masse retraction using midpalatal miniscrews and a modified transpalatal arch: Treatment duration and dentoskeletal changes. *Korean J Orthod.* 2014 Mar; 44(2):88-95.

Manni A, Mutinelli S, Pasini M, et al. Herbst appliance anchored to miniscrews with 2 types of ligation: Effectiveness in skeletal Class II treatment. *Am J Orthod Dentofacial Orthop.* 2016 Jun;149(6):871-80.

Patterson BM, Dalci O, Darendeliler MA, et al. Corticotomies and Orthodontic Tooth Movement: A Systematic Review. *J Oral Maxillofac Surg.* 2016 Mar;74(3):453-73.

Sakar M, Ogle O, Dym H. *Oral and Maxillofacial Surgery*, 2nd ed. St. Louis: Mosby 2009. Chapter 11, Basic and Complex Exodontia and Surgical Management Of Impacted Teeth; p.185-211.

Shroff B, Lindauer S. *Current Therapy in Orthodontics*, 1st ed. St. Louis: Mosby c2010. Chapter 22, Temporary Anchorage Devices: Biomechanical Opportunities and Challenges; p. 278-290.

Turkkahraman H, Sarioglu M. Are temporary anchorage devices truly effective in the treatment of skeletal open bites? *Eur J Dent.* 2016 Oct-Dec; 10(4):447-453.

Wolford L, Stevao E, Alexander C et al. *Peterson's Principles of Oral and Maxillofacial Surgery*, 2nd ed. Hamilton Ontario: BC Decker 2004. Chapter 55, Orthodontics for Orthognathic Surgery; p.1131-1132.

Xun CL, Zhao H, Zeng XL, et al. Intrusion of overerupted maxillary molars with miniscrew implant anchorage: a radiographic evaluation. *J Huazhong Univ Sci Technolog Med Sci.* 2013 Oct; 33(5):780-5.

Yi J, Xiao J, Li H, et al. Effectiveness of adjunctive interventions for accelerating orthodontic tooth movement: a systematic review of systematic reviews. *J Oral Rehabil.* 2017 Aug; 44(8):636-654.

Policy History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.

Other Restorative Procedures

Guideline Number: DCG024.11
Effective Date: January 1, 2025

[➔ Instructions for Use](#)

Table of Contents	Page
198. Coverage Rationale	203
199. Definitions	203
200. Applicable Codes	204
201. Description of Services	204
202. References	204
203. Guideline History/Revision Information	204
204. Instructions for Use	204

Related Dental Policy
<ul style="list-style-type: none"> Single Tooth Indirect Restorations

Coverage Rationale

Repair/Recement/Rebond of Single Tooth Indirect Restorations

These procedures are indicated for an [Inlay](#), [Onlay](#), [Crown](#), or [Laminate Veneer](#) in which the functional area is involved due to restorative material failure.

Reattachment of Tooth Fragment

Reattachment of tooth fragment is indicated for a tooth fracture confined to enamel and dentin with loss of structure.

Reattachment of tooth fragment is not indicated for fractures involving tooth roots.

Coping

[Coping](#) is considered inclusive to the preparation of a [Crown](#) and bridge Abutment Crowns unless a separate procedure is indicated for the following:

- If insufficient natural tooth structure remains to retain the Crown
- To allow a common path of insertion when retainer teeth are tipped or misaligned

Definitions

Abutment Crowns: An artificial crown that serves as retention or support of a dental prosthesis. (ADA)

Coping: A thin covering of the coronal portion of the tooth usually without anatomic conformity. Custom made or prefabricated thimble-shaped core or base layer designed to fit over a natural tooth preparation, a post core, or implant abutment so as to act as a substructure onto which other components can be added to give final form to a restoration or prosthesis. It can be used as a definitive restoration or as part of a transfer procedure. (ADA)

Crown: An artificial replacement that restores missing tooth structure by surrounding the remaining coronal tooth structure or is placed on a dental implant. It is made of metal, ceramic or polymer materials or a combination of such materials. It is retained by luting cement or mechanical means. (ADA)

Inlay: An intracoronal dental restoration, made outside the oral cavity to conform to the prepared cavity, which restores some of the occlusal surface of a tooth, but does not restore any cusp tips. It is retained by luting cement. (ADA)

Laminate Veneer: A thin covering of the facial surface of a tooth usually constructed of tooth colored material used to restore discolored, damaged, misshapen, or misaligned teeth. (ADA)

Onlay: A dental restoration made outside the oral cavity that covers one or more cusp tips and adjoining occlusal surfaces, but not the entire external surface. It is retained by luting cement. (ADA)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D2910	Re-cement or re-bond inlay, onlay, veneer or partial coverage restoration
D2915	Re-cement or re-bond indirectly fabricated or prefabricated post and core
D2920	Re-cement or re-bond crown
D2921	Reattachment of tooth fragment, incisal edge or cusp
D2971	Additional procedures to construct a new crown to fit under existing partial denture framework
D2975	Coping
D2980	Crown repair necessitated by restorative material failure
D2981	Inlay repair necessitated by restorative material failure
D2982	Onlay repair necessitated by restorative material failure
D2983	Veneer repair necessitated by restorative material failure
D2999	Unspecified restorative procedure, by report

CDT® is a registered trademark of the American Dental Association

Description of Services

All teeth and restorations are subject to breakage or fracture. Single tooth indirect restorations may become separated from original cement or bond and need to be reattached. Additionally, trauma may result in fractures of incisal edges or cusps of teeth. These procedures refer to the repair and reattachment of bonded and cemented restorations as well as reattaching tooth fragments.

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

References

American Dental Association (ADA) CDT Codebook 2024.

American Dental Association Glossary of Clinical and Administrative Terms.

International Association of Dental Traumatology, Dental Trauma Guidelines 2012.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any

applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Prefabricated Crowns

Policy Number: DCP012.12
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
205. Coverage Rationale	206
206. Applicable Codes	207
207. Description of Services	207
208. Clinical Evidence	207
209. References	209
210. Policy History/Revision Information	209
211. Instructions for Use	209

Related Dental Policy
<ul style="list-style-type: none"> Non-Surgical Endodontics

Coverage Rationale

Prefabricated crowns are indicated for the following:

- Restoration of teeth with more than two surfaces affected with carious lesions, or where extensive one or two surface lesions are present
- Large or multi-surface cavitated and non-cavitated carious lesions in documented high caries risk children; risk factors must be thoroughly documented by the provider in the dental record and include:
 - Mother or primary caregiver has active caries
 - White spot lesions or enamel defects
 - Visible caries or previous restorations
 - Sub-optimal systemic fluoride intake
 - Frequent exposure to cavity-producing foods and drinks
 - Individuals with special health care needs
 - Low socioeconomic status
 - Xerostomia
 - More than one interproximal lesion
- Developmental defects (hypoplasia, hypocalcification, enamel hypoplasia, amelogenesis imperfecta, dentinogenesis imperfecta, etc.)
- Interproximal caries extending beyond line angles
- Following pulpotomy or pulpectomy
- Restoration of a primary tooth that is to be used as an abutment for a space maintainer
- Intermediate restoration of fractured teeth
- Restoration and protection of teeth exhibiting extensive tooth surface loss due to attrition, abrasion, or erosion
- In individuals with impaired oral hygiene in which the breakdown of intra-coronal restorations is likely
- When the tooth cannot be effectively isolated for amalgam or composite restorations

Prefabricated crowns are not indicated for the following:

- A primary tooth that is close to exfoliation with more than half the roots resorbed
- Excessive tooth crown loss resulting in the inability for mechanical retention
- Loss of space due to tipping of neighboring teeth into carious defect interfering with the ability to attain proper fit
- Solely for cosmetic purposes
- As a preventive measure for teeth with no evidence of pathology

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D2928	Prefabricated porcelain/ceramic crown – permanent tooth
D2929	Prefabricated porcelain/ceramic crown – primary tooth
D2930	Prefabricated stainless steel crown – primary tooth
D2931	Prefabricated stainless steel crown – permanent tooth
D2932	Prefabricated resin crown
D2933	Prefabricated stainless steel crown with resin window
D2934	Prefabricated esthetic coated stainless steel crown – primary tooth

CDT® is a registered trademark of the American Dental Association

Description of Services

Prefabricated crowns are full tooth coverage restorations that may be made of stainless steel, porcelain/ceramic or acrylic. The dentist selects the best fit and adapts the crown as needed and cements it with a biocompatible luting agent. Prefabricated crowns are most commonly used for primary teeth as a means to retain the tooth until it naturally exfoliates, and permanent tooth erupts. They are typically not considered a definitive restoration for permanent teeth.

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

Clinical Evidence

Seale et al. (2015) conducted a systemic review of the literature on stainless steel crowns (SSCs) from 2002 to the present as an update to an earlier review published in 2002. Included were published papers on clinical studies, case series, and laboratory testing on SSCs (including esthetic SSCs and the Hall technique) in peer-reviewed journals. Study quality and strength of evidence presented were assessed for papers reporting clinical results for SSCs as a primary study outcome using a list of weighting criteria. Ten clinical studies had weighting scores between 26 percent and 68 percent, of which two were considered to be of good quality regarding validity and study design and three further studies were considered to be of moderate quality. This review, within the confines of these studies, demonstrates primary molar esthetic crowns and stainless-steel crowns had acceptable clinical performance as restoratives for posterior primary teeth. Additionally, this review supports the findings from the 2002 review regarding the placement of stainless-steel crowns in patients with high caries risk who exhibit anterior caries as well as multiple posterior lesions, or who receive treatment under general anesthesia for the protection of remaining tooth structure.

O'Connell et al. (2014) completed a statistical analysis on 34 paired crowns in 14 children with the aim of evaluating the clinical performance of posterior pre veneered stainless steel crowns after three years. NuSmile® pediatric crowns and Kinder Krowns® were randomly allocated on paired molars using a split-mouth design. After three years, 53 percent of crowns were fracture free compared to 81 percent at one year, and crowns had extensive fracture. No difference was reported in the clinical performance between the two crown types. Fracture was more likely to occur where the adjacent tooth was missing. The authors concluded that clinical performance of both crown types was similar and successful for three years and offers a more esthetically acceptable option to traditional silver stainless steel crowns.

Schuler et al. (2014) conducted an observational follow up study to assess the quality of stainless-steel crowns (SSC) placed in children at 1,3 and 5 years of service time. 428 SSC's in 171 children aged between 1.1 and 8.6 years were assessed for marginal adaptation, extension and proximal contacts, and plaque and gingival bleeding. Secondary caries was not assessed. Loss of SSCs due to pathological tooth mobility and perforation of the crown were scored as clinical failures. The overall success rate of SSCs was 97.2%, regardless of the extent of carious lesions or pulp treatment of the tooth. The majority of SSCs had sealed margins and the marginal extension reached sub-gingival level. Open proximal contacts occurred in approximately 20% of teeth. All qualitative defects increased with service time. Gingival bleeding was

observed in 72.1% of all SSCs, and 46.4% were free of dental plaque. The authors concluded that SSCs are clinically successful restorations in primary molars of high caries risk children.

Hutcheson et al. (2012) conducted a split mouth, randomized controlled trial comparing primary molars treated with white MTA pulpotomies and restored with either multi-surface composites (MSC) or stainless-steel crowns (SSC). Forty matched, contra-lateral pairs of molars received MTA pulpotomies and were randomly assigned to MSC or SSC restorations and evaluated clinically and radiographically at 6 and 12 months. Two calibrated, blinded examiners evaluated and scored radiographs. Thirty-seven matched pairs were evaluated at 6 months, and 31 were available at 12 months. All teeth in both groups were radiographically and clinically successful at 6 and 12 months. Dentin bridge formation was noted in 20% of the primary molars by 12 months. The composite restored group exhibited fewer intact clinical margins than the SSC group, and the vast majority (94%) of teeth restored with composite displayed gray discoloration at follow-up exams, which did not appear to affect the quality of the restoration and is believed to be associated with the white MTA. The authors concluded that the white MTA pulpotomies succeeded over 12 months regardless of the restoration; however, the teeth restored with composite were not as durable nor considered an esthetic alternative to the SSC.

Attari et al. (2006) conducted a review of the literature concerning the restoration of primary teeth with pre-formed metal crowns (PMC). A search of the dental literature was made electronically using key words to describe pre-formed metal for primary molars. There were 112 papers found, and fourteen met the search criteria of being relevant for pediatric dentistry. The 14 chosen were then graded using the U.S. Preventive Services Task force Grade Definitions. Of these, none were rated A or B1, seven B2 and seven C. Failure rates of PMC varied between 1.9 and 30.3%. In all studies the failure rate of PMC was lower than comparable restorations and, in some studies, this was statistically significant. This literature review showed that pre-formed metal crowns are indicated for the restoration of badly broken-down primary molars and their success rate is superior to all other restorative materials.

Shah et al (2004) conducted a retrospective cross-sectional study to evaluate the clinical success of (and parental satisfaction with) treatment using prefabricated resin-faced stainless-steel crowns (Kinder Krowns®) on anterior primary teeth. Patients treated within the last 3 years were recalled for clinical evaluation and completion of a parental satisfaction survey. Clinical evaluation was performed for crown retention, facing retention, and resin veneer wear. Forty-six teeth were evaluated in 12 children. The average age of the crown at the time of examination was 17.5 months (range 5-38 months). All crowns were still present in the mouth, and resin fracture resulting in partial or total facing loss was seen in 24% of the crowns. No resin facing fracture or visible wear was seen in 61% of the crowns. Six crowns had total facing loss from fracture (13%), while 5 (11%) had partial facing fracture. Wear was seen in 7 crowns, (15%) and was limited to less than the incisal one third of the crown. The parental satisfaction with the pre veneered SSCs overall was high. The authors concluded that pre veneered stainless steel crowns (Kinder Krowns®) have a high rate of success and parental satisfaction for the restoration of primary anterior teeth.

Almeida et al. (2000) conducted a retrospective study to assess the susceptibility of children to the future development of caries following comprehensive treatment for early childhood caries (ECC) under general anesthesia. The patients selected were identified by analyzing dental records of children receiving treatment at the Franciscan Children's Hospital & Rehabilitation Center, Boston, MA. In total, 4,143 records were reviewed. Of these, ECC was diagnosed in 42 patients before their admission to the operating room. Thirty-one control children were selected randomly from the dental records reviewed as a control group and were initially caries-free. The caries status of the children diagnosed with ECC was evaluated and compared with the control group. Children in both groups were seen for recall at intervals of six to nine months over a two-year period. Thirty-three of the 42 (79%) ECC children compared to nine of 31 (29%) control children had detectable carious lesions at subsequent recall visits. These differences were statistically significant. Additionally, of the 42 patients treated for ECC under general anesthesia, seven (17%) required retreatment under general anesthesia within two years following their initial full-mouth rehabilitation. The prevalence of NSSC in the ECC group was significantly higher than the control group. The authors concluded that despite increased preventive measures implemented for children who experienced ECC, this group of children is still highly predisposed to greater caries incidence in later years. These findings strongly suggest that more aggressive preventive therapies may be required to prevent the future development of carious lesions in children who experienced ECC.

Clinical Practice Guidelines

American Academy of Pediatric Dentistry (AAPD)

In the pediatric restorative dentistry best practice guideline 2022 revision, the AAPD states the following:

- The use of SSCs is supported on high-risk children with large or multi-surface cavitated or non-cavitated lesions on primary molars, especially when children require advanced behavioral guidance techniques including general anesthesia for the provision of restorative dental care

- Preformed metal crowns may be indicated as semi-permanent restorations on permanent teeth for treating severe enamel defects or gross caries

References

Almeida AG, Roseman MM, Sheff M, et al. Future caries susceptibility in children with early childhood caries following treatment under general anesthesia. *Pediatr Dent*. 2000 Jul-Aug; 22(4):302-6.

American Academy of Pediatric Dentistry Council on Clinical Affairs. Guideline on Caries-risk Assessment and Management for Infants, Children, and Adolescents. Adopted 2002. Revised 2022. Available at: https://webcache.googleusercontent.com/search?q=cache:KrHiHfIjXQ0J:https://www.aapd.org/media/Policies_Guidelines/BP_CariesRiskAssessment.pdf+&cd=1&hl=en&ct=clnk&gl=us. Accessed December 7, 2023.

American Academy of Pediatric Dentistry (AAPD) Council on Clinical Affairs. Pediatric Restorative Dentistry. Revised 2022. https://www.aapd.org/globalassets/media/policies_guidelines/bp_restoratedent.pdf. Accessed December 7, 2023.

American Dental Association (ADA) CDT 2024 Dental Procedure Code Book.

Attari N, Roberts JF. Restoration of primary teeth with crowns: a systematic review of the literature. *Eur Arch Pediatr Dent*. 2006 Jun; 7(2):58-62.

Dowd, F. DDS, PhD. *Mosby's Review for the NBDE*. 2nd ed. St. Louis: Elsevier Mosby; c2015. Section 5, Orthodontics and Pediatric Dentistry, 2.4, Restorative Dentistry for Children; p. 195.

Hutcheson C, Seale NS, McWhorter A, et al. Multi-surface composite vs stainless steel crown restorations after mineral trioxide aggregate pulpotomy: a randomized controlled trial. *Pediatr Dent*. 2012 Nov-Dec; 34(7):460-7.

Kindelan SA, Day P, Nichol R, et al. British Society of Paediatric Dentistry. UK National Clinical Guidelines in Pediatric Dentistry: stainless steel preformed crowns for primary molars. *Int J Pediatr Dent*. 2008 Nov; 18 Suppl 1:20-8.

O'Connell AC, Kratunova E, Leith R. Posterior pre veneered stainless steel crowns: clinical performance after three years. *Pediatr Dent*. 2014 May-Jun; 36(3):254-8.

Schüler IM, Hiller M, Roloff T, et al. Clinical success of stainless-steel crowns placed under general anesthesia in primary molars: an observational follow up study. *J Dent*. 2014 Nov; 42(11):1396-403.

Seale NS, Randall R. The use of stainless-steel crowns: a systematic literature review. *Pediatr Dent*. 2015 Mar-Apr; 37(2):145-60.

Shah PV, Lee JY, Wright JT. Clinical success and parental satisfaction with anterior pre veneered primary stainless-steel crowns. *Pediatr Dent*. 2004 Sep-Oct; 26(5):391-5.

Policy History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.

Removable Prosthodontics

Guideline Number: DCG020.15
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
212. Coverage Rationale	210
213. Definitions	211
214. Applicable Codes	211
215. Description of Services	213
216. References	213
217. Guideline History/Revision Information	214
218. Instructions for Use	214

Related Dental Policy

- Fixed Prosthodontics

Coverage Rationale

Complete and Partial Dentures

Removable **Complete** or **Partial** Dentures (including Immediate Complete and Partial Prosthodontics) are indicated for the definitive replacement of missing teeth lost due to disease, trauma, or injury.

Complete and Partial Dentures are not indicated for the following:

- Partial Dentures are not indicated for members with chronic poor oral hygiene, or abutment teeth that are in poor condition due to periodontal disease or extensive caries
- When there has been extensive bone atrophy resulting in an inadequate edentulous ridge
- Poor neuro-muscular control
- Unresolved soft tissue concerns (e.g., lack of vestibular depth, hypertrophy, hyperplasia, stomatitis)

Complete and Partial Denture Rebase and Reline Procedures

Denture **Rebasing** is indicated for the following:

- When changes to the residual ridge result in loss of denture stability, retention, or occlusal disharmony
- When replacing or rearranging teeth on a Partial Denture
- When the base has fractured or cracked

Denture **Rebasing** is not indicated for the following:

- When the prosthesis is broken or worn to the extent that replacement is warranted
- When the occlusion or structural integrity of the denture teeth are no longer functional
- When a Reline is sufficient

Denture **Relining** is indicated for the following:

- When changes to the residual ridge result in loss of denture stability, retention, or occlusal disharmony

Denture **Rebasing and Relining** are not indicated for the following:

- When the prosthesis is broken or worn to the extent that it is no longer functional and replacing the appliance is warranted
- Unresolved soft tissue hyperplasia or stomatitis

Interim Complete and Partial Dentures

Interim Prosthodontics are considered temporary and are indicated for the following:

- While tissue is healing following extractions

- Maintenance of a space for future permanent treatment such as an implant, bridge, or definitive fixed prosthesis
- To condition teeth and ridge tissue for optimum support of a definitive removable Partial Denture
- To maintain established jaw relation until all restorative treatment has been completed and a definitive denture can be constructed

Overdentures

Overdentures are indicated for the following:

- To preserve the integrity of the edentulous ridge
- When the teeth available as retainers have a good long-term prognosis

Overdentures are not indicated for the following:

- When there has been significant deterioration of the edentulous ridge
- Members with poor oral hygiene and non-compliance

Tissue Conditioning

Tissue conditioning is indicated for the following:

- The presence of inflammation and irritation of the mucosa or normal anatomic structures
- Subsequent to placement of Immediate Dentures

Tissue conditioning is not indicated for long term appliance stability and/or comfort.

Definitions

Fixed Partial Denture: A prosthetic replacement of one or more missing teeth cemented or otherwise attached to the abutment teeth or implant replacements. (ADA)

Immediate Denture: Any fixed or removable Dental Prosthesis fabricated for placement immediately following the removal of a natural tooth/teeth. (Academy of Prosthodontics)

Implant Denture: A denture is not an implantable device. Dental prostheses (fixed dental prostheses, removable dental prostheses) as well as maxillofacial prostheses can be supported and retained in part or whole by dental implants. (Academy of Prosthodontics)

Interim Complete and Partial Dentures: A prosthesis designed for use over a limited period of time. Also referred to as a temporary removable denture. (ADA)

Overdenture: Any removable Dental Prosthesis that covers and rests on one or more remaining natural teeth, the roots of natural teeth, and/or dental implants; a Dental Prosthesis that covers and is partially supported by natural teeth, natural tooth roots, and/or dental implants. (Academy of Prosthodontics)

Rebase: The laboratory process of replacing the entire denture base material on an existing prosthesis. (Academy of Prosthodontics)

Reline: The procedures used to resurface the tissue side of a removable Dental Prosthesis with new base material, thus producing an accurate adaptation to the denture foundation area. (Academy of Prosthodontics)

Removable Complete Denture Prosthesis: A Removable Dental Prosthesis that replaces the entire dentition and associated structures of the maxilla or mandible. (Academy of Prosthodontics)

Removable Partial Denture Prosthesis: Any prosthesis that replaces some teeth in a partially dentate arch. It can be removed from the mouth and replaced at will – also called partial Removable Dental Prosthesis. (Academy of Prosthodontics)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document

and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D5110	Complete denture – maxillary
D5120	Complete denture – mandibular
D5130	Immediate denture – maxillary
D5140	Immediate denture – mandibular
D5211	Maxillary partial denture – resin base (including retentive/clasping materials, rests, and teeth)
D5212	Mandibular partial denture – resin base (including retentive/clasping materials, rests, and teeth)
D5213	Maxillary partial denture – cast metal framework with resin denture bases (including any conventional clasps, rest and teeth)
D5214	Mandibular partial denture – cast metal framework with resin denture bases (including any conventional clasps, rest and teeth)
D5221	Immediate maxillary partial denture – resin base (including any conventional clasps, rests and teeth)
D5222	Immediate mandibular partial denture – resin base (including any conventional clasps, rests and teeth)
D5223	Immediate maxillary partial denture – cast metal framework with resin denture bases (including any conventional clasps, rest and teeth)
D5224	Immediate mandibular partial denture – cast metal framework with resin denture bases (including any conventional clasps, rest and teeth)
D5225	Maxillary partial denture - flexible base (including retentive/clasping materials, rests, and teeth)
D5226	Mandibular partial denture - flexible base (including retentive/clasping materials, rests, and teeth)
D5227	Immediate maxillary partial denture - flexible base (including any clasps, rests and teeth)
D5228	Immediate mandibular partial denture - flexible base (including any clasps, rests and teeth)
D5282	Removable unilateral partial denture – one piece cast metal (including retentive/clasping materials, rests, and teeth), maxillary
D5283	Removable unilateral partial denture – one piece cast metal (including retentive/clasping materials, rests, and teeth), mandibular
D5284	Removable unilateral partial denture – one-piece flexible base (including retentive/clasping materials, rests, and teeth – per quadrant
D5286	removable unilateral partial denture – one piece resin (including retentive/clasping materials, rests, and teeth) – per quadrant
D5410	Adjust complete denture – maxillary
D5411	Adjust complete denture – mandibular
D5421	Adjust partial denture – maxillary
D5422	Adjust partial denture – mandibular
D5511	Repair broken complete denture base, mandibular
D5512	Repair broken complete denture base, maxillary
D5520	Replace missing or broken teeth – complete denture – per tooth
D5611	Repair resin partial denture base, mandibular
D5612	Repair resin partial denture base, maxillary
D5621	Repair cast partial framework, mandibular
D5622	Repair cast partial framework, maxillary
D5630	Repair or replace broken retentive/clasping materials - per tooth
D5640	Replace missing or broken teeth – partial denture – per tooth
D5650	Add tooth to existing partial denture – per tooth
D5660	Add clasp to existing partial denture – per tooth
D5670	Replace all teeth and acrylic on cast metal framework (maxillary)

CDT Code	Description
D5671	Replace all teeth and acrylic on cast metal framework (mandibular)
D5710	Rebase complete maxillary denture
D5711	Rebase complete mandibular denture
D5720	Rebase maxillary partial denture
D5721	Rebase mandibular partial denture
D5725	Rebase hybrid prosthesis
D5730	Reline complete maxillary denture (direct)
D5731	Reline complete mandibular denture (direct)
D5740	Reline maxillary partial denture (direct)
D5741	Reline mandibular partial denture (direct)
D5750	Reline complete maxillary denture (indirect)
D5751	Reline complete mandibular denture (indirect)
D5760	Reline maxillary partial denture (indirect)
D5761	Reline mandibular partial denture (indirect)
D5765	Soft liner for complete or partial removable denture - indirect
D5810	Interim complete denture (maxillary)
D5811	Interim complete denture (mandibular)
D5820	Interim partial denture (including retentive/clasping materials, rests, and teeth), maxillary
D5821	Interim partial denture (including retentive/clasping materials, rests, and teeth), mandibular
D5850	Tissue conditioning, maxillary
D5851	Tissue conditioning, mandibular
D5862	Precision attachment, by report
D5863	Overdenture – complete maxillary
D5864	Overdenture – partial maxillary
D5865	Overdenture – complete mandibular
D5866	Overdenture – partial mandibular
D5867	Replacement of replaceable part of semi-precision or precision attachment , per attachment
D5875	Modification of removable prosthesis following implant surgery
D5876	Add metal substructure to acrylic full denture (per arch)
D5899	Unspecified removable prosthodontic procedure, by report

CDT® is a registered trademark of the American Dental Association

Description of Services

Removable dentures, either partial or complete, replace missing teeth to restore oral function, comfort, appearance, and health. These prostheses may be supported by the edentulous ridge, retained natural teeth, or intentionally retained roots of natural teeth. Over time, changes to the supporting structures or damage to the appliance may require adjustments that include relining, rebasing, and tissue conditioning. For partial dentures, additional teeth may be lost and be added to the existing partial. Interim prostheses are temporary and designed to be used for a defined time period to prepare for a definitive appliance.

References

American Dental Association (ADA) CDT Codebook 2025.

Academy of Prosthodontics. The Glossary of Prosthodontic Terms. Ninth Edition. Available at: https://www.academyofprosthodontics.org/lib_ap_articles_download/GPT9.pdf. Accessed October 14, 2024.

American College of Prosthodontics (ACP). Position Statement on the Frequency of Denture Replacement.2015. Reaffirmed 2018. Available at:

https://www.prosthodontics.org/assets/1/7/The_Frequency_of_Denture_Replacement_Position_Statement.pdf. Accessed October 14, 2024.

American Dental Association (ADA). Glossary of Dental Clinical and Administrative Terms. Available at: <https://www.ada.org/publications/cdt/glossary-of-dental-clinical-terms>. Accessed October 14, 2024.

Carr A, Brown D. McCracken's Removable Partial Prosthodontics, 13th ed. St. Louis: Elsevier c2016. Chapter 24, Interim Removable Partial Dentures; p.310-14.

Carr A, Brown D. McCracken's Removable Partial Prosthodontics, 13th ed. St. Louis: Elsevier c2016. Chapter 13, Diagnosis and Treatment Planning; p.155-87.

Carr A, Brown D. McCracken's Removable Partial Prosthodontics, 13th ed. St. Louis: Elsevier c2016. Chapter 14, Preparation of the Mouth for Removable Partial Dentures; p.200-201.

Carr A, Brown D. McCracken's Removable Partial Prosthodontics, 13th ed. St. Louis: Elsevier c2016. Chapter 21, Initial Placement, Adjustment and Servicing of the Removable Partial Denture; p.294-296.

Carr A, Brown D. McCracken's Removable Partial Prosthodontics, 13th ed. St. Louis: Elsevier c2016. Chapter 22, Relining and Rebased the Removable Partial Denture; p.298-301.

Carr A, Brown D. McCracken's Removable Partial Prosthodontics, 13th ed. St. Louis: Elsevier c2016. Chapter 24, Interim Removable Partial Dentures; p.310-313.

Dula LJ, Shala KSh, Pustina-Krasniqi T, Bicaaj T, Ahmedi EF. The influence of removable partial dentures on the periodontal health of abutment and non-abutment teeth. Eur J Dent. 2015 Jul-Sep; 9(3):382-6.

Felton D, Cooper L, Duqum I, et al. Evidence-based guidelines for the care and maintenance of complete dentures: a publication of the American College of Prosthodontists. J Am Dent Assoc. 2011 Feb; 142 Suppl 1:1S-20S.

Zarb G, Eckert S, Jacob R, et al. Prosthodontic Treatment for Edentulous Patients: Complete Dentures and Implant Supported Prosthesis, 13th ed. St. Louis: Elsevier c2013. Chapter 6, Additional Treatment Planning Options for Both Edentulous and Potentially Edentulous Patients; p.107-110.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Salivary Testing

Policy Number: DCP037.09
Effective Date: January 1, 2025

[➔ Instructions for Use](#)

Table of Contents	Page
219. Coverage Rationale	215
220. Definitions	215
221. Applicable Codes	215
222. Description of Services	216
223. Clinical Evidence	216
224. U.S. Food and Drug Administration	220
225. References	221
226. Policy History/Revision Information	222
227. Instructions for Use	222

Related Dental Policy
<ul style="list-style-type: none"> Miscellaneous Diagnostic Procedures

Coverage Rationale

Collection, Preparation, and Analysis of Saliva Sample for Laboratory Diagnostic Testing

Collection, preparation, and analysis of saliva sample for laboratory diagnostic testing may be indicated for the following:

- As part of oral disease [Risk Assessment](#) and subsequent management
- The identification of biomarkers associated with oral cancers

Assessment of Salivary Flow by Measurement

Assessment of salivary flow by measurement may be indicated for the following:

- Systemic disease known to cause xerostomia (e.g., Sjögren's syndrome, diabetes, autoimmune disorders)
- Polypharmacy
- Radiation therapy to the head and neck

Salivary flow measurement may also be indicated to monitor the effectiveness of [Sialagogues](#).

Definitions

Risk Assessment: Analysis of risks involved prior to action being taken.

Sialagogue: A drug that promotes the secretion of saliva.

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D0417	Collection and preparation of saliva sample for laboratory diagnostic testing

CDT Code	Description
D0418	Analysis of saliva sample
D0419	Assessment of salivary flow by measurement

CDT® is a registered trademark of the American Dental Association

Description of Services

Saliva is made of water, mucus, proteins, minerals, and an enzyme called amylase. It lubricates the mouth, provides protection to the teeth from bacterial acids, helps rebuild damaged enamel, and begins the first stage of the digestive process. Salivary biomarkers for oral cancers have been explored for their role in earlier detection of oral cancer, particularly oral squamous cell carcinoma (OSCC). This is an active and promising area of research.

While xerostomia is a subjective feeling of a dry mouth, hyposalivation is the objective measure of decreased salivary gland function. Hyposalivation and poor quality saliva increases risk for dental diseases. The information gathered from saliva testing (bacteria, biomarkers, quality, and quantity of saliva) can be an additional diagnostic tool to lower incidence and/or severity of oral disease.

Clinical Evidence

Caries

Piekoszewska-Ziętek et al. (2019) conducted a systematic review of the literature to assess the relationship of chosen salivary proteins and peptides levels with the occurrence of caries in children. Twenty-two studies were included in the review, from which the issue of glycoproteins (including immunoglobulins), AMPs and salivary enzymes was discussed. The research involved primary dentition (13 papers), as well as mixed (7) and permanent dentition (5). Caries assessment included visual inspection, dmft/s, and DMFT/S indexed; quantity of *Streptococcus mutans* and *Lactobacillus* spp. bacteria; and caries risk assessment. The authors concluded that the results are promising; however, further investigations should be undertaken. The majority of studies included are case-control and cross-sectional; however, it is necessary to conduct more cohort studies with adequate follow-up prior to considering this as markers for caries risk assessment.

Chokshi et al (2016) conducted a study to estimate the salivary levels of *Streptococcus mutans*, *Lactobacilli* and *Actinomyces* and to correlate it with dental caries experience in mixed and permanent dentition. The sample size comprised 110 subjects. The decayed, missing and filled teeth (DMFT) index of all the individuals participating in the study was calculated. Saliva samples were collected from patients and samples were inoculated on specific culture media and incubated for a period of 48 hours, and colony characteristics, *S. mutans*, *Lactobacilli* and *Actinomyces* were identified. A positive correlation exists between DMFT and *S. mutans*, *Lactobacilli* and *Actinomyces* in mixed dentition and permanent dentition group samples ($p < 0.001$). The conclusion from the results obtained was that *S. Mutans*, *lactobacilli* and *Actinomyces* which are the components of the normal microbial flora of the oral cavity play an important role in the pathogenesis of dental caries and increased number of microorganisms is associated with an increased caries frequency.

Periodontal Disease

Kim et al. (2020) conducted a systematic review to determine the changes in inflammatory cytokines after non-surgical periodontal therapy, and a meta-analysis of the utility of interleukin (IL)-1 β and matrix metalloproteinase (MMP)-8 as salivary biomarkers. The results showed that biomarkers that were present in high levels in periodontal disease were salivary IL-1 β , IL-4, IL-6, MMP-8, and tissue inhibitor of matrix metalloproteinases (TIMP)-2. Those in the controls were tumor necrosis factor (TNF)- α , IL-10, IL-17, and IL-32. Biomarkers that decreased after scaling and root planning (SRP) and oral hygiene instruction (OHI) in periodontitis patients were IL-1 β , MMP-8, MMP-9, prostaglandin E2 (PGE2), and TIMP-2. The pooled standardized mean difference of IL-1 β and MMP-8 was -1.04 and 35.90, respectively, but the differences between periodontitis patients and healthy controls were not significant. The authors concluded that although the changes in salivary IL-1 β and MMP-8 levels after non-surgical periodontal therapy were not significant, salivary cytokines could be used to confirm the effect of periodontal therapy or diagnose periodontal disease.

Liebsch et al. (2019) conducted a study regarding salivary metabolites and the relationship to oral parameters (clinical attachment level, periodontal probing depth, supragingival plaque, supragingival calculus, number of missing teeth, and removable denture). Subjects included 909 nondiabetic participants from the Study of Health in Pomerania. Linear regression analyses were performed in age-stratified groups and adjusted for potential confounders. A multifaceted image of associated metabolites ($n = 107$) was revealed with considerable differences according to age groups. In the young (20 to 39 y) and middle-aged (40 to 59 y) groups, metabolites were predominantly associated with periodontal variables,

whereas among the older subjects (≥ 60 y), tooth loss was strongly associated with metabolite levels. Metabolites associated with periodontal variables were clearly linked to tissue destruction, host defense mechanisms, and bacterial metabolism. Across all age groups, the bacterial metabolite phenylacetate was significantly associated with periodontal variables. The results revealed alterations of the salivary metabolome in association with age and oral health status with periodontitis significantly associated with the bacterial metabolite phenylacetate. The authors concluded this is a promising substance for further biomarker research.

Nisha et al. (2018) conducted a cross sectional study designed to estimate the levels of macrophage inflammatory protein-1 alpha (MIP-1 α) and monocyte chemo attractant protein-1 (MCP-1) in whole unstimulated saliva from 75 patients and to evaluate their role as reliable salivary biomarkers in discriminating gingivitis and periodontitis from health. Participants were divided into healthy (Group 1, n = 25), gingivitis (Group 2, n = 25) and chronic generalized periodontitis (Group 3, n = 25). MIP-1 α and MCP-1 levels were estimated by using ELISA and were correlated with clinical parameters. ROC curve analysis was done to determine the sensitivity and specificity of these biomarkers in distinguishing periodontal disease from health. The results showed both biomarkers were detected in all the saliva samples. There was a statistically significant difference in the concentration of both the analytes in Group 3 and Group 2 compared with Group 1 ($p < 0.001$). ROC curve analysis showed 100% sensitivity and specificity for MIP-1 α and MCP-1 in discriminating periodontitis from health. For discriminating gingivitis from health, MIP-1 α had a higher sensitivity and specificity (100% & 88% respectively) compared to MCP-1 (84.1% & 80% respectively). The authors concluded there is a substantial increase in the concentration of both MIP-1 α and MCP-1 with increasing severity of periodontal disease. Both the analytes showed promising results as biomarkers for discriminating periodontal disease from health.

de Lima et al (2016) conducted a systematic review and meta-analysis to evaluate the accuracy of host-derived salivary biomarkers in the diagnosis of periodontal disease by assessing the published literature. 4 studies were included for full analysis. One biomarker, macrophage inflammatory protein-1 alpha (MIP-1a), had excellent diagnostic accuracy (sensitivity 95% and specificity 93%) and interleukin-1 beta (IL-1b) and IL-6 showed acceptable diagnostic values: IL-1b sensitivity varied from 54% to 88% and specificity varied from 55% to 100% and IL-6 sensitivity varied from 59% to 88% and specificity varied from 60% to 97%. The meta-analysis forest plot showed that MIP-1a was the best marker evaluated. The authors concluded that MIP-1a had high diagnostic capability and excellent accuracy and that biomarkers IL-1b and IL-6 had acceptable accuracy. However, they also indicated that the evidence reviewed was too restricted to endorse the use of salivary biomarkers as a diagnostic tool based on the available data and suggested more and larger multi centered studies.

Kuboniwa et al (2016). In this pilot study, the authors explored the use of salivary metabolites to reflect periodontal inflammation severity with a recently proposed parameter-periodontal inflamed surface area (PISA)-used to quantify the periodontal inflammatory burden of individual patients with high accuracy. Following PISA determination, whole saliva samples were collected from 19 subjects before and after removal of supragingival plaque and calculus (debridement) with an ultrasonic scaler to assess the influence of the procedure on salivary metabolic profiles. Metabolic profiling of saliva was performed with gas chromatography coupled to time-of-flight mass spectrometry, followed by multivariate regression analysis with orthogonal projections to latent structures (OPLS) to investigate the relationship between PISA and salivary metabolic profiles. Sixty-three metabolites were identified. OPLS analysis showed that post debridement saliva provided a more refined model for prediction of PISA than did predebridement samples, which indicated that debridement may improve detection of metabolites eluted from subgingival areas in saliva, thus more accurately reflecting the pathophysiology of periodontitis. Based on the variable importance in the projection values obtained via OPLS, 8 metabolites were identified as potential indicators of periodontal inflammation, of which the combination of cadaverine, 5-oxoproline, and histidine yielded satisfactory accuracy (area under the curve = 0.881) for diagnosis of periodontitis. The authors' findings identified potential biomarkers that may be useful for reflecting the severity of periodontal inflammation as part of monitoring disease activity in periodontitis patients.

Morozumi et al (2016). A diagnosis of periodontitis progression is presently limited to clinical parameters such as attachment loss and radiographic imaging. The aim of this multicenter study was to monitor disease progression in patients with chronic periodontitis during a 24-month follow-up program and to evaluate the amount of bacteria in saliva and corresponding IgG titers in serum for determining the diagnostic usefulness of each in indicating disease progression and stability. A total of 163 patients with chronic periodontitis who received trimonthly follow-up care were observed for 24 months. The clinical parameters and salivary content of *Porphyromonas gingivalis*, *Prevotella intermedia* and *Aggregatibacter actinomycetemcomitans* were assessed using the modified Invader PLUS assay, and the corresponding serum IgG titers were measured using ELISA. The changes through 24 month period were analyzed using cut-off values calculated for each factor. One-way ANOVA or Fisher's exact test was used to perform between-group comparison for the data collected. Diagnostic values were calculated using Fisher's exact test. Of the 124 individuals who completed the 24-month monitoring phase, 62 exhibited periodontitis progression, whereas 62 demonstrated stable disease. Seven patients withdrew because of acute periodontal abscess. The ratio of *P. gingivalis* to total bacteria and the combination of *P.*

gingivalis counts and IgG titers against *P. gingivalis* were significantly related to the progression of periodontitis. The combination of *P. gingivalis* ratio and *P. gingivalis* IgG titers was significantly associated with the progression of periodontitis. The authors suggest this study shows that the combination of *P. gingivalis* ratio in saliva and serum IgG titers against *P. gingivalis* may be associated with the progression of periodontitis.

Zhang et al (2016). In periodontitis, activated macrophages not only initiate immune responses to periodontal-pathogen infections, but also damage the periodontal tissues by releasing a series of inflammatory cytokines. Macrophage-activating factor (MAF) and macrophage-chemotactic factor (MCF) are two important mediators involved in macrophage accumulation, activation, and function. This study analyzed the levels of salivary MAF and MCF in healthy individuals and those with different periodontal diseases, and assessed the usefulness of salivary MAF and MCF as diagnostic biomarkers in periodontal tissue health status. Ninety-five saliva specimens were collected from healthy individuals and patients with gingivitis, mild periodontitis, moderate periodontitis, and severe periodontitis. Pocket probing depth (PPD) and alveolar bone loss (ABL) were recorded via periodontal probing and dental radiography, respectively. Salivary MAF and MCF concentrations were assayed using enzyme-linked immunosorbent assays. MAF level tended to increase in saliva as periodontal diseases progressed. The concentration of salivary MAF in periodontitis correlated positively with ABL and PPD. In contrast, salivary MCF levels increased significantly only in periodontitis. The authors concluded that salivary MAF levels correlate positively with tissue destruction in periodontal diseases. It is a potential valuable biomarker that could be used to assess periodontal health status.

Oral Cancer

In a 2021 systematic review and meta-analysis, Chiamulera et al. identified salivary cytokines (SC) as biomarkers, and their role as a potential tool for earlier diagnosis of oral cancer. Only case-control studies that measured SC by ELISA from treatment naïve patients were included in the qualitative review. For the meta-analysis, all comparable studies that provided enough data (sample size, mean and standard deviation or standard error of the mean) for SC levels in OC patients, non-cancer controls and patients with oral potentially malignant disorders (OPMD), including leukoplakia were included. Comparisons with patients with oral lichen planus (OLP) and gingivitis were included in the qualitative analysis. 28 articles were included in the systematic review and describe 10 distinct SC, with IL-8 and IL-6 being the most commonly studied. This showed SC levels consistently higher among OC patients when compared with healthy controls, and patients with oral potentially malignant disorders (OPMD), oral lichen planus (OLP) and gingivitis. For the meta-analysis, 23 studies were eligible and showed IL-8, IL-6, TNF- α , IL-1 β and IL-10 salivary levels were significantly higher in OC patients compared to controls; and that IL-8, IL-6, TNF- α and IL-1 β salivary levels were also higher in OC patients compared to individuals with OPMD. When compared to healthy controls, OPMD patients showed significantly higher IL-6 and TNF- α salivary levels. The results showed SC were highly variable among the studies and further improvement and standardization is needed before being able to successfully test for SC in clinical practice.

Zielińska et al. (2020) conducted a study assessing the levels of IL-17 and TNF- α in the saliva of 71 patients with oral and oropharyngeal cancer prior to treatment. Saliva samples were collected from subjects, and cytokine concentrations in the saliva were measured with ELISA and Luminex Multiplex Assays. The higher salivary concentrations of IL-17A, IL-17F, and TNF- α were significantly associated with disease advancement. The authors concluded that these results suggest that IL-17A, IL-17F, and TNF- α measured in the saliva may be a potential biomarker for cancer of the oral cavity and oropharynx.

In a 2019 comparative study, Chu et al. sought to identify oral squamous cell carcinoma (OSCC) biomarkers by salivary proteomes, of OSCC patients. Individuals with oral potentially malignant disorders (OPMDs), and healthy volunteers were comparatively profiled with isobaric tags for relative and absolute quantitation (iTRAQ)-based mass spectrometry (MS). The salivary levels of 67 and 18 proteins in the OSCC group are elevated and decreased compared to that in the noncancerous group (OPMD and healthy groups), respectively. The candidate biomarkers were further selected using the multiple reaction monitoring (MRM)-MS and validated with the immunoassays. More importantly, the higher salivary level of three proteins, complement factor H (CFH), fibrinogen alpha chain (FGA), and alpha-1-antitrypsin (SERPINA1) was correlated with advanced stages of OSCC. The authors concluded that analysis of salivary proteome is a feasible strategy for biomarker discovery, and the three proteins are potential salivary markers for OSCC diagnosis.

Ishikawa et al (2016). The objective of this study was to explore salivary metabolite biomarkers by profiling both saliva and tumor tissue samples for oral cancer screening. Patients with oral cancer and healthy controls were recruited at the Department of Dentistry, Oral and Maxillofacial Plastic and Reconstructive Surgery of Yamagata University Hospital from 2012 to 2014. None had received any prior treatment such as chemotherapy or radiotherapy. All oral cancer patients provided both tumor tissues and saliva samples. No controls had a history of prior malignancy or autoimmune disorders. Paired tumor and control tissues were obtained from oral cancer patients and whole unstimulated saliva samples were collected from patients and healthy controls. The comprehensive metabolomic analysis for profiling hydrophilic metabolites was conducted using capillary electrophoresis time-of-flight mass spectrometry. In total, 85 and 45

metabolites showed significant differences between tumor and matched control samples, and between salivary samples from oral cancer and controls, respectively ($p < 0.05$ correlated by false discovery rate); 17 metabolites showed consistent differences in both saliva and tissue-based comparisons. Of these, a combination of only two biomarkers yielded a high area under receiver operating characteristic curves (0.827; 95% confidence interval, 0.726-0.928, $p < 0.0001$) for discriminating oral cancers from controls. Various validation tests confirmed its high generalization ability. The demonstrated approach, integrating both saliva and tumor tissue metabolomics, helps eliminate pseudo-molecules that are coincidentally different between oral cancers and controls. These combined salivary metabolites could be the basis of a clinically feasible method of non-invasive oral cancer screening.

Polz-Dacewicz et al (2016). Each year approximately 6,000 new cases of head and neck cancer are registered in Poland. Human papillomavirus (HPV) and Epstein-Barr virus (EBV) have been associated with tumor formation. Cytokines have been shown to play an important role both in inflammation and carcinogenesis and they can be detected in saliva and serum with ELISA assays. Salivary biomarkers may be used as markers of early cancer detection. The aim of this study was the analysis of the serum and salivary levels of IL-10, TNF- α , TGF- β and VEGF in patients with oropharyngeal cancer and in healthy individuals. The level of these biomarkers was also analyzed in HPV- and EBV-related cases. The study involved 78 patients with histopathologically confirmed oropharyngeal squamous cell carcinoma and 40 healthy controls. Serum and salivary levels of IL-10, TNF- α , TGF- β and VEGF were analyzed both in patients and in healthy individuals by ELISA method using Diaclone SAS commercially available kits (France). EBV DNA was detected by the nested PCR for amplification of EBNA-2. HPV detection and genotyping was performed using the INNO-LiPA HPV Genotyping Extraassay (Innogenetics N. V, Gent, Belgium). The obtained results were subjected to statistical analysis using Mann-Whitney and Kruskal Wallis tests. The level of tested cytokines was higher in patients than in controls both in serum as well as in saliva. EBV DNA was detected in 51.3 % of patients and 20 % of controls, HPV DNA was present in 30.8 % of patients and 2, 5 % of controls. The level of IL-10 was statistically higher in patients infected with EBV, HPV and co-infected with EBV/HPV. The level of TNF- α was significantly higher in patients infected with EBV, while TGF- β in patients with HPV infection and EBV/HPV co-infection. The authors concluded that the detection of salivary cytokines may be very helpful in early diagnosis, treatment, and prognosis of OSCC.

Guerra et al (2015). The purpose of this systematic review and meta-analysis was to evaluate the diagnostic value of salivary biological markers in the diagnosis of head and neck carcinoma. Studies were gathered by searching Cochrane, EMBASE, LILACS, MEDLINE, and PubMed. The references were also crosschecked and a partial grey literature search was undertaken using Google Scholar. The methodology of selected studies was evaluated using the 14-item Quality Assessment Tool for Diagnostic Accuracy Studies. 15 articles were identified and subjected to qualitative and quantitative analyses. The studies were homogeneous, and all had high methodological quality. Combined biomarkers demonstrated better accuracy with higher sensitivity and specificity than those tested individually. Furthermore, the salivary biomarkers reviewed predicted the early stages of head and neck carcinoma better than the advanced stages. A restricted set of five single biomarkers (interleukin-8, choline, pipercolinic acid, l-phenylalanine, and S-carboxymethyl-l-cysteine) as well as combined biomarkers demonstrated excellent diagnostic test accuracy. The results of this systematic review confirm the potential value of a selected set of salivary biomarkers as diagnostic tools for head and neck carcinoma.

Salivary Flow by Measurement

Villa et al. (2015) conducted a systematic review to assess the literature on the prevalence, diagnosis, treatment, and prevention of medication-induced salivary gland dysfunction (MISGD). Electronic databases were searched for articles related to MISGD through June 2013. Four independent reviewers extracted information regarding study design, study population, interventions, outcomes, and conclusions for each article. Only papers with acceptable degree of relevance, quality of methodology, and strength of evidence were retained for further analysis. There were limited data on the epidemiology of MISGD. Furthermore, various methods were used to assess salivary flow rate or xerostomia. Preventive and therapeutic strategies included substitution of medications, oral, or systemic therapy with sialagogues, use of saliva substitutes or of electro-stimulating devices. Although there are promising approaches to improve salivary gland function, most studies are characterized by small numbers and heterogeneous methods. Physicians and dentists should identify the medications associated with xerostomia and salivary gland dysfunction through a thorough medical history. Preferably, health care providers should measure the unstimulated and stimulated whole salivary flow rates of all their patients so that these values can be used as a baseline to rate the complaints of patients who subsequently claim to experience xerostomia or salivary gland dysfunction as well as the possibilities of effectively treating this condition.

Löfgren et al. (2012) conducted a systematic review to evaluate the quality of the evidence for the efficacy of diagnostic methods used to identify oral dryness. The most advocated clinical method for diagnosing salivary dysfunction is to quantitate unstimulated and stimulated whole saliva (sialometry). Since there is an expected and wide variation in salivary flow rates among individuals, the assessment of dysfunction can be difficult. A literature search, with specific indexing terms and a hand search, was conducted for publications that described a method to diagnose oral dryness. The electronic databases of PubMed, Cochrane Library, and Web of Science were used as data sources. Four reviewers

selected publications on the basis of predetermined inclusion and exclusion criteria. Data were extracted from the selected publications using a protocol. Original studies were interpreted with the aid of Quality Assessment of Diagnostic Accuracy Studies (QUADAS) tool. A total of 18 original studies were judged relevant and interpreted for this review. In all studies, the results of the test method were compared to those of a reference method. Based on the interpretation (with the aid of the QUADAS tool) it can be reported that the patient selection criteria were not clearly described and the test or reference methods were not described in sufficient detail for it to be reproduced. None of the included studies reported information on uninterpretable/intermediate results nor data on observer or instrument variation. Seven of the studies presented their results as a percentage of correct diagnoses. The authors concluded that the evidence for the efficacy of clinical methods to assess oral dryness is sparse and improved standards for the reporting of diagnostic accuracy are needed in order to assure the methodological quality of studies. There is need for effective diagnostic criteria and functional tests in order to detect those individuals with oral dryness who may require oral treatment, such as alleviation of discomfort and/or prevention of diseases.

Clinical Practice Guidelines

American Dental Association (ADA) Council on Scientific Affairs

In a 2014 report by the ADA Council on Scientific Affairs, the following recommendation was made: Initial evaluation of patients with dry mouth should include a detailed health history to facilitate early detection and identify underlying causes. Comprehensive evaluation, diagnostic testing, and periodic assessment of salivary flow, followed by corrective actions, may help prevent significant oral disease. A systematic approach to xerostomia management can facilitate interdisciplinary patient care, including collaboration with physicians regarding systemic conditions and medication usage. Comprehensive management of xerostomia and hyposalivation should emphasize patient education and lifestyle modifications. It also should focus on various palliative and preventive measures.

American Dental Association (ADA) Statement on Salivary Diagnostics

Large-scale, multicenter clinical trials and independent validation studies are required to establish evidence of clinical utility of salivary and oral fluid diagnostics in the early diagnosis and/or monitoring of oral cancer and other diseases or conditions. Current challenges include identification of disease-specific markers, establishing sensitivity and specificity of developed tests, and standardization of collection/storage of salivary samples. Refinement of oral fluid screening and diagnostic tests may further elucidate our understanding of the relationship between oral health and overall health. Presently there are no FDA approved salivary diagnostic tests for evaluating risk of periodontal disease, dental caries, or head and neck cancer (ADA 2023).

American Dental Association (ADA) Science & Research Institute

Standardized caries risk assessment developed by the ADA do not include salivary diagnostics as part of a comprehensive risk assessment strategy. Xerostomia and visually inadequate salivary flow are indicated as risk factors, however measurement is not mentioned (ADA 2023).

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

Examples of salivary diagnostic devices include, but are not limited to the following:

- MyPerioPath® (Oral DNA Labs, Inc.)
- DentocultSM® Strip Mutans (Orion Diagnostical)
- CRT® Bacteria (Ivoclar)
- Saliva-Check Mutans (GC America)
- Saliva-Check BUFFER (GC America)

The FDA has exempted almost all class I devices (with the exception of reserved devices) from the premarket notification requirement, however, these manufacturers are required to register their establishment. Specific information regarding classification of dental devices may be found here:

http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpdc/classification.cfm?start_search=1&submission_type_id=&device_name=&productcode=&deviceclass=&thirdparty=&panel=de®ulationnumber=&pagenum=500&sortcolumn=device_name. (Accessed August 20, 2024)

Laboratories that perform salivary diagnostic tests are regulated under the Clinical Laboratory Improvement Amendments (CLIA) Act of 1988. More information is available at: <https://www.cms.gov/clia/>. (Accessed August 20, 2024)

References

- American Dental Association Science and Research Institute. Oral Health Topics. Salivary Diagnostics. 2018. Updated 2023. <https://www.ada.org/resources/research/science-and-research-institute/oral-health-topics/salivary-diagnostics>. Accessed August 20, 2024.
- American Dental Association Council on Scientific Affairs. Managing xerostomia and salivary gland hypofunction: executive summary of a report from the American Dental Association Council on Scientific Affairs. 2014. [https://jada.ada.org/article/S0002-8177\(14\)60200-2/fulltext](https://jada.ada.org/article/S0002-8177(14)60200-2/fulltext). Accessed August 20, 2024.
- American Dental Association (ADA) Science & Research Institute. Caries Risk Assessment and Management. 2023. Available at: <https://www.ada.org/en/resources/research/science-and-research-institute/oral-health-topics/caries-risk-assessment-and-management>. Accessed August 20, 2024.
- Chokshi A, Mahesh P, Sharada P, et al. A correlative study of the levels of salivary Streptococcus mutans, lactobacilli and Actinomyces with dental caries experience in subjects with mixed and permanent dentition. J Oral Maxillofac Pathol. 2016 Jan-Apr;20(1):25-8.
- Chu HW, Chang KP, Hsu CW, et al. Identification of salivary biomarkers for oral cancer detection with untargeted and targeted quantitative proteomics approaches. Mol Cell Proteomics. 2019 Jun 28.
- de Lima CL, Acevedo AC, Grisli DC, et al. Host-derived salivary biomarkers in diagnosing periodontal disease: systematic review and meta-analysis. J Clin Periodontol 2016; 43(6): 492-502.
- Guerra EN, Acevedo AC, Leite AF, et al. Diagnostic capability of salivary biomarkers in the assessment of head and neck cancer: A systematic review and meta-analysis. Oral Oncol. 2015 Sep; 51(9):805-18.
- Ishikawa S, Sugimoto M, Kitabatake K, et al. Identification of salivary metabolomic biomarkers for oral cancer screening. Sci Rep. 2016 Aug 19; 6:31520.
- Liebsch C, Pitchika V, Pink C, et al. The Saliva Metabolome in Association to Oral Health Status. J Dent Res. 2019 Jun;98(6):642-651.
- Kim JY, Kim HN. Changes in Inflammatory Cytokines in Saliva after Non-Surgical Periodontal Therapy: A Systematic Review and Meta-Analysis. Int J Environ Res Public Health. 2020 Dec 29;18(1):194.
- Kuboniwa M, Sakanaka A, Hashino E, et al. Prediction of Periodontal Inflammation via Metabolic Profiling of Saliva. J Dent Res. 2016 Jul 28.
- Löfgren CD, Wickström C, Sonesson M, et al. A systematic review of methods to diagnose oral dryness and salivary gland function. BMC Oral Health. 2012 Aug 8; 12:29.
- Medical Dictionary for the Health Professions and Nursing. (2012).
- Morozumi T, Nakagawa T, Nomura Y, et al. Salivary pathogen and serum antibody to assess the progression of chronic periodontitis: a 24-mo prospective multicenter cohort study. J Periodontal Res. 2016 Jan 20.
- Mortazavi H, Baharvand M, Movahhedian A, et al. Xerostomia due to systemic disease: a review of 20 conditions and mechanisms. Ann Med Health Sci Res. 2014 Jul;4(4):503-10.
- Nisha KJ, Suresh A, Anilkumar A, Padmanabhan S. MIP-1 α and MCP-1 as salivary biomarkers in periodontal disease. Saudi Dent J. 2018 Oct;30(4):292-298.
- Piekoszewska-Ziętek P, Turska-Szybka A, Olczak-Kowalczyk D. Salivary proteins and peptides in the aetiology of caries in children: Systematic literature review. Oral Dis. 2019 May;25(4):1048-1056.
- Polz-Dacewicz M, Strycharz-Dudziak M, Dworzański J, et al. Salivary and serum IL-10, TNF- α , TGF- β , VEGF levels in oropharyngeal squamous cell carcinoma and correlation with HPV and EBV infections. Infect Agent Cancer. 2016 Aug 20; 11:45.
- Villa A, Wolff A, Aframian D. et al. World Workshop on Oral Medicine VI: a systematic review of medication-induced salivary gland dysfunction: prevalence, diagnosis, and treatment. Clin Oral Investig. 2015 Sep; 19(7):1563-80.
- Zhang P, Fan Y, Li Q, et al. Macrophage activating factor: A potential biomarker of periodontal health status. Arch Oral Biol. 2016 Jun 9; 70:94-99.
- Zielińska K, Karczmarek-Borowska B, Kwaśniak K, et al. Salivary IL-17A, IL-17F, and TNF- α Are Associated with Disease Advancement in Patients with Oral and Oropharyngeal Cancer. J Immunol Res. 2020;2020:3928504. Published 2020 Aug 13.

Policy History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.

Sealants and Preventive Resin Restorations

Guideline Number: DCP026.09
Effective Date: January 1, 2025

[➔ Instructions for Use](#)

Table of Contents		Page
228.	Coverage Rationale	223
229.	Definitions	224
230.	Applicable Codes	224
231.	Description of Services	224
232.	Clinical Evidence	224
233.	References	225
234.	Guideline History/Revision Information	226
235.	Instructions for Use	226

Related Dental Policies

- Prefabricated Crowns
- Single Tooth Direct Restorations
- Topical Medicaments for Caries Prevention or Remineralization

Coverage Rationale

Sealants

Sealants are indicated for the following:

- Caries prevention in pit and fissures on permanent molars
- Non-cavitated carious lesions
- Caries prevention in primary molars that are expected to have a reasonable period of retention

Sealants are not indicated for the following:

- In the presence of rampant caries and multiple interproximal lesions
- Extrinsic staining of pits and fissures
- For cavitated carious lesions

Preventive Resin Restoration (PRR)

Preventive Resin restorations may be indicated for the restoration of pit and fissures carious lesions contained to enamel in moderate to high caries risk individuals.

Preventive Resin restorations are not indicated for the following:

- When no caries is evident in pits and fissures
- When a Sealant is clinically indicated
- For carious lesions that extend into dentin

[Hydroxyapatite Enamel Regeneration](#)

Biomimetic products for the regeneration of tooth enamel are not indicated due to insufficient evidence of efficacy.

Clinical Practice Guidelines

In a 2016 joint evidence based clinical practice guideline, the American Dental Association (ADA) and the American Academy of Pediatric Dentistry (AAPD) recommend the use of Sealants compared with nonuse or fluoride varnish in permanent and primary molars. Additionally, Sealants could minimize the progression of non cavitated lesions. (Wright et al., 2016).

In a 2018 evidence based clinical practice guideline on non-restorative treatments for carious lesions, the ADA recommended Sealants as an effective intervention to arrest or reverse noncavitated carious lesions on occlusal surfaces

of primary and permanent teeth. The expert panel recommends clinicians prioritize the use of Sealants plus 5% NaF varnish (application every 3-6 months) or Sealants alone over 5% NaF varnish alone (Slayton et al., 2018).

Definitions

Composite: A dental restorative material made up of disparate or separate parts (e.g., resin and quartz particles). (ADA)

Hydroxyapatite: A bioactive and non-toxic ceramic that is similar to the inorganic portion of human teeth and bone. Tooth enamel is composed of 97% inorganic component, and the dentin is composed of 70% inorganic component and are mainly made up of hydroxyapatite. (Chen et al.)

Resin, Acrylic: Resinous material of the various esters of Acrylic acid, used as a denture base material, for trays or for other restorations. (ADA)

Sealant: A resinous material designed to be applied to the occlusal surfaces of posterior teeth to prevent occlusal caries. (ADA)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D1351	Sealant – per tooth
D1352	Preventive resin restoration in a moderate to high caries risk patient – permanent tooth
D1353	Sealant repair – per tooth
D2991	Application of hydroxyapatite regeneration medicament – per tooth

CDT® is a registered trademark of the American Dental Association

Description of Services

Dental Sealants are a thin protective coating that fills in the grooves of back teeth and prevents bacteria and food particles from being trapped and causing decay. Sealants can also prevent the progression of incipient carious lesions. Teeth are isolated from saliva contamination, cleaned, and prepared with a mild acid solution to aid in adherence. The tooth is then dried and the Sealant material is applied and either cured with a light, or self-cures. Preventive Resin restorations are fillings that also provide a protective barrier to the deep grooves when there is early decay present that has not extended into the dentin. A biomimetic self-assembling peptide P₁₁₋₄ has recently emerged as a promising biomaterial for the potential regeneration of tooth enamel. Unlike fluoride products that arrest caries progression, P₁₁₋₄ penetrates into the demineralized areas of enamel and facilitates Hydroxyapatite formation resulting in repair. This product has potential applications for managing early caries, white spot lesions and tooth sensitivity.

Clinical Evidence

While promising, the clinical evidence showing efficacy of self-assembling peptides for remineralizing tooth enamel in-vivo is limited at this time. Long term outcomes and superiority to standard caries arresting treatments cannot be established.

In a 2023 systematic review and meta-analysis of six randomized clinical trials, Keeper et al. assessed the efficacy of the self-assembling peptide P₁₁₋₄ (Curodont Repair (CR) and Curodont Repair Fluoride Plus [CRP]) on the arrest, cavitation, and progress of initial caries lesions. Primary outcomes were lesion progression, caries arrest, and cavitation at 24 months, however all included trials were only 6-12 months. Secondary outcomes included changes in combined International Caries Detection and Assessment System score categories, quantitative light-induced fluorescence (QLF; Inspektor Research System), esthetic appearance, and lesion size. All included trials showed a moderate to high risk of bias. The overall results showed CR likely results in caries arrest with 45% of all treated lesions arrested. CR likely shrinks caries lesions, but the overall effect of merged ICDA scores is very uncertain. The authors concluded that CR and CRP both have an effect on caries arrest with a synergistic effect apparent when fluoride is included. Further research with

blinding, larger numbers of caries lesions, and longer term follow up to evaluate the effect on caries progression are needed to validate these findings. This study is limited by a small number of participants and short follow up time. Additional high quality independent research is needed to validate these findings.

Doberdoli et al. (2020, included in Keeper study above) conducted a randomized clinical trial to assess the effectiveness of monomeric self-assembling peptide P₁₁₋₄ (SAP P₁₁₋₄) in combination with fluoride varnish or polymeric self-assembling peptide matrix (SAPM) at home for treating non-cavitated occlusal caries. Ninety children and adolescents were included and equally randomized. Group 1 received SAP P₁₁₋₄ and fluoride varnish twice at baseline and at 6 months, group 2 received SAP P₁₁₋₄ at baseline and twice weekly SAPM (home-application), and the control group received fluoride varnish at baseline and 6 months. Caries progression was measured by laser fluorescence, Nyvad Caries Activity, ICDAS-II-codes, and investigator assessments. The results showed increase in laser fluorescence values for groups 1 and 2 and group 3 showed no statistically significant changes. For ICDAS and lesions requiring restoration, none of the control treatment group regressed, however at Day 360, there were 7 increased lesion size and 2 required restoration. No lesions in groups 1 and 2 progressed and one required restoration after 6 months. There were no statistically significant differences between groups 1 and 2. The authors concluded that treatment of initial caries lesions with self-assembling peptides is superior to fluoride varnish alone in arresting initial caries in occlusal surfaces. Additional research with larger numbers of participants and longer follow up times is needed to validate these findings.

Alkilzy et al. (2018, included in Keeper et al. study above) conducted a randomized controlled single-blinded study to assess the clinical efficacy and safety of a self-assembling peptide P₁₁₋₄ (Curodont™ Repair) for the treatment of visible active early caries on erupting permanent molars in children with a mean age of 10 years. Seventy participants were equally randomized to either the test group (P₁₁₋₄ + fluoride varnish) or control group (fluoride varnish alone). Caries were assessed at 3 -and 6- month post treatment primarily via laser fluorescence, and also visually and using the International Caries Detection and Assessment System, and Nyvad caries activity criteria. Six participants missed the 3- month follow up and 3 missed the 6 month follow up visits. The results showed that the test group had statistically and clinically superior results in all assessment outcomes in comparison with the control group. The test lesions treated with P₁₁₋₄ and fluoride varnish exhibited significantly greater remineralization and inactivation of carious lesions than the control. The authors concluded that the P₁₁₋₄ and fluoride varnish combination is clinically superior to the current gold standard of fluoride varnish. This study is limited by the small number of participants, and high-quality studies with larger numbers of participants and longer follow-up are needed to validate these findings.

References

Alkilzy M, Tarabaih A, Santamaria RM, et al. Self-assembling peptide P11-4 and fluoride for regenerating enamel. J Dent Res. 2018 Feb;97(2):148-154.

American Dental Association (ADA) CDT Codebook 2024.

American Dental Association (ADA). Glossary of Dental Clinical and Administrative Terms.

Azarpazhooh A, Main PA. Pit and fissure Sealants in the prevention of dental caries in children and adolescents: a systematic review. J Can Dent Assoc. 2008 Mar;74(2):171-7.

Chen L, Al-Bayatee S, Khurshid Z, et al. Hydroxyapatite in oral care products- a review. Materials (Basel). 2021 Aug 27;14(17):4865.

Deery C. Clinical Practice Guidelines Proposed the Use of Pit and Fissure Sealants to Prevent and Arrest Noncavitated Carious Lesions. J Evid Based Dent Pract. 2017 Mar;17(1):48-50. Keeper JH, Kibbe LJ, Thakkar-Samtani M, et al. Systematic review and meta-analysis on the effect of self-assembling peptide P11-4 on arrest, cavitation, and progression of initial caries lesions. J Am Dent Assoc. 2023 Jul;154(7):580-591.e11.

Ritter A, Walter R, Roberson T, Sturdevant's Art and Science of Operative Dentistry, 7th ed. St. Louis: Mosby c2019. Chapter 8, Clinical Technique for Direct Composite Resin and Glass Ionomer Restorations; p.219-263.

Sanders, Brian. McDonald and Avery's Dentistry for the Child and Adolescent. 11th edition. St. Louis: Elsevier. c2022. Chapter 11, Pit-and-Fissure Sealants and Preventive Resin Restorations; p.219-226.

Slayton RL, Urquhart O, Araujo MWB, et al. Evidence-based clinical practice guideline on nonrestorative treatments for carious lesions: A report from the American Dental Association. J Am Dent Assoc. 2018 Oct;149(10):837-849.

Wright JT, Crall JJ, Fontana M, et al. Evidence-based clinical practice guideline for the use of pit-and-fissure sealants: A report of the American Dental Association and the American Academy of Pediatric Dentistry. J Am Dent Assoc. 2016 Aug;147(8):672-682.e12.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Single Tooth Direct Restorations

Guideline Number: DCG023.13

Effective Date: January 1, 2025

[➔ Instructions for Use](#)

Table of Contents	Page
236. Coverage Rationale	227
237. Definitions	228
238. Applicable Codes	228
239. Description of Services	229
240. Clinical Evidence	229
241. U.S. Food and Drug Administration	232
242. References	232
243. Guideline History/Revision Information	233
244. Instructions for Use	233

Related Dental Policies

- Core Buildup, Post and Core, and Pin Retention
- Non-Surgical Endodontics

Coverage Rationale

Direct Restorations

Direct Restorations are indicated for the following:

- To replace tooth structure lost to caries or trauma
- To replace restorative material lost in the course of accessing pulp chamber for endodontic therapy
- To replace existing restorations that exhibit recurrent decay, fracture, or marginal defects

In addition to the above, Glass Ionomer restorations are indicated for the following:

- When teeth cannot be isolated properly to allow placement of resin restorations
- As an alternative to resin sealants when the teeth cannot be properly isolated (patient cooperation, partially erupted teeth)
- [Class I, II, III, and V](#) restorations on primary teeth
- Class III and V restorations on permanent teeth that cannot be isolated in high risk patients
- As a caries control plan for high risk patients using atraumatic techniques

Direct Restorations are not indicated for the following:

- Teeth with a hopeless prognosis ([McGuire's Classification](#))
- Incipient enamel only lesions extending less than halfway to the dentinoenamel junction (DEJ)
- Primary teeth that are near exfoliation or less than 50% of the tooth root remains
- Composite resin restorations are not indicated for patients with heavy bruxism
- Composite resin restorations are not indicated for patients with extensive active caries, or high caries risk
- [Amalgam](#) restorations are not indicated for placement on teeth in which they will have contact with gold restorations

Protective Restoration

A protective restoration is indicated for the following:

- To relieve pain
- To promote healing
- To prevent further deterioration
- To retain tissue form

A protective restoration is not indicated for the following:

- As a liner or base for a definitive restoration
- Not for endodontic access closure
- Not for pulp capping
- As a definitive restoration

Resin Infiltration of Incipient Smooth Surface Lesions

[Resin Infiltration](#) of incipient smooth surface lesions is typically used for treating white spot, demineralized enamel resulting from orthodontic treatment, for aesthetic purposes. The code is used to describe a proprietary product (Icon Smooth Surface Caries Infiltration, DMG America Ridgefield park, New Jersey) and is not indicated due to insufficient evidence of efficacy.

Definitions

Amalgam: An alloy used in direct dental restorations. It is typically composed of mercury, silver, tin, and copper along with other metallic elements added to improve physical and mechanical properties. (ADA)

Composite: A dental restorative material made up of disparate or separate parts (e.g., resin and quartz particles). (ADA)

Direct Restoration: A restoration fabricated inside the mouth. (ADA)

Glass Ionomer: Polyelectrolyte cement in which the solid powder phase is a fluoride-containing aluminosilicate glass powder to be mixed with polymeric carboxylic acid. The cement can be used to restore teeth, fill pits and fissures, lute, and line cavities. It is also known as glass polyalkenoate cement, ionic polymer cement, polyelectrolyte cement. (ADA)

G.V. Black's Classification of Dental Caries and Restorations (Boushell, Roberson, Walter 2013):

- Class I: All pit-and-fissure preparations, these include preparations on occlusal surfaces of premolars and molars, occlusal two-thirds of the facial and lingual surfaces of molars, and the lingual surfaces of maxillary incisors.
- Class II: Preparations involving the proximal surfaces of posterior teeth.
- Class III: Preparations involving the proximal surfaces of anterior teeth that do not include the incisal angle.
- Class IV: Preparations involving the proximal surfaces of anterior teeth that include the incisal edge.
- Class V: Preparations on the gingival third of the facial or lingual surfaces of all teeth.
- Class VI: Preparations on the incisal edges of anterior teeth or the occlusal cusp tips of posterior teeth.

McGuire Classification of Tooth Prognosis (Levi 2016):

- Good: Teeth with adequate periodontal support where the etiologic factors can be controlled, including systemic factors.
- Fair: No more than 25% attachment loss with Grade 1 furcation invasion which can be maintained. Plaque control and systemic factors can be maintained.
- Poor: As much as 50% bone loss with Grade II furcation invasions, poor crown: root ratio; mobility greater than Miller Class I; systemic factors; poor patient participation in treatment.
- Questionable: Teeth with greater than 50% attachment loss; Grade II or III furcation involvements; the tooth is not easily maintained either with professional hygiene or by the patient.
- Hopeless: Inadequate attachment loss to support the tooth; Class III or IV furcation involvement; Miller Class III mobility; the tooth cannot be maintained with adequate plaque control by the clinician or by the patient.

Resin Infiltration: Application of a resin material engineered to penetrate and fill the sub-surface pore system of an incipient caries lesion to strengthen, stabilize, and limit the lesion's progression, as well as mask visible white spots. (ADA)

Therapeutic: Of or pertaining to therapy or treatment; beneficial. Therapy has as its goal the elimination or control of a disease or other abnormal state. (ADA)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document

and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D2140	Amalgam – one surface, primary or permanent
D2150	Amalgam – two surface, primary or permanent
D2160	Amalgam – three surface, primary or permanent
D2161	Amalgam – for or more surfaces, primary or permanent
D2330	Resin-based composite – one surface, anterior
D2331	Resin-based composite – two surface, anterior
D2332	Resin-based composite – three surface, anterior
D2335	Resin-based composite - four or more surfaces (anterior)
D2390	Resin-based composite crown, anterior
D2391	Resin-based composite – one surface, posterior
D2392	Resin-based composite – two surface, posterior
D2393	Resin-based composite – three surface, posterior
D2394	Resin-based composite – four or more surfaces, posterior
D2410	Gold foil – one surface
D2420	Gold foil – two surface
D2430	Gold foil – three surface
D2940	Protective restoration
D2990	Resin infiltration of incipient smooth surface lesions
D2999	Unspecified restorative procedure, by report

CDT® is a registered trademark of the American Dental Association

Description of Services

Direct Restoration procedures are the placement of restorative material directly into the defective, injured, or diseased tooth to re-establish normal form and function. Tooth preparation, all liners or bases, etching, and curing, as well as occlusal adjustments are inclusive. Preventive resin restorations are a conservative approach to restore a tooth that has active caries in pits and fissures that has not extended into the dentin. Protective restorations are placed to relieve pain, prevent further deterioration, and promote healing.

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

Clinical Evidence

In a 2020 systematic review, Bakdach et al. evaluated the current evidence on the management of orthodontically induced white spot lesions (OIWSLs). Thirteen articles were evaluated and reported interventions, and one included resin infiltration. Although this study indicated resin infiltration to be effective, there is a lack of available evidence to support this intervention for treating of OIWSLs and further research is needed.

Amin et al (2016). The purpose of this study was to assess the success rate of various treatments provided under general anesthesia for early childhood caries (ECC) over three-year follow-up period. ECC children no older than 72 months at the time of dental surgery, who had completed a three-year follow-up, were included. The success rate of every treatment was evaluated. The longevity of each treatment and significant factors associated with failures were assessed. A total of 818 children were included. Of these, 32.9 percent had restored teeth that required further treatment during the three-year follow-up. Amalgam restorations and stainless-steel crowns (SSCs) showed significantly longer survival than composite restorations in all types of restorations. The authors concluded that SSCs and amalgam restorations were clinically more successful and had better survival times than composite restorations.

Naghipur et al (2016). The purpose of this retrospective study was to determine the survival and reasons for failure of directly placed 2-surface composite resin restorations and directly placed 2-surface amalgam restorations on premolars

placed by Canadian dental students. Using The University of Manitoba's dental management software and paper charts, all 2-surface composite resin and 2-surface amalgam restorations placed on premolars between January 1, 2002, and May 30, 2014, were included. Short-term failure (within 2 years), long-term failure, and reasons for failure were collected. A Kaplan-Meier survival estimate with an associated P value comparing composite resin to amalgam restoration curves was performed using SPSS statistical software. Over 12 years, 1695 composite resin and 1125 amalgam 2-surface premolar restorations were placed. Of these restorations, 134 composite resins (7.9%) and 66 amalgams (5.9%) failed. Short-term failures (2 years or less) consisted of 57 composite resin (4%) and 23 amalgam (2.3%) restorations. Long-term failures (greater than 2 years) consisted of 77 composite resin (4.5%) and 43 amalgam (3.8%) restorations. After 12 years of service, the survival probability of composite resin restorations was 86% and that of amalgam restorations 91.5%. The differences in composite resin and amalgam survival curves were also found to be statistically significant ($P = .009$ for Log-rank test). The main reasons for failure were recurrent caries and fracture of the tooth being restored. The authors concluded that within the limitations of this study, both composite resin and amalgam restorations had acceptable success rates and similar failure modes. Recurrent caries was still the most common reason for failure.

Moraschini et al (2015) conducted a systematic review and meta-analysis to test the hypothesis that there is no difference in failure rates between amalgam and composite resin posterior restorations. Randomized controlled trials, controlled clinical trials and prospective and retrospective cohort studies were included in this review. The eligibility criteria included clinical trials in humans with at least 12 months of follow-up comparing the failures rates between occlusal and occlusoproximal amalgam and composite resin restorations. A total of 8 studies published between 1992 and 2013 were included in this review, and according to the risk of bias evaluation, all were classified as high quality. The results showed that the mean survival of amalgam and composite resin varied from 76.320 to 100% and 56 to 100% with a mean annual failure of 1.71 and 3.17%, respectively. The authors concluded that based on the results of this systematic review and meta-analysis, composite resin restorations in posterior teeth still have less longevity and a higher number of secondary caries when compared to amalgam restorations. In relation to fractures, there was no statistically significant difference between the two restorative materials regarding the time of follow-up.

Kwang et al. (2014) conducted a study to investigate the time-lapse of endodontic intervention subsequent to various restorations and tooth surfaces and to assess and compare the associated risk factors. A comprehensive computerized analysis of all dental school patients at the Case Western Reserve University School of Dental Medicine who received restorations from 2008-2013 was obtained. Data collected included restoration type, restored tooth surfaces, tooth type, and the dates of restoration and subsequent endodontic treatment. The mean time between restoration placement and resultant endodontic intervention was 270 days, and further analysis revealed composite resin was 1.91 times more likely than amalgam and 5.69 times more likely than crowns to cause resultant endodontic intervention. Of the patients who required endodontic treatment after restoration placement, the critical time-lapse was 9 months, and composite restorations and teeth with 2 or more restorative surfaces were significantly associated with the need for endodontic treatment.

Rasines et al (2014) conducted a Cochrane database systemic review to examine the effects of direct composite resin fillings versus amalgam fillings for permanent posterior teeth, primarily on restoration failure. Of the 2205 retrieved references, seven trials (10 articles) were included in the systematic review. Two trials were parallel group studies involving 1645 composite restorations and 1365 amalgam restorations (921 children) in the analysis. The other five trials were split-mouth studies involving 1620 composite restorations and 570 amalgam restorations in an unclear number of children. (Due to major problems with the reporting of the data for the five split-mouth trials, the primary analysis is based on the two parallel group trials). All seven trials were judged to be at high risk of bias. There were 3265 composite restorations and 1935 amalgam restorations analyzed. The parallel group trials indicated that resin restorations had a significantly higher risk of failure and increased risk of secondary caries than amalgam restorations but no evidence of an increased risk of restoration fracture. The authors concluded that while there is low-quality evidence to suggest that resin composites lead to higher failure rates and risk of secondary caries than amalgam restorations, the benefits of amalgam restorations are particularly useful in parts of the world where amalgam is still the material of choice to restore posterior teeth with proximal caries.

Kovarik (2009) reviewed the current evidence regarding choosing amalgam versus composite material for posterior direct restorations. The review addresses the limitations of most of the current studies, most of which are non-randomized, and/or university based rather than practice based. The restorative material decision is most often based on patient request or provider perception of composite over amalgam despite evidence to suggest higher failure rates. The author's goal was to find high level evidence to make evidence based decisions regarding restorative material choice. Only two studies met this criteria and both were conducted on children, with longevity a secondary outcome measured (the primary outcome measured was exposure to mercury from amalgams). In the New England Children's Amalgam Trial, 534 children randomly received composite or amalgam posterior restorations. Results showed a statistically insignificant survival rate between the two materials, however composites demonstrated more recurrent caries and required repair

more frequently. The second study had the neurobehavioral effects of dental amalgam in children as the primary outcome measure, with survival of restorations secondary. This study randomly assigned 472 children (ages 8–12) to receive either amalgam or composite restorations in their posterior teeth. It was shown that recurrent caries is much more common in composite restorations compared to amalgam. The authors concluded that the two highest quality evidence studies show amalgam as superior to composite for posterior restorations with significantly less recurrent caries.

Resin Infiltration of Smooth Surface Incipient Lesions

In a 2020 systematic review and meta-analysis, Bakdach et. al reviewed the current evidence on the management of orthodontically induced white spot lesions (OIWSLs). Thirteen publications were included. The interventions reported in the management of OIWSLs were topical fluorides, casein phosphopeptide-amorphous calcium phosphate (CPP-ACP)-containing products, fluoride containing bonding materials, laser therapy, resin infiltration, and micro-abrasion. The methodological quality of the reviews ranged between moderate and critically low. The results showed that casein phosphopeptide-amorphous calcium phosphate (CPP-ACP)-containing products were effective in preventing and reversing these lesions, and there was a lack of reliable evidence for the efficacy of resin infiltration.

Gözetici et al. (2019) conducted a randomized controlled trial to compare the therapeutic effects of the resin infiltration technique, self-assembling peptide (P11-4), and fluoride varnish application on white spot lesions (WSLs) on buccal surfaces based on LF pen measurements and LAA-ICDAS scores. The lesions of 113 patients from a total of 319 patients with at least four visible WSL on buccal surfaces were assessed by LAA-ICDAS and laser fluorescence (LF pen). To be included in the study, participants were required to have at least 4 buccal WSLs, each in different quadrants, with an LF pen score ≥ 8 . Twenty-one patients were included in the study based on the laser fluorescence values. The lesions were randomly assigned into 4 groups: IG (Icon), CRG (Curodont Repair), DG (Duraphat), and CG (control) groups. The treatment protocols were applied, but the control group received no treatment except regular brushing. Lesions were scored by LAA-ICDAS after 3 and 6 months and LF pen after 1 week, 3 and 6 months. The results showed a statistically significant decrease in LF pen measurements of the control and the intervention groups after 6 months when compared to baseline. The greatest lesion regression was observed with IG, which differed statistically significantly from CRG, DG and CG, followed by DG which differed statistically significantly from CG. Statistically significant differences were observed in the activity status of the lesions between baseline and 6 months, except for the control group. The authors concluded that in this study, the lesion regression rates shown by mean LF pen values in all groups after six months encourages the management of non-cavitated smooth surface caries lesions with non-operative treatment approaches. Regular brushing and professional tooth cleaning seem to be effective for the management of WSLs on buccal surfaces, and resin infiltration or fluoride varnish might enhance the improvement of these lesions in moderate- to high-caries-risk individuals.

Clinical Practice Guidelines

American Dental Association (ADA)

In 2023, an expert panel convened by the ADA Council on Scientific Affairs together with the ADA Science and Research Institute's program for Clinical and Translational Research conducted a systematic review and developed the following recommendations for the treatment of moderate and advanced cavitated caries lesions in patients with vital, nonendodontically treated primary and permanent teeth:

- Direct restorative materials for primary teeth:
- For moderate and advanced caries lesions on vital anterior primary teeth requiring a Class III (approximal) restoration, the guideline panel suggests the use of either nanocomposite or hybrid resin composite (conditional recommendation, very low certainty)
- For moderate and advanced caries lesions on vital anterior primary teeth requiring a Class V (cervical third of facial or lingual) restoration, the guideline panel suggests the use of either conventional GIC, hybrid RC, or resin-modified GIC (conditional recommendation, very low certainty)
- For moderate and advanced caries lesions on vital posterior primary teeth requiring a Class I (pit and fissure) restoration, the guideline panel suggests prioritizing the use of resin-modified GIC, RCs, conventional GIC, or preformed crowns over compomer or dental amalgam (conditional recommendation, very low certainty)
- For moderate and advanced caries lesions on vital posterior primary teeth requiring a Class II (approximal) restoration, the guideline panel suggests prioritizing the use of resin-modified GIC, RCs, or preformed crowns over compomer, conventional GIC, or dental amalgam (conditional recommendation, very low certainty)
- For moderate and advanced caries lesions on vital posterior primary teeth requiring a Class V (cervical third of facial or lingual) restoration, the guideline panel suggests the use of either conventional GIC, hybrid RC, or resin-modified GIC (conditional recommendation, very low certainty)
- Direct restorative materials for permanent teeth:
- For moderate and advanced caries lesions on vital anterior permanent teeth requiring a Class I (lingual pit and fissure) restoration, the guideline panel suggests the use of either conventional GIC, hybrid RC, or resin-modified GIC (conditional recommendation, very low certainty)

- For moderate and advanced caries lesions on vital anterior permanent teeth requiring a Class III (approximal) restoration, the guideline panel suggests the use of either nanocomposite or hybrid RC (conditional recommendation, very low certainty)
- For moderate and advanced caries lesions on vital posterior primary teeth requiring a Class I (pit and fissure) restoration, the guideline panel suggests prioritizing the use of resin-modified GIC, RCs, conventional GIC, or preformed crowns over compomer or dental amalgam (conditional recommendation, very low certainty)
- For moderate and advanced caries lesions on vital posterior primary teeth requiring a Class II (approximal) restoration, the guideline panel suggests prioritizing the use of resin-modified GIC, RCs, or preformed crowns over compomer, conventional GIC, or dental amalgam (conditional recommendation, very low certainty)
- For moderate and advanced caries lesions on vital posterior primary teeth requiring a Class V (cervical third of facial or lingual) restoration, the guideline panel suggests the use of either conventional GIC, hybrid RC, or resin-modified GIC (conditional recommendation, very low certainty) (Dahr et al., 2023)
- Definition of certainty of evidence:
- Very low: Very little confidence in the effect estimate; the true effect is likely to be substantially different from the estimate of effect
- Definition of conditional recommendations:
- For patients: Most patients in this situation would want the suggested course of action, but many would not
- For clinicians: Recognize that different choices will be appropriate for individual patients and that clinicians must help each patient arrive at a management decision consistent with values and preferences. Decision aids may be useful in helping patients making such decisions

Furthermore, the ADA supports the FDA recommendations regarding high risk groups for dental amalgam as good practice.

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

On September 24, 2020 the FDA issued recommendations for certain high risk groups regarding dental amalgam. These groups may be at higher risk of potential harmful health effects from mercury vapor and should avoid amalgam when possible and appropriate. These higher risk groups include:

- Pregnant women and their developing fetuses
- Women who are planning to become pregnant
- Nursing women and their newborns and infants
- Children, especially those younger than six years of age
- People with pre-existing neurological disease such as multiple sclerosis, Alzheimer's disease, or Parkinson's disease
- People with impaired kidney function
- People with known heightened sensitivity (allergy) to mercury or other components of dental amalgam

Refer to the following website for further information: <https://www.fda.gov/news-events/press-announcements/fda-issues-recommendations-certain-high-risk-groups-regarding-mercury-containing-dental-amalgam>. (Accessed March 26, 2024)

References

- American Academy of Pediatric Dentistry Guideline on Management of Dental Patients with Special Health Care Needs. Revised 2021.
- American Academy of Pediatric Dentistry Guideline on Restorative Dentistry. Revised 2022.
- American Academy of Pediatric Dentistry Position Paper: Glass Ionomer Cements. 2002.
- American Dental Association (ADA) CDT Codebook 2024.
- American Dental Association Glossary of Dental Clinical and Administrative Terms.
- Amin M, Nouri MR, Hulland S, et al. Success Rate of Treatments Provided for Early Childhood Caries under General Anesthesia: A Retrospective Cohort Study. *Pediatr Dent*. 2016; 38(4):317-24.
- Chen C. *Philips Science of Dental Materials*. 13th Ed. Elsevier c2022. Chapter 5, Resin-Based Composites; p. 87-114.
- Chen C. *Philips Science of Dental Materials*. 13th Ed. Elsevier c2022. Chapter 8, Dental Amalgams p. 153-68.

Boushell L, Roberson T, Walter R. Sturdevant's Art and Science of Operative Dentistry. 6th Ed. St. Louis, MO: Mosby c2013. Chapter 5, Fundamentals of Tooth Preparation and Pulp Protection; p. 141-150.

Bakdach WMM, Hadad R. Effectiveness of different adjunctive interventions in the management of orthodontically induced white spot lesions: A systematic review of systematic reviews and meta-analyses. Dent Med Probl. 2020 Jul-Sep;57(3):305-325.

Dhar V, Pilcher L, Fontana M, et al. Evidence-based clinical practice guideline on restorative treatments for caries lesions: A report from the American Dental Association. J Am Dent Assoc. 2023 Jul;154(7):551-566.e51.

Gözetici B, Öztürk-Bozkurt F, Toz-Akalın T. Comparative Evaluation of Resin Infiltration and Remineralisation of Noncavitated Smooth Surface Caries Lesions: 6-month Results. Oral Health Prev Dent. 2019; 17(2):99-106.

Kovarik RE. Restoration of posterior teeth in clinical practice: evidence base for choosing amalgam versus composite. Dent Clin North Am. 2009 Jan; 53(1):71-6.

Kwang S, Aminoshariae A, Harding J, et al. The critical time-lapse between various restoration placements and subsequent endodontic intervention. J Endod. 2014 Dec; 40(12):1922-6.

Levi P, Rudy R, Jeong Y et al. Non- Surgical Control of Periodontal Diseases: A Comprehensive Handbook. Berlin, Heidelberg: Springer c2016. Chapter 1.6, Prognosis; p. 17.

Moraschini V, Fai CK, et al. Amalgam and resin composite longevity of posterior restorations: A systematic review and meta-analysis. JDent. 2015 Sep; 43(9):1043-50.

Naghipur S, Pesun I, Nowakowski A, et al. Twelve-year survival of 2-surface composite resin and amalgam premolar restorations placed by dental students. J Prosthet Dent. 2016 Sep; 116(3):336-9.

Rasines Alcaraz MG, Veitz-Keenan A, Sahrman P, et al. Direct composite resin fillings versus amalgam fillings for permanent or adult posterior teeth. Cochrane Database Syst Rev. 2014 Mar.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Single Tooth Indirect Restorations

Guideline Number: DCG008.14

Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
245. Coverage Rationale	234
246. Definitions	234
247. Applicable Codes	235
248. Description of Services	236
249. Clinical Evidence	236
250. References	237
251. Guideline History/Revision Information	238
252. Instructions for Use	238

Related Dental Policies
None

Coverage Rationale

Damaged teeth should be restored using procedures that remove the least amount of tooth structure necessary to restore normal function.

Crowns and Onlays

Crowns and **Onlays** are indicated for the following:

- Extensive caries or tooth fractures
- To replace large defective restorations
- Complete cusp fractures
- Endodontically treated teeth (unless only need to restore the access opening on an anterior tooth) that are asymptomatic with a good apical seal
- Symptomatic “cracked tooth syndrome” (not enamel craze lines)
- Full coverage restoration of a primary tooth without a permanent successor
- A fracture within dentin that cannot be prepared for a direct restoration (e.g., pulpal floor fracture)

Crowns and Onlays are not indicated for the following:

- If a more conservative means of restoration is acceptable
- For teeth with a poor prognosis; this includes but is not limited to:
 - Untreated/uncontrolled periodontal disease
 - Periapical pathology
 - Teeth that do not have a favorable Crown/root ratio
 - Individuals with widespread, active decay
 - If root resorption is present

Inlays

In the published literature, [Inlays](#) have not been shown to have superior long-term clinical performance over direct restorations.

Definitions

Crown: An artificial replacement that restores missing tooth structure by surrounding the remaining coronal tooth structure or is placed on a dental implant. It is made of metal, ceramic or polymer materials or a combination of such materials. It is retained by luting cement or mechanical means. (ADA)

Inlay: An intracoronal dental restoration, made outside the oral cavity to conform to the prepared cavity, which restores some of the occlusal surface of a tooth, but does not restore any cusp tips. It is retained by luting cement. (ADA)

Onlay: A dental restoration made outside the oral cavity that covers one or more cusp tips and adjoining occlusal surfaces, but not the entire external surface. It is retained by luting cement. (ADA)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D2510	Inlay – metallic - one surface
D2520	Inlay – metallic - two surfaces
D2530	Inlay – metallic - three or more surfaces
D2542	Onlay – metallic-two surfaces
D2543	Onlay – metallic-three surfaces
D2544	Onlay – metallic-four or more surfaces
D2610	Inlay – porcelain/ceramic - one surface
D2620	Inlay – porcelain/ceramic - two surfaces
D2630	Inlay – porcelain/ceramic - three or more surfaces
D2642	Onlay – porcelain/ceramic - two surfaces
D2643	Onlay – porcelain/ceramic - three surfaces
D2644	Onlay – porcelain/ceramic - four or more surfaces
D2650	Inlay – resin-based composite - one surface
D2651	Inlay – resin-based composite - two surfaces
D2652	Inlay – resin-based composite - three or more surfaces
D2662	Onlay – resin-based composite - two surfaces
D2663	Onlay – resin-based composite - three surfaces
D2664	Onlay – resin-based composite - four or more surfaces
D2710	Crown, resin-based composite, indirect
D2712	Crown – 3/4 resin-based composite (indirect)
D2720	Crown – resin with high noble metal
D2721	Crown – resin with predominantly base metal
D2722	Crown – resin with noble metal
D2740	Crown – porcelain/ceramic
D2750	Crown – porcelain fused to high noble metal
D2751	Crown – porcelain fused to predominantly base metal
D2752	Crown – porcelain fused to noble metal
D2753	Crown – porcelain fused to titanium and titanium alloys
D2780	Crown – 3/4 cast high noble metal
D2781	Crown – 3/4 cast predominantly base metal
D2782	Crown – 3/4 cast noble metal
D2783	Crown – 3/4 porcelain/ceramic
D2790	Crown – full cast high noble metal

CDT Code	Description
D2791	Crown – full cast predominantly base metal
D2792	Crown – full cast noble metal
D2794	Crown – titanium
D2799	Interim crown – further treatment or completion of diagnosis necessary prior to final impression
D2956	Removal of an indirect restoration on a natural tooth

CDT® is a registered trademark of the American Dental Association

Description of Services

Indirect restorations are tooth restorations that are fabricated outside the mouth. They are prepared on a replica of the prepared tooth in a dental laboratory or by using computer-aided design/computer-assisted manufacturing (CAD/CAM) either chairside or in the dental laboratory. Local anesthetic, impressions, tooth preparation, temporary restorations, fitting, cementation, adjustment, and any liners or bases are generally considered inclusive to the procedure.

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

Clinical Evidence

Inlays

Rocha Gomez Torres et al. (2021) conducted a study comparing the clinical performance of large indirect restorations (IRs) with direct restorations (DRs) in permanent teeth for up to two years. Thirty subjects received two class II restorations, one fabricated from a pre-cured composite block (Grandio Blocs, VOCO) for the indirect technique (IT) and the other with light-cured composite (GrandioSO, VOCO) for the direct technique (DT). For IT, the restoration was created using the computer-aided design and computer-aided manufacturer (CAD/CAM) system. For DT, the material was applied light-cured by using a layering technique. All restorations were evaluated by using the World Dental Federation criteria. The results showed in the 23 patients that attended the 2 year follow up there were no significant differences between the techniques for most parameters analyzed ($p > 0.05$). and all restorations were esthetically acceptable after 2 years, and 93.3% of DT and 90% of IT showed acceptable function. The authors concluded that both restorations presented similar and good clinical behavior for all the properties analyzed, and that light-cured direct posterior composite restorations perform similarly to indirect composite restorations made with pre-cured CAD/CAM composite blocks up to 2 years.

In a 2018 systematic review, Azeem et al. sought to compare the clinical performance of direct versus indirect composite restorations in posterior teeth. This review included thirteen studies in which clinical performance of various types of direct and indirect composite restorations in posterior teeth were compared. Out of the thirteen studies which were included seven studies had a high risk of bias and five studies had a moderate risk of bias. One study having a low risk of bias, concluded that there was no significant difference between direct and indirect technique. However, the available evidence revealed inconclusive results, and further research should focus on randomized controlled trials with long term follow-up to give concrete evidence on the clinical performance of direct and indirect composite restorations.

Shu et al. (2018) conducted a systematic review to compare treatment outcomes of direct and indirect permanent restorations in endodontically treated teeth and provide clinical suggestions for restoring teeth after endodontic treatment. Electronic databases and gray literature were screened for articles that reported on prospective and retrospective clinical studies of direct or indirect restorations after endodontic treatment with an observation period of at least 3 years. Primary outcomes were determined to be short-term (≤ 5 years) and medium-term (> 5 and ≤ 10 years) survival. Secondary outcomes included restorative and endodontic success of restored teeth. The quality of included studies and risk of bias were assessed using Cochrane Collaboration's tool for RCTs (randomized controlled trials), the Newcastle-Ottawa Scale for cohort studies, and the Agency for Healthcare Research and Quality (AHRQ) methodology checklist for cross-sectional studies. The GRADE system was used for assessing collective strength of the overall body of evidence. Only 9 (2 RCTs, 3 retrospective cohort studies, 3 cross-sectional studies) met the inclusion criteria, and 8 studies were used in the meta-analysis. In general, indirect restorations (mostly full crowns) showed higher 5-year survival and 10-year survival than direct restorations. However, there was no statistical difference in short-term (≤ 5 -years) restorative success and endodontic success. The authors concluded that there is a weak recommendation for indirect restorations to restore endodontically treated teeth, especially for teeth with extensive coronal damage. Indirect restorations using mostly crowns have higher short-term (5-year) and medium-term (10-year) survival than do direct restorations using composite or amalgam (GRADE quality of evidence: low to moderate), but no difference in short-term (≤ 5 years) restorative success

(low quality) and endodontic success (very low quality). There is a need for high-quality clinical trials, especially well-designed RCTs.

Angeletaki et al (2016) conducted a systematic review and meta-analysis to evaluate the long-term clinical performance of direct versus indirect composite inlays/onlays in posterior teeth. The electronic databases MEDLINE, EMBASE, Cochrane Oral Health Group's Trials Register and CENTRAL were searched with no restriction to publication date or language. Only randomized controlled trials (RCTs) were included and evaluated according to Cochrane risk of bias tool. The main outcome assessed was the restoration failure, determined by several clinical parameters. Two studies concerning direct and indirect inlays (82 patients with 248 restorations) and one study for onlays (157 patients with 176 restorations) satisfied the inclusion criteria. Two trials, one of unclear and one of high risk of bias, could be mathematically combined. The meta-analysis indicated no statistically significant difference in the risk failure between direct and indirect inlays, after 5 years. Only one parameter, the marginal discoloration, slightly favored direct inlays after 11 years. Only one study dealt with onlays; an overall 5-year survival of 87% was reported. The authors concluded that the difference of the two techniques did not reach statistical significance in order to recommend one technique over the other, and the scarcity of primary studies support the need for further well-designed long-term studies in order to reach firm conclusions about both techniques. Resin composite materials, placed directly or indirectly, exhibit a promising long-term clinical performance when rehabilitation of posterior teeth is needed.

da Veiga et al (2016) conducted a systematic review and meta-analysis to assess the differences in clinical performance in direct and indirect resin composite restorations in permanent posterior teeth. PubMed, the Cochrane Library, Web of Science, Scopus, LILACS, BBO, ClinicalTrials.gov and SiGLE were searched without restrictions. The review included randomized clinical trials (RCTs) that compared the clinical performance of direct and indirect resin composite restorations in Class I and Class II cavities in permanent teeth, with at least two years of follow-up. The risk of bias tool suggested by Cochrane Collaboration was used for quality assessment. Twenty studies fulfilled the inclusion criteria after the abstract screening. Two articles were added after a hand search of the reference list of included studies. After examination, nine RCTs were included in the qualitative analysis and five were considered to have a 'low' risk of bias. The overall risk difference in longevity between direct and indirect resin composite restorations in permanent posterior teeth at five-year follow-up was 1.494, and regardless of the type of tooth restored, that of molar and premolars was 0.716 at three-year follow-up. Based on the findings, the authors concluded that there was no difference in longevity of direct and indirect resin composite restorations regardless of the type of material and the restored tooth.

Mendonca et al. (2010) conducted a study to evaluate the clinical performance of indirect composite restorations versus direct composite restorations after one year. Seventy-six separate restorations were placed on pre-molars and molars in healthy patients, either for new caries, or the replacement of deficient existing restorations. Materials were placed according to manufacturer's directions and evaluated at baseline and one year according to the modified United States Public Health Services (USPHS) criteria for: color match (CM), marginal discoloration (MD), secondary caries (SC), anatomic form (AF), surface texture (ST), marginal integrity (MI) and pulp sensitivity (PS). At 12 months, there was no SC or PS noted, and statistically insignificant changes in CM, AF, and ST. There were, however, statistically significant MI changes, with the direct composite restoration material showing superior results after one year. It was concluded that both provide satisfactory clinical performance, with the direct composite restorations performing better than indirect composite restorations for marginal integrity.

References

American Association of Endodontists (AAE). Endodontics: Colleagues for Excellence Newsletter; Restoration of Endodontically Treated Teeth: The Endodontist's Perspective, Part 1. Spring/Summer 2004.

American Association of Endodontists (AAE). Endodontics: Colleagues for Excellence Newsletter; Cracking the Cracked Tooth Code: Detection and Treatment of Various Longitudinal Tooth Fractures. Summer 2008.

American Association of Endodontists Guide to Clinical Endodontics, 6th edition. Updated 2013.

American Dental Association (ADA) CDT Codebook 2025.

American Dental Association (ADA). Glossary of Clinical and Administrative Terms.

Angeletaki F, Gkogkos A, Papazoglou E, Kloukos D. Direct versus indirect inlay/onlay composite restorations in posterior teeth. A systematic review and meta-analysis. J Dent. 2016 Oct; 53:12-21.

Azeem RA, Sureshbabu NM. Clinical performance of direct versus indirect composite restorations in posterior teeth: A systematic review. J Conserv Dent. 2018 Jan-Feb;21(1):2-9.

da Veiga AM, Cunha AC, Ferreira DM, et al. Longevity of direct and indirect resin composite restorations in permanent posterior teeth: A systematic review and meta-analysis. J Dent. 2016 Nov; 54:1-12.

Lubisich EB, Hilton TJ, Ferracane J; Northwest Precedent. Cracked teeth: a review of the literature. J Esthet Restor Dent. 2010 Jun;22(3):158-67.

Marchini L, Nesbit S. Diagnosis and Treatment Planning in Dentistry, 4th ed. St. Louis: Elsevier c2024. Chapter 3, Evidence-Based Treatment Planning: Assessment of Risk, Prognosis, and Expected Outcomes; p.74-100.

Melnick P, Takei H. Newman and Carranza's Clinical Periodontology, 13th ed. St. Louis: Elsevier c2019. Chapter 69, Preparation of the Periodontium for Restorative Dentistry; p.696-98.

Mendonca J, Neto R, Santiago S. et al. Direct resin composite restorations versus indirect composite inlays: One-Year Results J Contemp Dent Pract (Internet) 2010 May; 11 (3):025-032.

Rocha Gomes Torres C, Caroline Moreira Andrade A, Valente Pinho Mafetano AP, et al. Computer-aided design and computer-aided manufacturing indirect versus direct composite restorations: A randomized clinical trial. J Esthet Restor Dent. 2021 Sep 29.

Rosenstiel S, Land M, Fujimoto J. Contemporary Fixed Prosthodontics, 5th ed. St. Louis: Mosby c2016. Part 1: Planning and Preparation, Chapter 3 Treatment Planning; p.77-85.

Rosenstiel S, Land M, Fujimoto J. Contemporary Fixed Prosthodontics, 5th ed. St. Louis: Mosby c2016. Part II: Clinical Procedures Section, Chapter 7 Principles of Tooth Preparation; p.173.

Shu X, Mai QQ, Blatz M, et al. Direct and Indirect Restorations for Endodontically Treated Teeth: A Systematic Review and Meta-analysis, IAAD 2017 Consensus Conference Paper. J Adhes Dent. 2018;20(3):183-194.

Swift E, Sturdevant J, Boushell L. Sturdevant's Art and Science of Operative Dentistry, 6th ed. St. Louis: Mosby c2013. Chapter 11, Indirect Tooth Colored Restorations; p.280-94.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Space Maintenance

Guideline Number: DCG035.08
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
253. Coverage Rationale	239
254. Definitions	239
255. Applicable Codes	239
256. Description of Services	240
257. References	240
258. Guideline History/Revision Information	240
259. Instructions for Use	240

Related Dental Policies

None

Coverage Rationale

Space Maintainers are indicated for maintaining space due to premature loss of a primary tooth/teeth.

Space Maintainers are contraindicated for the following:

- When permanent tooth/teeth is/are close to eruption
- Member is not compliant or has poor oral hygiene
- Severe crowding already exists
- Space has already been lost

Definitions

Space Maintainer: A passive appliance, usually cemented in place, that holds teeth in position. (ADA)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D1510	Space maintainer – fixed – unilateral – per quadrant
D1516	Space maintainer – fixed – bilateral, maxillary
D1517	Space maintainer – fixed – bilateral, mandibular
D1520	Space maintainer – removable – unilateral – per quadrant
D1526	Space maintainer – removable – bilateral, maxillary
D1527	Space maintainer – removable – bilateral, mandibular
D1551	Re-cement or re-bond bilateral space maintainer – maxillary
D1552	Re-cement or re-bond bilateral space maintainer – mandibular
D1553	Re-cement or re-bond unilateral space maintainer – per quadrant
D1556	Removal of fixed unilateral space maintainer – per quadrant

CDT Code	Description
D1557	Removal of fixed bilateral space maintainer – maxillary
D1558	Removal of fixed bilateral space maintainer – mandibular
D1575	Distal shoe space maintainer – fixed – unilateral – per quadrant
D1999	Unspecified preventive procedure, by report

CDT® is a registered trademark of the American Dental Association

Description of Services

Space Maintainers are passive appliances designed to prevent tooth movement following premature loss of primary teeth so permanent teeth can erupt into proper position. Additionally, the goal of space maintenance is to prevent loss of arch length, width and perimeter by maintaining the relative position of the existing dentition.

References

Alnahwi HH, Donly KJ, Contreras CI. Space loss following premature loss of primary second molars. Gen Dent. 2015 Nov-Dec;63(6):e1-4. Erratum in: Gen Dent. 2016 Jan-Feb;64(1):79.

American Academy on Pediatric Dentistry Clinical Affairs Committee-Developing Dentition Subcommittee; American Academy on Pediatric Dentistry Council on Clinical Affairs. Guideline on management of the developing dentition and occlusion in pediatric dentistry. Pediatr Dent. 2008-2009;30(7 Suppl):184-95.

American Dental Association (ADA) CDT 2023 Dental Procedure Code Book.

American Dental Association (ADA). Glossary of Dental Clinical and Administrative Terms.

Basavaraj Subhashchandra Phulari. Orthodontics: Principles and Practice. Chapter 19 Preventive Orthodontics. Jaypee Brothers Medical Publishers; 2011. p. 244-245.

Peterson and Davis. Atlas of Pediatric Dentistry. Space Management in Pediatric Dentistry. Available at: <http://depts.washington.edu/peddent/AtlasDemo/space002.html>. (Accessed September 1, 2023).

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Surgical and Partial Extractions of Erupted Teeth and Removal of Retained Roots

Guideline Number: DCP005.11

Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
260. Coverage Rationale	241
261. Definitions	241
262. Applicable Codes	242
263. Description of Services	242
264. Clinical Evidence	242
265. References	243
266. Guideline History/Revision Information	243
267. Instructions for Use	243

Related Dental Policy

- Surgical Extraction of Impacted Teeth
- Dental Implant Placement and Treatment of Peri-Implant Defects/Disease

Coverage Rationale

Surgical Extraction of an Erupted Tooth

Surgical Extraction of an Erupted Tooth is indicated for any of the following:

- The fracture of a tooth or roots during a non-surgical extraction procedure
- Erupted teeth with unusual root morphology (dilacerations, cementosis)
- Erupted teeth with developmental abnormalities that would make non-surgical extraction unsafe or cause harm
- When fused to an adjacent tooth
- In the presence of periapical lesions
- For maxillary posterior teeth whose roots extend into the maxillary sinus
- When tooth has been crowned or been treated endodontically

Surgical Removal of Residual Tooth Roots

Surgical Removal of Residual Tooth Roots is indicated when tooth roots or fragments of tooth roots remain in the bone following a previous incomplete tooth extraction.

Partial Extraction for Immediate Implant Placement (i.e., Socket Shield Technique)

Partial Extraction for Immediate Implant Placement is not indicated due to insufficient evidence of efficacy.

Definitions

Partial Extraction for Immediate Implant Placement: A technique in which the buccal two-thirds of the root in the socket is preserved vertically. (Kumar, 2018)

Surgical Extraction of an Erupted Tooth: A tooth requiring removal of bone and/or sectioning of tooth, including elevation of mucoperiosteal flap if indicated. Includes related cutting of gingiva and bone, removal of tooth structure, minor smoothing of socket bone and closure. (ADA)

Surgical Removal of Residual Tooth Roots: The Surgical Removal of Residual Tooth Roots (cutting procedure) includes cutting of soft tissue and bone, removal of tooth structure and closure. (ADA)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this guideline does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D7210	Extraction, erupted tooth requiring removal of bone and/or sectioning of tooth, and including elevation of mucoperiosteal flap if indicated
D7250	Removal of residual tooth roots (cutting procedure)
D7252	Partial extraction for immediate implant placement
D7922	Placement of intra-socket biological dressing to aid in hemostasis or clot stabilization, per site

CDT® is a registered trademark of the American Dental Association

Description of Services

Surgical extraction is the removal of a tooth that presents clinically with a condition that does not safely or adequately allow access using a non-surgical approach. Surgical extractions require an incision, elevation, and bone removal. It may be an entire tooth, or any part of a tooth, including retained roots.

The Socket Shield technique, also known as partial extraction therapy, root membrane technique, and partial root retention, was introduced in 2010 and is technique in which the buccal two-thirds of the root in the socket is preserved vertically allowing the periodontium, bundle bone, and the buccal bone to remain intact. This is thought to improve the esthetics and contouring of implant rehabilitation by way of preventing the loss of the aforementioned structures (Kumar, 2018).

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

Clinical Evidence

In a 2023 systematic review, Oliva et al. evaluated the efficacy of the socket shield technique (SST) for reducing buccal bone resorption. Seventeen articles (randomized controlled clinical studies, prospective cohort studies, and retrospective case series) comprised of 656 implants placed using the SST compared with standard placement techniques were included. The mean follow up was 18 months. Outcomes assessed included the implant survival rate with SST, type and frequency of complications, and the long-term prognosis for the stabilization of buccal soft and hard tissues. The results showed that implant survival rate was 98.6% which is in line with standard implant placement techniques. Seventy-six percent of implant failures could be attributed to internal or external exposure due to surgical technique or infection. Marginal bone loss (MBL) was less and pink esthetic score (PES) higher in implants placed using SST. Two randomized controlled trials showed significantly less horizontal bone loss for implants placed with SST. The authors concluded that the results are encouraging, and further long term research is needed to establish clinical efficacy and safety before the SST can be recommend for routine clinical implementation.

Ogawa et al. (2022) performed a systematic review on the effectiveness of the SST in dental implant placement. Twenty studies were included, (one randomized controlled trial, two cohort studies, 14 clinical human case reports, and three retrospective case series) comprised of 274 patients that were treated with the SST and immediate implant placement. The implant placement in the majority of the included studies were placed in the maxillary anterior region, but there were other areas as well. Follow up ranged from 3- 60 months. The results showed that the treatment was successful in 248 of the implants placed, without complications or adverse events during follow up time reported. Complications and adverse events rate was 9.5% and included internal and external shield exposure, failure of osseointegration, shield mobility and infection. The authors concluded that the SST for implant placement is effective in preserving bone with a good esthetic outcome and low complication rates. This review is limited by the majority of studies being case series and only one randomized controlled trial and all but one had follow up of less than a year. Further high quality research with large patient populations and longer follow up are required.

Tiwari et al. (2020) conducted a study to compare the efficacy of immediate implant placement after extraction without socket-shield technique and with socket-shield technique in the esthetic region. Sixteen patients with unsalvageable maxillary anterior teeth with labial bone thickness of less than 2 mm as shown on preoperative cone beam computed tomography (CBCT) were chosen for the study and randomly assigned one of two groups. Group A patients has implant placement using the SST, and Group B patients had immediate implant placement without SST. The labial bone thickness was analyzed along its entire length through CBCT scan at follow-up intervals of 1, 4, 8 and 12 month. The results showed there was consistent stabilization of bone loss in Group A throughout the 12 month follow up period, and Group B showed stabilization until month 8, when it showed progression. that was not statistically significant. The authors concluded that further research is needed to demonstrate the efficacy of the SST.

References

American Dental Association (ADA), CDT Code Book, 2025.

American Dental Association (ADA) Glossary of Dental Clinical and Administrative Terms.

Blaschke C, Schwass DR. The socket-shield technique: a critical literature review. *Int J Implant Dent.* 2020 Sep 7;6(1):52.

Fragiskos, F. *Oral Surgery*, 1st ed. Berlin: Springer c2007. Chapter 6, Extraction of Root Tips; p114.

Kumar PR, Kher U. Shield the socket: Procedure, case report and classification. *J Indian Soc Periodontol.* 2018 May-Jun;22(3):266-272.

Ogawa T, Sitalaksmi RM, Miyashita M, et al. Effectiveness of the socket shield technique in dental implant: A systematic review. *J Prosthodont Res.* 2022 Jan 11;66(1):12-18.

Oliva S, Capogreco M, Murmura G, et al. The socket shield technique and its complications, implant survival rate, and clinical outcomes: a systematic review. *J Periodontal Implant Sci.* 2023 Apr;53(2):99-109.

Santhanakrishnan M, Subramanian V, Ramesh N, et al. Radiographic and esthetic evaluation following immediate implant placement with or without socket shield and delayed implant placement following socket preservation in the maxillary esthetic region - a randomized controlled clinical trial. *Clin Cosmet Investig Dent.* 2021 Nov 19;13:479-494.

Tiwari S, Bedi RS, Wadhvani P, et al. Comparison of immediate implant placement following extraction with and without socket-shield technique in esthetic region. *J Maxillofac Oral Surg.* 2020 Dec;19(4):552-560.

Guideline History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Coverage Guideline provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this guideline, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Coverage Guideline is provided for informational purposes. It does not constitute medical advice.

Surgical Endodontics

Policy Number: DCP010.14
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
268. Coverage Rationale	244
269. Definitions	245
270. Applicable Codes	246
271. Description of Services	247
272. Clinical Evidence	247
273. U.S. Food and Drug Administration	248
274. References	248
275. Policy History/Revision Information	249
276. Instructions for Use	249

Related Dental Policies
<ul style="list-style-type: none"> • Biologic Materials for Soft and Hard Tissue Regeneration • Bone Replacement Grafts • Dental Barrier Membrane Guided Tissue Regeneration • Non-Surgical Endodontics

Coverage Rationale

Apicoectomy

Apicoectomy may be indicated for the following:

- Failed retreatment of endodontic therapy
- When the apex of tooth cannot be accessed due to calcification or other anomaly
- Where visualization of the [Periradicular](#) tissues and tooth root is required when perforation or root fracture is suspected
- Further diagnosis when post endodontic therapy symptoms persist
- A marked over extension of obturating materials interfering with healing

Apicoectomy is not indicated for the following:

- Unusual bony or root configurations resulting in lack of surgical access
- If there is the possible involvement of neurovascular structures
- Teeth with a hopeless prognosis

Surgical Exposure of Root Surface(s) (Without Apicoectomy or Repair of Root Resorption)

Surgical exposure of root surfaces may be indicated for the following:

- Failed retreatment of endodontic therapy
- When the apex of tooth cannot be accessed due to calcification or other anomaly
- When a biopsy of Periradicular tissue is necessary
- Where visualization of the Periradicular tissues and tooth root is required when perforation or root fracture is suspected
- Further diagnosis when post endodontic therapy symptoms persist
- A marked overextension of obturating materials interfering with healing

Surgical exposure of root surfaces is not indicated for the following:

- Unusual bony or root configurations resulting in lack of surgical access
- If there is the possible involvement of neurovascular structures
- Teeth with a hopeless prognosis

Retrograde Filling

Retrograde Filling is indicated for the following:

- Periradicular pathosis and a blockage of the root canal system that could not be obturated by nonsurgical root canal treatment
- Persistent Periradicular pathosis resulting from an inadequate apical seal that cannot be corrected non-surgically
- Root perforations
- Resorptive defects

Retrograde Filling is not indicated for teeth with an overall poor prognosis.

Root Amputation

Root Amputation may be indicated for the following:

- Class III [Furcation](#) involvement
- Untreatable bony defect (of one root)
- Root fracture
- Root caries
- Root resorption
- Persistent sinus tract or recurrent apical pathology
- When there is greater than 75% bone supporting remaining root(s)
- The tooth has had successful endodontic treatment

Root Amputation is not indicated for teeth with an overall poor prognosis with or without Root Amputation.

Intentional Reimplantation

Intentional replantation may be indicated when all of the following clinical conditions exist:

- Persistent Periradicular pathosis following endodontic treatment
- Nonsurgical retreatment is not possible or has an unfavorable prognosis
- Periradicular surgery is not possible or involves a high degree of risk to adjacent anatomical structures
- The tooth presents a reasonable opportunity for removal without fracture
- The tooth has an acceptable periodontal status prior to the replantation procedure

Hemisection

Hemisection of multirooted teeth may be indicated for the following:

- Class III or Class IV periodontal Furcation defect
- Infrabony defect of one root of a multi-rooted tooth that cannot be successfully treated periodontally
- Coronal fracture extending into the Furcation
- Vertical root fracture confined to the root to be separated and removed
- Carious, resorptive root or perforation defects that are inoperable or cannot be corrected without root removal
- The tooth has had successful endodontic treatment

Definitions

Biologic Materials: Agents that alter wound healing or host-tumor interaction. Such materials can include cytokines, growth factor, or vaccines, but do not include any actual hard or soft tissue graft material. These agents are added to graft material or used alone to effect acceleration of healing or regeneration in hard and soft tissue surgical procedures. They are also known as biologic response modifiers. (ADA)

Furcation: The anatomic area of a multirooted tooth where the roots diverge. A Furcation involvement refers to loss of periodontal support in a Furcation. (ADA, 2016)

Glickman Classification of Tooth Furcation Grading (Sims, 2015):

- Grade I:
 - Incipient
 - Just barely detectable with examination hand instruments
 - No horizontal component of the Furcation is evident on probing
- Grade II:
 - Early bone loss

- Examination hand instrument goes partially into the Furcation, but not all the way through
- Furcation may be grade II on both sides of the tooth, but are not connected
- Grade III:
- Advanced bone loss
- Examination hand instrument goes all the way through Furcation, to other side of tooth
- Furcation is through-and-through
- Grade IV:
- Through-and-through, plus Furcation is clinically visible due to gingival recession

Guided Tissue Regeneration: A surgical procedure with the goal of achieving new bone, cementum, and PDL attachment to a periodontally diseased tooth, using barrier devices or membranes to provide space maintenance, epithelial exclusion, and wound stabilization. (AAP)

Hemisection (Biscuspidization): The surgical separation of a multirooted tooth, usually a mandibular molar, through the Furcation in such a way that a root and the associated portion of the crown may be removed or retained. (AAE)

Periradicular: Surrounding the root. (AAE)

Retrograde Filling: A method of sealing the root canal by preparing and filling it from the root apex. (ADA)

Root Amputation: Surgical removal of all of the root and adherent soft tissues leaving the crown of the tooth intact and supported by remaining root(s). (AAE)

Root End Resection/Apicoectomy: The surgical removal of the apical portion of a root and adherent soft tissues; may be performed in advance of root-end preparation for a root end filling or as a definitive treatment. (AAE)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D3410	Apicoectomy – anterior
D3421	Apicoectomy – premolar (first root)
D3425	Apicoectomy – molar (first root)
D3426	Apicoectomy/periradicular surgery (each additional root)
D3430	Retrograde filling – per root
D3450	Root amputation – per root
D3460	Endodontic endosseous implant
D3470	Intentional reimplantation (including necessary splinting)
D3471	Surgical repair of root resorption - anterior
D3472	Surgical repair of root resorption – premolar
D3473	Surgical repair of root resorption – molar
D3501	Surgical exposure of root surface without apicoectomy or repair of root resorption – anterior
D3502	Surgical exposure of root surface without apicoectomy or repair of root resorption – premolar
D3503	Surgical exposure of root surface without apicoectomy or repair of root resorption – molar
D3910	Surgical procedure for isolation of tooth with rubber dam
D3920	Hemisection (including any root removal), not including root canal therapy
D3950	Canal preparation and fitting of preformed dowel or post
D3999	Unspecified endodontic procedure, by report

CDT® is a registered trademark of the American Dental Association

Description of Services

When retreatment of endodontic therapy is unsuccessful or not possible, surgical treatment may be required. Surgical endodontics encompasses the elimination of pathology through Periradicular surgery, Root Amputation, and Hemisectioning of multirooted teeth.

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

Clinical Evidence

Surgical Endodontics

Many surgical endodontic procedures are being performed less frequently, as the high success rate of dental implants makes them an accepted alternative for challenging cases. As a result, new evidence for these procedures is lacking.

Kim et al. (2018) conducted a comprehensive review discussing current knowledge as well as future directions on regenerative endodontics. The European Society of Endontology and the American Association for Endodontists have both released position statements and clinical considerations for these procedures. Endogenous stem cells from an induced periapical bleeding and scaffolds using blood clot, platelet rich plasma or platelet-rich fibrin have been utilized in regenerative endodontics. It is hoped that with the concept of tissue engineering, namely stem cells, scaffolds and signaling molecules, that true pulp regeneration is an achievable goal. However, much is still not known about clinical and biological aspects of regenerative endodontics.

Song et al. (2012) published the results of a study to evaluate the outcomes of cases that were classified as successes in a previous study of the surgical treatment of lesions of endodontic and combined periodontic endodontic origin. Long-term predictability of treated teeth is important in the decision-making process between root retention versus extraction and other treatments. The purpose of this study was to evaluate the outcomes over a period of 6 to 10 years, of the 172 cases of the cases that were classified as successes in the previous study. Patients were followed up every 6 months for 2 years and every year up to 10 years. On every follow-up visit, clinical and radiographic evaluations were performed according to the same criteria as in the original study by the same 2 examiners. The results showed a follow-up rate of 104 out of the selected 172 cases. Of these 104 cases, 97 cases were included in the successful group, 91 with complete healing and 6 with incomplete healing, with the overall maintained success rate of 93.3%. The authors concluded that endodontic surgery has a high rate of long-term success and is a viable treatment for retaining endodontically involved teeth requiring surgery.

Intentional Tooth Reimplantation

Asgary et al. (2014) presented a case series aimed at comprehensively introducing intentional replantation (IR) with a focus on its indications and case selection in endodontics. Twenty teeth were selected and 19 of them had failed endodontic treatment and needed retreatment, surgical treatment, or extraction. The same private practice endodontist provided the IR procedure. Teeth were extracted atraumatically, extraoral time kept to a minimum (< 15 minutes), leaving the periodontal ligament and root surface untouched. Root end pathology was treated, and teeth reimplanted into extraction socket with position verified radiographically. Teeth were not splinted as they were deemed to be outside of primary occlusion. Patients were given post-operative instructions and returned for oral examination at 1, 7 and 14 days, with follow up beyond 6 months planned. Treatment was deemed successful via clinical and radiographic verification. Subjective symptoms such as pain or discomfort were considered failures, as were teeth that showed symptoms of infection or inflammation. Radiographic examination of teeth that showed no change in size of periapical lesion were also considered failures. Patients were followed up from 8-24 months, with the mean being 15.5 months. Of the original 18 teeth treated with IR, 18 were successful clinically and radiographically. One of the two classified as failures did have some resolution of the periapical lesion, however it was not completely eliminated. The authors concluded that with proper tooth and patient selection and skilled providers, IR can have a high success rate.

Hemisection and Amputation

Park et al. (2009) conducted a 10-year retrospective study on the long-term outcome of root resection of molars. From December 1992 to March of 2006, 579 patients received root resection on 691 molar teeth at the Institute of Oral Health Science, Samsung Medical Center in Seoul, Korea. Cases were chosen based on root resection therapy for periodontal problems, endodontic problems, caries, and root fracture. Ultimately 60 cases were excluded due to missing clinical information, and a retrospective review was done of all clinical and radiographic documentation. Data collected included type of prosthetic abutment, opposing dentition, furcation classification, and amount of bone support on remaining root.

They also included clinical information in regard to the presence of periapical lesions, endodontic status and total number of teeth remaining in the dentition. The amount of bone was measured using radiographs taken with the same film holding device to minimize operator differences in film and tube head placement providing standardization. The study showed a 10-year survival rate of molar resected teeth of 29.8% which is similar to previous studies. The researchers concluded that root resection is still a valid treatment option for retention of teeth with loss of bone due to periodontal disease or endodontic lesions, with periodontal defects showing a slightly higher long-term prognosis. Success is highly dependent on patient case selection, careful prosthetic planning, and practitioner skill level. The authors also concluded that further studies are needed in this area, but not likely due to more dentists and patients choosing extraction and implants as a treatment modality with higher long-term success.

Zafiropoulos et al. (2009) conducted a retrospective non-randomized study on the long-term success of mandibular molar resectioning and implant procedures in a private practice setting. A retrospective chart review was performed. In one group of patients 56 mandibular first or first and second molars were treated by hemisection (Group H). A second group received 36 implants in the mandible to replace periodontally involved first or first and second molars (Group I). All patients had been in maintenance for at least 4 years after treatment and the occurrence and timing of posttreatment complications were evaluated. The majority of hemisected teeth (68% of Group H) and implants (89% of Group I) remained free of complications for the entire observation period. Group H had a greater incidence of overall complications. The results indicated that both root resected mandibular molars and mandibular molar implants could be expected to have, on average, a complication-free survival of 6 years. Although root resected molars were at a significantly greater risk for complications, approximately 80% of root resected mandibular molars were retained overall, and almost 70% of root resected mandibular molars remained complication free for an average of 5 years. The authors concluded that within the limitations of this retrospective, practice-based study, implants replacing periodontally involved mandibular molars had fewer complications than hemisected mandibular teeth, but hemisected teeth have an acceptable long term survival rate.

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

Surgical endodontics encompasses procedures and are not subject to FDA regulation.

References

American Association of Endodontists (AAE). Glossary of Endodontic Terms. 10th edition. 2020.

American Association of Endodontists (AAE). Guide to Clinical Endodontics, 6th edition. 2013. Updated 2019. <https://www.aae.org/specialty/clinical-resources/guide-clinical-endodontics/>. Accessed October 29, 2024.

American Dental Association (ADA). Glossary of Clinical and Administrative Terms.

American Dental Association CDT Codebook 2025.

Asgary S, Alim Marvasti L, Kolahdouzan A. Indications and case series of intentional replantation of teeth. *Iran Endod J*. 2014 Winter; 9(1):71-8.

Elangovan FA, Takei H, Camargo P, Newman and Carranza's Clinical Periodontology and Implantology, 14th ed. St. Louis: Elsevier c2023 Chapter 22, The Periodontal Pocket Formation and Patterns of Bone Loss; p.308-330.

Kim SG, Malek M, Sigurdsson A, et al. Regenerative endodontics: a comprehensive review. *Int Endod J*. 2018 Dec; 51(12):1367-1388.

Marín-Botero ML, Domínguez-Mejía JS, Arismendi-Echavarría JA, et al. Healing response of apicomarginal defects to two guided tissue regeneration techniques in periradicular surgery: a double-blind, randomized-clinical trial. *Int Endod J*. 2006 May; 39(5):368-77.

Park SY, Shin SY, Yang SM, Kye SB. Factors influencing the outcome of root-resection therapy in molars: a 10-year retrospective study. *J Periodontol*. 2009 Jan; 80(1):32-40.

Royal College of Surgeons Guidelines for Surgical Endodontics. 2012.

Song M, Chung W, Lee SJ, Kim E. Long-term outcome of the cases classified as successes based on short-term follow-up in endodontic microsurgery. *J Endod*. 2012 Sep; 38(9):1192-6.

Sreedevi P, Varghese N, Varugheese JM. Prognosis of periapical surgery using bonegrafts: A clinical study. *J Conserv Dent*. 2011 Jan; 14(1):68-72.

Taschieri S, Corbella S, Tsesis I, et al. Effect of guided tissue regeneration on the outcome of surgical endodontic treatment of through-and-through lesions: a retrospective study at 4-year follow-up. Oral Maxillofac Surg. 2011 Sep; 15(3):153-9.

Taschieri S, Del Fabbro M, Testori T, Weinstein R. Efficacy of xenogeneic bone grafting with guided tissue regeneration in the management of bone defects after surgical endodontics. J Oral Maxillofac Surg. 2007 Jun; 65(6):1121-7.

Zafiroopoulos GG, Hoffmann O, Kasaj A, Willershausen B, Deli G, Tatakis DN. Mandibular molar root resection versus implant therapy: a retrospective nonrandomized study. J Oral Implantol. 2009; 35(2):52-62.

Policy History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.

Surgical Extraction of Impacted Teeth

Policy Number: DCP006.11
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
277. Coverage Rationale	250
278. Definitions	251
279. Applicable Codes	251
280. Description of Services	251
281. Clinical Evidence	252
282. U.S. Food and Drug Administration	254
283. References	254
284. Policy History/Revision Information	255
285. Instructions for Use	255

Related Dental Policies

- Non-Surgical Extractions
- Surgical Extraction of Erupted Teeth and Retained Roots

Coverage Rationale

Surgical Extraction of Soft Tissue, Partially Bony, and Complete Bony Impacted Teeth

Surgical extraction of Soft Tissue, Partially Bony, and Complete Bony Impacted Teeth is indicated for the following:

- The facilitation of orthodontic treatment
- For a tooth/teeth in the line of a jaw fracture or complicating fracture management
- As part of comprehensive treatment in orthognathic surgery
- Moderate to severe or acute pain, or recurrent episodes that do not respond to conservative treatment (i.e., pain medication or antibiotics)
- Non restorable caries
- Management of, or limiting the progression of periodontal disease
- In the case of acute/chronic infection (abscess, cellulitis, pericoronitis)
- Pulpal exposure
- Non restorable pulpal or periapical lesion
- Internal/External resorption
- As a prophylactic procedure for an underlying medical or surgical condition (e.g., organ transplants, alloplastic implants, chemotherapy, radiation therapy prior to intravenous bisphosphonate therapy)
- Tumor resection
- Ectopic position
- For purposes of prosthetic rehabilitation (partial dentures and complete dentures)
- When the third molar is causing or at risk of causing pathology to the adjacent second molar

Surgical extraction of Soft Tissue, Partially Bony, and Complete Bony Impacted Teeth is not indicated for the following:

- For prophylactic reasons other than an underlying medical condition
- For pain or discomfort related to normal tooth eruption

Coronectomy

Coronectomy is indicated for the following:

- When clinical criteria for extraction of Impacted Teeth is met; and
- If the removal of the complete tooth would result in damage to the neurovascular bundle

Coronectomy is not indicated for teeth with the following conditions:

- Mobility
- Root surface decay
- Periapical pathology
- Horizontal impactions in direct contact with nerves

Definitions

Completely Bony Impaction: Most or all of a tooth crown is covered by bone; requires mucoperiosteal flap, elevation, and bone removal. (ADA)

Completely Bony Impaction with Unusual Surgical Complications: Most or all of a crown covered by bone; usually difficult or complicated due to factors such as nerve dissection required, separate closure of maxillary sinus required, or aberrant tooth position. (ADA)

Coronectomy: Intentional partial tooth removal performed when a neurovascular complication is likely if the entire Impacted Tooth is removed. (ADA)

Impacted Tooth: An unerupted or partially erupted tooth that is positioned against another tooth, bone, or soft tissue so that complete eruption is unlikely. (ADA)

Partially Bony Impaction: Part of tooth crown covered by bone; requires mucoperiosteal flap elevation and bone removal. (ADA)

Soft Tissue Impaction: Occlusal surface of tooth covered by soft tissue; requires mucoperiosteal flap elevation. (ADA)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D7220	Removal of impacted tooth – soft tissue
D7230	Removal of impacted tooth – partially bony
D7240	Removal of impacted tooth – complete bony
D7241	Removal of impacted tooth – complete bony, with unusual surgical complications
D7251	Coronectomy - intentional partial tooth removal, impacted teeth only
D7259	Nerve dissection
D7922	Placement of intra-socket biological dressing to aid in hemostasis or clot stabilization, per site

CDT® is a registered trademark of the American Dental Association

Description of Services

Surgical extraction of Impacted Teeth is required when the tooth is not erupted in the oral cavity and is covered by soft tissue and/or bone, and the procedure requires the cutting of these tissues. The most commonly affected teeth are third molars and maxillary canines, but impaction can occur with any teeth.

The placement of intra-socket biological dressings following an extraction include products made of gelatin, collagen, and cellulose for soft tissue bleeding, and bone wax for cancellous bone bleeding. These products may be needed to aid in hemostasis or clot stabilization and are typically considered inclusive to the primary extraction procedure.

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

Yang et al., (2023) conducted a cross sectional analysis to assess the occurrence of distal pathologies of adjacent second molars in the presence of asymptomatic third molars. Included were 248 patients and 805 quadrants that were examined clinically and radiographically. The results showed that irrespective of impaction status, the presence of asymptomatic third molars increased the odds of the presence of caries and periodontal disease even after controlling for confounding factors such as age and overall periodontal status. Non impacted third molars in the mandible were more than twice as likely to contribute to periodontal probing depths greater than 4 mm on the distal of the adjacent second molar than the maxillary. The authors concluded that this study provides evidence for more proactive intervention regarding asymptomatic third molars and prophylactic removal to decrease the risk of second molar pathologies.

In a 2020 updated Cochrane Database systematic review, Ghaemina et al. evaluated the effects of removal versus retention of asymptomatic, disease free third molars in adolescents and adults. This updated includes the same two studies reviewed in 2016, one RCT and one prospective cohort study. No studies reported the effects of removal vs retention on health related QOL. Very low certainty evidence suggests that the presence of asymptomatic disease-free impacted wisdom teeth may be associated with increased risk of periodontitis affecting the adjacent second molar in the long term. There is insufficient evidence to show difference in caries risk, or if removal or retention has a significant impact on dimensional changes of the dental arch in patients that previously underwent orthodontic treatment. Neither study reported on other outcomes including adverse effects of retaining third molars such as infection, root resorption or cyst or tumor formation. The authors concluded that there is insufficient evidence to determine if asymptomatic, disease free third molars should be removed or retained, and decisions should be made on an individual patient basis using shared decision making principles. Furthermore, if asymptomatic third molars are retained, clinical assessment at regular intervals is advised (Ghaemina et al., 2016 was previously cited in this policy).

Toedting et al. (2019) conducted a systematic review and meta-analysis of epidemiological studies to assess the prevalence of distal surface caries (DSC) in second molars that are adjacent to impacted third molars. The meta-analysis included 3 studies and showed that the prevalence of DSC among third molars that were inclined mesially and horizontally were significantly higher than those that were inclined distally or vertically. The meta-analysis showed that about 1 in 4 are affected by DSC, with most significant associations being between mesially and horizontally impacted third molars.

Smailienė et al. (2019) conducted a retrospective study using cone beam computerized tomography (CBCT) to assess the relationship between external root resorption (ERR) on the distal aspect of second molars' roots and positional parameters of impacted third molars (ITM). Cone beam computed tomography scans of 109 patients (41 males, 68 females; mean age 26.4 ±7.9 years) with 254 ITM (131 in the maxilla and 123 in the mandible) were retrospectively analyzed. Positional parameters of ITM (mesio-distal position, angulation, impaction depth, and available eruption space) were evaluated. The presence, location, and depth of ERR of adjacent second molars were assessed. Analysis showed a relationship between ITM impaction depth, mesial inclination angle, and the presence of ERR. Mesial inclination angle of more than 13.6° increased the odds of ERR occurrence by 5.439 (95% CI, 2.97-9.98). ITM presence at the level of ½ of roots of the adjacent second molar or more apically increased the odds of ERR occurrence by 2.218 (95% CI, 1.215-4.048). No significant correlation was detected between the occurrence of ERR and patient age, gender, or the available eruption space in the mandible. Depth of ERR did not depend on its location. The author's concluded that the incidence of ERR in second molars is significantly associated with mesial inclination and a deep position of ITM.

Monaco et al. (2019) conducted a prospective cohort study of early (up to 1 month) and late (from 2 to 60 months) postoperative complications following coronectomy to reduce the risk of neurologic damage to the inferior alveolar nerve (IAN). 116 coronectomies in 94 healthy patients (37 men and 57 women; mean age, 28.99 ±8.9 years) were completed, and at 5 years' follow-up, re-evaluated 63 patients with 76 coronectomies. In total, 30 complications were verified. No cases of neurologic lesions to the IAN or lingual nerve were observed after surgery. In the first 3 years, the surgeons extracted migrated roots in 5 cases (6%) without any neurologic lesions to the IAN. No complications were observed from the third to fifth year. The author's concluded no cases of neurologic lesions, no cases of late infection of the retained roots at 5 years, and a low rate of immediate postoperative complications. Further investigations should include a follow-up study at 10 years and more research about the mechanism of pulp healing.

Mukherjee et al (2016) Iatrogenic damage to Inferior Alveolar Nerve (IAN) is a significant risk factor following prophylactic or therapeutic removal of impacted mandibular third molar. The risk to IAN injury increases many fold, when the third molar root overlaps the nerve canal as identified by the radiographic imaging. The aim of this study was to evaluate the fate of the root (resorbed, exfoliated, and covered by bone) after coronectomy or intentional root retention of impacted mandibular 3(rd.) molars in patients with high risk for inferior alveolar nerve damage as evaluated by the intra oral periapical radiograph. Twenty impacted mandibular third molar teeth, in 18 patients with high risk of injury to IAN based on

Rood's Criteria in an intra-oral periapical radiographic examination, between the age group of 18 to 40 years, were included in the study. Preoperatively the impacted third molars were evaluated clinically as well as radiographically. Pederson Difficulty Index and Winter's Classification of impacted tooth was recorded. Coronectomy was done at the cemento enamel junction leaving the roots 2-3mm below the alveolar crest and primary closure was done. Patients were evaluated periodically for two years at six months interval. Post-operative pain, swelling, IAN injury or any other complications were observed and recorded. The results showed none of the patients had IAN injury, required a second surgery to remove roots, or developed a post-operative infection. However, two patients had failed coronectomy (10%) due to mobilization of roots intra operatively and the roots were removed. One patient developed profuse bleeding intra-operatively in the failed coronectomy case. One patient had temporary lingual nerve paresthesia. The authors concluded that a coronectomy procedure is effective in controlling inferior alveolar nerve injury following third molar surgery, in radiographically evaluated high risk cases and it has very low incidence of complications.

Long et al. (2015) conducted a systemic review, to compare the outcomes between coronectomy and total removal for third molar extractions with high risk of nerve injury. PubMed, Embase, Web of Science, CENTRAL, and SIGLE database searches were conducted from January 1990 to October 2011, and included review of randomized or non-randomized controlled trials. Four studies met the inclusion criteria. A relatively high rate of failed coronectomy in one study (38.3%, compared with 2.3%-9.4% in others) may be attributed to a higher proportion of narrowing roots and vertical impactions. Although root migration rate was high (13.2%-85.29%), the migration distances were short (3.06 ± 1.67 mm), and the directions were away from the nerves. Moreover, the rates of re-operation and root exposure were low. It was concluded that coronectomy is superior to total removal for reducing inferior alveolar nerve damage and could be used in clinical practice for third molar extractions with high risk of nerve injury.

Martin et al. (2015) conducted in systematic review that examined the clinical outcomes after coronectomy. PubMed, SCOPUS, and the Cochrane Library publications were reviewed through January 31, 2014 and this included randomized clinical trials, controlled clinical trials, prospective cohort studies or retrospective studies. Ten articles qualified for the final analysis. The successful coronectomy varied from a minimum of 61.7% to a maximum of 100%. Several variables were evaluated, including inferior alveolar nerve (IAN) injury, lingual nerve (LN) injury, and postoperative adverse effects, pulp disease, and root migration. Coronectomy was associated with a low incidence of complications in terms of the variables evaluated, with the exception of migration of the retained roots which ranged from 2%-85.3%. It was concluded that coronectomy appears to be a safe procedure, with a reduced incidence of postoperative complications, and a coronectomy can be indicated for teeth that are very close to the inferior alveolar nerve. If a second operation is needed for the remnant roots, they can be removed with a low risk of paresthesia, because the roots have likely migrated away from the mandibular nerve.

Agbaje, JO et al.(2015) conducted a study to assess the surgical management of impacted third molar with proximity to the inferior alveolar nerve and complications associated with coronectomy in a series of patients undergoing third molar surgery. The position of the mandibular canal in relation to the mandibular third molar region (and mandibular foramen in the front part of the mandible) was identified on panoramic radiographs of patients scheduled for third molar extraction. Close proximity to the inferior alveolar nerve (IAN) was observed in 64 patients with an impacted mandibular third molar. Coronectomy was performed in these patients. Coronectomy did not increase the incidence of damage to the inferior alveolar nerve and would be safer than complete extraction in situations in which the root of the mandibular third molar overlaps or is in close proximity to the mandibular canal. The most common complication was tooth migration away from the mandibular canal ($n = 14$), followed by root exposure ($n = 5$). The results of this study indicate that coronectomy can be considered a reasonable and safe treatment alternative for patients who demonstrate elevated risk for injury to the inferior alveolar nerve with removal of the third molars.

Stathopoulos et al. (2011) conducted a retrospective analysis over an 11 year period from 1990-2001 assessing the type and frequency of cysts and tumors associated with impacted third molars (ITM). 7,782 ITMs were identified in 6,182 patients with the main reason for surgical removal being signs and symptoms of infection due to pericoronitis. The ages of the patients ranged from 12 to 92 years, with a mean of 32.7 years. The ratio of maxillary to mandibular molars was 1:2.9. Of the 7,782 ITM specimens examined, 417 met inclusion criteria with a pericoronal space of greater than 3 mm on the panoramic radiograph and were submitted for histopathologic examination. Of the 417 specimens submitted for examination, 167 cysts (40.04%) of which the majority were dentigerous or odontogenic keratocysts, 48 benign tumors (11.5%) that included ameloblastoma, odontoma, odontogenic myxoma, odontogenic fibroma, as well as 202 normal dental follicles (48.44%) were found. This retrospective analysis concluded that the incidence of cyst and tumor development around ITMs is low (2.77%) and suggests that, as far as the prevention of cyst and tumor development around ITMs is concerned, surgical removal is not sufficiently justified.

Clinical Practice Guidelines

American Association of Oral and Maxillofacial Surgeons (AAOMS)

In the 2016 white paper on the management of third molar teeth, AAOMS states the following:

“In the absence of evidence regarding current associated symptoms or disease to support surgical management, the surgeon should review the likelihood of pathology developing in the future, functionality, risks of removal, risks of retention, and protocol for active surveillance. Removal should be favored when the third molar is currently or likely to be non-functional, there is an overlying removable prosthesis, orthodontic removal is justified (such as when the tooth is preventing the eruption of the second molar) and in the case of planned orthognathic surgery. Patients should also be informed of the greater difficulty and increased rate of complications associated with third molar removal as they age. When appropriate, patients should be advised that if they retain their disease-free wisdom teeth, it is possible they could live their entire lives without problems.”

In a 2017 clinical paper on the management of impacted third molars, AAOMS states the following:

- All impacted third molar teeth are potentially pathologic and prudent care requires removal, exposure, repositioning, or long term monitoring in selected cases.
- Indications for treatment include, but are not limited to:
 - Pain.
 - To facilitate the management or limit progression of periodontal disease.
 - Ectopic position.
 - To facilitate prosthetic rehabilitation.
 - To facilitate orthodontic tooth movement and promote dental stability.
 - Tooth interfering with orthognathic and/or reconstructive surgery.
 - Fractured tooth.
 - Nonrestorable caries.
 - Internal or external resorption of tooth or adjacent teeth.
 - Tooth involved in tumor resection.
 - Prophylactic removal in patients with certain medical or surgical conditions or treatments (e.g., organ transplants, alloplastic implants, chemotherapy, radiation therapy).
 - Patient’s informed refusal of nonsurgical treatment options.
 - Nontreatable pulpal lesion.
 - Acute or chronic infection (e.g., cellulitis, abscess).
 - Abnormalities of tooth size or shape.
 - The presence of periodontal disease.
 - The presence of periapical pathology.
 - Elective therapeutic removal.
 - Tooth in the line of a jaw fracture complicating fracture management.
 - Pathology associated with tooth follicle (e.g., cysts, tumors).

AAOMS makes the following additional statements:

- Contraindications to the removal of impacted teeth include the medically compromised, extremes of age and the probability of damage to adjacent structures.
- The decision to maintain an impacted tooth should be based on valid evidence and expectations. In these cases, long-term clinical and radiographic observation is necessary, and the patient must be informed of the risks and benefits of surgical intervention versus maintenance of the tooth and long-term observation.

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

The FDA considers hemostatic agents to be Class III medical devices. Refer to the following website for more information regarding products. Search by device name or using product code LMF:

<https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMA/pma.cfm>. (Accessed September 1, 2022)

References

Agbaje J.O.; Heijsters G.; et al. Coronectomy of Deeply Impacted Lower Third Molar: Incidence of Outcomes and Complications after One Year Follow-Up. J Oral Maxillofac Res 2015.

American Association of Oral and Maxillofacial Surgeons (AAOMS) Clinical Paper. The Management of Impacted Third Molar Teeth, 2017.

American Association of Oral and Maxillofacial Surgeons (AAOMS) White Paper on the Management of Third Molar Teeth, 2016.

American Dental Association (ADA). Glossary of Clinical and Administrative Terms.

Dental Management of the Organ or Stem Cell Transplant Patient, National Institute of Dental and Craniofacial Research, Treatment Recommendations.

National Institute of Dental and Craniofacial Research. Dental Providers Pocket Oncology Guide.

Ghaemina H, Perry J, Nienhuijs ME, et al. Surgical removal versus retention for the management of asymptomatic disease-free impacted wisdom teeth. Cochrane Database Syst Rev. 2016 Aug 31.

Ghaemina H, Nienhuijs ME, Toedtling V, et al. Surgical removal versus retention for the management of asymptomatic disease-free impacted wisdom teeth. Cochrane Database Syst Rev. 2020 May 4;5(5):CD003879.

Gregg, J and Giglio, J. Oral and Maxillofacial Surgery, 3rd edition. St. Louis: Elsevier c2018. Chapter 25, Trigeminal Nerve Injuries; p. 381.

Long H., Zhou .Y, Liao L., et al. Coronectomy vs. total removal for third molar extraction: a systematic review. J Dent Res. 2012 Jul; 91(7):659-65.

Martin A., Perinetti G., Costantinides F., et al. Coronectomy as a surgical approach to impacted mandibular third molars: a systematic review. Head Face Med. 2015 Apr 10; 11:9.

Monaco G, D'Ambrosio M, De Santis G,. Coronectomy: A Surgical Option for Impacted Third Molars in Close Proximity to the Inferior Alveolar Nerve-A 5-Year Follow-Up Study. J Oral Maxillofac Surg.2019 Jun;77(6):1116-1124.

Mukherjee S, Vikraman B, Sankar D, et al. Evaluation of Outcome Following Coronectomy for the Management of Mandibular Third Molars in Close Proximity to Inferior Alveolar Nerve. J Clin Diagn Res. 2016 Aug;10(8):ZC57-62.

Pogrel M.A. Current Therapy in Oral and Maxillofacial Surgery. St. Louis: Elsevier Saunders c2012. Chapter 15, Removal of Third Molars; p. 130.

Smailienė D, Trakinienė G, Beinorienė A, et al. Relationship between the Position of Impacted Third Molars and External Root Resorption of Adjacent Second Molars: A Retrospective CBCT Study. Medicina (Kaunas). 2019 Jun 24;55(6).

Stathopoulos P., Mezitis M., et al. Cysts and tumors associated with impacted third molars: is prophylactic removal justified? J Oral Maxillofac Surg. 2011 Feb; 69(2):405-8.

Toedtling V, Devlin H, Tickle M, et al. Prevalence of distal surface caries in the second molar among referrals for assessment of third molars: a systematic review and meta-analysis. Br J Oral Maxillofac Surg. 2019 Jul;57(6):505-514.

Yang Y, Tian Y, Sun LJ, et al. The impact of anatomic features of asymptomatic third molars on the pathologies of adjacent second molars: a cross-sectional analysis. Int Dent J. 2023 Jun;73(3):417-422.

Policy History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.

Surgical Periodontics: Mucogingival Procedures

Policy Number: DCG015.12
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
286. Coverage Rationale	256
287. Definitions	257
288. Applicable Codes	257
289. Description of Services	258
290. Clinical Evidence	258
291. References	259
292. Policy History/Revision Information	259
293. Instructions for Use	259

Related Dental Policies

- Biologic Materials for Soft and Hard Tissue Regeneration
- Coronal Splinting
- Dental Barrier Membrane Guided Tissue Regeneration
- Dental Implant Placement and Treatment of Peri-Implant Defects/Disease
- Surgical Periodontics: Resective Procedures
- Oral Surgery: Alveoloplasty and Vestibuloplasty

Coverage Rationale

Tissue Graft Procedures

Pedicle soft tissue [Graft](#), Autogenous connective tissue Graft, non-Autogenous connective tissue Graft, and combined connective tissue and double pedicle Graft procedures are indicated for the following:

- Areas with less than 2 mm of attached gingiva
- Unresolved sensitivity in areas of Recession
- Progressive Recession or chronic inflammation
- Teeth with subgingival restorations where there is little or no attached gingiva to improve plaque control
- Ridge augmentation
- To increase vestibular depth for the correct fit of prosthesis
- To widen zone of attached gingiva for prosthetic abutment teeth
- To increase vestibular depth to allow proper oral hygiene techniques
- Gingival clefing

Pedicle soft tissue Graft, Autogenous connective tissue Graft, non-Autogenous connective tissue Graft, and combined connective tissue and double pedicle Graft procedures are not indicated for the following:

- Roots covered with thin bony plates
- Individuals with an untreated medical condition
- Autogenous connective tissue Graft is not indicated when there is a broad, shallow palatal donor site, or excessively glandular or fatty submucosal tissue in donor site

Free soft tissue Graft procedure (including donor site surgery) is indicated for the following:

- Unresolved sensitivity in areas of Recession
- Progressive Recession or chronic inflammation
- Teeth with subgingival restorations where there is little or no attached gingiva to improve plaque control
- To increase vestibular depth for the correct fit of prosthesis
- To widen zone of attached gingiva for prosthetic abutment teeth
- To increase vestibular depth to allow proper oral hygiene techniques
- Gingival clefing
- Areas with less than 2 mm of attached gingiva
- Ridge augmentation

Free soft tissue Graft procedure is not indicated for the following:

- Broad, shallow palatal donor site
- Excessively glandular or fatty submucosal tissue in donor site
- A donor site with roots covered with thin bony plates
- Individuals with an untreated medical condition

Surgical Revision Procedure (per Tooth)

A surgical revision procedure may be indicated to correct an abnormal healing response that interferes with the therapeutic goals of the original surgical procedure.

Surgical procedures are not indicated when the following are present:

- Unmanaged medical conditions
- Medications that may negatively impact healing response (e.g., corticosteroids, biphosphonates)

Definitions

Autogenous Graft: Taken from one part of a patient's body and transferred to another (AAP).

Graft: Defined by any of the following (AAP 2007):

- Any tissue or organ used for implantation or transplantation
- A piece of living tissue placed in contact with injured tissue to repair a defect or supply deficiency
- To induce union between normally separate tissues

Quadrant: One of the four equal sections into which the dental arches can be divided; begins at the midline of the arch and extends distally to the last tooth (ADA).

Recession: The migration of the marginal soft tissue to a point apical to the cemento-enamel junction of a tooth or the platform of a dental implant (AAP). Miller's Classification of Gingival Recession (Takei 2015):

- Class I: Marginal tissue Recession does not extend to the mucogingival junction. There is no loss of bone or soft tissue in the interdental area. This type of Recession can be narrow or wide.
- Class II: Marginal tissue Recession extends to or beyond the mucogingival junction. There is no loss of bone or soft tissue in the interdental area. This type of Recession can be subclassified into wide and narrow.
- Class III: Marginal tissue Recession extends to or beyond the mucogingival junction. There is bone and soft tissue loss interdentally or malpositioning of the tooth.
- Class IV: Marginal tissue Recession extends to or beyond the mucogingival junction. There is severe bone and soft tissue loss interdentally or severe tooth malposition.

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D4268	Surgical revision procedure, per tooth
D4270	Pedicle soft tissue graft procedure
D4273	Autogenous connective tissue graft, per tooth
D4275	Non-autogenous connective tissue graft (including recipient site and donor material) first tooth, implant, or edentulous tooth position in graft
D4276	Combined connective tissue and pedicle graft, per tooth
D4277	Free soft tissue graft procedure (including donor site surgery), first tooth or edentulous tooth position in graft

CDT Code	Description
D4278	Free soft tissue graft procedure (including donor site surgery), each additional contiguous tooth or edentulous tooth position in same graft site
D4283	Autogenous connective tissue graft, each additional contiguous tooth
D4285	Non-autogenous connective tissue graft procedure (including recipient surgical site and donor material) - each additional contiguous tooth, implant or edentulous tooth position in same graft site
D4999	Unspecified periodontal procedure, by report

CDT® is a registered trademark of the American Dental Association

Description of Services

Mucogingival conditions are deviations from the normal anatomic relationship between the gingival margin and the mucogingival junction (MGJ). Surgical grafting procedures for mucogingival conditions are the gold standard to correct localized gingival defects and provide a functionally adequate zone of attached gingiva. Success of these procedures is highly dependent on individual patient considerations such as level of oral hygiene, smoking, and overall health status. The development of various regenerative technologies in medicine and dentistry is rapidly advancing and the technologies outlined in this policy are not all inclusive. For information on guided tissue regeneration with barrier membranes, refer to the Dental Clinical Policy titled [Dental Barrier Membrane Guided Tissue Regeneration](#).

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

Clinical Evidence

In a 2018 Cochrane systematic review, Chambrone et al. sought to evaluate the efficacy of different root coverage procedures in the treatment of single and multiple recession-type defects. They included randomized controlled trials (RCTs) only of at least 6 months' duration evaluating recession areas (Miller's Class I or II ≥ 3 mm) and treated by means of root coverage periodontal plastic surgery (RCPPS) procedures. There were 48 RCTs in the review. Of these, the authors assessed one as at low risk of bias, 12 as at high risk of bias and 35 as at unclear risk of bias. The results indicated a greater reduction in gingival recession for subepithelial connective tissue grafts (SCTG) + coronally advanced flap (CAF) compared to guided tissue regeneration with resorbable membranes (GTR rm) + CAF. The authors concluded that the available evidence base indicates that in cases where both root coverage and gain in the width of keratinized tissue are expected, the use of subepithelial connective tissue grafts shows a slight improvement in outcome.

Zucchelli et al (2014) conducted a comparative short- and long-term controlled randomized clinical trial to compare short- and long-term root coverage and aesthetic outcomes of the coronally advanced flap (CAF) alone or in combination with a connective tissue graft (CTG) for the treatment of multiple gingival recessions. Fifty patients with multiple adjacent gingival recessions (≥ 2 mm) in the maxillary arch were enrolled. Twenty-five patients were randomly assigned to the control group (CAF), and the other 25 patients to the test group (CAF + CTG). Clinical outcomes were evaluated at 6 months, 1 and 5 years. The aesthetic evaluations were made 1 and 5 years after the surgery. No statistically significant difference was demonstrated between the two groups in terms of recession reduction and complete root coverage (CRC) at 6 months and 1 year. At 5 years, statistically greater recession reduction and probability of CRC, greater increase in buccal keratinized tissue height (KTH) and better contour evaluation made by an independent periodontist were observed in the CAF + CTG group. The authors concluded that despite no significant differences at 6 month and 1-year evaluations, CAF + CTG provided better CRC after 5 years than CAF alone.

Kuis et al. (2013) conducted a 5-year, split mouth-design randomized clinical trial, to evaluate the effectiveness of coronally advanced flap (CAF) alone versus CAF with connective tissue graft (CAF + CTG) in the treatment of single Miller Class I and II GR defects. Thirty-seven patients with 114 bilateral, single Miller Class I and II GR defects were treated with CAF on one side of the mouth and CAF + CTG on the other side. Clinical measurements (GR length [REC], keratinized tissue width [KT], complete root coverage [CRC], and percentage of root coverage [PRC]) were evaluated before surgery and after 6, 12, 24, and 60 months. There was a significant reduction of REC and increase of KT after surgery in both groups. CAF + CTG showed significantly better results for all evaluated clinical parameters in all observed follow-up periods. The authors concluded that both surgical procedures were effective in the treatment of single Miller Class I and II GR defects. The CAF + CTG procedure provided better long-term outcomes (60 months postoperatively) than CAF alone. Long-term stability of the gingival margin is less predictable for Miller Class II GR defects compared to those of Class I.

References

American Academy of Periodontology Glossary of Periodontal Terms, 2001.

American Academy of Periodontology Parameters of Care Supplement. Parameter on Mucogingival Conditions. 2000.

American Dental Association CDT Codebook 2024.

Atieh MA, Alsabeeha N, Tawse-Smith A, et al. Xenogeneic collagen matrix for periodontal plastic surgery procedures: a systematic review and meta-analysis. *J Periodontol Res.* 2016 Aug; 51(4):438-52.

Chambrone L, Salinas Ortega MA, Sukekava F, et al. Root coverage procedures for treating localized and multiple recession-type defects. *Cochrane Database Syst Rev.* 2018 Oct 2.

Cohen, Edward S, DMD. *Atlas of Cosmetic and Reconstructive Periodontal Surgery*, 3rd ed. Shelton, CT: Peoples Medical Publishing House c2007. Chapter 6, Advanced Periodontal Procedures; p. 288.

Klokkevold P, Mealy B, Otomo-Corgel J. *Carranza's Clinical Periodontology and Implantology*. 14th ed. St.Louis: Elsevier c2023. Chapter 67, Periodontal Treatment of Medically Compromised Patients; p.784-805.

Kuis D, Sciran I, Lajnert V, et al. Coronally advanced flap alone or with connective tissue graft in the treatment of single gingival recession defects: a long-term randomized clinical trial. *JPeriodontol.* 2013 Nov; 84(11):1576-85.

Reddy, Shantipriya, BDS MDS. *Essentials of Clinical Periodontology and Periodontics*, 2nd ed. Maryland Heights, MD: Jaypee Brothers Medical Publishers c2008. Chapter 43, Mucogingival Surgery; p. 360.

Takei H, Scheyer E, Azzi R et al. *Newman and Carranza's Clinical Periodontology and Implantology*, 14th ed. St. Louis: Elsevier c2023. Chapter 65, Periodontal Plastic and Esthetic Surgery; p. 775-779.

Zucchelli G, Mounssif I, Mazzotti C, et al. Coronally advanced flap with and without connective tissue graft for the treatment of multiple gingival recessions: a comparative short- and long-term controlled randomized clinical trial. *J Clin Periodontol.* 2014 Apr;41(4):396-403.

Policy History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.

Surgical Periodontics: Resective Procedures

Policy Number: DCP013.13
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
294. Coverage Rationale	260
295. Definitions	261
296. Applicable Codes	262
297. Description of Services	263
298. Clinical Evidence	263
299. References	264
300. Policy History/Revision Information	265
301. Instructions for Use	265

Related Dental Policies
<ul style="list-style-type: none"> • Coronal Splinting • Surgical Periodontics: Mucogingival Procedures

Coverage Rationale

Gingivectomy/Gingivoplasty

Gingivectomy/Gingivoplasty is indicated for the following:

- Elimination of suprabony pockets, exceeding 3mm, if the pocket wall is fibrous and firm and there is an adequate zone of keratinized tissue
- Elimination of gingival enlargements/overgrowth
- Elimination of suprabony periodontal abscesses
- Exposure of soft tissue impacted teeth to aid in eruption
- To reestablish gingival contour following an episode of acute necrotizing ulcerative gingivitis
- To allow restorative access, including root surface caries

Gingivectomy/Gingivoplasty is not indicated for the following:

- When bone surgery is required for infrabony defects, or for the purpose of examining bone shape and morphology
- Situations in which the bottom of the pocket is apical to the mucogingival junction
- In areas with a shallow palatal vault or prominent external oblique ridge

Anatomical Crown Exposure

Anatomical Crown exposure is indicated in a periodontally healthy area for the following:

- To facilitate the restoration of subgingival caries
- To allow proper contour of restoration
- To allow management of a subgingivally fractured tooth

Flap Procedures

Gingival Flap and apically positioned flap procedures are indicated for the following:

- The presence of moderate to deep probing depths
- Moderate/severe gingival enlargement or extensive areas of overgrowth
- Loss of attachment
- The need for increased access to root surface and/or alveolar bone when previous non-surgical attempts have been unsuccessful
- The diagnosis of a cracked tooth, fractured root, or external root resorption when this cannot be accomplished by non-invasive methods
- To preserve keratinized tissue in conjunction with Osseous Surgery

Clinical Crown Lengthening – Hard Tissue

Clinical crown lengthening – hard tissue is indicated for the following:

- In an otherwise periodontally healthy area to allow a restorative procedure on a tooth with little to no crown exposure
- To allow preservation of the biological width for restorative procedures

Osseous Surgery

Osseous Surgery is indicated for the following:

- Patients with a diagnosis of Stage III or Stage IV periodontal disease
- When less invasive therapy (i.e., non-surgical periodontal therapy, Flap procedures) has failed to eliminate disease

Osseous Surgery is not indicated for teeth with a hopeless prognosis.

Mesial/Distal Wedge

A mesial/distal wedge procedure is indicated for the following:

- The presence of moderate to deep probing depths (greater than 5mm) on a surface adjacent to an edentulous/terminal tooth area
- The need for increased access to root surface and/or alveolar bone when previous non-surgical attempts have been unsuccessful on a surface adjacent to an edentulous/terminal tooth area
- The diagnosis of a cracked tooth, fractured root, or external root resorption on a surface adjacent to an edentulous/terminal tooth area, when this cannot be accomplished by non-invasive methods

Resective Periodontal Surgical Procedures

Resective periodontal surgical procedures are not indicated for the following:

- Individuals who have been non-compliant with non-surgical periodontal therapies
- For teeth with a hopeless prognosis
- The presence of unmanaged medical conditions
- Individuals taking medications that may negatively impact healing response (e.g., corticosteroids, bisphosphonates)

Definitions

Anatomical Crown: That portion of tooth normally covered by, and including, enamel. (ADA)

Gingivectomy: The excision or removal of gingiva. (ADA)

Gingivoplasty: Surgical procedure to reshape gingiva. (ADA)

McGuire Classification of Tooth Prognosis (Levi 2016):

- Good: Teeth with adequate periodontal support where the etiologic factors can be controlled, including systemic factors
- Fair: No more than 25% attachment loss with Grade 1 furcation invasion which can be maintained. Plaque control and systemic factors can be maintained
- Poor: As much as 50% bone loss with Grade II furcation invasions, poor crown: root ratio; Mobility greater than Miller Class I; systemic factors; poor patient participation in treatment
- Questionable: Teeth with greater than 50% attachment loss; Grade II or III furcation involvements; the tooth is not easily maintained either with professional hygiene or by the patient
- Hopeless: Inadequate attachment to support the tooth; Class III or IV furcation involvement; Miller Class III Mobility; the tooth cannot be maintained with adequate plaque control by the clinician or by the patient.

Mobility: The movement of a tooth in its socket resulting from an applied force. (AAP) Miller Index of Tooth Mobility (Harpenau 2013):

- Class 0: Normal physiologic tooth movement.
- Class I: First distinguishable signs of movement beyond normal.
- Class II: Tooth movement up to 1mm in any direction.
- Class III: Tooth can be moved more than 1mm in any direction and/or the tooth can be depressed into the socket.

Osseous Surgery: Procedures to modify bone support altered by periodontal disease, either by reshaping the alveolar process to achieve physiologic form without the removal of alveolar supporting, or by the removal of some alveolar bone, thus changing the position of the crestal bone relative to the tooth root. (See: Ostectomy; Osteoplasty) (AAP)

Periodontal Flap: A section of the gingiva and/or the mucosa surgically separated from the underlying tissues to provide visibility and access to the bone and root surface. (Essentials of Clinical Periodontology & Periodontics)

Quadrant: One of the four equal sections into which the dental arches can be divided; begins at the midline of the arch and extends distally to the last tooth. (ADA)

Staging Periodontitis (AAP):

Stage I

- 1-2mm clinical attachment loss (CAL)
- Radiographic bone loss (RBL) of < 15%
- No tooth loss
- Complexity
- Maximum probing depth ≤ 4mm
- Mostly horizontal bone loss

Stage II

- 3-4mm interdental CAL
- RBL of 15-33%
- No tooth loss
- Complexity
- Maximum probing depth ≤ 5mm
- Mostly horizontal bone loss

Stage III

- ≥ 5mm CAL
- RBL extends to middle third of root and beyond
- Loss of ≤ 4 teeth
- Complexity includes all of criteria for Stage II as well as:
- Probing depths ≥ 6mm
- Vertical bone loss ≥ 3mm
- Class II or III furcation involvement
- Moderate ridge defects

Stage IV

- ≥ 5mm CAL
- RBL extends to middle third of root and beyond
- Loss of ≥ 5 teeth
- Complexity includes all of criteria for Stage III as well as:
- The need for complex rehabilitation due to:
 - Masticatory dysfunction
 - Secondary occlusal trauma (tooth mobility ≥ 2)
 - Severe ridge defects
 - Bite collapse, drifting and/or flaring
 - < 20 remaining teeth (10 opposing pairs)

The extent and distribution for each stage is described as:

- Localized (< 30% of teeth involved)
- Generalized; or
- Molar/incisor pattern

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D4210	Gingivectomy or gingivoplasty – four or more contiguous teeth or tooth bounded spaces per quadrant
D4211	Gingivectomy or gingivoplasty – one to three contiguous teeth or tooth bounded spaces per quadrant
D4212	Gingivectomy or gingivoplasty to allow access for restorative procedure, per tooth
D4230	Anatomical crown exposure – four or more contiguous teeth or bounded tooth spaces per quadrant
D4231	Anatomical crown exposure one to three teeth or bounded tooth spaces per quadrant
D4240	Gingival flap procedure, including root planing – four or more contiguous teeth or tooth bounded spaces per quadrant
D4241	Gingival flap procedure, including root planing – one to three contiguous teeth or tooth bounded spaces per quadrant
D4245	Apically positioned flap
D4249	Clinical crown lengthening – hard tissue
D4260	Osseous surgery (including flap entry and closure) – four or more contiguous teeth or tooth bounded spaces per quadrant
D4261	Osseous surgery (including flap entry and closure) – one to three contiguous teeth or tooth bounded spaces per quadrant
D4274	Mesial/distal wedge procedure, single tooth (when not performed in conjunction with surgical procedures in the same anatomical area)
D4999	Unspecified periodontal procedure, by report

CDT® is a registered trademark of the American Dental Association

Description of Services

Using non-surgical periodontal therapy, many individuals can be treated and maintained without the need for surgical intervention. However, surgical procedures may be required when periodontal health cannot be achieved or maintained non-surgically, and may be performed by electrosurgery, lasers or surgical scalpels. Resective periodontal surgery procedures are indicated to eliminate pockets and recontour osseous bone. They may also be indicated when there is a need to expose or lengthen the clinical crown for the completion of restorative procedures.

Pursuant to CA AB2585: While not common in dentistry, nonpharmacological pain management strategies should be encouraged if appropriate.

Clinical Evidence

Hayakawa et al. (2012) conducted a retrospective study with the aim of investigating the outcome of surgical periodontal therapy during the period of April 2010 through March 2012 at the General Dentistry, Tokyo Dental College Suidobashi Hospital. The main focus is to compare open flap debridement and regenerative treatment modalities. Following initial periodontal therapy, 17 clinicians performed a total of 138 periodontal surgeries in 80 patients with moderate to advanced periodontitis. Open Flap Debridement was the most commonly performed surgery (74%), followed by 29 regenerative procedures, 7 cases of periodontal plastic surgery, and no cases of guided tissue regeneration. Clinical parameters (probing depth, bleeding on probing and clinical attachment levels) were reduced following initial therapy for all cases, with surgical intervention reducing them further. There was a significant gain in clinical attachment level when regenerative therapy was performed on areas with an initial probing depth greater than 8 mm. The authors concluded that while initial non-surgical therapy improves clinical parameters, open flap debridement surgery results in significantly higher gain in clinical attachment level for probing depths over 6 mm, with periodontal regeneration surgery providing higher gain in areas with probing depths exceeding 8mm.

Heitz-Mayfield et al. (2002) conducted a systemic review of the evidence of effectiveness of surgical vs. non-surgical therapy for the treatment of chronic periodontal disease. Sources included the National Library of Medicine computerized bibliographic database MEDLINE, and the Cochrane Oral Health Group (COHG) Specialist Trials Register. The primary outcome measures evaluated were gain in clinical attachment level (CAL) and reduction in probing pocket depth (PPD). Meta-analysis evaluation of these studies indicated that 12 months following treatment, surgical therapy resulted in 0.6

mm more PPD reduction than non-surgical therapy in pockets 6 mm or greater. The authors concluded that both scaling and root planing alone and scaling and root planing combined with flap procedure are effective methods for the treatment of chronic periodontitis in terms of attachment level gain and reduction in gingival inflammation. In the treatment of pocket depths greater than 6 mm, open flap debridement results in greater PPD reduction and clinical attachment gain.

Levy et al. (2002) conducted an investigational study to examine the clinical and microbiologic effects of apically repositioned flap surgery. (This study was intended to extend the findings of a previous study that evaluated the effect of apically repositioned flap surgery on clinical parameters and the composition of the subgingival microbiota at 3 months posttherapy). Eighteen patients with chronic periodontitis received initial preparation (IP) including scaling and root planing followed 3 months later by apically repositioned flap surgery at sites with pocket depth greater than 4 mm. All subjects had at least 20 teeth and at least eight sites with pockets greater than 4 mm and eight sites with attachment loss greater than 3 mm. Subjects were monitored clinically and microbiologically at baseline, 3 months after IP, and at 3-, 6-, 9-, and 12-months post-surgery. Clinical assessments of plaque accumulation, gingival redness, suppuration, bleeding on probing, pocket depth, and attachment level were made at six sites per tooth and the presence and levels of 40 subgingival groups of organisms were determined using checkerboard DNA-DNA hybridization. Significant reductions were seen in mean pocket depth, bacterial colonization and percentage of sites exhibiting gingival redness and bleeding on probing in sites that received IP only and in sites receiving IP followed by surgery. Mean attachment level increased significantly for both sets of sites, but the increase was greater at the surgically treated sites. The study indicated that there were beneficial changes in most clinical parameters accompanied by clear reductions in the post pathogenic organisms associated with periodontal disease. One of the most important aspects of this study was the further improvement at sites that received IP only, once periodontal surgery had been completed at the deeper periodontal pockets. The reduction in pocket depth by surgical means and the associated decrease in reservoirs of periodontal pathogens may be important in achieving sustained periodontal stability. Thus, periodontal surgery appears to be an important part of the armamentarium to control periodontal infections. This study supported and extended the findings of the previous study and described changes not only at sites receiving apically repositioned flap surgery, but also at sites in the same mouth that received IP only. While the major beneficial clinical and microbiologic effect was observed at 3 months after surgery, these beneficial effects were sustained for at least 1 year and conceivably longer.

Serino et al. (2001) performed a clinical trial to determine the initial outcome of non-surgical and surgical periodontal therapy in subjects with advanced disease, as well as the incidence of recurrent disease during 12 years of maintenance following active therapy. There were 64 subjects included in the trial, and all showed signs of generalized gingival inflammation, had a minimum of 12 non-molar teeth with deep pockets (6mm or greater) and with 6mm or greater alveolar bone loss. They were randomly assigned to 2 treatment groups; one surgical (SU) and one non-surgical (SRP). After therapy, all subjects were enrolled in a maintenance care program and were provided with meticulous supportive periodontal therapy and maintenance 3-4 times per year. At these maintenance appointments, sites that bled on gentle probing and had probing depths greater than or equal to 5 mm were treated with subgingival instrumentation. Comprehensive re-examinations were performed after 1, 3, 5 and 13 years of maintenance therapy. It was observed that that surgical therapy was more effective than non-surgical scaling and root planing in reducing the overall mean probing pocket depth and in eliminating deep pockets, and that more non-surgical subjects exhibited signs of advanced disease progression in the 1–3-year period following active therapy than the subjects initially treated surgically. The authors concluded that in subjects with advanced periodontal disease, surgical therapy provides better short and long-term periodontal pocket reduction and may lead to fewer subjects requiring additional adjunctive therapy.

References

- American Academy of Periodontology (AAP). Staging and Grading Periodontitis. 2018. Available at: <https://www.perio.org/wp-content/uploads/2019/08/Staging-and-Grading-Periodontitis.pdf>. Accessed December 18, 2023.
- American Dental Association CDT 2024 Dental Procedure Codes.
- American Dental Association Glossary of Clinical and Administrative Terms.
- Bezerra B. Newman and Carranza's Clinical Periodontology and Implantology, 14th ed. St. Louis: Elsevier c2023. Chapter 62, Pocket Reduction Therapy-Resective Approach; p. 750-755.
- Cohen, Edward S, DMD. Atlas of Cosmetic and Reconstructive Periodontal Surgery, 3rd ed. Shelton, CT: Peoples Medical Publishing House c2007. Chapter 5, Gingivectomy and Gingivoplasty; p. 39.
- Do J, Takei H. Whang M, et al. Newman and Carranza's Clinical Periodontology, 13th ed. St. Louis: Elsevier c2019 Chapter 60, Periodontal Surgical Therapy; p.615.
- Hayakawa H, Fujinami K, Ida A, et al. Clinical outcome of surgical periodontal therapy: a short-term retrospective study. Bull Tokyo Dent Coll. 2012; 53(4):189-95.

Heitz-Mayfield LJ, Trombelli L, Heitz F, et al. A systematic review of the effect of surgical debridement vs non-surgical debridement for the treatment of chronic periodontitis. J Clin Periodontol. 2002; 29 Suppl 3:92-102.

Klokkevold P, Mealy B, Otomo-Corgel J. Carranza's Clinical Periodontology and Implantology. 14th ed. St.Louis: Elsevier c2023. Chapter 67, Periodontal Treatment of Medically Compromised Patients; p.784-805.

Klokkevold P, Takei H, Carranza F, et al. Newman and Carranza's Clinical Periodontology and Implantology, 14th ed. St. Louis: Elsevier c2023. Chapter 60, Gingival Surgical Techniques; p. 717-729.

Levy RM, Giannobile WV, Feres M, et al. The Effect of Apically Repositioned Flap Surgery on Clinical Parameters and the Composition of the Subgingival Microbiota: 12-Month Data. The International journal of periodontics & restorative dentistry. 2002;22(3):209-219.

Melnick P, Takei H. Newman and Carranza's Clinical Periodontology, 13th ed. St. Louis: Elsevier c2019 Chapter 69, Preparation of the Periodontium for Restorative Dentistry; p.696-698.

Reddy, S. Essentials of Clinical Periodontology & Periodontics, 5th Edition. JP Medical Ltd c2018; glossary, p.563.

Serino G, Rosling B, Ramberg P, et al. Initial outcome and long-term effect of surgical and non-surgical treatment of advanced periodontal disease. J Clin Periodontol. 2001 Oct; 28(10):910-6.

Policy History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.

Topical Medicaments for Caries Prevention or Remineralization

Policy Number: DCP018.10
Effective Date: January 1, 2025

[Instructions for Use](#)

Table of Contents	Page
302. Coverage Rationale	266
303. Definitions	267
304. Applicable Codes	267
305. Description of Services	267
306. Clinical Evidence	268
307. U.S. Food and Drug Administration	272
308. References	273
309. Policy History/Revision Information	274
310. Instructions for Use	274

Related Dental Policy

- Medically Necessary Orthodontic Treatment
- Sealants and Preventive Resin Restorations

Coverage Rationale

Topical Application of Fluoride – Excluding Varnish

Topical [Fluoride](#) treatments in the form of gel, foam, and rinses are applied in the dental office as a caries preventive agent.

Topical Application of Fluoride Varnish

Fluoride varnish may be the preferred delivery method for the following:

- Children under age 6
- Individuals receiving head and neck radiation therapy
- Sensitivity that does not resolve with an over-the-counter desensitizing dentifrice
- Moderate to high caries risk individuals with a medical or cognitive impairment
- [Xerostomia](#)
- Individuals in active orthodontic treatment
- The [Remineralization](#) of incipient or white spot enamel carious lesions

Interim Caries Arresting Medicament (Silver Diamine Fluoride) Application

Interim caries arresting medicament ([Silver Diamine Fluoride](#)) application may be indicated for caries arrest in the following situations:

- As conservative treatment for active, non-symptomatic carious lesions
- Individuals with high caries risk
- Individuals unable to tolerate standard restorative treatment. These include but are not limited to the following:
 - An uncooperative child
 - The elderly
 - Individuals with cognitive or physical disability
 - Individuals in which restorative treatment requiring general anesthesia is contraindicated
 - Individuals with multiple lesions that cannot be treated in one office visit
 - Caries that are difficult to treat with traditional restorations (i.e., crown margins, furcations, partially erupted teeth)
- Individuals with limited or restricted access to dental care

Interim caries arresting medicament application is not indicated for the following:

- Individuals with a silver allergy
- Pregnant women
- During the first six months of breast feeding

Caries Preventive Medicament Application (Other than Fluoride)

Non-Fluoride medicaments for caries prevention and/or Remineralization are not indicated due to insufficient evidence of efficacy.

Definitions

Fluoride: A compound of fluorine with a metal, a nonmetal, or an organic radical; the anion of fluorine; inhibits enolase; found in bone and tooth apatite; Fluoride has a cariostatic effect; high levels are toxic.

Remineralization: A process enhanced by the presence of Fluoride whereby partially decalcified enamel, dentin, and cementum become recalcified by mineral replacement.

Silver Diamine Fluoride: A colorless liquid that is 24.4% to 28.8% silver and 5.0% to 5.9% Fluoride. (ADA)

Xerostomia: Decreased salivary secretion that produces a dry and sometimes burning sensation of the oral mucosa and/or cervical caries. (ADA)

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CDT Code	Description
D1206	topical application of fluoride varnish
D1208	topical application of fluoride – excluding varnish
D1354	application of caries arresting medicament-per tooth
D1355	caries preventive medicament application - per tooth; for primary prevention or remineralization. Medicaments applied do not include topical fluorides

CDT® is a registered trademark of the American Dental Association

Description of Services

Fluoride is a naturally occurring mineral that has been well established as a caries prevention agent. Beneficial sources of Fluoride include drinking water, over the counter and prescription toothpastes and rinses, and Fluoride supplements, as well as topical application of professional strength products in an office setting. Combined, these provide a “halo” or “diffusion” effect of total Fluoride exposure and, along with individual patient risk, should be considered when making the decision to apply in office topical Fluoride treatments for caries prevention. Topical Fluoride treatments are typically applied with prescription strength products in a dental setting by a licensed dental professional; however, Fluoride varnish may also be applied in a medical setting by licensed providers as part of preventive services for children (USPSTF). Silver Diamine Fluoride (SDF) is a silver Fluoride salt made soluble in water through the addition of ammonia. The silver component functions as an antimicrobial, Fluoride promotes Remineralization and ammonia is a stabilizing agent. It is a non-invasive medicament that is applied to active decay and stops the progress. It is also being explored for caries prevention. Additional non-Fluoride medicaments may be applied to prevent caries, and/or facilitate Remineralization. These include, but are not limited to silver nitrate, thymol chlorhexidine (CHX) varnish, topical povidone iodine, and calcium phosphate derivatives.

In a 2018 systematic review of ten studies on different enamel remineralization therapies for post orthodontic white spot lesions, Fernández-Ferrer et al. concluded that neither fluoride mouth rinses nor phosphopeptide toothpastes with or without fluoride had any positive effect when added to oral hygiene maintenance with fluoride toothpaste. A 5% sodium Fluoride varnish was the only therapy to show a statistically significant improvement compared with results in the control group.

Lenzi et al. (2016) conducted a systematic review and meta-analysis of the literature to determine the effectiveness of professional topical fluoride application (gels or varnishes) on the reversal treatment of incipient enamel carious lesions in primary or permanent dentition. The statistical analysis was performed only for studies assessing fluoride varnish; there were insufficient data to perform it for fluoride gel studies. The therapeutic methods ranged considerably regarding the fluoride application protocols, and there was a significant trend of effectiveness of fluoride varnish on the reversal of incipient enamel carious lesions, and further clinical trials concerning efficacy of topical fluorides for treating lesions are still required, mainly regarding the fluoride gel. The authors concluded that dentists could use fluoride varnishes as an adjuvant for the treatment of active white-spot lesions in primary or permanent dentition.

Zero et al. (2016) conducted a systematic search of the literature to develop caries prevention strategies in Sjogren's disease to improve quality and consistency of care. A national panel of experts devised clinical questions in a Population, Intervention, Comparison, Outcomes format and included use of Fluoride, salivary stimulants, antimicrobial agents, and non-Fluoride remineralizing agents, and rated the strength of the recommendations by using a variation of grading of recommendations, assessment, development, and evaluation. After a Delphi consensus panel was conducted, the experts finalized the recommendations, with a minimum of 75% agreement required. Topical Fluoride was the only recommendation assigned a recommendation of "strong." Regarding the other recommendations, there were no study results link improved salivary flow to caries prevention, however the oral health community generally accepts that increasing saliva may contribute to decreased caries incidence, so increasing saliva through gustatory, masticatory, or pharmaceutical stimulation may be considered (weak). Chlorhexidine administered as varnish, gel, or rinse may be considered (weak); and non-Fluoride remineralizing agents may be considered as an adjunct therapy (moderate). The authors concluded that the incidence of caries in patients with Sjogren's disease can be reduced with the use of topical Fluoride and other preventive strategies, with topical Fluoride the only strategy given a strong recommendation based on current published literature.

Deng et al. (2015) conducted a narrative literature review regarding dental caries in head and neck cancer (HNC) population from 1985 to 2014. The authors also reviewed information from National Institute of Dental and Craniofacial Research (NIDCR), American Dental Association (ADA), Healthy People 2020, National Cancer Institute (NCI), American Cancer Society (ACS), and other related healthcare professional association web sites. This literature review focuses on critical issues related to dental caries in patients with HNC: potential mechanisms and contributing factors, clinical assessment, physical sequelae, negative impact on body image and quality of life, potential preventative strategies, and recommendations for practice and research in this area. Radiation-associated dental caries may progress rapidly in HNC patients who do not follow an appropriate oral care regimen. In a literature review conducted by the Oral Care Study Group of the Multinational Association of Supportive Care in Cancer and the International Society for Oral Oncology (MASCC/ISOO) which included 37 HNC trials, the prevalence of decayed, missing or filled teeth (DMFT), a standard outcome measure of dental health, was 17.01 for HNC patients who had received radiation versus 4.4 for healthy controls. The prevalence of dental disease appears to increase significantly over time as demonstrated by a retrospective study conducted in 314 nasopharyngeal cancer patients. In this study, the prevalence of dental disease escalated from 16% the first-year post-radiation to 36%, 55% and 74% at 3-, 5- and 7-years post-treatment respectively. National Institute of Dental and Craniofacial Research (NIDCR) recommends oral health maintenance in HNC patients before, during and after chemoradiation. Recommendations include pre-treatment assessment of dentition with extraction of non-viable teeth, rigorous oral hygiene, diets that minimize risk for dental caries and the use of prescription-strength fluoride to enhance enamel Remineralization. The authors concluded that the routine use of prescription-strength fluoride has been shown to be an effective preventive agent in the HNC population.

Makhija et al. (2014) conducted a twenty-month follow-up of occlusal carious lesions deemed questionable at baseline. A questionable occlusal caries (QOC) lesion can be defined as an occlusal surface with no radiographic evidence of caries, but caries is suspected because of clinical appearance. Fifty-three clinicians from The National Dental Practice-Based Research Network participated in this study, recording lesion characteristics at baseline and lesion status at 20 months. At baseline, 1,341 QOC lesions were examined; the treatment that was planned for 1,033 of those at baseline was monitoring (oral hygiene instruction, applying or prescribing Fluoride or varnish, or both), and the remaining 308 received a sealant (n = 192) or invasive therapy (n = 116). At the 20-month visit, clinicians continued to monitor 927 (90 percent) of

the 1,033 lesions identified for monitoring. The result of this study demonstrates the effectiveness of non-invasive management of these types of lesions.

Benson et al. (2013) conducted a Cochrane literature review with the primary objective of evaluating the effects of fluoride in reducing the incidence of demineralized white spot lesions (DWLs) on the teeth during orthodontic treatment. The secondary objectives were to examine the effectiveness of different modes of fluoride delivery in reducing the incidence and size of DWLs. This is an update of a Cochrane review first published in 2004. Trials were included in this review if they met the following criteria: (1) parallel-group randomized clinical trials comparing the use of a fluoride-containing product versus placebo, no treatment or a different type of Fluoride treatment, in which (2) the outcome of enamel demineralization was assessed at the start and at the end of orthodontic treatment. One placebo-controlled study of fluoride varnish applied every six weeks (253 participants, low risk of bias), provided moderate-quality evidence of an almost 70% reduction in DWLs. This finding is considered to provide moderate-quality evidence for this intervention because it has not yet been replicated by further studies in orthodontic participants. The authors concluded that there is moderate evidence that fluoride varnish applied every six weeks at the time of orthodontic review during treatment is effective, but this finding is based on a single study with a high number of participants. Further adequately powered, double-blind, randomized controlled trials are required to determine the best means of preventing DWLs in patients undergoing orthodontic treatment.

Dholam et al. (2013) conducted a study to evaluate the effectiveness of three-month fluoride varnish application on radiation caries and dental sensitivity and to assess compliance to three-month fluoride varnish application. There were 190 irradiated head and neck cancer patients randomly selected and reviewed retrospectively (oral prophylaxis, fluoride varnish application, and treatment of dental caries were done prior to radiation therapy). Decayed-missing-filling-teeth (DMFT) indices, dental sensitivity, and compliance to fluoride varnish application were noted every 3 months for fifteen months and analyzed statistically. Despite an increase in DMFT indices, the numbers were less than what was expected, and was highly dependent on site of disease and radiation dose. Sensitivity decreased and there was very high compliance with this regimen. The authors concluded that the application of fluoride varnish to the teeth of dental patients treated with radiation therapy results in lowered DMFT scores, decreased sensitivity and has high patient compliance.

Interim Caries Arresting Medicament Application

In 2023, Ruff et al. reported the results of the ongoing CariedAway single-blind, cluster randomized, school based clinical trial to evaluate the effectiveness and noninferiority of SDF with fluoride varnish in comparison with an established, active comparator of glass ionomer sealants and atraumatic restorative treatment with fluoride varnish for dental caries. Children received a single application of silver diamine fluoride with fluoride varnish or an active comparator of glass ionomer sealants and atraumatic restorations with fluoride varnish. A total of 2998 children with untreated dental caries were recruited and treated from September 16, 2019, to March 12, 2020, and follow-up observations were completed for 1398 children from June 7, 2021, to March 2, 2022. The mean (SE) proportion of children with arrested caries was 0.56 after experimental treatment and 0.46 after control treatment. The mean (SE) proportion of patients without new caries was 0.81 after experimental treatment and 0.82 after control treatment. There were no adverse events. The results showed silver diamine fluoride with fluoride varnish was noninferior to sealants and atraumatic restorations with fluoride varnish for caries arrest and prevention and these results may support the use of silver diamine fluoride as an arresting and preventive agent in school-based oral health programs.

In a 2021 randomized controlled trial, Mendiratta et al. compared the efficacy of caries arrest using Silver Diamine Fluoride (SDF) compared to Fluoride containing glass ionomer cement (GIC) with 5% Fluoride varnish (FV) in intellectually disabled individuals. Eighty two participants with active caries in permanent posterior teeth were randomized to each group, and caries arrest and preventive fraction was assessed at 6 month follow up. The results showed for the SDF group, a 94.5% caries arrest rate with a 45% preventive fraction rate over the GIC group. The authors concluded that SDF is at least as clinically effective as a combination of GIC and FV in arresting caries. Further research with larger numbers of participants and longer follow up are required to validate these findings.

Grandjean et al. (2021) conducted a systematic review and meta-analysis of three RCTs assessing the efficacy of SDF in arresting and preventing root surface caries in the elderly. A meta-analysis, using a fixed-effects model, was performed on the mean active root caries lesions (RCLs) present after SDF intervention compared to controls at 24 months and 30-36 months post intervention. The results showed a significant decrease in new RCLs following the application of SDF at both follow up points and demonstrates the efficacy it prevents and arrests root caries in the elderly. Further research is warranted to validate these findings.

Crystal et al. (2019) conducted a systematic review on the effectiveness of Silver Diamine Fluoride (SDF) as a caries arresting and preventive agent. It provides clinical recommendations around SDF's appropriate use as part of a comprehensive caries management program. These systematic reviews confirm that SDF is effective for caries arrest on

cavitated lesions in primary teeth and root caries in the elderly. It may also prevent new lesions and no caries removal is necessary to arrest the caries process. Therefore, the use of Silver Diamine Fluoride is appropriate when other forms of caries control are not available or feasible. Application is easy, noninvasive, affordable, and safe. Although it stains the lesions dark as it arrests them, it provides clinicians with an additional tool for caries management when esthetics is not a primary concern. Some limitations include most of the systematic reviews and meta-analysis included for this article face the obstacles of having to compile data from clinical trials that have substantial differences in treatment protocols (1 application, yearly, or twice a year applications), concentration of SDF used, dentition studied, follow-up time, outcome measured (arrest or prevention), and the way they report their findings. Their reported figures differ depending on the number of studies included and how they group the studies to make their comparisons, which may affect the generalizability of their results.

Trieu, et al. (2019) conducted a systematic review and meta-analysis on dentin caries arrest capabilities of SDF and sodium Fluoride (NaF). Four articles were considered for meta-analysis. When comparing the caries arrest lesions of SDF and NaF, SDF was found to be statistically more effective in dentin caries arrest of primary teeth during the 18- and 30-month clinical examinations. The weighted total effect size of the differences between SDF and NaF regarding arrested caries surfaces was calculated and showed nearly double the effectiveness of SDF to NaF at 30 months. The authors concluded that SDF is a more effective caries management reagent than NaF. Though the quality of evidence and meta-analyses are strong, the findings were based on a small number of studies, and further research is needed to evaluate the minimal necessary concentration and frequency of application to arrest dentin caries of primary and permanent teeth.

Oliveira et al. (2019) conducted a systematic review and meta-analysis on the efficacy of SDF in preventing caries in the primary dentition in children 0-12 years of age when compared to placebo or other active treatments. Four trials that randomized 1118 participants were included. Two compared SDF to no treatment (NT), one compared SDF to placebo and sodium fluoride varnish (FV) and one compared SDF to high viscosity glass-ionomer cement (GIC). The trials differed regarding type of tooth surfaces treated, and interval between SDF applications. The results showed when yearly application of 38% SDF is compared to quarterly application of fluoride varnish (22,600 ppm), there was a 54% reduction in new caries that favored SDF. When comparing SDF with sealing cavities using GIC, the results favor GIC over SDF after 12 months of follow-up. When comparing SDF to placebo or no treatment, with at least 24 months of follow-up SDF application significantly reduce the development of dentin caries lesions in treated and untreated primary teeth. The authors concluded that while these studies showed SDF as superior to no treatment, placebo and other active treatments, they all had a high or unknown risk of bias. Larger well designed studies are needed to validate these findings.

In a systematic review with meta-analysis, Oliveira et al. (2018) assessed the effect of Silver Diamine Fluoride (SDF) in preventing and arresting caries in exposed root surfaces of adults. The authors included 3 trials in which the investigators randomly assigned 895 older adults. Investigators in all studies compared SDF with a placebo; investigators in one also compared 38% SDF with chlorhexidine and sodium Fluoride varnishes. The results showed SDF applications had a significantly better preventive effect in comparison with the placebo, and they were as effective as either chlorhexidine or sodium Fluoride varnish in preventing new root carious lesions. SDF also provided a significantly higher caries arrest effect than did the placebo. The authors concluded yearly 38% SDF applications to exposed root surfaces of older adults are a simple, inexpensive, and effective way of preventing caries initiation and progression.

Contreras et al. (2017) evaluated the scientific evidence regarding the effectiveness of Silver Diamine Fluoride (SDF) in preventing and arresting caries in the primary dentition and permanent first molars. 7 studies were included. These included 1 study assessing the effectiveness of SDF at different concentrations; 3 studies comparing SDF with other interventions; 2 investigations comparing SDF at different application frequencies and with other interventions; and 1 study comparing semiannual SDF applications versus a control group. The study indicated at concentrations of 30% and 38%, SDF shows potential as an alternative treatment for caries arrest in the primary dentition and permanent first molars. To establish guidelines, more studies are needed to fully assess the effectiveness of SDF and to determine the appropriate application frequency.

Gluzman et al. (2012) conducted a literature review of 31 studies. The goal of this literature review was to conduct a systematic review on the effectiveness of the seven leading preventive agents for root caries and to provide recommendations for use to the general population of healthy older adults as well as specific recommendations for vulnerable older adults. Results showed the recommended choice for primary prevention of root caries is a 38% Silver Diamine Fluoride solution professionally applied annually; the recommended secondary prevention of root caries, is Fluoride varnish professionally applied every 3 months.

Non-Fluoride Caries Prevention Medicaments

Singal et al. (2022) conducted a systematic review and meta-analysis of 26 randomized controlled trials on the caries preventive and tooth remineralizing effect of various calcium phosphate (CaP) derivative agents compared to no-

intervention/placebo or fluoride (F) use alone among children. The meta-analysis of 10 studies showed complete white spot lesions (WSLs) regression, post intervention active WSLs and post intervention salivary *S. mutans* count significantly favored the CaP + F combined therapy as compared to F alone. No significant differences in the lesion area, Delta F, and DIAGNOdent values were observed between the 2 groups. The authors concluded that there was a low certainty of the evidence due to the high/unclear risk of bias, imprecision, and indirectness of included trials, and more high quality research is needed before providing definitive recommendations for the use of CaP.

In a 2020 systematic review and meta-analysis, Gupta et al. compared the effectiveness of topical fluorides and povidone iodine combined, and topical fluoride alone to reduce bacterial load and caries incidence among 1-12 year old children. Based on the results of very low quality, limited published literature, the results showed that overall, in the primary and permanent dentitions, caries incidence was significantly lower in the combined treatment group compared to fluoride alone, but no significant difference in bacterial load. The authors concluded that povidone iodine may have an added benefit for caries prevention, but more research with robust methodologies are needed to validate these findings.

Walsh et al. (2015) conducted a Cochrane database systematic review on the effects of CHX containing products (toothpastes, mouth rinses, varnishes, gels, gums and sprays) with each other, placebo or no intervention on the prevention of caries in children and adolescents. Included were eight RCTs that evaluated the effects of chlorhexidine varnishes (1%, 10% or 40% concentration) and chlorhexidine gel (0.12%) on primary or permanent teeth, or both, of children from birth to 15 years. The studies randomized a total of 2876 participants, of whom 2276 (79%) were evaluated. The results showed that six studies were at high risk of bias overall and two studies as being at unclear risk of bias overall. Follow-up assessment ranged from 6 to 36 months. Six trials compared chlorhexidine varnish with placebo or no treatment. Only one trial (10% concentration chlorhexidine varnish) provided usable data for elevated mutans streptococci levels > 4 with RR 0.93 (95% CI 0.80 to 1.07, 496 participants; very low quality evidence). One trial measured adverse effects (for example, ulcers or tooth staining) and reported that there were none; another trial reported that no side effects of the treatment were noted. No trials reported on pain, quality of life, patient satisfaction or costs. Two trials compared chlorhexidine gel (0.12% concentration) with no treatment in the primary dentition. Data for the effects of chlorhexidine gel on the prevalence of mutans streptococci were inconclusive. Both trials measured adverse effects and did not observe any. The authors concluded that there is limited evidence to either support or refute the assertion that chlorhexidine is more effective than placebo or no treatment in the prevention of caries or the reduction of mutans streptococci levels in children and adolescents. Further high quality research is needed, specifically research that evaluates the effects on both the primary and permanent dentition and using other chlorhexidine-containing oral products.

In a 2015 comparative study, Flamee et al compared the caries preventive effect of a CHX/thymol antibacterial varnish with fluoride varnish when applied during the eruption of permanent molars in 189 patients. The primary endpoint was caries incidence (primary and cavitated), and the secondary outcome was salivary mutans streptococci (MS) counts. The results showed the caries incidence after two years was low in both groups and there was no significant difference between the two groups with respect to occlusal caries development in the erupting molars, however, there were significantly lower levels of salivary MS. The authors concluded both medicaments are effective in preventing caries in erupting permanent molars.

Autio-Gold (2008) reviewed the published literature on the effectiveness of different modes of CHX delivery for caries prevention and management. It was concluded that based on the published reviews, that chlorhexidine rinses, gels and varnishes or combinations of these items with fluoride have variable effects, and due to the current lack of evidence on long-term clinical outcomes and reported side effects, chlorhexidine rinse should not be recommended for caries prevention. For the treatment and prevention of dental caries, there are alternative evidence-based methods available, such as fluoride applications, diet modifications and good oral hygiene practices.

Clinical Practice Guidelines

American Dental Association (ADA)

The ADA Council on Scientific Affairs recommends the following for people at risk of developing dental caries:

- 2.26% fluoride varnish or 1.23% fluoride (APF) gel, applied every 3-6 months or a prescription-strength, home-use 0.5% fluoride gel or paste or 0.09% fluoride mouth rinse for 6 years or older.
- Only 2.26% fluoride varnish is recommended for children younger than 6 years.
- As part of the evidence-based approach to care, these clinical recommendations should be integrated with the practitioner's professional judgment and the patient's needs and preferences. Patients at low risk of developing caries may not need additional topical fluorides other than over-the-counter fluoridated toothpaste and fluoridated water.

In a 2018 evidence based clinical practice guideline on nonrestorative treatments for carious lesions the ADA recommends the following:

- Prioritize the use of 38% SDF solution (biannual application) over 5% NaF varnish (application once per week for 3 weeks to arrest advanced cavitated carious lesions on any coronal surface of primary and permanent teeth.
- To arrest or reverse noncavitated carious lesions on approximal surfaces of primary and permanent teeth, the use of 5% NaF varnish (application every 3-6 months), resin infiltration alone, resin infiltration plus 5% NaF varnish (application every 3-6 months), or sealants alone.
 - To arrest or reverse noncavitated carious lesions on facial or lingual surfaces of primary and permanent teeth, the use of 1.23% APF gel (application every 3-6 months) or 5% NaF varnish (application every 3-6 months).

American Academy of Pediatric Dentistry (AAPD)

In the policy on the use of fluoride, the AAPD encourages the application of professional fluoride treatments for all individuals at risk for dental caries. Professional fluoride products should only be applied by or under the direction of a dentist or physician who is familiar with the child's oral health and has completed a caries risk assessment.

The AAPD Council of Clinical Affairs policy on the use of silver diamine fluoride (SDF) for pediatric dental patients states the following:

- The AAPD supports the use of SDF as part of an ongoing caries management plan for the patient with the aim of optimizing individualized patient care.
- The AAPD encourages more practice-based research to be conducted on SDF to evaluate its efficacy and impact on oral health-related quality of life.

In the policy on Early Childhood Caries (ECC): Consequences and Preventive Strategies, the AAPD states that professionally-applied topical fluoride treatments are efficacious in reducing prevalence of ECC. The recommended professionally-applied fluoride treatment for children at risk for ECC who are younger than six years is five percent sodium fluoride varnish (NaFV; 22,500 parts per million F). Additionally, the use of 38 percent silver diamine fluoride (SDF) is effective for the arrest of cavitated caries lesions in primary teeth.

National Comprehensive Cancer Network (NCCN)

The NCCN clinical practice guidelines for head and neck cancers advises fluoride varnish application three times per year for dental caries prevention for patients before and for the long term after radiation therapy. This recommendation is part of the overall principles of oral/dental evaluation and management which also includes strategies to alleviate dry mouth, dietary counseling, oral hygiene and regular, frequent dental visits.

Sjögren's Foundation

In 2016, the Sjögren's Foundation developed the first-ever U.S. Clinical Practice Guidelines for Caries Prevention in Sjögren's to ensure quality and consistency of care. The Oral Working Group had a high level of confidence that using topical fluoride represents a best clinical practice. The expert panel did not make a recommendation on fluoride type or frequency. This recommendation is part of the overall guidelines for best practices which also include salivary stimulation, non-fluoride remineralizing agents, and chlorhexidine varnish, gel or rinse.

United States Preventive Services Task Force (USPSTF)

In a 2021 recommendation statement, the USPSTF states there is inadequate evidence to assess the benefits and harms of oral screening (including risk assessment) by a primary care clinicians, and make the following recommendations (moderate certainty) regarding Fluoride and primary care clinicians for asymptomatic children younger than age 5:

- Prescribe oral fluoride supplementation starting at age 6 months for children whose water supply is deficient in Fluoride.
- Apply fluoride varnish to the primary teeth of all infants and children starting at the age of primary tooth eruption (Chou et al.).

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

Fluoride varnish currently has FDA approval as a cavity liner and desensitizer There are extensive manufacturers of fluoride varnish. Refer to the following website for more information and search by specific product name:

<https://www.accessdata.fda.gov/scripts/cder/daf/index.cfm>.

(Accessed January 17, 2024)

Fluoride gel, foams and rinses have FDA approval as caries preventive agents. There are extensive manufacturers of Fluoride products. Refer to the following website for more information and search by specific product name:

<https://www.accessdata.fda.gov/scripts/cder/daf/index.cfm>.

(Accessed January 17, 2024)

The FDA cleared Diamine Silver Fluoride Dental Hypersensitivity Varnish in July of 2014. Application as a caries arresting agent is considered off label use. The varnish is a Class II device intended to block dentinal tubules for the purpose of reducing tooth sensitivity. For additional information, refer to the following:

<http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmnmn.cfm?ID=K102973>.

(Accessed January 17, 2024)

On February 11, 2020, the FDA cleared Cervitec® Plus (Ivoclar) a chlorhexidine varnish under the 501(k) process as a Class II device for the treatment of dentinal hypersensitivity secondary to exposed dentin and root cervical surfaces. For additional information, refer to the following: https://www.accessdata.fda.gov/cdrh_docs/pdf19/K191453.pdf.

(Accessed January 17, 2024).

References

American Academy of Pediatric Dentistry. Policy on use of Fluoride. The Reference Manual of Pediatric Dentistry. Chicago, Ill.: American Academy of Pediatric Dentistry; 2023:100-2. Available at:

https://www.aapd.org/globalassets/media/policies_guidelines/p_fluorideuse.pdf. Accessed January 16, 2024.

American Academy of Pediatric Dentistry. Policy on the use of Silver Diamine Fluoride for pediatric dental patients. The Reference Manual of Pediatric Dentistry. Chicago, Ill.: American Academy of Pediatric Dentistry; 2023:103-5. Available at:

https://www.aapd.org/media/Policies_Guidelines/P_SilverDiamine.pdf. Accessed January 16, 2024.

American Academy of Pediatric Dentistry. Policy on early childhood caries (ECC): Consequences and preventive strategies. The Reference Manual of Pediatric Dentistry. Chicago, Ill.: American Academy of Pediatric Dentistry; 2023:88-91. Available at: https://www.aapd.org/globalassets/media/policies_guidelines/p_eccconsequences.pdf. Accessed January 16, 2024.

American Dental Association (ADA) CDT Codebook 2024.

American Dental Association (ADA) Glossary of Dental Clinical and Administrative Terms.

American Dental Association Council on Scientific Affairs. Professionally applied and Prescription-strength, Home-use Topical Fluoride Agents for Caries Prevention Clinical Practice Guideline. 2013.

American Dental Association Council on Scientific Affairs. Nonrestorative Treatments for Carious Lesions Clinical Practice Guideline. 2018.

Autio-Gold J. The role of chlorhexidine in caries prevention. *Oper Dent*. 2008 Nov-Dec;33(6):710-6.

Benson PE, Parkin N, Dyer F, et al. Fluorides for the prevention of early tooth decay (demineralized white lesions) during fixed brace treatment. *Cochrane Database Syst Rev*. 2013 Dec 12; 12:CD003809.

Chou R, Pappas M, Dana T, et al. Screening and Interventions to Prevent Dental Caries in Children Younger Than 5 Years: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force. *JAMA*. 2021 Dec 7;326(21):2179-2192.

Contreras V, Toro MJ, Elías-Boneta AR, et al. Effectiveness of Silver Diamine Fluoride in caries prevention and arrest: a systematic literature review. *Gen Dent*. 2017 May-Jun;65(3):22-29.

Crystal YO, Niederman R. Evidence-Based Dentistry Update on Silver Diamine Fluoride. *Dent Clin North Am*.

2019;63(1):45–68. doi:10.1016/j.cden.2018.08.011Deng J, Jackson L, Epstein JB, et al. Dental demineralization and caries in patients with head and neck cancer. *Oral Oncol*. 2015 Sep; 51(9):824-31.

Dholam KP, Somani PP, Prabhu SD, et al. Effectiveness of Fluoride varnish application as cariostatic and desensitizing agent in irradiated head and neck cancer patients. *Int J Dent*. 2013; 2013.

Farlex Partner Medical Dictionary (2012).

Fernández-Ferrer L, Vicente-Ruiz M, García-Sanz V, et al. Enamel Remineralization therapies for treating postorthodontic white-spot lesions: A systematic review. *J Am Dent Assoc*. 2018 Sep; 149(9):778-786.

Flamee S, Gizani S, Caroni C, et al. Effect of a chlorhexidine/thymol and a fluoride varnish on caries development in erupting permanent molars: a comparative study. *Eur Arch Paediatr Dent*. 2015 Dec;16(6):449-54.

Gluzman R, Katz RV, Frey BJ, et al. Prevention of Root Caries: A Literature Review of Primary and Secondary Preventive Agents. Special care in dentistry : official publication of the American Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry. 2013; 33(3):133-140.

Gupta A, Nishant, Sharda S, Kumar A, et al. Comparing the effectiveness of topical fluoride and povidone iodine with topical fluoride alone for the prevention of dental caries among children: a systematic review and meta-analysis. Int J Clin Pediatr Dent. 2020 Sep-Oct;13(5):559-565.

Lenzi TL, Montagner AF, Soares FZ, et al. Are topical Fluorides effective for treating incipient carious lesions? A systematic review and meta-analysis. J Am Dent Assoc. 2016 Feb; 147(2):84-91.

Makhija SK, Gilbert GH, Funkhouser E, et al. National Dental PBRN Collaborative Group. Twenty-month follow-up of occlusal caries lesions deemed questionable at baseline: findings from the National Dental Practice-Based Research Network. J Am Dent Assoc. 2014 Nov; 145(11):1112-8.

Mendiratta M, B C M, Kumar A, et al. Effectiveness of Silver Diamine Fluoride and glass ionomer cement combined with Fluoride varnish in arresting dental caries among intellectually disabled individuals: A randomized controlled trial. Spec Care Dentist. 2021 Sep;41(5):544-552.

National Cancer Institute. Oral Complications of Chemotherapy and Head/Neck Radiation—for health professionals 2016. Updated October 2022. Available at: <https://www.cancer.gov/about-cancer/treatment/side-effects/mouth-throat/oral-complications-hp-pdq> – NCI (cancer.gov). Accessed January 17, 2024.

National Comprehensive Cancer Network (NCCN). Clinical Practice Guidelines in Oncology. Head and Neck Cancers. Principles of Oral/ Dental Evaluation and Management. Version 2.2024 – December 8, 2023.

National Institute of Dental and Craniofacial Research, National Institutes of Health. Cancer treatments and Oral Health. 2018. Updated 2023. Available at: <http://www.nidcr.nih.gov/oralhealth/Topics/CancerTreatment/OralComplicationsCancerOral.htm#top>. Accessed January 17, 2024.

Oliveira BH, Rajendra A, Veitz-Keenan A, et al. The effect of silver diamine fluoride in preventing caries in the primary dentition: a systematic review and meta-analysis. Caries Res. 2019;53(1):24-32.

Oliveira BH, Cunha-Cruz J, Rajendra A, Niederman R. Controlling caries in exposed root surfaces with Silver Diamine Fluoride: A systematic review with meta-analysis. J Am Dent Assoc. 2018 Aug;149(8):671-679.

Ruff RR, Barry-Godín T, Niederman R. Effect of silver diamine fluoride on caries arrest and prevention: The CariedAway School-Based Randomized Clinical Trial. JAMA Netw Open. 2023 Feb 1;6(2):e2255458. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9912124/?report=printable>. Accessed January 17, 2024.

Singal K, Sharda S, Gupta A, et al. Effectiveness-of Calcium Phosphate derivative agents on the prevention and remineralization of caries among children- A systematic review & meta-analysis of randomized controlled trials. J Evid Based Dent Pract. 2022 Sep;22(3):101746.

Sjögren's Foundation's Clinical Practice Guidelines. Oral Management: Caries Prevention in Sjogren's Patients. 2015.

Trieu A, Mohamed A, Lynch E. Silver diamine Fluoride versus sodium Fluoride for arresting dentine caries in children: a systematic review and meta-analysis. Sci Rep. 2019;9(1):2115. Published 2019 Feb 14. doi:10.1038/s41598-019-38569-9.

Walsh T, Oliveira-Neto JM, Moore D. Chlorhexidine treatment for the prevention of dental caries in children and adolescents. Cochrane Database Syst Rev. 2015 Apr 13;(4):CD008457.

Weyant RJ, Tracy SL, Anselmo TT et al; American Dental Association Council on Scientific Affairs Expert Panel on Topical Fluoride Caries Preventive Agents. Topical Fluoride for caries prevention: executive summary of the updated clinical recommendations and supporting systematic review. J Am Dent Assoc. 2013 Nov; 144(11):1279-91.

Policy History/Revision Information

Date	Summary of Changes

Instructions for Use

This Dental Clinical Policy provides assistance in interpreting Healthplex Comprehensive and Limited dental plans. When deciding coverage, the member specific benefit plan document must be referenced as the terms of the member specific

benefit plan may differ from the standard dental plan. In the event of a conflict, the member specific benefit plan document governs. Before using this policy, please check the member specific benefit plan document and any applicable federal or state mandates. Healthplex reserves the right to modify its Policies and Guidelines as necessary. This Dental Clinical Policy is provided for informational purposes. It does not constitute medical advice.