

Delta Dental of Virginia Clinical Policy #800
Subject
 Endodontics

Originating Department
 Clinical Professional Services

Signature Authority
 Dental Director

Type: New Replacement Revision Clarification

Date: 11/15/2011 **Revision Date:**
Preamble:

The Clinical Policy Bulletin is an expression of Delta Dental of Virginia's (DDVA) determination regarding whether certain services or supplies are medically or dentally necessary. DDVA bases its conclusions on a review of currently available clinical literature. This includes, but is not limited to, clinical outcome studies published in the peer-reviewed medical and dental literature, regulatory status of the technology, evidence-based guidelines of public health and health research agencies, evidence-based guidelines and positions of leading national health professional organizations, views of physicians and dentists practicing in relevant clinical areas, and other relevant factors. DDVA reserves the right to revise these policies as new clinical information is available and we welcome submission of further relevant information.

A group may define covered dental services under their dental plan, as well as those services that may be subject to dollar caps or other limits. The plan documents outline covered benefits, exclusions and limitations. DDVA advises dentists and enrollees to consult the plan documents to determine if there are exclusions or other benefit limitations applicable to the service request. The conclusion that a particular service is medically or dentally necessary does not constitute an indication or warranty that the service requested is a covered benefit payable by DDVA. Some plans exclude coverage for services that DDVA considers either medically or dentally necessary. When there is a discrepancy between DDVA's clinical policy and the group's plan documents, DDVA is to defer to the group's plan documents as to whether the dental service is a covered benefit. In addition, if state or federal regulations mandate coverage then DDVA will adhere to the applicable regulatory requirement.

History:

Endodontic therapy is a sequence of treatment for the pulp of a tooth which results in the elimination of infection and protection of the decontaminated tooth from future microbial invasion. This set of procedures is commonly referred to as "root canal therapy." The pulp chamber and the associated root canals are the hollow part within a tooth that are naturally inhabited by nerve tissue, blood vessels and other cellular entities.

Root canal therapy treats injury and disease of the tooth pulp and associated periradicular conditions (1). The tooth pulp is commonly referred to as the tooth "nerve," and periradicular conditions are disease processes that involve the anatomic area surrounding the root of the tooth.

The tooth pulp occupies the "pulp chamber" of the clinical crown of a tooth and the canals in the tooth roots. Endodontic therapy is indicated in instances of irreversible inflammation of the tooth pulp, caused by either injury to or bacterial infection of the pulp. The inflammatory process in the tooth pulp is often accompanied by spontaneous or persistent pain, as well as sensitivity to heat and cold stimuli. The eventual result of the irreversible inflammatory or infective

process is necrosis or death of the pulpal tissue. Bacterial infection of the periradicular tissues then occurs as a sequela of pulpal necrosis.

The bacterial infection and associated periradicular conditions can usually be resolved following instrumentation and cleaning of the canals with “obturation.” Obturation is the process of filling and closing the canals completely and densely with an inert biocompatible material(2). Biologically, obturation of the canals eliminates progression of the infective process by preventing continued microleakage and invasion of bacteria from the treated tooth into the periradicular tissues(3).

A tooth for which endodontic therapy is being considered should have a good periodontal and restorative prognosis. A tooth should be functional and restorable, have treatable periodontal conditions, and an adequate crown-root ratio(4).

The majority of endodontic procedures are successful over time. Depending on the tooth involved and the period of observation, success rates for endodontic therapy generally vary from 80 to 95 percent of treated teeth(4,10).

Root canal failure can be the result of a single factor or combination of factors, most of which cause a resultant recurrent or persistent bacterial infective process. Factors which cause endodontic failure may be mechanical, anatomical or biological. Biological factors include compromised healing responses due to disease states such as diabetes(5), progressive periodontal conditions, and the presence of an evident periapical lesion prior to treatment(4). A periapical lesion is a definitive and discernable infection beyond the root tip (apex), the presence of which prior to treatment is considered the primary factor associated with endodontic failure(4,6,7,10).

Mechanical and anatomical factors causing failure include inadequate or incomplete obturation of a canal or canals, undiagnosed and unfilled main canals, the presence of accessory or lateral canals that cannot be filled, and calcified or anatomically tortuous canals which cannot be instrumented. Ultimately, the mechanical factors become biological by allowing bacterial contamination from the unfilled portions of the canals into the periradicular structures(8). Additional factors which may influence the prognosis of an endodontically treated tooth include overfilled canals, root perforations during instrumentation, and breakage or separation of an instrument in a canal(8,9,14).

Another common mechanical/biological factor resulting in endodontic failure is fracture of the tooth structure(11,12,13), which may be catastrophic or incomplete. Catastrophic fracture of the clinical crown may extend below the gingival margin or to the crest of the supporting alveolar bone of the tooth socket. This type of fracture may preclude successful restoration of the fractured or missing tooth segments, resulting in extraction.

Fracture may involve the root of the tooth, and, likewise, may be catastrophic, resulting in a split tooth and root, and immediate loss. The fracture may be incomplete, in which case the fractured segments of the root do not separate, but may cause pain upon mastication (chewing). Root fractures can result in a chronic persistent or intermittent pain in the tooth and bony socket around the root and may be accompanied by tenderness of the gum tissue. Incomplete fractures are often difficult to diagnose, as they are rarely evident on radiographs and may not be detectable on visual inspection(18,19). The persistent or intermittent pain associated with an incomplete root fracture is sometimes accompanied by no other signs or symptoms, such as pain on biting or sensitivity to heat and cold. Fractures involving the root of a tooth almost always lead to eventual loss of the tooth and,

	<p>often, this type of fracture can be diagnosed only after extraction.</p> <p>Endodontic therapy failures not involving fracture may respond to simple non-surgical retreatment of the root canals. Research indicates that non-surgical retreatment has a similar success rate to that of conventional initial endodontic therapy if the cause or causes of failure can be properly identified and corrected(14). In cases of persistent periapical pathology, “apicoectomy” surgery may be indicated(14,16). The “apicoectomy” procedure is defined as surgical removal of the apical or end portion of the tooth root and any attached soft tissue(15). The apicoectomy is an attempt to arrest the ongoing pathologic process by removing any unfilled portions of the canal or canals and to affect an apical seal which could not otherwise be accomplished by conservative non-surgical means(14). The mean success rate for retreatment of refractory cases with apicoectomy surgery is generally around 80 percent (16).</p>
Policy:	<p>Policy/Therapy Guidelines:</p> <ol style="list-style-type: none"> 1. A tooth for which endodontic therapy is being considered must have a good prognosis. Teeth that cannot be adequately restored or that have advanced or untreated periodontal problems are not good candidates for root canal treatment. 2. Claims for completed root canal therapy on three or more teeth on the same date of service require submission of post-operative X-rays. 3. Root canals must be filled with biologically acceptable, non-resorbable, semi-solid or solid core material, such as gutta percha.
Codes(1):	<p>D3110 – Pulp cap - direct (excluding final restoration) D3120 – Pulp cap - indirect (excluding final preparation) 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, bicuspid tooth (excluding final restoration) D3330 – Endodontic therapy, molar (excluding final restoration) D3332 – Treatment of root canal obstruction; non-surgical access D3333 – Internal root repair of perforation defects D3346 – Retreatment of previous root canal therapy - anterior tooth D3347 – Retreatment of previous root canal therapy - bicuspid D3348 – Retreatment of previous root canal therapy D3351 – Apexification/ recalcification/pulpal regeneration - initial visit (apical closure/ calcific repair of perforations, root resorption, pulp space disinfection, etc.) D3352 – Apexification/recalcification/pulpal regeneration - interim medication replacement) apical closure/calcific repair of perforations, root resorption, etc.) D3353 – Apexification/recalcification - final visit (includes completed root canal therapy – Apical closure/calcific repair of perforations, root resorption, etc.) D3354 – Pulpal regeneration - (completion of regenerative treatment in an</p>

	<p>immature permanent tooth with a necrotic pulp; does not include final restoration</p> <p>D3410 – Apicoectomy/periradicular surgery - anterior D3421 – Apicoectomy/periradicular surgery - bicuspid (first root) D3425 – Apicoectomy/ periradicular surgery - 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) D3910 – Surgical procedure for isolation of tooth with rubber dam D3950 – Canal preparation and fitting of preformed dowel or post D3999 – Unspecified endodontic procedure</p>
References:	<ol style="list-style-type: none"> 1. American Dental Association. <i>Current Dental Terminology. CDT 2011-2012</i>;20. ©2010 Amer Dent Assoc. 2. Jablonski S. <i>Illustrated Dictionary of Dentistry</i>.1982. W B Saunders Co. Phila PA. 3. Endodontics: Colleagues for Excellence. Obturation of root canal systems. Amer Assoc of Endodontists. Fall, 2009;4. 4. Tourabinejad M and Goodacre CJ. Endodontic or dental implant therapy. J Amer Dent Assoc 2006;137:973-977. 5. Fouad AF and Burleson J. The effect of diabetes mellitus on endodontic outcome. J Amer Dent Assoc 2003;134:43-51. 6. Freidman S, Abitol S and Lawrence HP. Treatment outcome in endodontics; the Toronto study. Phase 1--initial treatment. J Endod 2003;29:787-793. 7. Chugal NM, Clive JM and Spangberg LS. A prognostic model for assessment of the outcome of endodontic treatment: the effect of biologic and diagnostic variables. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2001;91:342-352. 8. Lin LM, Rosenberg PA and Lin J. Do procedural errors cause endodontic treatment failure? J Amer Dent Assoc 2005;136:187-193. 9. Schaeffer MA, White RR and Walton RE. Determining the optimal obturation length: a meta-analysis of literature. J Endod 2005;31:271-274. 10. Douad AF. <i>Endodontic Microbiology</i>. 2009. 1st Edition. Wiley-Blackwell. Ames, Iowa. 11. Ingle JI, Bakland LK and Baumgartner JC. <i>Ingle's Endodontics</i> 2008. Edition 6. B C Decker Inc. Hamilton Ont. ©2008 B C Decker Inc. 12. Ailor JE. Managing incomplete tooth fractures. J Amer dent Assoc;2000;131:1168-1174. 13. Cohen S, Blanco L and Berman L. Vertical root fractures. Clinical and radiographic diagnosis. J Amer Dent Assoc;134:434-441. 14. Shabahang S. State of the art and science of endodontics. J Amer dent

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