

Pulp Therapy for Primary and Young Permanent Teeth: Foundational Articles and Recommendations

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Background

Pulp therapy in the primary dentition aims to preserve the teeth until they exfoliate naturally. In the young permanent dentition, pulp therapy aims to preserve pulp vitality and allow root development to continue, helping to achieve a favorable crown-root ratio. It also aims to achieve wider dentinal walls for long-term retention and function of the teeth. Indications and type of pulp therapy depends on the status of the pulp: healthy, reversible pulpitis, irreversible pulpitis, or necrosis. Clinical diagnosis can be achieved from the medical and dental history; pain history (location, intensity, whether spontaneous,

duration, aggravating and relieving factors); clinical signs (extra- and intra oral); radiographic examination (crown, furcation, periapical areas, and the adjacent bone); and in permanent teeth with closed apices testing the sensibility of the pulp (electric pulp testing, cold test and heat test). The correct diagnosis affects the treatment and prognosis. The vital pulp therapy includes indirect pulp therapy (IPT), direct pulp capping (DPC) and pulpotomy. The non-vital pulp therapy includes pulpectomy and lesion sterilization and tissue repair (LSTR).

IAPD Recommendations

1. Teeth with pain of a short duration that is not spontaneous are likely to have a vital pulp that may have reversible pulpitis, and therefore should be treated with vital pulp therapy.

Evidence-based recommendation › Global agreement N/A

2. Teeth with spontaneous pain or pain that lasts after the removal of an aggravating factor, a sinus tract, soft tissue pathology or gingival swelling and inflammation (not associated with periodontal disease), excessive mobility (not from exfoliation), and radiographic signs (apical/furcation radiolucency, internal/external root resorption) suggests irreversible pulpitis and/or necrosis, and therefore should be treated with non-vital pulp therapy.

Evidence-based recommendation › Global agreement N/A

3. Patients' medical history and restorability of an

affected tooth should always be considered when determining the type of pulp therapy.

Consensus-based statement › Global agreement 94%

4. If pulp therapy is not recommended, then alternative treatment options such as extraction should be considered.

Consensus-based statement › Global agreement 94%

5. Regarding pulp therapy for primary teeth:

a. Clinicians may choose to use materials for indirect pulp treatment such as calcium hydroxide, glass ionomer cements, and dentin bonding agents.

Evidence-based recommendation › Global agreement 88%

b. Indirect pulp treatment should be used to treat vital primary teeth with deep caries to avoid

pulpal injury or exposure. Indirect pulp treatment consists of excavating to hard dentine on the peripheral walls of deep lesions while leaving the firm caries-affected dentine on the pulpal floor. Caries removal to soft dentine on the pulpal floor may be appropriate with deep lesions impinging on the pulp.

Evidence-based recommendation › Global agreement
N/A

c. Materials such as glass ionomer cement, resin-modified glass ionomer cement, calcium hydroxide, zinc oxide/eugenol, or MTA may be used for indirect pulp treatment and placed over the remaining dentine to enhance pulp healing and repair.

Evidence-based recommendation › Global agreement
N/A

d. Calcium hydroxide or MTA may be used as pulp capping agents in primary teeth with traumatic or iatrogenic pulp exposures.

Consensus-based recommendation › Global agreement
82%

e. Pulpotomies in primary teeth should be done preferably with MTA.

Evidence-based recommendation › Global agreement
N/A

f. Formocresol pulpotomies show high success; however, other materials such as Biodentine and MTA are as effective and may have greater parental acceptance.

Consensus-based recommendation › Global agreement
84%

g. Pulpectomies in primary teeth should be completed with resorbable materials such as iodoform and calcium hydroxide (Endoflas®), zinc oxide, non-reinforced zinc oxide eugenol, and iodoform and calcium hydroxide paste (Vitapex®, Metapex®).

Evidence-based recommendation › Global agreement
N/A

h. Lesion Sterilization Tissue Repair (LSTR) which includes disinfection of root canals with an antibiotic mixture (e.g., ciprofloxacin, metronidazole, and clindamycin) may be used to

treat necrotic primary teeth.

Evidence-based recommendation › Global agreement
N/A

6. Regarding pulp therapy for young permanent teeth:

a. Clinicians may use protective liners such as calcium hydroxide, zinc oxide and eugenol, dentine bonding agents, and glass ionomer cements.

Consensus-based statement › Global agreement 76%

b. Indirect pulp treatment should be used to treat vital permanent teeth with deep caries to support the pulp recovery and reduce the risk of pulp exposure.

Consensus-based recommendation › Global agreement
88%

c. In direct pulp capping, the exposed pulp should be capped with either calcium hydroxide or MTA and sealed from the rest of the oral environment by placement of a suitable restoration.

Consensus-based recommendation › Global agreement
88%

d. With pulpotomy (Cvek pulpotomy), the exposed pulp tissue should be covered with calcium hydroxide or MTA; and then restored.

Consensus-based recommendation › Global agreement
100%

e. Pulpectomy, apexification, or MTA apical barrier may be used for immature permanent teeth with non-vital pulp.

Consensus-based recommendation › Global agreement
88%

f. Pulp revascularization may be used for immature permanent teeth with non-vital pulp tissue.

Consensus-based statement › Global agreement 82%

g. Coronal pulpotomy may be used for the management of mature carious permanent teeth with reversible pulpitis.

Consensus-based recommendation › Global agreement
74%