

NTEA ENDO FAX

Compliments of North Texas Endodontic Associates

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***** Don't forget to mark your calendars on November 9th for the second seminar in the ENDO 2000 series.

Irrigation of the Root Canal System

This Endo Fax is written in response to questions we regularly receive, especially from recent graduates, regarding what we use to irrigate the root canal system.

Definition & History: Chemical preparation refers to the use of an irrigant or combination of irrigants during and after biomechanical preparation. The primary purpose of chemical preparation is the removal of organic (pulpal) and inorganic (dental) debris and microorganisms from the root canal system. Numerous types of irrigants have been recommended including acids, chelating agents, proteolytic enzymes, alkaline solutions, oxidizing agents, and normal saline.

Desirable Properties: An endodontic irrigant should possess four major properties: It should have antimicrobial activity, dissolve necrotic tissue, aid in debridement of the canal system, and be nontoxic to the periradicular tissues. Given these desirable properties there can be little argument that a solution of 5.25% NaOCl remains the irrigant of choice.

Sodium Hypochlorite: Clinical and laboratory studies have shown that a 5.25% solution of NaOCl will destroy most microorganisms found in the root canal system after exposure of 1 minute or less. Additional studies have shown that no other irrigant, including strong acids, are as effective as 5.25% NaOCl in dissolving necrotic tissue. This concentration has also been shown to have a solvent effect on vital pulp tissue and is capable of penetrating into the dentinal tubules and dissolving the contents of the tubules adjacent to the main canal. A number of studies have demonstrated that NaOCl is the most effective endodontic irrigant in removing pulpal debris from root canal systems. Investigators utilizing scanning electron microscopic technology have concluded that the most effective irrigant for chemomechanical preparation of root canals was 5.25% NaOCl. And finally, clinical studies have investigated the potential for toxicity of 5.25% NaOCl used as an endodontic irrigant during chemomechanical preparation. The studies show conclusively that the use of 5.25% NaOCl does not result in an increased incidence or degree of interappointment pain as compared with the use of normal saline solution as an irrigant. In fact, studies have shown a significantly lower incidence of postobturation pain in patients who were treated with 5.25% NaOCl than those treated with other irrigants, concentrations, or combination of irrigants.

Factors Altering the Effectiveness: Temperature: The antimicrobial and tissue dissolving properties of sodium hypochlorite may be enhanced increasing the temperature from room temperature to body temperature. Flushing: A high volume final flushing of the canal system after completion of instrumentation has been shown to produce extremely clean canal walls. A final flush of 17% EDTA (a chelating agent) followed by a flush of 5.25% NaOCl is the most effective at removing both organic and inorganic debris and opening dentinal tubules. Dilution: Dilution of full strength (5.25%) NaOCl by 50% triples the exposure time required to slaughter bacteria and has been shown to only dissolve 26% of the mass of necrotic tissue when exposed for seven minutes.

Technique: Copious amounts (2-5 ml) of NaOCl are used between file sizes. The needle is gently advanced apically as the canal is enlarged, BUT NEVER ENGAGED into the canal wall. This will force the solution through the apical constriction. A final flush of 10 ml of 17% EDTA followed by a 10 ml flush of 5.25% NaOCl will leave the canal walls clean and devoid of a smear layer.

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