

**Effect of Different Disinfecting Solutions on the Surface
Topography and Elasticity of Gutta percha and Resilon Cones**

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

(قَالُوا سُبْحَانَكَ لَا عِلْمَ
لَنَا إِلَّا مَا عَلَّمْتَنَا إِنَّكَ
أَنْتَ الْعَلِيمُ الْحَكِيمُ)

صدق الله العظيم

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My dear *Father* and dear *Mother*

For their prayer for me, encouragement and support

For my *Brother* and *Sisters*

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Introduction

I-Introduction

Endodontic procedures involve considerable effort devoted to the removal of microorganisms from within canals. These procedures should be accepted as a link of an aseptic chain. Preparing an access cavity, isolation, root canal instrumentation, irrigation, interappointment medication, using intracanal medicaments, obturation, and finally, coronal restoration are all parts of this chain. The practitioner must be concerned not only with endogenous oral microbial flora, but with exogenous bacterial contamination as well; that, which may occur by the introduction of contaminated Gutta-percha cones into the root canal.

Since its introduction in endodontics, Gutta-percha has been widely used and accepted as a core root canal filling material. Commercial Gutta-percha cones are basically composed of organic (Gutta-percha polymer and wax/resins) and inorganic components (zinc oxide and barium sulfate). Gutta-percha cones are produced under aseptic conditions and present potential antimicrobial properties, especially owing to their zinc oxide component. However, Gutta-percha points taken from sealed packages may be contaminated by a variety of microorganisms, after exposure to the dental operatory environment. Recently, a new thermoplastic, filled polymer (Resilon) that has the potential to challenge Gutta-percha as a root filling material has been introduced. The thermo plasticity of Resilon is provided by polycaprolactone, biodegradable polyester with a moderately low melting point, although its bond ability is derived from the inclusion of resin with methacryloxy groups. This filling

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Materials, which contains glass fillers and barium chloride as fillers, is also coupling to resin sealers.

Although most instruments used in endodontic treatment can be sterilized by autoclaving or dry heat before treatment, Gutta-percha cones cannot be sterilized by conventional autoclaving or in hot-air oven; because of its thermoplastic characteristic. Therefore, a rapid chair side chemical disinfection is needed, before use to maintain the aseptic chain, an essential factor in successful endodontic therapy. Cold chemical disinfectants such as alcohol, povidone-iodine, formaldehyde gas, quaternary of ammonium, glutaraldehyde, chlorohexidine and sodium hypochloride (NaOCl) are utilized in clinical practice to disinfecting Gutta-percha cones to avoid this possible source of exogenous contamination.

The time for these substances to kill microorganisms ranges from a few seconds to substance periods of time. Several disinfectant solutions have been reported to be a suitable means for disinfection of Gutta-percha and Resilon cones. Sodium hypochloride (NaOCl) is the most widely used disinfecting agent in endodontic therapy for irrigation as well as cone disinfection. It is an effective antimicrobial agent, but its effectiveness is related to concentration and exposure time. Another rapid disinfectant solution is chlorohexidine (CHX). This agent has inhibitory effects on bacteria and yeasts that are commonly found in endodontic infections. A new irrigant, BioPure MTAD has shown promise as antimicrobial. New formulation MTAD formulation of doxycycline, Tween-80, and citric acid. Both doxycycline and citric acid exhibit antimicrobial and acid etching properties.