Negative pressure differential vacuum irrigation units, which in combination with BioPure MTA may eliminate all residual debris from the canal and render it completely sterile. Additionally, an endodontic attachment for the Mark III HealOzone unit is currently being evaluated to determine its efficacy. In conjunction with resin sealers, the near total elimination and entombment of residual microflora may further accentuate success rates beyond current levels.

BioPure MTAD is a mixture of Doxycycline, Citric Acid, and Polysorbate 80 also referred to as Tween 80. It is being marketed by Dentsply/Tulsa Dental as an antibacterial root canal cleanser.

Doxycycline is a broad-spectrum antibiotic synthetically derived from oxytetracycline. Citric Acid is a "replacement" for EDTA and optimizes the removal of the smear layer. Tween 80 is a detergent that acts as a surfactant to facilitate the penetration of the citric acid and doxycycline into the complex anatomic vagueries of the root canal space. Most of the other irrigants used in endodontics due to their high surface tension do not readily penetrate into these areas.

The system comes as a powder & liquid and must be mixed just prior to use. There are 2 sizes available. A single dose comes as a 5 ml powder/liquid combination and a multicanal size is available (20 ml).

Residual uncontaminated, unused solution can be refrigerated up to 48 hours. I do not see it as a complete replacement for EDTA. Both are effective synergistically for removal of the calcified component of the smear layer. I disagree with the instructions recommending 1.3% bleach; 5.25% sodium hypochlorite is optimal. Concentrations of bleach less than 2.5% in all probability do not dissolve necrotic debris. As well, the use of 2% Chlorhexidine is proving increasingly integral to overall disinfection success based on current literature and its addition to the protocol is advised. New devices in prototype development include negative pressure differential vacuum irrigation units which in combination with BioPure MTA may eliminate all residual debris from the canal and render it completely sterile. As well, there is an endodontic attachment for the Mark III HealOzone unit, I am currently evaluating to determine its efficacy. In conjunction with resin sealers, the near total elimination and entombment of residual microflora may further accentuate success rates beyond current levels.
The purpose of this investigation was to compare the antimicrobial effect of MTAD (a mixture of a tetracycline isomer, an acid, and a detergent) with that of NaOCl with and without EDTA. Eighty-five extracted human teeth were contaminated with Enterococcus faecalis for 4 weeks. After biomechanical instrumentation using 1.3% or 5.25% NaOCl as root canal irrigant, the root canal and the external surface of each tooth were exposed to a 5-min application of MTAD, 1.3% NaOCl, 5.25% NaOCl or a 1-min application of EDTA followed by irrigation with 5 ml of 1.3% NaOCl or 5.25% NaOCl. Teeth or dentin shavings were cultured to determine presence or absence of the test bacteria. Fisher’s exact test showed that the combination of 1.3% NaOCl as a root canal irrigant and MTAD as a final rinse was significantly more effective against E. faecalis than the other regimens. The chi2 test showed no difference between the other regimens. E faecalis is a predominating pathogen in endodontic failures.

The smear layer in groups 1 to 3 was left intact. The smear layer in groups 4 and 5 was removed using 17% EDTA or MTAD, respectively. After obturation of root canals, the access opening to each canal was filled with India ink for 48 h. The depth of coronal-dye penetration was measured using the Sigmascan software. ANOVA analysis showed statistically significant differences among the groups (p < 0.05). Samples treated with MTAD yielded significantly less leakage than samples treated with sodium hypochlorite. The amount of dye penetration was not statistically different between teeth treated with MTAD or EDTA (p = 0.062).