



Waterclave

Recent research on an innovative, low-maintenance solution to contaminated output water



The Waterclave water treatment and chemical delivery system meets and exceeds Centers for Disease Control and Prevention (CDC) and American Dental Association (ADA) recommendations for dental treatment water, consistently delivering output water containing 0 CFU/mL of heterotrophic mesophilic bacteria. The low-maintenance system also eliminates the need for retrofits, self-contained water reservoirs, point-of-use filters, and continuous-release chemicals.

Plumbed directly to the municipal supply, the Waterclave unit heats city water to an autoclave-like temperature and pressure (270°F / 30 psig) and effectively removes from the water the free oxygen that supports the growth of aerobic bacteria. The closed system resists contamination from outside sources and unlike other chemicals and devices, requires chemical maintenance only two to three times per year (every four to six months). A pump kit allows easy chemical treatment of multiple chairs.

Here's what Loma Linda University researchers' independent studies have discovered after installing the Waterclave ...

Water heating unit effects on bacteria in dental unit waterlines

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Researchers designated eight experimental and eight control chairs at the university's main clinic. All chairs had been treated using the university's standard technique (commercially available chlorhexidine product introduced via individual self-contained water systems). Baseline water samples from air-water syringes and highspeed handpieces were collected, diluted, filtered, plated on R2A agar, and incubated at 25°C for seven days. The waterlines of the experimental chairs then were plumbed to the Waterclave and disinfected using the manufacturer-recommended protocol (i.e., an initial shock treatment comprising a commercially available hydrogen-peroxide-based line cleaner added directly to the Waterclave for delivery to the chairs). The chairs were then put into regular rotation for patient treatment, and weekly water samples were obtained from all chairs for three months.

Of the 88 samples obtained from the Waterclave-plumbed chairs, 87 (99%) contained less than 200 CFU/mL of bacteria; 75 contained no bacteria at all (0 CFU/mL). Nine experimental samples contained 20 CFU/mL, one yielded 40 CFU/mL, one recovered 60 CFU/mL, and one contained 120 CFU/mL. Only one of the 88 samples exceeded the ADA-recommended 200 CFU/mL. Conversely, only 17 of 88 (19%) samples from the control chairs met the ADA's 200-CFU/mL goal.

Waterclave® effects on bacteria in dental unit waterlines

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Expanding the pilot study presented above, researchers connected an additional 32 chairs (for a total of 40) to the Waterclave system and chemically treated the lines using the proprietary hydrogen-peroxide cleaner. Twelve of the 40 chairs were randomly selected as the experimental group, and water samples from air-water syringe and highspeed handpiece lines were collected and prepared as described above to obtain baseline bacterial counts. The chairs were used for patient treatment, and water samples were collected weekly for three months.

Of 360 Waterclave samples, 352 (98%) yielded 0 CFU/mL, and all contained less than the CDC-recommended 500 CFU/mL and the ADA recommended 200 CFU/mL of aerobic heterotrophic mesophilic bacteria. Six of the samples contained 20 CFU/mL; two contained 40 CFU/mL. All lines that had recoverable bacteria yielded 0 CFU counts in their next sample without chemically retreatment.

In summary...

The Waterclave water treatment and periodic chemical delivery system consistently delivers water of a microbiological quality that surpasses drinking water standards and far exceeds national public health recommendations for dental treatment water.