

Dental Water Quality: Distillation and Line Cleaning (4/04)

Palenik CJ, Miller CH. The effect of distillation and line cleaning on the quality of water emitted from dental units. *Am J Dent* 2003;16:385–389.

The presence of microbially contaminated water in dental unit waterlines (DUWL) was first reported in 1963 and since that time numerous studies have indicated the presence of large numbers of microorganisms in DUWL. This study monitored water emitted from dental units connected to centralized water distillation units fitted with reservoirs for dispensing chemicals designed to control biofilms. Levels of microbial contamination prior to the initiation of cleaning indicated marked variability (720-332,000 CFU/mL) and that water containing less than 200 CFU/mL was not being emitted from any operatory water source. However, acceptable water quality was obtained over a period of three weeks from all unit sources after line-cleaning processes were completed. In one office, cleaning was suspended for three weeks without affecting water quality. Resumption of weekly cleanings produced desirable water from all sources in the three offices within two weeks. **Results indicate that dental units attached to a centralized combined water distillation-cleaning solution distribution system can produce water with less than 200 CFU/mL and that missing one weekly cleaning did not negatively affect water quality.**



DIS Comment: In 1995, the American Dental Association addressed the dental water concern by asking manufacturers to provide equipment with the ability to deliver treatment water with ≤ 200 CFU/mL of unfiltered output from waterlines. Since the publication of this article, new recommendations for dental unit water quality have been published. The Centers for Disease Control and Prevention's Guidelines for Infection Control in Dental Health-Care Settings, 2003 now recommend that dental offices use water that meets EPA regulatory standards for drinking water (i.e., ≤ 500 CFU/mL of heterotrophic water bacteria) for routine dental treatment output water. Simply using source water containing ≤ 500 CFU/mL of bacteria (e.g., tap, distilled, or sterile water) in a self-contained water system will not eliminate bacterial contamination in treatment water if biofilms in the water system are not controlled. Removal or inactivation of dental waterline biofilms requires use of chemical germicides. Dental health-care personnel should be trained regarding water quality, biofilm formation, water treatment methods, and appropriate maintenance protocols for water delivery systems. Water treatment and monitoring products require strict adherence to maintenance protocols, and noncompliance with treatment regimens has been associated with persistence of microbial contamination in treated systems. Clinical monitoring of water quality can ensure that procedures are correctly performed and that devices are working in accordance with the manufacturer's previously validated protocol. The authors note that although the results of this study are encouraging, it must be considered as being preliminary. The sample size was small (nine operatories in three separate dental offices) and only one DUWL cleaning system and one type of cleaning chemical was tested. The authors evaluated the intentional missing of weekly cleaning sessions to study the effects of occasional unintended interruptions, not to save on cleaner cost or labor expenditures. Manufacturer recommendations regarding the frequency of use should always be followed.

