Dental Unit Waterline Review (1/03)


Experts from the National Institute of Dental and Craniofacial Research, the American Dental Association, the Organization for Safety and Asepsis Procedures, the U.S. Food and Drug Administration, the Centers for Disease Control and Prevention, the U.S. Department of Defense, academia, and private industry met to determine if a research agenda in the area of dental unit waterlines (DUWL) should be pursued and what questions such an agenda should involve. The members reviewed the scientific literature on the topic of DUWLs in an attempt to determine the evidential basis for management of DUWL contamination and the potential health risks, if any, of using contaminated water as a coolant in dental procedures. The workshop yielded four questions to be addressed in future research: What is the safest and most effective agent(s)/device(s) for achieving microbial levels of no more than 200 colony forming units per milliliter (CFU/mL), in dental effluent water? How should these products be evaluated and by whom? What are the adverse health effects, if any, of chronic exposure to dental bioaerosols or to the agents introduced into the dental unit to treat the waterlines for both dental staff members and patients? How could these health issues be evaluated?

DIS Comment: Standards for safe drinking water quality established by the Environmental Protection Agency, the American Public Health Association, and the American Water Works Association set limits of no more than 500 CFUs of heterotrophic bacteria per mL of drinking water, and the American Dental Association (ADA) recommends that dental manufacturers provide the ability to deliver treatment water of 200 CFU/mL of unfiltered output from waterlines. It is well documented that microorganisms colonize and multiply on the interior surfaces of DUWL resulting in the formation of biofilms. The levels of bacteria in water from untreated dental units often exceed 100,000 CFU/mL of water. Despite the lack of documented adverse health effects, exposing patients or dental healthcare personnel to water of uncertain microbiological quality is inconsistent with generally accepted infection control principles. Current dental unit water systems cannot deliver water of optimal microbiologic quality without some form of intervention (e.g., use of a disinfectant). In addition to providing an agenda for DUWL future research to assist with developing evidence-based parameters for the management of biofilm, the article is an excellent review of the science of DUWLs, the effects of biofilm on human health, and modalities and technology for DUWL treatment.