

Boil-Water Advisories

A boil-water advisory is a public health announcement that the public should boil tap water before drinking it. When issued, the public should assume the water is unsafe to drink. Advisories can be issued after 1) failure of or substantial interruption in water treatment processes that result in increased turbidity levels or particle counts and mechanical or equipment failure; 2) positive test results for pathogens (e.g., *Cryptosporidium*, *Giardia*, or *Shigella*) in water; 3) violations of the total coliform rule or the turbidity standard of the surface water treatment rule; 4) circumstances that compromise the distribution system (e.g., watermain break) coupled with an indication of a health hazard; or 5) a natural disaster (e.g., flood, hurricane, or earthquake) (346). In recent years, increased numbers of boil-water advisories have resulted from contamination of public drinking water systems with waterborne pathogens. Most notable was the outbreak of cryptosporidiosis in Milwaukee, Wisconsin, where the municipal water system was contaminated with the protozoan parasite *Cryptosporidium parvum*. An estimated 403,000 persons became ill (347,348).

During a boil-water advisory, water should not be delivered to patients through the dental unit, ultrasonic scaler, or other dental equipment that uses the public water system. This restriction does not apply if the water source is isolated from the municipal water system (e.g., a separate water reservoir or other water treatment device cleared for marketing by FDA). Patients should rinse with bottled or distilled water until the boil-water advisory has been cancelled. During these advisory periods, tap water should not be used to dilute germicides or for hand hygiene unless the water has been brought to a rolling boil for ≥ 1 minute and cooled before use (346,349–351). For hand hygiene, antimicrobial products that do not require water (e.g., alcohol-based hand rubs) can be used until the boil-water notice is cancelled. If hands are visibly contaminated, bottled water and soap should be used for handwashing; if bottled water is not immediately available, an antiseptic towelette should be used (13,122).

When the advisory is cancelled, the local water utility should provide guidance for flushing of waterlines to reduce residual microbial contamination. All incoming waterlines from the public water system inside the dental office (e.g., faucets, waterlines, and dental equipment) should be flushed. No consensus exists regarding the optimal duration for flushing procedures after cancellation of the advisory; recommendations range from 1 to 5 minutes (244,346,351,352). The length of time needed can vary with the type and length of the plumbing system leading to the office. After the incoming public water system lines are flushed, dental unit waterlines should be disinfected according to the manufacturer's instructions (346).

Special Considerations

Dental Handpieces and Other Devices Attached to Air and Waterlines

Multiple semicritical dental devices that touch mucous membranes are attached to the air or waterlines of the dental unit. Among these devices are high- and low-speed handpieces, prophylaxis angles, ultrasonic and sonic scaling tips, air abrasion devices, and air and water syringe tips. Although no epidemiologic evidence implicates these instruments in disease transmission (353), studies of high-speed handpieces using dye expulsion have confirmed the potential for retracting oral fluids into internal compartments of the device (354–358). This determination indicates that retained patient material can be expelled intraorally during subsequent uses. Studies using laboratory models also indicate the possibility for retention of viral DNA and viable virus inside both high-speed handpieces and prophylaxis angles (356,357,359). The potential for contamination of the internal surfaces of other devices (e.g., low-speed handpieces and ultrasonic scalers), has not been studied, but restricted physical access limits their cleaning. Accordingly, any dental device connected to the dental air/water system that enters the patient's mouth should be run to discharge water, air, or a combination for a minimum of 20–30 seconds after each patient (2). This procedure is intended to help physically flush out patient material that might have entered the turbine and air and waterlines (2,356,357).

Heat methods can sterilize dental handpieces and other intraoral devices attached to air or waterlines (246,275,356,357,360). For processing any dental device that can be removed from the dental unit air or waterlines, neither surface disinfection nor immersion in chemical germicides is an acceptable method. Ethylene oxide gas cannot adequately sterilize internal components of handpieces (250,275). In clinical evaluations of high-speed handpieces, cleaning and lubrication were the most critical factors in determining performance and durability (361–363). Manufacturer's instructions for cleaning, lubrication, and sterilization should be followed closely to ensure both the effectiveness of the process and the longevity of handpieces.

Some components of dental instruments are permanently attached to dental unit waterlines and although they do not enter the patient's oral cavity, they are likely to become contaminated with oral fluids during treatment procedures. Such components (e.g., handles or dental unit attachments of saliva ejectors, high-speed air evacuators, and air/water syringes) should be covered with impervious barriers that are changed after each use. If the item becomes visibly contaminated during use, DHCP should clean and disinfect with an EPA-