

Low-Speed Handpiece Sterilization (12/07)

Herd S, Chin J, Palenik CJ, Ofner S. The in vivo contamination of air-driven low-speed handpieces with prophylaxis angles. J Am Dent Assoc 2007;138:1360–1365.

The authors conducted an in vivo study to determine if low-speed handpiece motors can become contaminated with oral flora when used with prophylaxis angles. This crossover study involved 20 subjects, two types of handpieces and three prophylaxis angles. The authors used each handpiece/prophylaxis angle system to polish teeth, collected samples, spiral-plated the specimens and incubated them at 37°C anaerobically and aerobically (with 5% carbon dioxide). After incubation, the authors examined the plates for the presence of bacterial colonies. At least 75% of the handpiece/prophylaxis angle systems used on the 20 subjects had bacterial contamination for at least one cultured area. Of the 420 specimens, 258 (61.4%) produced bacterial growth. Contamination varied from zero to 6,300 colony-forming units per milliliter. **These data suggest that the internal surfaces of low-speed handpieces can become microbially contaminated during use with prophylaxis angles. Unless low-speed handpieces are sterilized properly after each use, they pose a risk for cross-infection.**



DECS Comment: Multiple semicritical dental devices that touch mucous membranes are attached to the air or waterlines of the dental unit. Examples include high- and low-speed handpieces, prophylaxis angles, ultrasonic and sonic scaling tips, air abrasion devices, and air and water syringe tips. During treatment, the internal portions of handpieces and other devices attached to the air and waterlines may become contaminated with patient saliva, blood, and other oral debris. Although no epidemiologic evidence implicates these instruments in disease transmission, studies of high-speed handpieces using dye expulsion have confirmed the potential for retracting oral fluids into internal compartments of the device. This determination indicates that retained patient material can be expelled intraorally during subsequent uses. An in vitro study showed that the internal portions of some low-speed handpiece motors have the potential to become contaminated when used with both disposable and reusable prophylaxis angles. The same study also showed that there is a potential for internal contamination to be released through the prophylaxis angle into the mouth of a patient during subsequent uses. The present in vivo study showed that unless low-speed handpieces are heat sterilized after each use, they pose a risk for cross-infection.

The USAF Guidelines for Infection Control in Dentistry require heat sterilization between patients for any devices that can be removed from the air and waterlines of the dental unit. This includes, but is not limited to, all handpiece attachments, handpiece motors, reusable prophylaxis angles, reusable air and water syringe tips, and ultrasonic scaler tips. Also, 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 before heat sterilization. This procedure is intended to help physically flush out patient material that might have entered the turbine and air and waterlines. Additionally, it is important to follow manufacturer instructions for cleaning and lubrication requirements for each handpiece and to use separate cans of the lubricant/cleaner before and after sterilization to prevent cross-contamination.

Selected References

- CDC. Guidelines for infection control in dental health-care settings – 2003. MMWR 2003; 52(No. RR-17):1–66.
- Chin JR, Miller CH, Palenik CJ. Internal contamination of air-driven low-speed handpieces and attached prophylaxis angles. J Am Dent Assoc 2006;137:1275–1280.
- USAF Guidelines for Infection Control in Dentistry.