

## Reusable versus Disposable Air/Water Syringe Tips

John A. Molinari, Ph.D., and Peri Nelson, B.S. | Dental Consultants, Inc., Ann Arbor, Michigan

There has been an accelerated increase in the health professions regarding the availability of disposable devices for clinical use in the past three decades. Numerous single-use (i.e., disposable) items are now commonly used in dentistry. These include anesthetic carpules, syringe needles, scalpel blades, cotton rolls, prophylaxis cups, matrix bands, dental dams, saliva ejectors, impression trays, and air/water syringe (AWS) tips. By definition, a single-use disposable item is manufactured and approved for use on one patient and then is to be discarded. As these items are typically neither easy-to-clean nor tolerant to heat, they are not intended for cleaning, sterilization, or re-use on another patient. While manufacturers may or may not identify an item as single-use or disposable in package labeling, printed materials that accompany these devices do not include reprocessing instructions. As a result, long-standing infection control recommendations for dentistry have required heat sterilization of reusable AWS tips between patient appointments to prevent cross-contamination. In addition, current CDC guidelines continue to emphasize the requirement for disposal of single-use items after one use.

Ongoing discussion of infection control issues surrounding reusable vs. disposable devices can present clinicians with information that sometimes includes conflicting rationales for choice and use. Air/water syringe (AWS) tips represent one type of item that is mentioned prominently in these debates. More product choices have become available and dental care providers should review and evaluate the inherent features of reusable and disposable tips, in order to make an informed choice. The following article considers current science and recommendations regarding both categories of AWS tips, as well as recent findings from microbiological testing.

A fundamental issue one initially needs to consider when deciding between reusable or disposable AWS tips is whether the reusable devices can be readily cleaned before heat sterilization. Both the tip and the syringe itself can become contaminated with bioburden and inanimate debris. The persistent presence of organic and inorganic deposits in the lumens could delay or even prevent penetration of sterilizing vapors. A number of reports have demonstrated the presence of accumulated deposits in metal AWS tips that have been reprocessed many times between patient uses. In some instances, the items were cultured and found to be sterile after autoclaving, while other studies demonstrated inconsistent sterilization outcomes. In a recent investigation conducted

by THE DENTAL ADVISOR Biomaterials Research Center, viable bacteria were cultured from the lumens of 3/32 (9.4%) metal AWS tips that had been used hundreds of times and heat sterilized. Particulate material was also visually observed after sterile trypticase soy broth was aseptically forced through 4/32 (12.5%) AWS tip lumens (Figure 1).

When bacterial cultures were gram stained and viewed microscopically, they were exclusively comprised of gram-negative rods. Bacterial presence and appearance were consistent with organisms of water-borne origin. Even though cross-infection has not been documented in this instance, the fact that microbial contamination was detected in approximately 10% of the metal AWS tips tested strongly re-enforces the need to clean lumens of reusable tips before heat sterilization.

A general infection control principle states that sterilization of reusable devices requires pre-cleaning. In the particular instance of AWS tips, the small lumen openings preclude visual examination of accumulated contaminants on the rough internal surfaces. Failure to detect the presence of accumulated debris and the inability to clean the lumens therefore provides strong support for routine use of disposable AWS tips.

A variety of devices are available, some do not require any converters on most common syringes (*FlashTips® Disposable Air Water Syringe Tips*, Sultan Healthcare), while others require special adaptors for air/water syringes (*Sani-Tip® Disposable Air/Water Syringe Tips*, Dentsply Professional).

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Figure 1: Flushing lumen of metal AWS tip with sterile trypticase soy broth.