Revisiting Dry Heat in the Orthodontic Office

Any protocol for sterilization in the orthodontic office must be compliant with current CDC (Centers for Disease Control) Guidelines and state Dental Board Regulations. The CDC has deemed orthodontic pliers as “semi-critical” items and requires processing of these instruments via heat sterilization. If semi-critical instruments are heat sensitive, the CDC allows for high level disinfection of these items. Unfortunately, there are no allowances made for moisture sensitive semi-critical instruments. Many orthodontic pliers fall into this last category. In states with mandatory bagging requirements for sterilization, steam autoclaving is the only practical option. This moisture-laden process has been historically contraindicated for hinged instruments, instruments with sharp edges, and moisture sensitive non-stainless materials (such as the tip inserts of many orthodontic pliers). Rapid Dry Heat Sterilization was developed under FDA oversight specifically for processing these types of instruments in a safe and effective manner. The mechanism of dry convective heating to raise instruments to sterilizing temperature precludes the use of bags or closed cassettes during the sterilize cycle. The current CDC guidelines (2003) do allow for unpackaged processing of instruments as long as they are used immediately or in a short period of time (previously interpreted in CA as same day).

Here is the protocol we recommend for using the Dentronix DDS series of dry heat sterilizers:

Organizing your sterilization area
The sterilization area in which instruments are processed must be set up in a manner that segregates the clean side from the dirty side. The sterilization and cleaning areas are prime candidates for cross-contamination scenarios to occur. Sterilizer unloading and clean instrument storage are on one side; dirty instrument staging and cleaning are on the other side. The sterilizer sits right on the boundary line. Barrier devices or surface disinfection should be used so that handling of sterilizer controls and door latches is done in a manner that does not allow for cross-contamination.

Cleaning Instruments
Organic material on pliers and instruments will bake onto the metal surfaces at dry heat sterilization temperatures, even if it is just saliva. It is important that all instruments are cleaned prior to loading into the sterilizer. For efficiency and safety, we recommend the use of an ultrasonic cleaning system with sufficient capacity for cleaning a full load of pliers and hand instruments. Use a non-foaming cleaning concentrate that is chemically neutral (pH7), contains no enzymes or phosphates, and has an effective rust inhibitor. Our DMP-USP fits this description and is an effective and economical option. If your water supply is high in minerals such as sulfur or iron, you may need to use filtered or RO water for mixing your cleaning solution. Clean instruments for 12 minutes; allow to drain so instruments and racks are not dripping wet, then load into the sterilizer. If your procedure requires rinsing instruments with water prior to loading in the sterilizer, use a clean batch of DMP-USP as a dip prior to loading the sterilizer to prevent rust and corrosion. Change the solution in the ultrasonic daily, or more frequently if it looks soiled. The solution in the tank becomes a repository for all materials removed from used instruments.
Always keep the cover on the ultrasonic machine when cleaning. There can be significant aerosol-ization of the cleaning fluid during ultrasonic cavitation which may release organic matter into the air. For this same reason, blowing off the instruments after cleaning with compressed air can spread droplets of contaminated cleaning solution outside your “dirty” area. Drip dry or paper towel dry only.

**Loading the sterilizer**
Always follow the manufacturer’s recommendation for loading of your sterilizer. Rack and tray systems included with your unit have been tested and validated to assure efficacy. Aftermarket products have not. Do not use packaging material of any type unless the sterilizer has been specifically designed for it (like the DDS 6000). Cassettes should also not be used as they can significantly increase thermal mass and disrupt the air flow of the chamber. After loading the sterilizer, remove disposable barriers or disinfect all surfaces that have been contacted during the loading process.

**Sterilize**
In the DDS series of dry heat systems, simply lock the door, push the START button and wait for the STERILIZE COMPLETE indication. Instruments will be cooled enough to handle immediately at the end of the cycle.

**Processed Instrument Storage**
The CDC guidelines are specific about preventing environmental contamination of sterilized instruments when they are processed unpackaged. We recommend placing a barrier such as our Dentronix Barrier Bags over the instruments to protect them from contamination. A written procedure for preventing contamination is required.

**Lubrication**
Instruments should be lubricated weekly with a food-grade, pure silicon product such as our DSL-16. This can be done before or after sterilization. Many offices find it is more practical to do this prior to loading in the sterilizer. Settle on a consistent place in your process to make sure the lubricant container doesn’t become a potential source of cross-contamination. Do not use petroleum-based lubricants in dry heat sterilizers. They will actually cause tightening of plier joints and can be toxic to patients.

**Using Process Indicators**
Your Dentronix sterilizer is equipped with a variety of mechanical process indicators which measure time and temperature parameters in real time. Chemical process indicators can be used with every cycle to show that temperature parameters were met inside the load, however the only way to verify your sterilizer’s effectiveness with certainty is to use Biological Indicators (BI’s). These tests use living organisms to verify that your sterilizer actually kills bugs. The CDC recommends that these tests be performed weekly. BI’s provide a test strip and a control strip and are cultured either by a third party or in your office. There are different organisms for dry heat and steam under pressure (Autoclave). Many strips are dual organism, but they are incubated at different temperatures depending on the type of sterilizer tested.

**Summary**
- Make sure there is a defined line between the dirty side and the clean side in your sterilization area.
- Thoroughly clean your instruments to remove organic materials.
- Load the sterilizer according to manufacturers’ instructions.
- Allow the sterilizer to cycle through a complete sterilization cycle before removing instruments.
- Protect clean, sterilized instruments from environmental contamination.
- Lubricate pliers weekly with silicon.
- Monitor your sterilizer’s effectiveness with process indicators.
- Familiarize yourself with national and state guidelines for infection control before an audit.