Table Top Sterilizers

****This in-service has been Approved by the CBSPD for 1 CEU.**

Table top sterilizers are usually found in facilities where there are a limited number of medical devices to be sterilized such as physician offices, dental offices, clinics and laboratories.

A table top sterilizer is a compact pressure vessel that has a chamber volume of not more than 2 cubic feet that generates its own steam when distilled or deionized water is added by the operator. Distilled or deionized water is recommended to prevent buildup of minerals in the reservoir and on processed devices and to ensure the purity of the steam generated for sterilization. Table top sterilizers are typically "unplumbed" i.e., not connected to a steam source and must be checked daily to ensure that there is enough water in the reservoir for the number of loads to be processed. The water is electrically heated and vaporized into the chamber during the sterilization process by a valve or other means of injection. After each cycle a condensation coil condenses the steam back into water. Sterilization cycles are between 250 degrees F (121 degrees C) and 270 degrees F (132 degrees C). Gauges (manual) or LED displays (automatic) are used to display temperature and pressure. Mechanical timers (manual) or programmable timers (automatic) are used to determine the length of the sterilization cycle.

Steam sterilizers in general consist of: a sterilization chamber, a source of steam, a process for evacuating air from the chamber and a method of infusing steam into the chamber, a means of heating the water and controls for timing the sterilization cycle. The sterilization chamber is the totally enclosed area into which materials are placed for sterilization. This chamber is equipped with an access door for closing and sealing (gasket) the chamber. Prior to operating the sterilizer all personnel should be taught to properly operate the sterilizer; the cycles it has available and what, if any, maintenance is required. It is essential to read the manufacturers instructions for operation and maintenance. The manufacturer's instruction manual should be kept by the user as long as the sterilizer is in service.

In most, there are different combinations of sterilization times and temperatures which are pre-programmed in the control unit to accommodate different packaging materials. The cycles are limited and consist of wrapped instruments or peel pouches, unwrapped instruments, and liquids. Most of these units are gravity displacement sterilizers but some manufacturers offer dynamic air removal table top sterilizers. The majority of these units have locked in cycles and the operator cannot alter the time or temperature settings. This creates a challenge when trying to process specialty items. If the cycle recommended by the manufacturer of the specialty device is not available on the sterilizer, the sterilizer should not be used to process that specific item. The device manufacturer should specify the conditions required for the sterilization of each

individual device. Most metal instruments require only surface sterilization. The addition of porous items or items with lumens require a longer sterilization time to assure adequate steam penetration. The drying time varies and depends on the sterilizer and load configuration. If the sterilizer has no programmed drying cycle it is customary to open the door ½ inch at the end of the cycle, allow the moisture to escape and then initiate the drying cycle which generally operates with the door open.

Before sterilization or high level disinfection, instruments should be thoroughly cleaned of all debris. Cleaning is an absolute pre-requisite to the sterilization of surgical and dental instruments. Thorough cleaning followed by rinsing is important to prevent spotting, staining and the accumulation of biofilms. To prevent drying or encrustation of debris, instruments should be kept moist with water or an enzymatic foam or gel if they cannot be cleaned immediately after a procedure. Enzymatic solutions facilitate effective instrument cleaning. Personal protective equipment must be worn when handling contaminated instruments.

Packaging cleaned, rinsed and dried instrumentation prior to sterilization protects them from contamination after they are removed from the sterilizer and during transport or in storage. The primary function of a packaging material is to allow sterilization of the contents, to maintain the sterility of the contents until the package is opened and to provide for the removal of the contents without contaminating it. It is important to follow the manufactures instructions for cleaning and sterilization of medical devices to ensure the effectiveness of the selected sterilization process. All instruments should be held open and in the unlocked position. Instruments that can be disassembled are to be processed as separate pieces. Devices with stylets or obturators should be disassembled before processing them in a table top steam sterilizer. Most, but not all, tabletop steam sterilizer manufacturers have not validated sterilization of either double peel pouches or peel pouches within wrapped goods. If the sterilizer you are using has not been validated for these configurations, the practice should be considered unacceptable because there is no assurance that the sterilizer is capable of processing the items.

Medical devices prepared for sterilization must be loaded into the sterilizer according to the manufactures instructions. Generally, linen items will be loosely loaded on their side with about one inch between the packages. Peel pouches should be placed on their side in a basket or loading rack with plastic to paper and all turned the same way. Solid trays should be tilted on edge if the sterilizer is large enough to accommodate them. Packaging materials should not touch the chamber walls of the sterilization unit. When the sterilizer is loaded there should be space for free circulation of steam around and within each packaged device. It is important to have the steam contact all surfaces that are to be sterilized. Metal devices should be placed on a separate shelf below textile packages.

When removing items from the sterilizer they should be visibly dry. Packages should not be touched while they are hot. Condensate moisture can wick contaminants into the package. Sterile items should never be handled before they are cool. Once the items are removed from the sterilizer they should be allowed to cool in the loading tray untouched. Place the tray in a low traffic area, away from air vents to decrease exposure to the

environment. After the sterile items are cool they should be stored in a clean, dry, easily accessible area on or in designated shelving, counters or containers. They should never be stored under sinks, near water or sewer pipes, or in any area where they can become wet.

Qualification testing should be done before the sterilizer is put into regular use to establish a baseline for the sterilizer's performance. The same testing should be done if there has been a sterilizer malfunction or a sterilization process failure. For the gravity displacement steam sterilizer validation is performed by performing three biological test packs processed back to back in full loads. Test packs should be assembled in a way that simulates the items routinely sterilized. If the tabletop is a pre-vacuum steam sterilizer the three biological tests should be followed by three dynamic air removal tests, processed back to back. The BIs in the pre-vacuum cycles should also be in full loads and packaged to simulate the items routinely sterilized. If large wrapped trays will be processed it may be possible to use commercially prepared test packs. Check with the BI manufacturer to determine if their packs are compatible with the table top sterilizer cycles you will be using. **If multiple cycles are used (e.g. wrapped, unwrapped,) all must be tested three times.** All three of the tests must be negative. Only after the results are known can the sterilizer can be put in to use.

AAMI recommends that routine biological testing be performed at least weekly but preferably daily. Each load containing implantable devices should be monitored and, when possible, the implantable device should be quarantined until the monitoring results have been obtained. If a sterilizer is to be used for multiple types of cycles each cycle should be monitored at least weekly. The more often the sterilization process is monitored the more likely you are to detect a sterilization process failure. These simple precautions reduce the risk of a patient infection and the financial impact of a recall, as well as cost of reprocessing. Proper functioning of steam sterilization cycles should be verified by the routine use of biological indicators. Biological indicators consist of about one million highly resistant bacterial spores of *Geobacillus stearothermophilus* . Several types of biological indicators are available. It is imperative that the BI used is the one designated for the cycle you are testing. The sterilizer manufacturer determines the placement of the biological. Generally, it is placed on the bottom shelf toward the front of the sterilizer chamber. Processed items should be held in quarantine until the results of the BI is known. A control biological indicator is necessary to validate the pre-sterilization viability of the test spores; the lot control number of the BI vial must match the lot control number of the control vial. The BI manufacturer's instructions should be followed for storing, using, incubating and reading the BI. All biological indicator results, including results from controls, should be interpreted by a qualified individual and the results noted in the sterilization records. Positive biological indicators should be disposed of according to manufacturer's instructions.

Both internal and external chemical indicators in the form of tape, strips and pre-marked packaging change colors after exposure to one or more sterilization conditions but do not guarantee sterilization. They are used as a visual to indicate that the package has been exposed to a sterilization cycle. The external indicator should be placed on every item

where it will be visible after the package is prepared. The indicator should be examined after sterilization and before use. The internal indicator is to be checked by the end user.

Mechanical monitoring is best described as the charts, gauges and printouts unique to each sterilization unit. At the end of each cycle the user should check and verify that the time, temperature and pressure were correct. These records should be initialed by the user and any discrepancies should be reported. If tabletop sterilizers do not have some type of recording device one should be installed. If the sterilizer cannot be equipped with a printout, a Class V chemical integrator should be used with each load to provide additional documentation that cycle parameters were met.

Administrative monitoring is the departmental policies and procedures for sterilization that all processing personnel should be familiar with in their facility.

The information supplied here does not address all that one needs to know about table top sterilizers but it does provide an overview of what they are, how they are used and how they are monitored. For more information regarding Table Top Sterilizers refer to AAMI ST-79 (Comprehensive Guide to Steam Sterilization and Sterility Assurance (2006) and the Basics of Sterile Processing, 2nd Ed., 2007.

POST TEST QUESTIONS: Table Top Sterilizers

This in-service is Approved by the CBSPD for 1 CEU. Complete this post test and follow the directions at the end of the test for payment and results.

1. How does a table top sterilizer get its steam?
   A. from a still
   B. from the boiler
   C. generates its own
   D. from the hot water faucet

2. What kind of water is used in table top sterilizers?
   A. pasteurized
   B. hot tap water
   C. sterile distilled
   D. distilled or de-ionized

3. Table top sterilizers are generally found in all of the following EXCEPT
   A. clinics
   B. laboratories
   C. dental offices
   D. medical centers

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POST TEST QUESTIONS: Table Top Sterilizers

4. Most table top sterilizers use which of the following as their steriliant
   A. steam
   B. dry heat
   C. ethylene oxide
   D. peracetic acid

5. Prior to sterilization all surgical and dental instruments must be
   A. clean
   B. labeled
   C. packaged
   D. approved by FDA

6. Which of the following facilitates effective instrument cleaning?
   A. warm tap water
   B. enzymatic solutions
   C. germicide solutions
   D. instrument lubricant

7. When the sterilizer is loaded there should be space around and within each packaged item
   A. to allow for air circulation
   B. for free circulation of steam
   C. to pick it up without touching others
   D. for the prevention of contamination

8. When removing items from the sterilizer they should
   A. be visibly dry
   B. be cool to the touch
   C. be cooled on a stainless steel table
   D. be immediately carried by hand to sterile storage

9. Qualification testing should be done before the sterilizer is put into regular use
   A. to establish a baseline for the sterilizer's performance
   B. so the manufacturer can be paid for the unit
   C. To meet Joint commission requirements
   D. Because it is recommended by AAMI

10. AAMI recommends that routine biological testing be performed
   A. at least weekly
   B. every load
   C. monthly
   D. on each shift

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POST TEST QUESTIONS: Table Top Sterilizers

11. Which of the following requires a biological to be run in the load?
    A. implantables
    B. dental hand pieces
    C. canulated instruments
    D. general surgical instruments

12. Monitoring precautions reduce all of the following EXCEPT
    A. financial impact of a recall
    B. risk of a patient infection
    C. cost of reprocessing.
    D. quality assurance

13. Both internal and external chemical indicators are used
    A. as visuals to indicate that the package has been xposed to a sterilization cycle.
    B. to verify that the time, temperature and pressure were correct
    C. to determine the sterility of a processed medical device
    D. as a means of record keeping on the patients chart

14. Qualification testing of table top sterilizers requires
    A. Three consecutive BI tests
    B. Three consecutive chemical indicator tests
    C. Empty chamber testing
    D. Extended cycle times

15. The primary purpose of external chemical indicators is to
    A. prove absolute sterility of the package contents
    B. serve as an indication the package has been exposed to the sterilization cycle
    C. assure steam has reached the inside of the package
    D. provide a space to record the set contents

Directions for Payment and Results

This in-service = $10
Re-do's = $10 each

No refunds (all sales are FINAL), prices subject to change.

Payment is accepted in the form of a Credit Card, Facility Check, or Money Order only. Sorry, no personal checks.

Please see the form on the following page.

Upon passing this in-service, your certificate will be mailed to you within 7-10 business days.

Please fill out the form below and submit it with your payment and the quiz to:

Sterile Processing University, 59 Allerton Road, Lebanon, NJ 08833.

Name: _____

Mail to: ___ Home ___ Work

Full Address: _____

_____

Phone: _____

Email: _____

For Credit Card Orders Only: ___ Visa ___ MasterCard ___ Discover

Credit Card Number: _____ Exp. Date: _____

Person's Name on Card: _____

Card Billing Address: _____

_____

If you have any questions, please email heidi@spdceus.com

Thank you!