IMPROVING THE QUALITY OF the Sonic Cleaning Process

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Objectives

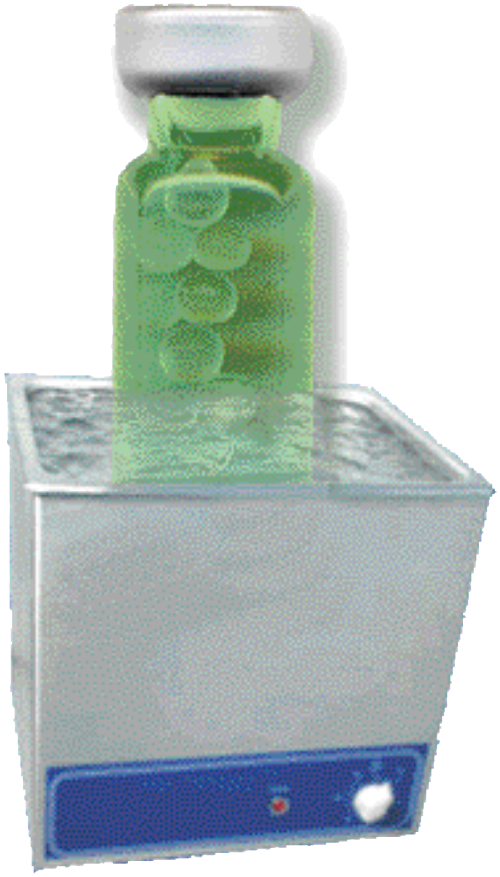
After completion of this self-study activity, the learner will be able to:

1. Understand the factors that influence the sonic cleaning process.
2. Describe the role de-gassing plays in sonic cleaning.
3. Test to determine if a sonic cleaner is functioning properly.
4. Design a quality improvement program for sonic cleaning.

Test Questions

True or False

1. According to the Association for the Advancement of Medical Instrumentation, ANSI/AAMI ST 35:2003 *Safe handling and biological decontamination of medical devices in health care facilities and in nonclinical settings*, sonic cleaners are meant only to clean, not to sterilize and disinfect.
2. A surgical instrument that is not properly cleaned could fail to be effectively sterilized.
3. De-gassing conditions the bath/solution for maximum efficiency and should be done for each new fresh bath/solution.
4. Decontamination holding time (DHT) is the amount of time that elapses between an instrument's last use and the start of the cleaning process.



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Managing Infection Control *and 3M Health Care will be working collaboratively to provide continuing education courses in monthly editions of* Managing Infection Control.

5. Improper water temperature could cause less than optimum function by an enzyme/detergent solution.
6. The dilution rate of the solution used in the sonic cleaner's tank can affect instrument cleanliness.
7. Sonic cleaner operators should never put their hands inside a working (running) unit.
8. Monitoring the key factors of the sonic cleaning process helps ensure that surgical instruments are getting clean.
9. Both Joint Commission for the Accreditation of Health Care Organizations (JCAHO) and Association for the Advancement of Medical Instrumentation (AAMI) encourage the use of quality improvement programs within Central Service (CS).
10. Always follow the detergent manufacturer's directions for complete rinsing of its product off instruments.

Introduction

"Cleaning is critical because residual organic material (e.g., blood, bone, proteinaceous material) can inactivate disinfectants; moreover, if a device is not cleaned thoroughly, sterility may not be achieved."[1]

Surface cleaning is a crucial aspect of any Central Service (CS) department's cleaning process. Effective cleaning of any surgical instrument is important regardless of the complexity of the instrument. There is no such thing as "sterile dirt."

Almost all surgical instrument manufacturers recommend sonic cleaning in their guidelines for care and cleaning of surgical instruments:

"Ultrasonic cleaners are used to remove soil from joints, crevices, lumens, and other difficult to access locations. The use of enzymatic detergent in the ultrasonic cleaner is recommended. Ultrasonic Cleaners should be monitored routinely to ensure that they are working properly."[2]

Just as instruments have become more advanced and complex, so has the sonic cleaning equipment that can be purchased by hospital CS departments. These advancements have taken a simple tank with transducers to a level where sonic equipment now can combine the power of irrigation with sonic energy to clean lumen instruments better than ever before. Add the advancements that have been made with cleaning solutions, and today many sonic equipment manufacturers claim they can:[3,4]

- Improve consistency of cleaning in internal areas of surgical instruments;
- Reduce risk to staff from airborne and blood-borne pathogens created by manual brushing;
- Improve patient care by reducing risk of exposure to cross-contaminants;
- Reduce time spent trying to manually clean places that cannot be seen or reached;
- Reduce internal and external instrument damage caused by manually brushing, tapping or bending; and
- Reduce instrument-repair budgets.

From an instrument manufacturer's point of view, ultrasonic cleaning is an essential part of the cleaning process and should be used as frequently as possible. Today's CS professionals must understand how sonic cleaning works and are responsible for ensuring that their department's ultrasonic equipment is working properly.

What Is Sonic Cleaning?

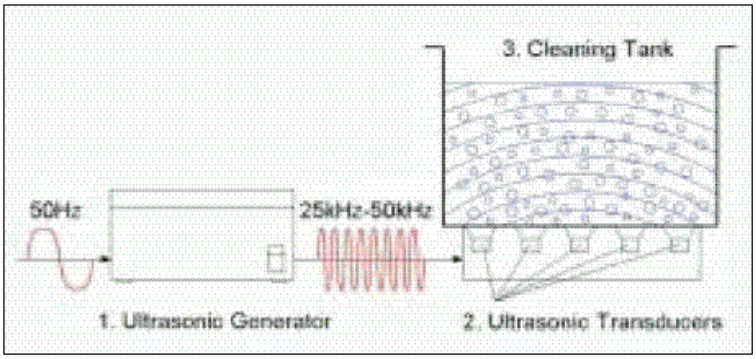
Sonic cleaners are designed for fine cleaning of medical devices, not for disinfection or sterilization. They are used to remove soil from joints, crevices, lumens and other areas that are difficult to clean by other methods.[5]

A sonic cleaner can have a single tank or as many as three tanks in a hospital setting. In a multitank system, the first tank is usually for cleaning, the second is for rinsing, and the third is for drying. In a two-tank system, one tank cleans, and the other rinses and dries.

The sonic cleaners used in hospitals work via high-frequency sound waves (usually above 20kH) to produce an effect called *cavitation*—tiny bubbles of vaporized liquid that implode (rapidly collapse) and create high-pressure shock waves.

Ultrasonic transducers create this high-frequency sound by converting high-frequency electrical power to mechanical energy (vibrations). See Figure 1. This energy is transmitted to the cleaning solution via a bank of transducers attached to the underside of the cleaning tank.

Figure 1: Sonic Cleaner Unit Diagram



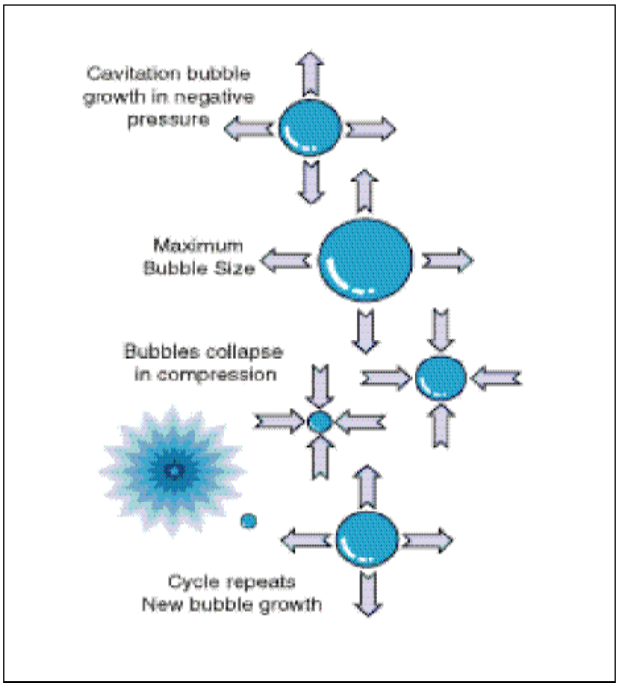
Cleaning takes place as the cavitation dislodges soil from the surface, tiny crevices and other areas that are difficult to clean on contaminated instruments, which are placed in the tank with cleaning solution. Cavitation literally sucks soil off the instrument like a vacuum (Figure 2 on page 86).

Most sonic cleaners have multiple transducers producing the cavitation energy. If one or more of these transducers are not functioning, the sonic cleaner tank can have what are known as "cold spots," areas within the tank where there is no cavitation. Obviously it is important to know the location of any cold spots. In a machine with several cold spots, cleaning time will be extended.

Like any cleaning process, sonic cleaning is affected by outside factors. Factors that influence the effectiveness of sonic cleaning are:

1. *Energy*—created by the mechanical action of the generators and transducers to produce the cleaner's cavitation;
2. *Target soil*—the type of soil being cleaned;
3. *De-gassing*—freeing trapped air;
4. *Chemical activity*—the type and amount of the cleaning solution chosen;
5. *Water quality*—hardness and pH;
6. *Water temperature*—hot or cold cleaning solution;

Figure 2: Cavitation



7. *Time*—length of exposure to cavitation;
8. *Human factors*—training, loading procedures, proper use of equipment;
9. Other issues—such as pre-cleaning and safety.

The various combinations of these factors determine how clean an instrument can or will be when placed inside the bath/solution of a sonic cleaner.

The first factor, energy, has been explained above in the section on cavitation. Now let us look at the other factors.

Target Soil

Sonic cleaning is used primarily on surgical instruments, so the target soil is usually blood. Many other soils can be present, but blood is a primary concern for the CS department when cleaning surgical instruments.

Several characteristics of blood are important to know for cleaning. The first is that hemoglobin becomes highly insolvent when it dries. Secondly, fibrin, the coagulating agent in blood, is inherently water insoluble. Third, blood denatures at temperatures above 113ºF (45ºC). When blood denatures, it becomes highly insolvent. It bonds strongly to the substrate (i.e., the surface of the instrument) and dries, becoming very resistant to any cleaning action. Thus, it is very important to keep decontamination holding time (DHT) (the time between when the instruments were last used and the cleaning process starts) to a minimum. The sooner the cleaning process begins, the better.

De-gassing

De-gassing is the process of releasing dissolved air bubbles within the cleaning solution. In order for the degassing process to work, it must be done with the detergent/enzyme mixed in the bath solution. It is important to expel these air bubbles because they have a direct effect on the ability of the equipment to clean. The presence of dissolved air weakens the cavitation force of the sonic cleaner.

De-gassing is done after the cleaning solution has been added. The amount of time will vary, depending on the type of chemical used (e.g. aqueous or solvent), temperature, size of the tank and water quality. Generally, the process takes as long as one cycle without any instruments in the filled tank. Consult the ultrasonic cleaner's instructions for use on the length of time required to de-gas a tank full of solution.

Remember that de-gassing conditions the bath/solution for maximum efficiency and should be done for each new fresh bath/solution. If the sonic cleaner has not been used for some time, the solution should be de-gassed because dissolved air can reenter the cleaner.

Chemical Activity

There are many types of cleaning solutions on the market today; each has its plusses and minuses. When choosing a solution, always consider the following:

- The type of instrument to be cleaned;
- The instrument manufacturer's recommendation;
- The type of soil to be cleaned;
- Compatibility of the solution with your sonic equipment;
- Use of a low-foaming solution to minimize foam settling on instruments;
- Technical data (such as white papers) supporting the claims of the solution manufacturer. (A material safety data sheet [MSDS] should be provided with any solution. These can be used to evaluate the key ingredients and their possible impact on items being cleaned.)

For proper use of the cleaning solution:

- Be aware that excess amounts of certain chemical additives will not support sonic cleaning. More is not always better; if solution must be added manually, use the correct amount.
- Many solutions are concentrated and must be diluted with water. In some cases, distilled water may be required. The best solution concentration is indicated on the solution container.

Remember, not all solutions are created equal. Some solutions need a higher temperature to work at their optimum efficiency. A solution with many features may not be necessary in a particular CS department. It's more important to know which solution will work best in your department on your instruments.

Although blood is the usual target soil on surgical instruments, a different, somewhat slimy soil is commonly found on orthopedic instruments and is hard to clean. It could be synovial fluid; if so, a product that can remove it must be chosen. It cannot be stressed enough the importance of knowing what type of soil is being removed, and choosing the appropriate product or products in each case. In some situations two solutions may be required.

Water Quality

Water quality is a broad concept covering several key characteristics of water. For the CS professional, the relevant measurable characteristics are pH level and hardness. The pH is the measurement of the acidity or alkalinity of a liquid. The scale goes from 1, which is acid, to 14, which is alkaline. The midpoint, 7, is neutral. The pH scale is logarithmic, meaning each number in the scale represents a 10-fold increase over the previous number. For example, water with a pH level of 4 is 10 times more acidic than water at pH 5.

The pH level can affect detergent/enzyme performance; thus, it is important to know the optimum pH value for the cleaner being used.

Water hardness is defined as the concentration of calcium and magnesium ions expressed in terms of calcium carbonate. These and other minerals bind with the cleaning agents in detergents/enzyme solutions and prevent them from reacting with the soil on instruments. Water that is too hard (containing too many minerals) can cause spotting and filming on instruments, and cause unsatisfactory cleaning outcome.

The pH and hardness values of water can fluctuate over time. These fluctuations will affect the performance of the solution in a sonic cleaner. Therefore, it is important to test and monitor water quality to ensure that optimum values are present.

Water Temperature

Equally important to knowing water quality is understanding and knowing the temperature of the bath/solution in the ultrasonic cleaner. Each solution has a temperature at which it functions best. The solution must be kept at this optimum temperature in order to clean most effectively. The sonic process itself creates heat, and over time this heat can raise the temperature of the bath/solution to a point where it reduces the cleaning efficacy of a particular solution. Remember, "hotter is not always better." Achieving the proper temperature and maintaining it throughout the cleaning cycle is key to effective cleaning; thus CS professionals would be wise to monitor temperature during the cycle.

Time

Cleaning times can very depending on the type of soil, the solution used, water temperature, and the degree of cleanliness desired. Instruments should be visibly cleaner almost immediately after they are placed in a sonic cleaner.

The tray/basket used in the machine can affect the cavitation energy the instruments receive.[6] The type of tray and the density of the load (number of instruments placed in the tray) is directly proportional to length of cleaning time. With certain trays and loads, a standard cycle time might not do the job.

Many sonic cleaners have a variable time setting. This is important, because it allows a CS department to adjust for the many variables associated with sonic cleaning.

Cleaning time is the easiest (and often the wrong) factor to adjust to compensate for process variables. An experienced operator can approximate cycle duration for a certain instrument load, but should validate by actual use with the chosen solution and the actual soiled instruments. An easy way to do this is by testing a few instruments at a time.

CS staff should ask for the instrument and sonic cleaner manufacturers' recommendations regarding cleaning time for their products. This information provides the CS department with a starting point from which timing adjustments for particular instruments or soils can be made.

Proper Loading of Instruments

Loading instruments into a sonic cleaner is very important, so one must:

- Separate instruments to avoid electrolytic action between different metals (stainless steel instruments should not be mixed with their aluminum, brass or copper counterparts).
- Remove gross soil from instruments by prerinsing prior to sonic cleaning.
- Do not place chrome-plated and ebonized instruments or items made of cork, wood or glass in the sonic cleaner.
- Rinse any prefoam or spray off the instruments; such materials may not be compatible with the cleaning agent used in the tank's bath/solution.
- Place all box locks in the open position.
- Fill lumen items with fluid so the cavitation power can work inside the lumen.
- Spread instruments out over the tray to allow maximum exposure to the cavitation power.
- If using an irrigation/sonic cleaner, use the correct ports and close off any unused ports. This will allow for maximum flow into the lumen items.
- Completely submerge instruments in the bath/solution.
- Make sure the tray/basket is properly located inside the tank. This allows for maximum exposure to the cavitation power.
- Rinse all instruments after cleaning them in a sonic unit that has *only one tank*. This is important because residual detergent/enzymes on an instrument is undesirable.
- Follow manufacturer's directions for the proper rinsing of the instrument. Consult the manufacturer of the instruments to be cleaned and the sonic cleaner manufacturer for any special instructions.

Human Factors

CS staff should understand how the sonic equipment works; such knowledge is key to ensuring that instruments are safe to assemble and then sterilize.

Staff training should involve the following:

- Demonstration of proper use of sonic equipment by a manufacturer's representative. All shifts must attend a demonstration.
- Documentation of the inservice/training.
- Minimum yearly review of the sonic cleaning process for all staff.

Proper inserving of the staff will help ensure that instruments are properly exposed to the cavitation power of the sonic cleaning process.

Other Issues—Safety, Bath Changes, Solution Levels

Safety is always important when dealing with any powered equipment, including sonic cleaners. All staff should be aware of safety procedures and should be properly attired in the appropriate personal protective equipment (PPE), and should be aware of these safety procedures:

- When the equipment is being used for cleaning (not testing) the lid must always be closed to prevent excess emission of noise and aerosols.
- No part of the operator's body should be submerged in the bath/solution during operation.
- The sonic cleaner should be off when inserting or removing trays/baskets from the tank.
- Carefully lower trays (do not drop quickly) into the bath/solution. This will minimize or reduce the amount of air introduced into the bath/solution.

Professional opinions vary regarding the need to change the bath/solution in the sonic cleaner. The majority of the manufacturers recommend immediate replacement of water once it is heavily contaminated. Contaminated solution can result in a loss of cavitation power. My recommendation is to change the solution as often as needed, preferably after each use. After each change of bath/solution, check the screen or trap, and clean off any debris, such as bone chips or paper. Many automatic machines will refresh the bath after each use. Again, the key to effective sonic cleaning is cavitation power. Frequent bath changes help maximize this power, ensuring a better cleaning process.

Maintaining the proper level of solution in the tank is also important; sonic cleaning is a "fine-tuned system." Improper solution levels can negatively affect the sonic cleaning process and can damage the cleaner. Sonic cleaning systems were tested with specific volumes of solution. Insufficient solution volume can reduce the cavitation effect power.

Quality Control for the Sonic Cleaning Process

JCAHO and AAMI recommend that sterile processing departments have process performance programs in place:

> *"Medical equipment is maintained, tested and inspected."*[7]

> *"A problem analysis should be completed for any aspect of decontamination that can pose a risk to personnel or patients. The problem analysis should define and resolve the problem and the system should be monitored to ensure that the problem has been corrected."*[8]

> *"Ultrasonic Cleaners should be moni - tored routinely to ensure that they are working properly. Recommended monitoring methods are:*
>
> *1) Sonocheck monitoring vials (from Healthmark Industries Co., 22522 East Nine Mile Road, St. Clair Shores, MI 48080 USA) which change color when the ultrasonic cleaner is supplying sufficient energy and conditions are correct.*
>
> *2) Aluminum Foil Test (Reference: The Aqueous Cleaning Handbook: A Guide to Critical-Cleaning Procedures, Techniques, and Validation, Alconox, Inc. 2002, 3rd Edition, White Plains, NY, pps.110-111."*[9]

The Organization for Safety and Asepsis Procedures (OSAP) is a global dental safety organization, and this organization recommends routine testing of sonic cleaners within the dental practice.

The FDA considers the sonic cleaner a Class 1 medical device. The cleaner must be maintained in proper working order, and CS staff need to know whether or not it is working properly. One of the best ways to ensure that the machine is functioning properly is to establish a quality improvement program for the sonic cleaning process. A quality improvement process helps ensure adherence to both JCAHO and AAMI standards.

Testing is a key component of a quality improvement program. Tests provide a means of monitoring the variables that affect the effectiveness of sonic cleaning (i.e., water quality, time, detergent/enzymes, temperature, agitation, speed, initial temper-

ature, chemical concentration, equipment failure). Ultrasonic cleaners should be tested at least weekly, and the results of the test should be documented. Tests fall under two categories: periodic functional tests and routine tests.

A **periodic functional test** is performed for initial set-up and then quarterly or after repairs. Its purpose is to verify uniform distribution of cavitation in the sonic cleaner. Uniform distribution of sonic cavitation within the bath ensures satisfactory performance by the cleaner and allows performance of routine testing. A periodic functional test can be used to fine-tune the ultrasonic cleaning process if results are found to be unsatisfactory. It also helps identify "cold spots" in the tank. (See Figure 3 for placement of testing devices for the periodic functional test.)

A **routine test** is performed weekly to verify that proper cavitation is taking place. Such parameters as water level, de-gassing, instrument load, and energy supplied by the transducers can cause variations in the process that affect performance. Only routine testing will detect ultrasonic performance deterioration and prevent ineffective ultrasonic cleaning. The routine test is performed under normal conditions in an empty tank. (See Figure 4 for placement locations for individual test devices.)

Figure 3: Periodic Functional Test (Size of Tank)

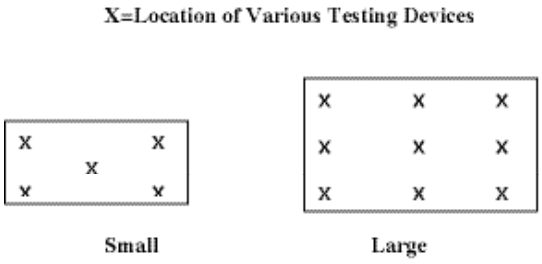
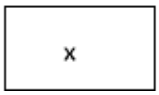


Figure 4: Routine Test (Center of a Tank)



The following is a simple program for monitoring the sonic cleaning process. Sterile processing departments should include it as part of their JCAHO process improvement program.

Inspection & Testing

Daily:

- Follow manufacturer's guidelines for daily inspection of equipment (wipe down tank at end of day, check gaskets, clean screens, etc.).
- Inspect the level of detergent. Each day, mark the date on the solution container at the level of solution remaining. This will allow staff to see how much solution is being used.
- Log all observations in a report.
- Report any concerns to the proper management staff.

Weekly:

A complete test of all inputs of the ultrasonic process should be run each week. Observations and test results should be entered in a log/report.

Step 1—Equipment Inspection: Inspect equipment (screens, gaskets, etc.) according manufacturer instructions. Record results.

Step 2—Water Quality Inspection: Measure hardness and pH of the tank bath/solution before adding cleaning solution. (A simple dip stick method can be used. Record results, and report any concerns to the proper management staff.)

Step 3—Water Temperature Inspection: Measure the tank bath/solution temperature with a liquid reversal thermometer. The thermometer should be applied to the inside of the tank wall just below the water line. Record results on log sheet, and report any concerns to the proper management staff.

Step 4—Test Sonic Cleaner Performance: CS staff have traditionally chosen one of four methods—a pencil load test, an aluminum foil test, an ultrasonic activity detector, and a SonoCheck™ to test sonic activity in the cleaning tank.[10]

Procedures for Testing Sonic Activity

Each test will be described in this section. In each case, test results should be recorded and then compared with results of the same test conducted when the cleaner was originally installed. In case of unsatisfactory test results, refer to the troubleshooting guide supplied by the manufacturer of the particular test being used. Any concerns should be reported to the proper management staff to address.

Pencil Load Test

In a pencil load test (also known as the ceramic disc test), the surface of an unglazed ceramic disc or plate having a matte finish and a diameter of approximately 50mm (thickness is not critical) is rubbed with a standard HB lead pencil and then immersed in the cleaning tank. *Consistent, equal application of the lead onto the disc every time is very important*. (The Steris® Company has recommended this method in the past, but the disks are no longer available.)[11]

A ground glass stopper, a sheet of ground glass, or an aluminum sheet with a thickness of 2-3mm may be substituted for the ceramic disc. The ultrasonic cleaner should completely remove the pencil lead within three minutes.

Strip of Aluminum Foil

A strip of aluminum foil can also be used to test a sonic cleaner. Several tests using aluminum foil have been described in the literature.[12] Recommendations vary regarding the thickness of the foil strip, but it should be at least 0.025mm. One test recommends suspending nine strips of aluminum foil, 15mm to 20mm wide, within 10mm of, but not touching, the bottom of the tank. Another method is to take three pieces of foil, each measuring 10-20cm, and fold them over rods suspended in various areas of the tank. The presence of significant pitting and a uniform pattern of dents and holes in the foil strips after cleaning indicate the unit is working.

Ultrasonic Activity Detector

Testing can also be done with an ultrasonic activity detector, a device developed to determine ultrasonic activity levels.[13] The device consists of a stainless steel probe with a plastic handle and connecting cable. The cable plugs into a hand-held instrument that indicates and monitors ultrasonic activity. The probe is placed into various sections of the tank, and measurements are taken for each spot tested.

SonoCheck™

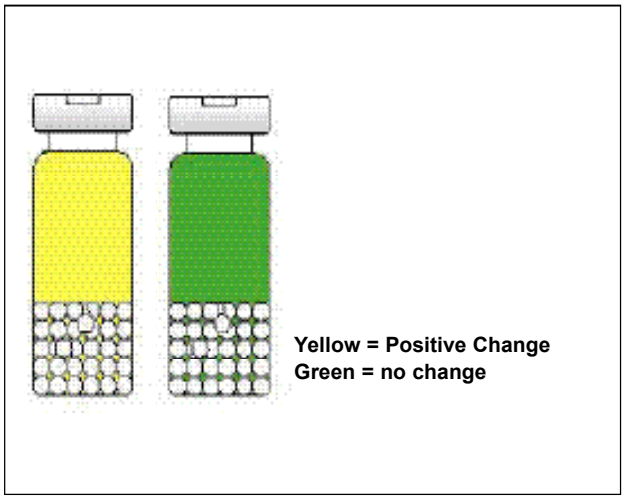
The fourth testing method is the SonoCheck™[14]. (See Figures 5 and 6.) The SonoCheck is a chemical indicator vial that verifies the cavitation capability of the ultrasonic bath. The test device is a closed vial containing fluid and glass beads. The vial is placed in the sonic bath, which then is switched on. When effective cavitation is achieved, the color of the fluid in the vial changes from green to yellow. The length of time it takes to change color is proportional to the cavitation power of the sonic cleaner. The person conducting the test records the amount of time that elapses prior to the color change.

Each of these test methods has its pluses and minuses. A CS department must determine which test is best suited for its particular needs, and then use the chosen test as part of a quality improvement program. Criteria for selecting a test include:

- Ease of use and interpretation of results—results should be objective. Subjective results can lead to misinformation about the equipment.
- Availability and cost.
- Correlation to cavitation.
- Reliability and reproducibility of the test results.

Information gleaned from running the sonic performance test should help resolve concerns about whether the sonic process is working.

Figures 5 and 6. SonoCheck™



Procedures for Testing Sonic Cleaning Effectiveness (Soil Test)

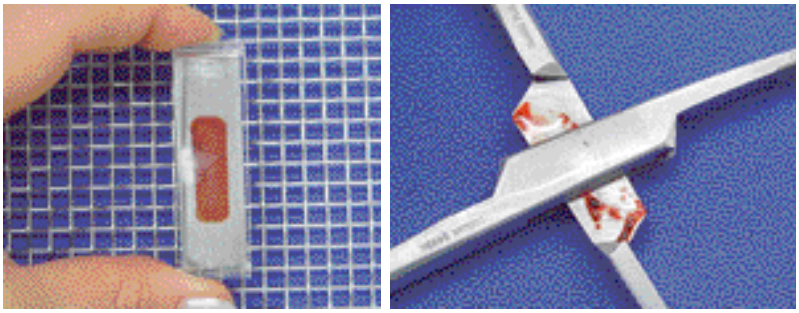
Recently a new type of test has become available as an option for evaluating the sonic cleaner's effectiveness; namely, a *soil test*. A soil test contains a soil sample that must be completely removed by the sonic cleaning process.

As stated previously in this article, blood is a primary target soil for the sonic cleaner. Logically, therefore, a soil test should contain a sample of this target soil. Two types of test kits containing blood or a blood substitute are available today—a paint-on type such as an Edinburgh soil, and the TOSI™, a prepared test object.

The paint-on soil is spread over the instruments being tested. The *soil must be applied consistently each time the test is performed*. The soil is allowed to dry (following manufacturer's instructions regarding length of drying time), and the instruments are loaded into the sonic cleaner using a normal loading pattern. A visual inspection of the instruments is required after the sonic cleaning process. Results are recorded and interpreted according to the soil manufacturer's guide.[15]

The TOSI™ (Test Object Surgical Instruments; see Figure 7) has three components: the blood soil, a stainless steel plate and a clear plastic holder. The soil is composed of blood components mixed and applied in a precise manufacturing process, which provides a consistent challenge to the effectiveness of the sonic cleaner. The stainless steel plate is "scratched" or grooved, replicating the uneven surface of surgical instruments. The plate is mounted in the plastic holder at an angle, providing a gradually more difficult cleaning test from one end to the other.[14]

Figure 7: TOSI™ (test object surgical instrument)



During the test, one TOSI is placed inside an empty approved tray/basket for one cycle length. Users should follow the manufacturer's instructions and refer to the troubleshooting guide in case of unsatisfactory results. Results of the test are recorded, and concerns reported to the appropriate staff for follow-up.

Just as with the sonic energy tests described above, CS staff must determine the best test method for their particular facility, and then use the chosen test in their quality improvement program. Criteria for selection include:

- Ease of use and interpretation of results;
- Consistency of application of the test;
- Availability and cost;
- Correlation of test soil with human blood;
- Reliability and reproducibility of the test results; and
- Ability of the test to identify and resolve concerns regarding cleaning effectiveness.

Procedures for Testing Sonic Cleaning Effectiveness for Hollow/Lumen Instruments (Soil Test)

Many of today's advanced sonic cleaners have the ability to irrigate hollow instruments, allowing the CS department to better clean lumen items. (Refer to the article "*Manual versus automated methods for cleaning reusable accessory devices used for minimally invasive surgical procedures.*[16]) A new test, the LumCheck™ [17] (see Figure 8), can be used to evaluate the cleaning performance of sonic equipment that irrigates lumen items. The test consists of a capsule with lumens on either end, into which a TOSI test strip is inserted. The dimensions of the test capsule are similar to those of long hollow instruments. Users should read the manufacturer's instructions for hooking up lumen/hollow instruments to the equipment, and use the same procedure to hook up the test device. Run a complete cycle and record the results. In case of unsatisfactory results, refer to the troubleshooting guide for the LumCheck™. Report any concerns to the appropriate management staff for follow-up.

Figure 8: LumCheck™

As of this publishing, the author was not aware of methods other than the LumCheck™ available to hospitals for testing lumens. Author's note: "Our data demonstrate that the lumen TOSI is a relatively easy challenge and if residual material remains, it indicates that the lumen cleaning ability of the washer has been severely impaired (less than one-half usual conditions)."[18]

Equipment Maintenance

After any maintenance is done on the sonic equipment, all tests should be conducted to ensure that the equipment is functioning properly. The type of maintenance done and the results of all tests should be documented and recorded. The person who performs the maintenance should not leave until the tests have been completed, so that necessary adjustments can be made immediately.

Summary

A quality improvement program for the sonic cleaning process should include the following:[19]

- Measuring pH and water hardness.
- Monitoring the bath/solution temperature.
- Performing a cavitation test on the equipment.
- Performing a target soil cleaning test.
- Perform an appropriate lumen test on cannulated/lumen type cleaning equipment.
- Daily/Weekly visual inspection of equipment (observations of machine operation/conditions).
- Constant daily visual inspection of all instruments.
- Training of staff on a continues basis
  1. De-gassing procedure
  2. Loading of instruments
  3. Selection of trays
  4. Other key factors/inputs relevant to each hospital's process.
- Record all results of test and observations in a log /book.
- In case of unsatisfactory results refer to the trouble shooting guide for the tests and equipment used.
- Report any concern to the proper management staff within the department to follow up.

Today's CS departments are very active and dynamic. Surgical instrumentation and processes change constantly, and the cleaning equipment needed to process these instruments safely is evolving as well. It only makes sense to have a well-qualified and trained staff to process these surgical instruments.

A sonic cleaner, like any piece of equipment, can malfunction at any time. Knowledge of when and why the cleaner is malfunctioning is key to ensuring properly cleaned surgical instruments. A quality improvement program helps ensure that staff are protected and patients are receiving the best possible care. It enables CS staff to know that their equipment (in particular, the sonic cleaner) is working properly. Then staff can be sure that the instruments are clean and ready for the next stage of the reprocessing cycle.

SonoCheck™, TOSI™, and LumCheck™ are trademarks of Healthmark Industries of St. Clair Shores, Mich. ✛

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Sterile Process and Distribution CEU Information

CEU Applicant Name _____

Address _____

City _____

State _____ Zip Code _____

The CBSPD (Certification Board for Sterile Processing and Distribution) has preapproved this inservice for one (1) contact hour for a period of five years from the date of publication and to be used once in a recertification period. Successful completion of the lesson and post test must be documented by facility management and those records maintained by the individuals until re-certification is required. **DO NOT SEND LESSON OR TEST TO CBSPD.**

For additional information regarding Certification, contact: CBSPD, 2 Industrial Park Road, Suite 3, Alpha, NJ 08865 or call 908-454-9555 or visit www.sterileprocessing.org.

IAHCSMM has awarded one (1) contact point for completion of this continuing education lesson toward IAHCSMM recertification.

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This inservice is 3M Health Care Provider approved by the California Board of Registered Nurses, CEP 5770 for (1) contact hour. This form is valid up to five years from the date of publication.

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5. Answer the CE questions.
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ANSWERS

1. T	6. T
2. T	7. T
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