IAHCSMM

Fellowship Committee Members

213 West Institute Place, Suite 307

Chicago, Illinois 60610

February 14, 2009

Dear Committee,

It is with great pleasure that I submit this paper for consideration for Fellowship in the International Association of Healthcare Central Service Materiel Management.

I decided to write this informational paper on boiling instruments in a Third World Country because it is so important that technicians be able to function as they contribute to surgical missions. As American sterile processing technicians venture into remote places to work, it is news worthy to have a guide that helps us function in our job. Providing instruments for surgical use is our duty. This paper offers future mission minded technicians the needed information for processing high-level disinfected instruments. I had the pleasure to work in Bangladesh for six surgical missions and each one has gotten easier as I have taken lessons learned to heart. I now boil instruments as second nature knowing that I provide a clean, high-level disinfected product to my customers.

I have worked in healthcare for thirty years in various positions and departments. I started in Central Service in 1982 after working in labor and delivery for five years. I became a sterile processing technician and found my niche. I attended Albany State College, Albany Georgia with a major in nursing. Due to illness I did not finish that course. I will receive my B.S. in Healthcare Management in June 2009. I have served in a leadership capacity in sterile processing for the last fifteen years. I presently manage the sterile processing department at Bon Secours Mary Immaculate Hospital in Newport News, Virginia. I have been a member of IAHCSMM since 1990. I teach the IAHCSMM Central Service Technical course and I believe in giving back to society. I have taught cleaning techniques to the technicians in Bangladesh since 1998.

Thank you for the opportunity to hopefully receive Fellowship Status in IAHCSMM. I am out of the country on a surgical mission at this time. I can be contacted via e-mail through Col. Aziz in Bangladesh at colaziz44@yahoo.com if you have questions or need more information. I return to America on March 8, 2009.

Respectfully Submitted

[Signature]

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Educational Background
• BS in Healthcare Management anticipated graduation 6/2009
• IAHCSMM/Purdue Central Service Technical Course – 1993
• Albany State University, Nursing Course – 1974-1978

Certifications
• Certified Registered Central Service Technician – 2005-Present
• Certified Food Manager – 2001-Present
• Certified Nursing Assistant – 1980-Present

Professional Employment Experience
• Mary Immaculate Hospital – 2005-Present
  • CSD Manager, Sterile Processing
  • Maintain budget for Sterile Processing
• Sentara CarePlex Hospital (formerly Sentara Hampton General Hospital), Hampton, VA
  • Inventory Specialist/SPD Team Leader, Sterile Processing – 1997-2005
  • Controlled instrument budget and the acquiring of special items for SPD
  • Helped facilitate the design of new Sterile Processing facility – 2000-2002
  • Materials Supply Technician/Sterile Processing Technician – 1990-1997
  • Operating Room Assistant – VA 1985-1990
  • Nursing Assistant Medical/Surgical – 1983-1985
  • Nursing Assistant Maternal Child – 1981-1983
• Memorial Medical Center, Savannah, GA
  • Labor and Delivery Technician – 1978-1981

Volunteer Missions
  • Served as Inventory Specialist/Sterile Processing Technician
  • Taught the IAHCSMM Technical course to Sterile processing technicians in Bangladesh.
• HRSP&CSA instructor for the IAHCSMM Technical course – 2004-Present
• Friends of the Homeless Shelter – 1997-Present
  • Served on the Board.
  • Help maintain the budget to keep this facility open year round.

Memberships and Related Activities
• IAHCSMM, 1993-Present
  • Secretary/Treasurer 2006-2008
  • Executive Board, 2005
  • Parliamentarian, 2003-2005
  • Representative to the Board HRSP&CSA 2004-2005
  • Committee Chairperson/AAMI, 2005-2006
  • Golden Slipper Award Winner, 2004
• IAHCSMM, HRSP & CSA
  • President 2004-Present, Treasurer, 2000-2004
  • Founding Member 2000-Present
• Virginia Association Central Sterile
  • Member 1990-1995

Achievements
• 2008-IAHCSMM Educator of the Year
• 2006-2007 Strathmore’s WHO’S WHO
• 2007-2008 Madison’s WHO’S WHO
• 2007 Presented at the AESCULAP ACADEMY Quality Instrument Manufacturing
RUNNING HEAD: Boiling as a High-Level Disinfectant

Boiling: The Answer to High-Level Disinfecting of Surgical Instrumentation in a Village of a Third World Country

Sharon Greene-Golden, CRCST
Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>2</td>
</tr>
<tr>
<td>Experiment</td>
<td>2-5</td>
</tr>
<tr>
<td>Methods</td>
<td>5-6</td>
</tr>
<tr>
<td>Analysis and Discussion</td>
<td>7-8</td>
</tr>
<tr>
<td>Illustrations</td>
<td>7-9</td>
</tr>
<tr>
<td>Conclusion</td>
<td>10</td>
</tr>
<tr>
<td>References</td>
<td>11-12</td>
</tr>
</tbody>
</table>
Introduction

In 1998, I became part of a surgical mission to the country of Bangladesh. I tried to prepare myself for the conditions and challenges I would face. With all of my preparation, nothing could possibly have prepared me for my eventual experiences. While working in the big city of Dhaka, I only had to mentor and ask for items to complete sterilization. I taught the local technicians how to separate dirty areas from clean. (They built a room in a room) I remember thinking, "This isn’t so bad”. Little did I realize, our mission work would move to the villages of Bangladesh.

Experiment

We set up our services in a small two room operating theater. I had access to one drum (pressure cooker) autoclave and a boiling pot. I pondered how to utilize a boiling pot for the high-level disinfection process. Upon entering the operating suite, I first learned that the drum autoclave was not available for use until in the evening. They were more than happy to provide me with a boiling pot. As studies about boiling flashed through my mind, I asked where the decontamination area was located. I found out that we had one community sink; first, you scrub for surgery then it became the decontamination area. This sink was located in front of the community bathroom. My main concern was being able to provide a quality product for our patients. I had to be able to provide instruments that were clean and ready to be proficiently disinfected by boiling. I set-up a portable decontamination station consisting of two basins on a ring stand beside the community sink. I also had cleaning brushes, a cleaning agent, syringes for flushing, and towels for drying as needed. My foremost method was to have clean instruments. Once the instruments were clean, I then selected the instruments needed for the surgical
procedure and placed them on a stringer. Next, I placed the string in the boiling pot and waited for a gentle rolling boil. Once boiling, I started timing. At approximately twenty minutes, I took the Cheatle forceps and removed the instruments from the pot. These instruments were then placed on the sterile field for the surgical case that was to proceed immediately. I took time to explain to the technicians from Bangladesh what my procedures were and how we would effectively use this method all day and how I planned to implement these methods for the duration of my tenure there. This practice was performed for sixty surgical cases over an eight day period.

Individuals working in a village encounter various challenges when attempting to process instruments. Limited resources, such as water, sinks and electricity, are problematic when processing instruments. The cleaning process is paramount to high-level disinfection. Boiling provides proficient disinfection of instruments. The technician must boil the instruments at the correct temperature and for the correct duration. If processed correctly, instruments that are cleaned are high-leveled disinfected (HLD) and ready for use in any surgical case.

In the 19th Century, surgery was a dangerous process. If a patient was scheduled to have a simple surgery, the risk of contracting an infection was astronomical. Surgery was not performed under aseptic conditions. Studies show that the operating room, the surgeon's hands, and the surgical instruments were laden with microbes. These microbes caused high levels of infection and mortality (Todar, 2008).

Surgeons in mid-1800 often wore their street clothes while operating without washing their hands. They frequently used ordinary sewing thread to suture wounds, and stuck needles in the lapels of their frock coats in between patients. Surgical dressings were often made up of surplus cotton or jute straight from the floors of cotton mills (Todar, 2008).
It was at this time that French scientist, Louis Pasteur, demonstrated that invisible microbes caused disease. Dr. Pasteur’s studies helped to influence an English surgeon named Joseph Lister. Lister was credited with founding modern antiseptic procedures for surgery. His plan included the spraying of operating rooms with a solution of carbolic acid (phenol) before every case. It was then noted that the survival rates for surgery did increase due to Lister’s methods. As studies continued over time, scientists learned that chemical agents would either kill or prevent the growth of microorganisms. At this time the study of microbiology took a higher priority in the surgical outcome of patients. In microbiology, sterilization refers to the complete destruction or elimination of all viable organisms in or on a substance being “germ-free”.

Almost simultaneously, boiling was widely considered a great form of sterilization. Boiling water was our most powerful germicide via the rapidity of its action being excelled only by flame contact. It is, however, more certain than the latter, because every part of the article to be sterilized may be brought into direct and simultaneous contact with an intense and uniform degree of heat. This method will destroy, with certainty, all forms of pathogenic microorganisms and their spores within five minutes; thus, it forms an ideal process. Water can be quickly heated to the boiling point, making it time efficient. The boiling mass possesses a really uniform temperature throughout the system it can be depended upon for thorough work. It requires no extensive appliances, chemicals or time loss. It is economical. As time evolved and research continued, we learned that items boiled were not sterile but were to be considered high-level disinfected (Todar, 2008).

The world consensus confirmed sterilization the safest and most effective method for the processing of instruments; often, sterilization equipment is either unavailable or not suitable (Rutala, 1996). In these cases, high-level disinfection is the only acceptable alternative.
Research has proven that boiling instruments in water for twenty minutes will kill all vegetative forms of bacteria, viruses including hepatitis B, hepatitis C and Human Immunodeficiency Virus (HBV, HCV, and HIV), yeasts, fungi and tuberculosis. Boiling will not kill all endospores reliably. To this end, we know that high-level disinfection, not sterilization, can be achieved by boiling water.

Cleaning, an essential beginning to ensure high-level disinfection can subsequently be achieved. Cleaning is a process which physically removes contamination but does not necessarily destroy micro-organisms. Microbes are much more easily killed if instruments are clean. It is also important to have a good cleaning agent that effectively helps to destroy bacteria (Central Service Technical Manual, 2007).

One will show up in a village to find out they have only one drum autoclave that is used only once a day due to electrical constraints. The only method you will have to process the instruments for surgical cases is boiling. When correctly using the process for boiling instruments, the technician can effectively process for the surgical cases. It is important that the technician have a guide as to the process for boiling instruments. Listed are the complete and official seven steps you need to follow in order to achieve high-level disinfection by boiling.

**Methods**

*Step:* 1 Decontaminate and clean all instruments and other items to be high-level disinfected.

*Step:* 2 If possible, completely immerse items in water. Adjust the water level so that there is at least 2.5 cm (1 inch) of water above the instruments. In addition, make sure all bowls and containers to be boiled are full of water.
Step: 3 Close lid over pan and bring water to a gentle, rolling boil. Boiling too vigorously wastes fuel, rapidly evaporates the water and may damage delicate or sharp instruments.

Step: 4 Note when rolling boil begins, then start timing.

Step: 5 Boil all items for twenty minutes.

Step: 6 After boiling for twenty minutes remove objects with previously high level disinfected forceps. Never leave boiled instruments in water that has stopped boiling. As the water cools and steam condenses, air and dust particles are drawn down into the container and may contaminate the instruments (Perkins 1983). The long-handled forceps used to remove the instruments are called Cheatle’s. The Cheatle forceps are boiled first and then placed in a container with cresol ("Lysol") up to their handles. This is done daily (Tietjen LG, W Cronin and N McIntosh, 1992).

Step: 7 Use instruments and other items immediately, or with high-level disinfected forceps or gloves, place objects in a high-level disinfected container with a tight fitting cover. Once the instruments are dry, if any pooled water remains in the bottom of the container, remove the dry items and place them in another high-level disinfected container that is dry and can be tightly covered (Tietjen LG, W Cronin and N McIntosh, 1992).

Analysis and Discussion

Studies and personal experiences show that whenever boiling is used as the method for high-level disinfecting, lime deposits may form on the metal instruments. This scale formation, caused by lime salts in the water, is difficult to avoid.
By following these steps, however, the problem of lime deposits can be minimized:

*Step:* 1 Boil water for ten minutes at the beginning of each day before use. This process precipitates much of the lime salt in the water on to the walls of the boiling pot before instruments are added.

*Step:* 2 Use the same water throughout the day, adding only enough to keep the surface at least one inch above the instruments to be high-level disinfected. Frequent draining and replacing the water, and boiling too vigorously, increase the risk of lime deposits on instruments.

*Step:* 3 Drain and clean the boiler or pot at the end of each day to remove lime deposits (Tietjen LG, W Cronin and N McIntosh, 1992).

Included are pictures of the different boiling pots encountered on one of six mission trips. Also, there are pictures of different size boiling pots, non-boiling and rolling boiling, lime deposits and placement of instruments onto the sterile field. These pictures bring the steps described in this paper to life.

**Types of Boiling Pots**

Rectangular  
Round
Types of Boiling

Gentle Rolling Start Timing

Twenty Minutes Later Remove Instruments

Cheatle Forceps

Cheatle Forceps in Container of Lysol

Removing Instruments Using Cheatle Forceps
Placements of Instruments

Preparing Table Using Cheatle Forceps

Ready for Instruments

 Lime Deposit

Transferring Instruments from Boiling Pot using Cheatle Forceps

Lime Deposits Formed in the Boiling Pot
Conclusion

In today's society, people believe in the thought that "We are our brothers' keepers". In this world, it is an accepted practice that as members of this society, we give back from our abundance. As we become "Mission Minded Sterilization Technicians", it is imperative that we function normally with limited resources as we work in other countries. In Bangladesh, hospitals have units labeled "dirty wards" for patients who have contracted all types of infections. Approximately 17 percent of these infections are attributed to some type of surgical procedure. The magnitude of surgical site infection is a profound problem. It is critical that sterile processing Technicians traveling to serve in Third World countries be prepared to adapt professionally with knowledge in all settings of sterilization. The data has shown in this paper that high-level disinfection by boiling is the answer to processing instrumentation in Third World country villages when formal sterilization methods are restricted.
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