What's Growing On Your Instruments?

Scenario 1
The incident:
It's Monday in Dr. Feinstone's oral surgery practice and things are busier than usual. Three unscheduled patients called with problems and just had to be seen. It was difficult to process all of the instruments used that morning due to the extra heavy patient load. The staff had reservations for lunch that day to celebrate Sally's 40th birthday. Sally was one of the dental assistants. Dr. Feinstone had planned to go out with the group but decided to stay at the office. Just after the staff left Dr. Feinstone got a call from a dentist colleague (Dr. Wartzel) who had some pain associated with a third molar. He asked Dr. Wartzel to come in by 1:00 pm. To prepare for the appointment Dr. Feinstone retrieved a wrapped instrument cassette from the sterilizing room and set up the operatory. He seated Dr. Wartzel, placed the bib, unwrapped the cassette, donned his gloves, mask and eyewear, grabbed an explorer and said, "open wide". Just then, Sally pops her head in and said, "Dr. Feinstone may I see you a moment please"? She told him she needed to get another instrument cassette, for the one he was about to use had not been sterilized.

Potential consequences:
When Sally had returned from lunch she went to the sterilizing room and noticed that one of the instrument cassettes that had been cleaned and wrapped and was ready to be sterilized was missing. In this instance Dr. Feinstone had not actually used the non-sterile instruments. Using such instruments to treat a patient could result in the transfer of potentially pathogenic microbes. There are many unknown variables at

Learning Objectives
After reading this article, the reader should be able to:
- describe the importance of using internal and external chemical sterilization indicators;
- summarize guidelines of key design features to visually identify sterile and non-sterilized packages in the instrument processing area;
- discuss general instrument-processing and recirculation procedures;
- describe the importance of cleaning instruments before sterilization procedures;
- explain the proper use of cleaning and sterilization equipment.

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The instruments that Dr. Feinstone was about to use at least had been cleaned, and this reduced the bioburden present. However, cleaning cannot be considered to remove ALL microbes. The purpose of cleaning is to reduce the bioburden present to give the subsequent sterilization step the best chance to work. So cleaning should never be seen as a terminal step in instrument processing. We must always sterilize after cleaning.

Prevention:
In some practices, the doctor, new staff or temps may not be totally familiar with all of the happenings in the sterilizing room. The wrapped cassette Dr. Feinstone obtained looked just like all the other wrapped instrument cassettes that are usually brought to chairside. If the outside of the wrapped cassette had been marked with a chemical indicator (e.g., “autoclave tape”), Dr. Feinstone would have seen that the cassette retrieved had not been processed through the sterilizer (i.e., no dark stripes on the autoclave tape). Also if the cassette had had a chemical indicator placed inside next to the instruments, he would have noticed that this internal indicator had not changed. Alternatively if the cassette had been packaged in a large see-through paper/plastic peel pouch with an internal chemical indicator present, the doctor would have no problems in the sterilizing room. The wrapped cassette Dr. Feinstone obtained looked just like all the other wrapped instrument cassettes that are usually brought to chairside. If the outside of the wrapped cassette had been marked with a chemical indicator (e.g., “autoclave tape”), Dr. Feinstone would have seen that the cassette retrieved had not been processed through the sterilizer (i.e., no dark stripes on the autoclave tape). Also if the cassette had had a chemical indicator placed inside next to the instruments, he would have noticed that this internal indicator had not changed. Alternatively if the cassette had been packaged in a large see-through paper/plastic peel pouch with an internal chemical indicator present, the doctor would have noticed that the instruments were not ready to use. Also, signs (e.g., “Sterile”, “Non-Sterile” or “Ready”, “Not Ready”) or some other visual alert used to differentiate between processed and unprocessed packages in the sterilizing room could have prevented this situation. Proper training of everyone in the office as to the physical arrangement and work-flow pattern in the sterilizing room and how to use and read sterilization indicators, including weekly biological monitoring, is important.

Some related regulations or recommendations:

- “Designate a central processing area. Divide the instrument processing area, physically or, at a minimum, spatially, into distinct areas for 1) receiving, cleaning, and decontamination; 2) preparation and packaging; 3) sterilization; and 4) storage. Do not store instruments in an area where contaminated instruments are held or cleaned” (CDC).

- “Use an internal chemical indicator in each package. If the internal indicator cannot be seen from outside the package, also use an external indicator” (CDC).

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Scenario 2
The incident:

Dr. Topps was scheduled to do oral exams on the 6th grade class Wednesday at the Minnie Hartman School where his wife Miranda was the assistant principal. It was the day before the school exams, and the office staff had not had time to prepare the instruments needed for Wednesday. Also, Dr. Topps had earlier arranged for all of his staff and himself to receive the required annual OSHA bloodborne pathogens training on Tuesday evening. So Miranda volunteered to go in to the office after hours and prepare the needed 25 exam packs (explorer, probe, mirror and napkin chain). Dr. Topps’ main dental assistant (Vince) offered to show Miranda how to work the ultrasonic cleaner and the sterilizer, but she told him she remembered how to do things from her college days when she was her husband’s part-time assistant.

So Miranda began by placing all the instruments needed in the bottom of the ultrasonic cleaner tank. Then she added the liquid detergent to just cover the instruments and “zapped” them for 9 minutes. She then put on vinyl exam gloves and a waterproof apron, reached into the cleaner tank, grabbed instruments and laid them all in the bottom of the sink. She rinsed them off with the tap water sprayer, gathered them up, placed them on a towel and blotted them dry with another towel. She placed each exam set along with a chemical indicator strip in a paper bag, folded the top down and stapled the bag closed. She stacked up all of the bags in the steam sterilizer chamber (it was a tight fit but she got them all in) and processed them through a 121°C sterilization cycle for 20 minutes. As soon as the pressure in the sterilizer read zero, she put on heat-resistant gloves, opened the door, removed the packages and placed them under a fan to cool them off. She then placed all the packs in a heavy-duty shopping bag ready for transport to the school.

Potential consequences:
Miranda was not too well versed on current instrument processing procedures. Things had changed since she worked in the office several years earlier. Not wearing proper personal protective equipment when processing instruments could have led to sharps injuries and exposure to contaminants. Not properly cleaning instruments prior to sterilization could have prevented sterilization at areas where the debris remained, and this cannot be detected by the use of chemical or biological sterilization indicators. Not properly loading the sterilizer chamber could have prevented sterilization and increased patient risk with the use of non-sterile instruments. Allowing wet packages to dry outside the sterilizer could have permitted microbes from the environment (e.g., air, dust, sneezes, hands, surfaces) to wick (i.e., penetrate) through the paper and contaminate the instruments inside. Placing the instrument packages under a fan draws in microbe-laden air from the rest of the office and blows it over the packages.

Prevention:
Miranda should have worn heavy utility rather than exam gloves especially since she directly handled sharp instruments. Placing a large number of instruments in the ultrasonic cleaner can stress the system to a point where some instruments may not become clean. Although it’s not known exactly how many instruments should be cleaned at one time, cleaning a couple of layers of instruments in each run seems reasonable. Instruments should not be placed directly on the bottom of the cleaner tank, for the best cleaning occurs up in the solution which should be added to about one inch from the top edge of the tank. Thus instruments should be placed in a metal cleaning basket which allows for easy placement into and removal from the cleaning solution. The basket enhances safety by reducing the direct handling of the instruments, and it facilitates rinsing. It also raises the instruments off the bottom of the tank to provide optimal cleaning. Using instrument cassettes reduces the direct handling of instruments through the entire instrument processing procedure.

Sharp instruments should not be placed in paper bags for sterilization, for the instruments can easily puncture the bags, and this breaches sterility. Paper bags are fine for lightweight non-sharp items but should not be stapled for this leaves holes in the paper. Fold over the top and seal with tape. Puncturing and tearing of the paper bags are also facilitated by handling the wet bags rather than letting them first dry inside the sterilizer before handling. It’s possible that Miranda overloaded the sterilizer chamber. If so, some of the bags may not have been adequately exposed to the steam. Packages should not be layered or stacked up but rather placed on their edges to provide more space around each for the best exposure to the steam. At least each bag contained a sterilization monitoring strip, which should detect inadequate exposures. Unfortunately, this will not be known until the bags are opened.

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in the school at the time of the exams. This emphasizes the importance of using an external sterilization indicator, which can be analyzed immediately after removal from the sterilizer. Excess handling of even dry paper bags containing hand instruments also will increase the chances that the paper will tear and breach the package’s sterility. Using paper/plastic peel pouches (which have heavy paper) or wrapped instrument cassettes help reduce chances for instrument punctures.

The ultrasonic cleaner and the sterilizer manufacturers’ directions should be followed carefully.

Some related regulations or recommendations:

- “Wear puncture- and chemical-resistant/heavy-duty utility gloves for instrument cleaning and decontamination procedures” (CDC).
- “Wear appropriate personal protective equipment (e.g., mask, protective eyewear, and gown) when splashing or spraying is anticipated during cleaning” (CDC).
- “Clean all visible blood and organic contamination from dental instruments and devices before sterilization or disinfection procedures” (CDC).
- “Use automated cleaning equipment (e.g., ultrasonic cleaner, washer-disinfector) to remove debris to improve cleaning effectiveness and decrease worker exposure to blood” (CDC).
- “Before sterilization of critical and semicritical instruments, inspect instruments for cleanliness, then wrap or place them in containers designed to maintain sterility during storage (e.g., cassettes, organizing trays)” (CDC).
- “Use an internal chemical indicator in each package. If the internal indicator cannot be seen from outside the package, also use an external indicator. For unwrapped loads, place an internal chemical indicator among the instruments or items to be sterilized. Use only Food and Drug Administration (FDA)-cleared chemical and medical devices for sterilization and follow the manufacturer’s instructions for proper use” (CDC).
- “Allow packages to dry in the sterilizer before they are handled to avoid contamination” (CDC).

Oh and by the way, Dr. Topps should have been reminded that the required OSHA bloodborne pathogens training must be provided during working hours not in the evenings (OSHA).

Did You Know?  

Did you know that if you missed the June 2010 OSAP symposium in Tampa, you can still access the PowerPoint presentations on OSAP’s web site? They include information on Immunizations, Regulations, Social Media, Biological & Chemical Indicators, Technologies, Green Infection Control, Data-driven Infection Prevention, H1N1, Rapid HIV Screening, Effective Speaking Skills and more. Go to http://www.osap.org, place the cursor on “Resources” in the left side menu, and move down to and click on “Symposium Resource 2010”.

What’s Wrong With This Picture?  

Can you identify any breach in infection control and safety procedures in this photo?

Check your answers below.

1) The dental assistant should be wearing heavy utility gloves rather than exam gloves for best protection against sharps injury and exposure to contaminants.

2) The open lab coat and improper placement of face mask below the nose are also breaches in infection control and safety.
**Around the World**

**Infection Prevention and Control Inaugural Meeting**

An inaugural meeting for Infection Prevention and Control (IPC) educators from all ten Canadian Faculties of Dentistry was held in Winnipeg on April 28 and 29, 2010. Each Faculty presented their unique pedagogical and clinical curriculum for teaching IPC. Discussions also included concerns regarding interpretation of: 1) guidelines for prophylactic antibiotic use following total joint replacement and 2) guidelines for decontamination of burs and endodontic files.

Dr. John Molinari kindly consented to attend the closing question and answer period. The consensus from the meeting was that there are still two major challenges facing IPC educators. These are: 1) compliance among clinical staff members (especially those who graduated prior to routine use of PPE during all dental procedures); 2) professionalism among students and new graduates.

Strong interest was expressed by the attendees to maintain communication between the Faculties for infection control and prevention regarding their concerns. A summary program was collated and distributed by Dr. Blaine Cleghorn.

Appreciation is extended to Drs. Cleghorn and Molinari for their contributions to this successful meeting and to the Canadian Dental Association (CDA) for their kind support of this teaching conference.

Dr. Nita Mazurat
University of Manitoba
Co-ordinator and Chair
CDA Teaching Conference for IPC Educators

**OSAP Conducts First Patient Safety Summit**

On June 11, OSAP preceded its annual Symposium with a Global Summit on Dental Patient Safety. The summit reviewed outcomes of WHO’s multi-curricular guide on patient safety. Participants discussed implementation strategies in the oral healthcare profession and the draft of the “Tampa Declaration on Patient Safety in Oral Healthcare 2010 – A Commitment to Action.” Also, representatives from the US Army Patient Safety Initiative, Roberta (Robbie) Sjelin RN RDH MA and Heidi King MS FACHE, shared the significant progress they have made and showed the audience many of the tools they developed to successfully implement this important concept. OSAP will be posting updates on this initiative at its new Dental Patient Safety site at OSAP.org.

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OSAP thanks the following companies that help to underwrite each issue of this special series of Infection Control In Practice in 2010.

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- Patterson Dental [pattersondental.com](http://pattersondental.com)
  - Dental’s most trusted partner for service, supplies, equipment and technology.
- PDI, The healthcare division of Nice-Pak [pdi.com](http://pdi.com)
  - Live a healthier life with clinically proven products that safely clean, disinfect and control disease infection.
- SciCan [scican.com](http://scican.com)
  - SciCan Inc., the final word in all dental instrument reprocessing.
- Septodont [septodontusa.com](http://septodontusa.com)
  - Septodont, providing better dentistry through pain control, restoratives and infection control products.
- SmartPractice [smartpractice.com](http://smartpractice.com)
- Sultan Healthcare [sultanhealthcare.com](http://sultanhealthcare.com)
  - Products to complete the cycle of infection control.
- TotalCare [kentotalcare.com](http://kentotalcare.com)
  - Offering high-quality infection prevention products to protect staff and patients in the dental operatory.
Roadmap to OSAP

If you have received this newsletter from a friend or associate, you can access other helpful resources and timely information on infection control and safety by becoming a member of the OSAP community.

**Member resources include:**

► OSAP discount on all CE at [www.ineedce.com](http://www.ineedce.com) -**NEW** (see Member Orientation at OSAP website for details)
► Growing list of dental issues’ Toolkits posted on website, e.g., see recently added “Instrument Processing – Best Practices”
► Written referenced responses to your IC questions (“Ask OSAP”)
► Helpful time and $$-saving “Practice Tips”
► Toolkits on how to address challenging IP/Safety Issues
► Surface disinfectants chart
► Free online OSAP Guide to CDC Guidelines course
► Weekly and monthly online IC news round-ups
► PowerPoint presentations and other resources from the 2010 Infection Prevention Symposium
► Discounted registration for 2011 programs (January 10-13 in Atlanta and June 9-12 in Dallas)
► Infection Control Educator’s Toolkit
► Free downloads of mission trip IC guide, traveler’s guide and much more!

**Member registration is easy.**

Online at [www.osap.org](http://www.osap.org) or by phone: 1-800-298-OSAP (6727) within the U.S. or 1-410-571-0003 outside the U.S.

**Current membership levels:**

► Individual member (within the U.S.) $110  ► Individual member (outside the U.S.) $160
► Web-only member (anywhere) $100  ► Student member $25
► Corporate memberships are welcome; please contact OSAP for more information.

(Notice: The OSAP Board voted to maintain these rates through June 30, 2011.)

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**Glossary**

_Wicking:_ The drawing of microbes or other particles through material that is wet.

_Chemical Indicator:_ Material (e.g., strips, tapes) containing a chemical that changes color or form upon exposure to certain levels of heat, steam or oxide gas and is used to monitor the sterilization process.

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**Links to Resources**


CE Unit 4/10

If you wish to obtain one (1) hour of continuing education (CE) credit, complete the following test by selecting the best answer and fax or mail it to the OSAP Central Office for grading. Please include a check or credit card to cover the handling charges. Pending satisfactory results (at least seven out of ten), you will be issued a letter for one (1) CE credit hour. OSAP is recognized by the American Dental Association as a CERP Provider. For more information, call OSAP at 800-298-6727 (1-410-571-0003).

For each item, pick the best answer.

1. According to the CDC when should an internal chemical indicator be used?
   a. In one package per week
   b. In one package per month
   c. In one package per sterilizer load
   d. In every package

2. According to OSHA, when is the required annual bloodborne pathogens training to be given?
   a. During the evenings
   b. On weekends
   c. During working hours
   d. At any time the employer so desires

3. Although it’s not known exactly how many instruments should be ultrasonically cleaned at one time, what might seem reasonable?
   a. A couple of layers
   b. 10 instruments
   c. Until the tank is ¾ full
   d. As many as will fit into the tank

4. Wicking during instrument processing is defined as:
   a. tearing of paper sterilization bags.
   b. penetration of microbes through wet, paper sterilization bags.
   c. rusting of metal hand instruments.
   d. penetration of sharp instruments through paper sterilization bags.

5. Using an ultrasonic cleaning basket reduces the direct handling of instruments, allows for easy placement into and removal from the cleaning solution, facilitates rinsing of the cleaned instruments and:
   a. raises the instruments off the bottom of the tank to provide optimal cleaning.
   b. prevents corrosion of the instruments.
   c. keeps the cleaning solution from splashing out of the tank.
   d. eliminates the need for a tank cover.

6. How should wrapped instrument cassettes and packages be loaded into a sterilizer?
   a. Stacked one upon the other
   b. With openings in the packaging material to allow entrance of the sterilizing agent
   c. On their edges
   d. Packed as tightly as possible to eliminate most of the air in the chamber

7. According to the CDC automated cleaning equipment (in contrast to hand scrubbing) should be used to clean contaminated instruments to remove debris, to improve cleaning effectiveness and to:
   a. prevent corrosion of the instruments.
   b. permit the use of plain water instead of a detergent.
   c. eliminate the need for final sterilization.
   d. decrease worker exposure to blood.

8. CDC recommends that the central instrument processing area in a dental facility should be divided into four main areas receiving, cleaning, and decontamination; sterilization; storage; and:
   a. preparation and packaging.
   b. waste disposal.
   c. instrument sharpening.
   d. handwashing.

9. What’s the best way to dry instrument packages/cassettes that have been steam sterilized?
   a. Under a fan in the sterilizing room
   b. In the sterilizer
   c. In a closed cabinet in the sterilizing room
   d. On top of the hot sterilizer

10. Paper bags for steam sterilization are best used to package:
    a. explorers and periodontal probes.
    b. metal impression trays.
    c. light weight non-sharp items.
    d. hand mirrors and napkin chains.

Please mail or fax completed test with the appropriate payment to receive one (1) hour of continuing education credit.

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What’s It All About?

This issue presents scenarios describing various breaches of safety and infection control protocol in the dental setting that may facilitate unnecessary exposure to microbes or hazardous chemicals.

These include facilitating sharps injuries, improper use of cleaning and sterilizing equipment, recontamination of sterilized instrument packages, not wearing proper personal protective equipment, not following infection prevention rules and recommendations and inadequate training.

► Are your instruments properly cleaned before sterilization?
► Are you using personal protective barriers when processing instruments?
► Do you know how to use internal and external sterilization indicators?
► Does everyone in the office know how to identify instrument package/cassettes that have NOT been sterilized?
► Are you drying instrument packages/cassette inside or outside of your steam sterilizer?
► Are you following the manufacturer’s directions for using your instrument cleaner and sterilizer?

Read On!

In the next issue... First Do No Harm