

## Choosing A Reprocessing Method

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### WHICH INSTRUMENT REPROCESSING METHOD IS BEST FOR YOUR PATIENT?

The short answer to this question is that there is no single best method. There are many reprocessing methods available to hospitals and to Operating Rooms so any choice will depend on the particular situation at your facility and with your patients. The purpose of this article is to outline the factors to be considered when assessing or comparing reprocessing methods.

#### Spaulding's Classification

In the mid-1960s Dr. Earl Spaulding developed a framework to guide reprocessing decision-making. The system is based on the patient's risk for infection that various types of instrument or equipment contact can create. The following table summarizes his system.<sup>1</sup>

**Critical Contact** – The normally sterile parts of the body that are covered by intact skin have no contact with the external environment or with the microorganisms that abound there. If, through inadequate or inappropriate instrument reprocessing, some of those external microorganisms are introduced into this normally sterile tissue, a patient's risk for infection is high. A sterilization procedure, or use of a chemical germicide formulated as a

sterilant, is recommended for reprocessing of instruments in order to keep patients safe.

**Semi-Critical Contact** — While there is still a risk for infection with mucous membrane contact, it is not as high as with trans-parenteral contact. Consequently, a high-level disinfection procedure is recommended for reprocessing semi critical instruments. Although chemical germicides formulated as high-level disinfectants do not kill high numbers of bacterial spores, they are active against all bacterial and viral pathogens and, as a result, they will still keep patients safe.

**Non-Critical Contact** – In a situation where a patient's intact skin comes in contact with a reusable item (e.g. a blood pressure cuff on the arm), or does not come in direct contact with the item at all (e.g. lying on a bed covered by a fresh sheet), the risk of infection is very low. The safe level of reprocessing is also low. At this point it is important to note that intermediate and low level disinfectants have been designed for use on environmental surfaces and not on invasive medical devices.

#### Available Methods

Taking Spaulding's system one-step further, the next table categorizes the reprocessing methods currently in use in Canada.

#### How to choose?

To choose a reprocessing method, the first step is to assess the type of contact the item will make with the patient. Use Spaulding's classification in Table 1.

Table 1

TYPE OF CONTACT	DEFINITION	EXAMPLE	MINIMUM REPROCESSING LEVEL REQUIRED
CRITICAL	Contact with a normally sterile body part	Major Orthopaedic instrument set	Sterilization
SEMI-CRITICAL	Contact with mucous membrane or broken skin	Oral Airway, Flexible Gastroscope	High Level Disinfection
NON-CRITICAL	Contact with intact skin or no direct contact	OR bed, Blood Pressure Cuff	Intermediate or Low Level Disinfection

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## Post-Operative Nausea and Vomiting



### Maybe not this time.

Avoidance of PONV was shown to be even more important to patients than avoidance of post-operative pain.<sup>1,2</sup> Thanks to the prophylactic use of Zofran in high risk surgical patients – greater patient satisfaction was shown to have been achieved compared to placebo.<sup>2,\*</sup>

Zofran has demonstrated 24-hour efficacy in the prevention of PONV:

- superior to metoclopramide<sup>3,\*\*</sup>
- similar to droperidol<sup>4,††</sup>

And Zofran has an excellent safety profile.<sup>5,6,†</sup>

The most frequent adverse events reported in controlled clinical trials were headache (11%) and constipation (4%).<sup>5</sup>

Please refer to Product Monograph for full prescribing information.

#### Consider Zofran first line in your high risk patients.<sup>2</sup>

Zofran is indicated for the prevention and treatment of postoperative nausea and vomiting.<sup>5</sup>

Y In this study, 101 patients completed a survey in which they rank ordered possible postoperative clinical anesthesia outcomes. Vomiting was the least desirable outcome by both the ranking methodology and the relative value methodology (F-test <0.01). Ranking and relative value data were positively and significantly correlated (r=0.69, P<0.0001).  
\*2061 high risk patients (history of PONV or motion sickness) undergoing highly emetogenic procedures in 2 randomized, double-blind studies received either 4 mg ondansetron, 0.625 mg droperidol, 1.25 mg droperidol or placebo 20 minutes before induction. Patients were followed for a period of 24 hours. Ondansetron was more effective than placebo at reducing nausea and vomiting (p<0.05) and reduced mean-median total costs vs placebo (p=0.001). Patients receiving ondansetron were more satisfied than patients receiving placebo (p<0.05).  
\*\* In a double-blind, randomized, placebo-controlled, multicentre study (n=1044) for the prevention of PONV in patients undergoing major gynecological surgery, ondansetron (4 mg IV, n=465) was superior in achieving complete control of emesis and nausea versus metoclopramide (10 mg IV, n=462) (44% and 37%, p=0.049, and 32% and 24%, p=0.009, respectively) over 24 hours.  
†† Two identical, randomized, double-blind, placebo-controlled studies enrolled 2,061 adult surgical outpatients at high risk of PONV to compare IV ondansetron 4 mg (n=515) with droperidol 0.625 mg (n=518) and droperidol 1.25 mg (n=510) for the prevention of PONV. In the 0 to 24 hour postoperative period, complete responses for ondansetron (53%) and droperidol 1.25 mg (56%) were superior to placebo (36%), p<0.05. Patient satisfaction scores for ondansetron were superior to placebo, p<0.05.  
† Reductions in dosage are recommended in patients with moderate or severe hepatic dysfunction.

**Zofran**<sup>®</sup>  
iv/tablets/oral formulation  
*first*<sup>††</sup>  
\*\*First 5-HT<sub>3</sub> antagonist<sup>5</sup>

**gsk** GlaxoSmithKline Member **R&D** **PAAB**



Photo by J. Porteous

Custom pack

Brenda Zdunich, the Cardiovascular Specialty Coordinator, really sees the benefit of the patient being dry at the end of the operation. In the past, when taking the vein for the coronary bypasses, the drapes under the legs were saturated and had strike through when we used linen. Now, with the single-use drapes, the patients are dry.

Zdunich also finds that custom packs are efficient for emergencies. The circulating nurse can spend more time with the patient and the anaesthetist, instead of being back with the scrub nurse opening packages. In emergency situations, the room is now ready to go even before the patient even arrives.

Zdunich says she would never go back to linen. The Cardiovascular team looks forward to the day when all they have to open are their gloves!

In summary, since their introduction in 1996 custom packs have been very popular in both the OR and the processing department of the Regina Qu'Appelle Health Region. We now have forty different packs and have expanded from basic packs to more specialized ones. These include ablation packs, laparoscopic nephrectomy packs and paediatric packs. Nurses are happier; surgeons and patients are more comfortable. Some of our nurses have even claimed that they would quit if we ever stopped using custom packs!

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**BENEFITS IN REGINA:**

**PROCESSING**

- Case cart preparation was reduced to two night staff picking for about two hours.
- Lower stress level & frustration
- Save 1 hour/day returning incorrectly picked items – annual savings of \$3,000 \$4,000.
- Eliminated 2 positions in Sterile Processing at approximately \$48,000 per year
- Dollar savings from standardizing to less expensive components – the packs drove the standardization.
- Reliable drape supply

**NURSING**

- No strike through
- Reduced ICU stay for CABG – annual savings of \$728,000.
- Patients dry and warmer
- Standardized components/draping
- Specialty draping to fit needs
- Surgeons now cool and comfortable
- Saving set up time – 10 to 15 minutes per procedure
- Easier teaching of new staff
- Latex Free
- Quick set up for emergencies
- More time can be spent with the patient pre-op
- Greater employee satisfaction

Table 2

TYPE OF CONTACT	MINIMUM REPROCESSING LEVEL REQUIRED	REPROCESSING METHODS CURRENTLY AVAILABLE
CRITICAL	Sterilization	<ul style="list-style-type: none"> <li>• Steam</li> <li>• Ethylene Oxide</li> <li>• Hydrogen Peroxide Gas Plasma (Sterrad)</li> <li>• Liquid Peracetic Acid (Steris System I)</li> <li>• Ozone (TSO3)</li> </ul>
SEMI-CRITICAL	High-Level Disinfection	<ul style="list-style-type: none"> <li>• Glutaraldehyde</li> <li>• <i>ortho</i>-phthalaldehyde (OPA)</li> <li>• Hydrogen Peroxide (apx. 7%)</li> <li>• Hot Water Pasteurization</li> </ul>
NON-CRITICAL	Intermediate or Low-Level Disinfection	<ul style="list-style-type: none"> <li>• Alcohol (70%)</li> <li>• Phenolics</li> <li>• Moist heat</li> <li>• Halogens (Chlorine &amp; Iodine)</li> <li>• Hydrogen Peroxide (apx. 3%)</li> <li>• Quaternary Ammonium Compounds (QUATS)</li> </ul>

The second step is to identify the alternatives that will provide the minimum reprocessing level necessary to keep patients safe. Use Table 2.

The third step is to compare the choices within a selected category. Use Table 3 to identify the issues for comparison of the selected reprocessing methods.

**EFFICACY**

In reviewing any reprocessing method, the first criterion to consider is efficacy. If the method is not effective against the spectrum of microorganisms of concern, patients will not be safe from infection. For example, during the reprocessing of anaesthetic equipment, tuberculosis is always a concern. Equipment must therefore receive high-level disinfection. The processing time for high-level disinfection is based on the time needed to kill *M. tuberculosis var. bovis*. Low-level disinfection procedures are not as potent as high-level disinfection and were not designed to be used on instruments. Following Spaulding's classification will ensure appropriate spectrum efficacy.

Once efficacy is confirmed, a short cycle/contact time is usually preferable. This will allow instrument inventory to be turned around quickly as possible.

The effectiveness of any sterilization or high-level disinfection process must be monitored.<sup>2,3</sup> Some monitoring requirements may be more onerous than others and this will have implications for ease of use.

**SAFETY**

Once it is determined that the efficacy of a system is appropriate, the next issue to address is safety. Staff using any system must be safe. Ideally, a reprocessing method will pose no occupational health or safety risks. If that is not possible, the risks associated with any process must be mitigated. Include the costs of mitigation when comparing systems or methods. Environmental safety is also a concern and the same considerations apply to it as to staff safety. Ideally, the method should cause no harm but, if it might, the costs of mitigation must be factored in to any comparison.

Confirm device compatibility with the reprocessing method(s) being considered. Contact the device or the reprocessing method

Table 3

CRITERIA	ISSUES FOR COMPARISON
EFFICACY	<ul style="list-style-type: none"> <li>• Spectrum</li> <li>• Cycle/Contact time</li> <li>• Monitoring protocols</li> </ul>
SAFETY	<ul style="list-style-type: none"> <li>• Staff OH&amp;S</li> <li>• Instrument &amp; equipment compatibility</li> <li>• Environment</li> </ul>
BENEFITS & LIMITATIONS	<ul style="list-style-type: none"> <li>• Ease of use</li> <li>• Cost per use or per item processed</li> <li>• Total processing time</li> </ul>

## Choosing A Reprocessing Method (cont.)

manufacturer for written guidelines. Reprocessing instructions accompany all new reusable medical devices. Keep a copy on file.

### BENEFITS AND LIMITATIONS

Once it has been determined that the processes being considered are both effective and safe, the in-use characteristics become relevant. Depending on the processes, there may be a wide variety of method-specific benefits or limitations to consider. The three listed in Table 3 are common to all reprocessing methods. Add any others that are relevant to your facility and to the specific methods being considered.

### CONCLUSION/SUMMARY

The choice of a reprocessing method depends on many factors and there is no one perfect method that suits all situations. The needs of patients, staff and the healthcare facility, as well as the types of products available at any given time, will all influence the decision. And that decision will not be final. Products change as do

consumer needs. As a result the reprocessing decision will need to be reviewed, on a regular basis, in order to ensure that it remains current.

For further information on this topic, or if you have any questions, please contact the author at [bbolding@medca.jnj.com](mailto:bbolding@medca.jnj.com).

### References:

1. Favero, M and Bond, W. Chemical Disinfection of Medical and Surgical Materials. In Block S. ed. *Disinfection, Sterilization and Preservation*. Philadelphia: Lippincott Williams & Wilkins, 2001:895-896.
2. Canadian Standards Association. *Z 314.3-01 Effective Sterilization in Health Facilities by the Steam Process*. CSA International. Toronto: 2001. pp 18-26.
3. Society of Gastroenterology Nurses and Associates, *Guideline for the Use of High-Level Disinfectants and Sterilants for Reprocessing of Flexible Gastrointestinal Endoscopes* p. 4. From the web [www.sgna.org](http://www.sgna.org) 30 August 2003. ✱

## CORL CORRAL (cont.)

and top of the head is very important to preclude any side vents. It is believed that staff members may have become infected with SARS due to improper wearing and handling of masks.

Use of the regulation N95 masks, with proper fit testing by the Occupational Health department, has become standard for SARS and related viruses. Initially it was thought that surgical masks were sufficient to protect against SARS but that theory has been disproved. Refusal to modify facial hair to accommodate the proper fit of N95 masks presents risk of inadequate protection. In addition, fit testing needs to be redone every year or two. The developments in this field and changing information are not widely understood among team members.

### Conclusion

It is of grave concern, in this age of mass media and easy access to information, advanced education and scientific evidence, that a lack of

compliance to the fundamental basics of hand washing and the proper wearing of masks still pose an infection prevention risk. It is sometimes said, "The further ahead we are, the further behind we become." Key points for safe health care teams include having current knowledge, sharing the information, following protocols and ensuring your teammates comply. Be a role model for all! Our patients, friends and families may live because of two basics in health care – hand washing and the proper use of masks.

### WASH YOUR HANDS!

### References:

1. Source: [www.handhygiene.org](http://www.handhygiene.org)

### Infection Prevention Source Web Sites:

[www.hc-sc.gc.ca](http://www.hc-sc.gc.ca)  
[www.health.gov.ab.ca](http://www.health.gov.ab.ca)  
[www.cdc.gov/ncidod/sars](http://www.cdc.gov/ncidod/sars)  
[www.cdc.gov/ncidod/hip.ARESIST/mrsawww.cdc.gov/flu/avian](http://www.cdc.gov/ncidod/hip.ARESIST/mrsawww.cdc.gov/flu/avian) ✱

# HOSING CAN BURN.

## PROTECT YOUR PATIENTS - ATTACH A BLANKET.



This patient was admitted to the hospital for surgery. While in surgery, the patient had a forced-air warming hose placed between his legs for more than four hours without it being attached to an inflatable warming blanket. As a result, the patient received third degree burns that required months of medical attention and two additional surgical procedures that resulted in scarring on both legs.

Every day patients are unintentionally and unnecessarily put at risk by a practice called "hosing" – using forced-air warming systems without their inflatable blankets. Forced-air warming, a safe and proven technology, improves patient outcomes dramatically. Hosing, however, has led to numerous reports of 1st, 2nd and 3rd degree burns, and injuries requiring plastic surgery and amputation. Ironically, practitioners of hosing may think they are saving money by not using an inflatable blanket. In actuality, inflatable blankets (most costing less than \$10) are an integral part of these safe, reliable, time-tested systems.

Every instance of such hosing, regardless of the system used, invites potentially harmful consequences. For an educational packet on the prevention of hosing or a copy of an ECRI hazard report on the misuse of forced-air warming, please call 1-800-733-7775 or find materials at [www.stophosing.com](http://www.stophosing.com).

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