CANADIAN
OPERATING ROOM
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Team Training

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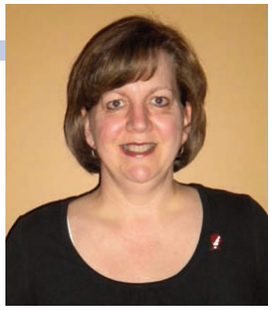
President's Message



This is my last message to you as ORNAC's President. Two years have gone by quickly and it has been a privilege to represent you. I have taken your support and encouragement into many meetings with diverse groups for the purpose of establishing and confirming ORNAC's role as a key player in perioperative nursing practice and patient safety.

The current and predicted rate of change in healthcare led ORNAC to reassess its goals, structure, and culture and develop a strategic plan for the future. These activities have created enormous challenges that are energy-consuming but also revitalizing and rewarding.

As nurses we can no longer remain as we are today. We must become comfortable with chaos and adopt a new perspective on change. We must develop adaptive skills to manage conflict and the astuteness to position ourselves in arenas where significant decisions are being made. In other words, it is time to begin "walking the walk" rather than merely "talking the talk".

My journey with you as the 13th ORNAC President will end at the national conference in Regina. It is my great pleasure to introduce you to the 14th President of ORNAC, Karen Frenette. During the past 2 years I have observed Karen's balanced approach to contentious discussions and appreciated the wisdom she brings to the issues facing ORNAC. Karen has a commitment to the pursuit of excellence in patient care and I wish her all the best in her new role.

From the first day I entered an Operating Room as a naïve student nurse, I knew that this was where I wanted to work. The "passion" that I developed for perioperative nursing many years ago remains alive and well today. It is with this passion that I begin to represent the members of ORNAC in the role of President.

Perioperative practice has evolved dramatically over the past few decades and ORNAC has begun the process of analyzing its role in this evolution through the development of a Strategic Plan. With the guidance of this new strategic direction we will move forth, ever conscious of the history that exists, and evolve as a leader in perioperative practice and patient safety.

The success of any organization is dependent on its members. As members, and leaders, each and every perioperative nurse has a role to play. Become involved in your provincial perioperative organization. ORNAC wants your input and involvement today and beyond! I look forward to working with members of the Executive and the Board as we prepare for the challenges in perioperative practice… today and into the future!

Bonnie W. McLeod, RN, BScN, MN, CPN(C), is Clinical Nurse Educator - Perioperative, Fraser Health Authority, Ridge Meadows Hospital site, the ORNAC representative on the Canadian Patient Safety Institute, and the past Chair of the ORNAC Standards committee.

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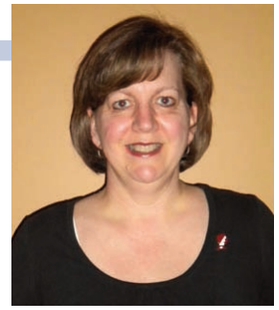
Mot de la president



Le présent message est le dernier que je ferai en tant que présidente de l'AIISOC. Deux années se sont déjà écoulées au cours desquelles j'ai été honorée de vous représenter. Lors des nombreuses réunions avec différents groupes, je me suis servie de votre appui et de vos encouragements dans le but d'établir et de confirmer le rôle de l'AIISOC en tant que joueur clé dans la pratique des soins périopératoires et la sécurité des patients.

Le rythme d'évolution actuel et prévu dans le domaine des soins de santé a mené l'AIISOC à réévaluer ses objectifs, sa structure et sa philosophie, et à élaborer un plan stratégique pour l'avenir. Ces activités demandant beaucoup d'énergie ont été un grand défi à relever, mais elles sont gratifiantes et ont aidé à la revitalisation de l'organisation.

Nous ne pouvons plus en tant qu'infirmières demeurer telles que nous sommes aujourd'hui. Nous devons nous adapter au chaos et adopter un nouveau point de vue de la façon dont nous considérons le changement. Nous devons développer des compétences d'adaptation afin de gérer les conflits, et des astuces afin de nous positionner dans les arènes où sont prises les décisions importantes. Autrement dit, il est temps de nous mettre au pas plutôt que de simplement en parler.

Mon aventure avec vous à titre de 13e présidente de l'AIISOC se terminera lors de la conférence nationale à Regina. C'est avec grand plaisir que je vous présente la 14e présidente de l'AIISOC, Karen Frenette. Au cours de mes deux années, j'ai pu constater l'approche équilibrée de Karen face aux discussions litigieuses et j'ai apprécié sa sagesse à l'égard des enjeux auxquels l'AIISOC fait face. Karen s'est engagée à la poursuite de l'excellence dans les soins apportés aux patients et je lui souhaite la meilleure des chances dans son nouveau rôle.

Dès la première fois où, encore la naïve étudiante-infirmière que j'étais, je suis entrée dans une salle d'opération, j'ai su que c'était l'endroit où je voulais travailler. La « passion » que j'ai développée il y a de nombreuses années pour les soins périopératoires est encore bel et bien vivante aujourd'hui. C'est avec cette même passion que j'entame mon mandat de présidente pour représenter les membres de l'AIISOC.

La pratique des soins périopératoires a considérablement évolué au cours des dernières décennies et l'AIISOC a entrepris d'analyser le rôle qu'elle joue au sein de cette évolution en élaborant un plan stratégique. Grâce aux lignes directrices de cette nouvelle orientation stratégique, nous irons de l'avant, toujours conscients de notre histoire, et nous nous imposerons en tant que chef de file dans la pratique des soins périopératoires et la sécurité des patients.

Le succès de tout organisme repose sur ses membres, et en tant que membres et meneurs, toutes les infirmières et tous les infirmiers en soins périopératoires sans exception ont un rôle à jouer. Je vous invite donc à vous impliquer au sein de votre organisme provincial en soins périopératoires. Dès aujourd'hui et à l'avenir, l'AIISOC veut vous entendre et vous incite à participer!

Je suis impatiente de travailler avec les membres de la direction et du conseil d'administration afin que nous nous préparions aux défis que nous présentera la pratique des soins périopératoires… aujourd'hui et demain!

Bonnie W. McLeod, infirmière autorisée, BScN, MN, CPN(C), est infirmière clinicienne enseignante (périopératoire) à la Fraser Health Authority, Ridge Meadows Hospital, représentante de l'AIISOC auprès de l'Institut canadien pour la sécurité des patients et ancienne présidente du comité des normes de l'AIISOC.

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EDITORIAL CONTENTS

Stainless Steel

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SIMULATION DE FORMATION EN ÉQUIPE DANS L'ÉDUCATION EN SOINS PÉRIOPÉRATOIRES

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RÉSUMÉ

L'actuel modèle d'apprentissage traditionnel en soins de santé ne répond plus aux besoins des personnes que nous formons.[1] Ce modèle nécessite que les personnes formées maîtrisent diverses compétences de base, qu'elles pratiquent une intervention sous supervision et qu'elles en fassent état en même temps aux autres membres du personnel dans un contexte complexe de salle d'opération. Certaines personnes considèrent que cette approche n'est plus acceptable. Par conséquent, les éducatrices en soins périopératoires font maintenant face au défi de trouver des formules d'éducation qui faciliteront l'apprentissage des personnes formées pour qu'elles deviennent compétentes et puissent offrir des soins sécuritaires à leurs patients. Le but de cet article vise à examiner les simulations de formation en équipe pour le perfectionnement des compétences des apprenties en soins périopératoires au Centre de perfectionnement professionnel pour les infirmières autorisées (Registered Nurses Professional Development Centre) à Halifax, en N.-É.

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RÉFÉRENCES :

1. Gettman, M.T. et al. (2009). Use of high fidelity operating room simulation to assess and teach communication, teamwork and laparoscopic skills: Initial experience. *The Journal of Urology,* 181, 1289-1296.

Les normes de l'AIISOC relatives à cet article figurent dans la publication Normes, lignes directrices et énoncés de positions pour la pratique de soins infirmiers périopératoires autorisés (9e édition) de l'Association des infirmiers et infirmières de salle d'opération du Canada (AISSOC) de juin 2009, section 1, p. 43, Normes 6.1

TEAM TRAINING SIMULATION IN PERIOPERATIVE NURSING EDUCATION

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ABSTRACT

The current traditional apprenticeship model in healthcare is no longer meeting the needs of our learners.[1] This model requires learners to master various core skills, carry out a procedure under supervision, and relate simultaneously to other staff in the complex operating room. The approach of "see one, do one, teach one" is considered, by some, to no longer be acceptable. Perioperative nursing educators are, as a result, now faced with the challenge of finding education modalities that will facilitate the learner's journey to competence and the delivery of safe patient care. The purpose of this paper is to discuss team training simulation in the competence development of perioperative nursing learners at the Registered Nurses Professional Development Centre (RNPDC) in Halifax, Nova Scotia.

INTRODUCTION

The Institute of Medicine's (IOM) publication *To Err is Human: Building a Safer Health System* estimates that 98,000 patients die in hospital each year as a result of medical errors. The operating room (OR) has been identified by the IOM as a high-risk area where patient safety is of the greatest concern.[2] The current traditional apprenticeship model in healthcare is, therefore, no longer effectively meeting the needs of our learners.[1] This model requires learners to master various core skills, carry out a procedure under supervision, and relate simultaneously to other staff in the complex operating room. The approach of "see one, do one, teach one" is considered by some to no longer be acceptable. Perioperative nursing educators are, as a result, now faced with the challenge of finding education modalities that will facilitate the learner's journey to competence and the delivery of safe patient care. According to Anderson and Leflore, simulation is a tool that may be used to increase competency and team effectiveness.[1] The purpose of this paper is to discuss team training simulation in the competence development of perioperative nursing learners at the Registered Nurses Professional Development Centre (RNPDC) in Halifax, Nova Scotia.

SIMULATION TRAINING

Simulation is a learner-centered teaching method that mimics real world situations in order to meet specific learning objectives. It involves immersing a learner in a scenario created within a physical space (simulator) which represents a realistic environment. A "simulator" is a generic term referring to a physical object, device, situation, or environment where a task or series of tasks can be realistically and dynamically represented.[3] According to Clark, Fisher, Arafeh, and Druzin, simulators in healthcare

range from simple objects or devices to technologically advanced mechanical systems representing a patient or work environment.[3] Simulation in surgical education appears to be driven by technological innovation, not education.[4] As a result, the appropriate application of simulation requires a conceptual framework.[4] RNPDC delivered team training simulation to perioperative nursing learners based on Windsor's hierarchy of surgical skills conceptual framework.[4]

Hierarchy of Surgical Skills: A Musical Analogy

Windsor compares the acquisition of surgical skills to the process of learning how to produce a harmonious melody on the violin.[4] A child enrolled in violin lessons has to learn several basic skills before attempting to play in public. The pupil begins by learning how to hold a violin and bow and create individual **notes**. It is only when these basic skills are mastered that a series of notes can be put together to produce a **melody**. To achieve this, the child first needs to master the basic knowledge and technical skills. **Harmony** is later created when several people join together as an ensemble.

The skills required in playing a note, melody, and creating harmony is analogous to the hierarchy of surgical skills: basic or core skills, procedural skills, and team skills. **Basic or core skills** (the note) include how to scrub, gown, glove, set-up a sterile field, load a suture, or identify and pass instruments. Competence in these core skills must become automatic before they can be applied to higher-level procedural skills. **Procedural skills** (the melody) include performing a surgical count at the appropriate time during a surgical procedure, participating in the clamp, cut, tie sequence during a bowel resection, or change a contaminated glove during a surgical procedure. These skills require knowledge of pertinent anatomy and physiology, and expected and unexpected steps of a procedure. The third layer of skills is **team skills** (the harmony). These skills include verbal and non-verbal communication, critical thinking, decision making, and an understanding of the roles of all members of the team.

Simulation and Hierarchy of Surgical Skills: RNPDC

Core Skills

In the Perioperative Nursing Program at RNPDC, the simulation required to allow team members to acquire each of the surgical core skills is simple, cheap, and effective. Loading sutures, hemoclips, or performing a surgical scrub are, for example, initially developed at independent table top stations. The simulations and skills are repeated and rehearsed in an undistracted manner outside of the clinical context.

Procedural Skills

Procedural skills at RNPDC are acquired using a cognitive simulation approach discussed by Windsor.[4] Cognitive simulation provides the basic knowledge and context required to facilitate the correct use of instruments — in the correct way, correct hand, correct order, at the correct time, and with the correct judgment to respond to expected and unexpected situations.[4] Procedural skills are developed in the perioperative program through weekly mock surgical procedure scenarios facilitated by an experienced instructor. The mock environment resembles the operating room and each learner assumes the role of the scrub nurse and progresses through each step of a surgical procedure.

Team Skills

The conceptual framework of Windsor's hierarchy of surgical skills identifies the importance of team skills in creating harmony.[4] Gettman et al. hypothesize that teamwork and effective operating room communication are the two key factors in optimizing patient outcomes and reducing errors.[1] In recognition of the importance of team work, and the fact that competency in the perioperative environment involves more than manual dexterity, the

Perioperative Nursing Program faculty at RNPDC collaborated with Capital District Health Authority Skills Centre for Health Sciences' coordinator and faculty from Dalhousie University's Surgical Foundations Program to develop and implement team training that utilizes simulation.[4] According to Clark et al., simulation based team training provides learners with the ability to practice surgical and communication skills in a structured scenario and receive feedback on both individual and team performance.[3]

The RNPDC Experience

Development

A team training simulation was developed based on identification of the following: identification of learner groups, learning objectives, scenario elements, required fidelity, implementation steps, debriefing session and evaluation.[5] A group of perioperative learners and first year general surgery residents were selected for simulation training based on their proficiency level in the required core and procedural skills from their individual programs.

Simulation objectives were developed for the perioperative learners and the residents to take on the roles of clinical experts, communicators, and collaborators (see Figure 1). For example, the scrub nurse would act as a clinical expert by performing the surgical count correctly and the surgeon would act as a communicator by confirming

Figure 1: Objectives developed for Scenario PART A: LAPAROTOMY (PRIOR TO INCISION)

1. PHYSICIAN	
Clinical Expert	Ensures proper/specific equipment is present
Communicator	Introduces self to team
	Performs team needs assessment
Collaborator	Discusses patients condition and anticipated need
2. NURSE	
Clinical Expert	Ensures proper/specific equipment is present
	Sets up room/table opens sterile set up
	Counts correctly
Communicator	Introduces self to team
Collaborator	Discusses patients condition and anticipated need
3. PHYSICIAN & NURSE	
Clinical Expert	Ensures proper positioning of the patient
	Ensure proper prepping and draping
Communicator	Ensures Surgical Safety Checklist/Time Out is performed
	Asks permission to cut (physician)
Collaborator	Leave time for circulating nurse to hook up equipment

the proper labeling of the surgical specimen (see Figure 2).

Courtesy the RN Professional Development Centre

Surgeon and nurse communicating proper labeling of the surgical specimen.

According to Anderson, a scenario should fit the learners' individual knowledge levels so that they have the opportunity to be successful.[2] An exploratory laparotomy leading to a bowel resection was, therefore, identified as the appropriate procedure for the team training simulation scenario. This procedure complemented the developed objectives, knowledge, core and procedural skills of all learners.

The realism, or fidelity, of the simulation was explored in terms of the following resources: equipment, supplies, expenses, and timelines.[3] According to Clark et al., creating simulations for successful team training is more reliant on creativity and commitment than it is on the use of expensive simulators.[3] The Skills Centre for Health Sciences provided a large open space with the required operating room equipment and surgical instrumentation to facilitate a realistic operating room. Supplies such as drapes, sponges, staplers, and count sheets were also identified to enhance the simulation's fidelity.

In keeping with on the chosen procedure, a realistic abdominal model was developed utilizing a mannequin with a hollow, removable abdomen and porcine small bowel (see Figure 3). One end of the bowel was occluded with two grapes to simulate a bowel obstruction. The other end of the bowel was filled with chocolate pudding to resemble bowel contents. Once assembled, the bowel was pinned to a large ham steak, which covered a grounding pad. This design permitted the use of an electrosurgical active electrode during the simulation. Finally, a flesh colored silicone was taped across the mannequin's abdomen to represent skin and fascia (see Figure 4).

A debriefing and evaluation session was planned to take place after the team simulation. Debriefing provides the learners with the opportunity to examine events that happened during the simulation and to discuss the learning that took place.[6] According to Smith, debriefing can be accomplished through the use of observation skills, videotaping, checklists, questionnaires, group discussions or any combination of these.[5] During development of the debriefing session it was decided that videotaping could not be used as a feedback tool due to the lack of resources. All other tools would be used.

Implementation

The team simulation took place at a time when both the perioperative learners and the residents were available. Both groups of learners were provided with learning objectives and the simulation scenario three days prior to the simulation.

As previously discussed, the primary aim of the simulation was for the surgical team to function as clinical experts,

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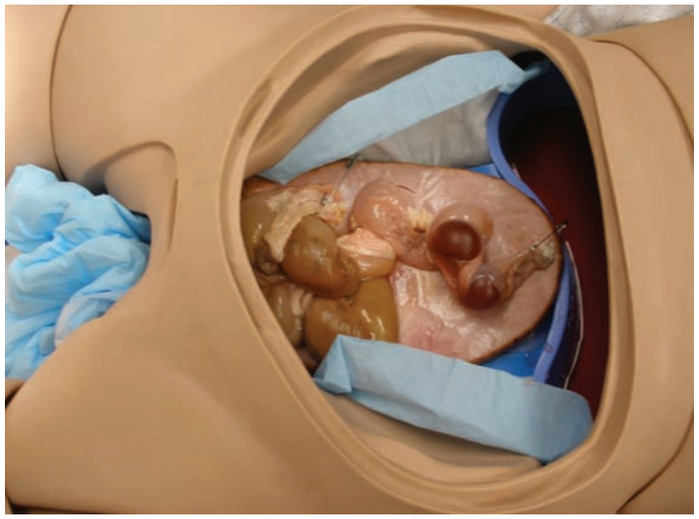

Courtesy the RN Professional Development Centre

Abdominal model prior to simulation

communicators, and collaborators in each of their designated roles during the surgical procedure. One learner was assigned the role of a scrub and two learners the role of circulating nurse. In order to create a realistic situation requiring communication, the scrub nurse was relieved and replaced with another learner which resulted in a change-over count. The surgical residents were assigned the respective roles of attending, first assistant, and second assistant surgeons for the duration of the procedure (see Figure 5).

The perioperative learners were given a realistic timeframe to set up for the laparotomy. This was followed by the gowning and gloving of the residents. The surgical team proceeded, in the usual fashion, to prep, drape, and create the sterile field. The team then implemented aspects of the World Health Organization's (WHO) *Surgical Safety Checklist* in their role as communicators.[7] The laparotomy and bowel resection were performed in the usual fashion with members of the surgical team communicating the appropriate names of instruments, discussing the selection of sutures and staplers, handling of specimens in the proper manner, performing counts, and asking for clarification when required. This portion of the scenario facilitated development of the group's core, procedural, and team skills.

According to Neil, developing relevant scenarios provides important teamwork experiences which build on the learners' communication, critical thinking, and psychomotor skills.[8] During the procedure the coordinator for the Skills Centre for Health Sciences therefore assumed the role of charge nurse and simulated normal and abnormal events in the operating room. The charge nurse, for example, announced a break in sterile technique on the part of one of the surgeons. The team then had to discuss and correct this break. The simulation coordinator also asked the second surgical assist to intentionally hide a sponge in the simulated patient's abdomen to promote communication regarding an incorrect count.

A few unplanned challenges, relating to core and procedural skills, were faced by the team. During the bowel resection, for example, the surgeon did not, when requesting a suture, communicate the specific suture characteristics to the circulating nurse. As a result, a cutting suture was presented to the sterile field instead of a taper needle. Once the error was recognized, communication from the entire team was required in order to identify the type of suture required. The surgeon, as a clinical expert, had to determine and communicate to the circulating nurse, in another instance, the correct size of linear stapler required. The surgeon asked for the wrong size stapler and the circulating nurse did not question his choice. Upon delivery

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POINTE DE VUE D'ESPC

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RÉSUMÉ

En tant que théoricienne en soins infirmiers, Virginia Henderson a reconnu que les soins infirmiers étaient bien plus que le prolongement du travail du médecin. Dans son livre, The Nature of Nursing, elle a mentionné quelque chose qui est fondamentalement important à la spécialité des soins périopératoires – et cette réflexion m'a touchée personnellement :

« L'infirmière est, de façon temporaire, la conscience de l'inconscient, l'amour de la vie du suicidaire, la jambe de l'amputé, les yeux de l'aveugle qui vient de perdre la vue, un moyen de déplacement pour le bébé, le savoir et la confiance de la jeune mère, la « porte-parole » de ceux trop faibles ou renfermés pour parler ». [1]

Ses paroles sont profondes. Elles donnent une nouvelle définition au rôle de l'infirmière en soins périopératoires et à la valeur fondamentale que nous donnons à l'expérience de chaque patient. Nous sommes les yeux, les oreilles et la voix des patients sous anesthésie. Nous nous assurons que les patients obtiennent les soins qu'ils désirent et méritent de recevoir malgré leur inhabileté à les exiger. Nous préconisons la sécurité des patients et nous faisons partie intégrante de l'expérience des soins aux malades. Notre conscience chirurgicale guide notre pratique et constitue peut-être ce qui évitera la mort aux patients à risque d'infection du site opératoire. Nous sommes la main réconfortante sur l'épaule d'un patient apeuré et notre présence peut transformer une expérience chirurgicale traumatisante en une expérience positive. Bien que je sois d'accord avec le fait que nous avons aussi un rôle technique complexe, il est important que nous continuions à nous raccrocher et à valoriser notre approche humaniste à l'égard des soins apportés dans le cadre de la profession infirmière. Contrairement à ce que je pensais, les soins périopératoires sont beaucoup plus que de simples soins. Nous possédons un historique d'expertise et de plaidoyer à la fois en faveur des patients et de la profession infirmière, et il est de notre devoir d'anticiper l'avenir des soins périopératoires.

RÉFÉRENCE

1. Henderson, V. (1966). The nature of nursing. New York: MacMillan

PNEC PERSPECTIVE

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As a nursing theorist Virginia Henderson recognized that nursing was more than just an extension of the physician hands. In her book, The Nature of Nursing, she stated something that was incredibly important to the perioperative specialty – and something that touched me on a personal level:

> "The nurse is temporarily the consciousness of the unconscious, the love of life for the suicidal, the leg of the amputee, the eyes of the newly blind, a means of locomotion for the infant, knowledge and confidence for the young mother, a 'mouthpiece' for those too weak or withdrawn to speak."[1]

Her words are powerful. They give a new definition to the role of the perioperative nurse and to the essential value we add to each patient's experience. We are the eyes, ears, and voice of the anaesthetized patient. We ensure the patient receives the care he/she wants and deserves despite the inability to ask for it. We are advocates for patient safety and provide an irreplaceable component of the patient care experience. Our surgical conscience guides our practice and can be the difference between life and death for those patients who are at risk of a devastating surgical site infection. Ours is the reassuring hand, on the shoulder of a frightened patient, that can mean the difference between a traumatic surgical experience and a positive one. While I agree we also have a complex technical role, it is important that we continue to hold onto and value our humanistic approach to the caring profession of nursing. Perioperative nursing is more nursing than I had ever imagined. We have a history of expertise and advocacy for both patients and the nursing profession. And we must also look towards the future of perioperative nursing.

We share our calling with 279,399 dedicated professionals across Canada who, like me, are proud to call themselves registered nurses.[2] An even closer knit family of 12,583 perioperative registered nurses exists in Canada[2] but 43.35% (5455) of this family is aged 50 or older and now eligible for retirement. As the average age of a perioperative nurse is 44.93 there will be many more ready for retirement in the next 5-10 years. As I look to the future of perioperative nursing, and the future of my own healthcare, I am uneasy. Why are we not growing our own and promoting our specialty? Why are we not advocating for the profession of perioperative nursing and making as much noise as possible to ensure Canadians recognize that we are not only valuable but that the health of the country hinges on our existence? I had the privilege of attending the Operating Room Nurses Association of Greater Toronto (ORNGT) 50th anniversary gala in June, 2010. It is here that I witnessed a glimmer of hope for the future and a renewed sense of pride and joy in the profession I have chosen. That night I remembered why, 16 years ago, I fell in love with perioperative nursing. During the gala event many representatives from the past, present, and future spoke about perioperative nursing. I was enthralled by a young man who had entered perioperative nursing only a year before. Phil Dudok is a 20 something 'millennial' nurse who has chosen the field of perioperative nursing and had an interesting perspective to share with the group. Phil has agreed to share his speech with all CORNJ readers (see page 18) and I hope you find it as inspiring as I did.

As each year we prepare to celebrate perioperative nursing week, in November, it is important to think about what we are celebrating. This is an opportunity, as professionals, to educate the public and our colleagues about what it is we do every day. It is a week to share the importance of the role of perioperative nurses and provide a glimpse into the future. It is our opportunity to inspire the next generation to enter perioperative nursing. Start thinking now how you can grasp this opportunity. We cannot hold on to the past but need to continue to reach out and embrace the future. This is a week to renew and challenge ourselves and each other.

Operating room nurses have the lowest percentage of master's/doctorate prepared education in all nursing specialties across Canada – a mere 0.73%[3] – but we have the opportunity to change that. Education is the key to our future and perioperative nurses capable of not only pursuing but also excelling in graduate studies that will elevate and demonstrate the commitment of perioperative nurses to the patient care experience in Canada.

We also need to advocate for our profession – not just as a group, but also individually. Write to your MP and MPP and share your opinion of how Canadian healthcare would suffer without perioperative nurses. Invite them to visit your surgical suites and see firsthand the important role you provide. They must understand that the faces behind

the masks are nurses, the nurses behind the masks are valuable, and this valuable asset is irreplaceable.

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Novice nurses such as me are considered to be the future of perioperative nursing. No one can truly predict the future, I am sure many of you were just like me when you began your careers, trying to figure out what it is going to be like in ten, twenty, or thirty years. This evening I would like to share with you my thoughts on the future of perioperative nursing.

Nursing is one of the fastest evolving professions today. Fifty years ago I would be wearing a dress and stockings. As unappealing an image that may be it shows us how quickly our profession has changed. The perioperative setting is an area that seems to evolve on a regular basis; this is in part due to the ever changing face of technology. This constant evolution has caused perioperative nursing to grow in many different ways. Registered Nurses' focus still remains on patient advocacy and safety, however how we achieve this has changed dramatically. The future of our profession is bright, although there will be many obstacles along the road I believe that when I come to the end of my career, perioperative nursing will have reached new heights never before imagined. Organizations such as ORNGT and ORNAC will play pivotal roles in expanding the profession in the future. Collaboration and unity will drive perioperative nursing into the forefront of many issues.

I believe that we must sow the seeds for the future now. Novice nurses such as me need guidance and wisdom from expert nurses when we begin our careers. There is an old saying that I have heard on numerous occasions that nurses eat their young. This simply cannot be the case within the perioperative setting. A toxic environment will do nothing but corrupt the future by causing novice nurses to leave the profession in general. A nurturing environment must be further developed, in which novice and expert nurses can collaborate and have an open relationship in which ideas can be shared freely. This will produce strong leaders in nursing who will be able to lead the charge in the future. Associations such as ORNGT should play a key role in this exchange of information. Through meetings and gatherings such as this one, relationships can be created which will aid this process. Novices will be able to experience a sense of community within the profession and be able to network with other nurses. I have found this to be one of the most important factors in aiding in my professional development. Although the operating room has changed rapidly over the years many things have remained the same. For me, being able to reach out to different generations of nurses for advice has truly been helpful in my maturation.

The future of the operating room will be driven by technology. Technology has already reinvented many of the ways surgical procedures are being done. A question that must be asked by all nurses is what will our role be in the future? They already have created robots which are able to identify, pass, and keep track of instruments on a surgical field. Although I believe technology such as this could never truly replace a nurse in the operating room, the

2. Canadian Nurses Association (2010). 2008 Workforce profiles of registered nurses in Canada. Ottawa, ON.

3. Canadian Nurses Association (2010). RN Workforce Profiles by Area of Responsibility – year 2008. Ottawa, ON.

decreasing cost of implementing technology and the increasing shortage of nurses may force institutions to seriously consider this possibility. Many of the new technologies being developed seem like they are being plucked straight from science fiction. If it is difficult for us now to handle when some our current technology fails, what are we going to do when the 3D/4D holotouch module malfunctions? Education will become of even greater importance to our profession with the increasingly complex technology being introduced into the operating room. As a novice nurse I feel that I must seek out every opportunity available to me to increase my knowledge base. ORNGT has numerous educational sessions that are open to all perioperative nurses. I look forward to attending such events as I journey down my career path. Attending professional conferences will also be critical in helping me grow as a professional. For nurses such as me and the ones to come in the near future, innovative technology will become an expectation. Working at St. Michael's Hospital, I have been fortunate enough to see many of these new technologies that have been brought into the operating room. Being able to work in the new interventional radiology room has truly opened my eyes to the endless possibilities technology will provide for us. Watching a surgical robot being used on a weekly basis, across several different surgical specialties was something that would have been unheard of thirty years ago. However as technology advances we must not dehumanize the art of operating room nursing. Our focus must still remain on patient care and not be fixed on the machines that aid in this process.

Professional organizations are fundamental in expanding the role of the professions they represent. ORNGT, ORNAO, and ORNAC will define the future of perioperative nursing. The operating room will continue to change whether we choose to or not. By having these established organizations, perioperative nurses will be able to keep up with the current trends. Conferences and meetings such as these will continue to create a sense of unity within our profession. Novice nurses have a lot to gain from being part of these organizations. We are able to learn from the past and begin to develop our skills not only within the perioperative setting but also begin to get involved in other important issues at the local and provincial level which affect our profession. ORNAC, ORNAO and ORNGT need to lobby the government to ensure that they understand that nurses are an important part of the health care system, and that less nurses means a lower standard of care for our patients. As time moves forward and we, the novice nurses begin to become the face of this profession the lessons we have learned from our mentors will guide us in how we lead. In fifty years when we are celebrating the centennial of this organization, it will be because many of you have worked so hard to lay the foundation on which this great profession was built on.

- **Phil Dudok**, Perioperative Nurse and presenter at the **Operating Room Nurses Association of Greater Toronto** (**ORNGT**) 50th anniversary gala, June, 2010

of the stapler to the sterile field it was obvious to the team that the wrong size had been chosen. These challenges provided the team with the opportunity to communicate and correct the errors. According to Neil, one advantage of simulations is that learners are allowed to make errors and can learn from them before entering the clinical area.[8]

Evaluation

After the team simulation was completed, faculty from both programs, the coordinator for the Skills Centre for Health Sciences, and the learners all met for a group debriefing session in an adjoining room. According to Clarke et al, debriefing is a formal reflective period that allows the learners to integrate the experience of the simulation with their prior knowledge.[3] The debriefing session also provides discussion in a safe, non-punitive, atmosphere.[1]

Faculty guided the debriefing session with planned, open-ended questions that allowed the learners to reflect on their individual performances and the performance of the team (see Figure 6). The learners identified where they felt they did well as well as areas for improvement and information to validate their conclusions.[1] The following comments have been taken directly from this debriefing session:

"During the count at the end of the case, we were missing a hemostat. I instantly thought it was my fault because I was scrubbed and was frantic looking for it. The scrub team was closing and even though we told them we were missing an instrument, they ignored us a little. I ended up telling them to stop closing until we found it. They found it in the belly. This was such an important lesson for all of us. If the scrub team doesn't believe you, you have to be very clear and assertive in telling them what's going on."

"I was crazy nervous, unbelievably so, but I'm pretty sure I was able to do the count under the allotted time. Once I calmed myself down, settled into the routine things came a little easier. I wasn't super comfortable with my setup but I let myself be rushed. So I think it is good that I recognized that, and I know it is something I have to work on."

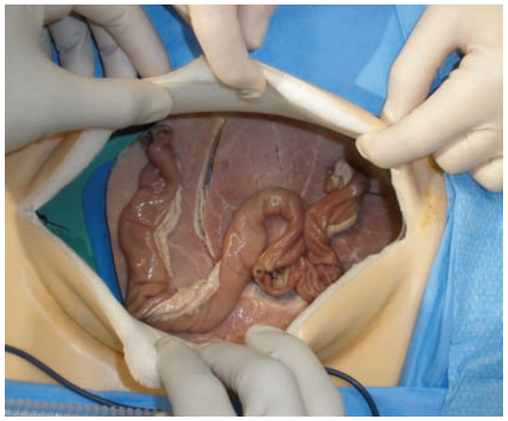
Perioperative learners were, overall, very positive in their feedback and felt the objectives were met. These comments, as taken from the anonymous team training simulation evaluations, provide examples of the types of feedback experienced:

"As for the team simulation with the 1st year surgical residents – what a great experience! It was good to see the residents were learning too. They make mistakes just like we do."

"It was a really great experience to have! It was really great to work with the first year residents and to see them when they are just learning the flow of things as well. I think we worked well as a team and although I know it would be impossible, having more than one would be pretty great! Having a situation where it is as real as possible helps put everything into perspective! I had a really great time!"

FUTURE CONSIDERATIONS

The feedback received from the team training simulation emphasized its positive impact on learning in the perioperative environment. As a result, the RNPDC Perioperative Nursing Program will continue to incorporate team training simulations. According to Clark et al., training that includes multidisciplinary teams is most representative of clinical care and has more potential to improve team performance, competency, and patient safety.[2] Therefore, the program will add



Courtesy the RN Professional Development Centre

Abdominal model prior to simulation

anaesthesia to the team training simulation in order to more fully represent the multidisciplinary team.

Simulation can also be used to assess the core/basic skill levels of the perioperative learners. Instead of having the learners load a suture at an assessment station, the learner can be assessed in a team training simulation that mimics, in a safe environment, the real stress of performing under pressure. As a result the second concept to be included will be the competency assessment/evaluation. The team training simulation will then provide educators and learners with a more realistic representation of the performance relating to a particular skill.

Courtesy the RN Professional Development Centre

Implementation of the team training simulation

CONCLUSION

Perioperative educators are providing OR staff with the necessary basic core and procedural skills discussed in Windsor's hierarchy of surgical skills.[3] There is a need, however, to continue to foster the development of team skills in perioperative education programs. Registered Nurses Professional Development Centre's experience demonstrated that team training simulation is an effective teaching method in the development of teamwork and communication skills.

Figure 6: Team training simulation evaluation for perioperative learners

TEAM TRAINING SIMULATION EVALUATION

1. What did the group do well?

2. Were you able to meet the required objectives?

3. Which ones were you unable to achieve (*if any*)?

4. If we were to do this again, what recommendations would you suggest for revisions?

GENERAL COMMENTS

Please write any other comments you wish to make.

ACKNOWLEDGEMENT

The authors wish to thank the Jason Follett, BBA, BSc, from the Skills Centre for Health Sciences and Guy F. Brisseau, MD, FAAP, FACS, FRCS(C), for their help facilitating the team training simulation.

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L'INOX EST-IL VRAIMENT INOXYDABLE?

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RÉSUMÉ

L'achat initial et les frais de remplacement des instruments chirurgicaux constituent de nos jours un élément important des budgets de salles d'opération. Le personnel de salles d'opération et le personnel de retraitement des dispositifs médicaux travaillent ensemble pour assurer une gestion efficace de cette marchandise de valeur. Le but de cet article est d'examiner la composition des instruments chirurgicaux en acier inoxydable afin d'identifier des processus pour minimiser les dommages aux instruments causés par l'altération de l'aspect, la corrosion et la corrosion par piqûres. Il vise aussi à ce que l'on se serve de cette information pour décrire des mesures efficaces afin de manier adéquatement les instruments à la fois en salles d'opération et dans les zones de retraitement.

Les normes de l'AIISOC relatives à cet article figurent dans la publication Normes, lignes directrices et énoncés de positions pour la pratique de soins infirmiers périopératoires autorisés (9e édition) de l'Association des infirmiers et infirmières de salle d'opération du Canada (AISSOC) de juin 2009, section 2, p. 133-147, Normes 8.1 – 8.7.13.

IS STAINLESS STEEL REALLY "STAINLESS"?

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ABSTRACT

Initial purchase and replacement costs for surgical instrumentation are significant components in today's operating room budgets. OR staff and medical device reprocessing personnel work together as a team to ensure effective management of this valuable commodity. The purpose of this article is to discuss the composition of stainless steel surgical instruments, to identify processes to minimize damage to instruments caused by staining, corrosion, and pitting, and to utilize that information to describe effective measures to manage instrumentation in both the OR and reprocessing areas.

A significant portion of OR budgets is dedicated to purchasing surgical instruments. In order to get value for these health care dollars, we make efforts to prolong the life of these instruments by conscientious intraoperative management and scientific reprocessing techniques. The purpose of this article is to discuss the composition of stainless steel surgical instruments and to identify processes to minimize damage to instruments caused by staining, corrosion and pitting. What are some effective strategies that perioperative nurses and medical device reprocessing personnel can employ to help to prolong the life of surgical instruments?

By/Par: J. Porteous

Scrub Nurse handing a stainless steel instrument to a Surgeon.

Exploring the Composition of a Surgical Instrument:

What is in stainless steel? Stainless steel is a material composed of iron, carbon, chromium, nickel, manganese, silica and small quantities of other metals. The grade of the stainless steel determines the quantities of each of these components. The higher the chromium content, the more corrosion-resistant the metal will be. The qualities of the instrument are determined by the composition of the steel (carbon-chrome ratio) as well as the heat treatment and finishing process used by the instrument's manufacturer.[1]

There are two basic grades of instruments: floor-grade (sometimes referred to as "ward-grade") and surgical-grade. Floor-grade instruments are made from a less than optimal metal and are not constructed precisely.1,2 They often show pitting and staining after the first few sterilization processes.1,2 Surgical-grade instruments are constructed of high quality stainless steel and other metal alloys that resist bending, pitting, scratching and dulling.[1]

Because stainless steel is subject to corrosion, a manufacturing process called passivation protects instruments from corrosion. Passivation is a manufacturing process that removes manufacturing impurities and coats the surface of the instruments to protect from corrosion.[2] During the passivation process, the instruments are put into a nitric acid solution to remove carbon steel residue, and produce a surface coating of chromium oxide. Chromium oxide is important because it produces a resistance to corrosion. The instrument is polished to remove any pits and prevent corrosion. Some manufacturers may substitute electro-polishing for passivation. This produces a less expensive instrument which does not have a long life.[1]

By/Par: J. Porteous

A flaw in a surgical vaginal speculum in which debris will accumulate.

Three types of finishes are used on metal instruments. A bright, mirror finish is resistant to surface corrosion, but can create a glare from surgical lights. A satin finished instrument, while non-glaring, is more susceptible to corrosion and stains from the effects of detergents and contact with water containing high levels of minerals/solutes. Ebonized instruments have a dull black finish and are used for laser surgery.[2,3]

The majority of surgical instruments are manufactured outside Canada. Rothrock (2007) reports that unlike some other countries, the United States does not have an agency that reviews or sets standards for manufactured surgical instruments. The quality is set by the individual manufacturer. Stainless steel qualities are designated by grading the steel into series by the American Iron and Steel Institute. Handheld ringed surgical instruments manufactured in the US should be made with their 400 series graded stainless steel.[4]

Tighe (2007) states that a well-made, properly cared for instrument can be expected to last 10 years.[1]

Types of Damage to Surgical Instruments:

Stains are discoloration of metal caused by material being added to the surface of the metal.

Brown/orange coloured stains are often mistaken for rust. The stain is usually, in fact, a phosphate deposit on the instrument, and will lead to pitting if not removed. Phosphates can come from traces of minerals in the autoclave water source, a dirty autoclave, high alkaline or

acidic detergents, chemicals in laundered surgical wrappings, or dried blood or tissue. Rubbing an instrument with a pencil eraser is a good test as it will remove mineral deposits but not rust. True rust on an instrument is very rare.[5]

A brown/orange or blue/black stain can be caused by plating during the autoclaving process. Through electrolysis, when dissimilar metals touch while being autoclaved, ultrasonically cleaned, or even stored together, plated stains actually bond the stain to the metal.

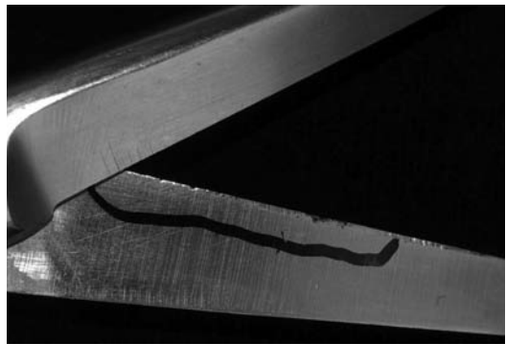
Black stains are usually due to an acid reaction. Always use neutral pH detergents and de-ionized or soft water for cleaning, and completely rinse instruments before steam sterilization.

Multicoloured, or rainbow-coloured, stains are a result of having excessive heat applied to the instrument. Their presence indicates that the instrument may have lost some of its original hardness.[5]

Boilers, used to generate the steam for sterilizers, if not cleaned or maintained properly, will produce contaminated steam which can deposit minerals onto instruments during the sterilization process. Steam lines should be flushed after major adjustments to boilers.

Pitting can occur when an instrument is exposed to a solution containing chloride or and an acid-based detergent. Hydrochloric acid forms in the solution and the acid removes the protective chromium oxide layer from the stainless steel. It then attacks the unprotected steel and creates pits. Organic matter and other debris can become lodged in the pits, creating a challenge for reprocessing.

Use of pH neutral cleaning concentrates has been shown to optimize the efficacy of the passive oxide layer on the instrument.[5] Many cleaning concentrates utilize an alkaline detergent with an acid neutralizer. Many instrument manufacturers recommend against



By/Par: J. Porteous

Staining and metal break-down on a pair of surgical scissors.

using these detergents and recommend using a neutral pH detergent.

Pitting also develops when dissimilar metals come into contact with each other in an ultrasonic cleaner or autoclave. The steam in the sterilizer acts as a conductive solution that facilitates electrolysis. During this process metal molecules are transferred from one metal to another, leaving pits in one instrument.[5]

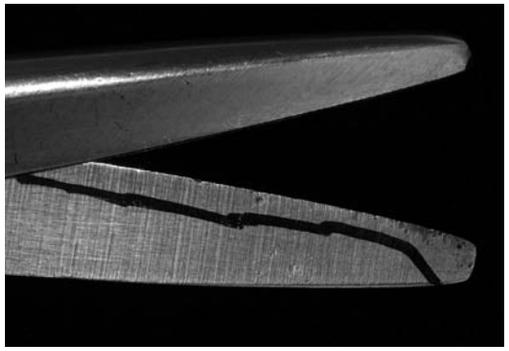
Corrosion may be inhibited by enhancing the passive oxide layer of the surgical instrument. Corrosion starts in the pores of the metal and is often related to improper cleaning. Cleanliness is the single most important factor in preventing corrosion.

Corrosion can be inhibited with the application of an instrument lubricating and protective "milk"[2]. This solution helps to maintain a thin protective coating on the instrument making it more resistant to corrosion. Some newer washer/disinfector systems apply an instrument lubricant/protector with every cycle. The milk is not recycled, which eliminates the old problem of bacterial growth in reused solutions.

Contact between dissimilar metals can cause corrosion when ultrasonics are applied. Overloading and low water temperatures will decrease the effectiveness of ultrasonic equipment. Visible debris and blood should be removed from the instrument prior to ultrasonic cleaning.[6]

What Can OR Personnel Do To Minimize Damage to Instruments?

One of the most effective measures that can be used by OR personnel to prevent instrument damage is to wipe instruments, intraoperatively, using a sponge moistened with sterile distilled water (not saline).[7,8] Sterile distilled water is not used as often for patient care in today's OR environment and so staff may find it tempting to "save" opening a bottle of sterile water and just use saline for wiping instruments. The cost of opening one bottle of sterile water for each procedure is, however, much less than the cost of replacing corroded, stained or pitted instruments.



By/Par: J. Porteous

Staining, pitting and corrosion on a pair of surgical scissors.

As many surgical procedures can take several hours or more the blood and tissue will dry and remain on the instruments for many hours if the instruments are not wiped with sterile distilled water. Reduce long exposures to blood and saline during complex surgical procedures, by wiping or rinsing often during the procedure, in order to prevent corrosion.

Cleaning of surgical instruments should not be performed at a surgical scrub sink, with the substitution of hand antiseptics for detergents, or with no detergent. Hand antiseptics located at scrub sinks may not be pH neutral and not using detergent can result in a failure to remove organic material and microorganisms – this will promote corrosion, staining and pitting, and will render disinfection and sterilization ineffective. Chlorexidine and iodine-based products, often located at scrub sinks, act as an enemy to stainless steel and cause pitting and corrosion.10 Instruments should be sent to medical device reprocessing areas for cleaning and disinfection.

Another strategy to prevent instrument deterioration is to ensure that instruments are transported to medical device reprocessing areas immediately after the surgical procedure has been completed and that these instruments are immediately reprocessed upon arrival in that department.[9]

It is very challenging for reprocessing departments to separate surgical instruments of different grades or different metal composition for reprocessing. The initial additional purchase cost of surgical-grade stainless steel instruments is balanced out by the extended life of the instruments. If an instrument becomes corroded or pitted in a short amount of time, perhaps another manufacturer should be considered. Return new items to the vendor and request a replacement if the set is not holding up under the manufacturer's specifications for reprocessing. Utilize the manufacturer's warranty agreement to its greatest advantage.

Hospital-acquired vibrating engraving devices scratch off the protective surface of the instrument and increase the risk for corrosion. Etching processes are preferred, because they do not harm the instrument. Manufacturers may offer etching or stamping at the time of purchase.[1] It is helpful to have the manufacturer etch or stamp the date of purchase on the instrument, as that allows OR personnel to evaluate the ability of that instrument to maintain quality over time.

Surgical instrumentation is the joint responsibility of the OR and the medical device reprocessing departments. When purchasing any new instrumentation it is essential to consult with the reprocessing department regarding the manufacturer's recommendations for cleaning and re-sterilizing. It is not cost-effective to purchase surgical instruments that cannot be cleaned and reprocessed effectively. It is impossible to sterilize an instrument that has not

been cleaned effectively. Manufacturers' specifications for cleaning and parameters for re-sterilizing can be quite different from standard reprocessing practices.

Invite industry representatives or educators from instrument manufacturers to give a talk to OR and medical device reprocessing personnel about the principles of good instrument management. It can be an investment in an extended life for surgical instruments and improved purchasing skills that is well worthwhile.

What Can Medical Device Reprocessing Departments Do to Minimize Damage?

Medical Device Reprocessing departments also are committed to employing strategies to reduce damage to instruments purchased by operating room departments. Instrument reprocessing practices should be based on current Canadian Standards Association (CSA) standards.8 Some key steps in the prevention of pitting, staining and corrosion include:

1. Cleanliness is a critical factor in the prevention of instrument damage. Instrument washers/disinfectors should be serviced and maintained on a regular basis. New guidelines from the Association of OR Nurses (AORN), the Association for the Advancement of medical Instrumentation (AAMI) and the CSA call for testing of automated instrument washer disinfectors before initial use, weekly during service and after major maintenance.[8,9] Test kits are available that utilize a surrogate device to approximate the type of soils on surgical instruments;

2. The decontamination process should begin within 10 minutes following a surgery. This is the best defence against corrosion, pitting and staining.[8,11] Do not allow blood and debris to dry on instruments as this causes corrosion. Clean instruments or apply treatment, to prevent drying and encrustation of blood, body fluids and debris, as quickly as possible after use. If cleaning must be delayed, then place instruments in a covered container with enzyme-detergent or apply an enzyme-detergent foam spray to delay drying;

3. An inexpensive and simple way to detect gross amounts of protein is to completely immerse the instrument in hydrogen peroxide after it has gone through the cleaning process. Bubbling indicates the presence of organic matter, and hydrogen peroxide is not harmful to the instrument;

4. Other test kits are available to measure water quality, temperature, instrument cleaning efficiency, as well as to test residual soil on instruments;

5. Neutral pH surgical instrument cleaning products are recommended universally by surgical instrument manufacturers.[5] Lubrication protects the instruments from staining and rusting during sterilization and storage.[5,8] Instructions for rinsing are also important. Multiple rinses are required for some products;[1]

6. If the washing process is to be delayed, the instruments can be soaked in or sprayed with an enzymatic cleaning solution to prevent drying. The decontamination process should include sorting, soaking, washing, rinsing, drying and lubricating;[1,8,9]

7. The necessity for water treatment will depend on the local water quality. Soft or de-ionized water should be used for the final rinse to reduce water impurity

By/Par: J. Porteous

Pitting on a pair of plastic surgery scissors.

deposits. If untreated tap water is used for final rinsing then the instruments should be dried immediately to avoid staining;[6]

8. On-line instrument inspection programs are available for purchase. These programs can be a tremendous resource towards education and skill-building for personnel working in reprocessing departments;

9. Re-usable wrappers, towels and drapes can retain soap particles. During the sterilization cycle, steam passes through the fabric, picks up these particles and deposits them on the surface of instruments.[12] Re-usable wrappers should be washed with minimal detergent and rinsed well;

10. Working closely with OR instrument purchasers promotes the use of instruments for which the manufacturers' cleaning recommendations can be met; and

11. Avoid contact between dissimilar metals in ultrasonic cleaners and steam sterilizers. The solution in ultrasonic cleaners must be changed as recommended by the manufacturer or the bioburden on instruments can actually increase.[1]

CONCLUSION

The term "stainless" is indeed misleading. While steel does not tarnish, rust or corrode easily, some staining and spotting will occur with normal use. Efficient management of surgical instruments is an important process in today's fast paced and high cost surgical environment. Operating room and medical device reprocessing personnel can work together as a team to effectively minimize damage, reduce costs and prolong the life of surgical instrumentation, and maintain them in optimum and safe working condition.

ORNAC Standards pertaining to this article can be found in the Operating Room Nurses Association of Canada (ORNAC) (June 2009). Recommended Standards, Guidelines, and Position Statements for Perioperative Registered Nursing Practice (9th edition), Section 2, p. 133-147, Standard (s) 8.1 – 8.7.13.

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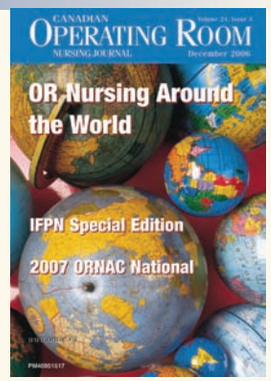

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