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President's Message

Two things have recently inspired me to reflect on the way perioperative nursing is perceived within the entire spectrum of nursing practice.

The first occurred while I was attending the Canadian Student Nurses Association annual conference, in Winnipeg. ORNAC was, for the first time, involved as a sponsor of this dynamic organization. I came fully prepared with brochures, banners, copies of CORNJ, and a copy of our Standards. I wanted to show off ORNAC and motivate and encourage these future leaders to consider perioperative nursing as a career option. What I didn't expect was the confusion and frustration resulting from the varied entry requirements for perioperative practice in different parts of the country. Some provinces have very strict requirements while others offer innovative opportunities for students and new graduates to enter the perioperative world. One province requires new graduates to have 2000 hours as an RN in general practice before they can apply for a perioperative program. Other provinces are working with educational institutions to hire nurses into the operating room straight out of school or are increasing the numbers of senior practicum seats in the operating room as a means of enticing students to consider the operating room as a career option.

A common theme heard at this conference was the age old issue of not providing enough opportunities for students to experience nursing in the operating room during their schooling. Many students expressed their disappointment that they did not receive enough of a 'snapshot' of the perioperative environment to allow them to give it serious consideration, much less choose it as a career. It is no wonder that we are not one of the top choices for students - the minimal exposure received by students to the OR and the varied rules controlling entry to practice are keeping our next generation of nurses out!

The second incident that gave me cause for concern took place, oddly enough, over an enjoyable lunch with some co-workers. A group of educators had brought along a nursing student who was finishing up his senior rotation. Given my recent experience I was curious to hear this student's perception of the

OR and if he was considering it as a potential career option. I was not prepared for his answer...fortunately there was no food in my mouth or I'm sure I would have aspirated! His response was "No, or at least not for a long while, as I want to work for several years on a med-surg ward or in critical care. I don't want to lose the nursing skills that I've just spent four years learning." Those of us from the OR who were at this lunch immediately went on the defensive about why his perception of perioperative nursing, and the skills required, were erroneous and just plain wrong.

In retrospect I realize that while the lack of exposure during nursing school may play a part in this clouded opinion, I have to wonder how much influence I have had in substantiating or disproving this view when talking with students or with fellow nurses. It's clear that we, as a profession, need to do a better job of promoting perioperative nursing practice! It is our responsibility if we want to attract future leaders into the OR! 🍁

Linda M. Socha

Linda M. Socha, RN, BSN, RNFA, CPN(C), CEPT, CTBS, is President of the Operating Room Nurses Association of Canada. She is Clinical Nurse Educator for the OR at Saskatoon City Hospital and Casual Tissue Donor Coordinator for the Saskatchewan Transplant Program. She is also the past Chair of the ORNAC Editorial Committee.

Linda M. Socha, infirmière autorisée, baccalauréat en sciences infirmières, RNFA, CPN(C), CEPT, CTBS, est la présidente de l'Association des infirmières et infirmiers de salle d'opération du Canada. Elle est infirmière clinicienne enseignante de salle d'opération au Saskatoon City Hospital et coordonnatrice occasionnelle des dons de tissus pour le Saskatchewan Transplant Program. Elle est également la présidente sortante du comité de rédaction de l'AIISOC.



President's Message

Dernièrement, deux expériences m'ont poussée à réfléchir sur la perception des soins périopératoires en contexte de la gamme complète des soins infirmiers.

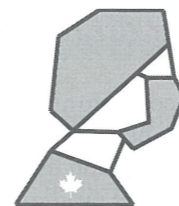
La première de ces expériences est survenue pendant la conférence annuelle de l'Association des étudiant(e)s infirmier(ère)s du Canada à Winnipeg. L'AIISOC participait, pour la première fois, à titre de commanditaire de cet organisme dynamique. J'y suis arrivée munie de brochures, de bannières, de copies de la revue de l'AIISOC et d'un exemplaire de nos normes. Je voulais mettre en vedette l'AIISOC tout en motivant et en encourageant ces futurs dirigeants à considérer les soins périopératoires comme choix de carrière. Ce à quoi je ne m'attendais pas, c'était la confusion et la frustration associées aux différents critères d'admission dans diverses régions du pays. Dans certaines provinces les exigences sont très rigoureuses, tandis que d'autres provinces offrent des programmes novateurs aux étudiants et aux nouveaux diplômés voulant se lancer dans le monde des soins périopératoires. Une province exige que les nouveaux diplômés accumulent 2 000 heures comme infirmier(ère) autorisé(e) en médecine générale avant de soumettre une demande au programme périopératoire. D'autres provinces font équipe avec des établissements d'enseignement afin de placer immédiatement de nouveaux diplômés dans la salle d'opération. Encore d'autres augmentent le nombre de places en salle d'opération pour les stages de dernière année pour inciter les étudiants à envisager une carrière en soins périopératoires.

J'ai entendu à plusieurs reprises pendant cette conférence la vieille anecdote voulant que les possibilités de travailler en salle d'opération pendant la formation des étudiants ne soient pas assez nombreuses. Plusieurs étudiants ont exprimé leur déception à ne pas avoir reçu une vue d'ensemble assez complète de l'environnement périopératoire pour leur permettre de le considérer sérieusement comme carrière. Il n'est donc pas difficile de voir pourquoi nous ne classons pas parmi les premiers choix des étudiants. Le peu qu'ils voient de la salle d'opération et la variété de

critères d'admission réglant l'accès au domaine ne font que décourager la prochaine génération d'infirmières et d'infirmiers!

La deuxième expérience inquiétante a eu lieu, drôlement, pendant un lunch sympathique avec des collègues de travail. Un groupe de formateurs avaient invité un étudiant-infirmier qui terminait son dernier stage. Étant donné mon expérience à la conférence à Winnipeg, je m'intéressais à découvrir ce que pensait cet étudiant de la salle d'opération et à savoir s'il envisageait les soins périopératoires comme choix de carrière potentiel. Je n'étais pas du tout prête pour sa réponse et chanceuse de ne pas avoir la bouche pleine car je m'aurais certainement étouffée! Sa réponse était, « Non, sinon pas pour longtemps car je veux travailler plusieurs années dans un service médico-chirurgical ou en soins intensifs. Je ne veux pas perdre les habiletés que je viens d'apprendre depuis les quatre dernières années ». Moi et mes collègues en soins périopératoires présents à ce lunch se sont immédiatement trouvés sur la défensive en expliquant pourquoi cette perception des soins périopératoires, ainsi que des habiletés requises, est incorrecte et tout simplement fausse.

En y réfléchissant maintenant, bien que je voie qu'un manque d'expérience dans la salle d'opération pendant les études puisse jouer un rôle dans la formation de cette opinion erronée, je me demande également à quel point j'ai contribué à propager ou à réfuter cette perception lors de mes échanges avec des étudiants ou des collègues. Il est évident que nous, en tant que membres de cette profession, devons apprendre comment mieux promouvoir la pratique des soins périopératoires! Nous devons assumer cette responsabilité si nous voulons attirer la prochaine génération de leaders dans la salle d'opération!!



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In the December 2007 issue the article "Teamwork and Dedication" should have ended with the sentence "The quilt should help remind everyone that behind these double doors is a very caring and dedicated team!". Due to a printing problem the end of this sentence did not appear. We apologize to the authors and to our readers.

LES DÉPOUILLES : LES TISSUS HUMAINS, LA COMPÉTENCE ET LE CONSENTEMENT DANS UNE ÈRE DU PROFIT

Eike-Henner W. Kluge, PhD, département de Philosophie, University of Victoria, Victoria (BC). M. Kluge était le premier témoin expert en éthique médicale reconnu par les tribunaux canadiens et le directeur fondateur du département des affaires éthique et judiciaires de l'Association médicale canadienne. Le professeur Kluge a été conseiller de l'Association médicale du Commonwealth et expert-conseil du ministère de la Santé (sous-direction de la protection de la santé), du ministère de la Justice du gouvernement canadien et des provinces de l'Ontario et de la Colombie-Britannique. Il s'est aussi présenté devant le Comité permanent de la Chambre des communes sur les affaires judiciaires et a témoigné devant la Commission royale. Le Comité sénatorial spécial sur l'euthanasie et le suicide assisté a également demandé son témoignage.

Il est l'auteur de six œuvres en éthique biomédicale, a préparé une étude sur les banques de tissus humains commandée par la sous-direction de la protection de la santé du ministère de la Santé et a rédigé plus de quarante articles sur des sujets aussi variés que l'attribution des ressources en soins de santé, les politiques de don d'organes, la génie génétique, le système de soins de santé canadienne et la mort voulue en milieu de soins de santé.

RÉSUMÉ

Depuis plusieurs décennies les tissus et les fluides humains intéressent de plus en plus les chercheurs en santé en raison de leur rôle potentiel dans le développement de nouveaux outils diagnostiques, médicaments et traitements. Ils sont également devenus substances de valeur jouant de grands rôles dans la récupération de protéines ainsi que d'hormones pour procédures cosmétiques. Ils sont également fréquemment utilisés dans l'industrie bio-pharmacologique. Malheureusement, la compréhension actuelle du statut éthique et légal des tissus et fluides

humains, ainsi que des conditions de récupération et d'utilisation appropriées, est peu uniforme. L'objectif de cette présentation est de dresser un tableau des considérations juridiques et éthiques à envisager lors de la création d'un protocole de récupération et d'utilisation répondant aux normes appropriées.

THE REMAINS OF THE BODY: HUMAN TISSUE, COMPETENCE AND CONSENT IN AN AGE OF PROFIT

Eike-Henner W. Kluge, PhD, Department of Philosophy, University of Victoria, Victoria, BC. Mr. Kluge was the first expert witness in medical ethics recognized by Canadian courts and was the founding Director of the Canadian Medical Association's Department of Ethics and Legal Affairs. Prof. Kluge has acted as an advisor to the Commonwealth Medical Association and as consultant to the Ministry of Health (Health Protection Branch) the Ministry of Justice of the Canadian Government and the Ontario and British Columbia Ministries of Health. He has appeared at various times before the House of Commons Standing Committee on Judicial Affairs, has presented testimony to the Royal Commission, and was invited by the Special Senate Committee on Euthanasia and Assisted Suicide to give testimony.

He is the author of six books in biomedical ethics, has prepared a commissioned study on human tissue banking for the Ministry of Health, Health Protection Branch and has authored more than eighty articles on subjects on such subjects as health care resource allocation, organ donation policies, genetic engineering, the Canadian health care system, and deliberate death in the health care setting.

ABSTRACT

Over the past few decades human tissues and fluids have increasingly become of interest to health-oriented research due to their potential use in the development of new diagnostic tools, drugs and treatment modalities. They have also

REMAINS OF THE BODY (cont.)

become valuable commodities that figure prominently in the recovery of hormones for cosmetic purposes, the production of proteins and in a whole range of uses in the bio-pharmacological industry. Unfortunately, current understanding of the ethical and legal status of human tissue and fluids, and of the conditions under which they may be recovered and used, is somewhat uneven. The aim of this presentation is to outline the ethical and legal considerations that must be met if a recovery and use protocol is to meet appropriate standards.

Introduction

For most of history, human fluids and tissues were of interest to health care professionals only for pathology purposes. Interest expanded, however, into the therapeutic field with the advent of transfusion and transplantation. As biological sophistication increased, researchers became more interested in human biological materials (biologicals) for their potential usefulness in developing new diagnostic tools, drugs and treatment modalities, and the bio-pharmacological industry began to consider them valuable commodities for the recovery of hormones for cosmetic purposes, the production of proteins and a whole range of other uses.

Historically these developments occurred in parallel with an increasing societal concern for the ethical and legal issues that centre around autonomy, privacy and informed consent. As a result, the right to self-determination came to include the right to decide what happens not only to one's body, as a whole, but also to one's body parts and products;^{1,2} privacy issues expanded to encompass personal genetic information;³ and the notion of informed patient consent was adapted to include not only the right of the patient to decide on medical treatment but also the right to be given, prior to making a decision, all the information that an objective reasonable person would require before making the decision about treatment.⁴

These developments occurred independently of each other, but their intersection gave rise to a series of considerations that centre around the recovery, storage, manipulation and use of human

biologicals. The situation was further complicated by the fact that research, delivery of health care, industrial usage, and data handling/manipulation had become transborder enterprises that straddled countries and legal systems.

Unfortunately, these developments have not been paralleled by a corresponding increase of their nature and importance within the perioperative profession. The aim of this discussion is to outline some of the more salient factors that are involved, with special focus on the recovery, storage and handling of human biologicals in the OR setting. Legal considerations will be important to this discussion, but it will be suggested, however, that ultimately, because of the international context of contemporary health care delivery, consultation and research, and because of the global field-of-operation of the bio-pharmacological industry, it is ethical considerations that should be at the core of any protocols that might be devised. This is the only way that inter-jurisdictional conflicts can be minimized.

Autonomy and informed consent:

Patients have a right to autonomy — which is to say, they have the right to decide what shall happen to them.^{4,5} Since patients are physical beings, this includes not only the right to make informed consent about any intervention, but also the right to decide what shall happen to their bodies, their body parts, or the products of their bodies. The easiest way to conceptualize the implications of this, for the OR setting, is to distinguish between the right of ownership and the right of disposition.

Ownership

Legally, the term 'ownership' refers to the bundle of rights that someone has in relation to a particular thing, entity, substance or process.⁶ This includes the right of possession, control, use, benefit, and exclusion, as well as the right to transfer or sell what is thus owned.

In Canada, as in most countries,⁷ there is no ownership recognized in relation to human bodies or body parts. The implications of this are

REMAINS OF THE BODY (cont.)

clearly expressed in the British Columbia *Human Tissue Gift Act*,⁸ which stipulates at Section 10 that, “A person must not buy, sell or otherwise deal in, directly or indirectly, for a valuable consideration, any tissue for a transplant, or any body or parts other than blood or a blood constituent, for therapeutic purposes, medical education or scientific research.”

There are three major reasons for adopting this stance. *First*, if ownership in human bodies were allowed, then bodies could be sold. This would mean that slavery would become legal. *Moreover*, it would legalize commercial trade in body parts. The individuals most likely to be affected by this practice would be socioeconomically disadvantaged persons. As examples from the uncontrolled blackmarket industries in India, Pakistan and Turkey show, it is invariably poor people who sell their organs for use in what is euphemistically referred to in the media as ‘transplant tourism’.^{9,10} *Third*, to treat human bodies, body parts and tissues as property is to adopt a perspective that treats human beings as mere biological machines. This would undermine the principle of the dignity of the human person that is affirmed in the International Declaration of Human Rights.¹¹ It should also be noted that neither the BC statute, nor its analogues in other Canadian jurisdictions, distinguishes between living and dead human bodies or body parts.

There is, therefore, no recognized ownership of, and no legal commerce in, human bodies, body parts or tissues. And while blood, placentas, foetuses and other biologicals that are replaceable by normal bodily functions and repair are not specifically mentioned in the statutes just referred to, most jurisdictions specifically prohibit the sale of these items (with the exception of blood) in separate and distinct clauses and for similar reasons.

Disposition

The absence of ownership does not, however, mean an absence of control over bodies, body parts, and tissues. This is usually expressed by saying that all persons have a right to the control over the disposition over their own

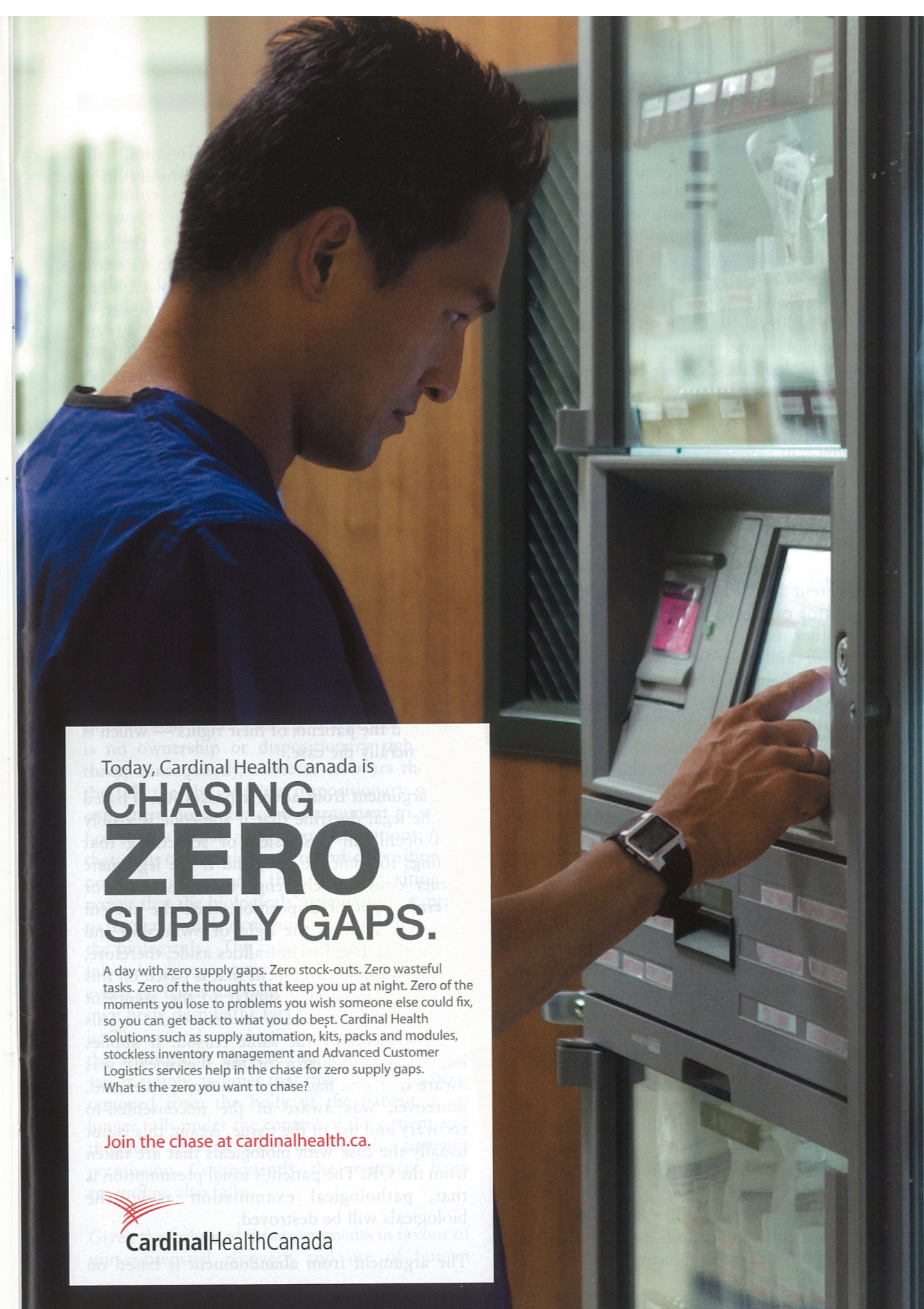
bodies, body parts and tissues.¹² The reason for this is again threefold. *First*, as biological entities, all human beings are presumed to have an abiding interest in what constitutes their unique physical being. This, among other things, is what underpins the right to the inviolability of the person, the right to donate organs, the right to decide how one shall be buried, etc. *Second*, the biologicals themselves have been produced by their human originators and no-one else. There is a standard presumption that whoever has produced something has a right of control over it, as underlies patent law. *Third*, all human biologicals contain genetic markers that are unique to their originators. The right to privacy that surrounds all persons, and the right to decide who shall have access to information about oneself,¹³ therefore entails that the originator of the biologicals has a privacy-grounded right of control over them.¹

By way of filling out the picture, it should be noted that the right of disposition does not lapse when their biological originator is incompetent (or dead). It devolves onto the duly empowered substitute decision-maker. The only exceptions are coroners and pathologists engaged in the execution of their legally mandated duties. Moreover, the order of duly empowered substitute decision-makers is fixed by law and goes as follows: patient-appointed substitute, spouse, child, parent, sibling, anyone else related by birth or adoption. Priority in this list confers exclusive decision-making power — unless it can be shown in a court of law that the higher-ranked person would violate the wishes or values of the incompetent person. The ranking reflects the standard assumption that, all other things being equal, the higher in the list would be more likely to know the originator’s values than someone ranked lower. There is case law to this effect.¹⁴

Guidelines

The preceding considerations are clearly accepted by the Interagency Panel on Research Ethics (IPRE)¹³ and the Canadian Institutes of Health Research (CIHR)¹⁴. These bodies have

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promulgated guidelines against which the ethics of all publicly funded research in Canada is measured. Failure to adhere to these guidelines entails not merely censure of the implicated individuals or institutions but, in the most egregious cases, will result in withdrawal of accreditation and loss of public funding. Moreover, while the private sector is not directly subject to these guidelines, they may apply indirectly because, in any litigation affecting human biologicals, they are the standards that are applied to all actions irrespective of whether these actions are carried out in the public or the private sector.

Both IPRE and CIHR subscribe to, and follow, the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans*.¹⁷ This policy states that the collection of human tissue shall be undertaken only with the free, competent and informed consent of the originator of the tissue; that gametes, fetuses and other biologicals (including fluids) are included; and that in the case of deceased donors, consent must be acquired from the duly empowered substitute decision-makers of the individual in question.¹⁷ In addition, the consent process must disclose the proposed use, any known or expected commercial potential and any known or reasonably expected privacy implications.¹⁷ The only exception to this is when the use is for pathology purposes and other exemptions provided by law. Collection for the destructive disposal of biologicals does not require consent, since patients generally assume that unless their consent is explicitly requested, the biologicals in question will be destroyed after an operation. It is also worth noting that donorship must never be a condition of treatment.

Traditional arguments against informed consent

Despite the clear position of IPRE, the Tri-Council, and CIHR on this matter, it is often assumed that informed consent for the collection and use of human biologicals is unnecessary in the OR. This stance, insofar as it has been defended at all, usually involves an appeal to one or more of the following four legal arguments: the argument from *laches*, the

argument from adverse possession, the argument from abandonment, and the argument from *res nullius*.

The argument from *laches* is based on the legal doctrine that whoever is negligent in asserting their ownership or dispositional power, when it was possible to do so, loses that power to anyone who cares to assume it. By way of example, this doctrine was taken to ground in what historically came to be called “squatter’s rights” in the domain of real estate. However, even if one ignores the fact that human biologicals are not property and therefore could not, strictly speaking, be covered by this doctrine, there is also the fact that in order for the argument to be acceptable in a court of law, the owner of the property must have been aware of the right of ownership and disposition. This is not usually the case with patients whose biologicals are removed in the operating room. Consequently, the patients’ failure to assert their dispositional power is not indicative of negligence but is a consequence of ignorance. In other words, this argument would apply if, and only if, the medical staff had previously informed the patients of their rights — which is not generally the case.

The argument from adverse possession is based on the legal doctrine that if someone is visibly and openly in possession of something that belongs to someone else, and if the legitimate owner does not challenge that possession or assert a right of disposition, then the current possessor acquires the right of ownership and disposition. Legal technicalities aside, therefore, the human-tissue argument that is based on this doctrine is essentially similar to the argument based on the doctrine of *laches* — and it fails due to essentially the same reason. It applies only if the originator of the biologicals was aware that s/he had dispositional power and, moreover, was aware of the unconsented-to recovery and use of the tissue. Again, this is not usually the case with biologicals that are taken from the OR. The patient’s usual presumption is that, pathological examination aside, the biologicals will be destroyed.

The argument from abandonment is based on

the legal doctrine that if someone abandons something, the act of abandonment extinguishes all rights of control and possession. The doctrine of abandonment, however, only applies if the abandonment was intentional. Consequently, in order for this argument to apply to biologicals from the OR, the patient would have to be aware that there was a right of ownership or disposition and, moreover, that the biologicals would not in fact be destroyed but would be retained and used. Again, this is not usually the case. The standard assumption of patients undergoing removal of tissues or fluids in the OR is that these will either be destroyed directly upon completion of the procedure or that they will be destroyed after an examination for pathological indicators. Consequently, the argument from abandonment also fails because the presuppositions on which it is based are not met.

The argument from *res nullius* is based on the old Roman maxim that “Res nullius fit primi occupantis,” or “What belongs to no-one falls to the dispositional power of whoever first takes possession of it.” The argument holds that since human biologicals are not property, there is no ownership or dispositional right over them; consequently, whoever recovers them in the OR thereby acquires dispositional power over them. In order for the argument to work, however, it has to make two assumptions: *first*, that only ownership can ground dispositional power; and *second*, that the dispositional power that the biologicals’ originator has, prior to the removal, is extinguished upon removal of the biologicals. The first assumption is simply false. As diverse statutes and legal cases attest, everyone has a dispositional power over their own body despite the fact that they do not own it. The second assumption simply asserts what the argument is supposed to prove. That is to say, it simply assumes that once tissue has been removed from the body of the patient it no longer falls under the control of the patient and therefore may be used without the patient’s permission. Consequently, the argument from *res nullius* also fails.

Given the failure of these arguments in favour of non-consensual recovery and use of human

biologicals, given also that these biologicals contain the potential for tremendous financial profit, and given further that the patient has ethically and legally recognized privacy interests in the information that can be derived from such materials, it would seem reasonable to conclude that consent must be acquired for any use of human biologicals taken from the OR, beyond those taken for pathological examination or destruction.

Conclusion

During the gold rush of the 19th century, the lure of profit gave rise to practices that ignored both ethics and law. “Claim jumping,” where miners simply worked property that legally belonged to other miners, was not uncommon. In some instances, current practices surrounding the retrieval and use of human biologicals in the OR — the surgical “leftovers” — follow a similar pattern.

It is dangerous to assume that if the matter ever came to litigation, Canadian courts would follow the ruling in *Moore v. Regents of the University of California*.¹⁶ In that case, the Supreme Court of California held that the patient whose spleen was removed as part of his treatment for hairy cell leukemia had no proprietary or dispositional right in the tissue and therefore had no right to a share in the hundreds of millions of dollars of profit that flowed from the subsequent use of the MO cell line. In the first place, this is a US case and hence not binding on Canadian courts. Given that the Supreme Court of Canada refused to follow US precedent when it rejected a patent application for genetically modified animals,¹⁹ it cannot be assumed, as a matter of course, that the Supreme Court would slavishly follow *Moore* in this instance. Secondly, the *Moore* case was decided without taking into account the patient’s legally protected privacy interests. The Supreme Court of Canada, however, has repeatedly signalled that it places tremendous importance on these interests.^{1,2} It is likely, therefore, that, at a minimum, the Court would require that these interests be protected.

Continued on Page 13

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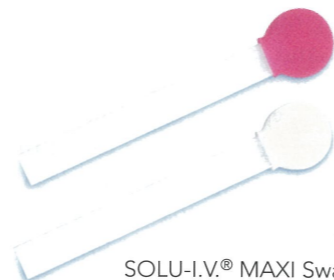
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REMAINS OF THE BODY (cont.)

Thirdly, and perhaps most importantly, the Tri-Council Guidelines that are subscribed to by IPRE and CIHR make it very clear that non-consensual use of human biologicals is ethically unacceptable. These Guidelines, and the principles that underlie them, form the basis for all ethical review of contemporary Canadian research. Violating them runs the risk of severe administrative, financial and legal repercussions. Therefore even if institutions and researchers are not persuaded by ethical considerations, purely prudential considerations should persuade them to follow at least the spirit of the Guidelines. This holds true especially if the partners involved in any such recovery, research or use are international — as is the case in many research and commercial ventures. Not only are the Guidelines considered a model of research ethics, they also reflect international Conventions such as the Oviedo Convention.²⁰ Given the variations among legal provisions in different jurisdictions the only guarantee that one's practice will survive concerted scrutiny is to follow ethical principles.

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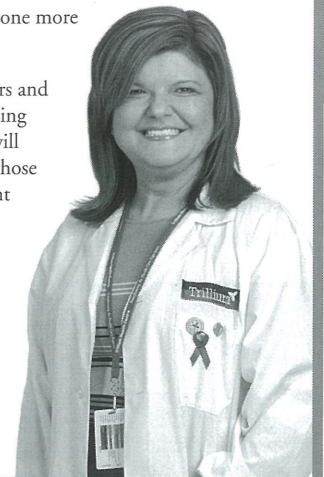
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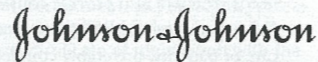


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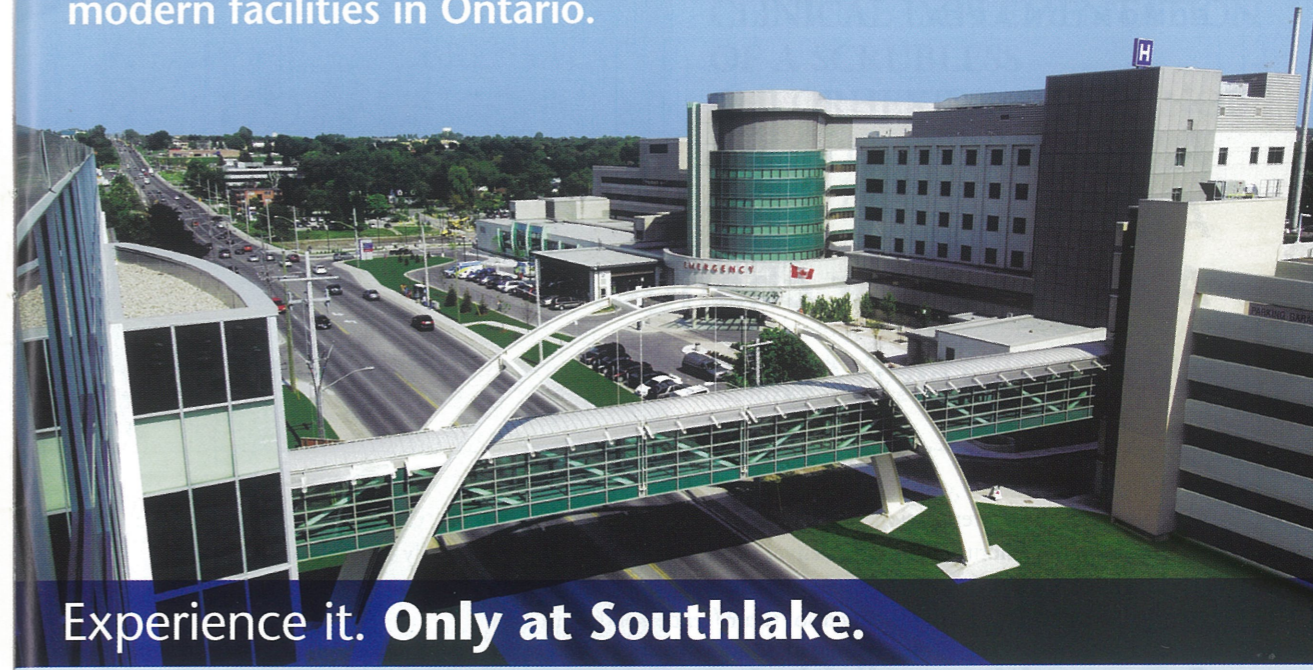
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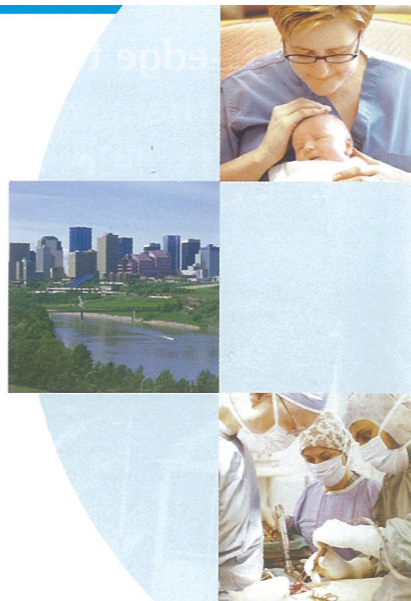
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INTRODUCTION EN CLINIQUE D'UN BROSSAGE PRÉ-CHIRURGICAL SANS BROSSE À BASE DE CHLORHEXIDINE/ÉTHANOL

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RÉSUMÉ

L'objectif du brossage chirurgical est de réduire la biocontamination des mains de l'équipe chirurgicale dans l'espoir de réduire également le nombre de bactéries introduites dans le champ opératoire et le risque d'infection dans le cas de perforation ou de déchirure des gants. Le brossage répété lors de longues procédures, cependant, peut être improductif car il a tendance à endommager la peau et à causer des blessures sans toutefois réduire davantage le risque d'introduction de bactéries. Au sein d'une révision générale des procédures de salle d'opération, le brossage chirurgical a été remplacé par une «nouvelle» procédure de brossage pré-chirurgical sans brosse. Cet article en résume les résultats.

Les normes recommandées relatives au lavage chirurgical des mains sont présentées dans le module 2 de l'Association des infirmières et infirmiers de salle d'opération du Canada (ORNAC Recommended Standards, Guidelines and Position Statements for Perioperative Registered Nursing Practice) (8^e édition), Association des infirmières et infirmiers de salle d'opération du Canada (2006).

CLINICAL IMPLEMENTATION OF A SCRUBLESS CHLORHEXIDINE/ETHANOL PRE-OPERATIVE SURGICAL HAND RUB

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ABSTRACT

The objective of surgical scrubbing is to reduce the bioburden on the hands of the surgical team in hope that if gloves are punctured or torn, the number of bacteria released at the operation site will be minimal and therefore reduce the risk of site infection. Long procedures with scrubbing and soaping can, however, be counterproductive because with repetition they tend to cause skin abrasions, damages and injuries without further reducing the risk of bacterial release. Within a general review of OR processes, it was decided to substitute to the standard surgical scrub a "new" scrubless pre-op surgical hand rub procedure. This article summarizes the results.

INTRODUCTION

The objective of surgical scrubbing is to reduce the bioburden on the hands of the surgical team in hope that if gloves are punctured or torn, the number of bacteria released at the operation site will be minimal and therefore reduce the risk of site infection.^{4,13} Therefore the objective of the surgical hand disinfection is to obtain the lowest achievable skin bacterial count after the cleaning, and if possible for it to be maintained as low as possible during the whole procedure.³

SCRUBLESS PRE-OP HAND RUB (cont.)

Although many studies have proven the relative high incidence of glove punctures,^{6,7,8,12} fortunately all leaks do not result in infections since normal host defence mechanisms can take care of the glove juice inoculum, especially if it is kept low. However the risk of infection is much greater when these mechanisms are lessened by diseases like diabetes, cancer or HIV, but also when circulation is impaired by necrotic tissues or implants.

For obvious ethical reasons, there had been no well controlled studies conducted to compare the effectiveness of different surgical hand preparation methods. Nevertheless indirect evidences had been collected over the years to support their use.^{1,4}

The "standard hand scrub is performed with an antiseptic detergent and a scrub brush." The hands are dried with a sterile towel (or drape) in the OR before donning the surgical gloves. However long procedures with soap and scrubbing can be counterproductive because with repetition they tend to cause skin injuries, abrasions and damages without further

reducing the release of bacteria. In fact the opposite can be observed when irritated skin inflammatory responses may exhibit an increase in bacterial count.⁹ Skin damages being often increased by alcohol, it was not generally recommended to scrub hands before applying an alcohol rub.

In response to healthcare workers frequent complaints of skin irritation, some alcohol and alcohol based antiseptic combination rinses or gels with different emollients had been developed. Their sustained antimicrobial efficacy has been well proven, in particular for the alcohol/chlorhexidine gluconate (CHG) combination.^{2,10,11} Furthermore, these waterless gels have been found quite acceptable to healthcare personnel and in many studies demonstrate much less drying effect than chlorhexidine detergents.

In 1990, Rotter and Koller¹⁴ proposed a sequential combination using chlorhexidine gluconate detergent as a first step for a surgical hand wash. Since then, many institutions – mostly in Europe – have implemented, or adapted with some modifications, the hand preparation, but only a few published a description of their clinical experience and outcome.⁵

Typically waterless surgical hand disinfection is used following a "first case" hand wash. The hands are gently but thoroughly washed with an antiseptic or a mild soap and dried with a soft paper towel before applying the hand rub. The hand rub methods that had been developed are generally performed using small volumes (approx. 3 to 5 mL) of antiseptic poured into one cupped hand, dipping the nails of the other hand then rubbing it onto the entire surface of hand and forearm. This is repeated on the other side. A third final application (for a total of approximately 9 to 15 mL) is used to complete the exposure of the hands. To prevent an "occlusive" type of irritative dermatitis it is imperative to let the alcohol evaporate before donning gloves. For the following cases, unless the surgeon left the OR, no other hand wash but the hand rub will be systematically required.



By/Par: J. Porteous

Karen Church, ORT, prepares to begin the waterless surgical hand "scrub" procedure

Continued on Page 26

L'ÉQUIPE DE RÉDACTION DE LA REVUE DE L'ASSOCIATION DES INFIRMIÈRES ET INFIRMIERS DE SALLE D'OPÉRATION DU CANADA SE FAIT UN PLAISIR DE VOUS PRÉSENTER UNE NOUVELLE CHRONIQUE D'INFORMATION :

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QUESTION :

Dans le cas d'un incendie dans l'hôpital, que devrait faire le personnel infirmier en service interne et externe s'il est au milieu d'une procédure chirurgicale (une laparotomie, par exemple)?

RÉPONSE :

Toute salle d'opération doit avoir un plan de sécurité-incendie dont les exercices d'évacuation sont régulièrement pratiqués. Si un incendie se déclare dans un hôpital, aucun nouveau patient ne doit être admis ni transféré à la salle d'opération avant que la fin de l'alerte ne soit annoncée. Le plan de sécurité-incendie dans un hôpital sera coordonnée par une personne désignée telle qu'un commissaire des incendies ou un spécialiste de secours d'urgence. Cette personne décidera s'il est nécessaire d'évacuer les différentes sections de l'hôpital, y compris la salle d'opération. Pour prendre cette décision, le lieu du feu, l'étendue de l'incendie et la proximité de celui-ci à la salle d'opération seront tous considérés.

Les chirurgiens en cours de procédure doivent être informés de la situation afin de pouvoir prendre des décisions sur comment procéder. La décision du chirurgien dépend principalement du progrès de la procédure, de la stabilité du patient et de la proximité de la fumée ou de l'incendie. Le chirurgien peut décider de fermer l'abdomen si le temps permet. Si le temps ne permet pas, le chirurgien pourrait remplir la plaie de gaze humide, couvrir l'incision et continuer la chirurgie une fois le patient transféré dans un lieu sécuritaire. Si l'évacuation de la salle d'opération est jugée nécessaire, le patient doit être évacué de manière aussi sécuritaire que possible. Dans la plupart des cas, l'anesthésiologiste mène l'équipe en ce qui concerne le déplacement physique du

patient vers le lieu plus sécuritaire.

Nous espérons tous ne jamais avoir à faire face à une telle situation, mais en cas d'incendie, avoir un plan de sécurité-incendie est essentiel. Le plan de sécurité-incendie doit préciser le rôle de chaque membre de l'équipe chirurgicale en cas d'incendie. Un plan bien défini et bien pratiqué limitera la confusion d'une telle situation, ce qui favorise le meilleur résultat possible pour le patient ainsi que pour le personnel de soins de santé.

Les normes relatives aux incendies se trouvent dans le Module 4 (2003) de l'Association des infirmières et infirmiers de salle d'opération du Canada (AISOC - *Operating Room Nurses Association of Canada [ORNAC]*) (2007). *ORNAC Recommended Standards, Guidelines and position Statements for Perioperative Registered Nursing Practice*. (8^e édition).

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QUESTION:

In the event of a hospital fire, what should the scrub and circulating nurses do if they are in the midst of a surgical procedure i.e. laparotomy?

RESPONSE:

Every operating room shall have a Fire Safety Plan with practice drills conducted on a routine basis. If a fire alarm sounds in a hospital, there should be an immediate hold put on any patients entering the operating room or sending for any further patients until the all clear is sounded. The response to a fire in the hospital will be coordinated by a designated person such as a Fire Marshall or Emergency Response Officer.

ASK A QUESTION - ORNAC STANDARDS (cont.)

This designated person will make the decision whether to evacuate any area of the hospital including the operating room. Information such as location of Fire Zones, extent of fire and proximity of the fire/smoke to the operating room will be used to help make this decision.

Surgeons who are operating must be kept informed of the situation so decisions can be made regarding how they will proceed. What the surgeon chooses to do primarily depends on how far along the surgery is, the stability of the patient and the proximity of the smoke/fire. The surgeon may choose to close the abdomen if there is adequate time. If there is no time, the surgeon may pack the abdomen with moist packs, cover the incision; and continue the surgery once the patient is transferred to a safe environment. If it is deemed necessary to evacuate the operating room, the patient must be evacuated as safely as possible. In most cases, the anesthesiologist is the team member who takes the lead in co-coordinating the actual

move of the patient to an alternate location.

This is one of those situations we all hope we will never have to experience, but should a fire occur, having a Fire Safety Plan will help. The Fire Safety Plan should include the role of each member of the surgical team in the event of a fire. A documented and practiced plan will reduce confusion in a fire emergency situation, thus ensuring best possible outcome for the patient and health care team members.

The recommended standards for Fire are covered in Module 4 (2003) of the Operating Room Nurses Association of Canada (ORNAC) (2007). *ORNAC Recommended Standards, Guidelines and position Statements for Perioperative Registered Nursing Practice*. (8th edition).

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SCRUBLESS PRE-OP HAND RUB (cont.)

Within a general modernization and review of OR processes – with the recommendation and support of the institution infection control committee – it was decided to replace the “working” standard surgical scrub with a “new” scrubless pre-op surgical hand rub procedure.

OBJECTIVES

The main objective of this study was to compare and measure the impacts of the implementation of a scrubless, waterless (except the first case) chlorhexidine/ethanol pre-operative surgical decontamination on the incidence of surgical site infection rates, reported skin irritations and healthcare personnel acceptance in a 160-bed university affiliated heart institute. An informal cost analysis would complete the study.

METHOD

Study Design: a one year retrospective data analysis of infection rates, staff appreciation and cost analysis

The principal hypothesis was that a scrubless surgical decontamination with a proven sustained activity would be equal to the standard preparation as measured by compiled infection rates, since it would not influence the major factors of acquisition (the patients themselves and the nature of the treatments they received). At best, because the hand skin flora is maintained low, the unknown fractional of infections which could be attributed to per operative glove leakage could be lessened. In corollary to this hypothesis, if an increase of post-op infectious rates was to be observed and attributed to a failure of the new surgical decontamination, it would require that the implicated germs were proven to be acquired from elsewhere than the patient’s own flora. Consequently any suspicious increase in post-op infection rates would result in the Infection Control Committee ordering a laboratory investigation that could go as far if needed as to phylogenic typing and DNA profiling to eliminate the possibility of transmission from the surgical staff. For such, strains from all significant infections would continue to be banked (as it is actually part of normal



By/Par: J. Porteous

One pump from the dispenser of waterless hand scrub

epidemiology surveillance routine) and processed only if needed.

Because a parallel, prospective comparison was impractical in our setup, it was decided before implementation to compare retrospectively the infectious rates of the last full year of the standard surgical scrub preparation to the full first year of the new method. It was hoped that a whole year comparison would minimize seasonal fluctuations rates and forward comparable data about types and numbers of surgical interventions, operation duration, ICU stay and pathogen profiles. Infection surveillance and rates calculation would be maintained as part of the normal routine activities. Any other modification to OR processes would be noted in order to assess its potential effect on infection risks. To minimize paperwork, consensus was not to implement any formal complaints collect mechanism to record skin problems. However to evaluate acceptance and compliance, a questionnaire would be sent to all OR personnel in the few weeks following the introduction of the scrubless procedure. Staffs were encouraged to report all noted skin problems before and after the change of procedure.

Continued on Page 29

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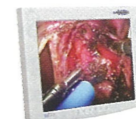
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The secondary hypothesis was that the scrubless surgical decontamination would be associated with fewer complaints about irritation and would enjoy a high level of compliance/acceptance by the involved healthcare workers.

Subjects

The Montréal Heart Institute performs approximately 2000 heart surgeries per year. About two thirds are coronary artery bypass grafts (CABG) using venous grafts and/or mammary arteries (in half of the cases). The remaining one third involve valvular (aortic, mitral, tricuspid) surgery with or without CABG. Venous harvesting is endoscopic in approximately one third of the cases. Data from all surgeries were used.

Protocol and Measures

The chosen protocol was one of a first-case initial hand wash plus alcohol/CHG hand rub followed by "waterless" hand rub disinfections only for the subsequent cases. A sterile scrub brush would be used "on demand" for heavily soiled hands, generally at the first case.

The antiseptic hand rub product used was part of a commercial package which included a slightly acidic soap, single use nail cleaners, touchless infrared (IR) activated dispensers, a combined 70% ethyl alcohol / 0.5% chlorhexidine gluconate hand rub rinse, and a moisturising hand cream for very dry skins. Also if needed, option was given to use dry sterile sponge-brushes for scrubbing.

Procedure

The different OR groups were met during one of their usual scientific or management activities at least one month before the implementation. Four meetings were organized (surgeons, anaesthesiologists, nurses, and technical support). They were informed of the planned change and the reasons why. Questions were addressed. Every individual received a letter restating the date of implementation and the procedure. To replace the tissue towel drying step, the OR antechamber old paper dispensers were replaced by new "M-fold" individual sheet delivery dispensers for softer paper towels. The

antiseptic IR activated dispensers were installed a week ahead and the technical staffs were informed on battery and antiseptic re-supply procedures. As of the first day of implementation, demonstration charts were hung on the walls and, for 2 weeks, all staff members were trained and monitored to ascertain the proper steps of application.

Any problems – from the personnel's comprehension of the application method, acceptability skin irritation, or mechanical troubles with the dispensers – were reported immediately to the head of OR and to the supplier.

Within a week or two of the training, a written questionnaire was sent to all personnel involved with the procedural change. The responses were compiled. Related cost and budget impact were calculated after a full year of implementation.

RESULTS

The data of the pre- and post-implementation years – twenty six (26) consecutive administrative time periods of four weeks ($13 \times 4 = 52$ weeks $\times 2$ for a total of 104 weeks) – were analyzed. Standard scrubbing periods: July 2002 to June 2003 and new scrubless protocol periods: July 2003 to June 2004.

Almost concomitantly to this study, the ongoing OR modernisation and process review implemented a rapid post-operative extubation and early ICU discharge with practice with a "tight systematic follow-up" policy. To ascertain comparability of the two years, the overall rates of all infections, numbers and types of surgeries were looked at through common denominators.

Surgical Site Infection Rates

During the last year of the standard scrub preparation, 2,084 operations were performed followed by 69 in situ infections for an infectious rate of 3.31 percent. Half of these surgeries involved one or two mammary artery(ies). At the end of the new "scrubless" year there were 2,175 compiled surgeries followed by 78 in situ infections for a rate of

3.59 percent. Surgical types, patients' characteristics, mean pre-operative stay (3.63 vs 3.87), mean operation duration (03:26 vs 03:11 hours) and mean total hospital stay were statistically comparable (5 days). The difference in the surgical site infectious rates is not statistically significant. Because of the implementation of the policy of rapid post-op extubation and discharge from ICU, the mean ICU stay fell from 4.94 days to 2.9 days and constituted the only significant different variation for the two periods and was maintained since. No modification in pathogen types or profiles was reported by the microbiology lab.

Acceptability, Compliance and Subjective Skin Assessments

Forty-nine (49) questionnaires were sent from July 21st to August 10th, 2003 (3 weeks to a month after the beginning of the project). Thirty-eight (38) questionnaires were received from surgeons and assistant staff (14/17), anaesthesiologists (9/14), nurses (15/18), for a response rate of 77 percent. Ninety seven (97) percent of the responders approved of the change and would recommend it to others. Four (4) persons noted an improvement in their skin condition including one that was quite dramatic. One had no opinion (pro or con). Five (5) said that the gel emollient was leaving a transient "sticky oily feeling" after application. However this did not prompt any of the latter five to state that they would prefer to return to the standard scrub technique. At the time of writing the present report, no member of the staff mentioned they would like to return to the standard hand rub.

Adverse Event

One major skin problem incident came from a surgeon who presented a mild to severe irritative dermatitis during the second month of implementation. A quick examination of his doings showed that his major skin problems appeared when he decided to use twice the prescribed volume of antiseptic rinse and in order to save time, he began donning the gloves before a full drying of the alcohol. The dermatitis cleared up following a quick return to the recommended procedure.

Related Costs

The "standard hand scrub" related costs of direct supplies were evaluated to be around \$6,000 per year for 2,000 surgeries, not including the cost of cleaning and sterilizing surgical towels. The predicted cost of the new procedure before implementation was to be \$2,875 plus an initial non-recurrent investment of \$1,920 for the new paper towels and infrared dispensers. The actual expenses incurred after a full year were \$2,531 dollars, for an annual savings of approximately \$3,500. A dramatic decrease in surgical towel usage (an average of 300 fewer towels per week or 1,200 per period) added to the savings.

DISCUSSION AND CONCLUSION

In vitro assays estimate the extent of the chosen antiseptic residual activity to be at least three hours.¹³ This coverage is believed appropriate for most surgeries. For longer surgeries, a new gel with an increased concentration of chlorhexidine gluconate may show a longer residual activity but also more irritation.

The implementation of the scrubless preoperative hand rub decontamination using a chlorhexidine gluconate/alcohol based emollient rinse gel – as reported in previously cited studies – did not seem to have any significant influence on surgical site infectious rates. The small increase noted during the first year of the new procedure is not statistically significant.

In terms of toxicity assessment, it is one thing to apply an antiseptic on the skin of a patient once for a surgical intervention while it is another thing to apply it 10 to 15 times a day, everyday of the week, all year round, on healthcare workers' hands.

The major adverse event observed confirmed that surgical gloves constitute a form of "occlusive" dressing enabling the alcohol to induce a dermatitis if not completely dried before donning the gloves. To minimize the risks of toxic dermatitis for the staff, we therefore tend to favour the lowest CHG concentration providing 2 to 3 hours of sustained protection and maintain the regular glove replacement directive. When used as directed, the appreciation and the level of

acceptance were high because of the general impression of the reduction of skin irritation and dryness problems. In one instance the improvement was spectacular. The introduction of this new procedure was not associated with an increase in costs.

The new scrubless pre-op hand preparation was associated with a decrease in informal complaints about skin irritation while skin improvement was noted in four cases and it had no deleterious impact on the site infection rates or the budget. An alcohol/gel hand rub procedure can be a cheaper, safe and welcomed alternative to the standard surgical scrub.

Competing interests: Dr. Marchand had received consultant fees from SoluMed for medical advices on previous research protocols. None declared by the other co-authors.

The recommended standards for Scrubbing are covered in Module 2 of the ORNAC Recommended Standards, Guidelines and Position Statements for Perioperative Registered Nursing Practice (8th edition). Operating Room Nurses Association of Canada (2006).

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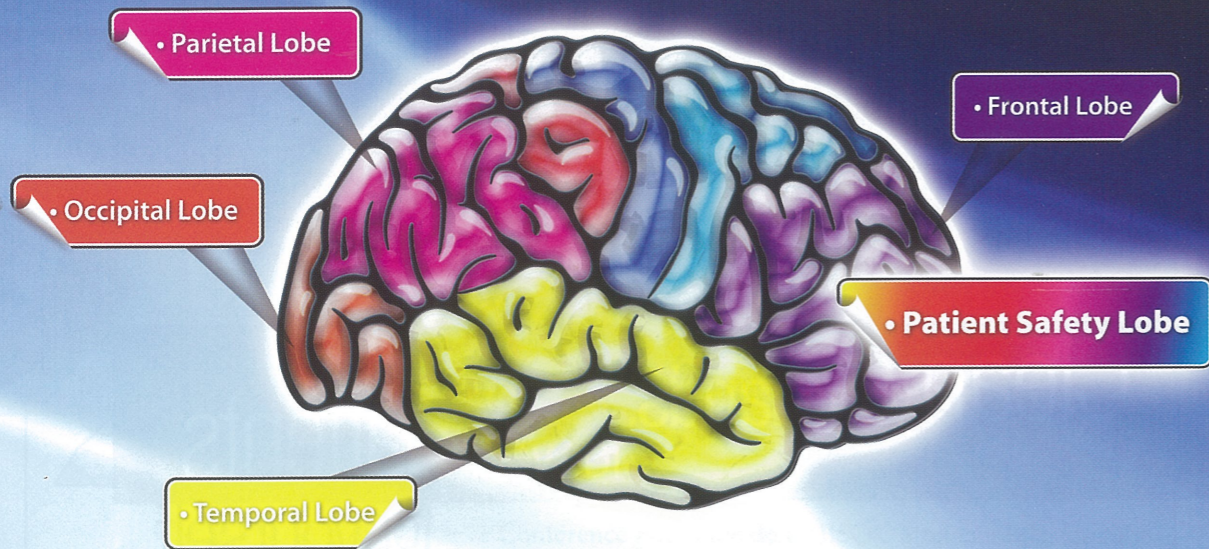
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« EN PASSANT, LA PATIENTE EST ENCEINTE! »

Auteure : Joan Porteous, infirmière autorisée, baccalauréat en sciences infirmières, CPN(C), est formatrice en soins périopératoires au Health Sciences Centre à Winnipeg au Manitoba.

RÉSUMÉ :

Environ 1 à 3 pour cent des femmes enceintes subissent une chirurgie non liée à leur grossesse.¹ Au Canada, cela représente environ 5000 patientes chaque année posant des défis particuliers pour le personnel infirmier périopératoire, ainsi que toute l'équipe chirurgicale.² De 5 à 10 pour cent de ces patientes sont victimes de trauma, ce dernier étant la cause de 46,3 % des décès maternels.^{2,3,4}

Un pourcentage réduit d'interventions chirurgicales non urgentes a lieu pendant le premier trimestre, avant que la patiente elle-même ne sache qu'elle est enceinte. La majorité de procédures est requise en raison de conditions urgentes et très urgentes nécessitant la chirurgie malgré les risques pour la mère et le fœtus.²

Cet article examinera les soins périopératoires de patientes enceintes non obstétriques et présentera des lignes directrices de soins infirmiers à utiliser comme outil de référence rapide. Les soins discutés dans les lignes directrices en annexe visent les patientes enceintes et est à utiliser en conjonction avec les pratiques de soins périopératoires routinières.

Les interventions chirurgicales semi-électives et urgentes ne sont pas contre-indiquées par la grossesse, bien que l'anesthésique et l'approche chirurgicale doivent être modifiés afin de protéger la mère et son fœtus. Lorsque possible, l'intervention devrait être reportée au deuxième trimestre.⁴ Rendu au deuxième trimestre, les systèmes principaux du fœtus sont formés et l'utérus n'empiète pas encore sur les structures abdominales; la manipulation peut donc se limiter. Pendant le premier trimestre, le plus grand risque est celui de l'avortement spontané à 12 %. Ce risque descend jusqu'à moins de 5 % pendant les deuxième et troisième trimestres. L'accouchement précoce est le plus grand risque pendant les deuxième et troisième trimestres.

Les conditions nécessitant le plus souvent une intervention chirurgicale pendant la grossesse sont l'appendicite, les maladies de voies biliaires, un blocage intestinal, le calcul urinaire et le trauma.

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“OH, BY THE WAY, THE PATIENT IS PREGNANT!”

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ABSTRACT:

Approximately one to three per cent of pregnant women undergo surgery that is unrelated to their pregnancy.¹ In Canada this represents about 5,000 patients each year that present unique challenges to the perioperative nurse and the entire surgical team.²

Approximately five to ten per cent of these patients are involved in trauma, which causes 46.3% of maternal deaths.^{2,3,4}

A small percentage of elective procedures are carried out in the first trimester, before the patient herself is aware of the procedure. The majority of procedures are required for urgent and emergent conditions that require surgery despite the risks to the mother and fetus.²

This article will discuss perioperative care of the non-obstetric pregnant patient and to introduce a nursing care guideline that can be used as a

Perioperative Care FOR THE NON-OBSTETRICAL PREGNANT PATIENT

FIRST TRIMESTER 1-12 Weeks
Risk for teratogenicity and abortion

Assessment:

- Gestation?
- Maternal/fetal condition?
- Obstetrics consult?
- Anxieties?

Plan For:

- Increase Theatre temperature to approximately 24° C
- Offer explanations to decrease anxiety
- Regional or local anesthesia
- Closely monitor patient
- Warming blankets
- Pre-op epidural for post-op pain control
- Sequential compression stockings and/or TEDS
- Second IV site/arterial line
- Foley catheter for surgery > 1 hour or laparoscopy
- Good pre-oxygenation
- Cricoid pressure during endotracheal intubation

X-Rays Required:

- Consult with radiology tech to use lowest dose possible (< 5-10 rads is recommended)
- Lead protection under patient's uterus, if using fluoroscopy
- Lead protection over patient's uterus

Laparoscopic Procedure:

- Primary trocar inserted using an open technique?
- Trendelenburg position as indicated
- Prepare for fast switch to laparotomy if necessary
- Lowest possible intra-abdominal inflation pressure of at least < 15mmHg

Electrosurgery:

- Follow standard safety measures

Cardiac Arrest:

- Resuscitating mother will resuscitate the fetus
- Use standard resuscitation measures
- Defibrillate as indicated
- Use standard drug therapy

SECOND TRIMESTER 13-27 Weeks
Lowest risk period
Risk for abortion and pre-term labor

In addition to first trimester care:

- Wedge under right hip on transport stretcher to OR after 18-20 weeks gestation
- Wedge under right hip on OR bed and for supine surgical position after 18-20 weeks gestation
- Arm-board on left for balance
- Fetal heart rate monitoring after fetus is viable at 20-24 weeks gestation, but may be considered before viability
- Fetal heart rate < 100 or > 160 indicates a cause for concern
- Prep and drape patient before general anesthetic induction? (consult with surgeon & anesthetist)

THIRD TRIMESTER 28-40 Weeks
Risk for pre-term labor and fetal distress

In addition to first and second trimester care:

- Plan for potential C-Section and neonatal care when indicated
- Neonatal team and obstetrician notified and available if required
- Monitor for contractions likely. Decelerations in heart rate in conjunction with uterine contractions is a cause for concern for the fetus
- Who will monitor fetus?
- Anesthetist or obstetrical nurse?

This document is to be used in combination with routine perioperative care practices

quick-reference tool. The care discussed in the appended Guideline focuses on the pregnant condition and is to be used in conjunction with routine perioperative care practices.

Semi-elective and urgent surgery is not contraindicated by pregnancy, although anesthetic and surgical approaches must be modified to promote the safety of mother and her fetus. If possible, the surgery should be postponed to the second trimester.⁴ By this time major systems of the fetus are formed and the uterus does not yet infringe on abdominal structures and manipulation may be kept to a minimum. In the first trimester, spontaneous abortion is the greatest risk at 12%. This decreases to less than five per cent in the second and third trimesters. Pre-term labor presents the greatest risk in the second and third trimesters.^{2,3,4}

The most common need for surgery in pregnancy is associated with appendicitis, biliary tract disease, intestinal obstruction, urinary calculi and trauma.⁴

Appendicitis:

Appendicitis is the most common surgical problem in pregnancy and it causes the most fetal loss.³ One case of appendicitis is reported for every 550 pregnancies. Appendicitis, treated immediately, has a two to eight per cent incidence of fetal loss that rises as high as 35% with rupture and peritonitis.⁴ This is because of the varied presentation of symptoms, the greater chance of delayed diagnosis and the significant risk that surgery presents to the fetus. The symptoms of appendicitis mimic symptoms of normal pregnancy, i.e. anorexia, nausea, vomiting and abdominal discomfort. To complicate matters, an elevated temperature is not consistent in pregnant women with appendicitis. The appendectomy should be carried out in the usual timely fashion.

Biliary Tract Disease:

Acute cholecystitis is the second most common emergency in pregnant women.⁵ Increased progesterone levels associated with pregnancy decrease motility of the gallbladder resulting in bile stasis that promotes stone formation.

Surgery during pregnancy is reserved for

complications such as choledocholithiasis, pancreatitis, cholecystitis and biliary colic.

Intestinal Obstruction:

Most bowel obstructions during pregnancy are caused by adhesions from previous surgery (80%) or volvulus.⁴ A small bowel obstruction is often presumed for any patient presenting with nausea, vomiting and a history of abdominal surgery, until it is proven otherwise. If x-rays are required, the risk of radiation exposure to the fetus is weighed against the potential morbidity and mortality of a missed diagnosis.

Urinary Calculi:

The pregnant patient with an untreated urinary obstruction combined with an infection has a high risk for abortion and premature labor. Ureteral stones may be treated with ureteroscopy and stone removal by basket or laser lithotripsy. Ultrasonic lithotripsy is contraindicated because the effect of shock waves on the fetus is unknown. Ultrasound may be used for stent placement to relieve hydronephrosis associated with kidney stones, which can be removed later after delivery.²

Trauma:

Trauma occurs in five to 10 per cent of all pregnancies.⁶ Motor vehicle accidents account for up to 60% of trauma in pregnant women, followed by falls (22%) and domestic violence (21%).⁴

The pregnant trauma patient is managed in essentially the same way as a non-pregnant patient. The mother is the first priority. Stabilization of the mother improves both maternal and fetal survival.

In hypovolemic shock, blood is shunted away from the uterus and the expense of the fetus. The fetus becomes hypoxic very quickly because the pregnant uterus is viewed as a non-essential organ in this situation. Fetal demise is 80% in maternal hypovolemic shock. The usual indicators of hypovolemic shock are unreliable in the pregnant trauma patient due to an increased heart rate and increased oxygen requirements of pregnancy.⁷ It is assumed the pregnant trauma victim is in shock until proven otherwise.

PATIENT IS PREGNANT (cont.)

In the event of a ruptured uterus, a caesarean section and hysterectomy may be required with preparation for neonatal resuscitation. If the maternal condition is critical, the primary concern is to save the mother.⁶

Cardiac Arrest:

When a cardiac arrest occurs in a pregnant woman, standard resuscitative measures and standard drug therapy should be used without modification.⁸ The key to resuscitation of the fetus is to resuscitate the mother.⁷ In a pregnant patient close to term, the supine position without a wedge can result in a 30% decrease in cardiac output as a result of compression on the inferior vena cava. The patient's torso should be angled 30-40 degrees from the OR bed. The uterus may need to be displaced to the left manually during resuscitation. Standard drug therapy should be used without modification. Ventricular fibrillation should be treated with the standard shock therapy. Shocks have not been found to transfer a significant current to the fetus.⁸

If a maternal pulse has not been restored, the decision to perform a caesarean section should be made rapidly with delivery affected within 4-5 minutes of the arrest. Delivery of the fetus may relieve aortal compression and allow recovery of the venous return to the heart. If resuscitation efforts are successful before surgical delivery is attempted, caesarean section is not recommended, because in-utero resuscitation is likely.⁸

While the optimal interval of arrest to delivery is within 5 minutes, there are case reports of intact infant survival after more than 20 minutes of maternal arrest.⁸ If gestation is less than 24 weeks, pregnancy viability is probable following a successful resuscitation. When hypoxic episodes cause fetal brain damage, intrauterine fetal demise is the usual result. The fetus often survives when there has been no brain damage due to the "all or nothing" rule.⁹

Goals of Perioperative Care:

Gestational age plays a pivotal role in planning care. Goals of perioperative care for the pregnant patient include:

1. A thorough preoperative assessment is conducted, including:

- What is the gestation of the pregnancy?
- What is the maternal and fetal condition?
- Is there an obstetrics consult?
- What are the patient's anxieties?
- Will intraoperative x-ray or ultrasound procedures be required?

2. Reassure the patient:

- The family may have had little time to adjust to the uncertain outcome and risks
- The family's happiness is replaced with anxiety about the risks associated with the surgery
- Discomfort and pain often complicate normal coping strategies
- Sympathetic nerve fiber discharge results in decreased uterine blood flow
- Provide as much reassurance as possible
- If regional anesthesia is utilized and the fetus is being monitored, the volume on the monitor can be increased
- The anesthetist will be prepared to discuss concerns about teratogenicity associated with medications and discuss other concerns

3. Monitor maternal oxygenation and blood pressure:

- Pulse oximetry readings should remain above 94% to prevent fetal hypoxia
- Continuous oxygen is usually administered
- Maternal hemoglobin levels are closely monitored. Maternal hemoglobin levels may be decreased, due to the increased proportion of serum plasma associated with pregnancy
- A maternal blood pressure of less than 90mm Hg is likely associated with impaired placental perfusion
- A second IV site may be established or an arterial line may be inserted for monitoring

4. Use appropriate medications:

- The majority of anesthetic agents cross the placenta and enter fetal circulation¹
- Some drugs that adversely affect fetal development during the first trimester include nitrous oxide, halogenated agents, sedatives, tranquilizers, antidepressants and amphetamines. Many of these drugs may be

- administered in the second and third trimesters⁶ The fetal liver is immature and metabolizes narcotics slowly, so short-acting drugs may be preferable
- Local and regional anesthetics have not shown teratogenicity
- Lidocaine is preferable to Bupivacaine which may cause bradycardia⁴
- Heparin does not cross the placenta
- The anesthetist's goal is to limit drugs to those that are known to be safe for the pregnant patient

5. Prevent aspiration:

- Gastric emptying is delayed and there is an increased acid accumulation in the stomach associated with pregnancy
- An antiemetic or antacid may be prescribed preoperatively
- The patient is treated as if she has a full stomach with increased acidity associated with pregnancy
- Cricoid pressure is required during endotracheal intubation as directed

6. Avoid pre-term labor

- There is no association of any single anesthetic agent with an increase or decrease of pre-term labour⁶
- Vasopressors and drugs used to reverse muscle relaxants may stimulate the uterus to contract and initiate pre-term labor
- The use of halogenated agents in the third trimester decreases uterine tone and may prevent uterine contractions⁶
- Surgical manipulation of a gravid uterus may initiate pre-term labor

7. Minimize the patient's time under anesthesia:

- Local anesthetics with sedation and regional anesthetics are used whenever possible
- Be prepared to perform skin prep and draping before induction of a general anesthetic
- Have devices for electronic or ultrasonic fetal monitoring functioning before anesthetic induction begins. This may well provide some reassurance and comfort to the mother
- Some techniques to produce a light general anesthetic may increase the possibility of awareness under anesthesia¹⁰

8. Monitor the fetal heart rate (FHR):

- Although fetal heart rate can be heard at 10-14 weeks gestation, it is generally not reliable under 18 weeks and is most useful beyond 22 weeks. Many anesthetists may choose not to monitor FHR before the fetus is viable.⁴ Instead, they will focus their close attention to optimizing the maternal condition. However, pre-viable fetal monitoring may initiate actions to preserve fetal wellbeing.^{1,4,7,12} Positioning adjustments to improve placental blood flow and increasing fetal oxygenation by increasing maternal oxygenation may benefit the fetus.
- Fetal tachycardia may be the first sign of maternal hypoxia
- A FHR of less than 100 or more than 160 should alert the anesthetist to search for causes¹²
- If fetal monitoring is used, personnel competent in monitoring techniques should be involved.^{1,4,6,7}
- Optimizing maternal physiological status also optimizes placental perfusion and is more important than any mode of fetal monitoring.

9. Monitor for pre-term uterine contractions:

- If the uterus is being monitored for contractions, it should be carried out by experienced personnel.^{1,4,6,7} Because the anesthetist is focusing on the patient, an obstetrical nurse may be required.

10. Positioning

- Position the patient in a left tilt position after 20 weeks gestation to relieve pressure on the vena cava and aorta.
- i. Arrange to have the patient positioned in the left tilt position when being transported to the OR on a stretcher
- ii. Position the patient with a wedge under her right hip on the OR bed
- iii. Placing her left arm at 90 degrees on an armboard will help to stabilize her tilt
- Because of the hypercoagulable state associated with pregnancy, apply sequential compression stockings and/or TEDS preoperatively. This hypercoagulable state is nature's protection against bleeding at the time of delivery.

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PATIENT IS PREGNANT (cont.)

11. Prevention of hypothermia:

- Maternal hypothermia should be prevented
- i. Maternal hypothermia causes decreased utero-placental perfusion and may cause bradycardia
- ii. Hypothermia is associated with ventricular fibrillation in the mother and in the fetus
- iii. Pre-term labor is associated with re-warming the mother
- Theatre temperature should be at about 24 degrees Celsius⁶
- Use pre-warmed solutions and warming blankets
- Keep the patient's head covered

12. Electrosurgery:

- General safety principles associated with electrosurgery are followed
- The amniotic fluid absorbs and conducts energy well
- Use the lowest settings possible

13. Radiological investigation:

- Effects such as malformation, growth retardation, CNS abnormalities and fetal loss are dependant on exposure time and dosage⁶
- Radiation exposure should be minimized and radiation doses carefully documented
- Clear communication with the radiology technician may help to limit radiation exposure
- CT scans and x-rays must be used cautiously
- Ultrasonography and MRI do not use ionizing radiation and may be sufficient
- The pregnant uterus should be shielded from above and also from below if fluoroscopy is used
- The patient should be informed of the risks associated with radiation

14. Urinary catheter insertion:

- Bladder distention can cause uterine irritability and preterm labor
- After 12 weeks gestation, the bladder should be decompressed to allow adequate exposure in the pelvis and lower abdomen⁶
- A Foley catheter is recommended for procedures lasting more than 1 hour
- Urine output should be approximately 25 mL/hour



Jennifer Devodder RN (pregnant patient) and Joanna Dlugosz RN (nurse)

By/Par: J. Porteous

15. Laparoscopic surgery:

- The benefits of laparoscopic surgery probably outweigh the risks⁴
- Use an open technique to insert the primary trocar
- Increased abdominal pressure leads to decreased uterine blood flow, decreased maternal vena cava blood return and decreased maternal residual capacity
- Use the lowest possible intra-abdominal insufflation pressure. Less than 15 mm Hg is recommended
- A trans-vaginal Doppler could be used for fetal monitoring
- Be prepared to convert to laparotomy swiftly and efficiently if required

16. Be prepared for pre-term delivery when applicable:

- The fetus is viable after 24 weeks gestation
- In the event of untimely rupture of the membranes, pre-term labor or fetal distress, a caesarean section may be required to save the fetus
- If a caesarean section is a possibility:
- iv. Notify the obstetrician
- v. Notify the neonatal team
- vi. Have neonatal equipment available

PATIENT IS PREGNANT (cont.)

17. Facilitate postoperative care:

- Inform PACU about the patient's pregnancy and condition well ahead of time to allow them to prepare
- Ensure the patient is in a left tilt position on the recovery bed or stretcher
- Supplemental oxygen may be administered on transport to PACU
- Fetal monitoring initiated in the OR will continue in PACU
- Patients in their second and third trimesters may be monitored for uterine contractions
- Abruptio placenta occurs in 40-60% of major trauma victims, often occurring after surgery¹¹

Conclusion:

Careful planning, which incorporates the gestational age of the fetus as well as maternal physiological and emotional changes, will ensure the best outcome for the pregnant surgical patient and her unborn child. Appendix A is a planning tool which can be utilized by perioperative nurses who are about to care for a pregnant patient who requires urgent or emergent surgery. This tool will be helpful to plan care when the nurse hears a colleague state "Oh and by the way, the patient is pregnant!"



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Jennifer Devodder RN (pregnant patient) and Joanna Dlugosz RN (nurse)

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