



SAFETY IN THE OPERATING ROOM

A self-study monograph for continuing education for registered nurses with an interest in patient safety and infection prevention.

LEARNING OBJECTIVES

At the conclusion of this activity, participants should be able to:

1. Understand the importance and complexity of healthcare worker safety in the operating room (OR);
2. Describe the characteristics of the major types of preventable events that compromise OR worker safety; specifically sharps injuries and ergonomic injuries;
3. Discuss necessary behaviours to reduce occupational injuries;
4. Outline available strategies including preparing a business case and engaging unit-based champions for change; and
5. Appreciate the important relationship between surgical patient safety and OR staff safety.

ISSUE 2

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The opinions expressed in this edition are the author's only and may not represent the official position of Ansell or Bond University.

THE ESSENTIALS OF HEALTHCARE WORKER SAFETY IN THE OPERATING ROOM

The operating room (OR) is well recognised as a high risk environment for occupational injury. Most often occupational injuries in this setting are the result of accidental skin penetration, falls, slips, trips, or ergonomic stress from excessive force, heavy lifting, strains or maintaining a static posture for an extended period.¹ Unique features of the operating environment that contribute to the risk of injury to OR nurses include OR design, the high volume of equipment including cabled electrical devices, movement and spatial limitations required to maintain asepsis, the inability of unconscious patients to cooperate in their own movement or repositioning and the weight and design of surgical devices and instruments including sharps.¹

A HIGH RISK SETTING

Compared to other clinical settings usage of sharps in the OR is high. Frequent passing, handling and disposal of sharps each bring opportunities for OR staff to sustain sharps injury. Each sharps injury can potentially involve inadvertent exposure to serious bloodborne viral pathogens including hepatitis B and C and/or human immunodeficiency virus (HIV). One of the few Australian studies to specifically review sharps injuries among OR nurses reported injury rates of between 1.11-2.53 injuries per 1,000 surgical procedures.² More recent international data collected from 87 hospitals in the United States from 1993 through to 2006 confirmed that almost one-third of all reported occupational sharps injuries occurred in the OR. Of those injuries three-quarters were sustained while healthcare workers were passing sharp devices between members of the surgical team.³

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Valid and reliable data about the incidence of occupational injury including ergonomic and sharps injuries sustained by OR nurses is not readily available in the public domain. Despite extensive searching no such Australian data exists. The US-based Association of Perioperative Registered Nurses (AORN), the world's largest professional association for operating nurses, considers provision of a safe environment of care for perioperative staff and patients to be an issue of significant concern. AORN addresses the issue through a specific set of Recommended Practices for a Safe Environment of Care included in their current edition of Perioperative Standards and Recommended Practices For Inpatient and Ambulatory Settings.¹ AORN has also published a separate guidance statement for sharps injury prevention in the perioperative setting.⁴ Each document provides detailed guidance on recommended safe practice and working conditions. They also clearly detail the respective roles of management and workers in regard to compliance with the recommendations. The Australian College of Operating Room Nurses (ACORN) which is Australia's equivalent to AORN have not yet published a specific set of guiding principles or practice standards addressing occupational injury prevention in the OR.

THE ESSENTIALS OF HEALTHCARE WORKER SAFETY IN THE OPERATING ROOM

Experts worldwide agree that providing a safe working environment for OR nurses requires risk assessment and implementation of multi-modal risk reduction strategies. Recognised risk reduction strategies typically fall within one of the following categories; administrative, engineered or behavioural.⁵

Administrative strategies include ensuring:

- Good governance structures are in place.
- Senior management support and adequate resourcing of risk reduction strategies.
- Approved, clearly written policies are available to staff and that their recommended safety practices are implemented and healthcare worker compliance with them is monitored.
- Sufficient numbers of staff are available to safely perform the required volume of work in a reasonable period of time.
- OR staff are trained and sufficiently competent for all their required work as well as being familiar with all necessary safeguards, equipment and practices.

Engineered solutions include use of purpose designed and built equipment which when used correctly eliminates specific targeted risks. These include:

- Safety engineered sharps devices with sheathing, retracting or blunting components that reduce the risk of users sustaining a sharps injury.
- Anti-fatigue mats and stools which engineer out the risks of musculo skeletal strain or injury due to extended standing or height discrepancies among members of the surgical team.
- Absorbent pads and high visibility cord covers to reduce the potential for slips, stumbles and falls.
- Lifting aids and devices that reduce friction, load and resistance whilst also redistributing a patient's weight so that patient transfers and repositioning can be accomplished easily and with less likelihood of injury to the healthcare worker's back.

Behavioural solutions are strategies used to ensure that healthcare workers comply with recommended practices. They can be wide-ranging, diverse and often innovative. Mostly they include:

- Ensuring healthcare workers are educated and aware of how to work safely in the OR and in the broader healthcare environment.
- Systems to monitor, analyse, report and remediate or celebrate healthcare worker behaviours.
- Making certain that healthcare workers are competent in their practice and in using all provided aids and safety equipment.
- Engaging healthcare workers in order to determine their unique insights into specific OR risks and involving them in processes to identify, implement and evaluate possible solutions.

Knowing what strategies to activate is only one part of the equation. The challenge would be to get an equal level of commitment at every level of the organisation to make things happen.⁵

Failure to improve ergonomic and sharps safety in hospitals and in the OR unnecessarily burdens patients, families, organisations and the healthcare system. In the next section we review a de-identified case report of a serious preventable injury to an OR nurse to further highlight the importance of healthcare worker safety in the OR.^{3, 5}

INJURED OPERATING ROOM WORKER CASE STUDY: HOW NOT TO BECOME THE NEXT STATISTIC



Over time, Infection Control Plus staff have met with several key opinion leaders (KOLs) from the South East Asian and Australasian OR communities. Our discussions included the current state of healthcare worker safety in the OR. Not surprisingly, many KOLs expressed concern about increasing workloads, extended work schedules and increased work pace. They realised that the changing nature of healthcare is raising a whole new set of challenges with the potential to jeopardise healthcare worker and OR staff safety. Specifically, they recognised that fatigue, “inclination to take shortcuts”, unfamiliarity with new technologies and even some disregard for safe practices by surgical team members can place OR staff at increased risk of injury. They shared stories of staff injured as a consequence of one or more of these factors.



The most confronting story was that of a senior OR nurse who had several years ago occupationally acquired human immunodeficiency virus (HIV) after sustaining a sharps injury from a contaminated suture needle during a procedure on a known HIV positive patient. Thankfully the staff member has remained well following initial management and ongoing medical and pharmacological treatment. Her HIV status prevented

her from being involved in exposure-prone procedures and forced her redeployment from the OR to the recovery room where she now works. Whilst most of her colleagues remain unaware of her status, within her own hospital she has become a committed and active advocate for better sharps safety including universal adoption of safety engineered sharps devices.

Further details of this tragic case highlighted its many preventable aspects. The injury occurred during passage of a sharp which is well recognised as one of the most dangerous opportunities for such injuries among healthcare workers and especially OR nurses.³ Failure to engineer out this risk through routine use of safety designed devices and strict enforcement of a designated “neutral zone” for sharps passage contributed to this nurse’s HIV acquisition. Poor visualisation of sharps in the operating field also increased this worker’s risk.

Disregard for safe practices by surgical team members can place OR staff at increased risk of injury.

THE NEED FOR LEGISLATION

Now, several years after this event healthcare workers are fortunate in that we now understand much more about how, why, when and where sharps injuries occur and we are more knowledgeable about their prevention. However, a risk of sharps injury remains any time a sharp is used in healthcare, especially in the OR.⁶ Fortunately, several innovative safety engineered devices are available to eliminate this risk and several countries have mandated their use. In the United States, The Needlestick Safety and Prevention Act of 2000 was added to OSHA's Bloodborne Pathogens Standards, because occupational exposure to bloodborne pathogens from accidental sharps injuries in healthcare continued to be a serious problem. The act mandated additional requirements for maintaining a sharps injury log and for the involvement of non-managerial healthcare workers in evaluating and choosing devices.

In 2010, the European Union (EU) adopted a new Directive, intended to achieve the safest possible working environment for healthcare providers by preventing sharp injuries. The Directive became legally binding in 2013, and requires healthcare organisations to adopt safety measures that protect healthcare workers from sharp injuries.

Australian governments lag behind their European and North American peers as demonstrated by the absence of legislation mandating of safety engineered devices.^{2, 7-15} This disregard for healthcare worker, and in particular nurses' safety, is an increasingly contentious and frustrating issue often raised in the infection prevention and industrial relations communities and in public forums and media outlets.¹⁶

Despite there being no legislative mandate for use of safety engineered sharps devices, Standard 3.1 of the new Australian Safety and Quality Standards include prevention of occupational exposure to blood and body substances as an example of infection minimisation. As a result many Australian hospitals have voluntarily adopted use of specific safety engineered devices as part of their local risk management strategies.

For the case described above it is highly likely that use of an easily recognisable hands-free transfer tray capable of accommodating various sized and shaped



sharps for safe sharps passage would have provided the injured nurse with a far greater chance of avoiding injury and subsequent acquisition of the potentially life-threatening illness she now endures.

In addition to making sure safety engineered devices are available and used correctly and routinely, there are other measures OR staff can take to ensure their safety and that of their peers.

These measures apply equally to sharps and ergonomic injury prevention and include:

- Respectfully questioning, rather than tolerating, unsafe behaviours and actions among colleagues irrespective of your or their level of seniority.
- Providing valuable input and feedback from the coalface to staff responsible for risk assessment and procurement of risk reduction solutions.
- Recalibrating any personal misperceptions such as the false belief that sharps injury and seroconversion "*will not happen to me*".
- Personally committing to improving your own knowledge, behaviours, compliance with and advocacy for recommended healthcare worker safety measures.

IMPLEMENTING SAFETY DEVICES – MAKING A WISE INVESTMENT

One of the harsh realities of contemporary healthcare is that for most hospitals their budget is shrinking. As a result, procuring additional or new resources and equipment requires the preparation of well-thought out business cases. Such business cases must include detailed organisation-specific data and a demonstration that there will be savings, preferably direct and indirect, to the organisation. Other identified obstacles to the introduction of safety devices include surgeon resistance, lack of awareness and training and cost concerns.⁶

When particular pieces of equipment are positioned as having the potential to improve patient or healthcare worker safety or health outcomes it is often difficult for manufacturers to provide compelling data collected in clinical settings. In fact with some safety devices if the benefit is obvious it is impossible for researchers to

ethically design a proper study to prove the relationship between use of the device and improved safety. This difficulty arises from the fact that any healthcare worker allocated to a comparison group where a safer alternative exists may be inadvertently placed at greater risk and suffer harm. Without valid and reliable research evidence hospitals must often make purchasing decisions based on anecdotal reports from peers. Or they may decide to purchase safety devices specific to local need and circumstance. Both are legitimate positions for a hospital to adopt.

Regardless of the typical approach to procuring safety engineered devices in your organisation the following are ten suggested steps to follow when preparing the business case and making decisions about investing in safety devices.

1. Work with frontline representatives who are representative of the end-users of the safety devices you are planning to implement and allow them to contribute unique insights often.
2. Research and completely understand the healthcare safety issue that you are hoping to address with the proposed new technology and equipment;
 - a) Determine how, why, where, when and what happens in relation to these types of injuries.
 - b) Especially know their frequency.
3. Try to quantify the impact of the injuries you are trying to prevent to your organisation, individuals and to patients in financial and human terms.
4. Establish what risks and disadvantages are associated with not implementing safer alternatives.
5. Highlight the expected advantages of transitioning to a safer system through implementing safety devices.
6. Be aware of any obstacles to device implementation such as the need for staff education or reorganization of the physical layout of areas where the device is going to be used.
7. Agree on targets, endpoints and interventions during the introduction of the new safety device so that measuring the impact and benefit of its implementation are clearly pre-defined.
8. Ensure that adequate volume is ordered so that staff can always access the safety devices as needed.
9. Evaluate and report on the safety device's impact and the organisation's return on investment.
10. Make a decision about long-term investment.

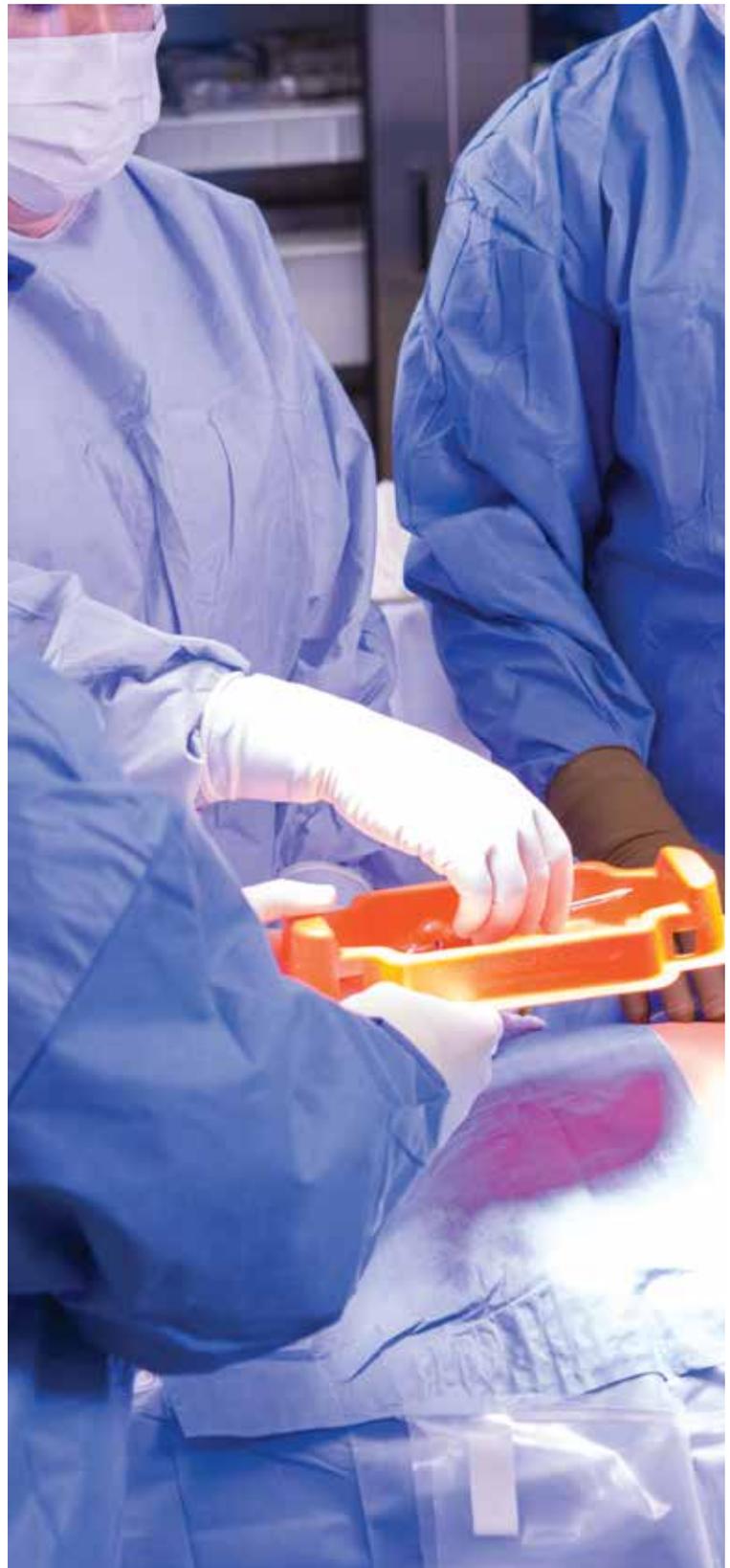
IMPLEMENTING SAFETY DEVICES – MAKING A WISE INVESTMENT

The following are recognized advantages of introducing safety engineered devices and equipment designed to reduce the risk of ergonomic and sharps injury among healthcare workers. It is important however, that key decision makers appreciate that the overall benefit of introducing specific staff occupational health and safety programs may not be immediately apparent and that in some cases it may take up to at least two years for compelling data to clearly quantify benefit.

Well-coordinated safety programs that routinely include use of safety engineered devices and organizational investment of staff health can potentially:

- Eliminate waste and improve the organisation's productivity by protecting employees from injury.
- Help the organisation to meet its occupational health and safety obligations.
- Create a safer environment for patients and staff and thereby increase their satisfaction.
- Assist the organisation to maintain a reputation for service excellence and care of their staff.

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BECOMING A CHAMPION OF HEALTHCARE WORKER SAFETY IN YOUR ORGANISATION

There are many examples where the efforts of ward or unit-based supporters and advocates for special causes have led to substantial improvements in patient outcomes, safety and quality. Two models that immediately come to mind are ward-based infection control link nurses and hand hygiene champions.¹⁷⁻²¹ It is likely that adopting a similar model where a designated unit-based staff member or group become the local champion(s) for healthcare worker safety may lead to great improvements.²² This section briefly describes the process of how to become a champion. It is based on the 2009 Association for Professionals in Infection Control and Epidemiology (APIC) Champion's Kit model.²³

The critical first step in any campaign is to establish support from the hospital's leadership. This includes the OR management and senior leaders outside of the OR. Each group needs to be seen to be supporting your OR's efforts to improve safety. They can show this support by making public announcements in newsletters, by visiting the OR and encouraging staff to protect themselves and more practically by resourcing the OR appropriately so that sufficient human and capital resources are available to support safe practice.

The next step includes recruiting a small group of like-minded people from within the OR to assist with ideas, implementation and promotion. As well, they can function as an informal peer-report network and over time can provide valuable insight into safety issues that are concerning OR staff or provide feedback about implemented strategies.



Unit-based champions have a key role in helping to develop and implement a plan for improving safety. The plan must show the goals of the program and provide a clear pathway with definite tasks and activities.

One of the most difficult tasks unit-based champions may encounter from fellow OR staff is resistance to change. Some may be reluctant to introduce new ways to work and new pieces of equipment with which to work. When this occurs, the champion's role is to remain firm and confidently maintain their agreed position based on the benefits identified earlier in the process and in the organisation's business case as described in the section above.



BECOMING A CHAMPION OF HEALTHCARE WORKER SAFETY IN YOUR ORGANISATION

Ensuring that OR staff are compelled to change in accordance with the new safety measures is a key role of the unit-based champion and in extreme cases it may mean the physical removal of old equipment or devices which pose risk and across-the-board replacement with new, specially designed safety engineered devices and equipment.

Unless there is an immediate, serious, new or life-threatening risk to OR staff safety it may be best to time the introduction of a focussed healthcare worker safety program when there are no other competing events such as an accreditation survey or an outbreak of seasonal disease. This maximises the likelihood of staff engagement and cooperation with the proposed new safer ways of working and reduces their stress and resistance.

When discussing how to champion sharps safety in the OR Knudson highlights that even though OR staff work as part of a surgical team and are therefore subject to “shared risk” based on the team members’ techniques and tools they are also well placed to assume personal responsibility for their own safety and that of their patients.²²

The remaining key tasks and proven methods for championing change are listed in the box below.²³ Applied properly they will lead to significant improvement in staff safety within the OR which in turn provides the surgical patient with a better change for good surgical outcomes. In the final section of this InTouch we briefly discuss how patients benefit when healthcare workers work in safe environments.

Key Tasks and Proven Methods for Championing Change:

- Make sure necessary resources are available
- Communicate key messages clearly and simply
- Share your drive and passion
- Collaborate with peers of influence
- Recognise and celebrate success



HOW HEALTHCARE WORKER SAFETY IMPACTS OUR PATIENTS

In a recent discussion about the importance of ergonomic guidelines for safe patient handling in the OR, Waters highlights several positive benefits for OR staff and each has a flow-on effect for surgical patients.⁶ These benefits are similar to those realised with general staff safety program.

First he recognises that safer work systems and use of safety equipment should lead to fewer and less severe musculoskeletal injuries. In turn, this leads to reductions in lost work time and disability enabling more highly skilled and experienced OR staff to remain working in the field.

Additionally, Waters suggests that if the OR environment is safer and more comfortable OR workers will be less fatigued and stressed, therefore enabling them to function at normal levels of productivity and deliver a consistent, acceptable standard of care. Conversely, fatigue and stress are both known to be major contributors to medical error often with dire consequences for patients.

Fatigue and stress are both known to be major contributors to medical error often with dire consequences for patients.

The relationship between patient safety and healthcare worker safety is best described by AORN, who promote the notion that patient safety and workplace safety must be “strategically aligned” to ensure that outcomes expected by surgical patients and by OR staff can both be achieved. Safer OR nurses translate to safer patients, and better surgical outcomes. Few other opportunities in healthcare present such a perfect win-win outcome and we recommend widespread review of healthcare worker safety within your OR today. We expect you will find areas for improvement and we are pleased to have offered you some possible solutions in this edition of InTouch.



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Useful websites and resources

1. Alliance for Sharps Safety and Needlestick Prevention in Healthcare <http://www.allianceforsharpssafety.org/>
2. Australian College of Operating Room Nurses (ACORN) <http://www.acorn.org.au/>
3. Association of Perioperative Registered Nurses (AORN) <http://www.aorn.org/default.aspx>
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