



**A SELF STUDY GUIDE**

# **SHARPS SAFETY IN HEALTHCARE**

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Registered Nurses



# SHARPS SAFETY IN HEALTHCARE

## OVERVIEW

Accidental sharps injuries are a serious problem in healthcare – particularly in the perioperative environment. Many healthcare workers (HCWs) acquire infectious diseases from bloodborne pathogens or sharps injuries during their work. The cost of injury and exposure takes an emotional and financial toll on HCWs, their families and the facilities where they work. Awareness of the risk associated with these exposures has led to an emphasis on protection for healthcare workers and patients alike. The Centers for Disease Control (CDC), Occupational Safety and Health Administration (OSHA) and many other government and professional organizations around the world have formulated guidelines and regulations to protect and keep HCWs safe. This education module examines basic strategies and processes that can raise awareness of and help minimize the risk of sharps injuries. Best practices and other evidence-based techniques to decrease sharps injuries will be outlined.

### PROGRAM OBJECTIVES

Upon completion of this educational activity, the learner should be able to:

1. Discuss the risk of percutaneous exposure to infectious disease.
2. Identify the key steps in reducing risk of occupational exposure to bloodborne pathogens.
3. Discuss the 4 core elements of a sharps safety program.
4. Discuss the recommendations for progress on sharp safety.

### INTENDED AUDIENCE

The information contained in this self-study guidebook is intended for use by healthcare professionals who are responsible for or involved in the following activities related to this topic:

- Educating healthcare workers
- Establishing institutional or departmental policies and procedures
- Decision-making responsibilities for safety and procedures
- Maintaining regulatory compliance

### INSTRUCTIONS

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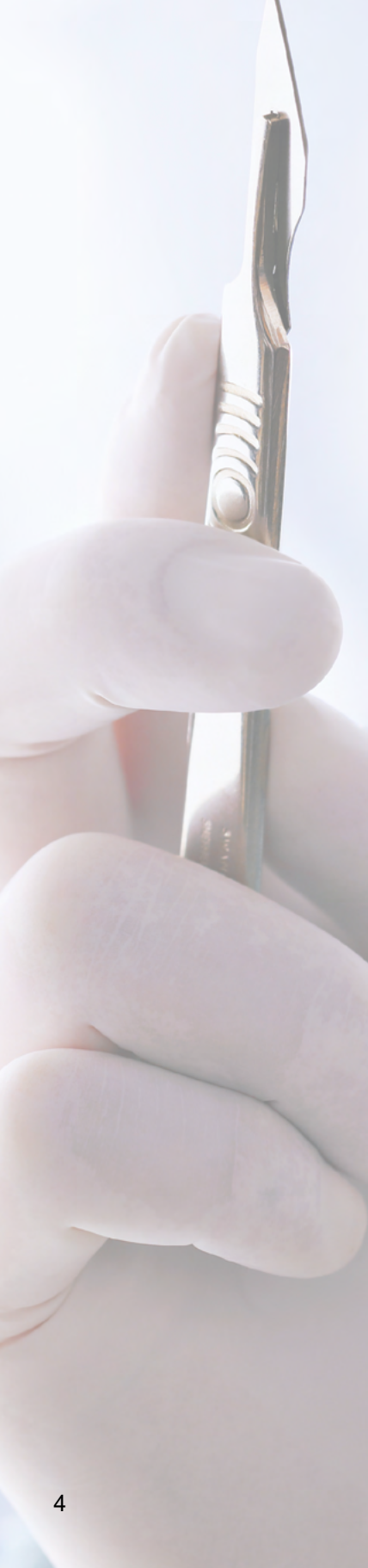
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# SHARPS SAFETY IN HEALTHCARE



## INTRODUCTION

There are approximately 50 million surgeries (30 million in acute care hospitals and 20 million in non-hospital settings) performed in U.S. hospitals each year.<sup>1</sup> In the not-so-distant past, HCWs may have considered percutaneous injuries part of the job. That is not the case any longer. With the infection prevention practice regulations recommended by the CDC for Universal Precautions, and OSHA enforcing the use of Universal Precautions and the enactment of the Bloodborne Pathogens (BBP) Standard (1991), there is a strong regulatory influence for employers and employees to be compliant to best practices.

Additionally, on November 6, 2000, the Needlestick and Safety Prevention Act was enacted by the 106th Congress. This revised the bloodborne pathogens standard, in effect under the OSHA Act of 1970 (OSHA) to include safer medical devices, with engineering controls designed to eliminate or minimize occupational exposure to bloodborne pathogens through needlestick and other percutaneous injuries.<sup>2</sup> Unfortunately, accidental sharps injuries in the perioperative setting continue to be a serious and persistent problem. Many healthcare workers acquire infectious diseases from bloodborne pathogens or injuries during their work. Sharps injuries are an occupational risk for healthcare professionals around the world. According to Jagger et al, "An estimated 384,000 percutaneous injuries are reported by HCWs in hospitals in the United States each year, placing them at risk of exposure to human immunodeficiency virus (HIV), hepatitis B virus (HBV), or hepatitis C virus (HCV)".<sup>3</sup>



The World Health Organization (WHO) reported in the World Health Report 2002, that of the 35 million HCWs, 2 million experience percutaneous exposure to infectious diseases each year. It further notes that 37.6% of hepatitis B, 39% of hepatitis C and 4.4% of HIV / AIDS in HCWs around the world are due to needlestick injuries.<sup>4</sup>

Between 2004 and 2013 a total of 4830 healthcare-associated occupational exposures to body fluid were reported in the UK, 71% of these for percutaneous injuries.<sup>5</sup> The European Commission estimate the number of needlestick injuries that occur in Europe to be approximately 1.2 million. The most common causes being needles and other sharp instruments.<sup>6</sup> In June 2013, The Federal Parliament in Australia received a motion that highlighted the ongoing danger of needlestick injuries of HCWs and nurses in that country. It has been estimated that there are 18,000 reports of needle and sharps injuries a year in Australia. But it is also estimated that half of these injuries are not reported which further highlights the seriousness of this issue.<sup>7</sup>



It appears from a review of the literature that no country in the Asia-Pacific region currently has laws or policies mandating the use of safety-engineered safety devices.

In Japan, a nationwide epidemiologic study of multiple hospitals, conducted between April 2009 and March 2011, measured the mean Needlestick and Sharps Injury (NSI) incidence rate per 100 beds per year to be 5,463 cases.<sup>8</sup> Additionally, the incidence rate of NSIs tended to be higher for larger hospitals and in workers aged less than 40 years; injury occurrence was more likely to occur in places such as patient rooms and operating rooms.

## ADDITIONAL FACTS AND STATISTICS

There are numerous sources of sharps injury data. Needlestick injuries are not the only means of injury. Sharps injuries can result from the use of many different instruments including, but not limited to, hollow bore needles, suture needles, scalpel blades, broken glass, wire sutures, guide wires, stylets, scissors and lancets. Because of percutaneous and/or mucocutaneous exposures, HCWs can be at risk for several maladies.



Injuries from needles and other sharp devices used in healthcare and laboratory settings are associated with the occupational transmission of more than 20 pathogens. HBV, HCV, and HIV are the most commonly transmitted pathogens during patient care. Prospective studies show that the average risk of accidental needle stick injuries can lead to seroconversion from a known positive source at the following rates:<sup>9</sup>

- 0.3% transmission of HIV infected blood
- 30% for hepatitis B virus
- 1.8% for hepatitis C virus

Sharps injuries can lead to a variety of diseases, including but not limited to, mycobacteria, brucellosis, malaria, blast mycosis, Rocky Mountain spotted fever, cryptococcus, cutaneous gonorrhea, diphtheria, tuberculosis, syphilis, herpes, mycoplasma caviae, sporotrichosis, streptococcus pyogenes, staphylococcus aureus, and toxoplasmosis.

The International Sharps Injury Prevention Society (ISIPS) offers numerous facts and statistics in their monthly newsletter. They reveal the continued need for improvement and attention when discussing this issue. ([www.isips.org](http://www.isips.org))

# SHARPS SAFETY IN HEALTHCARE

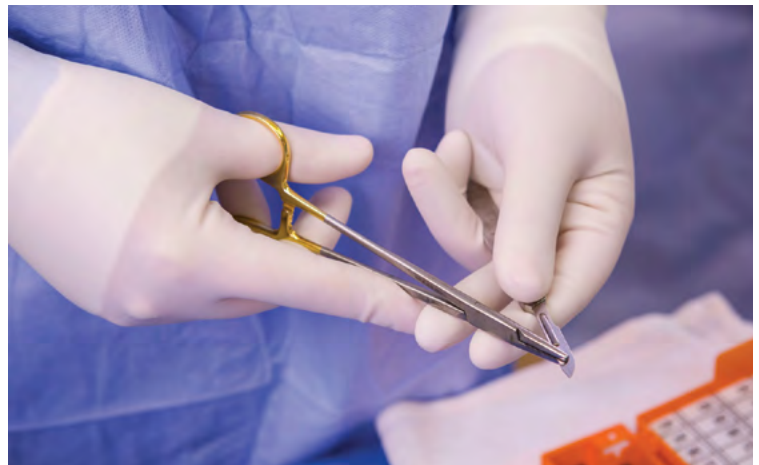
## EMPLOYEE SAFETY <sup>10</sup>

In the United States, OSHA is the regulatory agency that has oversight for employee safety. A component of their charter is to:

- Develop mandatory job safety and health standards and enforce them effectively; and
- Provide for the development, analysis, evaluation and approval of state occupational safety and health programs.

OSHA standards are rules that illustrate the measures employers are legally obligated to pursue, to protect HCWs from hazards. These standards require the use of certain safe practices and equipment, and require employers to monitor certain workplace hazards. It should be recognized that there are employer and employee rights and duties as part of these standards.

In the UK, the management of occupational health, safety and well-being is central to the National Health Service (NHS) constitution. Like other workplace standards, it centers around the healthy and safe workplace. Helping to achieve the safest possible working environment for healthcare workers, the EU Directive 2010/32/EU was adopted in May 2010 by NHS. <sup>11</sup>



The European Agency for Safety and Health at Work oversees and has developed European directives (EU Directive 2010/32/EU) that are legally binding and must be transposed into national laws by Member States.

The European Directives set out minimum requirements and fundamental principles, such as the principle of prevention and risk assessment, as well as the responsibilities of employers and employees.<sup>12</sup>

The World Health Organization (WHO) has a large charter to direct and coordinate international health within the United Nations system.<sup>13</sup>



## BLOODBORNE PATHOGENS STANDARDS

### United States<sup>14</sup>

OSHA's Bloodborne Pathogens standard (29 CFR 1910.1030), as amended pursuant to the Needlestick Safety and Prevention Act of 2000, prescribes safeguards to protect workers against the health hazards caused by bloodborne pathogens. Its requirements address items such as exposure control plans, universal precautions, engineering and work practice controls, personal protective equipment, housekeeping, laboratories, hepatitis B vaccination, post-exposure follow up, hazard communication and training, and record keeping. The standard places requirements on employers whose workers can be reasonably anticipated to contact blood or other potentially infectious materials (OPIM), such as unfixed human tissues and certain body fluids.

The Needlestick Safety and Prevention Act (the Act) (Pub. L. 106-430) was signed into law on November 6, 2000. Because occupational exposure to bloodborne pathogens from accidental sharps injuries in healthcare and other occupational settings continues to be a serious problem, Congress required modification of OSHA's Bloodborne Pathogens standard (29 CFR 1910.1030) to set forth in greater detail (and make more specific) OSHA's requirement for employers to identify, evaluate and implement safer medical devices such as needleless systems and sharps with engineered sharps protections. The Act also mandated additional requirements for maintaining a sharps injury log and for the involvement of non-managerial HCWs in identifying, evaluating and choosing effective engineering and work practice controls. These are workers who are responsible for direct patient care and may be potentially exposed to injuries from contaminated sharps.

Many countries have also developed their specific guidelines and regulations to decrease the exposure to blood and bloodborne pathogens or bloodborne viruses (BBV). Decreasing sharps injuries is a critical component of these guidelines and regulations. Needlestick injuries are the most common method of exposure for HCWs.

### Europe<sup>15</sup>

In Europe, Directive 2010/32/EU outlines a framework agreement to prevent sharps injuries in the hospital and healthcare sector. This agreement is applicable to all workers in the healthcare and medical industry. This agreement aims to:

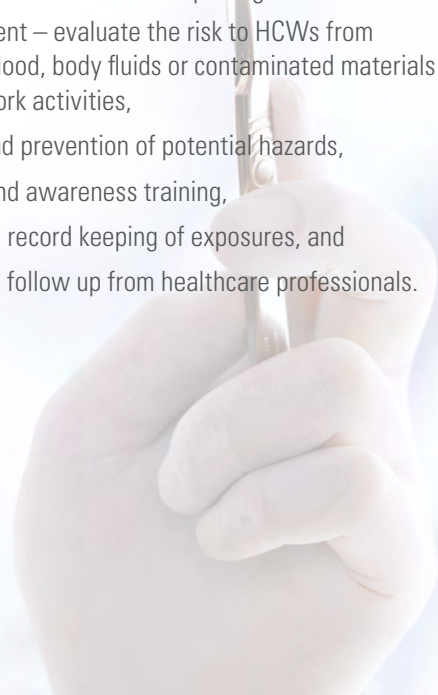
- Protect workers at risk,
- Achieve the safest possible working environment for employees in the hospital and healthcare sector,
- Prevent injuries to workers caused by sharp medical objects and instruments,
- Set up an integrated approach to assessing and preventing risks, and
- Training and informing healthcare professionals.

### Australia<sup>16</sup>

In Australia, National Code of Practice for the Control of Work Related Exposure to Hepatitis and HIV (bloodborne) Viruses [NOHSC: 2010 (2003)] by Safe Work Australia provides a guideline for managing the risk of bloodborne pathogens at the workplace.

Australian and European frameworks closely follow OSHA regulations where the key steps in reducing risk of occupational exposure to bloodborne pathogens are:

- Risk assessment – evaluate the risk to HCWs from exposure to blood, body fluids or contaminated materials because of work activities,
- Elimination and prevention of potential hazards,
- Information and awareness training,
- Reporting and record keeping of exposures, and
- Response and follow up from healthcare professionals.



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## DEVELOPING A SHARPS SAFETY PROGRAM 17, 18, 19, 20, 21, 22, 23, 24

Healthcare workers are at risk of occupational exposure to bloodborne viruses (BBV), including hepatitis B virus, hepatitis C virus and human immunodeficiency virus (HIV), through exposure to blood or other body fluids or body tissues from an infected patient. Injuries from needles and other sharp devices carry the greatest risk of BBV transmission. Most of occupational exposures can be prevented through an effective sharps safety program.

An effective sharps safety program includes 4 core elements which should be implemented simultaneously.

### 1. SHARPS SAFETY PLAN

- Establish an exposure control plan
- Review and update annually
- Establish a vaccine protocol
- Follow product complaint processes for sharps safety devices which fail to function as required (e.g. safety device fails to operate when activated)
- Regularly review the devices used and establish if there are any safer alternatives available
- Investigate each incident conducting a thorough, systematic root cause analysis
- Involve the unit manager and direct-care staff in investigations, especially when a trend or problematic process is identified
- Partner with senior staff, such as a senior surgeon, to become advocates for any change as well as safety in general
- Establish an occupational exposure protocol with data analysis and assessment of risks
- Establish a process of reporting any occupational exposure to key stakeholders





## 2. ENGINEERING CONTROLS

- Eliminate unnecessary needles and sharps whenever possible
- Provide medical devices incorporating safety engineered protection mechanisms (e.g. retractable syringes, blunt-tip sutures, or safety scalpels with retractable sheath)
- Use of sharps disposal systems that conform to regulations



## 3. WORK PRACTICE CONTROL

- Care in handling sharp devices
- Recapping avoidance
- Use of neutral sharps safety zones
- Organize contaminated sharps in a standardized way, until they are disposed
- Ensure sharps are not passed by hand – use of transfer trays
- Clear communication, especially when passing a sharp
- Availability of point of use sharps containers
- Use of personal protective equipment – gloves, gowns, masks, eye protection, etc.
- Double glove application during surgical procedures (for example, reducing the risk of glove perforation)
- Establish a responsibility practice – the person who generates the sharp is responsible for the safe disposal of the sharp



## 4. TRAINING

- On induction, new hire and annual education regarding sharps safety
- On the correct use of medical devices incorporating sharps protection mechanisms including demonstrated competent use of the device
- On sharp safety preventative measures
- On the reporting, response and monitoring procedures for occupational exposures
- On introduction of a new device
- If a member of staff sustains a sharps injury



Additionally, successful implementation should also include employee input. Employers must solicit input from non-managerial employees responsible for direct patient care regarding the identification, evaluation, and selection of effective engineering controls, including safer medical devices. Employees selected should represent the range of exposure situations encountered in the workplace.



# SHARPS SAFETY IN HEALTHCARE



## THE COST IMPACT

The financial impact on healthcare providers must also be considered. A 2016 review of studies conducted in the past two decades in the U.S., Europe, Australia and Asia concluded that managing a single sharps injury can cost 650 to 750 international U.S. dollars (I\$).<sup>25</sup>

Other reports have suggested that the cost of ONE non-infecting sharps exposure will run between \$500 (low risk exposure) and \$3,000 (high risk exposure) simply due to reporting, medical testing, precautionary treatments and lost work hours. Social and psychological costs are immeasurable.<sup>26</sup> If an infection occurs, the cost could be well over \$300,000 per incident.<sup>27</sup>

The cost of one sharps injury alone can be persuasive enough to use safer sharps practices. One sharps injury can affect various costs for the healthcare facility, including but not limited to:

- Loss of employee time
- Cost of tying up staff to investigate the injury
- Expense of laboratory testing
- Cost of treatment for infected staff
- Cost of replacing staff<sup>28</sup>

Coupled with the costs incurred by the healthcare facility, the stress on the affected worker and the worker's family can be enormous. In addition to the initial concern, testing for bloodborne pathogens can last for months, producing feelings of anxiety and distress for an extended period.



## BEST PRACTICES

A best practice is a method or technique that has been shown by research and experience to produce optimal results and that is established or proposed as a standard suitable for widespread adoption. Best practices are often set forth by an authority, such as a governing body or professional organization, depending on the circumstances.

Sharps injury has been a global concern and numerous professional and government agencies have developed specific standards and recommended practices associated with sharps injury prevention. Their recommendations and standards represent some of the best evidenced-based practice recommendations. Below is a partial list of organizations who offer best practice standards to reduce sharps injury.

### NORTH AMERICA

- Occupational Safety and Health Administration (OSHA)
- National Institute for Occupational Safety and Health (NIOSH)
- Centers for Disease and Control (CDC)
- US Food and Drug Administration (FDA)
- The Joint Commission (JC)
- Association of periOperative Registered Nurses (AORN)
- American College of Surgeons (ACS)
- American Nurses Association (ANA)
- Association of Surgical Technologists (AST)

### EUROPE

- European Agency for Safety and Health <sup>29</sup>
- Health and Safety (Sharp Instruments in Healthcare) Regulations 2013 (Health and Safety Executive (HSE) – UK <sup>30</sup>
- European Operating Room Nurses Association (EORNA)

### ASIA

#### Hong Kong / PRC:

Recommendations on the Management and Postexposure Prophylaxis of Needlestick Injury or Mucosal Contact to HBV, HCV and HIV (2007) <sup>31</sup>

### JAPAN

- Guidelines for preventing occupational diseases and injuries at health care settings: Preventing needlestick and sharps injury version: [http://www.chikousai.jp/boushi/boushi\\_H21/H21\\_hospital\\_manual.pdf](http://www.chikousai.jp/boushi/boushi_H21/H21_hospital_manual.pdf)
- Training handbook for preventing occupational diseases and injuries in health care settings: Preventing needlestick and sharps injury version: [http://www.chikousai.jp/boushi/boushi\\_H21/H21\\_hospital\\_handbook.pdf](http://www.chikousai.jp/boushi/boushi_H21/H21_hospital_handbook.pdf)

### AUSTRALIA

- Australian Government – National Health and Medical Research Council <sup>32</sup>
- Queensland Government – Queensland Health <sup>33</sup>
- Victoria Work Safe <sup>34</sup>
- Safe Work Australia. National Code of Practice for the Control of Work Related Exposure to Hepatitis and HIV (blood borne) Viruses [NOHSC: 2010 (2003)] by Safe Work Australia provides a guideline for managing the risk of blood borne pathogens at the workplace. <sup>35</sup>
- Australian College of Perioperative Nurses

### GLOBALLY <sup>36, 37, 38</sup>

- World Health Organization (WHO)

As it is impossible to list every government's and professional organization's guideline pertaining to sharp safety, we selected the AORN Guidelines as the information in the guidelines is a collaboration between professional and regulatory organizations, industry leaders, and other health care partners who support the same mission.

*The other guidelines can be viewed at each individual organization's website.*





# SHARPS SAFETY IN HEALTHCARE

## ***AORN BEST PRACTICE***

The following was included in the AORN position statement on sharps safety: <sup>39, 40</sup>

- Adopt and incorporate safe habits into daily work activities when preparing and using sharp devices.
- Focus attention on the intent of the action when working with sharp items, and minimize rushing and distractions while applying safety techniques during critical moments.
- During preparation for operative or other invasive procedures:
  - » Inspect the surgical field for adequate lighting and space to perform the procedure.
  - » Organize the work area so that the sharps are always pointed away from staff members.
  - » Establish a separate area to place reusable sharps for safe handling during the procedure.
  - » Use standardized sterile field set-ups; and include identification of the neutral zone in the preoperative briefing.



- During the procedure:
  - » Wear two pairs of gloves and monitor gloves for punctures.
  - » Encourage the use of blunt suture needles.
  - » Use neutral zones or hands-free techniques for passing sharp items whenever possible or practical, instead of passing hand-to-hand.
  - » Give verbal notification when passing a sharp device.
  - » Keep visual contact with the procedure site and the sharp device.
  - » Take steps to control the location of the sharp device.
  - » Be aware of other staff members in the area when handling a sharp device.

- » Keep track of and account for all sharp items throughout the procedure.
- » Contain used sharps on the sterile field in a designated, disposable, puncture-resistant needle container, and replace it as necessary.
- » Check to be sure the disposable, puncture resistant needle container is securely closed before handing it off the field.
- » Load suture needles using the suture packet to assist in mounting the suture needle in the needle holder, and use the appropriate instrument to adjust and unload the needle.
- » Remove the needle from the suture before tying, or use “control-release” sutures.
- » Activate the safety feature of a safety engineered device immediately after use according to manufacturers’ instructions.
- » Keep hands away from the surgical site when sharp items are in use (e.g., suturing, cutting).
- » Use one-handed or blunt instrument- assisted suturing techniques to avoid finger contact with the suture needle or tissue being sutured.
- » Provide a barrier between the hands and the needle after use; and use gloves and an instrument to pick up sharp items (e.g., suture needles, hypodermic needles, scalpel blades) that have fallen on the floor.
- During post procedure clean up:
  - » Inspect the surgical setup used during the procedure for sharps.
  - » Transport reusable sharps in a closed, secure container to the designated clean-up area.
  - » Inspect the sharps container for overfilling before discarding disposable sharps in it.
  - » Make sure the sharps container is large enough to accommodate the entire device.
  - » Avoid bringing hands close to the opening of a sharps container.
  - » Do not place hands or fingers into a container to dispose of a device.
  - » Keep hands behind the sharp tip when disposing.

## RESISTANCE TO CHANGE

Change is difficult. Changing something about your surgical routine is not easy. Common objections to trialing new products that have sharp safety mechanisms are as follows:

### Denials of occupational risk

Quite often claims are: that the risk is low, that it is part of the job, or that they are always careful with sharps. It doesn’t and shouldn’t have to be part of the job when solutions are available.

### Failure to consider risk of their behavior to O.R. teammates and others

Sometimes people on the team forget about the risk for the other team members. Often injuries are caused by one team member to another.

### No surgeon accountability for preventable injuries

### Safety devices not acceptable

With so many new options available to trial, there is no excuse not to protect yourself, the patient and those working around you.

### Continued access to conventional sharps items

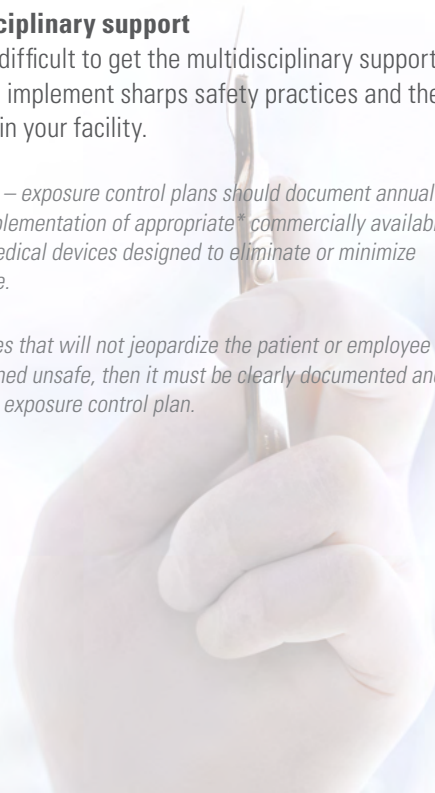
### Lack of education and awareness programs identifying the seriousness of sharp-related injuries

### Lack of multidisciplinary support

Sometimes it is difficult to get the multidisciplinary support that you need to implement sharps safety practices and the safest products in your facility.

*It is important to note – exposure control plans should document annual consideration and implementation of appropriate\* commercially available and effective safer medical devices designed to eliminate or minimize occupational exposure.*

*\*Appropriate = Devices that will not jeopardize the patient or employee safety. If it is determined unsafe, then it must be clearly documented and justified in the annual exposure control plan.*



# SHARPS SAFETY IN HEALTHCARE



## SUMMARY

Occupational exposure to bloodborne pathogens via percutaneous injuries is one of the most serious dangers healthcare providers face daily. The risk of sustaining a percutaneous injury can be reduced through employee education, clear communication, implementation and use of engineered safety devices, and focused work practice controls. There are numerous professional and regulatory agencies that provide compelling data and best practice guidelines to assist in meeting local, national and international standards.

Facilities should comply with regulatory requirements to reduce sharps injuries. Use of best practice guidelines can reduce blood exposure incidents and injuries to improve workplace safety and satisfaction. Healthcare professionals have a responsibility to themselves and their colleagues to do so.



## GLOSSARY

### **ENGINEERING CONTROLS**

Engineering controls include all control measures that isolate or remove a hazard from the workplace, such as sharps disposal containers and self-sheathing needles. The original bloodborne pathogens standard was not specific regarding the applicability of various engineering controls (other than the above examples) in the healthcare setting. "Safer medical devices, such as sharps with engineered sharps injury protections and needleless systems" constitute an effective engineering control, and must be used where feasible.

### **WORK PRACTICE CONTROLS**

Work practice controls mean controls that reduce the likelihood of exposure by altering the way a task is performed, e.g., prohibiting recapping of needles by a two-handed technique.

### **SHARPS WITH ENGINEERED SHARPS INJURY PROTECTIONS**

These devices include non-needle sharps or needle devices containing built-in safety features that are used for collecting fluids or administering medications or other fluids, or other procedures involving the risk of sharps injury.

### **NEEDLELESS SYSTEMS**

This is a newer term defined as devices which provide an alternative to needles for various procedures to reduce the risk of injury involving contaminated sharps.

Needleless systems are devices that do not use needles for:

1. The collection of bodily fluids or withdrawal of body fluids after initial venous or arterial access is established;
2. The administration of medication or fluids; or
3. Any other procedure involving the potential for occupational exposure to bloodborne pathogens due to percutaneous injuries from contaminated sharps.



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