Sharps management in hospital: an audit of equipment, practice and awareness

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Abstract
The safe handling and disposal of needles and other sharp instruments forms part of an overall strategy to protect staff, patients and visitors from exposure to blood-borne pathogens. As with many infection prevention and control policies, the assessment and management of the risks associated with the use of sharps is paramount, and safe systems of work and engineering controls must be in place to minimize any identified risks. The use of sharps in hospitals should be avoided where possible; when their use is essential, particular care is required in handling and disposal – if possible, use safer sharps devices. An audit of sharps management was undertaken to observe equipment, practice and awareness. The audit reported very positive results. However, some areas needed further review to improve practice. The infection control team implemented an action plan as a result of the audit and set about initiating measures for training and awareness. It is necessary to audit sharps management routinely to have an accurate assessment of current practice and prevent occupational exposure to blood-borne pathogens.

Key words: Blood-borne pathogens ■ Needles ■ Sharps management

The safe handling and disposal of needles and other sharp instruments forms part of an overall strategy to protect staff, patients and visitors from exposure to blood-borne pathogens (Health Services Advisory Committee, 1999).

In 2003 the National Audit Office found that needlestick injuries ranked alongside moving and handling, falls, trips and exposure to hazardous substances as the main types of accidents experienced by NHS staff. In 2001 the Royal College of Nursing (RCN) launched its ‘Be Sharp Be Safe’ campaign aimed at reducing sharps injuries (RCN, 2001). A component of the campaign is surveillance using the software EPINet™. Fifteen sites contributed to the RCN survey and reported a total of 1445 injuries (Watterson, 2004). Although many injuries (52.6%) were superficial, 44.6% (626) ranked moderate, including some bleeding, and 2.8% (39) were severe. Nurses were the group with the highest proportion of sharps injuries, accounting for 41.2% of all reported injuries.

A report from the Health Protection Agency (HPA, 2008) confirms that healthcare workers are still being exposed to blood-borne virus infections, even though such exposures are largely preventable. The number of reported occupational exposures increased by 49% in 3 years from 206 in 2002 to 306 in 2005, with almost half of all exposures occurring in nurses. The report draws attention to the need for NHS Trusts to provide local protocols and information on the risk of blood-borne viruses in the work place and to ensure that healthcare workers are adequately trained on how to prevent injuries.

The average risk of transmission of blood-borne viruses following a single percutaneous exposure from an infected person, in the absence of appropriate post-exposure prophylaxis, has been estimated by the Centers for Disease Control and Prevention (CDC, 2006) and HPA (2008) to be:

- Hepatitis B virus: 33.3% (1 in 3)
- Hepatitis C virus: 1.8–1.9% (1 in 50)
- Human immunodeficiency virus 0.3% (1 in 300).

National and international guidelines are consistent in their recommendations for the safe use and disposal of sharp instruments and needles (CDC, 1988; Ward et al, 1997; Department of Health [DH], 1998; Occupational Safety and Health Administration, 1999). As with many infection prevention and control policies, the assessment and management of the risks associated with the use of sharps is paramount and safe systems of work, and engineering controls must be in place to minimize any identified risks, e.g. positioning the sharps bin as close as possible to the site of the intended clinical procedure (Health and Safety Executive, 2002). Any healthcare worker experiencing an occupational exposure to blood or body fluids needs to be assessed for the potential risk of infection by a specialist practitioner, e.g. physician, occupational health nurse, and offered testing, immunization and post-exposure prophylaxis if appropriate (DH, 2002).

This article discusses the safe management of sharps within a hospital setting. It looks at the equipment, practice and awareness of sharps management after a clinical audit had been undertaken. Recommendations for improving practice are discussed.

Safe sharps management in clinical practice
The use of sharps in hospitals should be avoided where possible. When their use is essential, particular care is required in handling and disposal. If possible, use safer sharps devices.

Safe handling
Sharps must always be handled carefully, in accordance with...
Figure 1. A needle re-sheathing/removing device for administering a drug.

Figure 2. A needle re-sheathing/removing device for taking blood.

the following principles (Scottish Executive, 2001):
- Do not re-sheath used needles
- In exceptional circumstances, if re-sheathing cannot be avoided, use a specific needle re-sheathing/removing device, such as the ones indicated for administering a drug (Figure 1) or taking blood (Figure 2) — both created by Vanishpoint, Retractable Technologies, Inc, Texas, United States
- Always get help when using sharps with a confused or agitated patient
- Never pass sharps from person to person by hand — use a receptacle or ‘clear field’ to place them in
- Never walk around with sharps in your hand
- Never leave sharps lying around — dispose of them yourself
- Dispose of sharps at the point of use — take a sharps container with you
- Dispose of syringes and needles as a single unit — do not remove the needle first
- When transporting a blood gas syringe, remove the needle using a removal device and attach a blind hub prior to transport
- Use needleless intravenous devices (Figures 1 and 2) whenever possible, where available.

Use of sharps bins
Ensure sharps bins are of an appropriate size for the clinical activity. Do not select excessively large sharps containers, or those that are too small for the size needle/syringes you use:
- Sharps must only be disposed of in designated sharps containers that meet the requirements of the British Standard: BS 7320 (Medical Device Agency [MDA], 2001).

Always assemble sharps containers correctly:
- Lid on properly
- Label completed
- Placed in suitable, safe location
- Sharps containers should be available at the point of use of the sharp. They should be taken to the bedside, placed on drug and cardiac arrest trolleys, and be carried by all staff who use sharps as part of their work in the community.
- Wall and trolley brackets should be used, as appropriate
- Sharps containers must be located at approximately waist height, and never placed on the floor, on top of high surfaces, or where children or confused adults can tamper with them
- Between uses, use the temporary closure device on the container to prevent accidental spillage of sharps if the containers is knocked over
- Always carry a sharps container by the handle, or use the carry tray provided for smaller containers; never place it against your body
- Never overfill a sharps container; replace it when filled to the line marked
- Ensure sharps containers are closed and locked before disposal, and complete the label on the container
- Do not place sharps containers in yellow bags for disposal; community staff may place them inside a clear plastic bag during transport in their vehicles to prevent leakage
- Used sharps containers must be stored in a locked, segregated cupboard or clinical waste bin provided for the purpose.

Safety devices
Many sharps injuries can be avoided by adherence to the principles of safe practice. However, it is recognized that some injuries are complete accidents. It is, however, possible to reduce the risk of these happening by the use of safety devices. These are devices that incorporate a built-in safety feature in their design, which is intended to reduce the risk of sharps injury. An integrated safety feature is part of the basic design of the device that cannot be removed. A passive safety feature is one that does not require the user to activate it, and remains effective before, during and after use. Staff should consider the use of safety devices in preference to standard devices wherever possible. In areas where there are assessed to be higher infection risks, safety needles should be used for venepuncture and other procedures.

Many agencies, including the DH and NHS Employers, encourage healthcare providers and their employees to pursue safer methods of working through considering the benefits of new safety devices (NHS Employers, 2005; Medicines and Healthcare products Regulatory Agency, 2007). The incidence of sharps injuries has led to the development of needlestick prevention devices in many different product groups (Emergency Care Research Institute, 2003). They are designed to minimize the risk of operator injury during needle use as well as so-called ‘downstream’ injuries that occur after disposal, often involving the housekeeping or portering staff responsible for the collection of sharps disposal units.

Earlier systematic reviews by Pratt et al (2001) and Pellow et al (2003) failed to identify any convincing evidence that needlestick prevention devices were responsible for any significant impact on injury rates. This was primarily due to the lack of well-designed, controlled intervention studies.

It would seem to be logical that where needle-free or other...
protective devices are used, there should be a resulting reduction in sharps injuries. A review of needlestick injuries in Scotland suggested that 56% of injuries would ‘probably’ or ‘definitely’ have been prevented if a safety device had been used (Cullen et al, 2006). However, some studies identify a range of barriers to the expected reduction in injuries, including staff resistance to using new devices, complexity of device operation or improper use, and poor training (Pratt et al, 2001).

In the UK, the NHS Purchasing and Supply Agency (2006) identifies that meaningful evaluations are paramount in assessing user acceptability and clinical applicability of any needle safety devices. Clinicians should consider the use of needlestick prevention devices where there are clear indications that they will provide safe systems of working for healthcare practitioners. Evaluation of such devices should ensure that the safety feature works effectively and reliably that the device is acceptable to healthcare practitioners and that it does not adversely affect patient care.

**Audit of sharps management**
The University Hospital of South Manchester NHS Foundation Trust (UHSM) undertook an audit of sharps management in July 2008. The terms of reference of the work were in accordance with Frontier Medical’s ‘sharps audit, follow-up and education’ (SAFE) programme outline (Box 1) and were agreed on behalf of the UHSM covering the three broad areas: equipment, practice and awareness.

In order to conduct the audit the 29 clinical areas throughout UHSM were inspected. This involved observing the sharps container products being used, and holding brief discussions (questionnaires were not undertaken) with the staff of UHSM. The overall conclusion of the audit work, to date, is that sharps management within UHSM is good (but not excellent, as all the areas audited did not score 100%). However, there were areas where attention is needed to enforce basic sharps awareness training and practice.

**Background to legislation and developments**
Research into sharps injuries have revealed clear patterns in terms of both types of devices and the dangerous practices involved. All conclude that sharps containers should be taken to the point of procedure to minimize the risk of needlestick/sharps injury (RCN, 2001; Pratt et al, 2007), and that the majority of injuries take place between the point of use and the point of disposal (Scottish Executive, 2001). Currently, sharps management guidelines state that sharps containers, near patient safety devices (NPSDs), should be available at the point of use, or that they should be taken to the point of use (Pratt et al, 2007).

NPSDs are plastic sharps containers. These containers should be assembled correctly and dated and signed when using them in clinical practice. They allow practitioners to dispose of a sharp (needles or blades) immediately. It deters practitioners from placing sharps into a container when used, and having to unnecessarily handle them when disposing of them in a container that may be attached to a wall in the treatment room. They reduce the actual handling of a sharp and hence the probability of sustaining a sharps injury. These plastic sharp containers (NPSDs) should be placed as close to the patient’s bed as reasonably possible this allows the sharp to be immediately disposed of straight away.

**Methodology**
The SAFE programme methodology was discussed and agreed by the infection control team at UHSM with a representative from Frontier Medical. The audit fieldwork was carried out by a representative from Frontier Medical on the 3rd July 2008. The work involved visiting each ward area, outpatient department or operating theatre included in the audit, checking the containers in use in the area, observing practice in relation to sharps and holding brief discussions with staff members.

**Results**
The results in Table 1 can be ranked into areas of excellence and concern to the reader. Lowest percentages are areas that must be addressed immediately; mid-range percentages are areas of concern that should be looked into further and 100% areas are where the Trust has performed extremely well.

**Box 1. ‘Sharps audit, follow-up and education’ (SAFE) programme**
The SAFE programme is one of a series of initiatives from Frontier Medical Group to improve the safety of users of clinical sharps. The key points of the SAFE programme are:

- Frontier resources to be made available to coordinate the programme and carry out much of the fieldwork, if required
- Programme follows a recognized clinical audit model
- Programme is a ‘closed loop’, ensuring actions are effectively implemented
- Work can be tailored to meet specific requirements and concerns of the hospital

From: Frontier Medical Group (2008)

**Table 1. Sharps audit, follow-up and education (SAFE) programme results**

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<th>Per cent</th>
<th>OK</th>
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N/A = Not appropriate/applicable; NEG = How many failed; NPSD = Near patient safety devices; OK = How many passed
and are commended on their achievement. Due to the large number of 100% areas resulting from the audit they have not been included in Table 1.

**Equipment**

It was observed that all areas audited had equipment that meets the legislative requirements (BS 7320 and UN3291). Sharps containers were found to be correctly assembled in 97% (28/29) of the areas audited. It was noted that where appropriate, 89% (25/28 – one area not applicable) of areas had sharps containers that were found to be using NPSD equipment or positioning accessories, while 93% (27/29) of areas were sited appropriately and all areas had a sufficient number of containers available to ensure the safe disposal of contaminated sharps.

**Practice**

It was found that all areas were disposing of sharps at the point of use. All other results were also encouraging, except that the temporary closure feature was found to be in use in only 10% of areas and that only 52% of areas were found to correctly labelling the containers prior to or on disposal of the containers (Figure 3).

Other areas were encouraging and it was observed that all areas audited were found to be disposing of sharps at point of use, a regime which has the potential to dramatically reduce the risk of needlestick injury. Where used, all containers were appropriate for the purpose and all areas were found to be securely closing the containers when full, a process which virtually eliminates the risk of any downstream sharps injury.

**Awareness**

In all areas the staff could correctly describe the procedure for disposal and the correct procedure following a needlestick injury; therefore, awareness of sound practice related to sharps was good throughout the clinical areas. On the day it was documented that 69% (20/29) of clinical areas had safety posters on display (Figure 4).

**Discussion**

The audit clearly identified problems for which recommendations have been formulated by Frontier Medical staff in conjunction with clinical staff at UHSM. It is advised that a series of meetings should be arranged to plan and implement these recommendations. An action plan has been designed to rectify the issues noted with the work to be carried out jointly by Frontier Medical and UHSM. Further observation will be scheduled to ensure that the action plan has achieved the necessary changes.

**Implications for practice**

Those areas highlighted within the audit as being of concern can all be promptly and effectively addressed to create a safer working environment for Trust employees, with a successful staff training partnership between the UHSM and Frontier Medical. There are two areas that were particularly weak in the audit; these frequently come out as weak regardless of educational interventions to address them. There may be several reasons for this:

- The temporarily closure mechanism is rarely used on sharps bins as staff are seldom aware of its importance. Sharps bins must be closed over, but not shut, until used again as this is a safety feature on the containers to deter the sharps inside being exposed. It also stops staff carelessly dropping the syringe into the bins. If they are open this allows staff to do this. Unfortunately, the culture of the ward environment with its fast pace deters staff from carefully closing over the sharps bin until it needs to be used again. It has also been recognized that staff are reluctant to attempt to temporarily close the bin lids in fear of closing them permanently.

- The sharp’s bins were not correctly labelled by staff on the wards. This is usually taught on infection control courses, but if staff have not had the opportunity to attend these courses this will be information that staff do not have access to. Certain members of staff may see it as a qualified nurse’s role and will not complete the documentation on the bins. Again, the busy aspects of ward life may prevent staff from taking time to sign the bins appropriately.

A re-audit will be undertaken in 6 months. A map of prevention of needlestick injuries is required from a national strategy to individual staff.

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![Figure 3. SAFE programme results of practice. NPSD = near patient safety devices.](image)

![Figure 4. SAFE programme results for awareness.](image)
Recommendations

Training

Infection control policies in hospitals must clearly contain information on universal precautions and safe working practices as well as the procedure to be undertaken in the event of a needlestick or sharps injury. The procedure for dealing with inoculation injury and other contamination with blood and body fluids must be placed on the policy/procedure intranet for easy access of staff. It is also recommended that hospital risk managers discuss the value of completing a root cause analysis as a way of identifying what went wrong at the time of the sharps injury and the action required to control the work practice to prevent further incidents from occurring. It is also necessary to encourage clinical audit to establish how risk assessment and root cause analysis can improve work practice and reduced injuries.

Awareness

Frequent items in hospital news articles, Trust bulletins and performance feedback would be a way of highlighting the importance of safe working practices and the reporting of all sharps injuries to staff in hospitals. It is important to have awareness sessions on sharps management and this should be provided on a regular basis. This is where the analysis of incidents is identified, existing work practices are featured and those that require review should be actioned immediately. The aim of these sessions will be to share and discuss information and to set up action plans to change practice. In addition, Trust-wide emails sent out regularly informing all Trust employees on clinical incidences and reporting strategies should be used, as well as safety posters situated in areas where clinical staff are handling sharp items.

Conclusion

Avoiding sharps injuries is everybody’s responsibility. Needlestick injuries are a hazard for all healthcare workers in the clinical arena and are a risk of potential transmission of blood-borne pathogens following an inoculation injury. To improve equipment, practice and awareness of sharps, it is essential to understand healthcare workers’ behaviour, including reasons for not adopting the stated guidelines specified in policies and procedures, and to review current reporting processes. Indeed, a standardized protocol of sharps’ management across all hospitals may reduce confusion among healthcare workers who frequently move jobs.

The UHSM audit into sharp’s equipment, practice and awareness reported very positive results. However, some areas need further review to improve practice. The infection control team at UHSM will implement the action plan and set about initiating measures for training and awareness. A re-audit will commence in 6 months. It is necessary to audit sharps management routinely to have an accurate assessment of current practice and prevent occupational exposure to blood-borne pathogens.

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KEY POINTS

- The safe handling and disposal of sharp instruments forms part of an overall strategy to prevent injury.
- The use of sharps in hospitals should be avoided where possible. Particular care is required in the handling and disposal of sharps – if possible, use safer sharps devices.
- An audit of sharps management is necessary to highlight practical issues in regard to equipment, practice and awareness.
- Improved training and awareness in sharps management is a necessary strategy to prevent hospital staff being exposed to sharps injuries.
- It is necessary to audit sharps management routinely.