

# Needlestick injury

## What is a needlestick injury?

Although healthcare workers are those most often affected by needlestick injuries, other occupations can be affected – eg, refuse collectors, cleaners and tattoo artists. Needlestick injuries may also affect carers and children picking up used needles.

Any infectious agent can theoretically be transmitted by needlestick injury but in reality the major blood-borne pathogens of concern are hepatitis B virus (HBV), hepatitis C virus (HCV) and HIV.

## Needlestick epidemiology

The average estimated seroconversion risks from published studies and reports are<sup>[1]</sup> :

- 0.3% for percutaneous exposure to HIV-infected blood.
- 0.1% for mucocutaneous exposure to HIV-infected blood.
- 0.5–1.8% for percutaneous exposure to HCV-infected blood with detectable RNA.
- 30% for percutaneous exposure of a non-immune individual to an HBeAg positive source.

A Health Protection Agency (HPA) report regarding healthcare workers, released in 2012, stated that<sup>[2]</sup> :

- Between 2002 and 2011, 4,381 significant occupational exposures were reported (increasing from 276 in 2002 to 541 in 2011).

- Between 2008 and 2011, there were five HCV hospital-acquired transmissions from patients to healthcare workers following percutaneous exposure injuries; three reported from England and two in Scotland.
- Even though percutaneous needlestick injuries remain the most commonly reported occupational exposures in the healthcare setting, they have decreased over time as a percentage of all exposures (from 79% in 2002 to 67% in 2011), whilst mucocutaneous exposures have shown an increase (from 21% in 2002 to 29% in 2011).
- The percentage of healthcare workers reporting percutaneous exposures that involved an HCV-infected source patient declined from 38% in 2002 to 32% in 2011.
- Between 2002 and 2011 most occupational exposures occurred in the nursing profession. In 2011, medical and dental professions reported a similar number of occupational exposures as nursing professionals. Exposures in the medical and dental professions increased by 131% (from 100 to 231) between 2002 and 2011.
- 72 significant occupational exposures reported between 2002 and 2011 involved ancillary staff. The majority of these exposures were due to non-compliance with standard infection control precautions for the handling and safe disposal of clinical waste.
- The total number of HCV seroconversions in healthcare workers reported between 1997 and 2011 is 20; 17 cases reported in England and 3 in Scotland.
- The last case of an HIV seroconversion in an occupationally exposed healthcare worker was reported in 1999.

Certain features of a percutaneous needlestick injury carry a particularly high risk<sup>[3]</sup> :

- A deep needlestick injury.
- Terminal HIV-related illness in the source patient.
- Visible blood on the device which caused the needlestick injury.
- Injury with a needle which had been placed in a source patient's artery or vein.

In one study of 98 UK surgeons in a large district general hospital, 44% anonymously admitted to having a needlestick injury. The study concluded that the incidence of such injuries was likely to be under-reported, particularly in the surgical sector<sup>[4]</sup> .

## Needlestick management

Follow local or national or international protocol<sup>[5]</sup> <sup>[6]</sup> <sup>[7]</sup> <sup>[8]</sup> . The study of surgeons in a district general hospital found that only 3% followed agreed local policy, and promotion of the importance of safety procedures needed to be emphasised<sup>[4]</sup> .

### First aid

- Contaminated needlestick, sharps injury, bite or scratch – encourage bleeding, wash with soap and running water.
- Blood or body fluid in the eyes or mouth – irrigate with copious quantities of cold water.
- Blood or body fluid on broken skin – encourage bleeding if possible and wash with soap under running water (but without scrubbing).

### Report the needlestick injury and discuss with a local public health consultant immediately

Discuss type of needlestick injury, donor HIV status if known, etc. In the case of definite exposures to blood or other high-risk body fluids known or considered to be at high risk of HIV infection, post-exposure prophylaxis (PEP) should be offered as soon as possible, preferably within one hour of the needlestick injury. It may still be worth considering up to 72 hours after the exposure, but the relative benefit of prophylaxis diminishes with time. PEP is not recommended if the index case is known to have a low viral load.

The current standard recommended regimen for PEP is a 28-day course of<sup>[1]</sup> :

- Truvada® (tenofovir disoproxil 245 mg/emtricitabine 200 mg) one tablet twice a day, plus

- Isentress® (raltegravir 1200 mg once daily for 28 days)

For hepatitis B vaccine and immunoglobulin see the separate [Hepatitis B Vaccination and Prevention](#) article.

The exposed person should also be advised:

- If they choose to have sex, to practise safe sex and to ensure that they follow such advice for a period of three months.
- Not to donate blood until all necessary screening tests are clear.
- To see their GP if they develop a fever.

## Investigations<sup>[5]</sup>

- Take blood from the injured person for virology (HIV, hepatitis B, hepatitis C). Start PEP where appropriate and consider the need for antibiotic therapy or hepatitis B immunisation. A negative result on a fourth generation HIV test performed at four weeks of post-exposure is highly likely to exclude HIV infection. A further test at eight weeks of post-exposure need only be considered following an event assessed as carrying a high risk of infection. Re-check hepatitis serology three and six months later unless adequate pre-exposure vaccine-related immunity has been established<sup>[9]</sup>
- LFTs should be performed and repeated at three and six months.
- Female workers should have a beta-hCG check to exclude pregnancy.
- It can be very helpful to test source patients, with their informed consent, for HIV, HBV and HCV, regardless of risk factors, unless very recent results are available:
  - Testing should only be done after appropriate discussion and counselling . See the separate [Consent to Treatment \(Mental Capacity and Mental Health Legislation\)](#) and [HIV Counselling](#) articles.
  - Robust systems should be in place for ensuring that source patients are made aware of the results and that any positive results are managed appropriately.

## Documentation

Fill out the accident book and the complete critical event audit. Consider carefully how subsequent events can be prevented.

## Follow-up

Ensure there is adequate follow-up of both care worker and donor. The care worker in particular will require early involvement by the occupational health service. They may need specific advice on having to take sick leave if medication is required and the possible requirement for psychological support.

## Prevention of avoidable exposure in an occupational setting

This is of prime importance. The HPA (now part of Public Health England) advises the following<sup>[6]</sup> :

### General measures

- Wash hands before and after contact with each patient and before putting on and after removing gloves.
- Change gloves between patients.
- Cover with waterproof dressings any existing wounds, skin lesions and all breaks in exposed skin; wear gloves if hands are extensively affected.
- Wear gloves where contact with blood can be anticipated.
- Avoid usage of sharps where possible and, where such usage is essential, exercise particular care in handling and disposal.
- Avoid wearing open footwear in situations where blood may be spilt, or where sharp instruments or needles are handled.
- Clear up spillage of blood promptly and disinfect surfaces.
- Pre-employment occupational health assessment should identify those with damaged skin (eg, fissured hand eczema), who may be at higher risk of occupationally acquired infection; ensure that advice is given about minimising any occupational health risk to which they may be exposed.

- Wear gloves when cleaning equipment prior to sterilisation or disinfection, when handling chemical disinfectant and when cleaning up spillages.
- Follow safe procedures for disposal of contaminated waste.

### **Specific measures**

This will obviously depend on the procedure being undertaken but may include:

- Use of new, single-use disposable injection equipment for all injections is highly recommended. Sterilisable injection should only be considered if single-use equipment is not available and if the sterility can be documented with Time, Steam and Temperature indicators.
- Discard contaminated sharps immediately (and without recapping) in puncture- and liquid-proof containers that are closed and sealed and destroyed before completely full.
- Document the quality of the sterilisation for all medical equipment used for percutaneous procedures.
- Wash hands with soap and water before and after procedures; use protective barriers such as gloves, gowns, aprons, masks and goggles where there is direct contact with blood and other body fluids.
- Disinfect instruments and other contaminated equipment.
- Handle soiled linen properly. (Soiled linen should be handled as little as possible. Gloves and leakproof bags should be used if necessary. Cleaning should occur outside patient areas, using detergent and hot water.)

### **National Institute for Health and Care Excellence (NICE) recommendations<sup>[10]</sup>**

- Safe use and disposal of sharps:
  - Sharps should not be passed directly from hand to hand and handling should be kept to a minimum.
  - Used needles must not be bent or broken before disposal and must not be recapped.
  - Used sharps must be discarded immediately by the person generating the waste sharps into a sharps container conforming to current standards.
- Sharps containers:
  - Must be located in a safe position that avoids spillage, is at a height that allows the safe disposal of sharps, is away from public access areas and is out of the reach of children.
  - Must not be used for any other purpose than the disposal of sharps.
  - Must not be filled above the fill line.
  - Must be disposed of when the fill line is reached.
  - Should be temporarily closed when not in use.
  - Should be disposed of every three months even if not full, by the licensed route in accordance with local policy.
- Use sharps safety devices if a risk assessment has indicated that they will provide safer systems of working for healthcare workers, carers and patients.
- Train and assess all users in the correct use and disposal of sharps and sharps safety devices.

More advice is available in the 2013 Sharp Instruments in Healthcare Regulations <sup>[11]</sup> .

Guidance for NHS employers (who are now under a statutory obligation to prevent and control spread of healthcare-associated infection) can be found on the NHS Employers' website <sup>[1]</sup> .

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## Further reading

- [Sharps Injuries](#); Health and Safety Executive

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