

## Risk assessment and needlestick injuries

### Introduction

The health of workers, particularly those in the health and welfare sectors, is at risk from exposure to blood-borne pathogens at work, often through an injury sustained by a worker. Such injuries are of concern as they can cause the worker to be infected by blood-borne pathogens (viruses, bacteria, fungi and other micro-organisms<sup>12</sup>). The Human Immunodeficiency Virus (HIV) and hepatitis B (HBV) or C (HCV) are the commonest risks<sup>3</sup>, but there are more than 20 blood-borne diseases, that may be transmitted.

The workers are exposed to the risk of infection through coming into contact with infectious blood or other human bodily fluids when those come into contact with wounds or mucous membranes. Such contact can be a result of:

- Inoculation of blood by a needle or other 'sharp'
- Contamination of broken skin with blood
- Swallowing a person's blood e.g. after mouth-to-mouth resuscitation
- Contamination where the individual has an open wound, and clothes have been soaked by blood
- Bites (where the skin is broken).<sup>4</sup>

Because the most well-known form of such contact is a puncture wound by a syringe, these incidents are frequently referred to as "needlestick" or "sharps" injuries.

In addition to such injuries, infection can occur through blood splashes to mucous membrane (e.g. eyes or mouth). This can occur during cleaning tasks such as high-pressure cleaning of a contaminated area.

It is not just medical professionals who are at risk. While nurses working in acute medical situations are identified as being at the highest risk, many other workers have the potential for these injuries. For example workers who clean public spaces (e.g. on trains, or public parks) may come across material that is contaminated with bodily fluids such as needles used by intravenous drug users.

Other identified areas where workers may be at risk include:

- Prison and probation services
- Police and security services
- Customs services
- Social service workers and youth workers
- The funeral industry
- The body piercing/body art industry
- Waste disposal and
- The construction/demolition industry.<sup>5</sup>



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It is difficult to estimate the level of infection risk to workers because there is under-reporting of needlestick injuries and health surveillance measures may not be in place. The World Health Organisation estimates about 3 million of the 35 million health care workers worldwide are exposed to blood-borne pathogens each year<sup>6</sup>

The risk after exposure to infected blood has been estimated as:

- Hepatitis B (risk ~30%)
- Hepatitis C (risk ~10%)
- HIV (risk ~0.3%)<sup>7</sup>

### Preventing harm – the European approach

Within the EU, there exists a common prevention approach to occupational safety and health. This approach is set out in the “framework” directive (89/391/EEC<sup>8</sup>) and associated directives, and sets out the “general principles of prevention” of risks to workers:

- Avoiding risks
- Assessing the remaining risks
- Combating risks at source
- Adapting the work to the individual
- Adapting to technical progress
- Replacing the dangerous by the non- or less- dangerous
- Developing an overall prevention policy
- Collective measures above individual methods
- Instructions to workers

The framework directive has been transposed into national legislation. Member States, however, have the right to enact more stringent provisions to protect their workers (please check the specific legislation of your country).

Also transposed into Member States is the biological agents directive (2000/54/EC) that gives more specific information on the assessment, prevention, and control of risks from biological agents.<sup>9</sup>

## Risk assessment

### What is risk assessment?

Risk assessment is the process of evaluating risks to workers’ safety and health from workplace hazards. It is a systematic examination of all aspects of work that considers:

- what could cause injury or harm,
- whether the hazards could be eliminated and, if not,
- what preventive or protective measures are, or should be, in place to control the risks<sup>10</sup>.



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Employers have a general duty to ensure the safety and health of workers in every aspect related to work and to carry out a risk assessment. The EU framework directive highlights the key role played by risk assessment and sets out basic provisions that must be followed by every employer. Member States, however, have the right to enact more stringent provisions to protect their workers (please check the specific legislation of your country).

### **Why carry out a risk assessment?**

Risk assessment is the basis for successful safety and health management, and the key to reducing work-related accidents and occupational diseases. If it is implemented well, it can improve workplace safety and health — and business performance in general.

### **How to assess the risks**

The guiding principles that should be considered throughout the risk assessment process<sup>i</sup> can be broken down into a series of steps.

#### **Step 1 — Identifying hazards and those at risk**

Looking for those things at work that have the potential to cause harm, and identifying workers who may be exposed to the hazards.

#### **Workers who may be at greater risk**

- Workers with disabilities
- Migrant workers
- Young and old workers
- Pregnant women and nursing mothers
- Untrained or inexperienced staff
- Maintenance workers
- Immunocompromised workers
- Workers with existing ill-health conditions such as bronchitis
- Workers on medications that may increase their vulnerability to harm

#### **Step 2 — Evaluating and prioritising risks**

Estimating the existing risks (their severity, their probability, etc.) and prioritising them in order of importance. It is essential that the work to be done to eliminate or prevent risks is prioritised.

#### **Step 3 — Deciding on preventive action**

Identifying the appropriate measures to eliminate or control the risks.

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<sup>i</sup> Whether the risk assessment process in your country is divided into more or fewer steps, or even if some of the five steps are different, the guiding principles should be the same.



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### **Step 4 – Taking action**

Putting in place the preventive and protective measures through a prioritisation plan (most probably all the problems cannot be resolved immediately) and specifying who does what and when, when a task is to be completed and the means allocated to implement the measures.

### **Step 5 – Monitoring and reviewing**

The assessment should be reviewed at regular intervals to ensure it remains up to date. It has to be revised whenever significant changes occur in the organisation or as a result of the findings of an accident or 'near miss' investigation.

### **Involvement of workers and other employers in the risk assessment process**

Risk assessments should not be carried out by the employer or the employer's representative working in isolation. They should involve employees or their representatives. Workers should be consulted as part of the assessment process itself and given information on any conclusions reached, as well as on the preventive measures to be taken.

Workers and/or their representatives have the right/duty to:

- be consulted on arrangements for the organisation of the risk assessment and for the appointment of those undertaking the task;
- participate in the risk assessment;
- alert their supervisors or employers about perceived risks;
- report changes in the workplace;
- be informed of the risks to their safety and health and of the measures required to eliminate or reduce these risks;
- ask the employer to take appropriate measures and to submit proposals to minimise hazards or to remove the danger at source;
- cooperate to enable the employer to ensure a safe working environment;
- be consulted by the employer when drawing up the records of assessments.

When carrying out risk assessments, always consider the potential presence at the workplace of employees from other businesses (e.g. cleaners, private security guards, maintenance workers) or other outsiders (e.g. clients, visitors, 'passers-by'). They should be considered as persons at risk but attention should also be paid to whether their presence may introduce new risks into the workplace.

Where employees from different enterprises work in the same workplace, assessors from each employer may need to share information about risks and the measures needed to tackle those risks.



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### **Risk assessment and needle-sticks**

When looking at the risks from needle-sticks, it is essential that all the workers who may be harmed are identified. Nurses and other medical staff may be at highest risk, but cleaners, laundry workers, and others such as laboratory technicians and students may also be at risk. Ask all workers whether they have come across “sharps” at work.

Consider all the places, situations, tasks, and equipment that may result in the transmission of blood-borne pathogens. Even if nurses using syringes in acute medical situations may be at highest risk, do not forget all the other potential situations, such as a sharp being caught up in dirty laundry and exposing the laundry worker of an outside contractor to risk.

While eliminating the risk of transmission of blood-borne pathogens through needlestick injuries is difficult, particularly in health care establishments, there are many measures that can substantially reduce the risk. These measures should consider collective means of prevention first, for example by procurement of syringes with retractable needles. Personal prevention (e.g. gloves) are a last resort when the risk cannot be adequately controlled through other means. Immunisation for hepatitis B virus is an option<sup>11</sup>, but does not prevent the transmission of other blood-borne pathogens.

All measures need to be supported by information provision and training, and consulting those who will have to use the protective measures

When putting new measures in place, check that new dangers are not also being created. Be clear who does what and when, and make sure the resources needed are available. A range of measures (e.g. for workplace, work organisation, work equipment, training) is often most effective.

The employer should also have a plan of action should a needlestick injury occur. This should focus on the well-being of the injured worker through medical care and counselling, but also prompt a review of preventive measures to learn from the event. There should not be a “blame culture”.

Measures that can be considered include:

- Procurement of safer medical equipment such as syringes with retractable needles
- Better control of medical waste
- Improved working conditions such as lighting
- Improving work organisation – for example, dealing with fatigue (e.g. from long shifts) which can be a causal factor of worker harm, and improving supervision to ensure compliance with systems of work
- Personal protective equipment
- Immunisation for Hepatitis B virus
- Safe systems of work (no re-capping of needles)



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- Safe disposal of sharps and other clinical waste
- Training and information

### Preventive measures

Basic measures to protect workers from blood-borne pathogens include:

- hand washing after each patient contact and after contact with blood or body fluids.
- appropriate PPE (Personal Protective Equipment)
- disposable gloves should be worn whenever working with blood or body fluids.
- disposable plastic aprons/impermeable gowns should be worn when splashing with blood or body fluids may occur
- eye protection (visors, goggles, or safety spectacles) should be worn when blood, body fluids or flying contaminated debris/tissue might splash into the face.
- covering any cuts or abrasions with waterproof plasters.
- Immediate and safe disposal of sharps into appropriate, puncture-proof sharps bins.
- not overfilling sharps containers and
- never re-sheathing needles<sup>12</sup>

In the event of a sharp injury/contamination incident:

- Encourage bleeding from the wound
- Wash the wound in soap and warm running water (do not scrub)
- Cover the wound with a dressing (skin, eyes or mouth, wash in plenty of water)
- Ensure the sharp is disposed of safely i.e. using a non-touch method into a sharps container
- Report the incident to immediate supervisor, and go with someone to your doctor<sup>13, 14</sup>

Further immediate action may be taken, depending on the source of the needle/sharp, the degree of exposure and if there is knowledge of the source patient/client.<sup>15</sup> If transmission is likely, you could be treated or monitored depending on your medical status and the status of the source.<sup>16</sup>

### Case study

A large hospital in Germany had between 0.41 and 0.98 needlestick injuries per worker per year, but recognised that there was large scale under-reporting. Three approaches were taken to reduce incidence in a 2 year study:

- G1 – Use of conventional needles/syringes
- G2 – Giving of advice and training
- G3 – Use of safety instruments + training



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It was found that in studies G1 and G2, there was little significant change in incidence rates, whereas in G3, incidence rate dropped to 3.6% from around 10%, all incidents involving conventional equipment.

The study concluded that training and information alone are not sufficient; Technical improvements and training/education is required.

The safety equipment provided should be easy to use and activate, and safety disposal containers should be provided. This should be supported by start-up and refreshing training and the monitoring/registration of accidents to ensure the sustainability of measures.

### References:

<sup>1</sup> Tarantola et al, 'Infection risks following accidental exposure to blood or body fluids in health care workers: A review of pathogens transmitted in published cases', *American journal of infection control* 2006; 34:367-375.

<sup>2</sup> Canadian Centre for Occupational Health and Safety, *OSH answers, Needlestick injuries*, [http://www.ccohs.ca/oshanswers/diseases/needlestick\\_injuries.html](http://www.ccohs.ca/oshanswers/diseases/needlestick_injuries.html)

<sup>3</sup> Expert Advisory Group on AIDS and the Advisory Group on Hepatitis: *Guidance for clinical health care workers: protection against infection with blood-borne viruses: Recommendations of the Expert Advisory Group on AIDS and the Advisory Group on Hepatitis* 1998, <http://www.dh.gov.uk/assetRoot/04/01/44/74/04014474.pdf>

<sup>4</sup> Essex Health Protection Unit *Community Infection Control Guidelines Section E- Management of sharps injuries*  
[http://www.hpa.org.uk/web/HPAwebFile/HPAweb\\_C/1194947344785](http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1194947344785)

<sup>5</sup> Health and Safety Executive *needlestick injuries* (website)  
<http://www.hse.gov.uk/healthservices/needlesticks/index.htm>

<sup>6</sup> World Health Organisation (WHO) *The world health report*, 'Chapter 4 - Selected occupational risks' <http://www.who.int/whr/2002/chapter4/en/index8.html>

<sup>7</sup> International Council of Nurses, *ICN on Preventing Needlestick Injuries*, [http://www.icn.ch/matters\\_needles.htm](http://www.icn.ch/matters_needles.htm)

<sup>8</sup> Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work  
<http://europa.eu/scadplus/leg/en/cha/c11113.htm>

<sup>9</sup> Directive 2000/54/EC of the European Parliament and of the Council of 18 September 2000 on the protection of workers from risks related to exposure to biological agents at work (seventh individual directive within the meaning of Article 16(1) of Directive 89/391/EEC) [http://eur-lex.europa.eu/smartapi/cgi/sga\\_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=en&umdoc=32000L0054&model=guichett](http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=en&umdoc=32000L0054&model=guichett)

<sup>10</sup> *Guidance on risk assessment at work*, Luxembourg: Office for Official Publications of the European Communities, 1996

<sup>11</sup> RAS *Protocol prikaccidenten voor schoonmaak werkzaamheden (Protocol needle stick injuries during cleaning activities)*. 2006, (Dutch),



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<http://www.zowerkjeprettiger.nl/content/files/Protocol%20Prikaccidenten%20-%20voor%20schoonmaakwerkzaamheden.pdf>

<sup>12</sup> Health and Safety Executive *Needle sticks*

<http://www.hse.gov.uk/healthservices/needlesticks/index.htm>

<sup>13</sup> Essex Health Protection Unit *Community Infection Control Guidelines Section E- Management of sharps injuries*

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<sup>14</sup> *Ras informatieposter en arbozakboekje over omgaan met prikaccidenten (Poster and information leaflet: how to handle needle stick injuries)*, (Dutch),

<sup>15</sup> Essex Health Protection Unit *Community Infection Control Guidelines 'Section E- Management of sharps injuries'*

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<sup>16</sup> Landelijke coördinatiestructuur infectieziektebestrijding. *Draaiboek Prikaccidenten, Maatregelen bij accidenteel contact met bloed of andere lichaamsvloeistoffen die tot infectie met HBV, HCV of HIV kunnen leiden (scenario needle stick injuries, measures when accidental blood contact or contact with other body fluids may cause HBV, HCV or HIV infections. 2005, (Dutch)*,

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