7. Training approaches

7.1 Basic questions to answer

All medical and support staff should be trained to understand the benefits of the new health care waste management system and what their responsibilities will be. If a person is not shown how to carry out a task to meet certain requirements, then management cannot hold them accountable for inadequate performance.

A health care manager needs answers to the following questions, from those responsible for setting up the new waste management system.

- Who is responsible for training staff?
  *Training should be led by the infection control officer or, at a larger health care establishment, the waste management officer.*

- What training has been devised for medical and support staff?
  *Look through the training materials already available nationally or from the WHO and other international bodies. Is it simple to understand and straightforward to use? Can it be delivered to small groups in their medical areas to minimize disruption to normal medical duties?*

- Is any specialist training needed to improve the treatment and disposal end of a new waste system?
  *Only modest training will be needed if minimal on-site treatment and disposal are to be used. More extensive training of technicians and engineers will be required for more sophisticated treatment and disposal options.*

- What resources for training are going to be needed?

- When will the training start?

7.2 Key points to remember

Training is necessary to increase the chances of the new waste management system being well received and properly implemented by medical and support staff. The following are key points to remember.

- Every member of staff should be trained to carry out their waste management duties.

- Identify the target groups (e.g. doctors, nurses, support staff) and train them separately using tailored training programmes in line with their occupations. Keep the training short and simple for each target group (Figures 9 and 10).
Figure 9. Training of nurses and senior nurses

Figure 10. Training of health care waste handlers
• Start more intensive training of those involved in operating waste treatment and disposal facilities as soon as possible. It takes time to build up the necessary skills and confidence among technicians and engineers to develop and operate better waste treatment and disposal facilities.

• Once trained, there should be no excuse for doing it incorrectly.

### 7.3 General principles

#### 7.3.1 Training to inspire

Training is intended to make the waste management plan effective, explain what people should do, explain personal responsibilities when handling waste and reinforce the aims to improve infection control, hygiene and personal and patient safety. The best approach to training is to work with staff to let them discover through practice their personal abilities and the benefits of the new waste system. Training should not be about lecturing in an unimaginative way.

#### 7.3.2 The training and awareness raising package

The common approach is for the infection control committee to delegate someone to devise a training package for staff and awareness raising materials for patients and visitors. Useful guidance is provided in [1] and [5]. The package should identify:

• the target groups in medical areas for training (i.e. managers, doctors, nurses, housekeeping staff, porters and auxiliary staff, engineers and technicians);

• content for a one-hour practical training course in the workplace for each target group, including distributing useful notes and possibly showing a demonstration video;

• content of a longer one-day or two-day course for supervisory staff in each group;

• duration of the training programme and number of training courses to be delivered;

• arrangements to train new staff and provide refresher courses in the future;

• copies of labels, signs, posters and instructions to be distributed around the health care establishment;

• arrangements to educate and raise the awareness of patients and visitors (e.g. distribution of brochures, fliers, posters and discussion of these materials with patients and visitors) about the risk of health care waste, improvements being made, safe practices they can do to prevent their exposure and their role in reducing secondary infections in health care establishments.
7.4 Minimum approach

In many small or regional locations and crisis situations time for organized training events using prepared training materials is a luxury. In these circumstances, the nurses and doctors in a medical area typically work out a new system themselves, assisted by the infection control officer. Once started, they will then demonstrate by example to other medical staff elsewhere and, hence, train them on the job.

WHO has suggested [1] that a minimal level of training for all staff producing and handling health care waste should cover:

- identification and separation of wastes, the use of containers, as well as the handling and storing of all health care waste components;
- wearing of protective gloves and aprons when handling health care waste containers;
- operation of on-site treatment and disposal facilities;
- safety precautions, emergency measures and protection from chemical hazards;
- occupational risks associated with handling sharps.

7.5 Desirable enhancements

An organized introduction of a new waste management system should be accompanied by a training package. The link with infection control and hygiene needs to be emphasized. Training arrangements should be part of the waste management plan and discussed and agreed with the manager of the health care establishment.

Wherever possible hospital staff involved in setting up and using the new waste system should lead the training rather than relying on external specialists. Training in waste management should also become part of the induction training for all new members of staff.

Health care waste management should be part of the basic training that every nurse receives at nursing school and should be included in the education curricula of doctors.
8. Health protection and safety practices (for medical staff and waste handlers)

8.1 Basic questions to answer

Action plans for the safe management of health care waste in health care establishments (as a minimum approach, see Section 2) include provisions for minimizing the risks of secondary infection and physical injury to patients, staff and visitors. An infection control programme and procedures should also address measures to improve occupational safety and hygiene.

The most frequently exposed groups are medical staff and waste handlers. They are regularly exposed to blood and other body fluids during their daily work. Many infections, including human immunodeficiency virus (HIV), hepatitis B (HBV) and hepatitis C (HCV) are found in nosocomial infection surveys. The risk of infection depends on the prevalence of a disease in body fluids and the type and frequency of exposure. Exposure to health care waste can be minimized by training in safe working practices and use of equipment and protective clothing. Continuous monitoring of staff health, including immunization and post-exposure prophylaxis, e.g. in the event of needle-stick or other sharps injuries, and medical surveillance is of paramount importance.

A health care manager should be able to answer the following questions.

- Are all staff aware of the potential risk associated with health care waste?
  *If not known ask casually a cross-section of staff.*

- Who trains and checks new staff to ensure they understand the importance of maintaining good safety practices to minimize occupational exposures?
  *This applies especially to new doctors, nurses, medical assistants and cleaning staff.*

- Are all staff immunized against, at least, hepatitis B?
  *HBV is a widely present infection and easily transmitted to others in blood and body fluids.*

- What protective clothing is available to medical staff and those handling wastes?
  *A rapid assessment of risks posed to staff from present health care waste practices should identify the protection measures necessary.*

- What is being done now to prevent needle-stick injuries?
  *This is the most common cause of infection in health care workers.*

- What is being done now to clean up spills of body fluids (e.g. vomit, blood, urine and faeces) quickly?
8.2 Key points to remember

When reviewing the current arrangements for minimizing the risk of infections to staff and waste handlers from the hazards posed by health care waste, the following key points should be remembered.

- The principal routes for transmission of a communicable disease are air, water, food/ingestion, vectors and physical contact. Physical contact is the most common transmission route.
- There are three distinct types of contact transmission of infection to patients: i) from the hands of medical staff; ii) from contaminated equipment used on patients; and iii) from poorly cleaned surfaces and rooms.
- The main source of contact transmission of infection to medical staff and waste handlers is through needle-stick injuries.
- Data from a recent study in 98 health care facilities in a country in the Eastern Mediterranean Region [16] showed that 36% of percutaneous injuries occur due to two-handed recapping of needles.
- Among the 35 million health workers worldwide, about 3 million receive percutaneous exposures to bloodborne pathogens each year; two million of those to HBV, 0.9 million to HCV and 170 000 to HIV. These injuries may result in 15 000 HCV, 70 000 HBV and 500 HIV infections [15].
- Ensure that all staff are aware of the safe medical practices when treating patients and the risks associated with handling health care waste.
- Most needle-stick injuries are related directly to poor working practices, such as recapping of needles, and failure to dispose of used needles (and used sharps) properly in puncture-resistant sharps containers. Prevention of occupational sharps injuries is an important component of infection control in health care establishments.
- If serious incidents of infection are occurring then something is going wrong that cannot be ignored.

8.3 General principles

8.3.1 Medical staff and worker safety

Medical and health care waste staff are exposed to many body fluids in their daily work. The risk of contracting an infection depends on the prevalence of a disease, the presence of possible transmission routes to workers and the frequency of exposure. The most common form of occupational exposure experienced by medical staff and waste
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handlers is by pathogens present in blood, such as hepatitis B and C and HIV, through a needle-stick injury [15].

Safety measures to protect staff focus on three topics [1]:

- training of staff on handling wastes and used sharps, avoiding accidents and post-exposure procedures;
- provision of protective clothing and equipment;
- establishing immunization, post-exposure treatment and regular medical surveillance.

Reporting, containing and cleaning up spillages of infectious materials quickly and thoroughly are essential to avoid the risk of infection in the health care establishment. General procedures for effective spills control are described in many authoritative publications [see 1,12,13,16].

8.3.2 Protective clothing

The type of protective clothing to make available depends on the types of risk experienced by staff. Medical staff routinely have access to masks, gloves and aprons to protect them from direct contact with body fluids. Waste workers are more at risk from physical injuries from waste items (Figures 11 and 12). The following clothing is recommended by WHO [1] for health care waste workers:

- strongly recommended: overalls, industrial standard aprons and gloves, leg protectors and/or strong boots;
- advisable if there is risk of exposure to uncontained waste or if working with waste treatment equipment: safety glasses, face masks and helmets.

8.3.3 Needle-stick injury

The most common causes of needle-stick injuries are two-handed recapping of needles and unsafe disposal of sharps resulting in them protruding from waste bags. To avoid these causes the immediate disposal of used syringe and needle assemblies, blades and other sharps into a sharps container should be obligatory. However, in some medical interventions and laboratory manipulations recapping of needles may be practised. Therefore, training on the one hand technique for recapping needles should be addressed in training sessions (Figure 13).

All needle-stick injuries should be reported to infection control to administer post-exposure medical assistance, take blood samples for testing and provide surveillance until there is no longer a likelihood of developing a disease. Equally important is to investigate the cause and to change procedures to prevent the accident from reoccurring. Reporting ‘near misses’ also helps protect staff by changing procedures to minimize the chances of future accidents taking place.
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Figure 11. Protective clothing of a worker in charge of loading bagged waste in an incinerator-loading device

Figure 12. Protective clothing reduces the risk of infections and injuries to waste handlers

Figure 13. A training session on the one hand technique for recapping needles in a health care establishment in the Region. This technique is recommended particularly for dentists and laboratory technicians in haematology laboratories (i.e. in order to avoid haemolysis/destruction of red blood cells laboratory technicians should remove needles after their recapping)
The reporting of an accident should not penalize the worker(s) involved. This will only discourage staff from reporting injuries and stop them seeking the medical attention that they should receive. All incidents involving health care waste should be regarded as an accident and reporting all occurrences should be encouraged by managers to ensure a prompt and accurate response and to find ways to prevent it happening again.

8.3.4 Hand hygiene

The hands of medical staff frequently come into close contact with a patient and are an obvious transmission route for infections. This route occurs much more often than vector-borne or airborne transmission. Transmission by hand contact from staff to a patient or from patient to patient is rarely ‘direct’, but instead ‘indirect’. An infected person contaminates the surface of an object or instrument, which then comes into contact with another patient. The exposed patient may then develop a nosocomial cross-infection.

It is not possible to avoid all contact with infected tissue or with potentially contaminated body fluids, excreta and secretions. Consequently, health care establishments should enforce an internal policy that expects all staff, not only medical personnel, to maintain a high standard of personal hygiene and cleanliness. To achieve this, washing facilities are needed for staff before, during and after their daily work. Achieving a good routine of personal cleanliness, especially hands, is a significant advancement in patient care.

Regular and thorough handwashing with soap and water removes over 90% of the microbial flora present on hands. It should be undertaken routinely after physical contact with every patient. The use of anti-microbial soap achieves a higher reduction of the microbial flora providing washing continues for several minutes.

8.3.5 Equipment hygiene

All objects in contact with patients are considered potentially contaminated. Objects in contact with instruments, linen and other items that have been in contact with patients are also considered potentially contaminated and should not be touched with bare hands at any time.

If the object is disposable, it should be discarded as waste. If it is reusable, the transmission of pathogens has to be prevented. This is achieved to different extents by cleaning, disinfection or sterilization. For additional information in this regard see [1].

8.3.6 Building hygiene

Thorough cleaning and disinfecting of buildings, rooms and floors should not be regarded as a minor housekeeping function. Building surfaces, ventilation systems and less accessible places and spaces act as reservoirs for pathogens, if not kept clean.
Procedures should be agreed with the infection control officer for cleaning high-risk areas, such as isolation rooms, emergency departments, operating theatres, medical laboratories, mortuaries, and central and local health care waste storage areas. The training and supervision of the cleaning staff is particularly important in this aspect of infection control. The safest approach is to assume high-risk areas are contaminated with infectious organisms and require regular and thorough cleaning.

Attention should also be paid to toilets and showers. Hand-washing facilities should be provided in each medical area, as well as in toilets and showers and should be thoroughly cleaned at least once a day or more frequently if used by a large number of people. Inadequate and unsanitary toilet facilities have to be regarded as unacceptable in a health care establishment.

The construction, maintenance and regular cleaning of septic tanks or external pit latrine systems should be treated as a priority to control the risk of infection transmission.

### 8.4 Minimum approach

Ideally, all of the safety measures described above should be implemented. They represent common sense procedures and, within the limitations of the resources available, should be possible for a manager to apply. WHO advises that the following simple set of ‘universal precautions’ are followed to protect patients and health care workers [15].

- Wash hands after any direct contact with patients.
- Ensure safe collection of sharps in puncture-proof and leak-proof containers (clearly labelled) in each patient area.
- Wear gloves for contact with body fluids, broken skin and mucous membranes.
- Wear a mask, eye protection and a gown and plastic apron if blood or other body fluids might splash.
- Cover all cuts and abrasions with a waterproof dressing.
- Promptly and carefully clean up spills of blood and body fluids.
- Set up a safe system of health care waste management and disposal.

In lower income areas and health care centres in rural settings, it is advised to provide hepatitis B vaccination to all staff.
8.5 Desirable enhancements

More can be done to achieve greater protection to health care workers beyond the universal precautions. Additional simple measures have been summarized by WHO [15] and are paraphrased below.

Routine immunization of all health care workers against hepatitis B is an effective way to protect them. It is the most prevalent bloodborne virus. The vaccine is effective, widely available and low cost (less than US$0.5 a dose). The following simple steps considerably improve protection.

• Immunize health care workers early in their careers.
• Use a 0, 1 and 6 month schedule of three injections.
• If possible, conduct post-vaccination testing.

Note. Protection is lifelong, so routine boosters are not necessary. Pre-vaccination serological testing is also unnecessary.

If tuberculosis is endemic, all staff should also be vaccinated against that disease. Those staff handling waste should also be vaccinated against tetanus.

Personal protective equipment should be made widely available.

• Provide adequate supplies of equipment in each medical area.
• Involve staff in the selection of protective equipment; equipment of poor quality or uncomfortable to wear will not be used.
• Train staff in correct use of equipment.
• Make use of senior medical staff as role models to promote the use of equipment.
• Monitor staff compliance and appropriateness of use; inappropriate glove use wastes resources.
• Dispose of used personal protective equipment safely.

The risk of infection from a needle-stick injury must be minimized. When an occupational exposure does occur, then an effective response should be made.

• Develop guidelines outlining the first aid required, a reporting mechanism and a procedure to be followed for post-exposure prophylaxis and follow-up testing.
• Disseminate the guidelines to all staff.
• Ensure all staff have access to post-exposure information, education and communication.
• Provide support and counselling to those exposed.
• Where possible, provide post-exposure prophylaxis.
• Analyse reported cases of exposure in order to improve practices.
References and bibliography


**Further reading**