

15

Training

15.1 Public education on hazards linked to health-care waste

Promotion of the appropriate handling and disposal of medical waste is important for community health, and every member of the community should have the right to be informed about potential health hazards. The objectives of public education on health-care waste are the following:

- *To prevent exposure* to health-care waste and related health hazards; this exposure may be voluntary, in the case of scavengers, or accidental, as a consequence of unsafe disposal methods.
- *To create awareness and foster responsibility* among hospital patients and visitors to health-care establishments regarding hygiene and health-care waste management.
- *To inform the public* about the risks linked to health-care waste, focusing on people living or working in close proximity to, or visiting, health-care establishments, families of patients treated at home, and scavengers on waste dumps.

The following methods can be considered for public education on risks, waste segregation, or waste disposal practices:

- Poster exhibitions on health-care waste issues, including the risks involved in scavenging discarded syringes and hypodermic needles.
- Explanation by the staff of health-care establishments to incoming patients and visitors on waste management policy. This may be difficult to achieve, in which case the distribution of leaflets should be considered.
- Information poster exhibitions in hospitals, at strategic points such as waste bin locations, giving instructions on waste segregation. Posters should be explicit, using diagrams and illustrations to convey the message to as broad an audience as possible, including illiterate people.

For maximum effectiveness, all information should be displayed or communicated in an attractive manner that will hold people's attention.

In the health-care establishment, waste bins should be easily accessible for patients and visitors and should be clearly marked with the waste category for which they are intended.

Growing awareness of health and environmental hazards has greatly increased public demand for information and guidance on these issues. Demand has intensified as the prevalence of HIV/AIDS and viral hepatitis B has risen. Health-care establishments should set an example to society by managing their waste in a manner designed to protect health and the environment.

15.2 Education and training of health-care personnel

15.2.1 Principles

Aim

A policy for the management of health-care waste cannot be effective unless it is applied carefully, consistently, and universally. Training health-care personnel in implementing the policy is thus critical if a waste management programme is to be successful. The overall aim of training is to develop awareness of the health, safety, and environmental issues relating to health-care waste, and how these can affect employees in their daily work. It should highlight the roles and responsibilities of health-care personnel in the overall management programme. Health and safety at the workplace and environmental awareness are the responsibility of all and in the interests of all.

Employees to be trained

All hospital personnel, including senior medical doctors, should be convinced of the need for a comprehensive health-care waste management policy and the related training, and of its value for the health and safety of all. This should ensure their collaboration in the implementation of such a policy.

Separate training activities should be designed for, and targeted to, four main categories of personnel:

- hospital managers and administrative staff responsible for implementing regulations on health-care waste management;
- medical doctors;
- nurses and assistant nurses;
- cleaners, porters, auxiliary staff, and waste handlers.

Since action is needed at management level, by those producing the waste as well as by the waste handlers, training of all of these categories of personnel is equally important.

Medical doctors may be educated through senior staff workshops and general hospital staff through formal seminars. The training of waste managers and regulators, however, could take place outside the hospitals, at public health schools or in university departments.

Content

Staff education programmes should include:

- information on, and justification for, all aspects of the health-care waste policy;
- information on the role and responsibilities of each hospital staff member in implementing the policy;
- technical instructions, relevant for the target group, on the application of waste management practices.

One of the best ways of learning is through practice, and hands-on training of small groups of personnel should be considered where appropriate. Testing the participants at the end of the course, by means of simple true/false or multiple-choice questions, often provides an incentive for learning, and allows the course organizers to assess the knowledge acquired by participants.

The instructors should have experience in teaching and training, and be familiar with the hazards and practices of health-care waste management; ideally, they should also have experience in waste handling.

Follow-up and refresher courses

Periodic repetition of courses will provide refreshment training as well as orientation for new employees and for existing employees with new responsibilities; it will also update knowledge in line with policy changes. Follow-up training is instructive for trainers, indicating how much information has been retained by course participants and the likely need for future refresher courses.

Training responsibility

The Infection Control Officer (ICO) should be given responsibility for all training related to the segregation, collection, storage, and disposal of health-care waste. He or she should ensure that staff at all levels are aware both of the hospital waste management plan and policy and of their own responsibilities and obligations in this regard. A record should be kept of all training sessions, and the content of training programmes should be periodically reviewed and updated where necessary.

For similar training of those concerned with smaller sources of health-care waste, the regional health authority may be able to make centralized arrangements for courses.

15.2.2 Implementing a training course

The training package

A training package could be developed by the national government agency responsible for the disposal of health-care wastes or by an international or development agency. The package should be suitable for various types of health-care establishments, including government, private, teaching, and dental hospitals, polyclinics, health centres, health-care research institutions, and clinical laboratories. It would also be useful for more general educational establishments and for organizations that provide services for health-care waste disposal.

The package should be liberally illustrated with drawings, diagrams, photographs, slides, or overhead transparencies. These should reflect the environments in which trainees work and provide examples of measures that have been (or will be) implemented. Where it is likely that waste handlers and other workers are illiterate, all procedures should be carefully represented in diagrams and photographs.

Selection of participants

The ideal number of participants in a training course is 20–30; larger groups may make effective discussions and exercises difficult. Courses should be aimed at all categories of personnel; discussions may be easier and more useful if the group is composed of trainees from various disciplines (e.g. supervisors, medical and nursing staff, laboratory staff, engineers, ancillary staff) or at least contains one or two medical assistants and nurses. It may also be valuable to include senior administration staff and heads of departments in certain training groups to demonstrate their commitment to the waste management policy and to show the relevance of the policy to all personnel of health-care establishments.

Box 15.1 Training and waste segregation

All staff who produce health-care waste should be responsible for its segregation, and should therefore receive training in the basic principles and practical applications of segregation. Waste is generated by a large number of personnel, many of whom are directly involved with care of patients, often in conditions of urgency; management of the waste generated in such circumstances may thus seem to be of little importance. Training should make staff aware of the potentially serious implications of the mismanagement of waste for the health of waste handlers and patients, provide them with an overall view of the fate of waste after collection and removal from the ward, and teach them the importance of proper segregation of the different categories of waste.

Line managers may find it worthwhile to run the training sessions themselves, for their own personnel.

Training recommendations: health-care personnel

The training course should provide an overview of the waste management policy and underlying rationale and information on practices relevant to the targeted group of trainees. For personnel who provide health-care, waste segregation is a key element in their training in waste management (see Box 15.1).

In addition to the practices outlined in the various chapters of this book, which may form the basis for the course, the following precautions should be emphasized:

- The greatest care should be taken if needles have to be removed from syringes.
- In no case should any attempt be made to correct segregation mistakes by removing items from a bag or container or by placing one bag into another of a different colour.
- Hazardous and general waste should not be mixed. If the two are accidentally mixed, the entire mixture should be treated as hazardous health-care waste.
- Nursing and clinical staff should ensure that adequate numbers of bag holders and containers are provided for the collection, and subsequent on-site storage, of health-care waste—in the wards, clinics, operating theatres, and other areas where waste is generated. These receptacles should be located as close to the common sources of waste as possible.

Training recommendations: waste handlers

Again, relevant chapters of this book may form the basis for a training course. Topics covered may include the waste management policy, health hazards, on-site transportation, storage, safety practices, and emergency response. Among staff who routinely handle health-care waste, awareness of the need for safety may decrease with time, which will increase the risk of injury. Periodic refresher training is therefore recommended.

Points that should be stressed in the training of waste handlers are summarized in Box 15.2.

Box 15.2 Training of waste handlers

- Check that waste storage bags and containers are sealed; no bags should be removed unless properly labelled and securely sealed to prevent spillages.
- Bags should be picked up by the neck only. They should be put down in such a way that they can again be picked up by the neck for further handling. Manual handling of waste bags should be minimized whenever possible.
- Waste bags should not touch the body during handling and collectors should not attempt to carry too many bags at one time—probably no more than two.
- When moving of waste bags or containers is complete, the seal should again be checked to ensure that it is unbroken.
- To avoid puncture or other damage, waste bags should not be thrown or dropped.
- Sharps may occasionally puncture the side or bottom of a polypropylene container; the container should therefore be carried by its handle and should not be supported underneath with the free hand.
- Bags for hazardous health-care waste and for general waste should not be mixed, but segregated throughout handling; hazardous waste should be placed only in specified storage areas.
- Appropriate cleaning and disinfection procedures should be followed in the event of accidental spillage; any such incident should be reported immediately to the responsible member of staff.
- Adequate protective clothing should be worn during all waste handling operations.

15.3 Training of health-care waste management operators

The minimal training for waste management operators should include:

- information on the risks associated with the handling of health-care waste;
- procedures for dealing with spillages and other accidents;
- instructions on the use of protective clothing.

The training needs will obviously depend on the type of operations the operators perform, but may well include specific topics such as operation of incinerators and waste transportation.

15.3.1 Training for staff who transport waste

The health-care establishment itself may carry out the transportation of waste, or it may contract this operation to an “authorized” waste transporter. Drivers and waste handlers should be aware of the nature and risks of the transported waste. In particular, transport staff should be

trained in the procedures listed below. They should be able to carry out all procedures in accordance with the instructions, without help from others.

- Correct procedures for handling, loading, and unloading waste bags and containers.
- Procedures for dealing with spillages or other accidents; written instructions for these procedures should be available in the transport vehicle.
- The wearing of protective clothing and strong footwear at all times.
- The availability at all times in dedicated waste collection vehicles of spare plastic bags, protective clothing, and the cleaning tools and disinfectants needed to deal with any spillage that occurs during loading, transport, or unloading.
- Documentation and recording of health-care waste, e.g. by means of a consignment note system, to allow waste to be traced from the point of collection to the final place of disposal.

The head of the health-care establishment should liaise with the transport contractor to ensure that members of the waste collection crew are well trained. Untrained personnel should never be allowed to handle hazardous health-care waste.

15.3.2 Training of treatment plant operators

Qualified operators are needed for incinerators and other treatment facilities. If no qualified operators are available, health-care establishments should arrange to train an adequate number of personnel.

Treatment plant operators should have received technical education to at least secondary school level, and should be specifically trained in the following areas:

- general functioning of the treatment facility, including heat recovery and flue-gas cleaning technologies, where appropriate;
- health, safety, and environmental implications of treatment operations;
- technical procedures for operation of the plant;
- emergency response, in case of equipment failures and alarms for example;
- maintenance of the plant and record-keeping;
- surveillance of the quality of ash and emissions, according to the specifications.

Further details for the training of treatment plant operators are given in in Box 15.3.

15.3.3 Training of landfill operators

In many middle- and lower-income countries, “safe burying” will continue to be used for the disposal of health-care waste until there is sufficient capacity for incineration or other disinfection. The training of landfill operators is important for limiting the risks associated with buried health-care waste, in relation to both scavenging and the quality of groundwater. Landfill operators should therefore be trained in the following issues:

Box 15.3 Issues to address in training treatment plant operators

Waste handling

- Procedures for receiving, handling, and storage of health-care waste.
- Loading of waste into the treatment unit.

Operation of the plant

- Operation of the plant equipment, including start-up and shut-down procedures.
- Operation and testing of control, alarm, and instrumentation systems; corrections where necessary.
- Optimum operating temperatures, pressures, concentrations of emissions, speeds, flows, etc., and maintenance of correct conditions.
- Detection of defects or malfunctions (following written procedures) and servicing.
- Safe removal of residues and ashes.

Maintenance

- Daily, weekly, monthly, semi-annual, and annual tests, inspection, cleaning, lubrication, replacement and replenishment of consumables (e.g. thermocouples), and overhaul, with special attention to major components of the installation; appropriate action when necessary.

Safety measures and emergency response

- Use of protective equipment; personal hygiene.
- Fire precautions.
- Procedures for emergency response, including manual operation of the plant under emergency conditions; dealing with spillages, accidents, and other incidents.
- Contingency plans for implementation during breakdown or planned maintenance.

Administrative procedures

- Licence conditions and regulations governing emissions.
- Record-keeping.
- Reporting of spillages, accidents, and other incidents.

- health risks related to health-care waste;
- hazards related to the sorting of this type of waste, which should *not* be practised either by the landfill operators or by other people;
- minimizing the handling of health-care waste by drivers or site operators;
- use of protective equipment, and personal hygiene;
- safe procedures for landfilling the wastes;
- procedures for emergency response.

