

## **2. Teaching and training in health-care waste management**

### **2.1 Rationale for training in health-care waste management**

Health-care waste is special in that it has a higher potential of infection and injury than any other type of waste. Therefore, it has to be handled with sound and safe methods wherever generated. Inadequate handling of health-care waste may have serious public health consequences and impact on the environment. Health-care waste management is, therefore, an important and necessary component of environmental health protection.

Hospitals and health-care establishments have responsibilities and a “duty of care” for the environment and public health, particularly in relation to the waste they produce. They also carry a responsibility to ensure that there are no adverse health and environmental consequences as a result of waste handling, treatment and disposal activities. Unfortunately, health-care waste management is, in many regions, not yet carried out with a satisfactory degree of safety. This course aims at transmitting the basic skills for the development and implementation of a health-care waste management policy, including the components outlined in this programme. In this way, health-care and research facilities can take steps towards securing a healthy and safe environment for their employees and communities.

### **2.2 The HCW course programme**

The proposed programme for a three day course is shown in Table 1. Should the course be expanded or condensed, then the course programme should be adjusted to meet the objectives set out in 1.4. The programme should not be too ambitious or impracticable but be designed to make the objectives easily achieved. According to the participant’s interests and level of knowledge, certain parts of this course may be condensed and others expanded.

The last ten minutes of each lecture should always be dedicated to questions of the participants. Should the lecturer finish his presentation before, she/he may foster a discussion with the participants on how the presented aspects relate to their local situation.

**Table 1: Proposed time-table for a three day course**

	Day 1	Day 2	Day 3
45 min	Introduction	Minimization, recycling and segregation <u>Lecture 5</u>	Wastewater management <u>Lecture 10</u>
45 min	Definition of health-care waste; hazards and public health impacts of health-care waste <u>Lecture 1</u>	Handling, storage and transportation <u>Lecture 6</u>	Worker's health and safety and emergencies <u>Lecture 11</u>
	Break		
45 min	Introduction to legislation <u>Lecture 2</u>	Minimization, segregation and handling options <u>Workshop 3</u>	Waste management related costs <u>Lecture 12</u>
45 min	Current national and local legislation <u>Workshop 1</u>	Treatment and disposal options (i) <u>Lecture 7</u>	Training <u>Lecture 13</u>
	Lunch break		
45 min	National programme for HCW management <u>Lecture 3</u>	Treatment and disposal options (II) <u>Lecture 8</u>	Options: (a) Regulatory package (b) Waste management plan - design <u>Workshop 5</u>
45 min	HCW management programme for a health-care establishment <u>Lecture 4</u>	Application of treatment and disposal methods to health-care waste categories <u>Lecture 9</u>	
	Break		
90 min	HCW management plan a) Action plan for implementation of national HCW management b) How to improve HCW management plan of the health-care establishment <u>Workshop 2</u>	Treatment and disposal options <ul style="list-style-type: none"> <li>• policy considerations</li> <li>• major urban hospitals</li> <li>• smaller or remote establishments</li> </ul> <u>Workshop 4</u>	Workshop 5 (continued) Results of the workshop Evaluation of the course Final discussions and closure

## **2.3 Planning the HCW course**

It is essential that there is one course coordinator, who takes on the responsibility for planning and delivering the course. Sufficient time should be given to these activities.

The course coordinator's role is crucial in ensuring the course has the right pace and that all of the activities are kept to the time allocated. The coordinator must ensure that the lecturing and teaching staff are properly briefed and the necessary resources are available on site and on time.

## **2.4 The problem solving approach to learning**

The hazards relating to health-care waste, the regulatory issues and the operational practices will be presented through formal teaching and illustrated by visual aids. If the students apply health-care waste management principles to their own tasks and guidance, and supervision ensures that this is done correctly, the learning will be detailed and long lasting.

The problems that the students deal with in a course setting should be of increasing complexity and they should be encouraged to use appropriate resource materials. A first step in problem solving is to encourage students to answer questions based upon local problems during the lectures. Secondly, during the workshop settings, a scenario should be developed which will be based directly on material that has already been presented formally, structured questions will then be asked, which will lead to a particular solution. Thirdly they should be required to tackle real issues, preferably local in origin where the students develop the questions to be asked, seek the information required and find a solution themselves. This is the most complex situation and the students will require assistance from the tutors.

## **2.5 Formal presentations**

Through giving lectures or presentations, one person can inform a large number of course participants of the content of the course and the principles of the subject. This enables new ideas to be introduced, particularly information on the national and local situation which is not readily available in text books or other published material. Although the audience will have a limited attention span, by proper planning the effects of this can be minimized.

Lectures are an important way of disseminating information. A well prepared lecture can be an extremely satisfying experience and a very efficient means of teaching. Thorough preparation is essential and the lecturer must be confident and have a thorough knowledge in the subject, particularly when the opportunity is given for a question and answer session at the end of the lecture. However, instant answers are not always possible. Should the lecturer be unable to answer, every effort should be made to find the answer as soon as possible or advise where the answer may be found.

At the end of each lecture, an interactive discussion between presenter and participants to address questions or applicability to the participant's situation is recommended.

During the workshop sessions, small group discussions led by the lecturer or an assistant can be an effective method of learning. It widens the knowledge base and reinforces the information given in lectures.

Recommendations for effective communication of the lecture content to the participants are given below:

### ***Useful hints for effective presentations***

- *Face participants at all times*
- *Maintain eye contact*
- *Speak clearly and at a moderate speed*
- *Pause for a few seconds at the end of making a point*
- *Leave each overhead slide on the screen for sufficient time to allow the participants to make notes (distribute reduced overheads before the presentation)*
- *Engage in interactive question and answer style*

## **2.6 Audiovisual and other teaching aids**

This Guide proposes to use visual aids to accompany the lectures and workshops. The overheads shown in this Guide may be copied directly onto transparent plastic sheets and used with overhead projectors. Overhead transparencies can be produced with many photocopying machines. The use of a bright projector that does not require a darkened room is best. Overhead projectors are readily portable and not as expensive as slide projectors.

The overheads could also be produced as 35mm slides. Slide projectors however may be less reliable than overhead projectors and require a darkened room. They can be helpful to illustrate practical situations with photographs of plants, equipment and personnel.

Technology is now available for making presentations with a portable computer using a special projector. This equipment is expensive and may not be readily available in some countries, but is a convenient and may be considered. However, careful planning is required for its use.

In some situations, videotaped material may also prove to be a good means of presenting information and encouraging discussion. Again the necessary equipment is expensive and requires professional maintenance. Producing video material is time-consuming, difficult and if carried out professionally it is expensive.

All presentations should be prepared well in advance of the course to avoid loss of time or distraction from the objectives of the presentation.

This guide does not contain photographs. A selection of photographs on diverse aspects and applications of health-care waste management should be available on the Web site of the World Health Organization's Programme of Environmental Health (after October 1998, <http://www.who.ch/>). From there they could be printed directly onto transparent sheets and projected with an overhead projector. They would provide valuable illustrations of management practices and show practical examples.

## **2.7 Evaluation**

Evaluation aims at assessing the extent to which the course objectives have been attained and at determining the quality of the teaching. The evaluation results will allow the course to be improved or adapted as necessary for future use. An evaluation of the course can be made by carrying out a short initial assessment of the level of knowledge of the participants right at the beginning of the course and by comparing it to the knowledge assessed at the end of the course. A questionnaire for the initial assessment is proposed in Chapter 3.1, Introduction - resources. The same questionnaire may be completed by the participants at the end of the course and the initial and final results compared. Also, the participants should be consulted on the content, visual aids and teaching methods at the end of the course. This can be carried out by asking them to complete an anonymous written questionnaire. An example is shown in Table 2. The results could then be analysed by the organisers.

The teachers may also wish to carry out an assessment using *Self assessment for teachers of Health* by A. Rotem and F. Abatt (World Health Organization, Geneva, 1982, WHO Offset Publication No. 68), which is a good source of advice. It illustrates the teaching skills that can be developed and indicates ways of improving those skills.

Evaluation of the course and the teachers by the participants is as important as assessing the competence of the participants at the end of the course.

## Table 2: Course evaluation form for participants

It is through your comments that we can improve this course and maintain a high standard in the future. We would greatly value your help by completing this questionnaire. This evaluation is anonymous, only mark your name if you wish. **Thank you.**

*Please underline your answer*

1. Did this course help to improve your knowledge on the subject and fulfil your expectations? Yes/No

Comments \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Were any topics omitted from the programme that you felt should have been included?  
If so state what they are:

\_\_\_\_\_  
\_\_\_\_\_

3. Did you feel that the course level was appropriate for you? Too high/adequate/too low

4. Was the course too theoretical? yes/no

5. Was the ratio lecture/workshops & discussions adequate? yes/no

Comments \_\_\_\_\_  
\_\_\_\_\_

6. Do you feel that another related course should be held (yes/no)? If yes who do think should attend?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

7. Did this course provide you with the necessary elements and confidence to contribute to improvement of health-care waste management practices in your country/ region/ establishment? yes/no

Comments \_\_\_\_\_  
\_\_\_\_\_

8. Please indicate your ratings for the following:

Method of presentation (Use of audio visual equipment)	Very Good/Good/Fair/Poor
Documentation	Very Good/Good/Fair/Poor
Location and facilities	Very Good/Good/Fair/Poor

Table 2 (continued)

**Please evaluate the Lectures and Workshops using the following scale**  
**5 = Excellent 4 = Good 3 = Average 2 = Fair 1 = Poor**

Activity	Presentation	Content
Lecture 1 - Definitions, hazards, risks.		
Lecture 2 - Legislation		
Workshop 1 - Current national and local laws		
Lecture 3 - National programme		
Lecture 4 - Health-care establishment programme		
Workshop 2 - Waste management plan		
Lecture 5 - Minimization, recycling, segregation		
Lecture 6 - Handling, storage and transport		
Workshop 3-Minimization, recycling, segregation		
Lecture 7 - Treatment and disposal (i)		
Lecture 8 - Treatment and disposal (II)		
Lecture 9 - Application to waste categories		
Workshop 4 - Treatment and Disposal Options		
Lecture 10 - Wastewater management		
Lecture 11 - Worker's health and safety		
Lecture 12 - Related costs		
Lecture 13 - Training		
Workshop 5 - Regulatory package/ Management plan		
The course overall		

**Comments** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_