

3.2 Lecture 1

Definition of HCW, hazards and public health impact

Overheads

Overhead 1.1	Definitions
Overhead 1.2	Health-care activities
Overhead 1.3	Hazardous health-care waste
Overhead 1.4	Major sources of health-care waste
Overhead 1.5	Minor sources of health-care waste
Overhead 1.6	HCW generation by region
Overhead 1.7	What is risk?
Overhead 1.8	Hazardous properties of HCW
Overhead 1.9	Hazardous properties of chemicals
Overhead 1.10	Who is at risk?
Overhead 1.11	Public health risks of hazardous HCW
Overhead 1.12	Public sensitivity

Teacher-s notes

Handouts

Handout 1.1	Categories of hazardous health-care waste
Handout 1.2	A selection of infections from exposure to health-care wastes, agents and transmission pathways
Handout 1.3	Occupational transmission of HIV in the USA and in France
Handout 1.4	Spreading of nosocomial infections
Reduced overheads	

Definitions

Health-care waste

Total waste stream from HCW generators
(major and scattered sources)

Hazardous health-care waste

75 - 90% of general waste (similar to domestic waste)
10 - 25% is hazardous (infectious, toxic etc.)



Health-care activities

Health-care activities (for humans) generating waste include:

- Diagnosis
- Treatment
- Prevention of diseases
- Alleviation of disablement
- Associated research



Hazardous health-care waste

- Infectious
- Pathological
- Sharps
- Pharmaceutical
- Genotoxic
- Chemical
- Heavy metals
- Pressurized containers
- Radioactive



Major sources of health-care waste

- Hospitals
- Clinics
- Laboratories
- Research centres
- Animal Research
- Bloodbanks
- Nursing Homes
- Mortuaries
- Autopsy centres



Minor sources of health-care waste

- Physician's office
- Dental clinics
- Home health-care
- Nursing homes
- Acupuncturists
- Psychiatric clinics
- Cosmetic piercing and tattooing
- Funeral services
- Paramedic services
- Institutions for disabled persons



HCW Generation by Region

Region	kg/bed/day
• North America	7 - 10
• Latin America	3
• Western Europe	3 - 6
• Eastern Europe	1.4 - 2
• Middle East	1.3 - 3
• East Asia High Income	2.5 - 4
• East Asia Middle Income	1.8 - 2.2



What is Risk ?

the probability that the hazard
of a substance will cause harm
and the severity of that harm



Hazardous properties of HCW

Hazardous HCW may have the following properties:

- contains infectious agents
- genotoxic
- contains hazardous chemicals or pharmaceuticals
- radioactive
- contains sharps



Hazardous properties of chemicals

- Toxic
- Corrosive
- Flammable
- Reactive
- Explosive
- Shock sensitive
- Genotoxic



Who is at Risk ?

- Doctors and nurses
- Patients
- Hospital support staff
- Waste collection and disposal staff
- General public



Public health risks of hazardous HCW

Potential health effects:

- AIDS
- Hepatitis B and C
- Gastroenteric infections
- Respiratory infections
- Blood stream infections
- Skin infections
- Effects of radioactive substances
- Intoxication



Public sensitivity

Public sensitivity

- about incidents involving HCW
- about visual impact of HCW

Cultural practices should be taken into account in HCW management.



Teacher-s notes - Lecture 1

Overhead 1.1

Health-care waste is defined as the total waste stream (solid and liquid) from health-care establishments, research facilities and laboratories. In addition, health-care activities in minor or scattered sources, including health-care provided at home, may also generate health-care waste. 75% to 90% of the waste of health-care providers is general waste, comparable to domestic waste, and mostly comes from the administrative and housekeeping function of the establishments. This general health-care waste may also include waste from the maintenance of the premises of a health-care facility. The remaining 10% to 25% are hazardous health-care wastes which may create a variety of health risks. In this course, only hazardous health-care waste will be considered. General wastes should join the municipal waste stream.

Overhead 1.2

This will also include some veterinary waste and dead animals arising in research and public health laboratories.

Overhead 1.3

Distribute Handout 1.1: Categories of hazardous health-care waste

The Table sets out the categories of health-care waste. These categories will be considered all throughout the course.

Overhead 1.4

Hospitals

University hospital, General hospital, District hospital

Other health-care establishments

Emergency medical care services, health-care centres and dispensaries

Obstetrical and maternity clinics, out-patients clinics, dialysis centres

First aid posts and sick bays, long-term health care establishments and hospices, transfusion centres, military medical services

Related laboratories and research centres

Medical and biomedical laboratories, biotechnology laboratories and institutions, medical research centres

Mortuary and autopsy centres, Animal research and testing, Blood banks and blood collection services, Old-age nursing homes

Overhead 1.5

They will rarely produce:

- a) Radioactive or cytotoxic waste although in high income countries this is on the increase;
- b) Human body parts;

Sharps will be mainly syringe needles.

Overhead 1.6

Health-care waste generation differs not only from country to country, but also within a country.

Waste generation depends on numerous factors such as waste management methods, type of health-care establishment, specializations of the hospital, ratio of reusable items in use, ratio of day care etc. It is therefore suggested that these data only be used as examples, and not as a basis for waste management within an individual health-care establishment. Even a limited survey will probably provide more reliable data on local waste generation than any estimation based on data from other countries or types of establishments.

Overhead 1.8

Pathogens may infect the human body through the following pathways:

- C absorption through an opening or cut in the skin
- C absorption through the mucous membranes
- C inhalation
- C ingestion

Sharps may not only cause cuts and punctures, but also infect the wounds by agents which previously contaminated sharps.

Genotoxic is the property of a substance or its metabolite that is capable of interacting directly with DNA (genetic material), leading to DNA damage that can be assayed. It may include carcinogenic, mutagenic or teratogenic substances.

Overhead 1.9

These are the properties that hazardous chemicals may have. Fractions of these will be found in HCW after their use or when they are no longer required. They may cause intoxications, injuries or burns. Intoxications can arise from absorption through the skin or mucous membranes and from inhalation or ingestion.

Overhead 1.10

All persons exposed to hazardous health-care waste are potentially at risk. That is why a tightly controlled management system is required.

The main groups at risk are the following:

- C Nurses, auxiliaries, and hospital maintenance personnel;
- C Patients in health-care establishments or under home care;
- C Visitors in health-care establishments;

- C Workers in support services to health-care establishments, such as laundries, waste handling and transportation;
- C Workers in waste disposal facilities (such as landfills or incinerators), including scavengers.

Overhead 1.11

Potential health effects from exposure to health-care waste are numerous. Infections may be transmitted by contact to patient's excretions or body fluids contained in the waste. Pathogens may also be distributed by rodents and insects that come in contact with unsafely stored waste.

Little data exist on the number of infections caused by exposure to infectious waste.

Poor management of HCW is also suspected to contribute to nosocomial (or hospital-acquired) infections. There is potential risk of nosocomial infections when the waste contaminates patients or surfaces. This may happen if the waste is not well packaged, stored or handled. Therefore there are strong links between health-care waste management and hospital hygiene. A selection of possible infections that could be caused by exposure to health-care waste is provided in Handout 1.2. Handout 1.4 illustrates the spreading of nosocomial diseases in a very summarized way. In the upper part of the handout are listed the possible sources of pathogens, which includes waste.

The middle part contains possible routes of transmission and examples of diseases which may be acquired in a health-care establishment.

Overhead 1.12

The general public is usually very sensitive about incidents involving health-care waste.

Also, in no culture it is acceptable to dump anatomic waste (recognizable anatomic parts from the human body) on a landfill.

In some cultures, especially in Asia, religious beliefs require that human body parts be turned back to the patient's family in little coffins, to be buried in cemeteries.

Handout 1.1

Categories of hazardous health-care waste

Waste category	Description and examples
Infectious waste	Waste suspected of containing pathogens <i>e.g. laboratory cultures, waste from isolation wards, tissues, materials or equipment having been in contact with infected patients, excreta</i>
Pathological waste	Human tissue or fluids <i>e.g. body parts, blood and other body fluids, human foetuses</i>
Sharps	Sharps waste <i>e.g. needles, infusion sets, scalpels, knives, blades, broken glass</i>
Pharmaceutical waste	Waste containing pharmaceuticals <i>e.g. pharmaceuticals which are expired or no longer needed, items contaminated or containing pharmaceuticals (bottles, boxes)</i>
Genotoxic waste	Waste containing substances with genotoxic properties <i>e.g. waste containing cytotoxic drugs (often used in cancer therapy), genotoxic chemicals</i>
Chemical waste	Waste containing discarded chemical substances <i>e.g. laboratory reagents, film developer, disinfectants which are expired or no longer needed, solvents</i>
Wastes with high content of heavy metals	e.g batteries, broken thermometers, blood pressure gauges
Pressurized containers	Gas cylinders, cartridges and aerosol cans
Radioactive waste	Waste containing radioactive substances <i>e.g. unused liquids from radiotherapy or laboratory research, contaminated glassware, packages or absorbent paper, urine and excreta from patients treated or tested with unsealed radionuclides, sealed sources</i>

Handout 1.2

A selection of infections from exposure to health-care wastes, agents and transmission pathways

Pathology	Examples of associated pathogens	Infected body fluids
Gastroenteric infections	Enterobacteria, e.g. <i>Salmonella</i> , <i>Shigella</i> spp. <i>Vibrio cholerae</i> , Helminths	Faeces and/or vomiting
Respiratory infections	<i>Mycobacter tubercul.</i> , Measles virus, <i>Strept. pneumoniae</i>	Breathing secretions, saliva
Ocular infection	Herpesvirus	Eye secretions
Genital infections	<i>Neisseria gonorrhoeae</i>	Genital secretions
Skin infections	<i>Streptococcus</i> spp.	Pus
Anthrax	<i>Bacillus anthracis</i>	Skin secretions
Meningitis	<i>Neisseria meningitidis</i>	Cerebrospinal fluid
AIDS	Human immunodeficiency virus (HIV)	Blood, sexual secretion
Haemorrhagic fevers	Junin, Lhassa, Ebola and Marburg viruses	All bloody products and secretions
Septicaemia	<i>Staphylococcus</i> spp.	Blood
Bacteraemia	Coagulase-negative staphylococci, <i>Staphylococcus aureus</i> , <i>Enterobacter</i> , <i>Enterococcus</i>	Blood
Candidaemia	<i>Candida albicans</i>	Blood
Hepatitis A	Hepatitis A virus	Faeces
Hepatitis B & C	Hepatitis B and C viruses	Blood and body fluids

Questions

- 1) How are the hospital acquired infections dealt with and controlled in your country/ establishment?
- 2) How do you think that they are transmitted ?
- 3) What measures would you take to control them?
- 4) To what extent do you think that health-care waste contributes to the spread of nosocomial infections ?
- 5) How would you prepare and carry out a programme to raise awareness amongst the staff of the dangers and the measures to combat these problems?

Handout 1.3

Occupational transmission of HIV in the USA and in France

USA:

In June 1994, 39 cases of HIV infections were recognized by the Centre for Disease Control as occupational infections, with the following pathways of transmission:

- C 32 from syringe needle injuries
- C 1 from blade injury
- C 1 from glass-tube injury
- C 1 from contact with non-sharp infectious item
- C 4 from skin or mycosis exposure

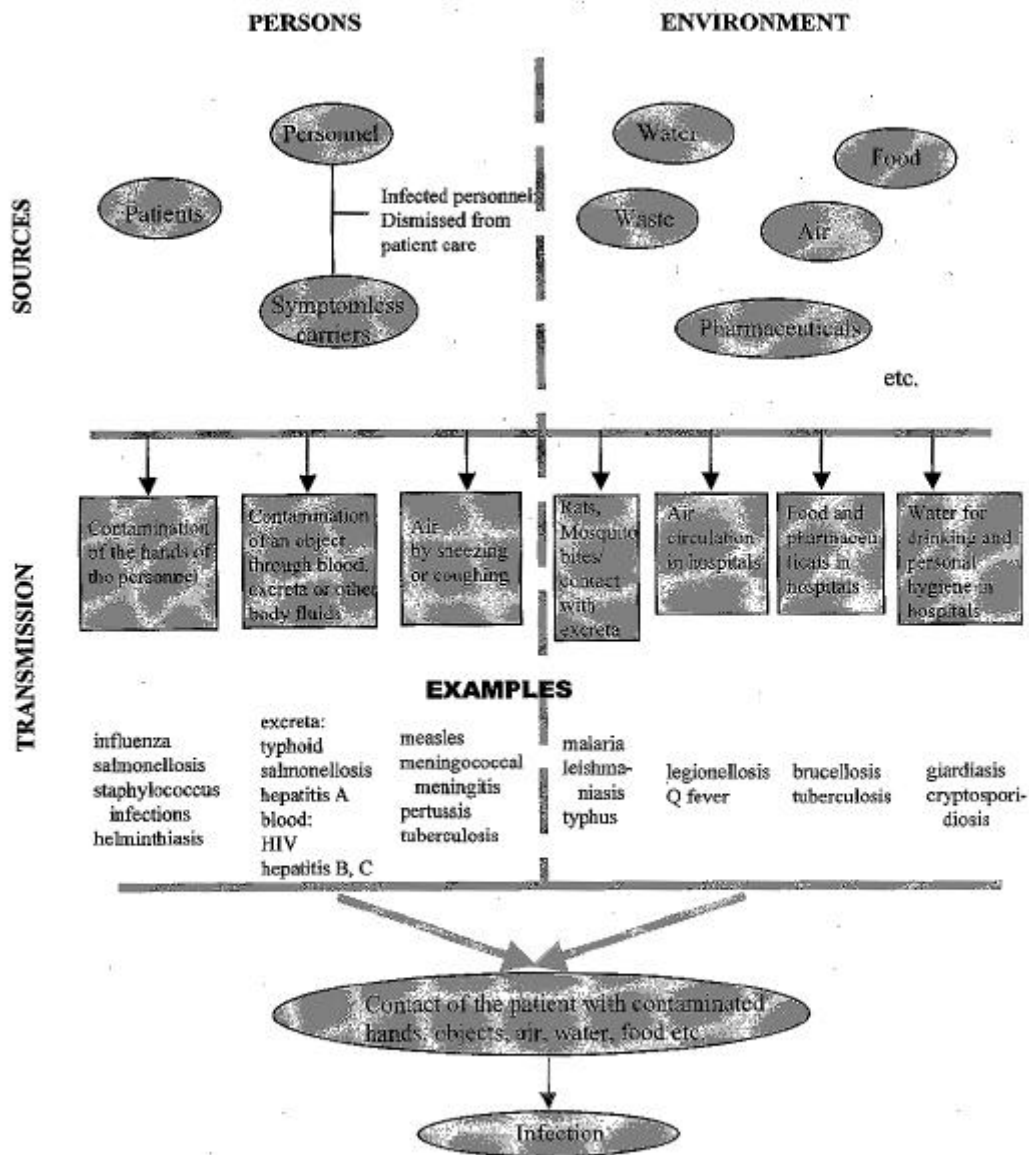
In June 1996, the cumulative recognized cases of occupational HIV infections had risen to 51. All cases were nurses, medical doctors or laboratory assistants.

France:

In 1992, 8 cases of HIV infections were recognized as occupational infections. Two cases of HIV transmission through infected wounds were reported among waste handlers.

Handout 1.4

Spreading of nosocomial infections



Note: Many of the listed diseases can spread via more than one route. This list contains only a few examples compared to the many diseases that may be transmitted within a hospital setting.


Reduced overheads - Lecture 1

Overhead 1.1

Definitions

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(major and scattered sources)

Hazardous health-care waste
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 World Health Organization

Overhead 1.2

Health-care activities

**Health-care activities (for humans)
generating waste include:**


- Diagnosis
- Treatment
- Prevention of diseases
- Alleviation of disablement
- Associated research

 World Health Organization

Overhead 1.3

Hazardous health-care waste


- Infectious
- Pathological
- Sharps
- Pharmaceutical
- Genotoxic
- Chemical
- Heavy metals
- Pressurized containers
- Radioactive

 World Health Organization

Overhead 1.4

Major sources of health-care waste


- Hospitals
- Clinics
- Laboratories
- Research centres
- Animal Research
- Bloodbanks
- Nursing Homes
- Mortuaries
- Autopsy centres

 World Health Organization

Overhead 1.5

Minor sources of health-care waste


- Physician's office
- Dental clinics
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- Nursing homes
- Acupuncturists
- Psychiatric clinics
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- Funeral services
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- Institutions for disabled persons

 World Health Organization

Overhead 1.6

HCW Generation by Region

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 World Health Organization

Reduced overheads - Lecture 1

Overhead 1.7

What is Risk ?

the probability that the hazard of a substance will cause harm and the severity of that harm


 World Health Organization

Overhead 1.8

Hazardous properties of HCW

Hazardous HCW may have the following properties:


- contains infectious agents
- genotoxic
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 World Health Organization

Overhead 1.9

Hazardous properties of chemicals


- Toxic
- Corrosive
- Flammable
- Reactive
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- Shock sensitive
- Genotoxic

 World Health Organization

Overhead 1.10

Who is at Risk ?

- Doctors and nurses
- Patients
- Hospital support staff
- Waste collection and disposal staff
- General public


 World Health Organization

Overhead 1.11

Public health risks of hazardous HCW

Potential health effects:

- AIDS
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- Respiratory infections
- Blood stream infections
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- Effects of radioactive substances
- Intoxication

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Overhead 1.12

Public sensitivity

Public sensitivity

- about incidents involving HCW
- about visual impact of HCW

Cultural practices should be taken into account in HCW management.

 World Health Organization

3.3 Lecture 2

Introduction to legislation

Overheads

Overhead 2.1	Introduction to legislation - International agreements and principles
Overhead 2.2	Basel Convention, 1989
Overhead 2.3	Polluter Pays Principle
Overhead 2.4	Precautionary Principle
Overhead 2.5	Duty of Care for wastes
Overhead 2.6	Proximity Principle
Overhead 2.7	National Legislation
Overhead 2.8	National Law
Overhead 2.9	Policy Document
Overhead 2.10	Technical Guidelines

Teacher-s notes

Handouts

Handout 2.1	Legal package - proposed content
Reduced overheads	

Introduction to legislation

International agreements and principles

- Basel Convention
- Polluter Pays Principle
- Precautionary Principle
- Duty of Care Principle
- Proximity Principle



Basel Convention, 1989

- Coordinated by the United Nations Environment Programme (UNEP)
- Signed by more than 100 Nations (Parties)
- Controls transboundary movements of hazardous waste



Polluter Pays

All waste producers are legally and financially responsible for:

- safe handling
- environmentally sound disposal
- creating an incentive to produce less



Precautionary Principle

Where risk is uncertain or unknown:

- Assume risk is significant
- Plan protection measures accordingly



“Duty of Care” for wastes

The “duty of care” principle stipulates that any person handling or managing hazardous substances or related equipment is ethically responsible for applying the utmost care.



Proximity Principle

Treatment and disposal of waste takes place as near as possible to the point of production as is technically and environmentally possible



National Legislation

- National legislation is the basis for improving HCW practices
- Permits legal controls and applying pressure
- Legal package: a law, a policy document and technical guidelines



National Law

- Clear definitions
- Defined responsibilities
- Duty of Care of waste producer
- Tracking systems and record keeping
- Defined penalties
- Regulatory and enforcement systems



Policy Document

- Description of health and safety risks
 - Reasons for safe and sustainable health-care waste management
 - Description of approved methods of waste minimization, handling and disposal
 - Record keeping and documentation
 - Training
 - Health and safety protection rules
- etc.



Technical Guidelines

- **Outline of the legal framework**
- **Responsibilities of actors**
- **Safe practices for :**
 - ▶ Minimization
 - ▶ Segregation
 - ▶ Storage
 - ▶ Handling
 - ▶ Transport
 - ▶ Treatment and Disposal



Teacher-s notes - Lecture 2

Overhead 2.1

International agreement has been reached on some underlying principles governing either public health or safe management of hazardous wastes.

These are explained in more detail in the following slides.

Overhead 2.2

The Basel Convention: Signed by more than 100 countries, this convention concerns transboundary movements of hazardous waste and is also applicable to hazardous health-care waste. Countries that signed this convention accepted the principle that the only legitimate transboundary shipments of hazardous waste are exports from countries without facilities, or expertise to dispose safely of certain wastes, to countries which have both facilities and expertise. Exported waste should be labelled according to the United Nations recommended standards.

Overhead 2.3

The **A**polluter pays@principle implies that any waste producer is legally and financially responsible for the safe and environmentally sound disposal of the waste he has produced. This principle also attempts to channel liability to the part which caused the damage.

Wherever practicable the polluter should pay for the costs they impose on the environment, whether they are national government, local government, commerce or industry or members of the public.

Overhead 2.4

The **A**precautionary@principle is a key principle governing health and safety protection. When a certain risk is insufficiently known, it should be assumed that this risk is significant. Health and safety protective measures should be designed accordingly.

Overhead 2.5

The producer should have objective standards by which the Duty of Care may be measured, which would apply locally, nationally and internationally (for example the Basel Convention).

Overhead 2.6

The **A**proximity@principle recommends that treatment and disposal of hazardous waste take place at the closest possible location from its source in order to minimize the risks linked to its transport.

According to a similar principle, any community should either recycle or dispose of the waste it has produced, inside its own territorial limits.

Overhead 2.7

National legislation is the basis for improving health-care waste practices of a country. This will permit legal controls and allow the national agency responsible for the disposal of health-care waste, usually the Ministry of Health, to apply pressure. The Ministry of Environment or the Environmental Protection Agency may also be involved. In this case there should be a clear distribution of responsibilities before initiating the process.

The legislation framework should consist in a law, completed by a policy document and technical guidelines, to be annexed to the law or to be considered as regulations issued from the law.

Overhead 2.8

A national law on health-care waste management may stand alone or be part of a more comprehensive law, e.g. law on hazardous waste management (application to health-care waste should be clearly stated), or law on hospital hygiene (a specific chapter or article should be devoted to health-care waste).

Operating a hospital and the disposal of health-care waste also has to comply with existing legislation related to it, e.g. waste regulations, air quality regulations, prevention and control of infectious disease regulations etc.)

Overhead 2.9

The policy document should outline the rationale, national goals and the key steps to achieve these goals.

Additional points that should be contained in the policy document are listed in Handout 2.1.

Overhead 2.10

The technical guidelines should be practical and directly applicable and include specifications, with a sufficient degree of detail.

Handout 2.1

Legal package - proposed content

A National Law

The law (or section) on HCW management should include the following:

- C A clear and properly categorized definition of hazardous health-care waste;
- C Detailed legal requirements for all persons who are producers, carriers, or who are engaged in the treatment and disposal of hazardous health-care waste so as to prevent harm to human health or pollution of the environment;
- C The methodology for record keeping and reporting;
- C A regulatory system for enforcing the law;
- C The penalties applicable to offenders and the designation of the law courts where cases will be tried.

The policy document

The policy document should outline the rationale, national goals and the key steps to achieve these goals. It may contain the following:

- C Description of health and safety risks resulting from mismanaged health-care waste;
- C Reasons for safe health-care waste management practices in health-care establishments;
- C Listing of approved methods of treatment and disposal for each waste category;
- C Warning against the most unsafe practices, such as disposing of hazardous health-care waste in municipal landfills;
- C Management responsibilities inside and outside health-care establishments;
- C Assessment of health-care waste management costs;
- C The key steps of health-care waste management: waste minimisation, separation, identification, handling, treatment, final disposal. Technical specifications for the implementation of each step should be described in separate technical guidelines.
- C Record keeping and documentation;
- C Training requirements;
- C Rules governing workers health and safety protection.

Handout 2.1 (continued)

The technical guidelines

The technical guidelines should be practical and directly applicable and include the following specifications, with a sufficient degree of detail:

- C Legal framework covering safe health-care waste management, hospital hygiene and occupational health and safety. Limitations for the emissions of atmospheric pollutants and protection of water resources may be addressed here or in the other national guidelines;
- C Responsibilities of the public health authorities, of the environmental protection agency, of the head of the health-care establishments, of the small producers in the community, of public waste management organizations and of private waste management agencies involved;
- C Safe practices for waste minimization;
- C Segregation, handling, storage and transport practices for health-care waste;
- C Recommended treatment and disposal methods for each health-care waste category and wastewater.

For ease of application, the legal definitions of each category of health-care waste should be repeated in the technical guidelines.

Reduced overheads - Lecture 2

Overhead 2.1

Introduction to legislation

International agreements and principles

- Basel Convention
- Polluter Pays Principle
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Overhead 2.2

Basel Convention, 1989

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 World Health Organization

Overhead 2.3

Polluter Pays

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- creating an incentive to produce less


 World Health Organization

Overhead 2.4

Precautionary Principle

Where risk is uncertain or unknown:


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 World Health Organization

Overhead 2.5

“Duty of Care” for wastes


The “duty of care” principle stipulates that any person handling or managing hazardous substances or related equipment is ethically responsible for applying the utmost care.

 World Health Organization

Overhead 2.6

Proximity Principle

Treatment and disposal of waste takes place as near as possible to the point of production as is technically and environmentally possible

 World Health Organization

Reduced overheads - Lecture 2

Overhead 2.7

National Legislation


- National legislation is the basis for improving HCW practices
- Permits legal controls and applying pressure
- Legal package: a law, a policy document and technical guidelines

 World Health Organization

Overhead 2.8

National Law


- Clear definitions
- Defined responsibilities
- Duty of Care of waste producer
- Tracking systems and record keeping
- Defined penalties
- Regulatory and enforcement systems

 World Health Organization

Overhead 2.9

Policy Document


- Description of health and safety risks
- Reasons for safe and sustainable health-care waste management
- Description of approved methods of waste minimization, handling and disposal
- Record keeping and documentation
- Training
- Health and safety protection rules
- etc.

 World Health Organization

Overhead 2.10

Technical Guidelines

- **Outline of the legal framework**
- **Responsibilities of actors**
- **Safe practices for :**
 - Minimization
 - Segregation
 - Storage
 - Handling
 - Transport
 - Treatment and Disposal

 World Health Organization

3.4 Workshop 1

Current national and local legislation

This workshop should review existing regulations and foster a discussion on possible improvements.

In your country what is the national and local legislation dealing with health-care waste? Try to answer the following questions (take 15 minutes at the end of the session for answering question 10):

- 1) Describe the national or regional regulations that apply to wastes and hazardous wastes.
- 2) What national or regional regulations address health-care wastes?
- 3) What legislation is there for the health and safety of workers?
- 4) Describe the legislation dealing with public health and how does the handling of health-care waste impact upon it?
- 5) Are there legal requirements to segregate health-care waste?
- 6) What legislation is there for the transportation of hazardous substances and does it affect HCW management?
- 7) What is the law dealing with waste collection and disposal and what if any are the specific laws or guidelines dealing with HCW management ?
- 8) What air quality legislation is likely to have an impact on health-care waste management?
- 9) What international agreements and protocols has the Government signed?
- 10) After having assessed the legal framework in your country, outline which type of legal documents or instruments would be required in your country/region.

3.5 Lecture 3

National programme for HCW management

Overheads

Overhead 3.1	International recommendations for waste management United Nations Conference on Environment and Development
Overhead 3.2	Action plan for a national programme of HCW management
Overhead 3.3	Policy commitment
Overhead 3.4	Conduct national survey
Overhead 3.5	Develop national policy and guidelines
Overhead 3.6	Develop treatment policies
Overhead 3.7	Develop national laws
Overhead 3.8	Implement a national training programme
Overhead 3.9	Establish a review of the HCW management programme

Teacher-s notes

Handouts

Handout 3.1	Action Plan for a national programme of sound health-care waste management
Reduced overheads	

International recommendations for waste management
***United Nations Conference on
Environment and Development***

Agenda 21 Waste Hierarchy

- Prevent or Minimize
- Re-use or recycle
- Incinerate with heat recovery
- Use alternative to incineration
- Landfill the residues



Action Plan for a national programme of health-care waste management

- Establish policy commitment
- Conduct a national survey
- Develop national guidelines
- Policy for regional cooperation
- Legislate
- National training programme
- Regularly review the plan



Policy commitment

- Designate the responsible authority
(usually Ministry of Health or of Environment)
- Interact with other government departments
- Commitment to developing a national policy
- Allocate a budget at different government levels



Conduct national survey

- Design and test the survey
- Distribute nationally
- Analyse results
- Use results for guidelines



Develop national policy and guidelines

- Analyze present legislation
- Consult hospitals and other waste producers
- Use survey results
- Draft national policy and technical guidelines



Develop treatment policies

- **Consider public and private services**
- **Consider suitable treatment methods**
 - Alternative Treatment Methods
 - On-site treatment options
 - Regional Facilities
- **Consider centralized and decentralized treatment**
- **Establish a national network of disposal facilities**



Develop national laws

- Examine international principles
- Use input from hospitals
- Include technical standards
- Prepare laws



Implement a national training programme

- Develop the programme
- Train the trainers
- Identify Institutions to deliver training
- Implement



Establish a review of the HCW management programme

- Create a review system of HCW management practices
- Carry out audits of waste treatment facilities
- Identify new technologies and practices
- Review report submitted by health-care establishments
- Implement improvements



Teacher-s notes - Lecture 3

Overhead 3.1

The United Nations Conference on the Environment and Development (UNCED) in 1990 led to the adoption of Agenda 21 and the concept of **sustainable development**. Sustainable development has been defined as **development that meets the needs of the present without compromising the ability of future generations to meet their own needs**.

One of the key precepts of the Action Programme is the sharing of responsibility which requires dialogue and action by all partners in society.

Overhead 3.2

A national plan will permit optimizing HCW management options on a national scale. It will provide a basis to the authorities for identifying actions at national or regional level.

The development of a national programme of sound health-care waste management is achievable through a seven step Action Plan. These seven steps and their suggested time frame are listed in Handout 3.1.

Overhead 3.4

Before the planning process can begin, a knowledge of the waste produced needs to be obtained.

A waste survey should therefore be undertaken with the objective of informing the waste planning process. It should provide information on types and quantity of wastes arising at each point of production, and methods of storage, handling, treatment and disposal. It should also provide the number of beds and occupancy rate for health-care establishments and personnel involved in HCW management.

Overhead 3.6

The policy should optimize HCW management at national and regional level. The planning policy will depend on local circumstances such as administrative control, number and location of health-care establishments, quality of road network, size and type of health-care establishments, financial and technical resources.

Overhead 3.7

The developed policy and guidelines should be supported by a law regulating their application.

This law is usually based on international agreements and underlying principles on sound waste management. The suggested content is outlined in Handout 2.1.

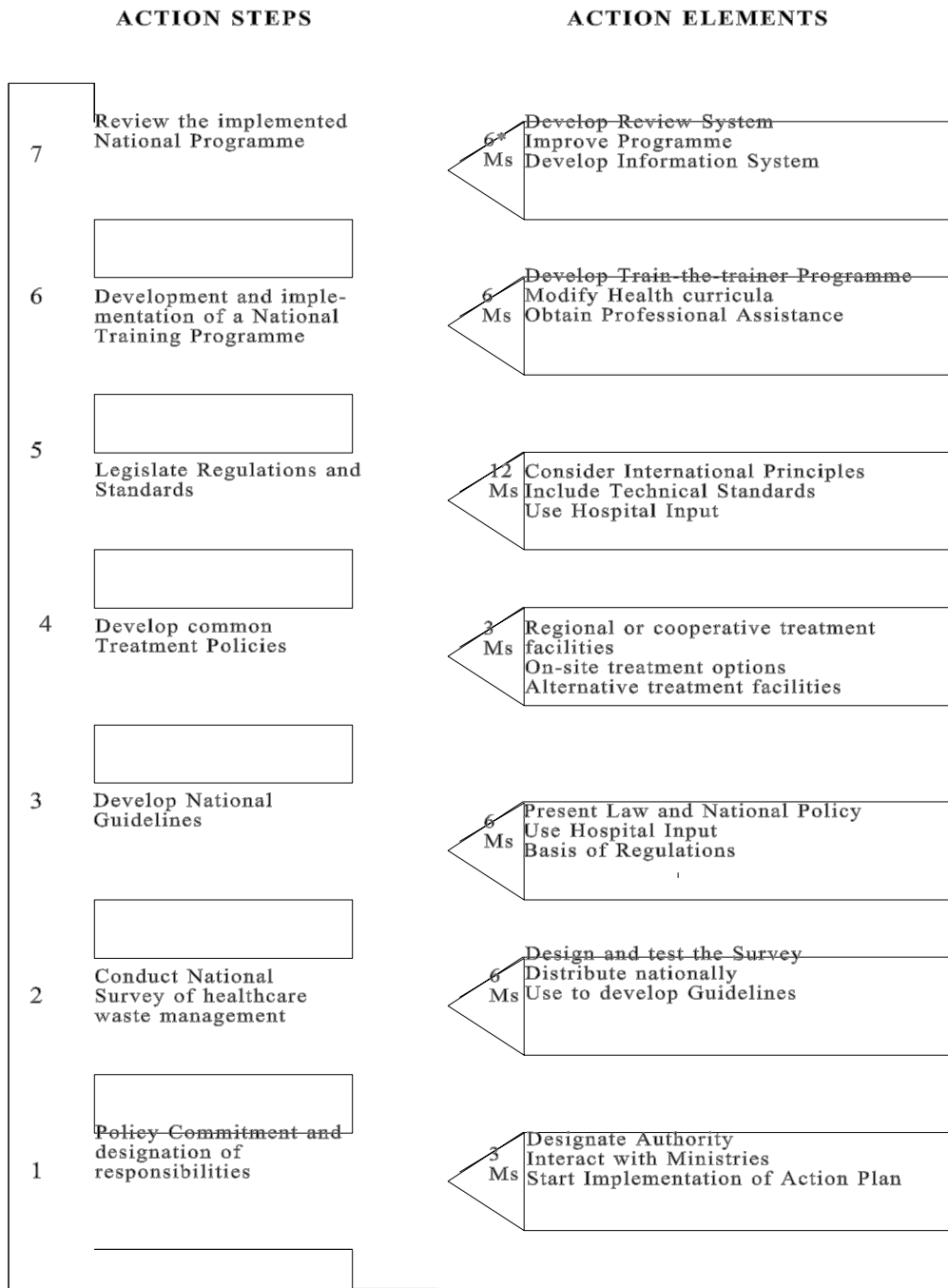
Overhead 3.8

In order to achieve acceptable HCW management practices and compliance with regulations, training of all managers and other personnel involved in HCW management is essential. The central government should assist in the preparation of **train-the-trainer** activities.

Overhead 3.9

The national programme should be viewed as a continuous one with periodic monitoring and assessment by the national government agency responsible for the disposal of HCW.

Handout 3.1: Action Plan for a national programme of sound health-care wastes management



*Time frame in months to complete action

Source: World Health Organization, Regional Office for South-East Asia, 1997.


Reduced overheads - Lecture 3

Overhead 3.1

International recommendations for waste management
United Nations Conference on Environment and Development

Agenda 21 Waste Hierarchy


- Prevent or Minimize
- Re-use or recycle
- Incinerate with heat recovery
- Use alternative to incineration
- Landfill the residues

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Overhead 3.2

Action Plan for a national programme of health-care waste management

- Establish policy commitment
- Conduct a national survey
- Develop national guidelines
- Policy for regional cooperation
- Legislate
- National training programme
- Regularly review the plan

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Overhead 3.3

Policy commitment


- Designate the responsible authority
(usually Ministry of Health or of Environment)
- Interact with other government departments
- Commitment to developing a national policy
- Allocate a budget at different government levels

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Overhead 3.4

Conduct national survey


- Design and test the survey
- Distribute nationally
- Analyse results
- Use results for guidelines

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Overhead 3.5

Develop national policy and guidelines


- Analyze present legislation
- Consult hospitals and other waste producers
- Use survey results
- Draft national policy and technical guidelines

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Overhead 3.6

Develop treatment policies

- **Consider public and private services**
- **Consider suitable treatment methods**
Alternative Treatment Methods
On-site treatment options
Regional Facilities
- **Consider centralized and decentralized treatment**
- **Establish a national network of disposal facilities**


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Reduced overheads - Lecture 3

Overhead 3.7

Develop national laws

- Examine international principles
- Use input from hospitals
- Include technical standards
- Prepare laws


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72

Overhead 3.8

Implement a national training programme

- Develop the programme
- Train the trainers
- Identify Institutions to deliver training
- Implement


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71

Overhead 3.9

Establish a review of the HCW management programme

- Create a review system of HCW management practices
- Carry out audits of waste treatment facilities
- Identify new technologies and practices
- Review report submitted by health-care establishments
- Implement improvements

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72

3.6 Lecture 4

HCW management programme for a health-care establishment

Overheads

Overhead 4.1	Health-care waste management in a hospital
Overhead 4.2	Waste management responsibilities
Overhead 4.3	Duties of the Head of the establishment
Overhead 4.4	Duties of the Waste Management Officer
Overhead 4.5	Duties of other key staff
Overhead 4.6	The Waste Management Plan
Overhead 4.7	Implementation of the Plan
Overhead 4.8	Waste from scattered small sources

Teacher-s notes

Lecture Handout

Handout 4.1	Hospital waste management structure
Handout 4.2	Sample sheet for the assessment of waste generation
Handout 4.3	The Waste Management Plan - Content
Reduced overheads	

Health-care waste management in a hospital

Good waste management depends on:

- A dedicated Waste Management Team
- Good administration
- Careful planning
- Sound organisation
- Underpinning legislation
- Adequate financing
- Full participation by trained staff



Waste management responsibilities

- **Project Executive:** Hospital Manager
- **Project Manager:** Waste Management Officer
- **Project Team Members:**

Hospital manager

Waste Management Officer

Heads of departments

Infection Control Officer

Senior Nursing Officer

Hospital Engineer

Finance Controller

Chief Pharmacist

Radiation Officer



Duties of the Head of the establishment

- Form a waste management team
- Designate the Waste Management Officer
- Allocate financial resources and manpower
- Ensure that monitoring procedures are carried out
- Ensure adequate training of key staff members



Duties of the Waste Management Officer

- Control internal waste collection
- Ensure correct storage
- Coordinate disposal operations
- Monitor on-site and off-site transportation of waste
- Liaise with department heads to ensure training is carried out
- Monitor waste generation, disposal, costs and public health aspects (e.g. injuries) of waste



Duties of other key staff

Department Heads, Senior Nursing Officer, Infection Control Officer:

Contribute to training and implementation of correct procedures

Chief Pharmacist, Radiation Officer, Supply Officer :

Same duties as above and responsible for the sound management of stores

Hospital Engineer

Same as above and responsible for installing and maintaining storage facilities and handling equipment



The Waste Management Plan

- 1 Assess present situation and carry out a waste survey
- 2 Identify opportunities for minimization, reuse and recycling
- 3 Identify handling, treatment and disposal options
- 4 Evaluate options
- 5 Prepare a management plan
- 6 Establish a record keeping system
- 7 Estimate related costs
- 8 Prepare training programme
- 9 Prepare implementation strategy



Implementation of the Plan

**The implementation is the responsibility of the
Head of the establishment**

- Phased introduction
- Opportunities for expansion
- Identify key personnel network
- Arrange training
- Implement
- Review the plan annually
- Prepare annual report for national government



Waste from scattered small sources

- Ensure that hazardous HCW is **segregated**
- **Prevent** hazardous HCW causing pollution of the environment or harm to human health
- Where possible arrange for **special collection**
- Ensure that the hazardous HCW is only handled and disposed of by **competent persons**



Teacher-s notes - Lecture 4

Overhead 4.1

Health-care waste management in hospitals or other health-care establishments relies on several necessary elements, which are listed on the overhead.

Overhead 4.2

Before commencing work on examining waste management practices and developing a waste management plan, it is essential to establish within any health-care establishment the responsibilities for waste management. A suitable team should then be assembled, by formal appointment by the establishment's head, with clearly defined duties. It is desirable that one person is given the responsibility for waste management matters (the Waste Management Officer) with direct access to the Head of the establishment.

A typical waste management structure for a relatively large hospital is given in Handout 4.1. It may be adjusted to the particular needs of each establishment. In smaller establishments, one person may carry out several tasks.

Overhead 4.4

The Waste Management Officer (WMO) is responsible for the day to day operation and monitoring of the waste management system. He directly reports to the Head of the establishment.

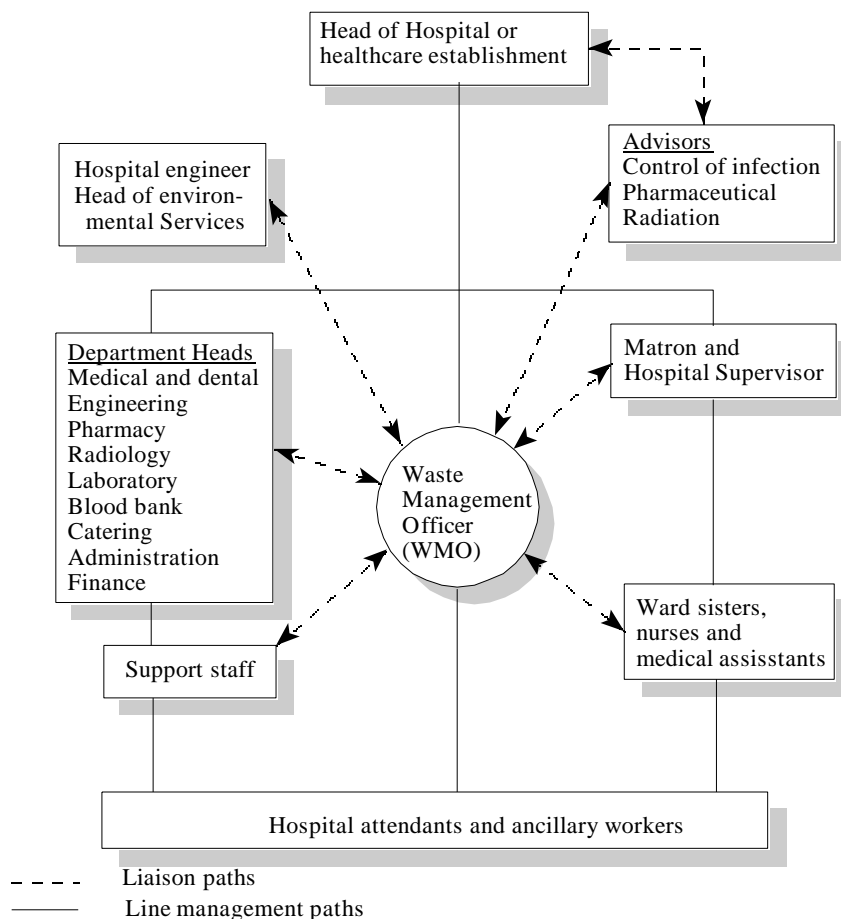
Overhead 4.6

The generation of waste needs to be assessed before considering management options. Categories and location of production of the wastes should be specified as accurately as possible. A sample sheet for assessment of waste generation is provided in handout 4.2.

The Waste Management Officer should prepare a draft Waste Management Plan, to be presented to the Waste Management Team, containing the elements outlined in Handout 4.3.

Handout 4.1

Hospital waste management structure



Source: World Health Organization, Western Pacific Regional Environmental Health Centre (EHC), 1994

Handout 4.2

Sample sheet for assessment of waste generation

Name of the health-care facility:

Week:

Waste collection point: Department/Location	Waste category ¹ (specify)	Quantity of waste generated per day (weight and volume)													
		Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday	
		kg	l	kg	l	kg	l	kg	l	kg	l	kg	l	kg	l

Source: Christen/SKAT, 1996

¹Infectious waste, pathological waste, sharps, pharmaceutical waste, cytotoxic waste, chemical waste, wastes with high content of heavy metals, radioactive waste

Handout 4.3

Waste Management Plant - Contents

- a) Drawings of the establishment showing designated bag holder sites for every ward and department in the health-care establishment; each bag site shall be appropriately designated as health-care waste or other waste site;
- b) Drawings showing the site of the central storage for health-care waste and the separate site for other waste; details of the type of containers, security equipment and arrangements for washing and disinfecting trolleys (e.g. wheeled) should be specified; the document should also address eventual needs for refrigerated facilities;
- c) Drawings showing the paths of waste collection trolleys through the health-care establishment, with clearly marked individual collection routes;
- d) A timetable for the frequency of collection for each trolley route, the type of waste to be collected, the number of wards and departments to be visited on one round and indicating the central storage point in the establishment for that particular waste;
- e) Drawings showing the type of bag holder to be used in the wards and departments;
- f) Drawings showing the type of trolley or wheeled container to be used for bag collection;
- g) Drawings of sharps containers with their specification;
- h) An estimate of the numbers and cost of bag holders and collection trolleys;
- I) An estimate of the number of sharps containers and health-care waste drum containers required annually, categorized into different sizes if appropriate;
- j) An estimate of the number and cost of yellow and black plastic bags to be used annually;
- k) Definitions of responsibilities, duties and codes of practice for each of the different categories of personnel of the establishment who, through their daily work, will generate health-care waste and be involved in the segregation, storage and handling of the waste;
- l) An estimate of the number of personnel required for waste collection;
- m) A definition of the responsibilities of hospital attendants and ancillary staff in collection and handling of wastes, for each ward and department; where special practices are required, e.g. for radioactive waste or hazardous chemical waste, the stage at which attendants or ancillary staff become involved in waste handling shall be clearly defined;
- n) Simple diagram (flow chart) showing waste segregation procedure;
- o) The procedures for segregation, storage and handling of wastes requiring special arrangements, such as autoclaving;
- p) Outline of monitoring procedures for waste categories and their destination;
- q) Contingency plans, containing instructions on storage or evacuation of health-care waste in case of breakdown of the treatment unit or when closed down for planned maintenance;
- r) Training courses and programmes;
- s) Emergency procedures.

Adapted from: World Health Organization, Western Pacific Regional Environmental Health Centre (EHC), 1994

Reduced overheads - Lecture 4

Overhead 4.1

Health-care waste management in a hospital

Good waste management depends on:

- A dedicated Waste Management Team
- Good administration
- Careful planning
- Sound organisation
- Underpinning legislation
- Adequate financing
- Full participation by trained staff


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Overhead 4.2

Waste management responsibilities

- **Project Executive:** Hospital Manager
- **Project Manager:** Waste Management Officer
- **Project Team Members:**


Hospital manager	Hospital Engineer
Waste Management Officer	Finance Controller
Heads of departments	Chief Pharmacist
Infection Control Officer	Radiation Officer
Senior Nursing Officer	

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Overhead 4.3

Duties of the Head of the establishment


- Form a waste management team
- Designate the Waste Management Officer
- Allocate financial resources and manpower
- Ensure that monitoring procedures are carried out
- Ensure adequate training of key staff members

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Overhead 4.4

Duties of the Waste Management Officer

- Control internal waste collection
- Ensure correct storage
- Coordinate disposal operations
- Monitor on-site and off-site transportation of waste
- Liaise with department heads to ensure training is carried out
- Monitor waste generation, disposal, costs and public health aspects (e.g. injuries) of waste

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Overhead 4.5

Duties of other key staff

Department Heads, Senior Nursing Officer, Infection Control Officer:
Contribute to training and implementation of correct procedures

Chief Pharmacist, Radiation Officer, Supply Officer :
Same duties as above and responsible for the sound management of stores


Hospital Engineer
Same as above and responsible for installing and maintaining storage facilities and handling equipment

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Overhead 4.6

The Waste Management Plan

- 1 Assess present situation and carry out a waste survey
- 2 Identify opportunities for minimization, reuse and recycling
- 3 Identify handling, treatment and disposal options
- 4 Evaluate options
- 5 Prepare a management plan
- 6 Establish a record keeping system
- 7 Estimate related costs
- 8 Prepare training programme
- 9 Prepare implementation strategy

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Reduced overheads - Lecture 4

Overhead 4.7

Implementation of the Plan

The implementation is the responsibility of the Head of the establishment

- Phased introduction
- Opportunities for expansion
- Identify key personnel network
- Arrange training
- Implement
- Review the plan annually
- Prepare annual report for national government


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36

Overhead 4.8

Waste from scattered small sources

- Ensure that hazardous HCW is **issegregated**
- **Prevent** hazardous HCW causing pollution of the environment or harm to human health
- Where possible arrange for **special collection**
- Ensure that the hazardous HCW is only handled and disposed of by **competent persons**

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37

3.7 Workshop 2

HCW management plan

Participants should be divided into two groups, according to their professional field of activity and interests:

I) Action plan for implementation of national HCW management (mainly for participants from national or regional authorities and policy makers)

Using the Handout 3.1 as a basis:

- 1) Go through the steps and decide what step your country has reached.
- 2) Which would be the aspects that would still have to be covered in your country?
- 3) How would the step sequence differ in your country compared with the Handout?
- 4) Now devise an action plan for the implementation of a national programme for health-care waste management.

II) How to improve the HCW management plan of the health-care establishment (mainly for participants from health-care establishments)

Using the Handouts of Lecture 4:

- 1) Are the responsibilities for health-care waste management clearly assigned in your establishment?
- 2) What is the structure for waste management in place? Compare it to Handout 4.1.
- 3) Has a waste management plan been established?
- 4) Do you feel that additional issues would have to be addressed in the waste management plan?
- 5) Outline possible improvements.
- 6) Formulate a strategy on how the improvements could be achieved.
- 7) What are your relations with the authority responsible for HCW?

Participants should designate a speaker in each group who will report to plenary the results of the working group. These results should be presented about 30 minutes before the end of the workshop.