

OCCUPATIONAL HEALTH AND SAFETY

Objectives

By the end of the lesson the learners will be able to;

- Define occupational health concepts like OHS, hazard, risk, hazard identification, and hazard control
- Types of occupational health hazards at different work places
- Prevention of occupational health hazards
- State four reasons why health hazard assessment is important
- Classify hazards
- Describe the 4 common health hazards in the health sector.
- Outline 4 likely sources of workplace hazards
- Explain 6 methods of hazard identification
- Roles of nurses in prevention of hazards at work places
- Definition of occupational health concepts
- Healthy service waste management
- Injection safety methods
- Workers compensation act

INTRODUCTION

Occupational Health and safety

Is also defined as the physical, mental and social wellbeing of man in relation to his work and working environment, his adjustment to work and the adjustment of work to man (Forsman 1976)

It's defined as the discipline which is aimed at preventing people from getting disease or injuries as a result of the work they do.

History of occupation health

Bernardino Ramazzini was a physician who discovered the relationship between work and diseases. He studied diseases that he identified with specific occupations thereby naming himself a title of **father of occupation health**

Historical Milestones of Occupation Health

There have been several trends in occupation health and a few of these include:

The industrial revolution wave

During this period, many workers had occupational illnesses but they were never protected at their places of work instead they were replaced immediately whenever they could fall sick.

Because of the poor conditions, they went on a strike.

Industrial health services wave

During this period, there was initiation of occupation health care but on a limited scale.

This was not enough and the workers went on strike again.

Occupation health wave

During this period, occupation health care became widely recognized and incorporated into the systems.

History of Occupation Health in Uganda

When occupation health came to the developing world, it was in the form of *industrial health*.

It came to Uganda in 1940s & started as a unit in the department of labour.

Aims of Occupation Health & Safety

- Promotion & maintenance of the highest degree of physical, mental & social wellbeing of workers in their occupations.
- Prevention of deviations & departures of workers due to ill health caused by poor working conditions
- Protection of workers in their employment from risk or hazards.
- Improvement of the working environment.

Why should we study occupation health

- ✓ Health workers will always encounter patients with work related problems
- ✓ Large numbers of people are exposed to toxic materials
- ✓ Many new chemicals are being introduced
- ✓ Many people especially in developing countries are exposed & unprotected
- ✓ Chemicals used in developing countries are used by poorly trained or non-trained personnel

Functions of occupation health

- ✓ To identifying & assess the risks to health hazards in the work place.
This involves surveillance of work places.
- ✓ It also requires a systematic approach to the analysis of occupation accidents & diseases.
- ✓ Advising on;
 - Planning & organization of work & working practices including the design of work places
 - Evaluation choice & maintenance of the equipment
 - Substances used at work therefore promoting the adaptation of work to the worker
 - Information, & training on occupation health, safety & hygiene.

- Surveillance of worker's health in relation to work
- Contributing to occupation rehabilitation
- Organizing first aid emergency treatment

Nurses Roles towards Occupation Health

The responsibility of occupational health nurse is divided into 3

- To the worker
 - To the employer
 - To his or her professional colleagues
- ❖ Prevention of occupational and non-occupational illnesses through health education, training, health surveillance and screening.
 - ❖ Provide emergency care, first aid & routine care in hospitals plus any other care as facilities allow
 - ❖ Carry out direct counseling, form safety committee with other members which includes both management & workers where equipment are protected, risks are detected & actions recommended
 - ❖ Implement programs, keep records, inspect & write reports
 - ❖ Reassure patients who have suffered from diseases
 - ❖ Coordinate occupation health & safety workshops
 - ❖ To participate in the health assessment (physical and Psychological assessment) of workers to facilitate proper recruitment (selection and placement)
 - ❖ Provisions for treatment/provide nursing care to workers with both occupational and non-occupational illnesses.
 - ❖ Provision of referral services to those who require advanced care.

- ❖ Advocate and or advise on occupational sanitation or industrial hygiene and safety education activities.
- ❖ Participate in planning for occupational health activities by establishing mutual goals and objectives of OHP (occupation health programe)
- ❖ Work cooperatively (collaborate, communicate and consult) with other professional and non-professional staff.
- ❖ Participate in rehabilitation and resettlement of those who have been disabled as a result of the occupations.

Role of employer in occupation health & safety

- ❖ To provide education & training to all employees on occupation health & safety
- ❖ Replacement of harmful substances with harmless or less harmful substances (substitution)
- ❖ Engineering controls to provide a safe work environment
- ❖ Good housekeeping or premises e.g. sanitation
- ❖ Provision of safe equipment e.g. safety needle & syringes
- ❖ Provision of health care

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Roles of government

- ❖ To provide training to the employers & employee
- ❖ Legislative control (setting laws)e.g. licensing of factories
- ❖ Networking with other departments in order to prevent occupation diseases & injuries e.g. ministry of labor, health , & industry

Principles of Occupational Health and Safety

- ✓ Protection and promotion of the health of workers by preventing and controlling occupational diseases and accidents and by eliminating occupational factors and conditions hazardous to health and safety at work.
- ✓ Development and promotion of healthy and safe work, work environments and work organizations through adaptation and adjustment of working conditions to the workers.
- ✓ Enhancement of physical, mental and social wellbeing of workers and support for the development and maintenance of their working capacity as well as professional and social development.
- ✓ Enablement of workers to conduct socially and economically productive lives and to contribute positively to sustainable development.
- ✓ Provision of curative and rehabilitative services
- ✓ Immediate response (first aid and emergency response to the victims).

Key components of occupational health: (importance's of OH)

- Ensuring availability of occupational health and safety regulations at workplace
- Ensuring availability of active and functional occupational health and safety committee at workplace
- Monitoring and control of factory hazards to health
- Supervision and monitoring of hygiene and sanitary facilities for health and welfare of the workers
- Inspection of health safety of protective devices
- Pre-employment, periodical and special health examination
- Performance of adaptation of work to man
- Provision of first aid
- Health education and safety training to the worker
- Advice to employers on the above mentioned items
- Reporting of occupational deaths, diseases, injuries, disabilities ,hazards and their related preventive measures at working

Definition of occupational health concepts

➤ **Ergonomics**

Fitting the job to the workers i.e. it involves designing machines, tools, equipment, layout of work places, methods of work and environment in order to achieve the improvement of human efficiency and wellbeing

➤ **Hazard**

It is a situation at the workplace capable of causing harm (personal injury, disease or death).

➤ **Risk**

The chance of a hazard actually causing injury, disease or death

➤ **Hazard identification**

Is the process used to find all possible situations in the work place where people may be exposed to injury, disease or death

➤ **Hazard control**

This involves the implementation of policies, standards, procedures, and physical changes to eliminate or minimize adverse risks.

DEFINITION OF HEALTH HAZARD ASSESSMENT

Is the process used at a workplace to identify, evaluate and eliminate

Or. Control health hazards

REASONS WHY HEALTH HAZARD ASSESSMENT IS IMPORTANT

- ✓ It increases awareness of workplace hazards.
- ✓ Provides opportunity to identify potential hazards.
- ✓ Helps in instituting control measures.

Hazard assessment includes the following steps:

- ❖ List all work-related tasks and activities.
- ❖ Identify potential biological, chemical, physical and psychological hazards associated with each task.
- ❖ Assess the risk of the hazard by considering the severity of consequences of exposure, the probability that the exposure will occur and the frequency the task is done.

- ❖ Identify the controls that will eliminate or reduce the risk. The hierarchy of controls should be followed. This means that engineering controls are the most effective, followed by administrative controls (such as training and rules), and followed by personal protective equipment (PPE).
- ❖ Implement the controls for each hazard.
- ❖ Communicate the hazard assessments and required controls to all workers who perform the tasks.
- ❖ Evaluate the controls periodically to ensure they are effective

CLASSIFICATION OF HAZARDS/ TYPES OF OHH

- Biological
- Physical
- Chemical
- Psycho-social
- Ergonomic

The 5 common health hazards in the health sector

Biological

- Blood borne pathogens (HIV, HBV, HCV)
- Air borne pathogens (TB, Emerging diseases like corona virus)
- Blood and body fluids

Physical

- Radiation X-ray
- Fire
- Electrical
- Needle-stick injuries (sharps)
- Slips, Trips and fall
- Aggressive patients

- Noise
- Lighting (too little or too much)

Chemical hazards

- Drugs
- Detergents
- Formalin
- Anesthetic agents
- Latex allergy
- Mercury
- Poor ventilation

Psycho-social

- Abusive patients
- Long working hours
- Shift work
- Sexual harassment
- Work place violence
- Ergonomics – Fitting work to people

Ergonomic hazards: are physical conditions that may pose risk of injury to the musculoskeletal system such as the muscles or ligaments of the lower back, tendons or nerves of the hands/wrists or bones surrounding the knees resulting in musculoskeletal disorders

Working positions- standing/sitting

Heavy and repetitive Lifting

Design of tools- hospital beds, dental chairs, ramps

Heavy lifting

Sources of workplace hazards

- ❖ Poor access routes e.g. lack of ramps, pot holes,
- ❖ Hazardous tasks in the workplace; e.g. repetitive lifting of patients
- ❖ Incorrect installation & use of appliances, lack of inspection, lack of maintenance and repair, or alteration of plant in the workplace; and
- ❖ Exposure to hazardous substances, e.g. blood and other body fluids
- ❖ Exposure to hazardous substances
- ❖ Exposure to hazardous substances

Methods of hazard identification

- I. Conduct a walk through visual inspection of the work or community environment where staff conduct official business
- II. Consult with workers and other staff who undertake the tasks.
- III. Seek information from various sources e.g. patients, attendants, visitors, safety and health experts, trade unions, books and Journals.
- IV. Carry out investigation of suspected risky conditions or diseases e.g. Ebola, cholera Typhoid fever
- V. Analyze records e.g. Accidents/incident reports, PEP.
- VI. Use inspection checklist

PREVENTION AND CONTROL OF OCCUPATIONAL HEALTH HAZARDS

Content

- Control measures
- Hierarchy of controls

- Good safety practices
- Action plan

TEACHING OBJECTIVES

By the end of the lesson the learners will be to;

- Describe 5 suitable hazard control measures.
- Outline the hierarchy of controls
- Explain good safety practices
- Develop hazard control action plan

Hazard control measures.

1. Elimination –take away the hazardous agents

Remove the spills from the floors (clean immediately)

Remove or replace worn out equipment or wires

Hand washing

2. Substitution –Replace hazardous conditions with less or non-hazardous ones.

Chloroform replaced by halo-ethane

Syringes (reusable replaced with single use)

3. Isolation –close off hazardous process or condition

Isolation rooms, camps etc.

4. Engineering controls – redesign process/equipment

-implement physical change to the workplace, which eliminates/reduces the hazard on the job/task) e.g. Introduction of Self /auto destruction syringes

Retractable syringes

5. Engineering Controls

Examples;

- Use a device to lift and reposition heavy objects to limit force exertion
- Reduce the weight of a load to limit force exertion
- Reposition a work table to eliminate a long/excessive reach and enable working in neutral postures
- Use diverging conveyors off a main line so that tasks are less repetitive
- Install diverters on conveyors to direct materials toward the worker to eliminate excessive leaning or reaching
- Redesign tools to enable neutral postures
- Example of an engineering control: mechanical devices that lift and tilt to adjust materials for easier handling

5. Administrative controls

- Training (induction, continuing professional development)
- Issue guidelines (standard operating procedures)
- Supervision
- Medical surveillance (pre-periodical and exit employment)
- Recruit enough competent staff

Definition of Hierarchy of controls

Is a system used in industry or work place to minimize or eliminate exposure to hazards

It is a widely accepted system promoted by numerous safety organizations. This concept is taught to managers in industry, to be promoted as standard practice in the workplace.

Various illustrations are used to depict this system, most commonly a triangle.

Note; the hazard controls in the hierarchy are, in order of decreasing effectiveness as shown above.



Elimination

Physically remove the hazard—is the most effective hazard control. For example, if employees must work high above the ground, the hazard can be eliminated by moving the piece they are working on to ground level to eliminate the need to work at heights.

Substitution

Substitution, the second most effective hazard control, involves replacing something that produces a hazard (similar to elimination) with something

that does not produce a hazard—for example, replacing lead-based paint with titanium white.

Note; to be an effective control, the new product must not produce another hazard.

Engineering controls

This is the third most effective means of controlling hazards. These do not eliminate hazards, but rather isolate people from hazards. It creates a physical barrier between personnel and hazards, such as using remotely controlled equipment. E.g. Fume hoods can remove airborne contaminants as a means of engineered control.

Administrative controls

These are changes to the way people work e.g. procedure changes, employee training, and installation of signs and warning labels.

NB. Administrative controls do not remove hazards, but limit or prevent people's exposure to the hazards, such as completing road construction at night when fewer people are driving

Examples:

- ✚ Require that heavy loads are only lifted by two people to limit force exertion
- ✚ Establish systems so workers are rotated away from tasks to minimize the duration of continual exertion, repetitive motions, and awkward postures.
- ✚ Design a job rotation system in which employees rotate between jobs that use different muscle groups
- ✚ Staff "floaters" to provide periodic breaks between scheduled breaks
- ✚ Properly use and maintain pneumatic and power tools

✚ Changing the way people work

✚ Changing the way people work

PREVENTION OF OCCUPATIONAL HEALTH HAZARD

Primary hazard prevention

- Health education aiming at personal life styles and use of protective gears.
- Assessment for fitness for work by carrying initial medical examination prior to starting work (pre-employment medical screening).
- Promotion of wellness activities at work programs.
- Environment monitoring including air monitoring to reduce health risks in case of hazardous substances are involved.
- Establishing and implementing health and safety at work regulations
- Sensitization of new workers on the operations of their job and risks of using equipment involved.
- Sensitize workers and their employers on their obligations as stipulated in the occupational safety and Health Act, 2006, the labor law.
- Employers to provide safety gears such as gloves, aprons, eye goggles, ear muffs, overalls, gum boots, swimming kits (floaters) and fire safety apparatus.
- Training of new employees on how to do the work and how to take precautions before they start on the job.

Manufacturing and production hazard prevention

- ❖ Pictures of hazard Control Measures
- ❖ General safety hazard control
- ❖ Proper well designed layout of ward, beds, furniture, equipment.

- ❖ Proper electrical wiring & properly grounded electrical service.
- ❖ Proper materials handling & storage areas.
- ❖ Maintenance of walk ways and access.
- ❖ Maintenance of fire prevention & control program.
- ❖ Good safety practices
- ❖ Inspect the work area daily
- ❖ Be an observer- stay alert
- ❖ If you are not sure-Ask some one
- ❖ Report Injuries/incident/illness
- ❖ Report safety issues to the safety committee
- ❖ Good Safety and Health Practices
- ❖ Provisions for noise and distraction control
- ❖ Personal protective equipment (PPE) e.g. gloves, masks, aprons, overcoats, safety boots.
- ❖ Proper signage e.g. entry and exit, wet floor, stairs, disability access, short roofs etc.
- ❖ Training on safety matters e.g. first aid, fire management and manual handling.
- ❖ Adequate working space
- ❖ Visibility/lighting concerns
- ❖ Presence of escape routes
- ❖ Availability of controls e.g. fire extinguishers, means of waste disposal
- ❖ Adequate aeration/ventilation
- ❖ Designated times and places for meals and breaks
- ❖ Provision and access to safe drinking water.
- ❖ Infection control measures

- ❖ Availability of guidelines addressing different aspects of pregnancy, age, disability, HIV etc.
- ❖ Designated toilet facilities for each gender.
- ❖ Availability of cloak rooms (changing rooms).

Hazard Control Plan

A hazard control plan describes how the selected controls will be implemented. An effective plan will address serious hazards first. Interim controls may be necessary, but the overall goal is to ensure effective long-term control of hazards.

It is important to track progress toward completing the control plan and periodically (at least annually and when conditions, processes or equipment change) verify that controls remain effective.

How to accomplish it

- ✓ List the hazards needing controls in order of priority.
- ✓ Assign responsibility for installing or implementing the controls to a specific person or persons with the power or ability to implement the controls.
- ✓ Establish a target completion date.
- ✓ Plan how you will track progress toward completion.
- ✓ Plan how you will verify the effectiveness of controls after they are installed or implemented.

Note: First aid management for liquid chemical hazards involves

- ✓ Take patient to hospital.
- ✓ Remove contaminated clothing.

- ✓ Wash skin with water without rubbing (if available, a solution of 5% ammonia or 2% chloramine is more effective than water). However, if eyes are contaminated they must be washed with water.
- ✓ If the pesticide has been swallowed, first give the patient water to drink and then induce vomiting by putting your finger down the patient's throat.
- ✓ Administer atropine (the antidote) intravenously.
- ✓ Administer artificial respiration if required.
- ✓ Administer cardio-respiratory stimulants.
- ✓ Later, treat the patient with oximes

Responsibilities of health unit committee

- ✓ Coordinate consultation and risk management implementation.
- ✓ Evaluate the hazards, and make recommendations for prevention
- ✓ Compile and analyze injury data for appropriate action.
- ✓ Regular reviews and analyze data from the exposure incidents within the institution
- ✓ Ensure appropriate follow up and post exposure prophylaxis.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

PPE is very important in protecting health workers against common health hazards. Health workers need to be sensitized on the need and importance of using PPE.

Examples of PPE include

Gloves, respiratory masks, plastic apron, gowns and uniforms, clinical coats, The gum boots face masks and gurgles.

Good safety and health practices in the health care facility

1. Use of personal protective equipment (PPE) e.g. gloves, masks, aprons, safety boots etc. during procedures as per prescribed standards.
2. Proper use of signage e.g. entry and exit wet floor, disability access, etc.
3. Regular training of staff on safety and health matters e.g. first aid management of adequate working space.
4. Provision, maintenance and management of adequate working space
5. Access to first aid services by all staff

WORK RELATED INJURIES AND FATALITIES

Terms commonly used

Occupational diseases are adverse health conditions in the human being, the occurrence or severity of which is related to exposure to factors on the job or in the work environment e.g. hazards

Work related diseases: are diseases which have a weak, inconsistent, unclear relationship to working conditions in the job

Accident: a sudden event that results in an undesired outcome such as property damage, bodily injury or death.

Occupational accident: accident occurring at the workplace which may cause damage to machinery, tools or people.

Injury: physical damage to body tissues caused by an accident or by exposure to environmental stressors. This injury may lead to death and is then called a "fatal accident" or may cause partial disability or lead to sick leave for a period of time.

Hazard: any existing or potential condition in the workplace which, by itself or by interacting with other variables, can result in death, injury, property damage or other loss. Simply, hazard is a potential source of harm.

Risk: the likelihood of harm (in defined circumstances).

Harm: the loss to a person (or people) as a consequence of damage.

Damage: the loss of inherent quality suffered by an entity (physical or biological).

Danger: the degree of exposure to a hazard.

Safety: the absence of danger.

Occupational safety: risk identification at the workplace and preventive measures taken to reduce or eliminate the hazard which may lead to accidents.

Safe behavior: acting in such a way that no risk of injury is caused by one's behavior.

Safety professional: a person whose basic job function and responsibility is to prevent accidents and other harmful exposures and the personal injury, disease or property damage that may ensue.

Work related diseases

Work related diseases may have a weak, inconsistent, unclear relationship to working conditions; in the middle of the spectrum there is a possible causal relationship but the strength and magnitude of it may vary

However, when such diseases affect the worker, they may be work-related in a number of ways: they may be partially caused by adverse working conditions; they may be aggravated, accelerated or exacerbated by workplace exposures; and they may impair working capacity. It is important to remember that personal characteristics, other environmental and sociocultural factors usually play a role as risk factors for these diseases....

Multifactorial "work-related" diseases are often more common than occupational diseases and therefore deserve adequate attention by the health service infrastructure, which incorporates the occupational health services

The work-related diseases which deserve particular attention are:

- I. Behavioral and psychosomatic disorders
- II. Hypertension
- III. Coronary heart disease
- IV. Peptic ulcers
- V. Chronic nonspecific respiratory disease
- VI. Locomotor disorders e.g. osteoarthritis etc.

Major source of adverse psychosocial factors

Risk factors for behavioral and psychosomatic disorders

(a) Environmental psychosocial risk factors

- Work overload and under-load
- Boredom and lack of control over work situation
- Shift work
- Migration (migrant workers)
- Organizational structure at the work establishment and the role of the individual in the organization; role ambiguity and role conflict
- Opportunity for career development and promotion
- Physical insecurity (fires, explosions) and responsibility for other people's safety
- Job design and degree of interest
- Low wages
- Job turnover
- Early or involuntary retirement

- Unemployment

(b) Physical stressors

- Thermal environment
- Noise
- Vibration
- Radiation
- Poor lighting

(c) Environmental chemical stressors

These can increase the risk of psychosomatic illness. Some chemical hazards however, have specific effects on the central nervous system, e.g. carbon monoxide, carbon disulfide, alcohols and some other solvents.

(d) Social support system

This improves the ability of an individual to adapt to environmental psychosocial stress. Support can be from the family, the work community or the community outside of work.

(e) Individual psychosocial factors

- Inter-individual relationship at work
- Personality type
- Individual susceptibility
- Age
- Sex.

Behavioral and psychosocial reactions to stress

- Overeating leading to obesity
- Smoking
- Alcohol and drug abuse and drug addiction, any of which can be a risk factor for psychosomatic illness
- Fatigue
- Anxiety
- Depression
- Hostility and aggression
- Neurosis causing a range of mental and emotional disorders
- Mental disorders and psychiatric disorders
- Mass psychogenic illness (mass hysteria)
- Psychosomatic disease: headache, backache, muscle cramps, disturbed sleep, peptic ulcer, diabetes mellitus, cardiovascular disorders etc.

OCCUPATION ACCIDENTS

Accident: a sudden event that results in an undesired outcome such as property damage, bodily injury or death.

Occupational accident: accident occurring at the workplace which may cause damage to machinery, tools or people.

Examples of occupation accidents

- Wounds, fractures
- Dislocations
- Burns
- Poisonings

- Diseases.

Mechanical energy

- Lacerations
- Fractures
- Contusions
- Amputations
- Crushing injuries
- Eye injuries
- (struck by foreign objects)
- Strains or sprains (overt)

Thermal energy

- Burns
- Heat strain
- Cold strain

Chemical energy

- Burns
- Asphyxiation
- acute toxicity

Electric energy

- Electrocutation
- Shocks

- Burns

Prevention and control of occupational accidents

The basic accident prevention activities are as follows:

- Eliminate the hazard from the machine, method, and material or facility structure
- Control or contain the hazard by enclosing or guarding it at its source or attaching an exhaust pipe to remove airborne hazards from the operator.
- Train operating personnel to be aware of the hazard and to follow safe job procedures to avoid it
- Prescribe personal protective equipment for personnel to shield them from the hazard
- Provide advisory services on safety and health problems and other matters related to accident prevention.
- Develop a centralized programme to control accident and fire hazards
- Keep informed of changes in legislation and safety codes and communicate such information to management.
- Develop and apply safety standards both for production facilities (equipment, tools, work methods and safeguarding) and for products, based on applicable legal and voluntary codes, rules and standards.
- Work closely with the engineering, industrial hygiene, medical, and purchasing departments to ensure that only safe tools, equipment and supplies are purchased.
- Develop, plan and implement a safety and health inspection programme to be carried out by the operating supervisors and field safety personnel to

identify potential hazards, both in the workplace and in the use of the company's products.

- Along with representatives from engineering, operating and personnel, inspect all new equipment to ensure adequate health and safety safeguards.
- Guide operating supervision in accident investigation to determine the accident's cause and to prevent recurrence.
- Review non-disabling-injury accident reports on a sample basis to check the thoroughness of the accident investigation and corrective actions taken.
- Collect and analyze data on illness and accidents for the purpose of instituting corrective action and to determine accident trends and provide targets for corrective action.
- Ensure education and training of employees in general as well as specific health and safety principles and techniques.
- Maintain supervisory contacts for new instructions, follow-up and general health and safety motivation.

Occupational diseases

Occupational diseases are adverse health conditions in the human being, the occurrence or severity of which is related to exposure to factors on the job or in the work environment. Such factors can be:

Physical: e.g. heat, noise, radiation

Chemical: e.g. solvents, pesticides, heavy metals, dust

Biological: e.g. tuberculosis, hepatitis B virus, HIV

Ergonomic: e.g. improperly designed tools or work areas, repetitive motions

Psychosocial stressors: e.g. lack of control over work, inadequate personal support

Mechanical: these mainly cause work accidents and injuries rather than occupational diseases.

In occupational diseases is where the relationship to specific causative factors at work has been fully established and the factors concerned can be

HEALTH CARE WASTE MANAGEMENT

Waste generated from health care activities.

Non-hazardous health care waste – one which does not cause harm

Hazardous health care waste – one with the potential to cause harm e.g. infectious waste, sharps.

Types of hazardous health care waste;

Infectious wastes - has living organisms

- ♣ Pathological waste – part of the human body removed as a result of sickness
- ♣ Sharps – objects that can penetrate into the flesh
- ♣ Pharmaceutical waste – expired drugs
- ♣ Chemical waste – corrosive substances or toxic substances
- ♣ Radioactive waste – radiations

Health care activities that lead to generation of wastes

- Diagnosis – instruments used to diagnose can be waste
- Treatment - ampoules, syringes & needles
- Prevention – use of masks gloves

Sources of health care wastes

- Hospital
- Blood bank
- Nursing homes
- Research
- Clinics
- Laboratories

Steps to manage health care wastes

Waste minimization

Waste segregation

Waste disposal

Reasons for waste segregation

- Easy disposal
- To avoid accident needle stick injuries
- To avoid accidental exposure to infectious material
- Its cost effective

Type of waste disposal

- ♣ Immediate disposal facility
- ♣ Final disposal

How to segregate medical wastes

Type of wasteimmediate disposal facility.....final disposal facility

- ✓ Wrappings of needle & syringes --Black bin-----Rubbish pit & burn

- ✓ Syringes & needles-----Safety box-----Incinerator burning
- ✓ Used swabs & gloves-----Yellow bin-----Incinerator burning
- ✓ Infectious plastics – IV-----Yellow bin-----Rubbish pit & burn
- ✓ Pathological waste-----Red bin-----Placenta pit
- ✓ Needle cut off the syringe-----Safety box-----Incinerator burning

Occupation hazards & the human body

Occupation hazards can affect any body system and the degree of the effect depends on the following:

- Amount
- Concentration
- Duration

EFFECTS OF HAZARDS ON THE DIFFERENT BODY SYSTEMS

Digestive system

Acute gastroenteritis may result from ingestion of soluble salts of a number of metals like arsenic, mercury, & antimony

Lead poisoning may manifest with attack of intestinal colic & constipation

Cardiovascular system

Hypertensive conditions have been associated with white color jobs where people are having sedentary lifestyle

There is evidence of causal relationship between certain toxic agents in the work places & coronary diseases

Workers are exposed to carbondio-sulphide as in manufacture of rayon have also undergone mortality due to hypertension

Arsenic compound give rise to hemolysis of blood

Reproductive system

Effects in men manifest with diminished libido/infertility due to abnormal sperm production.

In women menstrual disorders & amenorrhea are common

Musculoskeletal system

Disorders of skeletal systems due to occupation hazards vary & are sometimes extensive

These include trauma e.g. in cases of RTA falling from heights leading to fractures & other injuries

The above injuries cause loss of working times & even jobs.

People prone to the above includes drivers, constructions, and machine operators, those who lift heavy loads etc.

Another affected category include employees whose work requires repetitive movements such as carpenters, braiders, typists in such cases the tendon sheath of the most used muscles may become inflamed leading to Tenosynovitis

CNS

Any of the metals in particularly mercury & manganese can be dangerous to the CNS then some chemicals such as pesticides may be absorbed by inhalation or through skin contact & interfere with the nerves

Prevention of hazards

Protection

Sensitization

Protection

As a rule, garments/protective gears must be provided at workplaces e.g. gumboots, ear masks, face masks, goggles aprons

Sensitization

This involves instructing & informing workers about the dangers that exist with their work & the working environment.

Workers should be instructed on the following;

- How to safely use machines
- How to use the protective devices
- What to do in case of an accident
- Observation of safety precautions
- Early detection of malfunctioning appliances
- Importance of seeking early medical examinations
- Hygiene in the working environment
- Health living e.g. diet, exercise
- Change & replacement of dangerous products e.g. machines, materials.

Medical Examination

This is a procedure carried out by medical practitioner seeking information about a person regarding their physical, social or mental fitness for a given job

Types of medical examination:

- I. Pre-placement/pre-employment
- II. Routine/periodic employment
- III. Mandatory

I. Pre-placement examination

This is medical examination done on any specific potential employee for a specific job

In this case the person is not yet employed but the examination is part of the employment process

Reasons

- ❖ It provides baseline data on an employee's health
- ❖ It enhances self-confidence to the employee
- ❖ It creates job security
- ❖ It creates a sense of job responsibility to the employee
- ❖ It is a precursor for high productivity since a health work force is recruited

II. Routine examination

This follows pre-placement done at a specific times depending on:

- Types of exposure
- Age of employment
- Legal requirements e.g. those working in food processing units

Importance

It shows status of the employee at that time compared to the 1st examination & this assists decision of transfers, promotions, training e.t.c.

It builds confidence of the employee

It helps to monitor the general health status of the working population

Identification of any anticipated exposures

III. Mandatory examination

This is done to employee for the specific reasons e.g.

During an unusual happening

Frequent absenteeism due to illness

Need to shift from one department to another with different exposure

Notice on occurrence of frequent accidents

Importance

It creates information on use of personal protective wears

It assists in documentation of any new occupation hazard

It aids in screening out persons who have had an anticipated exposure
compensation of employees

Examples of medical cases that restricts employment

1. Chronic skin infections & allergies hinders individuals who wish to work in areas exposed to irritating or sensitizing agents
2. Anyone with cardiac conditions should not be assigned heavy duties
3. Individuals with known low hemoglobin levels should not be employed in places where their bone marrows are exposed to radiations, benzene or lead.
4. Applicants with defective eye vision that cannot be corrected should not be employed in fine detailed work places like assembling of plants, pilots should have normal vision with both eyes, with good color & perception.
5. Food handlers should be free from transmissible infections

School hazards

School employees include

Teachers

Information technology staff

Maintenance & custodial staff

- Paraprofessional e.g. nurse
- Clerical personnel
- Food services workers
- Estate managers
- Administrators
- Bus driver & aids
- security personnel

Potential hazards include in schools include:

- ✓ Stress
- ✓ Noise
- ✓ Violence
- ✓ Diesel exhaust
- ✓ Asbestos
- ✓ Mold & microbial contaminants

Ergonomics hazards

- Uneven ground in the school yard
- Slips, trips & falls
- Infectious agents
- Chalk dust

How to reduce school based occupation hazards

- Keep records of injuries & illness to identify potential risks
- Create guidance documents for hazards identification hazard control & indoor air quality
- Provide best guidance for school constructions & renovations
- Identify essential components of effective occupational safety & health programs for dissemination throughout the education industry
- Installation of fire extinguishers & raised fire places
- The canteen should be clean one
- The kitchen should be managed by trained personnel
- There should be a clean compound, latrines & dormitories
- Medical care facilities/first aid kits should be in places

OCCUPATIONAL SURVEILLANCE

This is a systematic & ongoing collection, analysis & dissemination of information on a disease or hazard.

Goals of occupational surveillance

- To provide a basis for research
- To define the magnitude & distribution of problems in work place (how big or wide)
- To guide the planning, implementation of learning & evaluation of the program in order to prevent & control hazards or injuries & illness.
- It helps to determine whether injuries are on a rise or declining
- To evaluate public policy
- It helps to identify institution & specific work sites that requires attention in form of inspection, consultation according to the established standards.

REHABILITATION IN OCCUPATIONAL HEALTH & SAFETY

Rehabilitation services are registered after illness or injury has occurred to prevent disability or further progression of disability.

Rehabilitation services include:

1. Curative services

Are services that are aimed at treating injuries or disease

Examples – treatment of acute or chronic intoxication that can be due to poisoning, & correction & fixations of fracture management

2. Tertiary services

These are services that are intended to prevent further progression of disability e.g. provision of appliances like wheel chairs, walking sticks,& long-term medication e.g. ARVs

SAFETY & HEALTH COMMITTEE

It's recommended that safety & health committee should be instituted at all levels

Composition of safety & health committee

- Health workers - $\frac{1}{3}$
- Managers - $\frac{1}{3}$
- Technical people occupational health & safety - $\frac{1}{3}$
- Chairperson (head of health facility or services) e.g. senior manager or PNO

Activities of occupational health service committee

- ❖ Coordinate policy setting & risk management implementation
- ❖ Identification & management of hazards
- ❖ Educate the workers about occupation health
- ❖ Organize workshops on occupational health & safety issues
- ❖ Make recommendation for preventive measures
- ❖ Review & analyze occupation health programs
- ❖ Management of occupation health & safety resources
- ❖ Follow up of post exposure prophylaxis

Screening for occupation diseases

- Searching for the previously unrecognized diseases
- Goals
- Early detection of diseases
- Early treatment of diseases
- Detection of previously unrecognized health effects e.g. damages

- Suitable job replacements
- Screening data – may be useful in surveillance system

OCCUPATIONAL SAFETY AND HEALTH ISSUES IN UGANDA

- The ILO (international labour organization) estimates that two million workers die as a result of occupational accidents and work related diseases every year
- Statistics for Uganda alone cannot be easily established due to the failure of the sector to undertake inspection and enforcement of the Act and collecting occupational data.
- The constitution of Republic of Uganda recognizes the importance of good working environment of all workers and their rights
- Article 39 gives workers a right to a clean and healthy environment while article 40(1) empowers Parliament to enact laws to provide for the rights of persons to work under satisfactory, safe and healthy conditions.
- As a result in 2005 a bill on Occupational Safety and Health was brought to Parliament ending into the enactment of Occupational and Health Act, 9, 2006 with the overall purpose of safe guarding safety and health of all workers in all work places in Uganda.

Common law of defense

- Doctrine of contributory negligence

If employees were found by judge to have contributed in any ways in any injuries then such employees would not win court cases.

- Fellow servant rule

If a fellow employee's actions were found by judges to have caused the injuries, then the employers were not considered responsible

➤ Assumption of risk

If injuries were found to be caused by hazards of which the workers were aware of, the employers would not cover damages.

International labor organization policies or principles (ILO)

According to ILO, these are the policies that they set as follows

- Workers should participate fully in the development of occupational health & safety policies. Their lives are directly affected by the policies
- Working conditions should be safe for all employees i.e. should have favorable conditions e.g. socially, mentally, physically & all favorable dimension.
- Workers should not be forced to try to work in unsafe environment.
- Workers should have all fundamental rights to all information about hazards on job.
- Workers who are temporarily or permanently disabled due to injuries, illness at work places deserve full & prompt compensation.
- Workers should not work with chemicals that have not been adequately tested for toxicity.
- Workers need health & safety laws of occupation in order to achieve protection on jobs

Objectives of the OHS Act, 9, 2006

- To operationalize articles of the constitution namely, 34(4), 39, 40 (1) by making provision for health, safety and welfare of persons in employment.
- To spell out steps to be taken before operating a work place of all sorts

- Spell out duties and obligations of both employers and employees in ensuring safety and health for all at work places.
- Stressing measures and methods that should be put in place to ensure safety and health at work

Uganda workers compensation act composition

- ♣ Employer's liability.
- ♣ Fatal injuries.
- ♣ Permanent total incapacity.
- ♣ Permanent partial incapacity.
- ♣ Temporary incapacity.
- ♣ Calculation of earnings.
- ♣ Notification of accident.
- ♣ Notification by employer to labor officer.
- ♣ Medical examination and treatment.
- ♣ Agreement as to compensation.
- ♣ Computed assessment of disability.
- ♣ Determination of claims.
- ♣ Power of court to submit question of law.
- ♣ Appeals.
- ♣ Effect of receipt of damages.
- ♣ Insurance.
- ♣ Powers of Minister regarding insurance.
- ♣ Bankruptcy of employer.
- ♣ Contracting out.
- ♣ Liability in case of contract of work.
- ♣ Compensation not to be assigned, etc.

- ♣ Decisions of the court concerning treatment and medical reports.

Part III—Medical aid.

- Procedures relating to claims. Part IV—Occupational diseases.
- Compensation payable in respect of diseases.
- Employer’s duty to report scheduled diseases.
- Liability to pay compensation.
- Fixing of dates.
- Presumption as to cause of disease.
- Power of Minister to amend the Third Schedule.

Part V—General.

- Regulations.
- Offence by bodies of persons.
- Rules of court.
- Workers and dependents outside Uganda.
- Power of Minister to amend the First Schedule.

Types of incapacities

- **Permanent total incapacity** - the worker is permanently incapacitated for any employment which he/she was capable of undertaking at the time when accident occurred
- **Permanent partial incapacity** - capacity to perform has been reduced by a percentage.
- **Temporary incapacity** - worker is able to regain capacity to perform after sometime.

Computation for Compensation

1. Permanent total incapacity; Total monthly earnings x 60 months x percentage of

incapacitation awarded by medical officer/practioner. In case the injured worker requires assistance (wheel chair, feeding, dressing, etc. The pay is increased by 25% of amount computed

2. Permanent partial incapacitation: Total monthly earnings x 60 months x percentage of incapacitation awarded by medical practitioner.
3. Temporary incapacity: Daily earnings x number of days of incapacitate x percentage of incapacity In case of death, settlement for claims is made through the Administrator general.

INJECTION SAFETY AND MANAGEMENT

- As defined by the World Health Organization (WHO), a safe injection does not harm the recipient, does not expose the provider to any avoidable risks and does not result in waste that is dangerous for the community (WHO, 2005).
- Syringes with a reuse prevention features offer the highest level of injection safety to recipients
- WHO (2005) urges that by 2005 all injectable medications are supplied with matching quantities of single use injection devices, appropriate diluents and safety boxes through essential medicine programmes and other health Programme supply mechanism

CONCEPT OF SAFE INJECTION

- A safe injection does not harm the recipient, does not expose the health workers to any avoidable risk and does not result in waste that is dangerous for the community
- The safe collection and disposal of used sharps (needles, syringes with

fixed needles) is an integral part of the life cycle of injection device

- The collection of sharps waste in safety containers (safety boxes) at the point of use and their safe and environmentally responsible disposal protect health care workers and the general public from needle stick injuries
- A first step toward evaluating the frequency of unsafe injection practices in countries is an injection safety assessment

Three major considerations are especially relevant in the assessment of potential unsafe injections-

- The safety of the recipient
- The safety of the health workers
- The safety of the community

Reasons for injection misuse & overuse

1. Patients tend to prefer injections because they believe these to be stronger and faster.
2. They also believe that doctors regard injections to be best treatment.
3. In turn, Drs, over prescribed injections because they believe that this best satisfies patients.
4. In addition, prescription of injection sometimes allows the charging of higher fee for service.

Better communication between patients & providers can clarify these types of misunderstandings & help to reduce injection overuse!

Planning/strategies for injection safety

Develop an injection safety plan

- Identify stakeholders;
- Assess the situation;

- Include the costs for safety in the financial plan;
- Ensure injection safety through education and provision of supplies;
- Manage sharps waste;
- Monitor and document results;
- Evaluate results and identify lessons learned.
- Ensure vaccine safety: from delivery up to and including vaccine administration
- Use pre-qualified or national regulatory authority-approved vaccine and injection materials;
- Communicate risks associated with unsafe practices to all levels;
- Train health care workers in proper techniques.
- Manage disposal of used injection equipment
 - Assess local environmental regulations and options for sharps treatment and disposal;
 - Plan storage, transportation, and disposal;
 - Identify practical, simple solutions;
 - Monitor disposal on a regular, frequent basis.

Principles of injection safety use

- Use a sterile AD syringe and needle to vaccinate each child.
- Use a disposable syringe and needle to reconstitute each vaccine.
- Prevent contamination of injection equipment and vaccine.
- Prepare each injection in a designated, clean area where blood or body fluid contamination is unlikely.
- Always pierce the septum of multi-dose vials with a sterile needle.
- Do not leave a needle in the stopper.
- Protect fingers with small gauze pad when opening ampoules.

- Discard a needle that has touched any non-sterile surface (hands, environmental surfaces).
- Anticipate and take measures to prevent sudden patient movement during and after injection.
- Prevent needle stick injuries by not recapping, and placing used needles directly in safety boxes.
- Collect used syringes and needles at the point of use in a safety box that is sealed when full (do not transfer contents or overfill safety boxes).
- Seal safety boxes for transport to a secure area. Do not open, empty or reuse them.
- Manage injection waste in an efficient and environment-friendly way.
- Prevent accidents to personnel in charge of waste disposal.
- Do not place empty vials in the safety box, they may explode while burning.
- Put only potentially contaminated injection equipment in the safety boxes. Do not put empty vials, cotton pads, compresses, etc. in the safety boxes.

PUBLIC HEALTH IMPORTANCE/ WHY SHOULD WE OBSERVE PROPER INJECTION SAFETY USE

- Unsafe injections or unsafe practices in relation to immunization are not only-
- Responsible for cases of Hepatitis B, C, HIV/AIDS, etc.
- And other serious potentially lethal side effects suffered by vaccine recipients
- May pose an occupational hazard to health providers
- Environmental hazards to the community (soil , air & water)
- Unsafe injection practices can seriously impede the progress made by

immunization programs leading to substantial negative effects on global immunization coverage

Way forward

- Safe & appropriate injections can be achieved by adopting a 3 part strategy-
- Changing behavior of health workers and patients
- Ensuring availability of equipment and supplies
- Managing wastes safely and appropriately

Management of needle sticks injury

In the event of a sharp or needle stick injury

- Encourage bleeding from the wound- do not suck or rub
- Wash area thoroughly with soap and water
- Cover with a water -proof dressing
- If known, note the name of the patient
- Report to occupational health unit
- Notify line manager and document the accident
- If patient is thought to be HIV +, post-exposure prophylaxis (PEP) may be required. This should be given as soon as possible after injury.

Principles of ensuring injection safety during mass immunization campaigns

Detailed campaign plans must

- Identify all key players and partners
- Plan, budget for and order adequate supplies of all necessary items
- Assess the current injection safety situation
- Include a detailed budget with costs of all safety components

- Plan for staff training and media messages
- Include safety in the campaign from the start
- Monitor, document and disseminate results
- Evaluate and identify lessons learned
- Safe vaccine administration
- Use WHO/UNICEF pre-qualified or nationally approved vaccine and injection material
 - Bundled distribution of vaccine and diluent with reconstitution syringes, auto-disable (AD) syringes and sharps boxes to the immunization sites
 - Emphasize need for sterile technique, correct reconstitution and safe administration
 - Train healthcare workers in proper techniques
 - Ensure traceability of vaccine by manufacturer and lot number

Sharps waste management

- Assess local regulations and possibilities for sharps treatment and disposal
- Identify practical, simple solutions for waste collection and disposal
- Ensure availability of sharps waste disposal facilities, adequate safety boxes
- Plan transportation, storage and disposal procedures before the campaign begins
- Provide clear instructions and guidelines for health staff on disposal
- Monitor disposal on a daily basis

Immunization waste disposal options that are currently available in most developing countries

1. Waste Burial pits

- Small health facilities that generate small volumes of waste may use waste burial pits. The bottom of the pit should be 1.5 meters above groundwater level. The bottom of the pit should be lined with a material of low permeability such as clay.
- Full safety boxes and ashes resulting from burning or incineration (see below) can be placed in waste burial pits.

2. Encapsulation

- Encapsulation is a process in which full safety boxes are placed inside cement or high-density plastic containers or metal drums. When the containers are full, an immobilizing material such as plastic foam, sand, cement or clay is added
- In some instances, chemical treatments or disinfectants can be used prior to or with encapsulation to reduce the threat of infection.

The cement encapsulation method involves:

- Digging a trench large enough to hold the accumulated waste;
- Adding a cement mixture to line the bottom of the trench and allowing it to set
- Carefully placing the waste inside the trench
- Encasing the waste completely with the cement mixture;
- After the cement has hardened, it should be covered with approximately 15 cm of soil

3. Low temperature burning

Used injection equipment may be readily burned at relatively low temperatures (< 400oC) either in open pits, in brick burners or in "drum" burners.

4. Medium and high temperature incineration

- Medium temperature (800-1000oC) and high temperature (>1000oC) incineration is defined as burning that reduces combustible waste to incombustible matter and results in a very significant reduction of waste volume and weight. In contrast to low-temperature burning, incineration ensures greater combustion and sterilization of used needles and syringes.

Methods of injection disposal are as seen in the table below

Methods	Strengths	Weakness
Waste burial pit/cement encapsulation or other immobilizing agent (sand, plaster)	<ul style="list-style-type: none"> • Simple • Inexpensive • Low tech • Prevents unsafe needle and syringe reuse • Prevents sharp related infections/injuries to waste handlers/scavengers 	<ul style="list-style-type: none"> • Potential of being unburied (if pit is only soil covered and waste not encapsulated) • No volume reduction • No disinfection of wastes • Pit will fill quickly during campaigns • Not recommended for non-sharp infectious wastes • Presents a danger to community if not properly buried • Inappropriate in areas of heavy rain or if water table is near the surface
Burning (<400oC) <ul style="list-style-type: none"> • Pit burning • Drum/Brick burning 	<ul style="list-style-type: none"> • Relatively inexpensive • Reduction in waste volume • Reduction in infectious material 	<ul style="list-style-type: none"> • Incomplete combustion • May not completely sterilize • Results in heavy smoke & potential fire hazard • May require fuel, dry waste to start burning • Toxic air emissions (i.e. heavy metals, dioxins, furans, flyash) which may violate environmental or health

		<ul style="list-style-type: none"> • Safety profile is not established
Melting syringes	<ul style="list-style-type: none"> • Greatly reduces volume of immunization waste • Prevents reuse 	<ul style="list-style-type: none"> • Emission of potentially toxic gases • Electricity required • Safety profile not established.
Steam sterilization (autoclaving or hydroclaving), microwaving (with shredding)	<ul style="list-style-type: none"> • Successfully used for decades to treat sharps and non-immunization health-care wastes • Range of models (simple to complex) and capacities available • Sterilizes used injection equipment • Less hazardous air emissions (no dioxins or heavy metals) than burning or incineration • Reduced waste volume when used with shredder • Plastic may be recycled for other uses after separation 	<ul style="list-style-type: none"> • Requires electricity and water • High operational costs • High maintenance • May emit volatile organics in steam during depressurization and opening of chamber. • Requires further treatment to avoid reuse (e.g. shredding) • Resulting sterile waste still needs to be disposed.