Medical equipment management (MEM)

Session objectives

At the end of this session you will be able to:

- Define medical equipment
- Identify some MEs and describe their purpose
- Explain main functions of medical equipment mgt (MEM)
- Describe MEM cycle
- Explain the standards of Ethiopian MEM
- Describe the MEM indicators

Have you ever seen these MEs?

Infant radiant warmer





Anaesthesia machine









Have you ever...

Neonate ventilator





CT scan



MRI









X-ray



Have you ever...

Ultrasound



Endoscopy









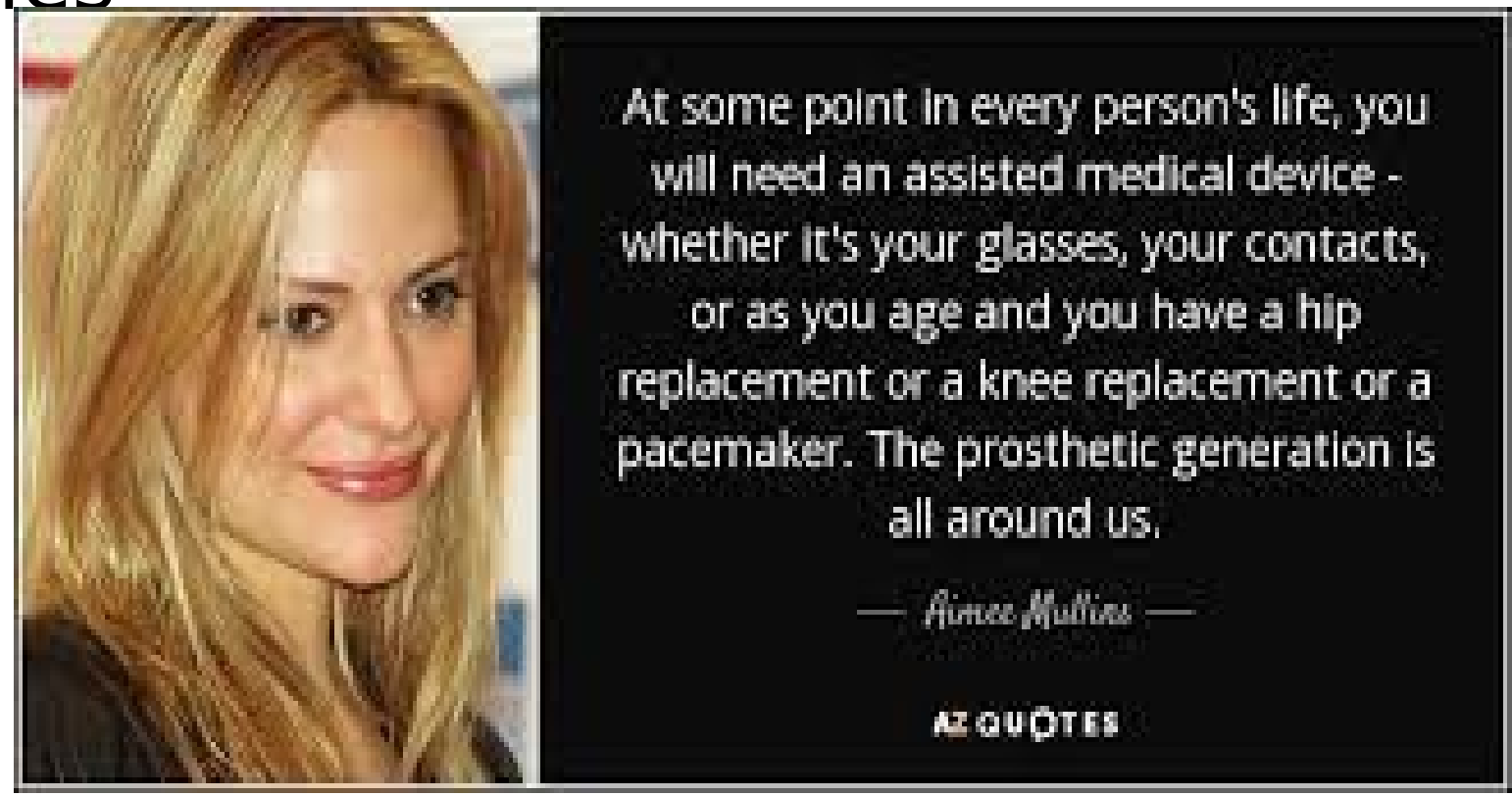


Introduction

- Health technologies are essential for a functioning health system.
- Medical equipment (ME) is an indispensable part of healthcare
- Medical devices in particular are crucial in the prevention, diagnosis, and treatment of illness and disease, as well as patient rehabilitation
- Medical equipment is an instrument, appliance, material, or other articles that can be used alone or in combination

Intro…

- Active mgt of medical devices is demanded by:
  - Gov’t policy
  - Professional bodies
  - Risk managers
  - Insurers



Intro…

Box A Definition of Medical Equipment

Medical equipment can be defined as "any instrument, apparatus, implement, machine, appliance, implant, *in vitro* reagent or calibrator, software, material or other similar or related article that is used for:

- Diagnosis, prevention, monitoring, treatment or alleviation of disease or injury,
- Investigation, replacement, modification, or support of the anatomy or of a physiological process,
- Supporting or sustaining life,
- Control of conception,
- Disinfection of medical devices,
- Providing information for medical or diagnostic purposes by means of *in vitro* examination of specimens derived from the human body,

and which does not achieve its primary intended action in or on the human body by pharmacological, immunological or metabolic means."

Source: GHTF/SG1/N29R16:2005, Global Harmonization Task Force, 2005.

Intro…

- In Ethiopia, lack of proper management of medical equipment (MEs) has limited the capacity of health institutions to deliver adequate health care

- It is estimated that:
  - 72% MEs are functional in AA public hospitals
  - In some hospitals in the country its functionality only about half per cent

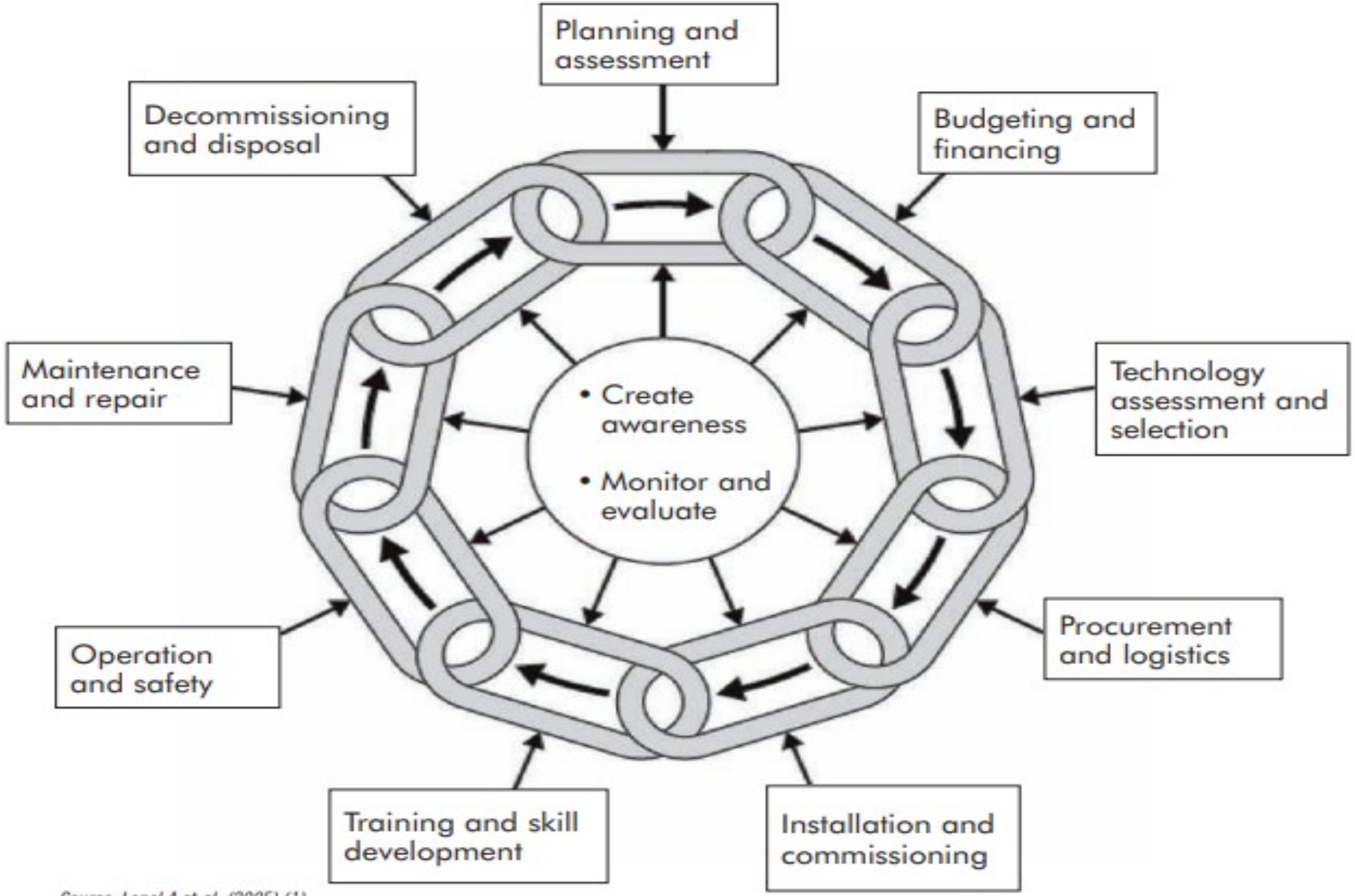
- The rising number of these non-functional equipment are due to:
  - Poor equipment handling and utilization, frequent power surges,
  - The age of the equipment, lack of operator training,

Intro…

- Lack of preventive maintenance, lack of spare parts,
- Lack of maintenance capacity, minimal knowledge regarding sophisticated equipment etc.

- The concern for MEs mgt emanates from:
  - Expansion of healthcare delivery
  - Introduction of sophisticated MEs

Medical equipment mat cycle



Source: Lenel A et al. (2005) (1)

Small group discussion



Ethiopian MEs mgt standards

1. The Hospital has in-house biomedical engineering department or directorate or unit to:

   – Oversee the entire ME mgt system that has operational plan as well as a necessary structure and staff

2. The hospital has appropriate ME maintenance workshop as per the national standard, proper calibration, maintenance and measuring tools in adequate manner

Ethio…

3. The Hospital has a MEM advisory committee from multi-disciplinary team to
   - Monitor policy implementation of planning, procurement, oversee inventory etc
   - Update the hospital's core ME list

4. The Hospital has computer-based or automated inventory management system that tracks all equipment and spare parts included in the equipment management program

5. An equipment history file is maintained for all ME, containing all key documents for the equipment

Ethio…

6. Equipment acquisition is carried out after proper planning and needs assessments including technical specifications development, procurement and reinstallation inspection

7. All new equipment’s are installed and commissioned in accordance with the manufacturer’s specifications and undergoes acceptance testing

- prior to its initial use to ensure the equipment is in good operating condition

Ethio…

8. There is a schedule for inspection; testing and preventive maintenance for each piece of equipment

- as per the service manual and that schedule is appropriately implemented on daily, weekly and monthly bases

9. All equipment operators and personnel are trained and re-trained on proper application, safety, and maintenance of medical equipment

Ethio…

10. There is a notification and work order system for corrective maintenance and calibration of ME based on their risk level

11. The hospital ensures decommissioning including relocation, uses as spare, donation or safe discarding

- Proper disposal of medical equipment is carried out according to international, national and regional legislations

MEM indicators

S/N	Indicators	Formula	Frequency
1.	% of medical equipment undergoes inspection, commissioning and entered in to inventory data	Total number of Medical Equipment under goes Inspection, commissioning and entered in to inventory data /Total Number of Medical entered in to the Hospital	Quarterly
2.	Percentage of medical equipment identified on model medical equipment list that is in use at the hospital	Total number of medical equipment identified on model equipment list that is in use at the hospital/ Total number of medical equipment identified on model equipment list *100	Quarterly
3.	% functional medical equipment	Total number of medical equipment that is functional/ total number of medical equipment *100	Quarterly
4.	a) Number of donated medical equipment b) % of donated items that are functional	a)Total number of donated medical equipment b) total number of donated medical equipment that is functional/total number of donated medical equipment*100	Quarterly

MEM indicators....

5.	a) Number of work orders received b) Number work orders completed c) % of work orders completed	a) Total number of work orders received for repair of medical equipment b) Total number of medical equipment work orders completed c) total number of medical equipment work orders completed/ Total number of work orders received for repair of medical equipment	Quarterly
6.	Average time to completion of work order	Σ of time taken to complete work order/ total number of work orders completed	Quarterly

MEM indicators...

7.	Actual expenditure on medical equipment as % of budget allocated to medical equipment	Actual expenditure on medical equipment /total budget allocated to medical equipment *100	Quarterly
8.	Number of incident reports related to medical equipment malfunction	Total number of incident reports received related to medical equipment malfunction	Quarterly

Summary

- ✓ Definition
- ✓ Some MEs and their purpose
- ✓ MEM cycle
- ✓ Functions in MEM
- ✓ Standards of MEM
- ✓ Indicators

Reading assignment

- Read the details of functions in MEM
- Infection prevention and pt safety
- Clinical governance
- Occupational health
- Patient satisfaction
- Health facility performance measurement


Any Questions


Thank you!

Quiz

1. Define medical equipment management
2. List at least four medical equipments
3. List the 9 medical equipment management cycles
4. List two of MEM indicators
5. What is the profession responsible for installation, inventory, maintenance etc. of medical equipment?
6. What is the purpose of infant ventilator?