Anaesthetic infrastructure and supplies

Key Points
15.1 EQUIPMENT AND SUPPLIES FOR DIFFERENT LEVEL HOSPITALS

• However well trained you are as an anaesthetist, your ability to provide safe anaesthesia is completely dependent on
  – the availability of the drugs,
  – oxygen supply and
  – equipment in your hospital.

• Drugs and oxygen must be correctly ordered and stored and equipment kept in safe working order by:
  – regular cleaning,
  – maintenance and
  – checks.

• Hospitals that do not follow these basic requirements will soon fail to provide safe anaesthesia.
15.1 EQUIPMENT AND SUPPLIES FOR DIFFERENT LEVEL HOSPITALS

1. Different levels of hospital require different personnel, equipment and drugs

2. Drugs must be correctly ordered and stored

3. A check list of essential emergency equipment for resuscitation should be in place

4. Ensure inventory of equipment and supplies

5. Best practice guidelines for emergency care should be in place

6. Hospitals with an intensive care unit may need additional equipment and supplies
The Intensive Care Unit (ICU)

- At the simplest level, the ICU is a ward that has a better standard of nursing and is better equipped than a general ward.

- While both medical and surgical cases will be admitted there, the ICU is particularly important for the postoperative care of major or complicated surgical cases and is usually located near the operating room.
15.1 EQUIPMENT AND SUPPLIES FOR DIFFERENT LEVEL HOSPITALS

Equipment for the ICU

- The ICU does not necessarily need to have ventilators or other expensive machines.

- An ICU might be a ward where:
  - Oxygen is available
  - Drips are kept running overnight

- At least hourly measurements and observations are made of:
  - Blood pressure
  - Pulse rate
  - Urine output
  - Oxygenation
  - Conscious level
  - Other general observations of the patient.
15.1 EQUIPMENT AND SUPPLIES FOR DIFFERENT LEVEL HOSPITALS

Equipment for the ICU contd.

- The pulse oximeter
  - The pulse oximeter is the most widely used physiological monitoring device.
  - It is especially useful in clinical anaesthesia and in the ICU and is simple to use.
  - The pulse oximeter should be the minimum standard of monitoring in every operating room where regular major surgery is carried out.
15.2 ANAESTHESIA AND OXYGEN

• A reliable oxygen supply is essential for anaesthesia and for any seriously ill patients.

• In many places, oxygen concentrators are the most suitable and economical way of providing oxygen, with a few backup cylinders in case of electricity failure.

• Whatever your source of oxygen, you need an effective system for maintenance and spares.

• Clinical staff need to be trained how to use oxygen safely, effectively and economically.
15.2 ANAESTHESIA AND OXYGEN

• Getting oxygen to patients requires more than simply having oxygen cylinders available.

• You must have in place an entire functioning system, comprising of not only the apparatus for oxygen delivery, but also people who have been trained to:
  – operate it
  – system for maintenance and repair and supply of spare parts.
15.2 ANAESTHESIA AND OXYGEN

- The ideal oxygen supply system is one based primarily on concentrators, but with a back-up supply from cylinders.

- Using oxygen from cylinders without a regulator is extremely dangerous.

- Oxygen cylinders are dangerous objects. If they fall over, they may injure or even kill.
15.2 ANAESTHESIA AND OXYGEN

**Oxygen Cylinders**

- A complete system for using oxygen in cylinders requires:
  - Reliable source
  - Transport to get to oxygen cylinders to the hospital
  - Procedures to ensure the hospital orders the appropriate amount of oxygen
  - Apparatus to deliver form cylinder to the patient
  - Clinical training to give the correct amount of oxygen, in the correct manner, to the patients who need it
  - Technical training to inspect, maintain and repair
  - Adequate budget to ensure the consistent availability of supply
• If ether is used on a compressed gas machine (Boyle’s machine), the gases are always explosive.

• To minimize the risk of explosion, never allow the simultaneous use of diathermy on a patient anaesthetized with ether. If one of these techniques must be used for the benefit of the patient, the other must not be allowed.

• No potential cause of combustion or source of sparking should be allowed within 30 cm of any expiratory valve through which a potentially flammable or explosive mixture is escaping.
The important principles of care and maintenance are:

- The anaesthetist working alone in a small hospital must understand and take responsibility for the upkeep of apparatus as well as for the care of patients.

- All equipment requires regular inspection, maintenance and repair to prevent it from rapidly deteriorating and becoming dangerous.
15.4 CARE AND MAINTENANCE OF EQUIPMENT contd.

- Make a detailed list or inventory of the equipment you have to enable you to identify any extra items needed.

- List:
  - basic equipment,
  - spare parts, batteries and other consumables that will be needed and find out in advance how you can obtain them

- Try to estimate when new parts will be required and order spares well in advance, before the machine breaks down and leaves you in difficulty
• Ensure that all types of apparatus are kept in a clean and dust-free environment, away from extremes of temperature and covered when not in use.

• Ensure that vaporizers are drained of anaesthetic if they are unlikely to be used for a week or more.

• Put a cork or spigot in the end of any gas port or tubing during storage to prevent the entry of insects.