Surgical Care at the District Hospital
14

Practical Anesthesia

Key Points
14.1 General Anesthesia

• Have a clear plan before starting anesthesia

• Never use an unfamiliar anesthetic technique in an emergency

• Always check your equipment

• Make sure you have an assistant before starting

• Ensure that you have the correct patient for the correct surgery on the correct side.
14.1 General Anesthesia

• Always begin your anesthetic with the patient lying on a table that can be rapidly tilted into a head down position in case of sudden hypotension or vomiting

• Your choice of an anesthetic technique, especially in an emergency, should be the one with which you are most experienced and confident
14.1 General Anesthesia

• General anesthesia with intubation and controlled ventilation is effectively a universal technique.

• Although relatively time-consuming for short cases, there is almost no procedure for which it is unsuitable.

• Oxygen cylinders must be checked to see that they are full and connections fit the breathing system.
14.1 General Anesthesia

• Cricoid esophageal compression should always be applied until the endotracheal tube is inflated

• Where there is no designated recovery room, make sure that the patient is awake, breathing and stable before leaving the operating room
14.1 General Anesthesia
14.1 General Anesthesia

• If you plan to intubate:
  - always have a backup plan in case of failure
  - do not persist with multiple attempts just to prove that you can do it
  - do not make your ability to intubate more important than the patient's life

• Give extra oxygen before and after the end of the anaesthetic

• Continue to monitor the patient just as carefully after you have turned the anaesthetic off until the patient is fully awake

• A blocked tracheal tube = a dead patient
14.1 General Anesthesia

Vomiting and regurgitation

• Seeing stomach contents in the unprotected airway of an unconscious patient is probably the worst thing that can happen in the practice of anesthesia.

• Do not let this happen to you.
14.2 Anesthesia During Pregnancy and for Operative Delivery

• If using general anesthesia in an eclamptic patient, there may be a huge rise in blood pressure at intubation.

• Prevent this with a bolus of 2–3 gm magnesium sulfate before intubation.

• If the mother and child are both critically ill, it is your clear duty to attend to the mother first.
• Place a pillow under one hip to tilt the uterus to avoid supine hypotension

• Don’t be so concerned about the baby that you fail to give the mother a sufficient dose of anesthetic.

• At the end of anesthesia:
  – remember that the mother has a full stomach,
  – remove the endotracheal tube with her in the lateral position
14.3 Pediatric Anesthesia

- For children under 15 kg, differences in anatomy and physiology mean you will have to significantly modify your anesthetic technique
- Pay special attention to fluid and heat losses in children.
14.3 Pediatric Anesthesia

• As a rough guide for normally nourished children more than about 2 years old, use the following formula to calculate the internal diameter of the tube likely to be of the correct size:

• Internal diameter of tube (mm) 
  = (age in years ÷ 4) + 4
14.3 Pediatric Anesthesia

- **Rough indicators of the correct size of tube are:**
  - Diameter the same as the child’s little finger
  - Most neonates will need a tube of 3 mm internal diameter
  - For premature infants, a 2.5 mm tube may be necessary
  - To estimate the length of tube needed, double the distance from the corner of the child’s mouth to the ear canal
  - To check, look at the child’s head from the side while holding the upper end of the tube level with the mouth to give you an idea of how far into the chest the tube will go.
14.3 Pediatric Anesthesia

- Do not attempt to put up an intravenous infusion while the child is awake as this will cause deterioration especially in children with larynngo-tracheitis.

- Do not send a child in respiratory distress to X-ray department, urgent management is needed.
14.3 Pediatric Anesthesia

Pediatric **Elective** Anesthesia

- Continuous monitoring of heart rate and respiration is essential in small children

- A precordial or esophageal stethoscope is invaluable for this
14.3 Pediatric Anesthesia

**Pediatric Emergency Anesthesia**

- Do not attempt to put up an intravenous infusion while the child is awake as this will cause deterioration especially in children with laryngotracheitis.

- Do not send a child in respiratory distress to the X-ray department. Urgent management is needed.

- Ensure that the nurses understand the need to prevent the tube becoming blocked with dried secretions.
14.4 Conduction Anesthesia

• **All local anaesthetic drugs:**
  – Are potentially toxic
  – May depress the central nervous system
  – May cause drowsiness, which may progress to unconsciousness with twitching and possibly convulsions
  – May cause hypotension related either to extensive sympathetic blockade, (e.g. after “high” spinal anaesthesia) or to direct depression of cardiac function from high blood levels of the drug.
14.4 Conduction Anesthesia

Toxicity And Safety Of Local Anaesthetic Drugs

- Local anaesthetic drugs can be toxic – you must know the maximum safe dose

- If a severe toxic reaction occurs, prompt resuscitation is needed

- Avoid toxicity by using the most dilute solution that will do the job, e.g.
  - 1% lidocaine or 0.25% bupivacaine for most nerve blocks
  - 0.5% lidocaine or pilocaine for simple infiltration.
14.4 Conduction Anesthesia

Toxicity And Safety Of Local Anaesthetic Drugs

• The rate of absorption of the drug can also be reduced by injecting it together with a vasoconstrictor drug, such as:
  – epinephrine, which is most often used in a dilution of 5 mg/mL (1:200 000); for infiltration, 2.5 mg/mL (1:400 000) is enough.

• Pre-mixed ampoules of local anaesthetic and epinephrine are often available but, if they are not, you can easily mix your own.

• To make a 1:200,000 dilution of epinephrine (adrenaline):
  – add 0.1 mL of 1:1000 epinephrine to 20 ml of local anaesthetic solution.
14.4 Conduction Anesthesia

Sedation during Conduction Anesthesia

• Never give sedation to cover an inadequate nerve block

• Do not let sedation drift into unconsciousness with an uncontrolled airway. A sedated patient should still be able to talk to you
14.4 Conduction Anesthesia

Spinal Anesthesia

• Check all equipment and drugs as for general anesthesia

• In a pregnant women at term, the block very easily goes high

• Always give oxygen to the mother during caesarean section

• Act immediately to treat the unresponsive patient, whether the cause is hypotension or high spinal

• A death or complication after spinal is usually due to neglect of vital signs
14.4 Conduction Anesthesia

Spinal Anesthesia

• Avoid spinal anesthesia in:
  – patients in shock who are not fully resuscitated
  – infection at the site of the spinal needle placement
  – frank coagulopathy
  – patient refusal
  – convulsion, raised intracranial pressure due to brain tumour

• Use a thin 25 gauge spinal needle
14.5 Specific Anesthetic Techniques

Ketamine Anesthesia

• Ketamine is a full general anesthetic; do not neglect routine precautions

• Contraindications to ketamine: patients with
  - elevated blood pressure,
  - pre-eclampsia,
  - eclampsia,
  - heart disease
  - raised intracranial pressure
14.5 Specific Anesthetic Techniques

General Anesthesia With Intubation

• General anesthesia with intubation and controlled ventilation is effectively a universal technique, although relatively time consuming for short cases, there is almost no procedure for which it is unsuitable.
14.6 Monitoring the Anesthetized Patient

- The most important monitors are the eyes, ears, hands and brain of the anaesthetist
- Keep your attention focused on the patient first, then on the monitoring devices.
- Handle patients gently at all times, whether awake or unconscious
- It is fundamental rule in anaesthesia, that you must never leave your patient unattended

- It is the duty of the trained health staff to:
  - monitor vital functions and ensure patient safety during the critical period of unconscious due to injury, illness, influence of general anaesthetic drugs
14.6 Monitoring the Anesthetized Patient

- Monitoring means *looking* at the patient.

- It is usually more important to look at the patient than the equipment but the alert anaesthetist pays constant attention to both.

- Observe the general operating room surroundings.

- Operating room chatter means not thinking about the patient.

- Observe the patient immediately before anaesthesia.

- If you cannot see the chest or abdomen, rearrange the drapes so that you can.
14.6 Monitoring the Anesthetized Patient

- The commonest way to give a fatal overdose of anaesthetic is by mechanical ventilation (IPPV).

- No matter what ventilator you have, when connecting it to the patient for the first time, check that the inspiratory/expiration phases of the ventilator correspond to the rise and fall of the chest and abdomen.

- Never allow yourself to be denied access to monitoring of respiration, pulse and blood pressure.
14.6 Monitoring the Anesthetized Patient

• Monitor your patient very closely immediately after giving a spinal anaesthetic. One of the best ways to monitor such a patient is to talk to them throughout anaesthesia.

• If a patient seems to be too ‘light’, check the ventilation first: the signs may be due to hypercarbia.

• If the pulse oximeter will not give a reading, it usually means that something is wrong with the circulation.
14.6 Monitoring the Anesthetized Patient

• The three events that probably contribute most to mortality in the postoperative period are:
  - Non-running drip
  - Postoperative hypotension
  - Respiratory failure.

• If the patient is restless, something is wrong
14.7 Postoperative Pain Management & Techniques

- Effective analgesia is an essential part of postoperative management.

- Opiate analgesics should be given cautiously if the age is less than 1 year. They are not recommended for babies aged less than 3 months unless very close monitoring in a neonatal intensive care unit is available.

- When using halothane as the sole anaesthetic in a fit patient, give an opiate analgesic with the induction agent.

- Prescribe regular analgesia. In practice, “On demand” often means “Not given”.
14.7 Postoperative Management

Care of the infusion site

• Postoperative infusions are life saving.

• Loss of the drip and failure to correct hypotension is the commonest cause of death during the first postoperative night after major surgery.
14.7 Postoperative Management

Postoperative ventilation

• Mechanical ventilation (IPPV) may be a planned part of postoperative management for a major operation or decided on at the end of surgery because circumstances demand it.

• IPPV should be continued postoperatively under the following circumstances:
  – Respiratory depression or oxygen saturation <80%
  – Deteriorating general condition
  – Severely distended abdomen
  – Severe chest trauma
  – Head injury or after intracranial surgery.
14.7 Postoperative Management

Postoperative ventilation

• Avoid giving long acting muscle relaxants to facilitate IPPV.

• If the patient is “fighting” the ventilator, ask why?
  – Is he/she hypercarbic?
  – In pain?
  – Hypertensive?

• Treat these needs first before giving a relaxant.