

# MODULE 4

# Practical Anaesthesia



# OBJECTIVES FOR MODULE 4

- To provide the necessary tools to deliver safe and effective anaesthetic care within emergency and trauma situations, including
  - Appropriate monitoring
  - Post-operative care
  - Essential equipment

# OUTLINE: Module 4

- Pre-operative assessment
- Pre-anaesthesia checklist
- Techniques: Local, Spinal, Ketamine
- Anaesthesia in emergency situations
  - Pregnancy
  - Paediatrics
- Monitoring
- Post-operative management
- Pain management

# PREOPERATIVE ASSESSMENT

- Always take history – if the patient cannot tell you, someone else may
- Make rapid evaluation of collapsed patient
- Follow with full, detailed examination to avoid missing anything important
- Pre-existing medical conditions have profound influence on anesthesia, surgery: diabetes, anemia, lung disease
- **Low blood sugar is the main intra-operative risk from diabetes; monitor blood sugar levels, treat as necessary**
- Urgent surgery: use your skills to minimize harmful effects of pre-existing conditions

# PREOPERATIVE ASSESSMENT

- Events leading up to admission should be carefully considered: trauma, injury, etc.
  - What happened?
  - When did it happen?
  - Was the patient a passenger, driver or pedestrian?
  - Was there any blood loss? How much?
  - How far away did it occur?
  - How did the victim get to the hospital?
  - If unconscious now, was the patient conscious before?

# PREOPERATIVE ASSESSMENT

- Before starting clinical examination, make an “end-of-the-bed” examination:
  - Breathing pattern (flail segment, asymmetry, paradoxical movement, tachypnea, dyspnoea)
  - Position of patient (sitting up, lying down)
  - Position of arms and legs (limb, pelvic fracture)
  - Restlessness (pain, hypoxia, shock)
  - Dehydration (skin turgor, sunken eyes)
  - Distended abdomen
  - Scars of recent surgery, dressings covering wound not yet inspected
  - Blood stained clothes

# PREOPERATIVE ASSESSMENT

- Before starting any case, ask:
  - “Have I missed anything?”
  - “Will further investigation be useful?”
- Talk to surgical colleagues to make sure everyone knows what others will do
- However strong the indications may seem for using a particular technique, the best anaesthetic technique, especially in emergencies, will normally be one with which you are most experienced and confident. Emergency situations are not the right time to practice new techniques

# PRE-ANAESTHESIA CHECKLIST

- ✓ Assistant available to help
- ✓ *Correct* patient scheduled for *correct* operation on *correct* side
- ✓ Patient properly prepared
- ✓ Patient's progress throughout hospital course known thoroughly
- ✓ Adequate intravenous access
- ✓ Surgical table can be rapidly tilted in event of rapid hypotension, vomiting
- ✓ Check equipment
- ✓ Have clear plan before initiating anaesthesia
- ✓ Oxygen available

For further reference on surgical checklists:  
<http://www.who.int/patientsafety/safesurgery/en/>



# LOCAL ANAESTHETICS

## All local anesthetic drugs:

- Are potentially toxic, you must know the maximum safe dose
- May depress the central nervous system
- May cause drowsiness, which may progress to unconsciousness with twitching and possibly convulsions
- May cause hypotension related to extensive sympathetic blockade or direct depression of cardiac function.
- These reactions are most likely to occur if the drug is accidentally injected into a vein or if an overdose is given by using either too high a concentration or too large a volume of drug.

# LOCAL ANAESTHESIA

- **Rate of drug absorption can be reduced by injection with a vasoconstrictor drug, such as:**
  - epinephrine
    - most often used in dilution of 5 mg/ml (1:200 000)
    - for infiltration, 2.5 mg/ml (1:400 000) generally sufficient
- **To make a 1:200 000 dilution of epinephrine (adrenaline):**
  - add 0.1 ml of 1:1000 epinephrine to 20 ml local anaesthetic solution

Pre-mixed ampoules of local anaesthetic, epinephrine often available

# LOCAL ANAESTHESIA: Sedation

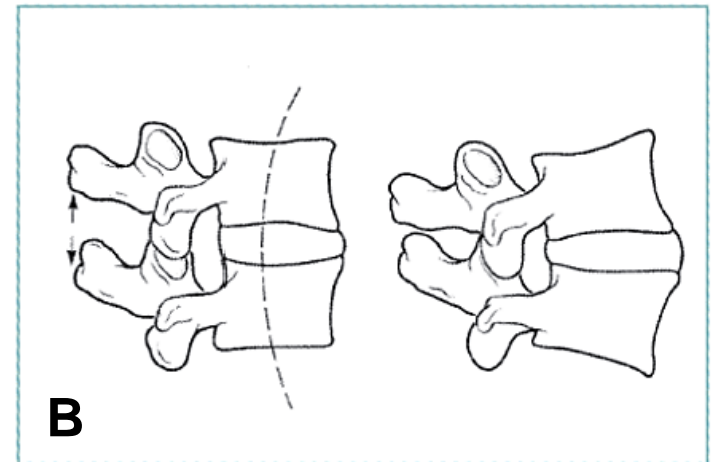
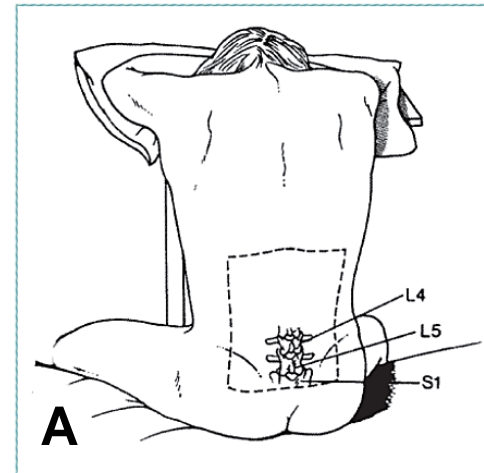
- Patients undergoing surgery under conduction anaesthesia often need some sedation to reduce anxiety or to help them to lie still.
- This is best achieved by oral premedication – drugs taken orally are safer and less expensive
- Never give sedation to cover inadequate nerve block
- Do not let sedation drift into unconsciousness with uncontrolled airway; a sedated patient should still be able to talk to you

# SPINAL ANAESTHESIA

- Useful for lower abdominal, perineum, lower extremity surgery
- Avoid in:
  - Patients in shock, not yet fully resuscitated
  - Infection at site of spinal needle placement
  - Frank coagulopathy
  - Patient refusal
  - Convulsion or raised intracranial pressure due to brain tumour

# SPINAL ANAESTHESIA

- Preload patient with 500-1000 ml of normal saline
- Position patient in sitting (A) or lateral position
- Prepare lower spinal area carefully
- Have patient maximally flex lower spine to open intraspinous space (B)
- Point of needle entry should be between L4-L5 or between L5-S1



# SPINAL ANAESTHESIA

- Perform lumbar puncture with fine spinal needle (25 or 27 gauge), ensuring good flow of cerebrospinal fluid
- Inject 1.5-2.0 ml "heavy" lidocaine or bupivacaine
- Quickly turn patient to supine position
- Be extra vigilant, actively treat any fall in blood pressure



# SPINAL ANAESTHESIA

- Check all equipment, drugs as for general anaesthesia
- In pregnant women at term, block easily goes high
- Always give oxygen to mother during Caesarean section
- Act immediately to treat unresponsive patient, whether the cause is hypotension or high spinal
- A death or complication after spinal is usually due to neglect of vital signs

# KETAMINE ANAESTHESIA

- Ketamine is full general anaesthetic; do not neglect routine precautions
- Contraindications:
  - Elevated blood pressure
  - Pre-eclampsia
  - Eclampsia
  - Heart disease
  - Raised intracranial pressure



# ANAESTHESIA ISSUES IN EMERGENCY SITUATIONS

- Choose suitable anaesthetic technique that best fits
  - Patient's condition
  - Surgeon's needs
  - Your own experience, skill
- Most cases are full-stomach emergencies; general anaesthesia will normally require protection of lungs with tracheal tube
- Seeing stomach contents in the unprotected airway of an unconscious patient is probably the worst thing that can happen in the practice of anaesthesia
- Do not let this happen to you!

# ANAESTHESIA ISSUES IN EMERGENCY SITUATIONS

- Where facilities for anaesthesia are limited, ventilators often do not have alarms warning of disconnection
- Trained, experienced anaesthetists are not available
- Emergency surgery under general anaesthesia in these conditions is safer when performed with patient breathing spontaneously

# ANAESTHESIA: PREGNANCY, OPERATIVE DELIVERY

- General anaesthesia in eclamptic patient, may cause huge rise in blood pressure at intubation
- Prevent with bolus of 2–3 G magnesium sulphate before intubation
- If mother and child are both critically ill, it is your clear duty to attend to the mother first

# ANAESTHESIA: PREGNANCY, OPERATIVE DELIVERY

- Place pillow under right hip to tilt uterus to avoid supine hypotension (reduce pressure on inferior vena cava)
- Don't be so concerned about the baby that the mother receives insufficient dose of anaesthetic
- At conclusion of anaesthesia:
  - remember the mother has full stomach
  - remove endotracheal tube with her in lateral position

# PAEDIATRIC ANAESTHESIA

Children have a large head in relation to body size. May need pillow under the shoulders rather than the head, to clear the airway or to perform laryngoscopy

$$\text{Correct tube size} = \frac{\text{Age}}{4} + 4$$

**What tube size would you use for a three year old child?**

# MONITORING DURING ANAESTHESIA

## Minimum

- Continuous pulse checks and regular blood pressure measurements

## Desirable

- Continuous cardiac monitoring
- Automatic blood pressure measurements
- Oximetry
- Oesophageal stethoscope
- Capnography

For more information on pulse oximetry

[http://www.who.int/patientsafety/safesurgery/pulse\\_oximetry/en/index.html](http://www.who.int/patientsafety/safesurgery/pulse_oximetry/en/index.html)

# POSTOPERATIVE MANAGEMENT

## Look out for the following in recovery:

- Airway obstruction
- Hypoxia
- Haemorrhage: internal, external
- Hypotension, hypertension
- Postoperative pain
- Shivering, hypothermia
- Vomiting, aspiration
- Falling to floor
- Residual narcosis

# PAIN MANAGEMENT TECHNIQUES

- Pain is often the patient's presenting symptom, provides useful clinical information
- Responsibility to use this information to help alleviate the patient's suffering
- Manage pain wherever the patient is seen (emergency, operating room, ward), anticipate needs for pain management after surgery, discharge
- Do not unnecessarily delay pain treatment; for example, do not transport the patient without analgesia simply so that the next practitioner can appreciate how much pain the patient is experiencing



# POSTOPERATIVE PAIN MANAGEMENT

- Effective analgesia is an essential part of postoperative management:
  - "*Pain management is our job*"
- Prescribe regular analgesia; in practice, "On demand" often means "Not given"
- Important injectable drugs for pain are opiate analgesics
- Non-steroidal anti-inflammatory drugs (NSAIDs), such as diclofenac (1 mg/kg) and ibuprofen can also be given orally and rectally, as can paracetamol (15 mg/kg)

# PAIN MANAGEMENT FOR CHILDREN

- Children suffer from pain as much as adults, but may show it in different ways
- Opiate analgesics should be given cautiously if age is less than 1 year; not recommended for babies less than 3 months
- When opiate analgesia is needed on ward, the most usual is to give intramuscular regimen:
  - Morphine:
    - Age 1 year to adult: 0.1–0.2 mg/kg
    - Age 3 months to 1 year: 0.05–0.1 mg/kg
- Ketamine anaesthesia is widely used, also good for pain control

# REVIEW of CORE LEARNING OBJECTIVES

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