Paediatric Anaesthetics

Presented by

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What is a general anaesthetic?

- It is an anaesthetic that produces loss of sensation in the whole body together with unconsciousness.
Guidelines: ASA score

ASA: Australian Society of Anaesthesiologists

1. A Normal healthy patient
2. A patient with mild systemic disease.
3. A patient with severe systemic disease.
4. A patient with severe systemic disease that is a constant threat to life.
5. A patient who is not expected to survive without the operation.
6. A declared brain-dead patient whose organs are being removed for donor purposes
Mallampati score

- **Class 1**: Full visibility of tonsils, uvula and soft palate
- **Class 2**: Visibility of hard and soft palate, upper portion of tonsils and uvula
- **Class 3**: Soft and hard palate and base of the uvula are visible
- **Class 4**: Only Hard Palate visible
Paediatric Anaesthesia

• Paediatric is a challenging, but incredibly rewarding speciality
Children are not small adults

- Paediatric patients vary considerably and include the following groups:
- Neonates – a baby within 44 weeks of age from the date of conception
- Infants – a child of up to 12 months of age
- Child – 1 to 12 years
- Adolescent – 13 to 16 years
- The differences between paediatric and adult anaesthetic practice are reduces as the patients become older.
Are Children Small Adults?

- Paediatrics have a higher O2 consumption
- Head larger than body
- Neck is short and the tongue is large
- Children breathe mainly through the nose
- Larynx is higher in the neck
- The epiglottis is large, floppy and U shaped
- The trachea is short
- The narrowest part of the airway is at the cricoid ring (adults is vocal cords)
The airway is funnel shaped and narrowest at the level of the cricoid cartilage. Here, the epithelium is loosely bound to the underlying tissue. Trauma to the airway easily results in oedema. One millimeter of oedema can narrow a baby’s airway by 60%.
Smaller jaw
Cricoid cartilage – narrowest part of the pediatric airway

Relatively greater proportion of soft tissue
Larynx more superior and anterior
Epiglottis rounder and floppier
Loosely attached mucous membranes
Practicalities for Anaesthetising Children

- **Pre-operative Visit**
  - Use this time to develop rapport and trust with the child and parent.
  - Address the child first and then include the parents in discussion.
  - Address the queries and fears of the child as well as those of the parent.
  - Explain the planned approach to induction so both parent and child know what to expect.
Cont.

• It is important to take a medical and anaesthetic history.
• Any previous problems with anaesthetics including family history
• Allergies
• Previous medical problems including congenital anomalies
• Recent respiratory illness
• Current medications
• Recent immunizations
• Fasting times
• Presence of loose teeth.
Pre-operative Fasting

- 6 hours for solids and milk if greater than 12 months of age
- 4 hours for breast milk and formula feeds if less than 12 months of age
- 2 hours for unlimited clear fluids (as this decreases gastric acidity and volume)
- There is an increased incidence of nausea and vomiting with long fasting periods.
Pre-medications

• In our hospital, sedative pre-medications is infrequently used. Psychological preparation and enlisting the help of the parents may decrease the need for sedative pre-medications.

• Sedation has a significant failure rate, tastes bad, increases time spent in recovery and delays discharge for day stay procedures. However, an appropriately chosen drug, timed correctly can produce a calm or cooperative child.
• Midazolam 0.5 mg/kg with a maximum of 15 mg given orally 15-30 minutes pre-operatively. It has a variable result and can produce a very unpleasant excitatory phase. Timing is important for best effect. A sweetener may be necessary, such as apple juice.

• Ketamine 3-8 mg/kg orally 30-60 minutes pre-operatively.

• Clonidine 2-4mcg/kg orally. It may cause hypotension.
• We most commonly use analgesic pre-medication drugs such as paracetamol, ibuprofen or codeine phosphate given more than a half hour pre-operatively.

• EMLA is applied to identifiable veins on those children for whom an intravenous induction is planned. Allergy is possible to this topical anaesthetic agent.
• Warm the theatre and prepare any warming devices. Keeping children warm can be a simple thing to do to improve post-operative wellbeing and outcomes.

• Use bandages or cotton velband padding to wrap the limbs and head. Plastic can also be useful to prevent radiant heat loss.

• Also, if a small infant place the child on top of the Bair hugger blanket. The heat will rise and keep them warm.
Psychology

• Infants less than 6 months of age are not usually upset by separation from their parents and will more readily accept a stranger.
• Children up to 4 years of age are upset by the separation from their parents and the unfamiliar people and surroundings. It is difficult to rationalize with a child of this age. The behaviour of this group is more unpredictable.
• School age children are more upset by the surgical procedure, its mutilating effects and the possibility of pain.
• Adolescents fear narcosis or becoming unconscious and pain, the loss of control and the possibility of not being able to cope with the illness. This is worsened by long periods of hospitalization.
• Parental anxiety is readily perceived and reacted on by the child
Children have limited coping skills to adapt to the stressful environment

- Children can wear their Pyjamas, clothes or hospital gown.
- They can bring their favourite toy or blanket
- Befriend the child
- Provide a friendly environment
- Strive to minimize pain
- Provide support for parents
Preparation for Anaesthesia

• A parent may join their child at the time of induction. It is not compulsory but can be useful in many instances. There must be a member of staff available to accompany the parent from the operating room after induction. It must be remembered that being present at induction can be very stressful for the parent.
Explain to the parent that as their child goes off to sleep the Childs breathing can change, their eyes might roll back into their heads and they can become restless and agitated but its all part of the anaesthetic process.

Inform them that if anything upsets them they can be removed from the theatre quickly, just to let me know otherwise they will be taken out when their child is asleep.

BUT!!!!!!!!!!
BEWARE

OF THE !!!!!!!!
Mother Bear!!!
Some mothers can become quite upset as their child goes off to sleep, most cry. However, it has been known for mothers to grab the unconscious child and try to run away or some even become violent!
Education for Parents

• Explain to the parents what is about to happen
• Noisy breathing
• Eyes that role back in their head
• Crying
• Escape clause
• Remove parent as soon as child is asleep by scout nurse
Equipment

- Have your equipment ready and checked.
- ETT or Nasal airway
- Face masks
- Laryngeal mask
- Laryngoscope and blades
- Magill forceps
- Paediatric circuit
- Monitoring
**Induction of Anaesthesia**

- An inhalational induction can be an excellent technique for the child that fears needles, has difficult venous access or is under 4. This is a two person technique.

- A skilled anaesthetic nurse will need to maintain the airway in the asleep child while intravenous access is obtained.
Sevoflurane is the agent of choice for gaseous induction

Sevoflurane is non-irritant and has a more rapid onset and offset of action as it is less soluble. A concentration of 8% can be used initially or it can be wound up gradually. Nitrous oxide use increases the rate and depth of anaesthesia obtained. It has improved haemodynamic stability. MAC values are 3.3 in infants, 2.5 in children and 1.7 in adults. Use is associated with emergence delirium.
The best sites for intravenous access are:
• Back of the hand
• Inner wrist
• Long saphenous vein

Other veins on the dorsum of the foot
Cubital fossa veins are difficult to find in infants and tissue easily at this site
Elastoplast, although not sterile, provides a secure means of fixation. But it’s a anaesthetists choice
Intubation

- Straight Magill blades are useful in neonates and infants.
- A size 0 blade is best in babies less than 4 kg.
- A curved blade is usually easier once the child is 6-10 kg.
Laryngeal Masks (LMA)

• LMA are used for quick surgery or one that does not invade internal organs.
• Airway is not protected from reflux
• These are calculated on weight.
• Simple rule to follow: 1yr – 1½ = 1.0
  
  1½ – 2 = 1.5
  2 - 4 = 2.0
  4 – 8 = 2.5
Cuffed ETT Tubes in Kids: Crazy or Correct?
Cuffed tubes

• Seal with a cuff membrane in the trachea, instead of rigid tube shaft in the cricoids
• Low rate of re-intubation, as cuffed tube reduces the need to replace oversized tracheal tubes, resulting in less patient trauma, time and material costs
• Reduced risk of aspiration of blood and secretions due to improved seal
• Sealing with a cuff compensates for different sized and shaped airways
Maintenance

• Add regional analgesia where necessary such as a caudal block for circumcisions.
• Beware intravenous narcotics in infancy especially ex-premature infants and neonates.
• Use intravenous fluids for cases with expected blood loss, intra-abdominal, or those taking longer than 30 minutes.
• Extubation laryngospasm tends to occur less frequently if the child is fully awake at the time of extubation.
• You may need to be with a child in recovery until fully awake if the recovery staff are inexperienced with children.
Difficult intubations

These hardly happen in a normal intubation, however, there are some circumstances which makes things difficult

Such as..........
Dental

Fell of their bike and face planted into concrete.
Remember......

- Children smell fear, act confident
- If they want to bring half their bedroom in allow it.
- Be happy, sing their favourite song, ask them about their school, family, find their ticklish spot.

- And even though some times you feel like doing this.........
DON’T

• Remember that they are not your children and you can hand them back!
Thank you