

PAEDIATRIC AIRWAY MANAGEMENT SUMMARY

DIFFERENCES IN ANATOMY & PHYSIOLOGY

Airway

- Larynx more anterior and cephalad (C3-4 rather than C4-5)
- Large floppy epiglottis and weak hyoepiglottic ligament
- Large tongue relative to oral cavity (site of obstruction rather than soft tissues)
- Prominent occiput flexes neck and occludes airway when supine
- Hyperextension of neck causes obstruction and kinks trachea (poor cartilaginous support)
- NPA less useful due to small nasal passages and hypertrophied adenoid tissue
- Narrowest portion subglottic (cricoid) rather than glottis
- Shorter trachea (predisposes to RMB intubation)
- Narrow trachea (increased resistance with swelling, surgical cricothyroidotomy contraindicated <10yo)

Breathing

- Obligate nose breathers <6mo
- Compliant chest wall which increases risk of respiratory fatigue, atelectasis and respiratory failure due to lower slow twitch fibres and cartilaginous skeleton
- Age related RR
- Smaller tidal volumes
- Lower FRC and higher O₂ consumption (shorter safe apnoea times)
- Higher vagal tone and pronounced bradycardia with laryngoscopy and suctioning

Circulation

- Larger circulating blood volume (80ml/kg)
- Immature liver metabolism
- Increase cardiac output by increasing heart rate, as stroke volume is fixed

PREPARATION

- Call for help early.
- Equipment (see below).

POSITIONING

- Align glabella + chin horizontally, Open anterior neck space, Align tragus horizontally with sternal notch
- Elevate head of bed
- **Infants <12 mo:** Shoulder roll
- **Child 1 – 8 yo:** Neutral position + slight neck extension
- **Child >8 yo:** Pillow beneath occiput to achieve ear-to-sternal notch.

PRE-OXYGENATION & APNOEIC OXYGENATION

- **Pre-oxygenation:**
 - HHFNP (FiO₂ 1.0 and Flow 2 L/kg) **OR**
 - CPAP (Infants >5-kg, FiO₂ 1.0, PEEP 5 cmH₂O) **OR**
 - BiPAP (Infants >5-kg, FiO₂ 1.0, IPAP 10 and EPAP 5 cmH₂O)
- **Apnoeic Oxygenation:**
 - NP at 2 L/kg/min (Max. 15 L/min)
 - **OR** continue BiPAP with timed RR if used for pre-oxygenation
 - Commence following induction

PRE-TREATMENT

- **IV Atropine 20 mcg/kg, consider in:**
 - Intubations <12-months old.
 - Intubations <5-years-old with repeated dose of Suxamethonium.
- **Shock:**
 - IV Saline 0.9% 10 – 20 ml/kg (Max. 40 ml/kg).
 - IV Adrenaline 10 mcg/kg.

PERFORM AN ANATOMICAL & PHYSIOLOGICAL RISK ASSESSMENT

- **Micrognathia:** Pierre-Robin, Treacher-Collins and Goldenhaar syndromes
- **Midface hypoplasia:** Apert, Crouzon and Pfeiffer syndromes.
- **Macroglossia:** Down's Syndrome, Beckwith-Widemann Syndrome, Mucopolysaccharidoses
- **Acquired:** Airway burns / trauma / infection / tumours, Tonsillar hypertrophy, Sleep apnoea, Foreign body aspiration, C-spine immobilisation.

PLAN

- **A:** CMAC + Adjunct (Style or Bougie) + ETT
- **Aa:** Suction / ELM / Pulling down right corner of mouth / Change head position / Change blade size or blade type / Change ETT size
- **B:** LMA
- **C:** FONA (Surgical cricothyrotomy)

INDUCTION

- **Infant <3-months:** IV Fentanyl 2 mcg/kg **OR** IV Morphine 0.1 mg/kg each over 60s
- **Infant or Child >3-months:** IV Ketamine 2 mg/kg
- **Status Epilepticus:** IV Propofol 2 mg/kg
- **Shock:** Lower dose of induction agent i.e., Ketamine 0.5 mg/kg

PARALYSIS

- IV Suxamethonium 2 mg/kg **OR** IV Rocuronium 1.2 – 1.5 mg/kg
- Higher dose range in shock

PLACEMENT WITH PROOF

- Waveform capnography
- Secure ETT with tape
- Commence ongoing sedation and analgesia, for example
 - <3-months: Morphine 10 – 40 mcg/kg/hr
 - >3-months: Morphine + Midazolam 2 – 6 mcg/kg/min