

Paediatric Anaesthesia

Paediatric Anaesthesia – Key Concepts & Practical Guide

1. Overview

Aspect	Details
Definition	Administration of anaesthetic drugs and techniques to children (birth to 18 yr) for surgery, diagnostics, or procedures.
Goals	• Provide analgesia, amnesia & immobility • Preserve physiologic stability (airway, ventilation, circulation, temperature, glucose) • Minimize perioperative stress and postoperative pain • Anatomical & physiological differences from adults
Unique Challenges	• Limited physiological reserve • Communication & cooperation issues • Drug dosing & pharmacokinetics variability

2. Physiologic Differences (Child vs. Adult)

System	Pediatric Specifics	Clinical Implications
Airway	• Larger tongue relative to mouth • More cephalad, floppy epiglottis • Narrowest part at cricoid (circular) • Smaller functional residual capacity (FRC)	• Rapid desaturation ? need for pre? oxygenation • Use appropriately sized cuffed or uncuffed tubes (size = (Age/4)+4)
Cardiovascular	• Higher baseline heart rate (HR) • Lower systemic vascular resistance • Limited ability to increase stroke volume	• HR is primary determinant of cardiac output ? avoid bradycardia • Fluid bolus may be needed before induction in hypovolemic infants
Respiratory	• Higher metabolic rate ? ? O₂ consumption (6–8 ml/kg/min) • Lower FRC, higher closing volume • More compliant chest wall	• Faster fall in PaO₂ during apnea • Use gentle ventilation, avoid high peak pressures

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System	Pediatric Specifics	Clinical Implications
Thermoregulation	• Large surface area to mass ratio • Limited brown fat stores & shivering response	• Warm environment, active warming devices, fluid warming
Pharmacology	• Faster hepatic blood flow relative to size but immature enzyme systems • Larger volume of distribution for water soluble drugs • Higher clearance for some agents (e.g., propofol)	• Dose by weight (mg/kg¹) with age adjusted limits • Titrate to effect, watch for prolonged recovery with certain drugs

3. Pre-operative Assessment

1. History

- Surgical/medical diagnoses, previous anaesthesia reactions
- Airway risk factors (e.g., craniofacial anomalies, obstructive sleep apnea)
- Family history of malignant hyperthermia (MH) or anesthetic complications
- Fasting status (clear liquids 2h, breast milk 4h, formula 6h, solids 6h)

2. Physical Examination

- Airway: Mallampati (modified), mouth opening, neck mobility, dentition, presence of tonsillar hypertrophy
- Cardiovascular & respiratory: murmurs, cyanosis, wheeze, chest infections
- Neurologic: seizures, developmental delay, muscle tone

3. Investigations (as indicated)

- CBC, electrolytes, coagulation profile
- Chest X-ray, ECG (for congenital heart disease)
- Specific labs for metabolic disorders (e.g., glucose, calcium)

4. Risk Stratification

- **ASA Physical Status** (