

Pediatric Anesthesia: Differences from Adult



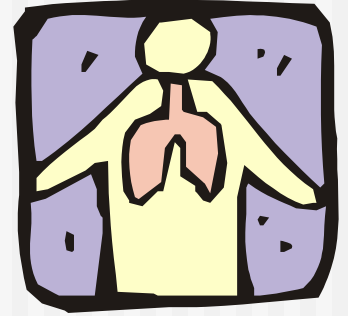
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Physiologic Differences: Cardiovascular



- ↑ HR
- ↓ BP
- ↑ blood volume
- Fetal Hemoglobin
- ↑ total body H₂O

Physiologic Differences: Pulmonary



- ↑ respiratory rate
- neonates may not exhibit **hypoxic pulmonary vasoconstriction**

Physiologic Differences: Neurologic



- immature sympathetic nervous system
- immature baroreceptors
- **hypoxic / hypercapnic drives reversed**

Physiologic Differences: Metabolic



- ↑ metabolic demand
- prone to **hypoglycemia**
- hyperglycemia → intracranial bleed

Physiologic Differences: Temperature



- no insulating fat
- large surface area : volume ratio
- neonates unable to shiver
- infants < 37wks unable to sweat

Anatomic Differences: Cardiovascular



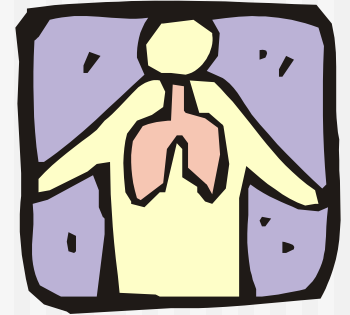
- **non-compliant left ventricle**
- residual fetal circulation
- difficult venous / arterial cannulation

Anatomic Differences: Airway



- large head / tongue
- narrow nasal passages
- anterior / cephalad larynx
- narrow / large epiglottis
- short trachea / neck
- prominent adenoids / tonsils

Anatomic Differences: Pulmonary



- high resistance to airflow
- **cricoid** narrowest part of airway
- weak intercostal muscles
- horizontal / pliable ribs
- protuberant abdomen
- low FRC
- ↓ lung compliance
- ↑ chest wall compliance



Pharmacologic Differences

- immature hepatic biotransformation
- **↓ protein-binding**
- More rapid induction & more rapid recovery
- **↓ MAC preterm but ↑ MAC infants**
- **↑ volume of distribution for H₂O-soluble drugs**
- **↑ sensitivity neuromuscular blockers**
- **Succinylcholine !!!**

Summary



- Airway
- Weight-based drug administration
- Stiff left ventricle