

ANATOMICAL & PHYSIOLOGICAL DIFFERENCES IN CHILDREN

Children are not just small adults; they are small adults with big heads.

1. Airway

- a. Neonates are obligatory nasal breathers
- b. Big tongue & Big occiput
- c. Large head, small jaw and strong muscular tongue
- d. Hyperextension can block the airway.
- e. Larynx higher in neck and more anterior "Look up" when intubating.
- f. Epiglottis at 45 degrees angle, large and floppy.
- g. Cervical spine more cartilaginous and flexible.
- h. Trachea is short, ETT are easily dislodged or pushed down into the right main bronchus; Recheck ETT after all movement.

2. Airway position

- a. Infants – neutral airway (Infant with big occiput - towel under shoulders)
- b. Children – sniffing air
- c. Hyperextension or hyperflexion can cause airway block.
- d. Upright for upper airway obstruction
- e. In the parent's lap if the child is upset.

3. Breathing differences

- a. Thorax more pliable and they are Belly breathers
- b. Higher normal respiratory rate for the age.
- c. Higher metabolic rate relative oxygen consumption and lower functional residual capacity result in rapid oxygen desaturation even with pre-oxygenation

4. Circulation differences

- a. Higher resting pulse rate for the age and tolerate much higher pulse rate
- b. Limited capacity to increase cardiac output / stroke volume.
- c. Age appropriate blood pressure ; lower normal blood pressure
 - i. Systolic BP: $[\text{Age} \times 2] + [70-90]$
 - ii. Hypertension in children is pre morbid
- d. Child in shock
- e. Predominantly chronotropic response to shock
- f. Volume resuscitation is with isotonic crystalloid solutions

5. Disability – Don't Forget Dextrose

- AVPU (Alert/ Responds to Voice/ Responds to Pain/ Unresponsive)
- "P" or "U" means that the child has an unprotected airway.
- GCS: age appropriate modification (two charts under 4 years and over 4years).
- Children have limited Glycogen stores; Check BSL in all sick children.

6. Exposure/Environment

- Large surface area in relation to size results in rapid heat loss.
- Check core temperature in sick children.
- Look for rashes in skin folds and pressure areas.

7. Normal paediatric parameters- Weight, HR, BP, RR chart

8. Formulae for calculating a child's weight and blood pressure

- a. Estimating body weight
- b. Broselow tape

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