

Infant/Adult Respiratory Differences

#1 Rule: Infants have little pulmonary reserve, so when they reach their limits they go sour FAST!!

Alveoli – About 300,000,000 in adults vs 25,000,000 in neonates. New alveoli formed until age 8.

Gas exchange area: body weight is 1/3 for neonate compared to adult, but neonate metabolism is 2 times adults per Kg.

Neonate is obligate nose breather so work of breathing increases with URI.

Small glottis and trachea with loose, edema-prone tissue and abundant secretions.

Infant = 4 cm long, 3 – 4 mm ID trachea

Adult = 11 – 13 cm long, 10 – 20 mm ID trachea

So... an infant with a 4 mm airway that has 1 mm edema leaves a 2 mm lumen, which is a 75% decrease in total cross sectional area

But... an adult with a 20 mm airway with 1 mm edema decreases the total cross sectional area by only 19%

Infants have a proportionally larger tongue which easily obstructs the airway.

Infant larynx is higher, epiglottis is longer and wider and more prone to obstruction with edema.

Trachea is less rigid and more prone to collapse.

Diaphragm is the primary muscle of respiration in infants. They have limited ability to use accessory muscles.

Cartilaginous thorax – less rigid so vigorous inspirations cause lots of retractions and decreased tidal volumes.