

A baby is considered premature when he/she is delivered before 37 weeks gestation. These preterm infants can present the anesthetist with several unique challenges. There are many conditions and situations that we must consider when caring for these babies, e.g. bronchopulmonary dysplasia, kernicterus, intracranial hemorrhage, respiratory distress syndrome, and apnea spells. It is imperative that we familiarize ourselves with these conditions and the other common diseases affecting this population in order to provide these kids with the very best of care.

Respiratory distress syndrome: RDS or hyaline membrane disease is the greatest killer of preemies (50-75%). The condition is a result of inadequate surfactant in the alveoli. This leads to alveolar collapse and shunting. Ultimately, arterial hypoxia and acidosis occur leading to death.

Bronchopulmonary dysplasia: (BPD) Dysplasia means abnormal growth or development of a tissue. BPD is associated with an unusually reactive airway, increased resistance, a decrease in pulmonary compliance, V/Q mismatch, and tachypnea. This disease is closely related to RDS. Intubation should only be performed after the patient is in a deep surgical plane of anesthesia.

Intracranial Hemorrhage: Intracranial hemorrhage (ICH) is a common condition in the premature infant. In fact, there is a 40-45% incidence in the neonate who is less than 35 weeks gestation. Impaired cerebral autoregulation, increased CVP, and immature capillary beds are all contributing factors to the development ICH. If a bleed develops, it may damage the arachnoid villi and result in hydrocephalus.

Retinopathy of prematurity: ROP is related to elevated PaO<sub>2</sub> levels (>80 mmHg). The condition leads to abnormal retinal vascularization and retinal scarring. Low birth weight is directly related to the risk of developing ROP (<1500g). The risk of ROP is almost zero after 44 weeks post conception. Anesthetic management is aimed at limiting PaO<sub>2</sub> and maintaining a saturation of 92-94%. N<sub>2</sub>O or air may be used to achieve the desired O<sub>2</sub> concentration.

Apnea of Prematurity: Apnea is defined as periods of at least 20 seconds with no air exchange. Bradycardia and cyanosis are a result of the apneic spells. There is a direct correlation between the degree of prematurity and the incidence of apnea. Sixty weeks post conception seems to be the magic age where apneic spells begin to abate (remember 60 weeks post conception). Outpatient anesthesia is not recommended for preemies who are less than 60 weeks post conceptual age.