Management of the Sick Baby
Specific Considerations

- STABLE Mnemonic to Guide Treatment
- Consider Congenital Heart Defect
- Other Congenital Conditions
- Congestive Heart Failure

STABLE Mnemonic to Guide Treatment

- **S**ugar
  - Consider Hypoglycemia: BGL <60mg/dl for pediatrics, <40mg/dl for neonates
    - Administer Dextrose
      - Pediatric<2 years: 0.5-1g/kg [2-4ml/kg D25, do not use D50]
      - Neonate: 0.5-1g/kg [5-10ml/kg D10 or 10-20ml/kg D5]
  - D5 Maintenance Fluids with risk of Hypoglycemia

Table 92. Estimation of Maintenance Fluid Requirements

Weight (kg)	Estimated Hourly Fluid Requirements	Sample Collection
<10	4 mL/kg per hour	8-kg infant: 4 mL/kg per hour × 8 kg = 32 mL/h
10-20	40 mL/h + 2 mL/kg per hour for each kilogram between 10 and 20 kg	15-kg child: 40 mL/h + 2 mL/kg per hour × 5 kg = 50 mL/h
>20	60 mL/h + 1 mL/kg per hour for each kilogram above 20 kg	30-kg child: 60 mL/h + 1 mL/kg per hour × 10 kg = 70 mL/h

An alternate calculation of maintenance hourly fluid rate for patients weighing greater than 20 kg is weight in kilograms + 40 mL/h.

- **T**emperature
  - Consider core body temperature/ rectal probe placement
  - If too high/ Fever, administer Acetaminophen: 10-15mg/kg PR (max 1000mg), once
  - If too low, implement measures to warm the baby
- **A**irway
  - Airway Management
  - Recognize that high concentrations of oxygen may not be appropriate for all babies
  - Consider padding baby's shoulders to maintain a patent airway

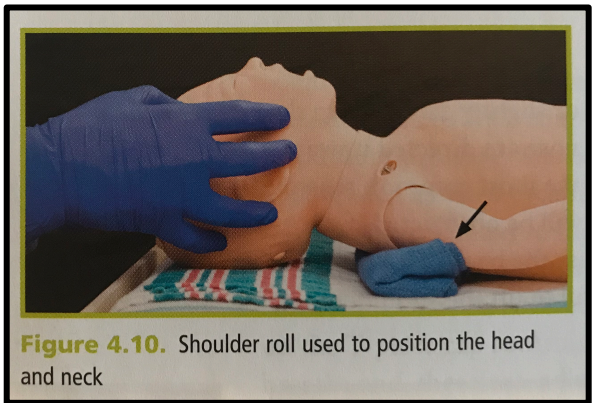


Figure 4.10. Shoulder roll used to position the head and neck

- **B**lood Pressure (treat per Hypotension to goals outlined below)

Table 10. Normal Blood Pressures

Age	Systolic Pressure (mm Hg)*	Diastolic Pressure (mm Hg)*	Mean Arterial Pressure (mm Hg)†
Birth (12 hours, <1000 g)	39-59	16-36	28-42‡
Birth (12 hours, 3 kg)	60-76	31-45	48-57
Neonate (96 hours)	67-84	35-53	45-60
Infant (1-12 months)	72-104	37-56	50-62
Toddler (1-2 years)	86-106	42-63	49-62
Preschooler (3-5 years)	89-112	46-72	58-69

Table 11. Definition of Hypotension by Systolic Blood Pressure and Age

Age	Systolic Blood Pressure (mm Hg)
Term neonates (0-28 days)	<60
Infants (1-12 months)	<70
Children 1-10 years	<70 + (age in years × 2) (this estimates systolic blood pressure that is less than the fifth blood pressure percentile for age)*

- **L**ab Work
  - Glucose (see above)
  - Electrolyte Abnormalities
  - Septic work-up (Infection and Fever)
  - BNP
- **E**motional Support

Consider Congenital Heart Disease

- Assessment
  - Baby's age?
    - Any infant **<1 month of age** with cyanosis or shock should be considered to have duct-dependent critical congenital disease until proven otherwise; this is almost always a left heart lesion/ ductal dependent lesion such as Tetralogy of Fallot
    - Shunting or mixing lesions such as VSD or PDA and heart failure typically present later during infancy, usually **after 1-6 months of age**
  - Color?
    - **Pink:** think *heart failure* (adequate pulmonary blood flow, relatively well-perfused and oxygenated; usually due to a shunting lesion)
    - **Grey:** think *shock/ circulatory collapse* (not enough systemic flow, not oxygenating well; usually left-sided obstructive, ductal-dependent lesion); these patients are very sick with hypotension, tachypnea and poor capillary refill
    - **Blue:** think *right obstructive* duct-dependent in the first moth of life or *mixing lesion* (inadequate pulmonary blood flow: usually right-sided obstructive ductal-dependent lesion or a mixing lesion) after one month
  - Exams and Tests
    - Assess for Obstructive Process (i.e. aortic coarctation or stenosis)
      - Absence or weakness of femoral (compared to brachial)
      - Difference >10mmHG between pre-ductal and post-ductal SBPs
    - SpO2 Differential
      - Findings: pre-ductal vs. post-ductal difference >3%, post-ductal value <94% or any value <90%
      - Indications: CHD or significant pathology that warrants specialty care
    - Heart Tones: should be assessed and discussed with receiving, however findings are not always reliable indicators of specific conditions for infants

- Treatment Considerations for Duct-Dependent Lesion
    - Prostaglandin therapy indicated with blue or grey babies less than one month of age (i.e. consider capabilities of receiving facility)
    - IV Fluids (consider incrementally at 5-10ml/kg per bolus)
        - Will improve preload
        - Will encourage further opening of PDA (and blood flow through duct)
    - Consider Inotropes/ Vasopressors early (Shock)
    - Positive Pressure ventilation cab increase PVR and decrease SVR (which adversely affects shunt flow), therefore consider minimal PEEP with PPV or Mechanical Ventilation
    - Rapid Sequence Intubation with Etomidate (over Ketamine), if indicated (Ketamine can worsen left-to-right shunt)

Other Congenital Conditions

- Robin Sequence
    - Combination of facial anomalies related to abnormal development of the mandible
    - With labored breathing, consider the following:
        - Place patient prone
        - Pass small (2.5) ETT to posterior oropharynx
        - LMA preferred to intubation

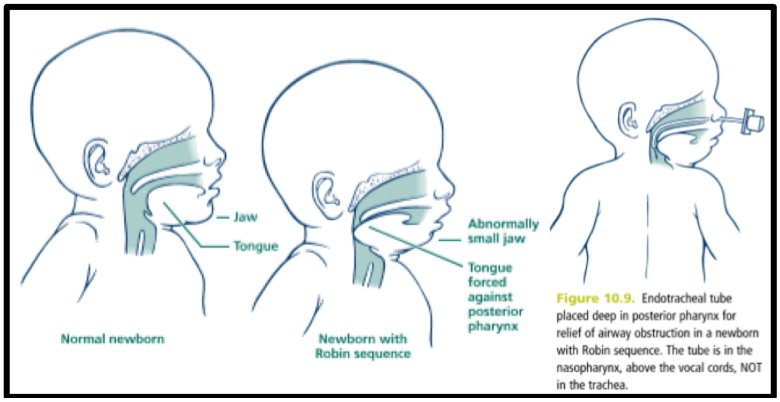


Figure 10.9. Endotracheal tube placed deep in posterior pharynx for relief of airway obstruction in a newborn with Robin sequence. The tube is in the nasopharynx, above the vocal cords, NOT in the trachea.

- Choanal Atresia
    - Condition in which nasal airway is obstructed by bone or tissue (usually unilateral)
    - Does respond well to PPV if indicated
    - Consider placement of short OPA to maintain airway patency

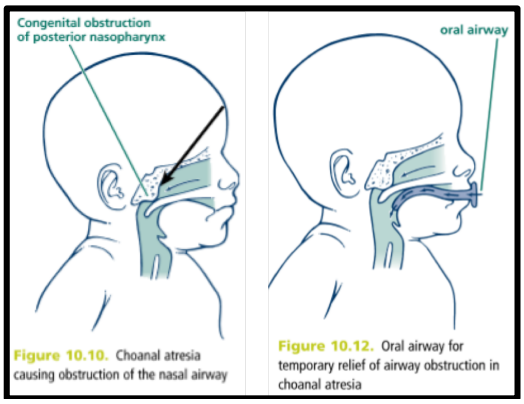


Figure 10.10. Choanal atresia causing obstruction of the nasal airway

Figure 10.12. Oral airway for temporary relief of airway obstruction in choanal atresia

- Diaphragmatic Hernia
    - Abnormal formation of the diaphragm, results in abdominal content within the chest cavity
    - Signs and symptoms: scaphoid abdomen, respiratory distress, hypoxemia
    - PPV via BVM can be detrimental, therefore intubate and place gastric tube

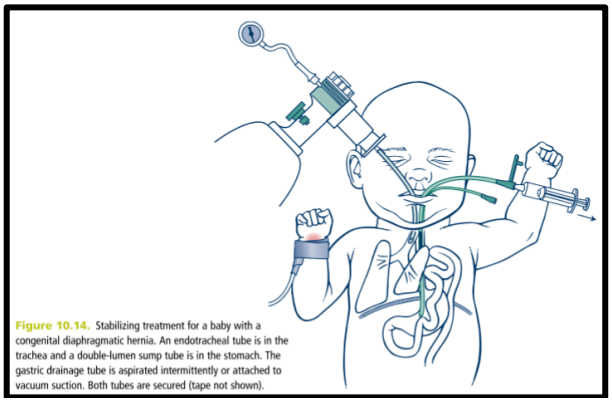
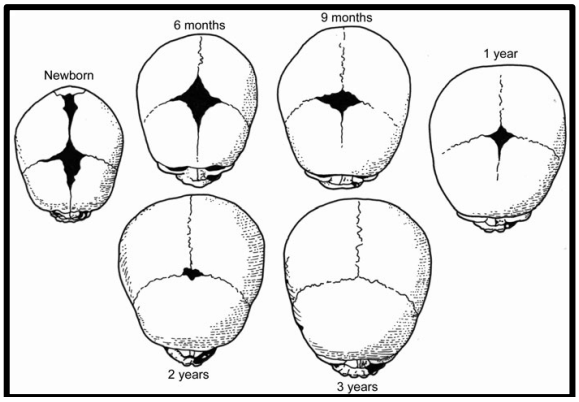


Figure 10.14. Stabilizing treatment for a baby with a congenital diaphragmatic hernia. An endotracheal tube is in the trachea and a double-lumen sump tube is in the stomach. The gastric drainage tube is aspirated intermittently or attached to vacuum suction. Both tubes are secured (tape not shown).

Congestive Heart Failure/ Pulmonary Edema

- Assessment
    - Often "pink" and well oxygenated; however, may be tachypneic or present with abnormal respirations
    - Assume wheezes in the infant result from CHF
    - Hepatomegaly (≥2cm below costal margin)
- Underlaying Pathology
    - Structural (i.e. CHD): VSD, ASD, Aortic Stenosis, PDA, etc.
    - Other: Dysrhythmia, cardiomyopathy, myocarditis
- Treatment
    - Use caution with supplemental oxygen
        - Oxygen promotes closure of a PDA
        - Infants may be able to tolerate a lower SpO2 than adults
    - Consider hydration status
        - CHF may be the result of tachycardia due to severe dehydration
        - Assess fontanelles & question staff/ caretaker about urine output



        - If IV Fluids indicated, consider smaller boluses of 5-10ml/kg
        - If not dehydrated (i.e. adequately hydrated/ overhydrated), Lasix: 1mg/kg IV, once