Special Considerations

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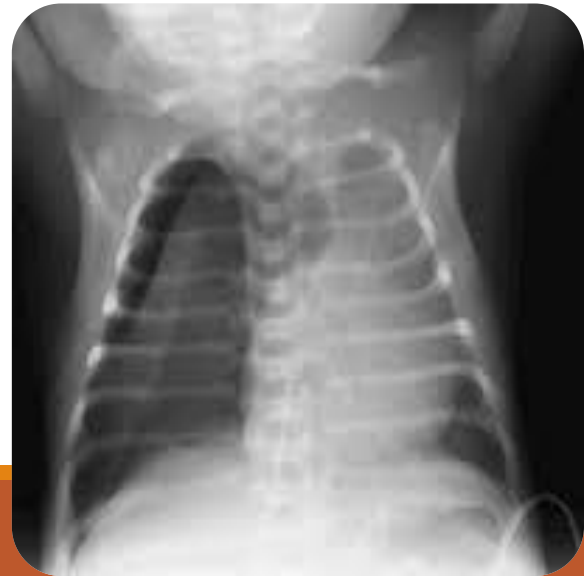
Pneumothorax

When air collects in the pleural space surrounding the lung, it is called a pneumothorax

Although a pneumothorax may occur spontaneously, the risk is increased by PPV, particularly in preterm babies, babies with meconium aspiration, and babies with other lung abnormalities.

A small pneumothorax may be asymptomatic or cause only mild respiratory distress.

If the pneumothorax becomes larger, the pressure from the trapped air can cause the lung to collapse.



- If the pneumothorax becomes large enough, it can interfere with blood flow within the chest causing severe respiratory distress, oxygen desaturation, and bradycardia (tension pneumothorax).
- It is a life-threatening emergency and requires urgent treatment to evacuate the air.
- You should consider the possibility of a pneumothorax if a baby fails to improve despite resuscitative measures or if a baby suddenly develops severe respiratory distress.
- Breath sounds may be diminished on the side of the pneumothorax, but
- breath sounds can be misleading because they are easily transmitted across the baby's chest and can sound normal even in the presence of a pneumothorax.

Causes of Diminished Breath Sounds

- Inadequate ventilation technique
- PPV device leak or equipment failure
- Mispositioned endotracheal tube
- Pneumothorax
- Pleural effusion
- Tracheal obstruction
- Congenital diaphragmatic hernia
- Pulmonary hypoplasia or agenesis
- Enlarged heart

Transillumination of the chest is a rapid screening test

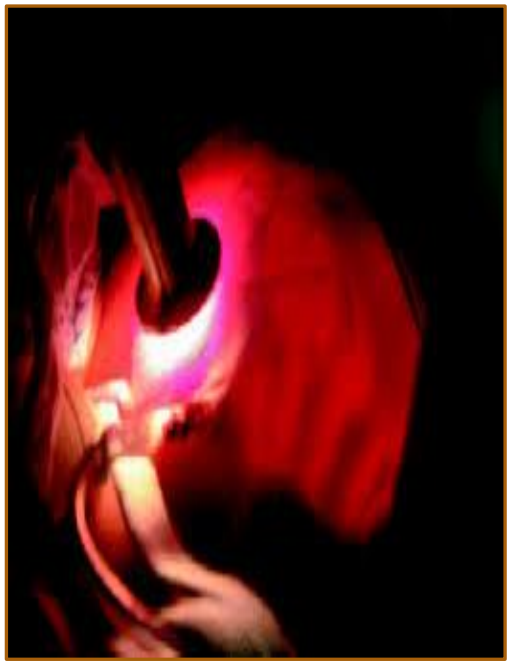
In a darkened room, hold a high-intensity fiber-optic light against the chest wall and compare the transmission of light on each side of the chest.

During transillumination, light on the side with a pneumothorax will appear to spread further and glow brighter than the opposite side.

In a life-threatening situation, a positive transillumination test can help to direct immediate treatment.

Be careful when interpreting the results of transillumination in very premature babies because their thin skin may cause the chest to appear bright even in the absence of a pneumothorax.

If a transilluminator is not immediately available and the baby is in severe distress, you may proceed with emergency treatment based on your clinical suspicion.



- **If the baby is stable, the definitive diagnosis of a pneumothorax is made with a chest x-ray.**

Thoracentesis

Ideally, thoracentesis should be performed using sterile technique with appropriate anesthetic for pain management;

however, modifications may be **required during emergency aspiration of a tension pneumothorax.**

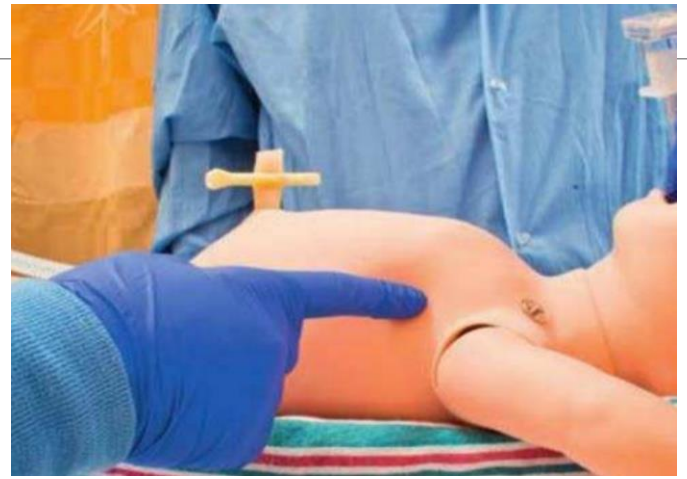
- **For a pneumothorax, the aspiration site is either the fourth intercostal space at the anterior axillary line or the second intercostal space at the mid-clavicular line.**

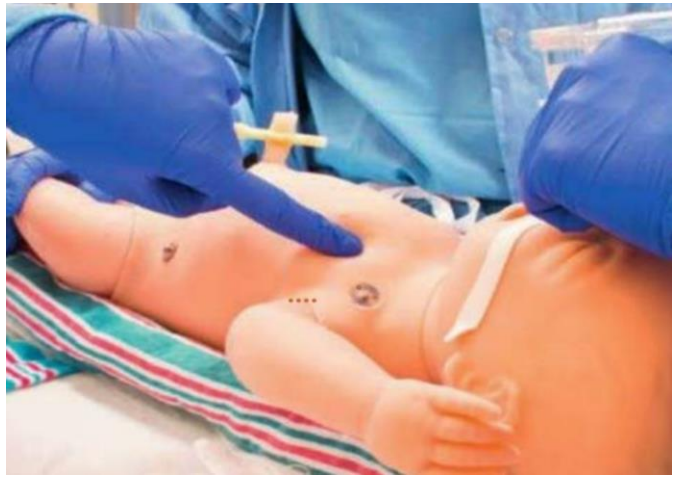
- **Using a small blanket roll, position the baby on their back (supine) with the affected side directed slightly upward to allow the air to rise to the upper (superior) portion of the chest.**

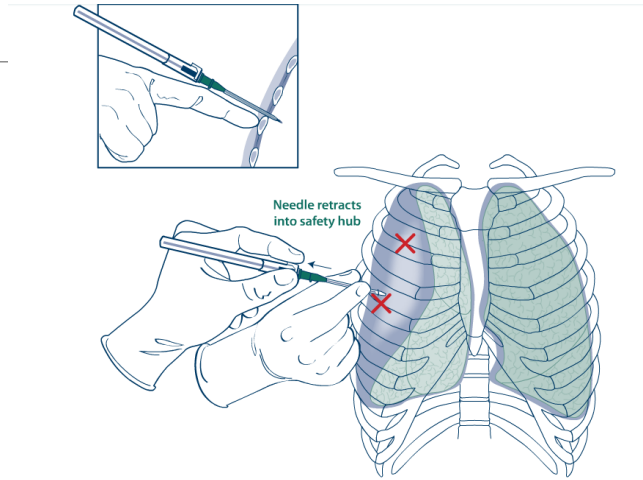
- **For a pleural effusion, the aspiration site is the fifth or sixth intercostal space along the posterior axillary line.**

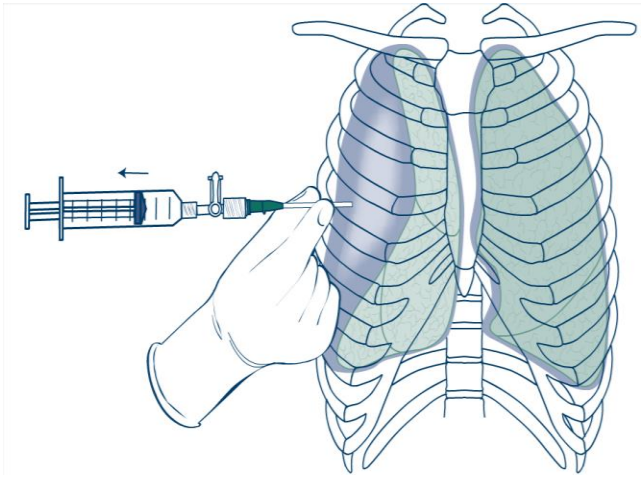
Place the baby on their back (supine) to allow the fluid to collect in the lower (posterior) portion of the chest.

Locations for percutaneous aspiration of a pneumothorax



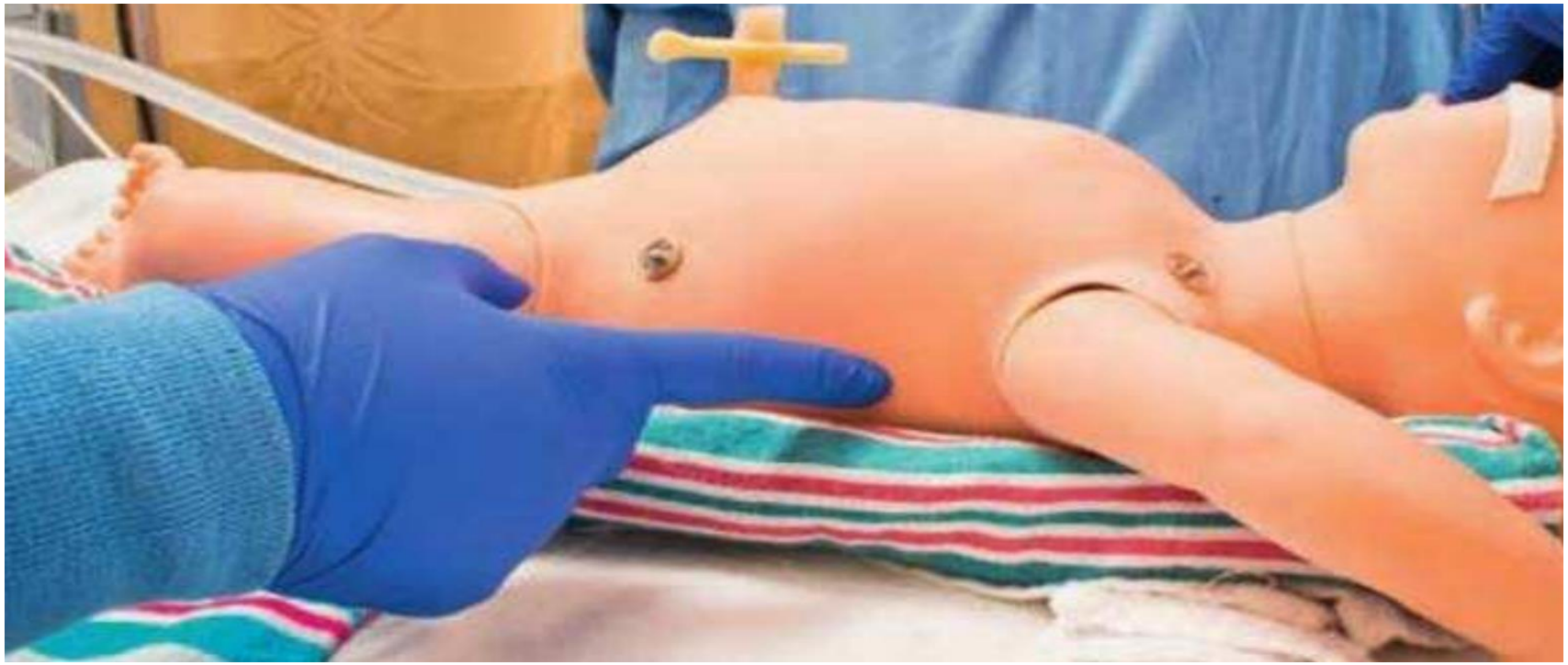






Location for aspiration of a pleural effusion

For a pleural effusion, the aspiration site is the fifth or sixth intercostal space along the posterior axillary line.



Technique of thoracentesis

Insertion 18 or 20 gauge percutaneous catheter-over-needle device perpendicular to the chest wall and just over the top of the rib.

Por a pneumothorax, direct the catheter slightly upward toward the front of the chest and for a pleural effusion, direct the catheter slightly downward toward the back.

Once the pleural space is entered, the needle is removed and a large syringe (20-60 mL) connected to a 3-way stopcock is attached to the catheter.

When the stopcock is opened between the syringe and the catheter, the air or fluid can be evacuated.

When the syringe is full, the stopcock may be closed to the chest while the syringe is emptied.

After the syringe is emptied, the stopcock can be reopened to the chest and more fluid or air may be aspirated until the baby’s condition has improved.

An x-ray should be obtained to document the presence or absence of residual pneumothorax or effusion.

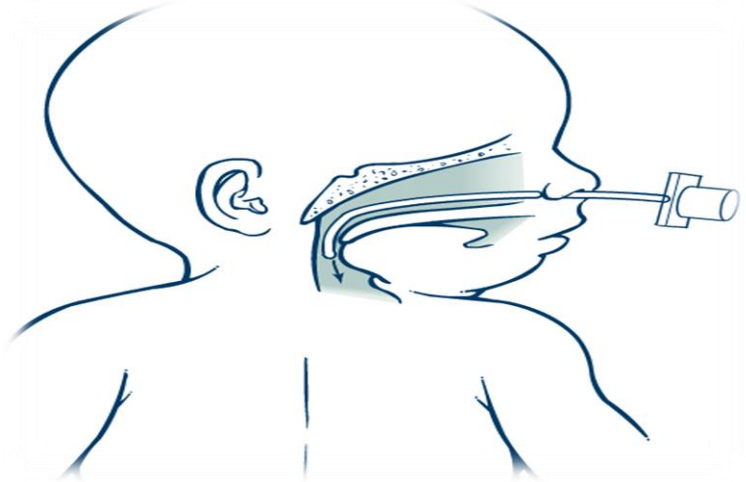
Robin Sequence

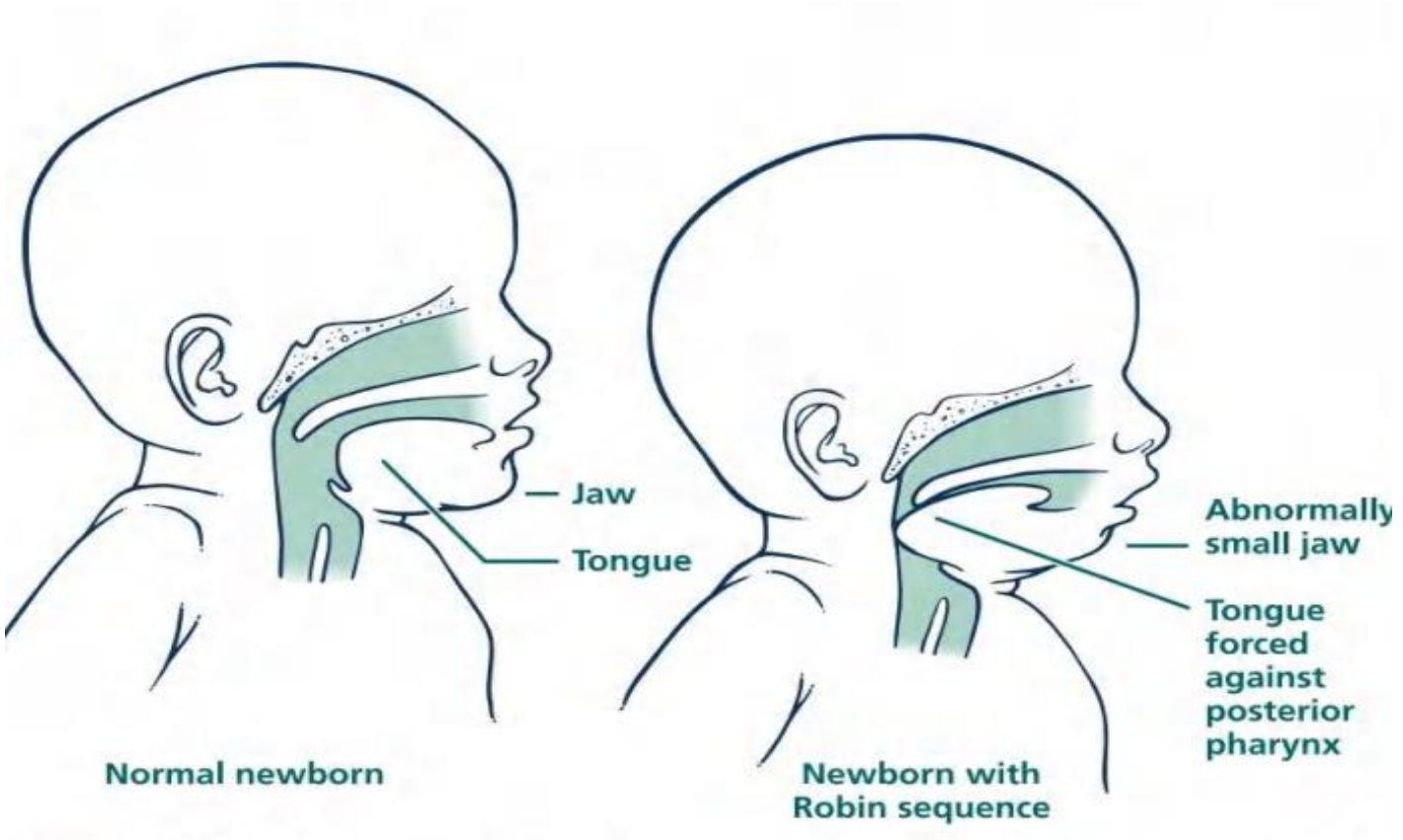
The lower jaw is small and set back in relation to the upper jaw.

The baby`s tongue is positioned further back in the pharynx than normal and obstructed the airway.

Cleft palate

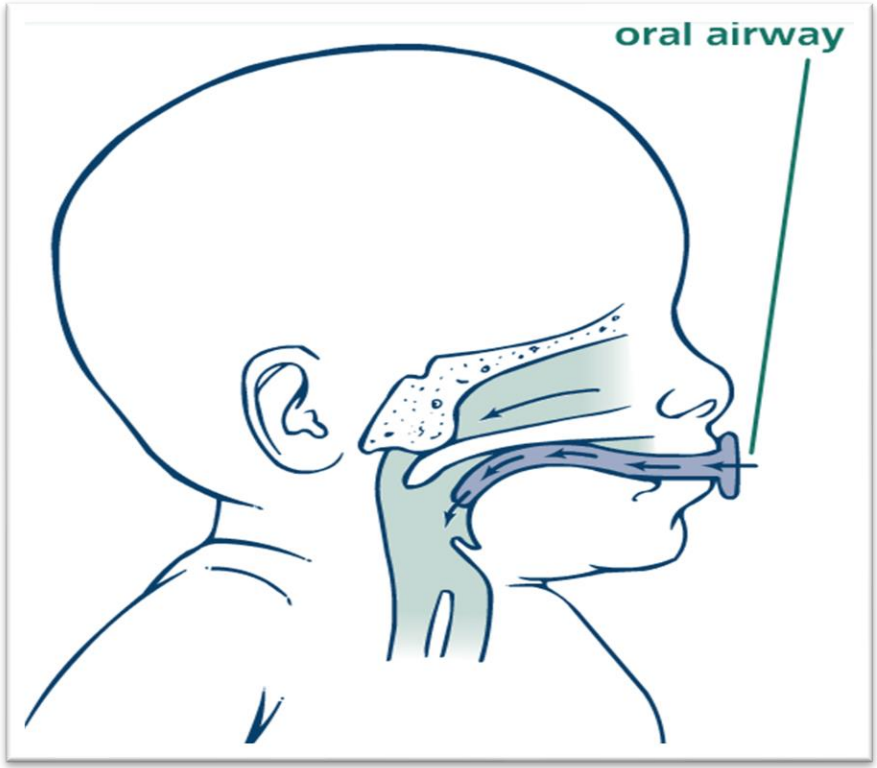
- Intervention:
  - Prone position
  - Inserting a nasopharyngeal tube (2.5 mm) with the tip above the vocal cord (laryngoscope is not required).
  - It usually is very difficult to place an endotracheal tube into trachea of a baby with Robin syndrome
  - LMA




Jaw
Tongue
Normal newborn
Abnormally
small jaw
Tongue
forced
against
posterior
pharynx
Newborn with
Robin sequence

Choanal Atresia

Although choanal atresia generally will not prevent you ventilating baby with positive pressure through the oropharynx, the baby may not be able to move air spontaneously through the blocked nasopharynx .



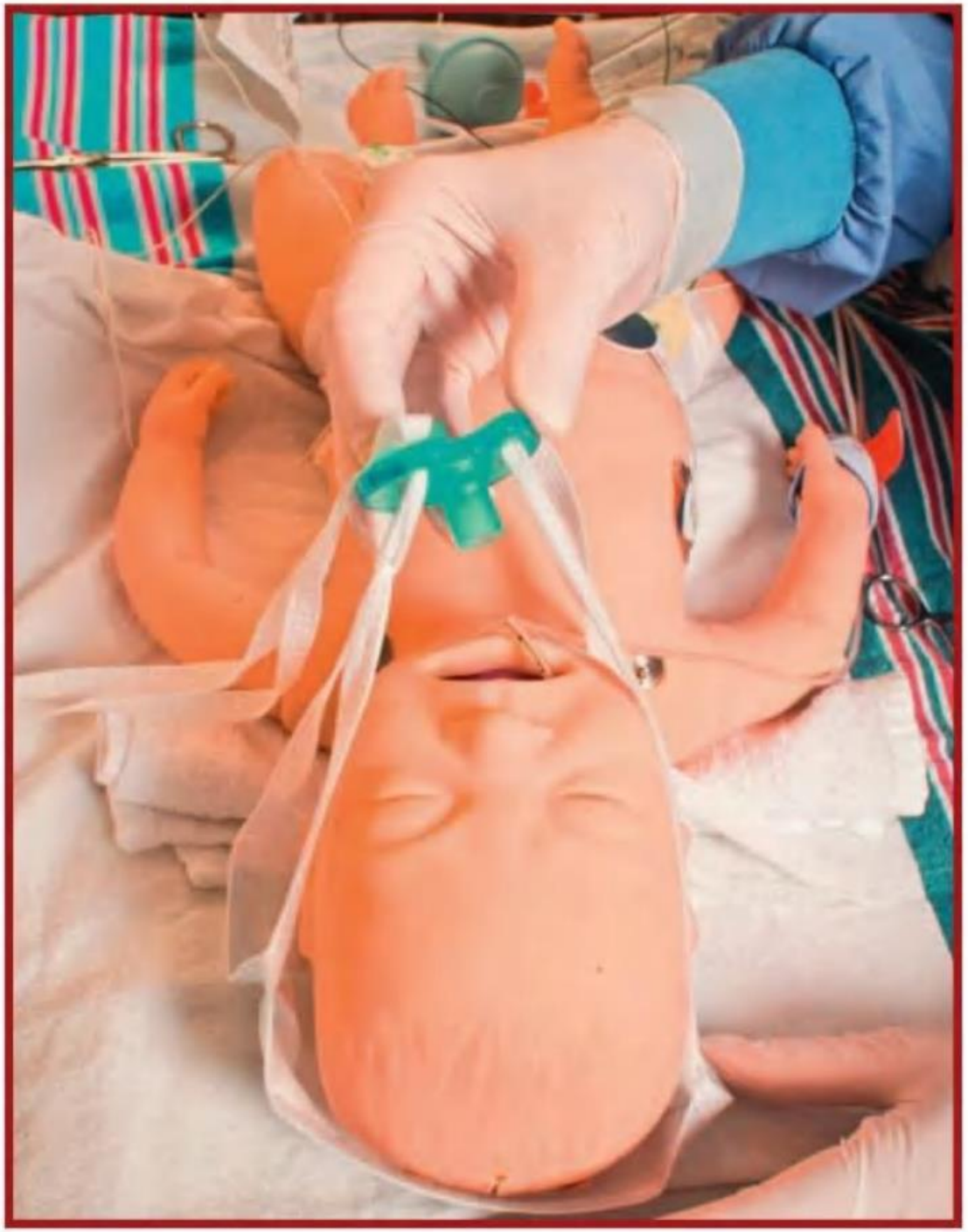
Coanal atresia

DX: passing a thin suction catheter to posterior pharynx from nares

Bilateral coanal atresia and respiratory distress:

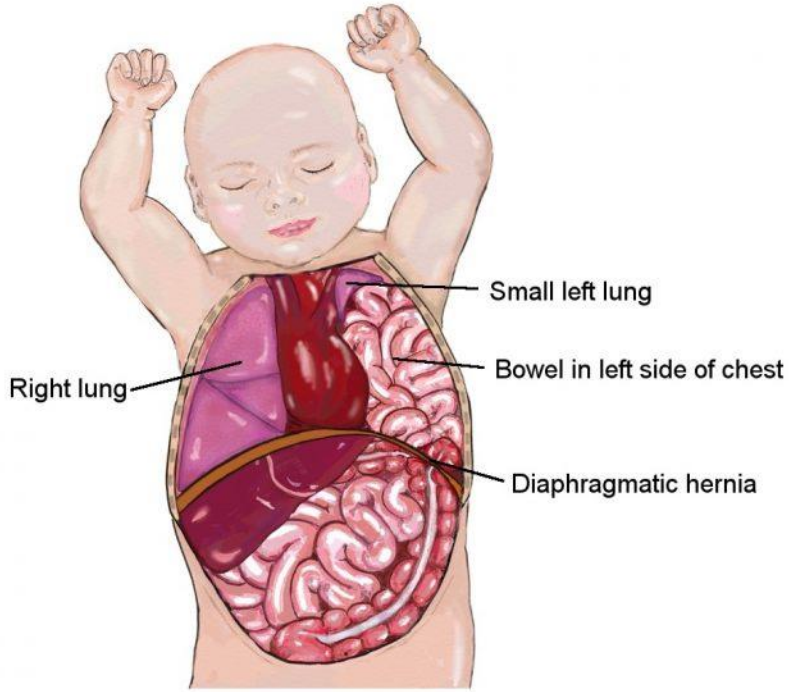
Keep the month open by:

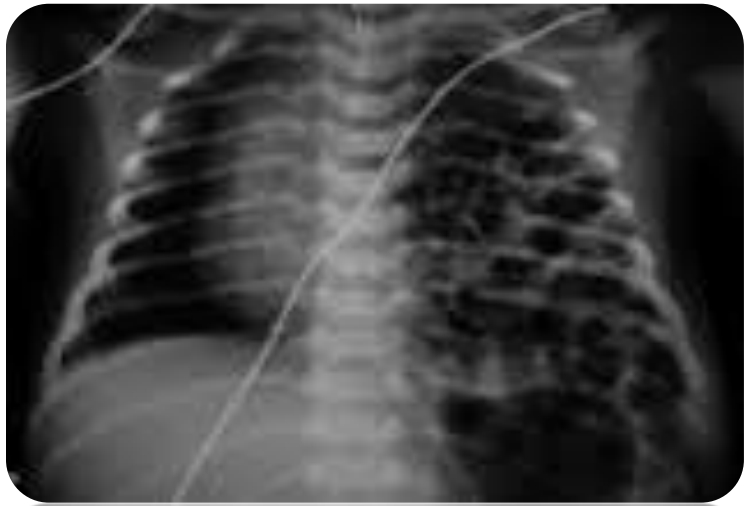
- A feeding nipple or pacifier modified by cutting of the end(Mc GOVERN nipple)
- Put the tip of endotracheal tube just beyond the tongue in the posterior pharynx
- use an oral air way



Congenital diaphragmatic hernia/CDH

When the diaphragm dose not form completely some of abdominal contents (intestine, stomach, and sometimes the liver) enter the chest and prevent the lungs (associated microvasculature) from developing normally

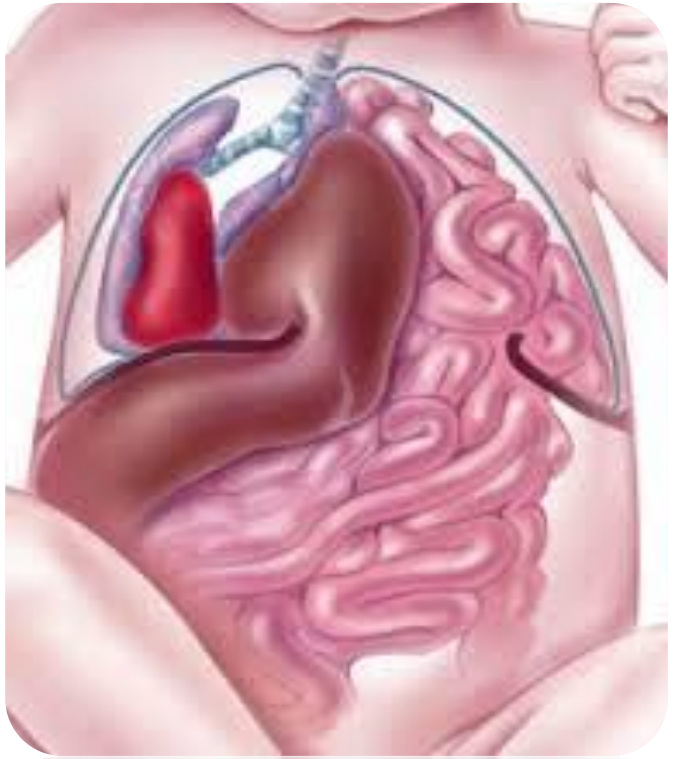




Congenital diaphragmatic hernia/CDH

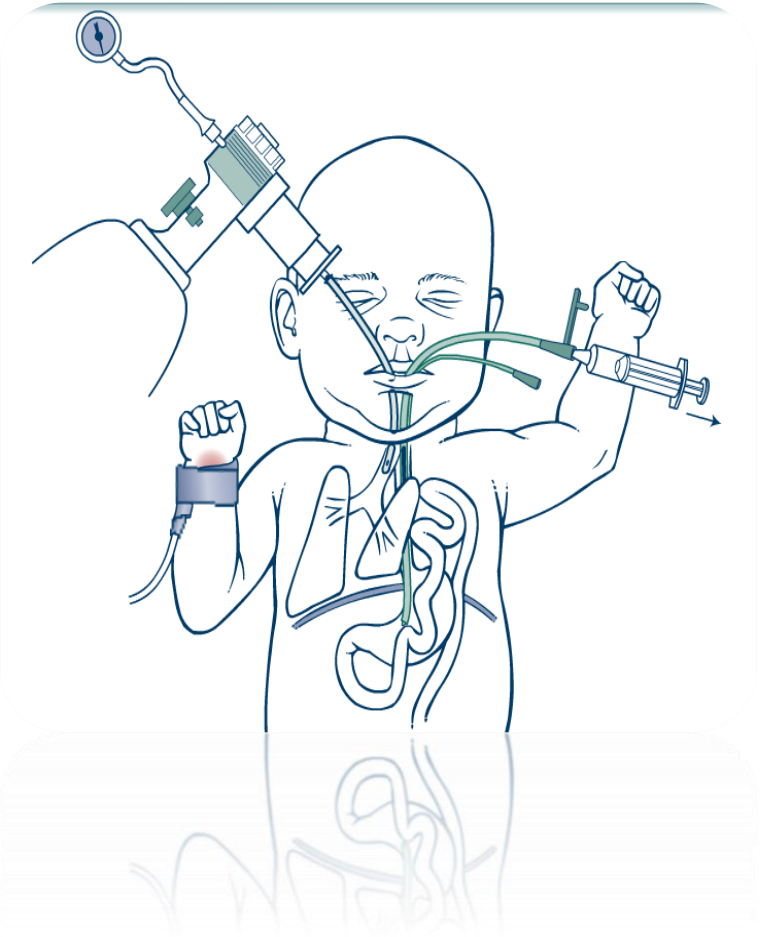
Clinical manifestations:

- **Unanticipated respiratory distress**
- **Flat-appearing (Scaphoid) abdomen**
- **Diminished breath sound**
- **Heard bowel sound**
- **Pulmonary hypertension:**
  - **Hypoxemia**
  - **Persistent cyanosis**



Congenital diaphragmatic hernia/CDH

- ***Avoid face-mask PPV for babies with a CDH***
  - Promptly intubate the trachea
  - Large OGT (10F)
  - Replogle tube(double lumen) is most effective Intermittent or continuous suction



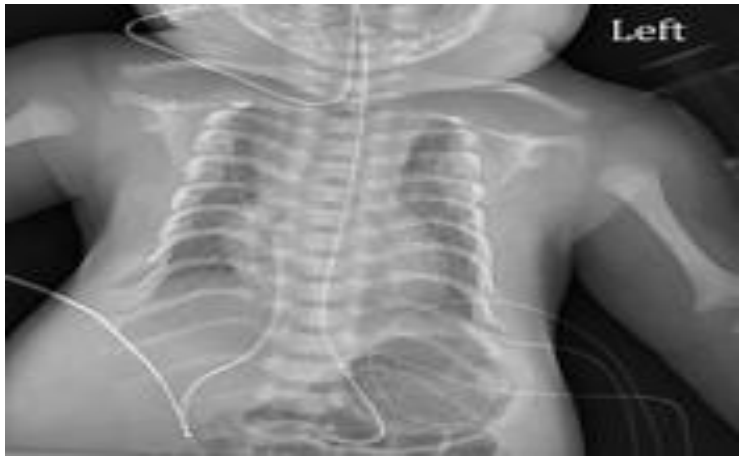
Pulmonary hypoplasia

Lung development requires adequate space within the chest.

Lung incompletely development:

- Any condition that occupies space in the chest
- Oligohydramnios (maybe have other deformity)
- High pressure maybe need for inflating hypoplastic lungs

Increase risk of pneumothorax



Chest x-ray: small and bell-shaped

Administrating opiate during labor

Opiates given to the laboring mother to relieve pain may cross the placenta and decrease the newborn's activity and respiratory drive.

Although the opiate antagonist naloxone has been used in this setting, there is insufficient evidence to evaluate the safety and efficacy of this practice.

Very little is known about the pharmacology of naloxone in the newborn.

Animal studies and case reports have raised concerns about complications from naloxone, including pulmonary edema, cardiac arrest, and seizures.

A newborn has respiratory depression after maternal opiate exposure, manage the baby's airway and provide respiratory support with PPV.

What if a baby does not breathe or has decreased activity and the mother did not receive an opiate during labor?

The baby may have depressed respiratory drive or muscle activity due to a medication self-administered by the mother, hypoxia, severe acidosis, a structural brain abnormality, or a neuromuscular disorder.

Medications given to the mother, such as magnesium sulfate and general anesthetics, can depress respirations in the newborn.

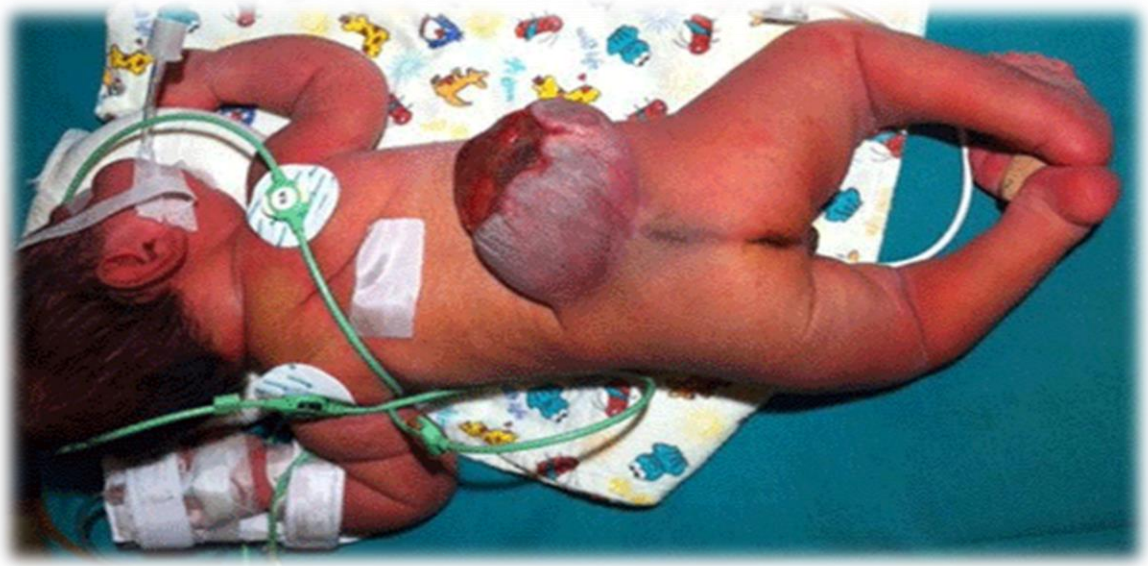
There are no medications that reverse the effects of these drugs.

The focus is to provide airway support and effective ventilation until the medication's effect has resolved.

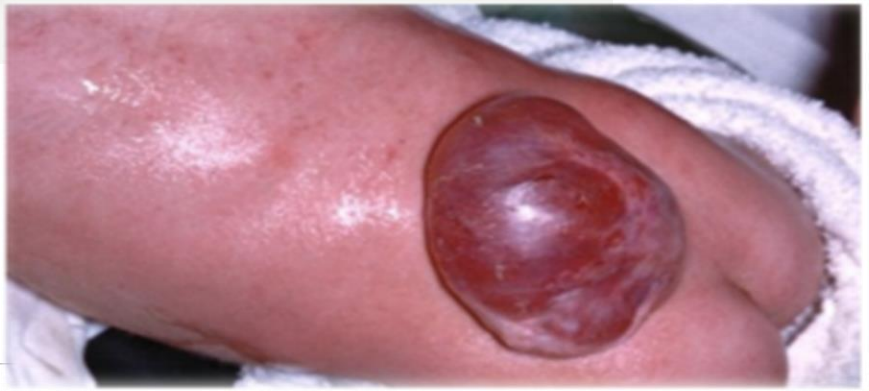
Myelomeningocele

Before birth, prepare a “donut” with towels or latex-free foam covered with towels in case the baby must be positioned on their back (supine).

- This will allow the defect to be placed within the “donut hole.”
- Newborns with neural tube defects are at risk of developing latex allergy.
- Use only latex-free equipment and supplies when caring for newborns with a neural tube defect.



Myelomeningocele



- After birth, place the newborn lying on their side or on their stomach (prone) to avoid pressure on the fluid sac and its contents.
- If it is necessary to place the baby supine for airway management position the baby on the prepared "donut" with the defect over the open "donut hole."
- Avoid drying or rubbing the defect during the initial steps of newborn care.
- Proceed with resuscitation steps as needed.
- Once the baby is stable, follow local guidelines for covering the lesion.

Some experts recommend placing non-latex, transparent plastic wrap across the lesion and wrapping it around the baby's abdomen/waist (with or without a non-adherent, moist gauze between the lesion and the plastic wrap).

Use caution to avoid rupturing the sac.

Abdominal wall defect

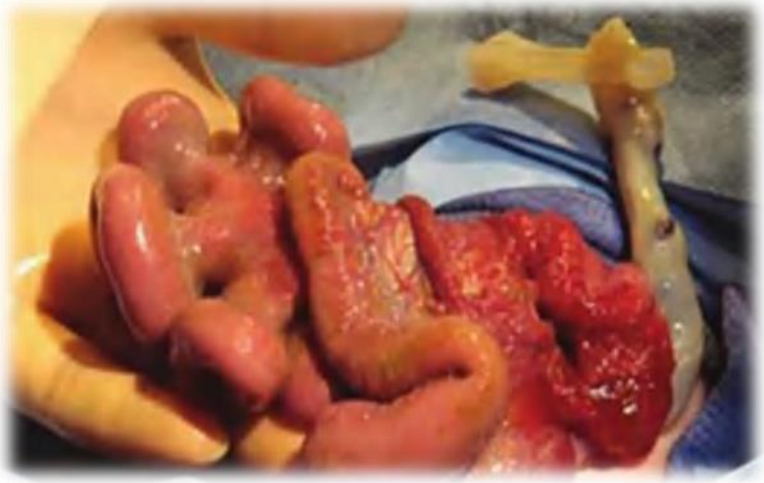
Gastroschisis is a defect where the baby's bowel protrudes through an opening in the abdominal wall.

- Most often, the defect is found on the right side of a normal-appearing umbilical cord.
- Although babies with gastroschisis are often born preterm or small for gestational age, most do not have any other anomalies.

Omphalocele is a defect in the abdominal wall that includes the umbilical cord.

- The baby's bowel is often contained within a large membranous sac that may contain other abdominal organs.
- The sac may rupture before or after delivery, exposing the abdominal contents.
- Babies with omphalocele frequently have other congenital anomalies or genetic syndromes.

For both defect it is important to protect bowel & abdominal organs from trauma.



Abdominal wall defect (gastroschisis)

- Ask the obstetric provider to clamp and cut the umbilical cord at least ***10 to 20 cm from the baby*** because the cord maybe used as part of the surgical repair.
- Place the baby and the exposed bowel in a sterile, clear plastic bowel bag and secure the bag across the baby's chest.
- Position the baby and exposed bowel on the right side to optimize perfusion.

Avoid prolonged face-mask ventilation to prevent air from distending the bowel.

- If assisted ventilation is necessary, consider inserting an ETT or laryngeal mask.
- Insert a large orogastric catheter (8F or 10F) and use low intermittent or continuous suction to prevent gaseous distention of the bowel.
- A double-lumen sump tube (Replogle tube) is most effective.

  Frequently monitor its color to identify worsening perfusion.
- In an emergency, an umbilical venous catheter can be inserted, however; attempt to leave as much intact umbilical cord length as possible to assist the surgical repair.

The exposed bowel increases heat and fluid losses.

Abdominal wall defect (omphalocele)

Be cautious to clamp and cut the umbilical cord well above the bowel or abdominal organs enclosed within the defect.

Place the baby's lower body, including the omphalocele, in a sterile, clear plastic bowel bag and secure the bag across the baby's chest.

Position the baby and omphalocele on the right side to optimize perfusion.

Insert a large orogastric catheter (8F or 10F) and use intermittent or continuous suction to prevent gaseous distention of the bowel.

A double-lumen sump tube (Replogle tube) is most effective.

Handle gently to avoid rupturing the sac or injuring the abdominal contents.

Newborns with large omphaloceles may require respiratory support (CPAP or MV).

An umbilical venous catheter cannot be used for emergency vascular access.

If emergency access is required, an intraosseous needle can be used.


THANKS
FOR YOUR
ATTENTION