Recognize complications

• Maternal-fetal factors
  – Maternal DM
  – PIH
  – Chronic HTN
  – Previous stillbirth
  – Rh sensitization
  – Infection
  – Substance abuse/Certain drug therapies (ie. Li, Mg, alpha blockers)
Recognize complications

• Maternal-fetal
  – Lack of prenatal care
  – 2nd or 3rd trimester bleeding
  – Fetal anomalies
  – Pre- or post-term gestation
  – Multiple gestation
  – Poly- or oligo-hydramnios
  – Size-date discrepancies
Recognize complications

- Intrapartum events
  - C-section
  - Abnormal fetal presentation
  - Premature labor
  - ROM > 24 hours
  - Chorioamnionitis
  - Precipitous labor
  - Prolonged labor > 24 hours
  - Maternal narcotics within 4 hours of delivery
Recognize complications

- Intrapartum events
  - Prolonged 2nd stage >3-4 hours
  - Non-reassuring FHT
  - GETA
  - Uterine tetany
  - Meconium in amniotic fluid
  - Prolapsed cord
  - Uterine rupture
  - Instrumented delivery
Fetal physiology

• High PVR
  – Alveoli collapsed and fluid-filled
  – 90% of RV output $\rightarrow$ DA

• Low SVR
  – 40% of CO $\rightarrow$ low resistance placenta

• R $\rightarrow$ L shunt through FO

• The cardiac ventricles pump in series
At birth...

• Compression of infant thorax in birth canal causes fluid to be expelled from airways
• Crying opens alveoli
• Surfactant is released
• Oxygenation increases
• Umbilical cord is clamped
As a result...

- PVR greatly decreases and PBF increases
- SVR abruptly increases
- $R \rightarrow L$ shunting through DA and FO is greatly reduced
- Oxygenation now occurs via the lungs and not the placenta
- The cardiac ventricles pump in parallel
If neonate does NOT breathe...

- NO oxygenation
- NO ventilation
- NO lung expansion
- NO decrease in PVR
- NO increase in PBF
Result

• Hypoxia
• Respiratory acidosis
• Persistent pulmonary HTN
• Persistent R $\rightarrow$ L shunting leading to cyanosis
• Imminent cardiac arrest and death
By far the most common cause of cardiac arrest in neonates is a result of respiratory arrest.
REMEMBER!!!

THE MOST IMPORTANT ACTION YOU CAN TAKE IN RESUSCITATING A NEWBORN IS...

VENTILATE THE LUNGS WITH POSITIVE PRESSURE
First 30 seconds...

• Assess
  – Clear of meconium?
  – Breathing or crying?
  – Good muscle tone?
  – Pink nailbeds, lips, tongue?
  – Term gestation?
If NO...

- **Clear airway**
  - Bulb suction or catheter
  - If meconium and baby not vigorous → DL → intubate → suction trachea as baby is extubated

- **Dry and stimulate baby**

- **Provide warmth**
  - Hypothermia increases PVR and increases metabolic expenditure → worsens acidosis

- **Give O2 if needed**
  - Blow-by or by BVM
Next 30 seconds…

• Evaluate
  – Heart rate
    • \( \geq 100, <60, \) or somewhere in between
  – Respiratory effort
    • Apnea, gasping, or adequate
  – Color
    • Pink or blue: look at central circulation (ie: tongue, lips, chest…NOT limbs)
Take action

• Apneic or gasping
  – Provide PPV at rate of 40-60 breaths/minute

• HR >=60 but <100
  – Provide PPV

• HR <60
  – Start chest compressions 90-100 per minute with PPV 30 breaths per minute

• Cyanotic
  – Provide O2 and PPV if needed
Reassess

- HR, respiratory effort, color
- Intubate if:
  - PPV with mask inadequate
  - Anticipate need for definitive / long term airway control
  - HR still <60 and need to give epinephrine (also start thinking about IV access either peripherally / centrally through umbilical vein)
Resuscitation meds

• **Epinephrine** (1:10,000 = 0.1 mg/mL)
  – First line for persistent bradycardia <60
    • Dose: 0.01-0.03 mg/kg IV or ET

• **Naloxone** (0.4 mg/mL)
  – Treatment for respiratory depression in infants whose mother has been given narcotics
    • Dose: 0.1 mg/kg IV or ET
Resuscitation meds

• **Sodium bicarbonate** (0.5 mEq/mL)
  – Given only if high suspicion of metabolic acidosis or as a last ditch effort for resuscitation
  – Ventilation must be adequate otherwise could cause/worsen respiratory acidosis
  • Dose: 2 mEq/kg IV over 2 minutes
Resuscitation meds

• **Volume expanders** (NS, LR, Albumin)
  – Only given cautiously if hypovolemia or hemorrhage known or highly suspected
  • Dose: 10 mL/kg IV over 5-10 minutes repeated as needed

• **Dopamine**
  – Inotropic/vasopressor support
  • Dose: 2-20 mcg/kg/min IV infusion
Consider

- **Dextrose**
  - For newborns of diabetic mothers, LGA, or post-term infants
    - Dose: 0.5-1 g/kg IV of D25 or D10 infused over several minutes
Review

• PPV is the single most effective measure in neonatal resuscitation
• Assess HR, respiratory effort, and color every 30 seconds
• Take action if any these is abnormal
• O2 if cyanotic
• PPV if respiratory effort abnormal or 60<HR<100
• PPV/Chest compressions/epinephrine if HR<60