Chapter 34
Neonatal Resuscitation

Chapter Goal
- Utilize assessment findings to formulate field impression & implement treatment plan for resuscitation of neonatal patients

Learning Objectives
- Define newly born, neonate, & infant
- Identify important antepartum factors that can affect childbirth
- Identify important intrapartum factors that can cause newly borns to be high risk
- Identify factors that lead to premature birth & low-birth-weight newly borns
- Distinguish between primary & secondary apnea
Learning Objectives

- Discuss pulmonary perfusion & asphyxia
- Identify primary signs utilized for evaluating newly borns during resuscitation
- Formulate appropriate treatment plan for providing initial care to newly borns
- Determine when ventilatory assistance is appropriate for newly borns
- Determine when chest compressions are appropriate for newly borns

Learning Objectives

- Determine when endotracheal intubation is appropriate for newly borns
- Determine when vascular access is indicated for newly borns
- Determine when blow-by oxygen delivery is appropriate for newly borns
- Discuss initial steps in resuscitation of newly borns

Learning Objectives

- Discuss effects of maternal narcotic usage on newly borns
- Discuss appropriate transport guidelines for newly borns
- Determine appropriate receiving facilities for low- & high-risk newly borns
- Describe epidemiology, including incidence, morbidity/mortality, risk factors, & prevention strategies for meconium aspiration
Learning Objectives

- Discuss pathophysiology of meconium aspiration
- Discuss assessment findings associated with meconium aspiration
- Discuss management/treatment plan for meconium aspiration
- Describe epidemiology, including incidence, morbidity/mortality, & risk factors for premature newly borns
- Discuss pathophysiology of premature newly borns

Learning Objectives

- Discuss assessment findings associated with premature newly borns
- Discuss management/treatment plan for premature newly borns

Introduction

- Newly born
  - First minutes to hours of life
- Neonate
  - First 28 days of life
Risk Factors

- Classified by:
  - Birth weight
  - Gestational age
  - Neonatal outcome

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Risk Factors

- Factors contributing to ↑ infant mortality rates
  - ↓ Placental perfusion
  - Infection
  - Maternal complications of pregnancy
  - Lack of prenatal care
  - Complications involving placenta, cord, membranes
  - Teenage mothers
  - Narcotic use by mother

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Adjustment to Extrauterine Life

- Respiratory system
  - As chest emerges from birth canal, fluid squeezed from lungs; thorax recoils; air enters airway

- Circulatory system

- Thermoregulation
  - Most critical to survival

- Hemopoietic system
  - Depends on amount of placental transfer of blood
Adjustment to Extrauterine Life

Changes in circulatory system at birth

Prenatal circulation  Postnatal circulation

Care of Newly Born in Distress

- Apgar scoring system
  - Appearance or color
  - Pulse
  - Grimace or irritability
  - Activity or muscle tone
  - Respiration

- Numerical rating
  - 7–10 = mild or no distress
  - 4–6 = moderate distress
  - 0–3 = severe distress
Meconium-Stained Amniotic Fluid

- **Meconium**
  - Thick, greenish-black material expelled from intestine shortly after birth

- **Aspiration syndrome**
  - Meconium inhaled
  - Possible airway obstruction
  - Severe aspiration may lead to respiratory failure

Comparison of Preterm & Full-Term Newly Born

**CLINICAL EVALUATION**

**Preterm**
- The preterm infant is a "premature" baby, born before the 37th week of gestation.
- The head is large in proportion to the body, the skin is thin, and the skin may appear orange.
- The infant may have more body fat.

**Term**
- The term infant is born at or near the 37th week of gestation.
- The skin is smooth, and the head is more likely to have a caput succedaneum.
- The infant has more body fat.

Comparison of Preterm & Full-Term Newly Born

**CLINICAL EVALUATION**

**Preterm**
- The preterm infant's skin is more likely to be red and translucent.

**Term**
- The term infant's skin is more likely to be firm and well-developed.

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Preterm/Premature Newly Borns

- Born <37 weeks’ gestation
- Incidence
  - Lower socioeconomic class
  - Multiple pregnancies
  - Pregnancy-induced hypertension
  - Placental problems
- Outlook
  - Related to state of physiological/anatomical immaturity

Preterm Newly Borns

- Distinct characteristics
  - Small, scrawny appearance
  - Proportionately large head compared to body
  - Bright pink, possibly translucent skin
  - Soft, pliable ear cartilage
  - Smooth soles & palms
  - Soft bones of skull & ribs
  - Eyes may be closed
  - Inactive/slistless
  - Absent, weak, or ineffectual sucking/swallowing/cough ability
  - Unable to maintain body temperature

Other Neonatal Emergencies

- Apnea of prematurity
  - Usually <30 weeks’ gestation
  - Periodic breathers
    - Lapse of spontaneous breathing for ≥20 sec
- Respiratory distress syndrome
  - Primarily related to developmental delay in lung maturation
- Bronchopulmonary dysplasia
  - Chronic lung disease
Other Neonatal Emergencies

- Hypovolemia/dehydration
  - Suspect if newly born does not respond to resuscitation
  - NS or LR 10mL/kg slow IV push over 5-10 min

- Hypoglycemia
  - Check blood glucose level is altered LOC
  - Only use 10% dextrose and water

- Sepsis
  - Generalized bacterial infection

Transport

- Neonatal ICU
  - Level I facility
  - Level II facility
  - Level III facility

Summary

- Premature newly borns at ↑ risk of:
  - Respiratory distress
  - Hypothermia
  - Head & brain injury

- At birth, 3 physiological adaptations necessary for survival:
  - Empty fluids from lungs; begin ventilation
  - Change circulatory patterns
  - Maintain body temperature
Summary

Priorities of neonatal resuscitation
- Prevent heat loss
- Clear airway by positioning & suctioning
- Provide tactile stimulation & initial breathing
- Further evaluation

If newly born’s condition gets worse, endotracheal intubation & drug administration may be required

Summary

Complications during post-resuscitation phase include endotracheal position change to include:
- Dislodgement
- Tube occlusion by mucus/meconium
- Pneumothorax

Maintain body temperature, O₂ administration, ventilatory support of newly born during transport

Summary

ALS may be required for:
- Respiratory disorders
- Cardiovascular disorders
- Gastrointestinal disorders
- Seizures
- Fever
- Hypothermia
- Hypoglycemia

Be aware of normal feelings/reactions while providing emergency care to ill or injured child