Transporting the Sick Neonate
Intrafacility & Interfacility

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Objectives

• Define goals of NRP and the S.T.A.B.L.E Program
• Identify techniques to increase safe care when transporting sick infants in the hospital setting and from outside hospital setting
• Explain importance of effective communication
• Identify appropriate equipment and supplies needed for transport
• List potential problems that interfere with neonatal transport
• Identify potential complications transporting sick neonates
The S.T.A.B.L.E Program

- All hospitals need to prepare for the resuscitation, stabilization and transport of sick and premature infants.
- A uniform, simple standardized process of care and a comprehensive approach can improve the overall outcome of the infant’s survival.
- The goal of all neonatal transport is to transport a well stabilized infant.
The S.T.A.B.L.E Program continued

- Designed for hospital settings, birth centers and emergency departments
- **ABCs/NRP 1st → S.T.A.B.L.E.**
  - Sugar
  - Temperature
  - Airway
  - Blood pressure
  - Laboratory findings
  - Emotional support
The S.T.A.B.L.E Program continued

- Adapting S.T.A.B.L.E principles to home birth environment
- Parent education with prenatal care
  - If prematurity is suspected → go to nearest hospital if possible and call for help
  - If birth is imminent:
    - Perform initial steps of resuscitation
    - Ensure patent airway
      - Remove secretions with clean cloth or bulb syringe
    - Provide warmth
      - Kangaroo care, hats, blankets
    - Feed (if able)
Intrafacility Transport

- Preparation
- Assess infants stability
- Effective communication and staffing
  - Communication devices
  - Does the receiving unit/department know you are coming?
  - What is the path you will take and how long will it take to get there?
  - How long do you expect to be there?
Intrafacility Transport  continued

• Transport isolette
• Blankets and hats
• Plastic bag
• Bulb syringe
• Monitoring devices
  ▫ CR monitor/pulse oximeter, stethoscope
• Medications (feeding, IVFs, etc)
• Documentation record
Intrafacility Transport continued

- Portable O₂ and medical air tanks- ✓ tanks
- O₂ blender
- T-piece resuscitators
  - provides consistent pressures with mask
- Portable ventilator
- Supplies necessary for preterm, VLBW neonates
Transport Isolette
The Golden Hour
Potential Complications Transporting the Sick Neonate Intra and Interfacility
Potential Complications Transporting the Sick Neonate Intra and Interfacility continued

- Alteration in airway
  - Respiratory distress, pneumothorax, respiratory failure, asphyxia
- Hypoglycemia
- Hypothermia
- Shock
  - Hypovolemic
  - Cardiogenic
  - Septic
Potential Complications

Transporting the Sick Neonate  

- **Intraventricular Hemorrhage (IVH)**
  - **Background information**
    - Periventricular area
    - Lines the outside of the lateral ventricles in the brain
    - Contains a rich network capillaries that are extremely thin and fragile and rupture easily
    - Ruptured periventricular capillaries cause blood to build up in the surrounding area (hemorrhage)
    - The size and severity of the hemorrhage is defined as a grade 1, 2, 3, or 4
IVH

- **Grade 1**
  - Periventricular hemorrhage
    - Hemorrhage in the periventricular germinal matrix
- **Grade 2**
  - Intraventricular hemorrhage
    - Hemorrhage extends into the inside of the ventricles
- **Grade 3**
  - Intraventricular hemorrhage with enlargement of the ventricles
- **Grade 4**
  - Parenchymal hemorrhage
    - Hemorrhage extends into the surrounding cerebral tissue
GRADES I–IV: Periventricular-Intraventricular Hemorrhage

Grade I - Subependymal hemorrhage only

Grade II - Intraventricular hemorrhage without ventricular dilation

Grade III - Intraventricular hemorrhage with ventricular dilation

Grade IV - Intraventricular hemorrhage with parenchymal hemorrhage
IVH

Risk Factors and Associated Clinical Factors

- **Prematurity** (<34wks)
- RDS requiring ventilatory support
- **Asphyxia**
- Maternal general anesthesia
- **Low 5-min. Apgar**
- Low birth weight
- Acidosis
- **Hypo/Hypertension**

- Low hematocrit
- Pneumothorax
- PDA ligation
- **Transport**
- Rapid volume expansion
- Rapid administration of NaHCO₃

(Verklan, 2010)
IVH

- Incidence
  - 30-40% of infants who
    - Weigh <1500 grams
    - ≤ 30 weeks gestation
  - Risk increases as gestational age decreases
  - Rapid onset
    - 50% occur by 24 hours of age
    - 90% occur by 72 hours of age
    - 99.5% have occurred by 7 days of age
      (Verklan, 2010)
IVH

- Signs and symptoms
  - A’s and B’s
  - Oxygen desaturation
  - Metabolic acidosis
  - ↓ hematocrit
  - Hypotonia
  - Shock
  - Hyperglycemia
  - Tense anterior fontanelle

- Symptoms of worsening hemorrhage
  - Full, tense fontanelles
  - ↑ ventilatory requirements
  - Seizures
  - ↓ LOC

- Some infants have not apparent symptoms
IVH

- **Diagnosis**
  - **Head ultrasound**
    - 3 and 7 days of life
    - Abnormal → repeat in 2 weeks
IVH • Prevention and patient care

- Prevent
  - Preterm birth
  - Asphyxia
  - Birth trauma
- Minimal stimulation (physical and environmental)
  - Prevent fluctuations in vital signs (BP)
- Clustering of care
- Provide pain management
- Fluid volume therapy
  - For hypotension
- Monitor blood gases and treat appropriately
- Ventilator management
- Monitor for signs of hemorrhage
- Careful head positioning
- Educate and support parents
IVH

- **Outcomes**
  - **Small Hemorrhage**
    - 10% have a major neurodevelopmental disability
  - **Moderate Hemorrhage**
    - 40% have a major neurodevelopmental disability during infancy
    - 10% mortality rate
    - Less than 20% have progressive hydrocephalus
  - **Severe Hemorrhage**
    - 80% have a major neurodevelopmental disability
    - 50-60% mortality rate
    - Hydrocephalus is common among survivors (Verklan, 2010)
Summary

• Initial stabilization is critical
• Maintain a well stabilized infant
• Plan and preparation for transport
  ▫ Parent prenatal education
• Effective communication
• Ongoing care
• Parent education and support
References


