THE ROLE OF A RESPIRATORY THERAPIST IN THE DELIVERY ROOM

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OBJECTIVES

• UNDERSTAND:
  1. The role of the lungs in the transition to extra-uterine life
  2. The role and importance of the Respiratory Therapist in the Delivery Room
  3. The Potentially Better Practices (PBP) that improve outcomes in the DR

Disclosure

• Nothing to disclose.
TRANSITION TO EXTRAUTERINE LIFE

- Immediate Newborn transition is a time of great physiologic adjustments and many infants need assistance to make a successful transition to newborn life.

- Assisted ventilation is the most important intervention performed during this transitional period.
ACOG Committee Opinion No 433 -May 2009

- Personnel other than the surgical team should be immediately available to assume responsibility for resuscitation of the depressed newborn infant
- The surgeon and anesthesiologist are responsible for the mother and may not be able to leave her care for the care of the newborn even when a regional anesthetic is functioning adequately
- Individuals qualified to perform neonatal resuscitation should demonstrate the following
  - Proficiency in rapid and accurate evaluation of the newborn’s condition including APGAR scoring
  - Knowledge of the pathogenesis of a depressed newborn (acidosis, drugs, hypoglycemia, trauma, anomalies, and infection), as well as specific indications for resuscitation
  - Proficiency in newborn airway management, laryngoscopy, endotracheal intubation, suctioning of airways, artificial ventilation, cardiac massage, and maintenance of thermal stability

History of Respiratory Therapy

- In the 1940s in Chicago, Illinois, a group of oxygen-tank technicians began meeting with doctors concerned with lung disease. This group named itself the Inhalational Therapy Association (“ITA”) in 1946. They gradually put together a series of classes for people administering medical gases to patients. In December, 1950, 31 members of the Association were issued certificates for attending 16 lectures. This was the first certification of “Inhalation Therapists." (Burton) It was an on-the-job training system for so-called “oxygen junkies". They had little formal education, but did have a desire to do their jobs better and help patients in the process.

ROLE OF RESPIRATORY THERAPIST IN THE NICU

- Respiratory therapists play a very valuable role in the care of your baby that begins in the delivery room and the NICU. The respiratory therapists at Children’s Hospital & Medical Center assess, treat and monitor babies with heart and lung (cardiopulmonary) problems that may require breathing assistance with a ventilator or initiation of medical gases. They will set up and monitor your baby’s ventilator, provide oxygen therapy and medical gas therapy for babies with specific kinds of lung or heart problems, and provide chest percussions and inhaled steroids and bronchodilators. If your baby is intubated (assisted with a breathing tube) and needs to be transported to other areas of Children’s for tests, a respiratory therapist will accompany your baby to monitor his or her ventilator.
DR Respiratory Intervention: 2week Pilot at UH

PULMONARY FUNCTION

- Improvement in oxygenation and ventilation
- Fluid filled lungs needs to be replaced with air
- Establishment of FRC
- Increase in pulmonary blood flow
- HR is the most important objective indicator of the status of an infant immediately after birth
  (Increase HR means good transitioning or effective resuscitation while Low HR is a sign that assisted ventilation is needed or ineffective)

HOW THE RT CAN HELP

- Skill acquisition is critical
  - observation skill of adequate chest rise; use of pressures that produce easily visible chest rise may be excessive (Lung Injury)
  - Role of colorimetric end tidal CO2 detection device
  - Provision of positive pressure in DR (BMV vs T-piece)
  - Face Mask application: Efficiency; amount of leak around the mask and Negative impact from too much pressure
HOW THE RT CAN HELP

- Lung Injury Prevention: Goal is to provide the amount of ventilation that is needed to help a baby transition after birth while causing the least amount of lung injury
  - Prevention of Barotrauma
  - Prevention of Volume trauma
  - Maintain FRC
  - Role of PEEP

HOW THE RT CAN HELP

- Oxygen: The fetus has survived in an environment with SPO2 as low as 30%; with development occurring in PaO2 as low as 15 – 20mmHg and SPO2 of 45 to 55%
- Antioxidants and Oxidative stress
- Assisted ventilation with 100% oxygen immediately after birth has been associated with increased risk of childhood lymphocytic leukemia.
- Risk of cancer higher if manual ventilation lasted for 3 minutes or more
Target pre-ductal Oxygen Saturation after birth

- 1 min 60-65%
- 2 min 65-70%
- 3 min 70-75%
- 4 min 75-80%
- 5 min 80-85%
- 10 min 85-95%

Oxygen Administration

- Use of Blender when administering oxygen
HOW THE RT CAN HELP

• CPAP- Several trials have compared early CPAP with early intubation and surfactant; no benefit seen with routine intubation or surfactant administration

• DR CPAP is the application of either nasal prongs or mask providing positive end expiratory pressure (PEEP), without the administration of positive pressure breaths, within 5 minutes of life

HOW THE RT CAN HELP

• HIGH-FLOW THERAPY
  - Flow delivered to the newborn by means of nasal cannula has been used for decades
  - HHFNC: humidified and optimally warmed resp gas is given via NC at flow rates between 2 and 8 LPM
  - Advantages: Should prevent airway water loss, airway cooling, thickened secretions and nasal irritation, due to lighter interface might lessen nasal septal damage. (Tested in Lab; no + or – effects in Newborn Resp system
  - Disadvantages: PEEP pressure is variable and unpredictable . Positive airway pressure is unregulated
  - Clinical effects on pulmonary function evolving

HOW THE RT CAN HELP

• Intubation- Endotracheal intubation is indicated when the infant remains apneic despite adequate noninvasive ventilation
  - Note that intubation attempts greater than 30secs associated with increase frequency of bradycardia and desaturations
Table 1

Respiratory Care/Reflex Hues/Respiratory Care RUTGERS/CH-RES/1139

Induction and Exclusion Criteria

- Severe CHF or CCF
- Severe hypoxemia
- Targeted pain during resuscitation

Criteria for Intubation

- Criteria for Reverse Tidal Volume in the NICU setting: 44 mls of Age

Ventilator Management

1. Initial settings—Conventional ventilator

2. Management

Weaning from Mechanical Ventilation

Exhalation Guidelines

- age

1. Indications
2. Initial settings
3. Weaning suggestions

Re-intubation Criteria

This is an abbreviated version of the original version of the playbook. Please refer to the full playbook for the fully detailed version.