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Care of the Infant with RSV in the NICU

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MASSACHUSETTS
Health & Hospital
ASSOCIATION

Monday, December 19, 2022

12:30 p.m.

Faculty

- **Estevan Garcia, M.D., DPH, MPA, FAAP**, Chief Medical Officer, Massachusetts Department of Public Health
- **Anne Hansen, M.D.**, Medical Director, Neonatal Intensive Care Unit, Boston Children's Hospital;
- **Kevin J. Bullock MS, RRT-NPS**, Director, Respiratory Care & ECMO Program, Boston Children's Hospital;
- **Cheryl Toole, R.N.**, Senior Director, Nursing and Patient Care Operations, Neonatal Intensive Care Unit and Maternal Fetal Care Center, Boston Children's Hospital;
- **Denise Casey R.N., MS, CCRN, CPNP**, NICU Nurse Practice Specialist, Boston Children's Hospital

Objectives

1. Discuss nursing-care-related issues for non-traditional NICU patients;
2. Identify non-traditional patients that may benefit from NICU admission;
3. Discuss respiratory-support-related interventions for non-traditional NICU admissions; and
4. Assess how a non-traditional NICU admission protocol might be implemented in your health system.

CARE OF INFANTS WITH RSV IN THE NICU

DECEMBER 19, 2022

Boston Children's Hospital NICU

- ❖ **Anne Hansen, MD, MPH** - *Medical Director, NICU*
- ❖ **Kevin Bullock, RT, MS, RRT-NPS** - *Director, Respiratory Care & ECMO Program*
- ❖ **Cheryl Toole, MS, RN, CCRN-K, NEA-BC** - *Nursing Director, NICU*
- ❖ **Denise Casey, MS, RN, CCRN, CPNP** - *Nurse Practice Specialist, NICU*

SUPPORTIVE CARE

- ❖ Respiratory
- ❖ Infectious
- ❖ Fluid and Nutrition
- ❖ Sedation management

RSV MANAGEMENT: RESPIRATORY

- Escalate support to achieve goal sats 95-99%, mild respiratory acidosis, comfortable WOB
 - LFNC O₂
 - HFNC O₂ (4 - 10 L/min of flow up to 2L/kg/min) humidification, adjust FiO₂ to achieve O₂ sat goal
 - CPAP (5 – 10 cm H₂O), adjust FiO₂ to achieve O₂ sat goal
 - (consider NIPPV for additional respiratory support, especially in setting of mild apnea)
 - Mechanical ventilation – lung protective (Pressure limited modes, adjust to goal blood gas of ~ 7.30-7.40/50's/>90)
- Frequent suctioning (at least q 4 hours), consider lidocaine via ETT may inhibit paroxysmal cough
 - Frequent position changes for postural drainage, chest PT if needed (may prompt coughing)
- Albuterol nebs PRN for wheezing (not recommended by 2014 AAP guidelines)
- NS nebs PRN for secretion mobilization
- (steroids, epinephrine and hypertonic saline nebs NOT recommended)

LFNC

- Limited oxygen delivery as a low flow, variable device
 - Dependent on rate, pattern and depth of breathing
 - Max 30-40% FiO₂
- Generally cannot exceed 6 L/min without back pressure and mucosal drying
- More comfortable front-line and temporizing intervention until other resources available

HFNC

- Better humidification at higher flow rates, 100% relative humidity
- Start at 2L/kg/min
- Provides higher FiO_2 by exceeding inspiratory flow demand and creating a reservoir in the upper airways
- Anatomic dead space washout can help improve WOB
- Should not be considered delivery of positive pressure, particularly for large infants and older children
- Wean FiO_2 to 30% or less before weaning
- Feeding is tolerated with HFNC, rare adverse events

CPAP / NIPPV

- No improvement with max HFNC, consider NIV
- CPAP to aid in lung expansion and oxygenation (5-10 cmH₂O)
 - generally nasal prong/mask less than 1 yr of age
 - Nasal-oral (full face) mask for > 1yr of age
- NIPPV
 - Can be done with ventilator and nasal prongs
 - Unload WOB, aid in oxygenation
 - Triggering can be difficult, set rate high enough to support

MECHANICAL VENTILATION

- Time constant management for efficient ventilation/oxygenation
 - Resistance (in and out)
 - I:E ratios
 - Slightly longer inspiratory times for laminar flow
 - Compliance
 - PEEP
- Pressure limited modes preferred due to dynamic changes in resistance and compliance
 - PC – slightly easier to tease out resistance vs compliance issues
 - Frequent assessment of volume changes
 - Consistently reliable flow waveform
 - PRVC
 - Will regulate peak
 - Fixed minute ventilation (unless limiting too frequently)
 - Careful of PIP creep

RSV MANAGEMENT: INFECTIOUS

- Contact precautions
 - Gown, gloves (masks in setting of background COVID)
 - Hand hygiene
- If afebrile with typical course, no need for bacterial sepsis evaluation or antibiotics
- If fever or lack of timely improvement (over 2 – 7 days), rule out bacterial infection
 - CBC, CXR
 - Blood culture
 - Urine culture
 - Respiratory culture if intubated

RSV: FLUID AND NUTRITION

- Initial need for fluid resuscitation depends on hydration status on presentation
- Once euvolemic, provide IV vs enteral nutrition/hydration at maintenance. Avoid over-hydration with risk of pulmonary edema
 - IVF: 100 mL/kg/day (more if fever, decreased oral intake)
 - Enteral feeds: 150 mL/kg/day or match estimated baseline, adjust for perceived hunger
- Decision regarding IV vs enteral depends on degree of cardiorespiratory instability
 - If concerns for unstable oxygenation, blood pressure or impending need for endotracheal intubation, treat with IVF (PN if $> \sim 3$ days)
 - If stable oxygenation and BP with respiratory status captured, start NG feeds while on positive pressure ventilation (HFNCO₂, CPAP or mechanical ventilation), or if respiratory distress including tachypnea with RR > 60

RSV: PAIN & SEDATION MANAGEMENT

- Non invasive support does not typically require sedation
- Intubation: Recommend RSI (atropine, versed, fentanyl, rocuronium)
- Sedation to tolerate mechanical ventilation. (monitor with pain and SBS and scores. SBS of -1 to -2 during acute illness, 0 to -1 as approaching extubation)
 - Morphine: Typical starting dose 0.05 mg/kg/hr
 - if ongoing distress due to pain, increase by 10% until achieve goal SBS and pain score
 - Versed: Typical starting dose 0.05 mg/kg/hr
 - if ongoing distress due to agitation, increase by 10% until achieve goal SBS

RSV: PAIN & SEDATION WEANING

- < 5 days of MSO4 and/or versed, can discontinue both without weaning, if clinically indicated
- 5-14 days of MSO4 and/or versed, wean versed 10% BID as tolerated to off, then same for MSO4
- > 14 days of MSO4 and/or versed, wean versed 10% q day as tolerated to off, then same with MSO4
- Monitor for withdrawal with NAS scoring

RSV MANAGEMENT IN THE NICU

- If you have questions or need help, call us!
- (617)355-0718 (attending line)