Reducing Chronic Lung Disease in VLBW Infants

Advocate Children’s Hospital, Oak Lawn, IL USA

Brett Galley M.D.; Corryn Greenwood M.D.; Phyllis Lawlor-Klean, RNC, MS, APN/CNS; Debra Skopec, RNC, BSN; Traci Wolfe, BS, RRT-NPS

Contact: Debra.skopec@advocatehealth.com, 708-684-4183

Keywords

CPAP, NIV, CLD, FRC, DR, Delivery Room

Aim

Reduce Chronic Lung Disease (CLD) rate from 22% to 12% (or VON 1st quartile) in infants <1500g by March 1 2015 with ongoing reduction by July 2015 by using PDSA cycles and a multidisciplinary team to standardize nCPAP use.

Setting

44-bed Level IV (Level IIIC in IL) pod-design, teaching Children’s hospital NICU with 4,012 deliveries and 684 NICU admissions in 2013 and 3,348 deliveries and 651 NICU admissions in 2014.

Mechanisms/Background

Our incidence of CLD is near the VON mean (goal = VON 1st quartile). We recognize, at our institution, no standard process exists for ventilator management and that nCPAP is frequently disrupted for assessments and equipment repositioning. Current literature suggests that a formalized protocol would alleviate the varied practices and enhance meeting our goal. We also hypothesized standardizing our team approach would reduce the disruption of nCPAP.

A protocol for initial ventilatory management, nCPAP in the Delivery Room, and intubation/extubation criteria was developed using evidence based practices followed by staff education.

A tool was developed to evaluate our protocol adherence and outcome measures. A retrospective chart review and a before-after design analysis was utilized to examine the results on a monthly basis.
Drivers of Change

Methods

- January 2014 - Joined NICQ Next – Minimizing Lung Injury Homeroom
- April 2014 - Developed delivery room nCPAP protocol
- April 2014 – Two parent advisers recruited to become an integral part of our team
- May 2014 - Evaluation of current usage of nCPAP devices and availability of equipment
- June 2014 - Educated staff regarding new protocol
- June 2014 - Development of a tool to evaluate new protocol
- July 2014 - Determined a core group of respiratory therapists
- August 2014 - Initiated CPAP Buddies concept to staff and determined nCPAP Super Users
- August 2014 - Implemented a “rounding pattern” to better partner with respiratory therapy
- September 2014 - Evaluation of staff in new protocol
- February 2015 - Test of Change on infant first touch in Delivery Room
- February 2015 - Initiated the revision of delivery room management documentation form
- March 2015 - Revised CPAP Buddies skin care components
- April 2015 - Staff education on skin care changes
- May 2015 – Boston Homeroom update
- June 2015 – Team and staff debrief
- Ongoing data collection
Measures

Our Performance measures include the rate of CLD, reasons for intubation, and ventilator days. Our Balancing measures were also included to assure there were no adverse effects. These include the rate of air leak, severe IVH, pulmonary hemorrhage, and morbidity.

Results

Our CLD rate decreased from 22% to 7.5%. 89% of the infants born after the protocol initiation received a trial of nCPAP in the DR compared to 25% pre-implementation, and the rate of intubation was reduced by 16%. Our rates of balancing measures have not increased and the morbidity remains low. Of note our time to extubation is trending upward therefore we will be evaluating the adherence to our extubation criteria.

![Outcome Chart]

Run charts will be presented in our poster with the most current data available.

Discussion/Implementation for Practice

By standardizing ventilator management, CLD can be reduced. Most of our infants were extubated within 48 hours, but it may be possible to reduce our total time of ventilation further. Our subsequent PDSA cycles will focus on developing a data collection tool to address this area. Confounding maternal factors may also affect outcomes. While data suggests most of our intubated infants are extubated within 48 hours, it may be possible to reduce total time of mechanical ventilation further, therefore, our future work will focus on compliance to our extubation guidelines.

Parent Involvement

Parent involvement has been an ongoing challenge. One step we took to improve this was our Kangaroo-A-Thon, which was a success at 419 hours and has brought us closer to the family centered care we are striving for. We are continuing with initiatives to further the parent child dyad.

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