Evidence-Based Practice: Neonatal Topics

Evidence-Based Practice Scholars: Neonatal Topics

Wednesday, October 14, 2009 & Wednesday, November 11, 2009

Brandi Raverty, RN, BS
“Neonatal Statlock”

Kathy Parrish, BSN, RN, HN-BC, CLC
“Implementing Developmental Care Practices on Admission to the NICU to Decrease Stress in the Neonate”

JoAnn Johnson, RN
“Does Noise Reduction Benefit Physiological Stability in the Pre-term Infant?”

At the end of this presentation, the learner will be able to:
1. Discuss the process used for exploring evidence-based practice.
2. Articulate key findings of this exploratory work.
3. Describe several proposed clinical changes based on evidence.

Accreditation

Children’s Hospitals and Clinics of Minnesota is accredited as a provider of continuing nursing education by the American Nurses Credentialing Commission on Accreditation.

Children’s Hospitals and Clinics of Minnesota designates this educational activity for 0.5 continuing education hour.

Introduction

Brandi Raverty, RN, BS
St. Paul NICU 3 years
- Unit Council, Transport Team
Past Nursing experience
- Labor and Delivery - 4 years
- Children’s Minneapolis - 4 years
- Desire to make constructive change, not just complain!
- Never stop asking why.
- Passion for education.
Is there something we can do better about the Peripheral IntraVenous (PIV) access of our patients?
- Decrease the number of pokes?
- Prolong the duration?

Does the use of the StatLock© to secure PIVs in neonatal patients increase the life of the PIV as compared to the traditional taping method?

Searching for Evidence

- **Databases used**
  - PubMED, Cochrane Collaboration, CINAHL, Joanna Briggs
- **Search Terms**
  - Neonatal, infant, catheter securement, venous catheter device, stabilizing device
- **Evidence** is adult focused, some pediatric studies
- **Lack of Neonatal research**

The StatLock© had statistically significant reduction in PIV complications in adults (Schears, G, 2006; Smith, 2006; Frey, 2006; Shippard, 1999)

Neonatal Skin Integrity

- Use semipermeable dressings and/or breathable barriers to anchor PIVs (Lund, Kuller et al., 2007)

Nursing Implications

- Many nurses may feel that catheter securement has no significant impact on patient care, their way of taping is best (Frey, 2006)
Recommendations

Based on the evidence, I recommend the St. Paul NICU try the StatLock© IV Ultra Neonate stabilization device.

Recommendations

- Get positive staff on board!
  - Utilize management, unit council, clinical educators, product representatives, proficient PIV starters
  - Easy to use documentation to follow product use and evaluation

Recommendations

- Provide thorough education prior to and after implementation
  - Hands-on product demonstration
  - Easily accessible references (poster, power point, written)
  - Bedside support for the change in practice
  - Superusers

Evaluation of the EBP process

- Wow! I thought it would be easier!
- Literature search
  - Can we say confusing!
- A reinforced respect for research.
- The graduate school bug is here...
- What is the next question I have...

Evaluation of the EBP process

- The most difficult part is fitting 8 weeks worth of learning into a 10 minute presentation!

Thank you

- I am honored to have participated in this program. I look forward to using the EBP model to further enhance the exceptional care we provide for our patients, everyday!
Neonates experience multiple procedures and interventions during a time when they are physiologically unstable and emotionally vulnerable.

Background

Admission Goals

- Minimize stress and conserve energy
- Establish and maintain airway, adequate oxygen, and circulatory support.

Physiologic responses

- Increased heart rate and blood pressure
- Increased motor stress behaviors
- Changes in stability and reorganizational behavior
- Hypoxia
- Increased intracranial pressure

Risks for IVH

Contributing factors:
- Rapid fluctuations in oxygenation and blood pressure
- Overwhelming stimuli
- Suctioning
- Unrelieved pain
- Hypothermia

Emotional Impact of Admission

Trust versus Mistrust
- Neonates learn to develop trust in themselves through the response of the environment
- During caregiving, the infant associates the caregiver with either comfort and trust or with lack of need satisfaction or mistrust.
**PICO Question**

During the admission process, do neonates cared for with a developmental care bundle exhibit decreased signs of stress when compared to neonates admitted using current practice as evidenced by vital signs and oxygen saturations within normal limits, softly-flexed normal tone, and steady sleep or awake states?

**Objective**

To evaluate the evidence that developmental care interventions can reduce stress during the admission process.

**Search Strategies**

Terms researched:
- NICU admission
- nursing procedures NICU
- neonate
- stress
- developmental care
- sucrose
- pain
- NICU light and noise
- prematurity
- preterm infant
- positioning

**Current Practice**

No standard of care for developmental care practices in the NICU

Most babies admitted under bright lights for visualization, positioned supine for easy access, as multiple procedures/interventions done.

**Developmental Care**

- Concept introduced (Als, 1986) and reported that developmental care reduces stress in neonates
- Individualized care based on a relationship between baby and caregiver
- Goal of developmental care is to “reduce the discrepancy between womb and NICU environment”

**Principles of Developmental Care**

- Individualized adjustment of all timing and implementation of all procedures
- Slowed tempo of all caregiving interventions
- Provide well-supported relaxation periods
- Observe behavior and stress cues and adjust caregiving
**Principles of Developmental Care**

- Support flexed, mid-line positioning
- Decrease stimulation by decreasing visual and auditory stimuli
- Comforting loving touch
- Parents are active participants

**Developmental Care Interventions**

- Environmental modifications
- Individualized caregiving modifications
- Family-centered care

**Evidence**

- Developmental care significantly decreases pain scores and hypoxic events during diaper changes. (Sizun et al 2002)
- Infants demonstrate increased response to subsequent painful experiences. (Porter et al, 1998)

**Evidence**

- Increasing lighting over sleeping 26 to 37 week infants significantly decreases oxygen saturation. (Shogan and Schumann, 1993)
- Incubator covers improve quality of quiet sleep. (Hellstrom-Westas, 2001)
- A "Quiet" period of decreased lighting, sound and caregiver handling results in reduced heart rate, reduced blood pressure, infant movements, decreased crying, and increased sleep. (Blackburn and Patterson, 1991, Slevin, 2000, Strauch et al, 1993)

**Evidence**

- Non-nutritive sucking is associated with improvement of sleep states and decreased stress behaviors (Pinelli, 2009)
- Sucrose reduces stress and pain (Stevens et al 2004, Heaton and others, 2007)
- Ventilated premies positioned prone have less crying, more quiet sleep and fewer stress responses. (Chang and others, 2002)

**Evidence**

- Swaddling/containment hold equally effective in decreasing pain response to heelstick
A developmental care bundle is beneficial for relieving stress in neonates during the admission process. The recommendation is that a clinical standard be developed to include a developmental care bundle that will be implemented for all babies during the admission process to the NICU.

**Nursing Interventions**

- Admission beds will be set up with developmentally appropriate positioning materials.
  - 2 frogs
  - Snuggle-up in appropriate size
  - Pacifier
  - Oral sucrose
  - ZFLO if needed.

- Infants will be positioned in tucked, flexed position as soon as possible during admission.
- When an intervention requires a change in position, return infant to tucked flexed when possible.

- Assign Father of baby or nurse for containment hold
- Provide small blanket to cover head of bed to protect baby’s eyes from light

- Reminder signs posted to move conversation away from bedside/dim lighting
- Pacifiers offered for comfort, pain and stress reduction
- Oral sucrose use for procedures (baby meets guidelines)
...while it is good to do the right thing, it is better to do the thing right...

References


There are 10 references listed in the references section of the document, each providing evidence-based practice insights into neonatal care topics. The references cover a range of studies from 1993 to 2008, demonstrating the evolution of knowledge and best practices in neonatal care during this period.
**PICO Question**

Does noise reduction benefit physiologic stability in the preterm infant?

**Searching for the evidence**

- Cochrane Collaboration, EBSCO Host, and CINAHL and a range of 10 years
- Terms used: Environmental noise, NICU
- Initially, the terms I had used were monitor alarm frequency with noise

**Background Evidence Found**

- Auditory development begins between 20 and 28 weeks.
- The critical period is between 20 weeks and 4 years of age (Graven 2009)
- Fetus is protected from high frequency sounds by mother’s tissue.
- Very early and low birth weight premature infants most at risk for hearing loss
- Sleep necessary for neurosensory development
- Auditory system is dependent on REM sleep

**Evidence Found**

- NICU infant’s sleep is interrupted an average of 132 times in 24 hours. (Levy, 2003)
- Undisturbed sleep periods range from 4.6 to 9.2 minutes!!! (Levy, 2003)
- Post NICU patient hearing loss partially due to irreversible cochlear damage caused by noise exposure in NICU. (Darcy, 2008)

**Evidence Found**

- American Academy of Pediatrics (AAP) recommendations for sound level in nurseries is 45Db
- Noise levels in an NICU range from 70-117Db (Brown, 2009)
Evidence-Based Practice: Neonatal Topics

Evidence Found

- Closing porthole: 73 Db
- Sink faucet: 57 Db
- Conversation: 60 Db
- Radio: 53-62 Db
- Cardiorespiratory alarm: 59 Db
- Ventilator Tube bubbling: 61 Db

Recommendations

- Measure the sound levels in Special Care Nursery
- Survey staff’s perception of noise before implementation
- Collect and analyze data
- Create a plan to reduce noise levels
- Educate staff, including all disciplines

Recommendations

- Create a PFEM for families about sound and effects on infant development
- Install a noise sensitive light alarm
- Assess sound levels regularly and post results
- Create a developmental clinical care standard for neonates with environmental noise recommendations

Evaluation of EBP Process

- Evidence based practice gives a nurse the opportunity to grow professionally, as he/she pursues research.
- Using evidence for our nursing interventions provides quality, safe care for the best outcomes for our patients.
- Share the knowledge of using the EBP process with my peers as they seek answers.

References