

# Abstracts Presented at the 13th National Advanced Practice Neonatal Nurses San Diego, CA, April 21-24, 2016

These are the abstracts for the poster and podium presentations from the recent 13th National Advanced Practice Neonatal Nurses Conference in San Diego, California. They represent a broad range of neonatal issues. By sharing this information, we hope to increase awareness of research and innovative programs within the neonatal health care community, and support evidence-based nursing practice. Some abstracts have been edited for publication.

---

## Using Case-Based Strategies to Engage and Support Student Learning

*Annette Carley, RN, DNP, NNP PNP*

UCSF SCHOOL OF NURSING  
SAN FRANCISCO, CALIFORNIA

Educators continually seek strategies to engage the learner, and effectively support learning. One strategy with a long tradition in nursing education is case-based learning. Carefully constructed case studies can support application of coursework concepts and principles with realistic situations.

One example of case-based learning is a student-generated unfolding case study, recently used to complement content presented in one neonatal pathophysiology course. For this exercise students were expected to generate and sustain a longitudinal story for an infant, developed in segments to parallel cardiovascular, pulmonary, gastrointestinal and neurologic system pathophysiology topics. The course faculty modeled expectations by initiating the storyline, and the students then worked sequentially in pairs to develop weekly ongoing case strands to present to their peers for analysis and online discussion. The ongoing story needed to plausibly evolve, and questions for discussion needed to challenge critical thinking in student peers. The student authors facilitated ongoing discussions and postings were required to be supported by evidence. Students found this exercise to be an effective and engaging way of applying pathophysiology concepts.

This presentation will showcase this and other examples of case-based learning integrated into an advanced practice neonatal nursing program.

---

## Very Low Birth Weight and Lactation: Decreasing Maternal and Environmental Barriers for Improved Infant Outcomes

*Christina Carsello, MS, ARNP-NNP-BC*

*Kris D. Guthrie, RN, IBCLC, RLC*

*Genieveve J. Cline, DNP, ARNP, NNP-BC, CNE, RN-BC*

JOHNS HOPKINS SCHOOL OF NURSING/DNP STUDENT  
SARASOTA, FLORIDA

In the U.S., approximately one in nine births are preterm. A large percentage of those infants suffer from a lifetime of disabilities. To decrease adverse outcomes among preterm births the recommended nourishment is breast milk.

The quality-improvement project, *Very Low Birth Weight and Lactation: Decreasing Maternal and Environmental Barriers for Improved Infant Outcomes*, measures six months of lactation among mothers who delivered VLBW infants receiving postnatal education and supportive lactation services. Information provided includes postnatal education on breast milk's impact upon preterm infants, and initiation of milk expression. Initial postnatal visit to the NICU includes a welcome brochure and meeting with the Lactation Specialist. To gain insight of the maternal experience surveys were conducted at the time of infant's discharge. Maternal milk volumes were monitored throughout the infant's hospitalization. A final analysis between a historical retrospective and prospective cohort to measure whether the length of lactation increases after intervention will be conducted.

The aim of this project is to mitigate the barriers among women who intend to provide human milk for their preterm infants. Successful execution was through an educational and supportive intervention that improved infant outcomes among the very low birth weight infants.

## Breastfeeding the Late Preterm Infant in the NICU: A Case Study of Best Practice Management Strategies

*Carol Chamblin, DNP, APN, RN, IBCLC*

DUPAGE MEDICAL GROUP

GENEVA, ILLINOIS

Breastfeeding the late preterm infant (LPT) presents unique challenges for the NICU clinician. LPT infants are at risk for several immaturity-related complications during the early post-birth that are exacerbated when milk intake during breastfeeding is inadequate. Immature feeding behaviors characterized by not waking to feed, slipping off the nipple and falling asleep quickly, are normal in this population, and contribute to inadequate milk intake. Targeted, proactive lactation interventions specific to this population of infants and their mothers were implemented in a case study of one mother and her 35 week infant son admitted to the NICU for respiratory distress. Best-practice management strategies that proved successful for this mother/infant included: early initiation of human milk expression, monitoring milk volumes, using the nipple shield, employing specific breastfeeding positions, and in-patient monitoring of breastmilk intake with pre/post- test weighing. Post discharge strategies monitored by the lactation staff included continued expression technologies and use of pre/post-test weighing to monitor infant breastmilk intake.

---

## Breastfeeding Promotion for Opioid-Dependent Mother-Neonatal Abstinence Syndrome Infant Dyads: A Quality Improvement Initiative

*Jan Gill, DNP, MSN, APRN, NNP-BC*

WAUKESHA MEMORIAL HOSPITAL

WAUKESHA, WISCONSIN

**Objective:** To promote breastfeeding (BF) for the opioid-dependent-mother (ODM)-neonatal abstinence syndrome (NAS) infant dyad with intent to improve BF rates.

**Design:** Retrospective/prospective BF rate data and a pretest/post test design to evaluate nurses' evidence-based BF knowledge.

**Setting:** A mid-western state healthcare system encompassing two perinatal assessment centers (PACs), a level one newborn nursery, and a level three NICU.

**Participants:** 21 NICU nurses, one PAC nurse, and 30 ODM-NAS infant dyads.

**Intervention/Measurements:** Three of the 10 Baby-Friendly USA Steps to Successful Breastfeeding were implemented to update the BF policy, provide NICU and PAC nursing staff with evidence-based BF education, and develop a prenatal BF information sheet for ODMs. Metrics included evaluating nurses' BF knowledge using a pre-post test format and monitoring BF rates for ODM-NAS infant dyads for six months pre-post intervention.

**Results:** Participants demonstrated a significant improvement in evidence-based BF knowledge related to NAS based on post-test scores. The exclusive BF rate including exclusive use of expressed breast milk increased from 13% to 40% post-intervention signifying a 68% increase in the BF rate.

**Conclusion:** Initiatives involving education and resource provision are capable of enhancing nurses' BF knowledge and improving ODM-NAS infant dyad BF rates.

---

## Reducing Leakage and Blowouts via Diaper Design Features

*Jennifer Gustin, BS*

*Susana Waiminsui, BS, MBA*

*David Maltbie, PhD*

*Roger Gibb, PhD*

*Donald Roe, BS*

P&G BABY CARE RESEARCH & DEVELOPMENT

CINCINNATI, OHIO

Diaper stool leakage and blowouts can cause delays and stress for the nursing staff in hospitals and for parents at home. The purpose of this study was to analyze the impact of diaper design features on the absorption of runny stool produced by breastfed infants. Two types of diapers were tested in a benchtop test and in an at-home diary study; one had a mesh-like topsheet to allow penetration of bowel movements (BMs) to the interior of the diaper, while the other had a non-apertured liner to help immobilize the BM in the topsheet. The benchtop study was conducted using two types of fresh BM samples (runny watery and runny mucousy) from breastfed infants, and showed a significant ( $p < 0.05$ ) advantage for the mesh-like design in allowing BM to penetrate into the interior of the diaper. The at-home diary study was a blinded, cross-over comparison study completed by 365 infants (aged 0 to 6 months; bottle-fed, breastfed and mixed diet) in 11 geographically dispersed markets throughout the US. The parents completed an online diary with every diaper change, which showed that the mesh-like design leaked significantly less than the non-apertured design (10.3% versus 14.3%,  $p$ -value = 0.0002) and left less BM on babies' skin (7.2% versus 11.5%,  $p$ -value = 0.0001).

### **Factors that Impact Safety Culture within NICUs**

*Angelita Hensman, MS, BSN, RNC-NIC*

UNIVERSITY OF RHODE ISLAND  
PROVIDENCE, RHODE ISLAND

Preventable medical errors cause harm and death and affect the safety culture of an organization. They add to the cost of health care, impact patients and families, and are identified as a global health care issue by the Institute of Medicine and the World Health Organization. Infants admitted to NICUs are especially vulnerable.

**Objective:** Perform a literature review to identify factors that affect safety culture in the NICU.

**Method:** The following databases were searched: PubMed, CINAHL, Cochrane Database of Systematic Reviews, Web of Science Core Collection, Google Scholar and Scopus, for peer reviewed research in English only using the search terms “safety culture” AND “NICU” and the MeSH term “Intensive Care Unit, Neonatal” OR “NICU”.

**Findings:** Safety culture within NICU’s varies a great deal with physicians rating it more positively than nurses. The following factors were identified as impacting safety culture: management involvement and support, allocation of resources, structured teamwork training and communication, a non-punitive approach (just culture), and positive overall perceptions of patient safety.

**Conclusion:** Future studies should examine how the safety culture within NICU’s impacts patient outcomes. Findings can be used to educate staff/management and to develop strategies to improve patient safety.

### **A Multidisciplinary Longitudinal Educational Program to Improve Neonatal Outcomes in the Republic of Georgia**

*Candice A. Hobbs, APRN, MSN, NNP*

MAYO CLINIC  
ROCHESTER, MINNESOTA

**Background:** A collaborative relationship between physician and civic leaders in the Republic of Georgia and a group of multidisciplinary neonatology care providers began in August of 2012.

**Aim:** Improve the health care delivered to Georgia’s neonatal population.

**Methods:** Four visits to the Republic of Georgia.

Visit	Strategy
8/2012	Needs Assessment/Discussions with Minister of Health, UNICEF and USAID
4/2013	Multidisciplinary team from taught Georgian neonatologists through lectures, locally produced culturally sensitive educational videos and simulation <ul style="list-style-type: none"> <li>• Resuscitation</li> <li>• Neonatal Airway Management</li> <li>• Peripherally Inserted Central Catheter Insertion</li> </ul>

	<ul style="list-style-type: none"> <li>• Therapeutic Hypothermia</li> <li>• Surfactant Administration</li> </ul>
11/2013	Neonatologists returned to Georgia for ongoing education on implementation of therapeutic hypothermia and management of congenital heart disease
11/2014	Multidisciplinary team returned and reinforcing educational principles and simulated use of newly integrated hypothermia delivery system.

**Results:** Analytic data is challenging to collect in the Republic of Georgia. However, observational data suggest that through this educational initiative, newborns are more likely to receive appropriate resuscitation, airway management, surfactant administration and peripherally inserted central catheters. Hypothermia has been initiated.

**Conclusions:** A multidisciplinary team based educational strategy in the Republic of Georgia has enhanced the care that newborns receive.

### Parental Video Education in the NICU for Spina Bifida and Other Birth Defects

*Lori J. Howell, DNP, MS, RN*

CHILDREN'S HOSPITAL OF PHILADELPHIA  
PHILADELPHIA, PENNSYLVANIA

**Problem:** An estimated 3,000 pregnancies are affected by spina bifida (SB) annually resulting in 1,500 births. SB care is complex, multidisciplinary and requires long term follow-up. Annual medical and surgical costs are estimated to range from \$373 to \$800 million. Assessment of parental perceptions of a video education tool for parents of a child with SB in the NICU and after discharge could result in standardized care.

**Literature Review:** Parental education for birth defects is supported yet, a paucity of information exists, mostly descriptive, related to SB care in the NICU and indicate parents are ill-prepared to take their neonates home from the NICU. Studies support multimedia education over verbal and print.

**Methodology:** EBP and IRB exempt study using a video intervention and survey tool distributed electronically to a convenience sample of parents whose child with SB was less than one year of age in a large, children's hospital.

**Data Analysis/Interpretation:** Surveys were analyzed using descriptive statistics rating the video highly positively. Statistics and parent perceptions finalized the video and standardized SB education in the NICU. Understanding parental perceptions of educational needs resulted in improved SB care.

### Understanding the Characteristics of Breastfed Baby Stool to Help Better Manage Runny Bowel Movements

*Dianna Kenneally, BS, MBA*

*Jennifer Gustin, BS*

*Don Roe, BS*

*Susana Waiminsui, BS*

*Ben Kutay, BS*

PROCTER AND GAMBLE  
CINCINNATI, OHIO

Current BM classification scales (Amsterdam, Bristol) provide limited options for classifying runny BM which do not adequately describe the range of consistencies found in healthy breastfed baby excretions. The purpose of this study was to evaluate the stool output and characterize stool consistency of healthy breastfed newborns. A total of 243 stool samples were collected under the supervision of 12 pediatric nurses from 77 exclusively breastfed infants (0-6 months old). The BM output was highly variable. The mean BM output was with about 9.1 g with standard deviation +/- 7.92 g with 68% of samples <10 g, 23% 10-20 g, and 9% over 20 g with a max one-time BM event of 4 times the mean (43 g). Breastfed stools were characterized as either mucousy (54%) or watery (44%) and could be sub-classified as thick (65%) or thin (35%) mucousy or watery with curds (83%) or without curds (17%). Thus, breastfed baby stool, while runny overall, has a variety of consistency which can impact the ability of a diaper to absorb and immobilize it effectively.

Additionally, the wide variability of output can help explain the not uncommon occurrence of BM leakage (aka blowouts) seen in breastfed infants.

---

### **Premature Infant Oral Motor Intervention: Comparing International Evidence**

*Brenda S. Lessen, PhD, RN*

ILLINOIS WESLEYAN UNIVERSITY  
BLOOMINGTON, ILLINOIS

The need for oral-motor therapy research in the neonatal intensive care unit is crucial. Oral feeding is a complex skill that requires the infant's ability to coordinate the muscles of the jaw, lips, tongue and cheeks for motor stability, as well as incorporate intra-and peri-oral tactile sensory stimuli. Oral motor therapy improves oral-motor musculature and neurobehavioral organization, therefore impacts oral feeding. Quality and safety of health care practices can be improved by comparative research across countries and cultures. As the evidence for improved feeding outcomes from oral motor therapy grows in the United States, this author formed international collaborations to study oral motor therapy in the global theatre.

Three international studies (United States, Iran, and Thailand) were designed to assess feeding success following the Premature Infant Oral Motor Intervention (PIOMI). The three randomized clinical trials assessed the same two primary outcome variables of feeding progression and length of stay. This comparative research presentation identifies successful strategies for international collaboration in nursing research, and highlights the consistency among results of studies that cross cultures and countries, generating international evidence for oral motor therapy.

---

### **The Utilization of Placental Blood for Neonatal Admission Labs**

*Desi Newberry, DNP, NNP-BC*

EAST CAROLINA UNIVERSITY  
APEX, NORTH CAROLINA

**Background:** The utilization of placental blood for neonatal admission labs has the potential to decrease the incidence of anemia of prematurity and intraventricular hemorrhage, frequency of blood transfusions and associated complications, and painful procedures related to lab sampling.

**Objective:** To determine the feasibility of drawing neonatal admission labs from the placenta rather than the neonate and to compare CBC and blood culture results between placental and neonatal blood.

**Study Design:** All infants less than 35 weeks' gestational age admitted to the NICU and all term infants with a maternal history of chorioamnionitis will be eligible to participate. Participating infants will have paired CBC and blood cultures obtained from the placenta and the infant. Treatment decisions will be based solely upon infant samples and clinical status.

**Plan for evaluating results:** Data collection includes demographic information, whether or not the placental blood sample was successfully collected, and paired results from all CBCs and blood cultures. The percentage of placental blood samples successfully obtained will be evaluated. The CBC and blood cultures will be examined to note any significant differences between sample sites.

---

### **Intranasal Medication Delivery: The Alternative Route for Medication Administration**

*Leora Patton, BSN, CCRN*

BAYLOR SCOTT & WHITE ALL SAINTS  
ARLINGTON, TEXAS

My objective is for participants to understand which medications have been researched for intranasal medication delivery, the key points of administration, and when intranasal delivery is indicated.

Wolfe (2010) reviewed intranasal medication delivery for children. Saunders (2010) researched the use of intranasal fentanyl with pediatric orthopedic pain. Robertson (2009) studied use of intranasal naloxone in prehospital narcotic overdose. Naloxone, fentanyl, and versed all have recommended intranasal doses for administration.

Intranasal delivery is an alternative route for medication administration using a commercially supplied atomizer when IV access is not available or not desired. Use of both nostrils to double the absorptive mucosal surface will

enhance drug bioavailability. Onset of intranasal medication is equivalent to IV administration of medication. Provide adequate dosing and minimize drug volume while maximizing drug concentration to promote administration.

Our facility used a poster presentation to explain the process of giving intranasal medication with a nasal atomizer and what medications can be given. Future research is needed on administering intranasal medications in the delivery room for infants requiring comfort care and administering intranasal naloxone in the hospital setting.

---

### **Interdisciplinary Nurse-Led Discharges in the NICU**

*Toby D. Richards, MSN, NNP-BC*

LOMA LINDA UNIVERSITY CHILDREN'S HOSPITAL/ CAMP PENDLETON NAVAL HOSPITAL  
TEMECULA, CALIFORNIA

**Aim:** An evidenced-based process improvement project (PIP) to improve discharge processes in a level III NICU using role supplementation and Iowa Model of EBP.

**Background and Significance:** Current discharge practices are problematic. Communication and understanding being the culprits for nurses, providers, and parents, resulting in delayed discharges. Poor discharge practices increase stress in parents, healthcare providers and unnecessarily utilize resources.

**Literature Review:** Searching databases Academic Search Premier, CINAHL Plus, Cochrane Library, Joanna Briggs Institute of Evidence Based Practice, National Guideline Clearinghouse, PubMed, and Science Direct. Twelve articles were reviewed.

**Methods:** With IRB approval Nurses/providers will receive education on an interdisciplinary NLD clinical pathway followed by a pre/post-test (Modified Collaboration and Satisfaction about Care Decisions). Patients/Parents meeting criteria will be selected and followed, and receive a modified HCAPS survey. Data will be collected and evaluated for safety, effectiveness and timely discharges.

**Results:** Data for this project will be analyzed using the paired t-test, using SPSS software to measure interdisciplinary and family satisfaction, and discharge times.

**Clinical Relevancy/Learner Objective:** An interdisciplinary NICU nurse-led discharge using a clinical pathway may be feasible for uncomplicated patients therefore improving discharge times.

---

### **Safe Transfer to Kangaroo Mother Care (KMC) for Vulnerable Preterm Infants: Keeping Mom and Baby Safe**

*Diane Schultz, RN, CKC*

*Kimberly Hamelin, RN, BA, CKC*

*Barbara Wheeler, RN, BN, MN, IBCLC*

ST. BONIFACE HOSPITAL  
WINNIPEG, MANITOBA, CANADA

Kangaroo Mother Care (KMC) provides many benefits to both mothers and infants. Infants experience improved thermoregulation, oxygenation, breastfeeding and brain growth; mothers achieve better milk supply, improved breastfeeding duration and exclusivity and better mother-infant attachment.

Unfortunately, there is often reticence from care provider teams to transfer into KMC those infants who could most benefit from it: vulnerable preterm infants who require extraneous life support equipment. There is empiric evidence that KMC reduces morbidity and mortality in low birthweight infants and that it is safe and effective for very low birthweight preterms; however, concerns regarding safe infant transfer sometimes result in avoidance or omission of KMC for this population.

Recognizing the benefits and fears regarding KMC for vulnerable infants, nurses at a large central Canadian hospital began exploring the literature for assurance of its safety and for strategies to safely accomplish transfer of these infants. The result is the creation of two protocols guiding providers to safely transfer vulnerable preterm infants into KMC.

## **Mitchell-Riley Syndrome: A Tale of Two Sisters**

*Lori Sgueglia, BSN, RNC-NIC*

BAYSTATE CHILDREN'S HOSPITAL  
WEST SPRINGFIELD, MASSACHUSETTS

Baby V was a full term IUGR female infant with a birth weight of 1,400 grams. Pregnancy was complicated by IUGR and polyhydramnios. Due to her size, she was admitted to the NICU for further assessment and observation. Within the first 24 hours after birth, she developed severe hyperglycemia requiring continuous insulin infusion. Her KUB was suspicious for duodenal atresia. She underwent surgical repair on Day of Life 2. Additional findings included intestinal malrotation, Meckel's diverticulum, pancreatic and gall bladder hypoplasia as well as liver hemochromatosis.

Baby G is a full term IUGR female infant with a birth weight of 2,000 grams. Pregnancy again was complicated by IUGR and polyhydramnios. Prenatal ultrasound was notable for echogenic bowel and suspected duodenal atresia. She too had significant hyperglycemia requiring continuous insulin infusion by 4 hours of age. She was severely anemic, requiring multiple transfusions. In addition to the duodenal atresia, intraoperative findings also included a jejunal atresia and jejunal web, pancreatic and gall bladder hypoplasia, intestinal malrotation, Meckel's diverticulum and liver hemochromatosis.

Parents underwent genetic counseling and testing. They were a consanguineous couple. Both were carriers of a mutation in the regulatory factor X 6 gene (RFX6), a known cause of Mitchell-Riley Syndrome.

---

## **Developing a Team of Neuro Super User Nurses**

*Paige Titus, RN, BSN, RNC-NIC*

*Brianna Donnelly, RN, BSN*

*Julia Cadogan, RN, BSN, RNC-NIC*

BRIGHAM AND WOMEN'S HOSPITAL  
BOSTON, MASSACHUSETTS

Our NICU has seen an increase in the number of infants requiring management of various neurologic issues, as well as needing therapeutic hypothermia. This is due in part to becoming a center for transports from surrounding hospitals.

A group of 22 nurses underwent 2 days of training. Topics included:

- The physical, neuromotor, cognitive, and psychiatric outcome of premature infants
- Neuro assessments
- Seizure drug therapies
- Current neonatal neurology research
- aEEG Monitoring
  - How the monitor works
  - Basic interpretation of the reading
  - How to place the aEEG leads and run the monitor
  - Who benefits from aEEG monitoring
- Therapeutic Hypothermia
- MRI imaging

The neuro super user nurses have become an integral part in the management of infants undergoing therapeutic hypothermia and any infant requiring aEEG monitoring. As of November, 37 infants in our unit have undergone therapeutic hypothermia in the past year. More have been evaluated; all of which had aEEG leads placed by nurses during evaluation.

## Stannosporfin is as Effective at Exchange Transfusion in Infants with Hemolytic Neonatal Hyperbilirubinemia

*Simon Tulloch, BM, BCh*

*K. Dung, MD*

NATIONAL HOSPITAL OF PEDIATRICS  
HANOI, VIETNAM

Exchange transfusion (ET) is used for hemolytic neonatal hyperbilirubinemia (HB) when phototherapy fails or is unavailable. Stannosporfin (SnMP) reduces bilirubin production through heme-oxygenase inhibition. Efficacy and safety studies are ongoing.

**Methods:** Open-label ascending-dose, 3-cohort study of safety, efficacy and impact on ET in 55 infants (intramuscular injection SnMP 0.75 mg/kg, n = 19; /1.50 mg/kg, n = 18; /placebo, n = 18) with severe HB. Subjects were term/near-term healthy infants,  $\leq 14$  days old. Infants were risk for ET based on total serum bilirubin (TSB). Infants received blue light phototherapy. Descriptive statistics used for efficacy variables. Statistical comparisons among/between groups for continuous variables used one-way ANOVA. Categorical values compared using Fisher's exact test. Safety assessed through adverse events (AE).

**Results:** No statistically significant differences among groups in incidence of AEs. All AEs were mild/moderate and not related to study treatment.

Twelve patients received ET. Statistically significantly fewer infants received ET in the SnMP groups (n = 3) (SnMP 0.75 mg/kg,  $p = 0.003$ ; SnMP 1.50 mg/kg,  $p = 0.027$ ). vs placebo (n = 9)

The SnMP 1.50 mg/kg group had fewer infants receiving ET (n = 2) than placebo (n = 9), and shortest mean total duration for PT (60.8 hours).

**Conclusion:** SnMP may reduce the need for ET, and duration of phototherapy in infants at risk for ET. Further studies of SnMP are underway.

---

## Light Cycling in the Neonatal Intensive Care Unit: A Quality Improvement Initiative

*Maria Cristina Yamzon, BSN, MSN, CCNS*

*Christopher L. Case, MD*

*Nicholas R. Carr, DO*

*Thornton S. Mu, MD*

*Pamela I. Stearns, BSN, MHA*

SAN ANTONIO MILITARY MEDICAL CENTER  
SAN ANTONIO, TEXAS

Prior to birth, the fetus is exposed to varying levels of light, sound, and maternal hormones which are thought to help to instill a circadian rhythm. This development is interrupted in preterm infants, and NICUs attempt to replicate this prenatal environment. Studies have demonstrated the benefits of light cycling (approximately 12hrs of light on and 12hrs of light off) in instilling this circadian rhythm in preterm infants manifested through increased weight gain, decreased length of stay in the NICU, and an improvement in infant's sleep-wake cycles following discharge compared to infants kept in continuous low light environments.

Within the framework of a multi-disciplinary quality improvement initiative, our institution's NICU ambient lighting pattern changed from one of inconsistent patterns of light and darkness to that of structured periods of brighter and dimmer light. During the 12 month period following the institution of the light cycling initiative, 25 infants met inclusion criteria for analysis. These infants had an average gestational age of 28+1 weeks, average birth weight was 1,187 +/- 385 gm. Outcomes followed showed an average weight gain of 26.7 +/- 5.5 gm/day, and an average length of stay of 40.5 +/- 16.0 days.



## Establishing Intervention Fidelity in Neonatal Practice: Lead the Way

*Brenda S. Lessen, PhD, RN*

ILLINOIS WESLEYAN UNIVERSITY  
BLOOMINGTON, ILLINOIS

Nursing research has historically been very limited in assessing intervention fidelity, and most studies establishing fidelity of interventions come from the mental health sciences. Intervention fidelity is defined as the competent and reliable delivery of an intervention/treatment. Testing the fidelity of a new intervention is essential to build evidence that an intervention can be properly taught and consistently performed before translating evidence-based interventions into practice. Fidelity of nursing interventions in neonatal clinical practice is needed to assure quality and safety in the clinical setting. The internal validity of any outcome study is dependent on the systematic and reliable delivery of the independent treatment variable.

This presentation describes the development of an instrument to measure intervention fidelity using an oral motor intervention on preterm infants as an exemplar. The process of assessing intervention fidelity is described, and how to interpret the results. Additionally, the importance of ongoing fidelity monitoring is crucial over the course of a study, especially over multi-year studies, to ensure that the treatment continues to be delivered as assigned. Existence of good fidelity measures also make it easier for researchers to describe their interventions in the literature and for other researchers to synthesize research when doing literature reviews.

---

## Neonatal Nurse Practitioners' Job Satisfaction and Intent to Stay in Current Position

*Jeanne Perino, NNP, MSN*

CHILDREN'S HOSPITAL OF ILLINOIS AT SAINT FRANCIS MEDICAL CENTER  
PEORIA, ILLINOIS

The projected shortage of neonatal nurse practitioners could have a large impact on the provision of care for high-risk infants and their families. Neonatal nurse practitioners (NNPs) have been an integral part of the healthcare team for decades. Job satisfaction of NNPs is essential to increase a workforce that is currently undergoing a shortage. It is important to understand if NNPs are satisfied and if they intend to stay in their current positions. The Misener Nurse Practitioner Job Satisfaction Survey, a validated tool measuring job satisfaction in NPs was sent via a blog to over 5,000 NNPs in the United States.

---

## Three Phased Process for Improving Number of Licensed Independent Practitioners in the NICU

*Susan Almarode, RN, MSN, NNP-BC*

UNIVERSITY OF VIRGINIA HEALTH SYSTEM  
CHARLOTTESVILLE, VIRGINIA

**Problem statement:** Restrictions on resident hour coverage and a decrease in resident numbers led to a deficit in care providers within our unit. As a licensed independent practitioner (LIP), the neonatal nurse practitioner was utilized as an alternative care provider to meet coverage deficits.

**Process:** There were three phases of building our team: Phase 1 was the onboarding of travel staff to provide unit coverage, relieve permanent staff of coverage stress, and allow for activities to promote professional growth and development of team. Phase 2 focused on the recruitment and hiring of permanent staff, which included the onboarding, credentialing, and orientation process. Phase 3 required a dedication to graduate education and willingness to precept graduate NNPs student. This phase has developed into an APN externship program, allowing the master's prepared, now graduate, NP to continue to train while awaiting certification and credentialing.

**Outcome:**

1. Streamlined orientation for travel and wage staff allowed for cost reduction in on-boarding. By reducing orientation to 3 days (total cost \$52,000), we saved \$35,000.
2. We were able to hire 7 new staff members through recruitment and our commitment to graduate education.

APN externship reduced length of orientation by 3 months, allowing LIP to be fully functional in staffing numbers. This has an estimated cost savings of \$50,000.

## Team-Based Care for ELBW Infants Reduces Risk

*Mindy Morris, DNP, NNP-BC, CNS*

CHOC CHILDREN'S HOSPITAL  
ORANGE, CALIFORNIA

**Background:** The care of extremely low birth weight (ELBW) infants presents complex and unique challenges. Although overall numbers of ELBWs are relatively small, survival rates continue to improve and we must strive to ensure survival without morbidities, which remain quite high.

**Purpose:** Given the complex and unique problems these vulnerable patients present, the multi-professional NICU team must develop a cohesive and consistent plan of care. Consistent day-to-day management strategies by a dedicated multi-professional team incorporating best evidence into practice, improves short and long term outcomes. Although care for each infant is individualized, use of guidelines and checklists by a consistent team improves standardization and safety.

**Findings:** A standardized feeding guideline was utilized in a Level IV NICU for 10 years and resulted in fewer days to initiate feeds and fewer central line days. This trend improved notably in the past 5 years with team-based care, also resulting in reduced growth restriction at discharge.

A core team also led to reduced laboratory specimens, which has resulted in a sizeable decrease in blood transfusions (with inherent risks) and an increased percentage of patients receiving no transfusion. Data and methods will be presented.

**Conclusions:** A team-based model of care improves processes and reduces risk for ELBW infants.

---

## Development of a Fetal Alcohol Spectrum Disorder Education Program for Nurses

*Carol Shaputinc, RNC-NIC, MPH*

UNIVERSITY OF CALIFORNIA  
SAN DIEGO, CALIFORNIA

Prenatal exposure to alcohol (PAE) can damage the developing fetus at any time during pregnancy. Fetal alcohol spectrum disorder (FASD) is the leading preventable cause of birth defects, and intellectual, developmental and behavioral deficits. FASD is a major social and economic burden that frequently goes unrecognized or misdiagnosed. Improvements in prevention, identification and care can be enhanced through systematic efforts to educate healthcare professionals.

As part of a national initiative for FASD prevention and recognition, the CDC awarded funding to academic and professional organizations across the U.S. to establish FASD Practice and Implementation Centers (PICs) charged with developing discipline specific education for nurses, pediatricians, obstetricians & social workers based on the latest research. The starting point was a review of the literature. The Nursing Discipline-Specific Workgroup conducted an environmental scan through the following activities: compiling data, research evidence, trainings, and nursing practice perspectives related to prenatal alcohol exposure and prevention; evaluating the relevance and quality; identifying gaps and opportunities; developing recommendations/strategies related to preparing and supporting nurses regarding PAE/FASD.

Findings indicate a general lack of information in the nursing literature regarding the identification and prevention of FASD. The development of dynamic web-based continuing education for perinatal nurses is in process.

---

## CHOC NICU, Our Experience 2008–2015: Mandibular Distraction Osteogenesis to Avoid Tracheostomy in Neonates Utilizing a Multidisciplinary Team Approach

*Tammy J. Anderson, MSN, RNC-NIC*

*Vijay Dhar, MD*

*Paul Yost, MD*

*Michael Sundine, MD*

*Jason Toranto, MD*

*Irfan Ahmad, MD*

CHOC CHILDREN'S HOSPITAL  
ORANGE, CALIFORNIA

**Background:** Pierre Robin described the triad of micrognathia, glossoptosis, and upper airway obstruction (UAO). Traditional treatments to relieve UAO include prone and side positioning, oral/nasal airways, tongue-lip adhesion and tracheostomy in severe UAO. While tracheostomy may be lifesaving, it is associated with numerous morbidities and greater economic burden during the course of treatment. A novel approach is Mandibular Distraction Osteogenesis (MDO) which can relieve UAO by lengthening of the mandible.

**Purpose:** To see if MDO can lead to decreased tracheostomies in infants with PRS and compare two different techniques of MDO.

**Methods:**

**Design:** A retrospective medical record review.

**Subjects:** n = 27 with Pierre Robin sequence and moderate to severe UAO who underwent external or internal MDO.

**Setting:** In a 238-bed tertiary Children's hospital with 67-bed NICU

**Results:** Twenty six infants underwent MDO, 19 with external and 7 with internal distraction. Tracheostomy was avoided in 16 % infants in external and 100% in internal MDO. As compared with external MDO, infants undergoing internal MDO had fewer days on ventilator (7.4 vs 15.4 days), fewer days on methadone for narcotic withdrawal (11.7 vs 22 days), fewer gastrostomy tubes (14.3% vs 63%) and fewer infants going home on anti-reflux medications (43% vs 63%). However, infants with internal distraction had a slight increase in facial paresis (57% vs 42%) and facial paralysis (14% vs 5%), needing bone grafts (14% vs 0%) and dislodgment of device (21% vs 14%), pin site infections (14% vs 42%).

**Conclusion:** MDO program at CHOC Children's Hospital with multi- specialty involvement was successful in preventing tracheostomy infants with PRS having moderate to severe UAO. Infants appeared to handle internal distraction better with less narcotic dependence and better nipping but had higher incidence of complications.

---

## Therapeutic Positioning in the NICU

*Kathy Faber, RN, MSN, CNL*

*Dennis Gutierrez, PT, DPT, PCS*

*Angela Alonzo, RNC, BSN*

*Yvette Bautista, RNC, BSN*

ST. JOSEPH'S CHILDREN'S HOSPITAL & MEDICAL CENTER  
PATERSON, NEW JERSEY

**Background:** Infants born prematurely are often subjected to many developmental obstacles while in the hospital. Pathological conditions including neurological, respiratory, cardiac and other pathologies affecting major organ systems are obvious medical conditions having a direct impact on their development. Less obvious are noise and lighting issues, poor positioning and improper handling and if not addressed accordingly can lead to development delays. Evidence supports the use of therapeutic positioning to promote normal development, facilitate behavioral organization, reduce the development of abnormal movement patterns, assist in reducing infant's response to pain, and maximizes the infant's developmental progression and participation in age-appropriate activities, (Mahoney & Cohen 2005, and Pearson, et al, 2005).

**Proposal:** In 2014 after a chart review demonstrating a 6% in-patient referral rate and a discharge referral rate of 2%, an interprofessional committee designed and implemented a standard of practice for appropriate care of the infant

surrounding sensory development, therapeutic positioning, and referral after discharge to ensure early intervention for disabilities seen immediately, during the hospital stay and at discharge.

**Results:** In 2015 the overall referral rate increased to 50%, the  $\leq 1,500$  gram infant increased to 94%, and the outpatient referral rates increased to 95%.

---

## **Recommendations for Psychosocial Support of NICU Parents: Translating Evidence into Clinical Practice**

*Isabell Purdy, PhD, NNP, CPNP*

*Jeanne Craig*

*Paula Zeanah*

*Mary Alice Melwak, PhD, NNP, CPNP*

MATELL CHILDREN'S HOSPITAL

LOS ANGELES, CALIFORNIA

**Background:** Parents with a newborn infant admitted to a NICU encounter many challenges and stressors. Infants born prematurely, with congenital anomalies or with a severe illness need specialized care during and after hospitalization.

**Objective:** In 2014, a National Perinatal Association multidisciplinary workgroup met to identify issues, review and critique the literature and develop evidence-based practice recommendations to improve parent support surrounding NICU discharge.

**Results:** We identified that NICU discharge planning and preparation is a logical progression that requires an intense multi-disciplinary dynamic team approach starting at admission and continuing beyond discharge. Based upon the evidence reviewed, the new recommendations address the following key areas to help decrease parent psychosocial stressors: emotional, parent education, medical guidance and home visitors.

**Conclusion:** Establishing individualized, flexible and realistic pre and post discharge plans with parents is vital to improve current practice and sustain healthy transitions to home and community. Parents need emotional and educational support and follow-up resources to navigate the complex inpatient and outpatient healthcare environment. Adopting these recommendations by NICU professionals is needed to advance the NICU discharge process.

---

## **Neonatal Epinephrine: Reducing Calculation Errors**

*Gaye Rotramel, MS, RN*

ST. JOHN'S MEDICAL CENTER

TULSA, OKLAHOMA

Epinephrine calculation errors of low birth weight and very low birth weight babies can significantly affect outcomes in terms of mortality and morbidity. A review of literature concluded that neonatal resuscitation epinephrine calculation errors occur when providers rely on memory and lack resources, safety features and standardized procedures (Benner, Sheets, Uris, Malloch, Schwed, & Jamison, 2002; Karlsen, 2006).

A quantitative quasi-experimental replication research study measured the effectiveness and reliability of a researcher-designed, epinephrine reference chart, specific to weights less than three kilograms. The sample size of 94 nurses, answered one epinephrine calculation question, requesting the amount to be administered in a given scenario. The experimental group used the Neonatal Epi Chart and the control group relied on memory and calculation.

A Chi Square test resulted in a p-value of  $<0.0001$ , suggesting calculation errors were significantly different for subjects utilizing the Neonatal Epi Chart in the experimental group. The difference was quantified with an Odds Ratio determined those not given the Neonatal Epi Chart were 39.8 times more likely to make an epinephrine calculation error. Utilization of the Neonatal Epi Chart will empower clinical nurses to ensure the delivery of safe patient care and reduce medication errors.