

Abstracts Presented at the 9th National Advanced Practice Neonatal Nurses Conference New Orleans, Louisiana, April 18–21, 2012

These are the abstracts for the poster presentations from the recent 9th National Neonatal Advanced Practice Neonatal Nurses Conference in New Orleans, Louisiana. They represent a broad range of neonatal and perinatal issues. By sharing this information, we hope to increase awareness of research and innovative programs within the perinatal health care community, and support evidence-based nursing practice. Some abstracts have been edited for publication.

Improving Human Milk Supply in the NICU: The Importance of Neonatal-Specific Lactation Programs

Jennifer L. Annino, BSN, RN, IBCLC

OCHSNER MEDICAL CENTER
NEW ORLEANS, LOUISIANA

Despite successful interventions to initiate the milk supply in mothers of preterm infants, sustaining the milk supply is difficult due to the stressors associated with the hospitalization of their preterm infant. Potential barriers to milk production include: lack of intention to breastfeed prior to preterm birth, maternal-infant separation, and lack of lactation support. Research supports neonatal specific lactation programs to improve the milk supply for preterm infants.

A neonatal specific lactation consultant built a lactation program using the following best practices: (1) daily rounding on mothers/infants in a 42-bed unit, (2) ensuring available pumps and supplies in the hospital and community, (3) partnering with March of Dimes for lunch/learn educational sessions, (4) promoting skin-to-skin contact, and (5) standardizing storage and collection procedures for mothers' own milk as well as donor milk.

Over twelve months, 209 mother/infant dyads participated in the program. Milk initiation rates increased from 75 percent to 95 percent. Median days of successful milk production was 28 with the number of lactation consultations per mother averaging 3 per week. The number of infants receiving human milk at discharge rose from 31.8 percent to 47.7 percent. Preliminary findings suggest that a dedicated neonatal-specific lactation consultant helps mothers of preterm infants improve their milk supply.

Cerebral Palsy: What Every NICU Nurse Needs to Know

Brenda J. Bugbee, BSN, RN

ST. PETER'S HOSPITAL
ALBANY, NEW YORK

The diagnosis of cerebral palsy (CP) is rarely seen in the NICU setting. Yet professionals in a special care nursery or neonatal intensive care unit are caring for the infants most at risk for this disorder. Overall 2–2.5 cases of CP are diagnosed for every 1,000 live births and the incidence in preterm infants is much higher. Many nurses and practitioners caring for the infants most at risk have little knowledge of this disorder. Many parents ask about CP while their infants are hospitalized. It is extremely important that parents be given accurate and consistent information.

The past idea that CP is always caused by a lack of oxygen to the brain has been disproven with current research, yet many health care professionals still consider this the only cause. Health care professionals need to understand the varied definitions of CP; the different types of CP; etiologies, which may include maternal/prenatal risk factors, perinatal causes, and postnatal factors; reasons for delay in diagnosis; treatments; and prognosis for these infants.

The Proper Care Environment for Infants Exposed to Opiates

Brenda J. Bugbee, BSN, RN

ST. PETER'S HOSPITAL
ALBANY, NEW YORK

Opiates are the class of drugs that most affect the infant population in special care nurseries and NICUs. This class of drugs causes a long and difficult withdrawal period for the infants exposed *in utero*. Even pregnant women in treatment programs using methadone or buprenorphine, will deliver infants at risk for neonatal abstinence syndrome (NAS). The care of these infants can be very frustrating and difficult. All professionals dealing with infants experiencing NAS need to be aware of the many nonpharmacologic environmental interventions that should be in place before using medication therapy.

Over several years, I have worked to institute a care policy for this patient population at my hospital. I have been able to positively impact the infants' care by changing how that care is given by nurses, nurse practitioners, and physicians. It is the many small changes that can be made to our environment that can help lessen the severity of the infant's symptoms.

Currently, I am involved in helping other institutions in my area change their care environments and nonpharmacologic practices to help deal with this special population.

Prevention of Hyperbilirubinemia and Kernicterus: Strategies to Impact Interdisciplinary Practice and Improve Safety in Hospital Systems

Maureen Cavanaugh, MS, MA, RN, C-EFM

Patricia Newell-Helfant, RNC, MS, CPNP

ST. PETER'S HOSPITAL
ALBANY, NEW YORK

A large Level III NICU was taken aback by an adverse event involving an infant with hyperbilirubinemia. Despite clear guidelines from the American Academy of Pediatrics (AAP), investigation of the event led to the conclusion that there was inconsistent practice regarding discharge of infants with borderline or high bilirubin levels, thus increasing the potential for preventable hyperbilirubinemia. It was unclear as to why the inconsistency in practice was occurring.

Nurses and physicians were asked to complete an anonymous survey. The IRB-approved survey included scenarios commonly encountered in newborns who had bilirubin levels in the moderate to high risk zones as defined by the AAP. Analysis of the survey was completed to determine the discrepancy between caregiver perception of risk and the actual risk as identified in the guidelines.

Analysis of the survey questions was instructive. Over one-fourth of both the physician and the nursing group would have discharged a baby with an unacceptably high bilirubin and inadequate discharge plan for follow-up in one of the scenarios. Re-education of nurses and physicians, systems changes including mandatory use of a web-based clinical decision support tool, and development of a computer-generated daily bilirubin log were undertaken. Analysis of readmissions for hyperbilirubinemia to evaluate for effectiveness is underway.

Promoting Evidence-Based Practice in Caring for the Late Preterm Infant

Carol Crawford, RN, NNP-BC, IBCLC

Amy Chambers, BSN, MSN/ED, RNC-OB

AULTMAN HEALTH FOUNDATION
CANTON, OHIO

Background/Problem Statement: The late-preterm infant's appearance and needs may seem similar to those of term infants. Evidence shows that late-preterm infants are at greater risk for problems and need additional assessments and interventions to thrive.

Purpose: To increase positive outcomes for infants born between 34 0/7 and 36 6/7 weeks gestation by educating staff on new care strategies.

Description of Project: The literature was reviewed and need for practice changes in caring for late-preterm infants were identified. Education was developed and presented in a variety of formats including formal lectures, skills days, online, and via bulletin boards.

Outcomes: A knowledge survey was completed prior to additional education. Birth Center nurses were recently resurveyed. Increases in correct, evidence-based answers and care provided had been achieved.

Future Implications: Ongoing education will be necessary to continue to increase an evidence-based knowledge base and practice.

Component of Magnetism: As a Magnet designated hospital, components of the Magnet Model linked to this practice project are identified. Nurses caring for late-preterm infants are now armed with the latest information to provide appropriate care.

Obstetric Trauma in the Emergency

Room: Care of the Neonate

Cheryl DiNardo, MSN, NNP-BC

UPMC MERCY

PITTSBURGH, PENNSYLVANIA

UPMC Mercy is an accredited Level I Trauma Center, providing comprehensive care to patients with complex and multi-system trauma including obstetrical emergencies. Obstetrical trauma is often associated with preterm labor and subsequent delivery, placenta abruption, hemorrhage and occasionally direct fetal injury. In the event of an emergent delivery, the quality of care provided to a neonate in the first few minutes of life can have long lasting outcomes.

Purpose of this educational project: to promote an understanding of the principles in neonatal resuscitation to the emergency room staff that are not required to participate in the Neonatal Resuscitation Program.

Goal of teaching strategy: to expand the emergency room staff's skills and knowledge of neonatal resuscitation in assisting the neonatal team in the event of an emergent delivery.

Method of teaching: to convey new knowledge of the principles in neonatal resuscitation during a one hour PowerPoint presentation and demonstration.

Outcome of project: the emergency room staff participants demonstrated a better understanding of the principles required to properly resuscitate a neonate and became better skilled in assisting the neonatal team. Recommendations for future educational opportunities included simulation scenarios.

Design and Implementation of an Interdisciplinary Perinatal High-Risk Care Planning Process

Susan Duke, RNC
Laura Robbins-Frank, MSN, RNC, APN
Olga Lazala, PhD(c), APN, RNC-OB
ADVOCATE GOOD SAMARITAN HOSPITAL
DOWNERS GROVE, ILLINOIS

The development and implementation of the Interdisciplinary Perinatal High-Risk Care Planning Process was designed to improve patient care delivery and promote excellence in nurse-physician relationships. Perinatal services at this hospital are interdisciplinary in concept but not necessarily in delivery of services. Patients are referred to the Maternal Fetal Medicine Specialist for consultation; after assessment, recommendations for care are made to the obstetrician. This information was often not available on the patient's prenatal record and thus not available at the time of delivery. A process was designed by which high-risk perinatal cases identified by the Maternal Fetal Medicine Service would be discussed with a core team and invited *ad hoc* members and a plan of care developed. Telephone conferencing is available for practitioners unable to attend the planning session; this has received positive feedback. Family meetings are often set up with the perinatal team to review the plan of care and identify any modifications. Patient-centeredness is the key focus for this aspect of the process in preparing for the high-risk delivery and subsequent care of the mother and infant. An algorithm of care was developed, and includes clear delineation of responsibilities. This process has improved care.

The Use of Vapotherm 2000i During Neonatal Transport in the Scottish Neonatal Transport Service West Region

Elaine Foye, RGN, RM, BSc
Sibasis Daspal, MBBS, DCH, MRCP
Charlie Skeoch, BSc, MB, ChB, MRCP, FRCPCH
Francis Loch
Lesley Jackson

YORKHILL HOSPITAL
GLASGOW, SCOTLAND

Non-invasive ventilatory support during neonatal transport was previously restricted to nasal continuous positive airway pressure (NCPAP) or nasal cannula oxygen, neither of which was humidified locally. Neonatal units in the United Kingdom now offer neonatal respiratory support using the Vapotherm 2000i (VT) which delivers high-flow, humidified oxygen at up to 8 liters/minute, thereby providing distending pressure. VT has been reported to be a well-tolerated form of respiratory support applicable to a wide range of infants.

Neonatal transport must adapt to accommodate technologic advances within neonatal units and the West of Scotland Neonatal Transport team became the first UK service to offer VT during transfer. The first ten babies transferred on VT are reported. Gestation ranged from 26 to 40 weeks, oxygen flow rates from 4.5 to 7 liters/minute and inspired oxygen concentrations of 21–30 percent. Journey times lasted up to one hour. The humidity was advantageous to thermoregulation, with normothermia documented in all. No adverse incidents were reported. No infant required an escalation of respiratory support during or following transfer on VT and the team reported advantages compared to other methods of respiratory support.

We would encourage neonatal transport teams internationally to consider the potential benefits of VT support during transfer.

Occlusive Bags to Prevent Hypothermia in Premature Infants: A Proposed Quality Improvement Initiative

Kathleen Godfrey, DNP, NNP-BC, CPNP-PC
Elizabeth A. Schlenk, PhD, RN

MAGEE WOMEN'S HOSPITAL OF
UNIVERSITY OF PITTSBURGH MEDICAL CENTER
PITTSBURGH, PENNSYLVANIA

This research is supported by the Leslie A. Hoffman Endowed Acute Care Nursing Research Award.

Problem: The aims of this quality improvement (QI) initiative are: to improve the initial body temperatures of infants born at less than 28 weeks gestation by placing them in an occlusive bag from the neck down immediately after delivery; implement and evaluate the clinical protocol; and establish a clinical practice change.

Evidence: A literature search was conducted and sufficient high quality evidence was found to support the proposed practice change.

Implementation: A one-group, posttest only, quasi-experimental design with a historical control group will be recruited. The control and treatment groups will consist of approximately 50 eligible preterm infants born at less than 28 weeks gestation. After a six month retrospective record review is performed to collect data for the control group, a 6-month prospective phase will occur in which infants in the treatment group will be placed in an occlusive bag from the neck down immediately after birth and nursery admission temperatures will be recorded. A staff satisfaction survey will be distributed.

Evaluation: Mean nursery admission temperatures of the two groups will be compared, controlling for delivery room site and time from birth to nursery admission. Staff satisfaction data will be described.

Outcomes: The project is currently underway, and the results are pending.

Golden Hour Neonatal Care: The First Hour of Life

Beckett S. Perkins, MN, NNP-BC
Cheryl Tessmer, RN

BENEFIS MEDICAL GROUP
GREAT FALLS, MONTANA

Introduction: Through collaboration with Vermont Oxford Collaborative our NICU identified the need to improve delivery team competency/communication, process, practice, patient safety, and family bonding through standardization of "Golden Hour" (GH) care practices.

Aim: Standardize resuscitation preparation, process, and review for neonates <1500 g utilizing evidence-based practices to improve care in the first hour of life.

Methods: QI focused on GH potentially better practices. The delivery attendance team formed checklists, SBAR tools for briefing/debriefing were developed, and videotaping high-risk deliveries began. Subsequent cycles of change included gentle ventilation strategies and target saturations. We discussed buy-in, barriers, and legal considerations. Literature and current practice reviews were concluded. Pre-data was collected 10/2006–2/2007. Guidelines were implemented using inservice education sessions, posters, and e-mails.

Results: GH protocol enhanced management of neonates with increased efficiency and family satisfaction. Measurement showed standardized practice change with increased communication/compliance. Increased resuscitation with CPAP, first ABG: PCO₂ 35–45, POX pre-ductal <2 minutes of life with decreased FiO₂ and temperature on admission to the unit was 97.5–99.2 degrees.

Discussion: Collaboration allows NICUs of all sizes and levels to improve the quality and safety of medical care for newborn infants through a coordinated program of research, education, and QI projects. Continued work to improve GH care is multifaceted, involving multiple cycles of change.

Mothers' Perceptions of Child Vulnerability when their Infants are Born with Low Birth Weight

Alice S. Hill, RN, PhD, FAAN

Kimberly L. Dickerson, PhD

THE UNIVERSITY OF TEXAS MEDICAL BRANCH
AT GALVESTON
GALVESTON, TEXAS

This research is supported by NIH/NINR 5R03 NR010030-02.

Objective: The purpose of this study was to determine if the same predictor variables of mothers' perceptions of child vulnerability were present for extremely low birth weight (ELBW) and very low birth weight (VLBW) infants at 4, 6, and 12 months.

Methods: A prospective comparison-group design was used to study 120 infants and 119 mothers at three assessment periods. Anthropometric measurements were taken and mothers completed a Pediatric Assessment Scale for Severe Feeding Problems and a Vulnerable Child Scale at each time point.

Results: Analysis of covariance indicated that mothers perceived their ELBW infants more vulnerable than VLBW infants at the three assessment periods. Regression analysis for ELBW infants revealed that days until first bottle feeding, feeding problems, and/or feeding practice accounted for a significant portion of the variance at different assessment periods. In VLBW infants, regression analysis showed that feeding problems and length of NICU stay accounted for a significant portion of the variance at 4 and 6 months; no variables were significant at 12 months.

Conclusion: Mothers' perceptions of child vulnerability can be predicted at 4, 6, and 12 months and the predictor variables may depend upon the birth weight category of the infant and the time of assessment.

A Hidden Benefit of Skin-to-Skin Holding

Amy Nagorski Johnson, PhD, RNC-NIC

CHRISTIANA HEALTH CARE SYSTEM
NEWARK, DELAWARE

There is a growing trend that mothers of premature infants express breast milk for early infant feedings in the NICU; however, the mothers' separation from the compromised infant, coupled with other factors, may interfere with successful lactation. The purpose of this study was to examine the relationship of skin-to-skin holding to the volume of maternal breast milk expressed by mothers of premature infants. Twenty mothers pumped breast milk on regular schedules over a 5-day study enrollment and held their premature infants skin-to-skin twice during the study. All expressed breast milk for holding and non-holding conditions was measured using a Navigator scale. Average milk volumes for

skin-to-skin holding and non-holding conditions were compared using repeated measures ANOVA. The holding intervention demonstrated a significant difference in breast milk volumes over the non-holding conditions ($p = .003$). Because breast milk volumes increased more than 20 percent after every holding intervention for every mother, skin-to-skin holding just may hold the hidden benefit of supporting lactation success in the NICU.

Power Walks and Certification Exams: Is Walking Preparation?

Amy Nagorski Johnson, PhD, RNC-NIC

CHRISTIANA HEALTH CARE SYSTEM
NEWARK, DELAWARE

Test anxiety is a physiologic and behavioral response nurses experience before and during certification examinations that is associated with a fear of failure. Anxiety must be managed to improve test performance. The purpose of this study is to determine the relationship of exercise to testing anxiety.

Design: Quasi-experimental factorial design. Independent variable: walking intervention prior to the exam. Dependent variable: score on the State-Trait Anxiety Inventory.

Procedure: Students self-selected control and experimental groups. 31 students power-walked on campus one hour before the first major exam. All students ($N = 52$) completed the 40-question State-Trait Anxiety Inventory (STAI) just prior to testing.

Results: Students who completed the exercise intervention had significantly less testing anxiety than those who did not exercise ($p = .001$).

Implications: Translating this research to neonatal nurses will aid in improving certification exam performance. Nurses in practice for longer than 10 years are skilled clinicians but tend to have high-anxiety as testing becomes more challenging with age and time out of formal educational programs. The results of this innovative research test suggest that walking exercises before exams is one strategy that can decrease testing anxiety before the certification examination.

Enhanced COPE Program Increases Kangaroo Care Time with Extremely Premature Infants in an All-Referral NICU

Jenn Gonya, PhD

Elizabeth Martin, RN, MSN

Ed Shepherd, MD; Leif Nelin, MD

NATIONWIDE CHILDREN'S HOSPITAL
COLUMBUS, OHIO

Background: Because the COPE program was not originally designed for extremely premature infants in an all referral setting, the decision was made to enhance the program by including a required face-to-face introduction of the program with regular face-to-face informal follow-up.

Objective: To analyze the effectiveness of a change in the COPE program protocol in promoting the amount of time that extremely premature infants participate in kangaroo care.

Methods: Kangaroo care total hours were analyzed for two groups those who received the original COPE program (December 2009–July 2010) and those that received the enhanced program (July 2010–May 2011).

Results: Mean gestational ages (COPE: 24.5 ± 1.1 weeks; COPE-enhanced: 24.8 ± 1.0 weeks) and birth weights (COPE: 709 ± 163.8 grams; COPE-enhanced: 749 ± 180 grams) of the two groups were not significantly different. Extremely premature infants whose parents received the enhanced COPE program participated in significantly more kangaroo care time than those whose parents received the original COPE program. ($t = -6.375, p < .001, df = 102$, effect size: 1.16)

Conclusion: The addition of face-to-face interactions with parents in the COPE program significantly increases the amount of time that extremely premature infants spend in kangaroo care.

Central Line–Associated Bloodstream Infection Prevention Efforts in the NICU

Karen V. Larry, MSN, RNC-NIC
Roy G. Allen, III, BSN, CCRN
Felimon R. Reyes, Jr., BSN, CCRN
Maria C. Yamzon, MSN, RNC-NIC, NNP-BC, CCNS
Lindy Winter, MD

U.S. NAVAL HOSPITAL OKINAWA (USNHO)
JAPAN

Purpose: To incorporate nursing care practice changes as a method to reduce bloodstream infections. Our objective was to reduce central line infection rates to 0 percent.

Background/Significance: Central line infections are responsible for poor neonatal outcomes. Historical central line data from 2004–2010 revealed average infection rates of 3.9 percent with onset of infection at 11 days post line placement in our NICU. Data obtained suggested catheter maintenance, not insertion technique, was the source of infection. Replacement of central line administration sets has been examined in peer-reviewed studies and reveals entering closed systems to change IV sets increases infection rates.

Methods: A quantitative study was performed to determine if sterile fluid replacement technique could reduce central line infection rates. Target population consisted of infants admitted to the NICU in our fiscal year (FY) 2011. The sterile technique required staff to wear mask, hat, and sterile gloves during all central line fluid changes. Data was collected on the number of lines inserted, days of insertion, and infection rates.

Results: In FY 2011, 69 central lines were placed for a total of 393 line days with no hospital acquired infections diagnosed.

Conclusions: Results provided sufficient evidence to support adopting the sterile fluid replacement technique into our unit practice.

Central Line–Associated Bloodstream Infection: Implementation of a Quality Improvement Initiative to Protect our Smallest Patients

Karen Lebo, MSN, RNC-NIC
Sinead Forkan-Kelly, BSEH, RN, CIC
Jeanne Wiesbroch, MS, BSN, IBCLC

ADVOCATE LUTHERAN GENERAL CHILDREN'S HOSPITAL
PARK RIDGE, ILLINOIS

Problem: Our NICU had a central line blood stream infection (CLABSI) incidence higher than acceptable. In 2010, our unit had eight National Healthcare Safety Network (NHSN) defined CLABSI.

Purpose: The purpose of this quality improvement (QI) initiative was to decrease CLABSI incidence in our NICU.

Development of Program: A literature review was done to explore and define best practices in the neonatal population. Additionally, the team referenced the Vermont Oxford Network, the Centers for Disease Control and Prevention (CDC), and the National Association of Children's Hospitals and Related Institutions (NACHRI).

Implementation: Central line insertion and maintenance bundles were developed to reflect neonatal evidence-based practice. Implementation of daily evaluation of the need, functioning, and possibility of medication conversion to expedite discontinuing the central line was integrated into rounds. Finally, a multi-disciplinary educational roll-out was done.

Evaluation: Methods of process measure evaluation included collection of insertion and maintenance bundles. Outcome measures were captured using the NHSN definition of CLABSI.

Results: Our NICU has had 100 percent compliance in the sterile technique protocols of our Central Line Insertion Practice Bundle since tracking began through the database in August, 2011. Incidence of CLABSI dropped from eight cases in 2010 to three cases in 2011.

Preventing Nosocomial Infections

Maryann McLaughlin, BSN, RNC
GEISINGER MEDICAL CENTER
DANVILLE, PENNSYLVANIA

According to the Healthy People 2020, it has been estimated that 1 out of 20 patients hospitalized in the U.S. will acquire a healthcare-associated infection (HAI). Studies have told us that many HAIs are preventable. In fact in the area of central line associated blood stream infections (CLABSI), implementation and close adherence to existing infection control practices will reduce these infections up to 70 percent.

In 2010, our NICU decided to fight infection with a positive culture change. Efforts were focused on increasing hand hygiene compliance rates, implementing aseptic line hanging, defining environment of care in our open pod unit, and improving awareness of late-onset sepsis being preventable.

Methods of communicating included a hand hygiene compliance chart; "Days without CLABSI" postings; unit-based newsletter updates; and graphically displaying infection rates. Evaluation of hand hygiene was completed by a daily count of the cleanser pump bottles. Evaluation of hand hygiene compliance in the patient area, and also hand hygiene reminders were efforts cited by staff nurses. They reminded each other, the medical staff, and any ancillary staff members that entered the unit. Nurses also educated parents.

CLABSI reduction was greater than 50 percent from July 2010 through June 2011. Hand hygiene compliance has increased to 100 percent with the campaign. Hand hygiene is also an important part of our admission education for new parents and families. Continued education and signage throughout the unit reinforces the importance of hand hygiene. The staff is committed and ready to advocate for our babies in fighting infection.

Case Study of a Rare Tracheostomy Complication: Hemorrhage Due to Tracheo-Innominate Artery Fistula

Sharon MacDonald, RN, BSN, MSN, NNP-BC

RILEY CHILDREN'S HOSPITAL
INDIANAPOLIS, INDIANA

M.L. is a 34 4/7 male born with multiple congenital anomalies, including profound hypotonia and tracheomalacia with respiratory insufficiency requiring tracheostomy. One month after tracheostomy, he suffered an acute tracheal hemorrhage. Exploratory vascular surgery revealed that this hemorrhage had been caused by a tracheo-innominate artery fistula.

Tracheo-innominate fistula (TIF) is an uncommon, but life-threatening complication of tracheostomy. The reported incidence of TIF is 0.1–1 percent. Seventy-eight percent of patients who develop a TIF bleed within the first three weeks. Mortality is 100 percent without operative intervention. Immediate control of arterial bleeding, adequate management of the airway and subsequent resuscitative treatment are imperative. Even with appropriate management, survival is only 14.3 percent.

As advanced practice professionals, we need to recognize that bleeding from a tracheostomy is unusual after 48 hours and a TIF should be considered. Also, we need to acknowledge that prompt diagnosis, resuscitative measures, and immediate surgical treatment are imperative for survival.

Decreased Readmission Rates Using the COPE Program in Extremely Premature Infants in an All-Referral NICU

Elizabeth M. Martin, RNC, MSN

Jenn Gonya, PhD

Richard McClelland, MC

John Hitchner

Jim Dail

Edward G. Shepherd, MD

NATIONWIDE CHILDREN'S HOSPITAL
COLUMBUS, OHIO

Background: Creating Opportunities for Parent Empowerment (COPE) was initiated in December for all infants in our unit born at <27 weeks gestation. It is designed to encourage, educate, and empower parents to manage the difficulties of an NICU stay by using an interactive approach.

Objective: To analyze the potential impact on readmission rates for infants born at <27 weeks gestation after the institution of the COPE program.

Methods: Analyzed the readmission rate of small baby patients that were discharged to home and readmitted within 30 days before the start of COPE and after the start of COPE.

Results: There was no difference in the mean gestational age at birth, or the mean birth weight between the groups. There was no difference between the two groups in days of IPPV, NEC, or admit DOL. There was a trend towards a shorter length of stay in the COPE group (117 ± 43 days) compared to the BEFORE group (128 ± 55 days). The COPE group had a decreased ($p < .05$) rate of readmission (13.2 percent) than did the BEFORE group (23.9 percent).

Conclusions: These findings support empowering parents to take an active role in their premature infant's care from the day of admission using COPE as its use appears to lower readmission rates.

An Educational Program for NICU Nurses: Best Practices for Wound Care

Tracey McKinney, DNP(c), APRN, NNP-BC

SUNRISE CHILDREN'S HOSPITAL
LAS VEGAS, NEVADA

Traditional care in the NICU may lead to variances in practice, care that is inappropriate with uncontrolled cost. Neonatal nurses must understand current principles of wound care, including the neonate's ability to absorb topical medications. In addition to surgical wounds, neonates may have complex skin care needs that can include IV extravasation wounds, diaper dermatitis, and congenital skin conditions. NICU nurses can improve the quality of care provided for the surgical neonate and infants with other wounds by implementing best practice guidelines based on formal education and training.

Nursing care for neonates can be improved by implementing an educational program to teach current best practice of skin care, wound care, ostomy care, and incontinence care. It is important that wound care include appropriate dressing selection, awareness of benchmark criteria, knowledge of when advanced products and complementary therapies should be used, and when to request consultation with other healthcare disciplines. The development of a wound care education program, specific to neonatal patients by a formally trained Neonatal Advanced Practice Nurse can facilitate quality, cost-effective outcomes in the NICU, potentially decreasing costs and length of stay while improving patient satisfaction scores.

Implementation of Palliative Care in the NICU

Lori Naquin, RNC

Jeanne Traylor, APRN, NNP-BC

OCHSNER MEDICAL CENTER
NEW ORLEANS, LOUISIANA

In-hospital neonatal deaths account for 23 percent of total fetal deaths. End of life is an extremely emotional and difficult time for families and staff. Research evidence suggests that providers with knowledge of palliative care best practices better understand the process and are able to assist families in coping and developing realistic goals.

The purpose of this project is to improve the end-of-life experience for infants/families in our neonatal intensive care unit (NICU) through early identification and implementation of palliative care best practices. Using a multidisciplinary team, family conferences, debriefings, and palliative care rounds at the bedside were conducted to identify areas for improvement. Palliative care staff education describing the process of death and needs of the infant/family was facilitated using multiple methods. Implementation of a standardized order set to guide multidisciplinary care at end of life is in process.

This presentation uses case studies to illustrate patient, family, and caregiver experiences that provide support for developing a multidisciplinary palliative care program. Pragmatic strategies in assessing unit-based palliative care needs and getting started in developing a program for any NICU are explored.

Probiotics: Challenges to Routine Implementation

Yenly Catharine Londono Calle, MN, RN

UNIVERSITY OF MANITOBA
WINNIPEG, MANITOBA

Probiotics are live microorganisms which, when administered in adequate amounts, confer a health benefit. The beneficial role(s) of commensal bacteria such as *Lactobacillus* species and *Bifidobacterium* species are widely accepted, and probiotics have been shown to improve the status of those in the adult population with intestinal disorders such as diarrhea and cramping. A recent study conducted with 743 very low birth weight infants suggests that probiotics are safe and well-tolerated, and meta-analyses provide evidence that probiotic supplementation reduces mortality and the risk of necrotizing enterocolitis in preterm infants. Furthermore, there is reason to believe that probiotics may promote renal and neurologic function. Despite such validation, there continues to be considerable variation in clinical practice and controversy regarding clinical practice guidelines for probiotic use in specific patient populations. Moreover, questions regarding bacterial strains, manufacturing and handling procedures, and co-supplementation remain unanswered. We describe herein some of the mechanisms of action of probiotics, as well as data supporting their use in the neonatal nursery. We also identify some of the specific concerns regarding probiotic use in enteral feedings for preterm infants and other barriers and questions that must be answered before this promising treatment becomes a standard of practice.

Successful Multidisciplinary Approach to Incorporating Prebiotics and Probiotics into an NICU Feeding Protocol

Natalia Rabovsky, RNC-NIC, MS, CNS, PNP

Carlos Botas, MD

Geraldine Burke, RN, IBCLC

Seson Kahn, RN, MSN

Carol Moseley, PharmD

Kimberley Olson, RD

Janet Shimotake, MD

Richard Topel, MD

KAISER PERMANENTE SAN FRANCISCO MEDICAL CENTER
SAN FRANCISCO, CALIFORNIA

Maternal or banked breast milk is a widely accepted standard for enteral nutrition for very low-birth weight (VLBW) infants, as it is known to significantly lower the incidence of necrotizing enterocolitis (NEC) and feeding intolerance when compared to formula. Both human milk and colostrum contain substantial quantities of prebiotics, which can selectively stimulate the favorable growth and activity of indigenous probiotic bacteria. Most VLBW infants continue to remain NPO during the first 1–2 days of life, and longer if on vasopressor or prostaglandin therapy. This leads to temporary luminal starvation and compromised gut integrity. Therefore, timely acquisition and administration of colostrum is essential via effective collaboration between all members of the NICU multidisciplinary healthcare team and the infant's parents.

Effectiveness of exogenous probiotics in reducing VLBW infants' morbidity and mortality caused by NEC has been repeatedly demonstrated by systematic reviews of randomized controlled studies and recently published meta-analyses. The aim of this clinical project was

to establish procedure and criteria for use of probiotics in the NICU, while continuing to adhere strictly to an evidence-based standardized unit protocol for enteral and parenteral nutrition. Seventy-five patients received probiotics from June–December 2011, with 0 confirmed cases of NEC since the time of protocol implementation.

A Meta-Analysis of Music Therapy Research in the Neonatal Intensive Care Unit

Jayne M. Standley, PhD, MT-BC

TALLAHASSEE MEMORIAL HEALTHCARE AND
FLORIDA HOSPITAL
ORLANDO, FLORIDA

The purpose of this study was to identify the developmental and medical benefits of music therapy for preterm infants by synthesizing outcomes of the last 35 years of research. The sample for this analysis was all empirical studies using music in care of preterm infants in the NICU that occurred since 1975. Thirty studies met criteria and analysis revealed that evidence-based NICU-MT (Neonatal Intensive Care Unit-Music Therapy) was highly beneficial with an overall large, significant effect size (Cohen's $d = .82$, $p < .00$). Effects due to music were consistently in a positive direction.

Results of the current analysis replicated findings of an earlier meta-analysis of the first 10 studies conducted in this field and included multiple uses of music, including music listening (both live and recorded), music to reinforce non-nutritive sucking and to promote independent nipple feeding, and music to promote tolerance for multi-layered stimulation. Live music therapy produced the greatest benefits as did use early in the infant's NICU stay (birth weight <1000 g, birth gestational age <28 weeks). These highly positive results justify strong consideration for the inclusion of evidence-based NICU-MT protocols in best practice standards for treatment of preterm infants.

Negative Pressure Wound Therapy, Neonatal Style

Patsy Uebel, MSN, RN, CNP, WCC

Teresa Taylor, BSN, RNIII, RNC-NIC, WCC

Tanya Burkhardt, BSN, RN

Kalaine Weatherly, BSN, RN, WCC

CINCINNATI CHILDREN'S HOSPITAL
CINCINNATI, OHIO

Many therapies for neonates have been extrapolated from adult and pediatric therapy, and we soon learn that neonates are not little adults. This poster outlines our experience with the increased use of Negative Pressure Wound Therapy (NPWT) in a Level III NICU, when new pediatric surgeons trained in the use of NPWT at other hospitals and a pediatric wound RN were involved with wound closure. NPWT was used on neonates with settings consistent with adult and pediatric usage. An NICU Skin Team consisting of a Neonatal APN, and neonatal nurses monitored the wounds and found an increase in enterocutaneous fistulas, a known complication in adults. A full literature search was done, and KCI, the company providing NPWT supplies, was consulted, revealing we were using inappropriate neonatal settings. In collaboration with the pediatric surgeons, the pediatric wound specialists, and the NICU team, we designed a NICU protocol for NPWT, using settings consistent with KCI and supported by literature. The NICU skin team continues to monitor NPWT, noting a decrease in complications.

Hypoxic-Ischemic Encephalopathy: Indications for Community Hospital Nurses

Robin Underwood, RNC, MSN, CNS, APN
Melody Wireman, MSN, APN, CNS, RNC-OB
Jennifer Novack, MSN, APN, CNS

BAYHEALTH MEDICAL CENTER
DOVER, DELAWARE

Although 18 percent of live births for the State of Delaware from May 2009 to February 2011 were from Bayhealth Medical Center, 50 percent of all neonates in the state that required cooling for hypoxic-ischemic encephalopathy were from this organization. Data assessment included audits of maternal/neonatal charts and interviews with involved nursing staff. Multi-disciplinary initiatives included facilitated system processes, improved communication, and implemented performance improvement strategies. Targeted specific L&D nursing interventions were: prompt intrauterine resuscitation efforts, earlier licensed independent practitioner notification/involvement, development of cord gas communication tools, and education on prompt recognition of neonates who qualified for cooling interventions.

Performance Improvement data demonstrates significant improvement in neonatal outcomes. There have been zero neonates transferred for cooling interventions at the Level III NICU once these performance improvement strategies were implemented nine months ago.

In an advanced practice role, clinical nurse specialists from a community hospital identified factors that contributed to a serious issue, developed a performance improvement plan and implemented educational opportunities that significantly changed neonatal outcomes. Collaboration between advanced practice nurses and L&D nursing staff dramatically improved and impacted the health and well-being of neonates born at a community hospital. Nurses do make a difference!

A National Survey of Gavage Feeding Practices in Very Low Birth Weight Infants

Tamara Wallace, DNP, RN, NNP-BC
Deborah Steward, PhD, RN
Thelma Patrick, PhD, RN
Mary Gottesman, PhD, RN, PNP, FAAN

THE OHIO STATE UNIVERSITY
COLUMBUS, OHIO

Problem/Objectives: Empirical evidence to determine best practices for gavage feeding in very low birth weight (VLBW) infants is limited and no standards of practice exist. This study was undertaken to describe current gavage feeding practices for VLBW infants in Level III newborn intensive care units, report nurse-observed complications, and to assess nursing beliefs about the evidence supporting gavage feeding practices.

Design/Methods: Electronic survey of practices. The study was exempt from IRB review.

Principle Results: Surveys were received from 59 NICUs for a response rate of 7.25 percent. Significant variations in practices were identified. Practices that demonstrated the most variability included those surrounding gavage tube placement and maintenance. The practices that demonstrated the least variability were those that had the potential to cause discomfort to the infant or for which there were manufacturer guidelines. The nurses reported reflux and tube malpositioning as frequent complications. The majority of nurses, 86 percent, believed that their unit's gavage feeding practices reflected current, evidence-based practice.

Conclusions: Wide variations in practice were identified. Further research is needed to identify the safest manner to administer gavage feedings. Nurses believe that their practice is evidence-based despite a paucity of empirical evidence and large variations in clinical practice.

A Comparison of Two Methods of Transition from Incubator to Open Crib

Christina Wilson, RN, MS, NNP-BC

LUCILE PACKARD CHILDREN'S HOSPITAL AT STANFORD
PALO ALTO, CALIFORNIA

Background: Transition from an incubator to an open crib (weaning) has evolved from thermoregulation's evidence-based research in the early 1950s to the enunciation of nursing guidelines (AWHONN, 1994) that are based on weight criteria (~1.5 kg), weight gain over time, and incubator air temperature. Others have advocated weaning based on nipple feeding and developmental competency.

Research Question: Which method leads to better growth velocity and length of stay?

Methods: A retrospective chart review (infant enrollment: cared for in an incubator and able to safely nipple) was performed at two university-affiliated nurseries from April 1, 2008 until March 31, 2009. Primary variables: growth five days before and after transition. Secondary variables: percentage of nipple feeds. All variables: birth weight (BW), birth gestational age (GA), postmenstrual age (PMA) at time of transition, temperature at time of transition, weight at transition, percentage of total volume of feeds nipples at transition, daily weights in days surrounding transition. Exponential growth velocities were calculated and stratified by birth GA. Data were tested with ANOVA with $p < 0.05$ significance.

Conclusions: Similar populations. No difference in gestational age at discharge. There were significant and different growth velocities for each method of transition.

Simulation Training and New Unit Transition

Kathy Chamberlain, RNC-NIC, MSEd

JOHN MUIR MEDICAL CENTER
WALNUT CREEK, CALIFORNIA

Purpose: This evidence-based project was to evaluate the use of simulation training to orient neonatal intensive care unit (NICU) staff nurses to a new unit as compared to a traditional orientation.

Background: The NICU was transitioning from a 19-bed open-bay unit to a 35-bed single-patient room design. A survey identified staff anxiety concerning patient safety, communication, and workflow on the new unit.

Methods: Forty-nine staff nurses participated in a traditional orientation followed by simulation training. The simulations were written based on a staff needs assessment. Training was mandatory, but participation in the surveys was voluntary and anonymous. Surveys were completed at four intervals to examine increases in and retention of staff confidence levels concerning patient care emergencies on the new unit.

Results: The results confirmed an increase in staff confidence levels after the simulation training. The follow-up surveys at four weeks (prior to the move) and six weeks (two weeks after the move) demonstrated that the staff remained confident above the baseline data.

Conclusion: The results of this project have demonstrated the effectiveness of simulation training for experienced nurses. My recommendation is for simulation training to be sustained in the NICU and expanded to a variety of staff training needs.

ANNP Led Neonatal Transport Service

Kate Campbell, RGN, RM, BSc

WEST OF SCOTLAND NEONATAL TRANSPORT TEAM
GLASGOW, SCOTLAND

Background: Scotland has an area of 30,420 square miles, a population of 5.2 million (Louisiana has 4.5 million) inhabitants and comprises of the northern third of Great Britain together with 186 nearby islands, most of which are contained in three groups, the Hebrides, Orkney and Shetland Islands. The Scottish Neonatal Transport Service (SNTS), established in 2003, consists of three regional teams and averages 1,600 neonatal transfers per annum. The Western regional team is based in Glasgow, oversees 650–700 neonatal transfers annually and is the only Scottish team where Advanced Neonatal Nurse Practitioners (ANNP) perform the majority of transfers.

Innovation of the ANNP Transport Service: Six years ago changes in European working legislation reduced the legal working hours of employees, posing a significant challenge to the provision of specialist medical services, including the neonatal transport service, for Scotland. The development of the ANNP role became fundamental to service redesign. This role integrated the fundamentals of advanced nursing practice and adopted aspects of neonatal care traditionally provided by doctors, thus providing “value added” neonatal care that transgressed previous professional boundaries. The ANNP role encompasses delivering neonatal transfers, acute stabilization in remote and rural areas and providing outreach training. This presentation highlights the challenges faced by the development of this new clinical role within an existing neonatal team, focusing on the sub-specialist training, development of independent prescribing, survival training, out-reach education, safety and aviation physiology, and the

challenges of providing quality neonatal care in unfamiliar environments. Implemented now for over five years, the role of the transport ANNP has exceeded initial expectations and currently provides highly specialized and skilled mobile intensive neonatal care by sea, road, and air routes in inclement Scottish weather.

Transitional Care: Thinking Outside the NICU

Tonya White, BSN, MSN, NNP-BC

UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER AT
SAN ANTONIO
SAN ANTONIO, TEXAS

The initial goal of the transitional clinic was to ease the burden on community providers and minimize the risk of hospital readmissions by employing a neonatal nurse practitioner to follow infants after discharge from the NICU. The clinic has metamorphosed into a neonatal comprehensive care/palliative care program. The diagnoses range from infants with severe debilitating disease processes to infants with terminal prognoses. One of the toughest challenges of the clinic has been anticipating and mobilizing the limited community and financial resources/support imperative to a successful transition of care. This was especially true for infants living far beyond expectations. The clinic is instrumental in the management of these medically fragile infants due to early recognition of and intervention for health complications and by educational initiatives to parents and community healthcare participants. The most significant contribution of the transitional clinic is terminally ill infants are being discharged home for a peaceful death experience surrounded by family. The program is deemed an asset to the community and funding has been continued.