

Abstracts Presented at the 11th National Advanced Practice Neonatal Nurses Honolulu, HI, April 23–26, 2014

These are the abstracts for the poster and podium presentations from the recent 11th National Advanced Practice Neonatal Nurses Conference in Honolulu, Hawaii. 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.

Minimizing Iatrogenic Anemia in the Preterm Infant

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A retrospective audit entitled, “Phlebotomy in the Wellington NICU,” has recently been undertaken in our unit. It provided an enlightening insight into the volumes of blood loss in the extreme low birth weight (ELBW) infants during the first 28 days of life.

Physiologic anemia of prematurity (AoP) is well known in the international NICU community. The iatrogenic cause of AoP, often referred to as “bleeding/haemorrhaging into the laboratory” further compounds the detrimental effect on this population.

The pain alone caused from phlebotomy, puts the infant at increased risk of neurodevelopmental compromise. When we add the resulting respiratory and cardiovascular decompensation, poor growth, and the risks associated with repeated blood transfusions, all as a result of AoP, we begin to recognize our potential contribution towards poorer outcomes such as intraventricular haemorrhage, necrotizing enterocolitis, retinopathy of prematurity, etc.

This audit alerted us towards possible effects of our current practice and has resulted in the implementation of new guidelines for blood testing of infants <1,250 grams or <28 weeks gestation at birth. In this presentation, I will share these guidelines and their implementation along with any preliminary results obtained thus far.

Creating Advance Directives for use at the Limits of Viability

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The number of extremely preterm births (EPB; 22–24 weeks gestation) remains constant accounting for 1–2 percent of all preterm births and more than half of infant mortality in the U.S. Often, preterm labor and birth occurs spontaneously without forewarning leaving parents ill prepared to make life-changing decisions.

Lack of knowledge pertaining to the risks associated with resuscitation in this population is especially problematic as morbidity and mortality are common. Decisions such as whether to resuscitate EPB are also costly. In 2005, the costs of resuscitation of EPB exceeded \$26.2 billion. Additional costs for the four major co-morbidities (cerebral palsy, vision impairment, mental retardation, and hearing loss) were estimated to be \$1.1 billion.

The process of providing parents information through the informed consent process is inadequate. EPB infants are the only population who do not have the benefit of advanced directives for decision making at the end-of-life. Action is needed to understand how to best provide informed consent, through the use of an advance directive tool, during early pregnancy prior to the possible event of preterm labor and birth. Educating parents could contribute to a decrease in the rate of resuscitation of EPB, resulting in a decrease in the overall costs of caring for this population over their lifespan, and is a worthy phenomenon to investigate.

Team Resource Management (TRM) Strategy of Reducing Medication Errors in the Neonatal Intensive Care Unit

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Background: From January to September 2012, there were 12 neonatal medication errors in the neonatal intensive care unit. The error rate was 0.3 percent, and it was much higher than NICU's annual target of <0.01 percent. By employing TRM, the NICU's goal was to bring neonatal medication errors to <0.01 percent by end of 2013.

Design and Methods: 1. *I AM SAFE*: SAFE is a way to ensure every staff member can understand the physical and mental condition of each member. Every shift leader must ensure all the members are SAFE, then staff members can identify and react effectively to those most in need. 2. *STEP*: STEP is a tool of situation monitoring. We presented information on the application and dilution of neonatal medications. In addition, we prepared references and guides so that medication orders are placed consistently. Finally, all medications must be checked by two nurses before it is administered.

Findings and Results: Over a 15-month period, from October 2012 to December 2013, the error rate dramatically decreased to 0.013 percent.

Conclusions: TRM provides simple framework that has been proven effective in reducing NICU's medical errors. By practicing TRM we could enhance the communication and coordination capability across all health care team members.

Predict 5-Year-Old Outcomes of Very Low Birth Weight Preterm Infants from Assessments at 2-Years-Old in Taiwan

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Very-low-birth-weight (VLBW) preterm infants are high-risk groups for developmental delays. The purpose of this retrospective study was to determine whether factors of developmental outcome at 2 years of corrected age predict developmental outcome at 5 years old. All VLBW preterm infants born in 21 hospitals, who contracted with the Premature Baby Foundation in Taiwan from 2000 to 2005, were recruited as participants. Bayley Scales of Infant Development, 2nd edition, was assessed by clinical psychologists at 2 years of corrected age. At 5 years of age, cognitive function was assessed with Wechsler Preschool and Primary Scale of Intelligence, revised. Among 940 VLBW preterm infants, 61.1 percent (206/337) of those with and 18.4 percent (111/602) without mental developmental index (MDI) < 85 at 2 years had full scale intelligence quotient (FSIQ) < 85 at 5 years, and 50 percent (170/340) with and 24.5 percent (147/600) without psychomotor developmental index (PDI) < 85 at 2 years had FSIQ < 85 at 5 years. MDI < 70, MDI 70–84, Apgar score < 6 points at 5 minutes after birth, fathers with lower education status or socio-economic status, and PDI < 70 were predictors of FSIQ < 85. Long term follow-up for VLBW preterm infants with MDI < 85 or PDI < 85 is highly recommended.

Giving a Warm Embrace: Decrease Low Body Temperature Rate of Neonates

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Background: Reducing the occurrence of low body temperature in neonates would improve neonatal outcome by stabilizing blood sugar levels, reducing the risk of brain damage, and decreasing the neonatal mortality rate. This study aimed at finding a practical clinical nursing setting which could effectively reduce the occurrence of neonatal low body temperature.

Design and Methods: This study compared the prior incidence of neonatal low body temperature with the incidence following introduction of this clinical nursing setting: 1) increased room ambient temperature, 2) neonate wearing a cotton cap and 3) exactly execution of skin-to-skin contact with the mother for more than 20 minutes.

Findings: By introducing the new clinical nursing setting from January to December 2013, the incidence of neonatal low body temperature decreased dramatically to 19.86 percent compared with the incidence prior to this project (40.8 percent).

Conclusions: Stability of body temperature helps neonates to improve sucking behavior, reduce the occurrence of hypoglycemia, and decrease morbidity and mortality rates in neonates.

Give Me the Best: Enhance the Rate of Exclusive Breastfeeding in the Nursery Unit

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Background: From January to December of 2012, we observed that the exclusive breastfeeding rate was low, only 27.77 percent. It was important to enhance families and nurses' cognition on exclusive breastfeeding for ensuring that every infant could get exclusive breastfeeding. The objective is to raise awareness and increase the exclusive breastfeeding rate to 35 percent in order to improve the quality of neonatal care and health.

Design and Methods: We used questionnaires to survey and analyze the reasons for mothers who did not practice exclusive breastfeeding. Our intervention method included: strengthening medical team members' understanding of breastfeeding and its benefits; providing parents' education and the services of rooming-in. In addition, we used observation sheets for ongoing evaluation of breastfeeding status to teach and to meet individual needs in the postnatal ward.

Findings: By end of 2013, the neonatal exclusive breastfeeding rate increased to 47.47 percent.

Conclusions: There are simple ways to improve the awareness and educate mothers, families, health care professionals, hospitals, and other ways to improve the rate of exclusive breastfeeding for newborns. In addition, to ensure adoption, continual education and participation of colleagues and families will encourage the implementation of exclusive breastfeeding for the long run.

Life Threatening Signs and Treatment Interventions of Critical Congenital Heart Defects in Newborns

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Understanding and identifying congenital heart disease can save the newborn infant's life. Prenatal ultrasound technology may facilitate identification of underlying disease, but some infants may still present without this critical prenatal information. Without screening, some newborns with critical congenital heart defects (CCHDs) might be missed. The CDC has implemented a newborn screening using pulse oximetry, which can identify some infants with CCHDs.

CCHDs are structural heart defects generally associated with hypoxemia and may require cardiac catheterization and early surgical intervention to decrease mortality and morbidity. CCHDs represent about 25 percent of all congenital heart defects and the diagnostics screen for 7 primary targets: hypoplastic left heart syndrome, pulmonary atresia with intact septum, tetralogy of fallot, total anomalous pulmonary venous return, transposition of the great arteries, tricuspid atresia, and truncus arteriosus; and 5 secondary targets: coarctation of the aorta, double outlet right ventricle, Ebstein anomaly, interrupted aortic arch, and single ventricle.

Screening and treatment protocols will be discussed and case based scenarios presented. The guidelines and use of the bedside near infrared spectroscopy for infant cerebral function monitoring will be provided including treatment protocols and interventions for monitoring.

Neonatal Diabetes: A Multidisciplinary Approach to Care

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Neonatal diabetes (ND) is a disease diagnosed within the first six months of life, requiring insulin for treatment. The incidence of ND is 1 in 300,000 to 500,000 live births. Uniquely set apart from Type I diabetes by its strictly genetic etiology, ND can be associated with developmental delay and epilepsy. Insulin dependence can be permanent or transient. Insulin is a growth factor that is critical for optimal growth. Consequent to insulin deficiency, infants with ND typically present with intrauterine growth restriction, small for gestational age, failure to thrive, polyuria, polydipsia, persistent hyperglycemia (>200 mg/dl), an elevated hemoglobin A1c, or a low/undetectable insulin-reserve marker known as C-peptide. Among other laboratory studies, initial diagnostic evaluation should include genetic testing for mutations. Secondary to missed or delayed diagnosis, infants can also present in severe diabetic ketoacidosis. Management of ND includes insulin followed by stabilization using oral sulfonylureas. Positive outcomes are contingent upon early diagnosis, euglycemia, early interventions including multidisciplinary involvement, rehabilitation services, and parental support with regard hypo/hyperglycemia management and insulin administration. The purpose of this presentation is to review case studies describing clinical presentation, etiology, clinical management, implications for practice and family support required to combat ND.

Using Technology: Evolution of the NNP Brain from Spiral Notebook to the Smartphone

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For several decades students and faculty have created and compiled useful neonatal information into pocket sized handbooks for clinical reference. This educational reference tool can be invaluable to the learner, however is best utilized by individualizing the pertinent clinical references to specific personal preferences by clinical sites. Third party published "housestaff manuals" are often too institutionally specific and often incomplete.

This presentation will present the historical evolution of faculty provided clinical reference templates initially organized in spiral bound notebooks, and creatively compiled into customized pocket notebooks. With the advent of PDA and Smartphone platforms this notebook morphed into a searchable Word™ document. Arising from this rudimentary electronic platform the NNP Brain has been further individualized with Smartphone applications are now readily available to the NNP student. The presentation will focus on novel individualization of neonatal reference data. Demonstrations include ways to add third party publications and individual information organized by separate software technology such as Evernote™ on Apple's iOS and Google's Android mobile operating systems.

Body Temperature in VLBW Infants over the First Two Weeks of Life

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Problem: Very low birth weight (VLBW) infants experience hypothermia because of their inability to generate heat. Immature thermoregulation may be linked to necrotizing enterocolitis (NEC).

Background: When VLBW infants become hypothermic, they should shunt blood centrally by peripheral vasoconstriction (PV). Previously we found VLBW infants had no PV their first 12 hours; infants also had hours when peripheral temperatures were warmer than central ones. Immature thermoregulation may reduce intestinal blood flow, leading to NEC after feedings begin.

Methods: Observational, case study design of 28 VLBW infants for 2 weeks after birth. Abdominal and foot temperatures were measured every minute. Data were analyzed with time series models.

Results: Mean infant birth-weight was 885 grams (± 212); GA was 27.3 weeks (± 1.3). Mean abdominal temperature was 36.51°C (SD = 0.19); foot temperature was 35.87°C (SD = 0.26). Hypothermia was defined within infants using all temperatures below ISC. No infant exhibited consistent PV when hypothermic. Infants frequently had warmer foot temperatures than abdomen ones which were associated with abnormal abdominal x-rays.

Conclusion: Thermoregulation was not mature by 2 weeks. Higher peripheral than central temperature was associated with signs of NEC; larger samples are needed to examine this association. Nurses should monitor central and peripheral temperature when caring for VLBW infants.

Probiotics for Premature Infants: Current Practices Worldwide

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Probiotics are live bacteria which confer health benefits. Previous studies have suggested that probiotics are a promising, safe prophylactic treatment for necrotizing enterocolitis (NEC), which afflicts up to 12.9 percent of preterm infants in North America. Despite this evidence, few North American NICUs utilize probiotics in preterm infant feeds. We review herein the latest research supporting probiotic use, as well as world-wide supplementation protocols. The latter were compiled through a combination of emails sent to authors of clinical trials and interviews with health care professionals (HCPs) who administer probiotics to preterm infants. Current, best evidence suggests that probiotics are indeed efficacious and safe. Moreover, the most recent and to-date largest randomized controlled trial suggests that *Lactobacillus thermophilus*, *Bifidobacter infantis*, and *B. lactis* reduce NEC by over 50 percent compared to placebo. Our research indicates that probiotic feeds are routinely used in NICUs worldwide, including France, Finland, Germany, Greece, Italy, Finland, Saudi Arabia, and Taiwan. We also compare similarities and differences in probiotic formulations, indications and contraindications, and course of treatment. Finally, we speculate on factors which may influence the willingness of HCPs to use this promising practice in the care of preterm infants.

Neonatal Intensive Care Unit Nurse's Experiences and Perceptions of Medication Errors

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Background: Medication errors are the most common patient safety issue in hospitals. The potential impact of medication errors on neonates is three times more than for adults. Statistically, the incidence of NICU medication errors is eight times higher than in adult ICUs. However, the medication error reporting rate is only about 1 percent. It is important to understand and explore neonatal nurses' experience and perception of medication errors in order to prevent medication errors.

Design and Methods: An exploratory, semi-structured, qualitative design interview was conducted for 17 nurses. They were recruited from the NICUs of 8 teaching hospitals in Taiwan using a snowball sampling method. Data was analyzed using content analysis.

Findings: Content analysis resulted in five major themes emerging from the findings:

1. Nurses worry about harm to neonates.
2. Lingering shadows—Remorse and guilt.
3. Labeling—Supervisors and peers' perception.
4. Conflicts with medication error reporting.
5. Being vigilant—no more errors.

Conclusions: Attending to a nurse's sense of guilt and remorse of committing medication errors is important to help the nurse to report the extent of harm to the neonate. Reporting system is not friendly and reporters cannot be anonymous. Simplifying the procedure of reporting will increase the rate of medication error reporting for enhancing neonatal medication safety.

A Systematic Review of Non-Pharmacologic Management of Heel-Stick Pain in Preterm Neonates

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Background: Neonates in an intensive care unit experience many painful procedures. Since repeated and sustained pain may affect the neurologic and behavior-oriented development of the newborn, systematic pain management is essential in neonatology. Non-pharmacologic treatments for pain prevention and relief are increasingly discussed.

Purpose: To identify effective non-pharmacological interventions in the literature regarding heel stick pain prevention and treatment in preterm neonates.

Methods: A literature search from 2007 to 2012 was conducted using MedLine, CINAHL, and the Cochrane Library databases, and was complemented by a search of known articles. Two independent reviewers extracted data and assessed methodological quality according to pre-defined criteria.

Results: We identified 14 randomized controlled studies that pertained to non-pharmacologic pain management methods. The selected interventions were "non-nutritive sucking," "sucrose," "glucose," "sensorial saturation," "facilitated tucking," "kangaroo care," "sensorial saturation," "breast milk," and "incubator care (inclined, nested, and prone)." Some of the non-pharmacologic interventions reduced changes in pulse rate, respiration and oxygen saturation, motor activity, and clinical excitation states during painful intervention.

Conclusion: Evidence supported "non-nutritive sucking," "sucrose," "glucose," "sensorial saturation," "facilitated tucking," and "kangaroo care" for their pain-alleviating effects on neonates. However, unambiguous evidence of their effects remains to be presented. Further research must use validated pain assessment instruments for the evaluation of the pain-alleviating effect of non-pharmacological interventions.

Outcomes of Neonates Receiving Nasal CPAP in a Level II Hospital from 2010 to 2012: A Clinical Audit

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Background: The use of nasal continuous positive airway pressure (NCPAP) in non-tertiary level II special care nurseries (SCN) in Victoria (Australia) has increased since the introduction of guidelines for its use. The aim of this study was to examine the use of NCPAP in a single non-tertiary level II SCN for compliance with the guidelines.

Method: A retrospective audit was conducted on all neonates who received NCPAP for initial treatment of respiratory distress in the 3-year period from January 2010 to December 2012, following ethics approval. Data were extracted from patient histories and included demographic

data, chest x-ray result, indication for NCPAP and NCPAP settings. Data analysis was performed using Statistical Packages Social Sciences (SPSS) v 21, with a two-tailed *p*-value < .05 significant.

Results: A total of 44 neonates commenced NCPAP in the three-year study period. Twenty-six stayed in the SCN and 18 were transferred to a tertiary center; guidelines were adhered to in all neonates. The transfer group had statistically higher oxygen requirements with a median FiO₂ of 0.4 (IQR 0.4–0.5) compared to neonates that stayed (median FiO₂ 0.3 (IQR 0.3–0.4). For neonates that stayed, the median time of NCPAP delivered was 22 hours and 37 minutes (IQR 16:41–44:08).

Conclusions: Management of NCPAP in the level II SCN complied with guidelines and was safe. Neonates transferred out had a statistically higher oxygen requirement compared to those who stayed.

A Collaborative Approach to the Management of Neonatal Abstinence Syndrome

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Sarasota Memorial Hospital (SMH) cares for nearly 100 infants per year at risk for neonatal abstinence syndrome (NAS) in our neonatal intensive care and pediatric units. More than half of these infants require pharmacologic intervention. With the state of Florida leading the nation in oxycodone prescribing, combined with the prevalence of methadone clinics and illicit substance abuse, this patient population will continue to grow. The care of these often challenging infants is optimally managed through a collaborative, multi-disciplinary approach. First, a task force was organized at SMH consisting of a neonatologist, staff nurses and pharmacists to develop evidence-based protocols and treatment guidelines. The next step was to ensure consistent and accurate use of the Finnegan scoring tool. To achieve inter-scorer reliability, the team conducted peer-to-peer validating of each nurse on the unit. The most important step in the management of infants with NAS is daily, nurse-driven multidisciplinary rounds. The nurse presents the patient, including scores over the last 24 hours. Decisions to wean or escalate treatment are made after discussion among the nurse, neonatologist and pharmacist. This collaborative approach has reduced the length of stay and provides consistent, quality care to infants suffering from NAS.

An Ontario NICU Infection Control (ONIC) Experience

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Background: An effective means to reduce neonatal nosocomial infections (NI) across Canada has been documented, largely from EPIQ (Evidence-based Practice for Improving Quality). The Ontario NICU Infection Control (ONIC) initiative evolved from EPIQ-based research; a continuous quality improvement process targeting NI reduction across multiple level II NICUs.

Purpose: Our intent was to apply practice changes from the ONIC NI bundle and report changes in our NI rate.

Methods: ONIC NI Bundle practice changes included 6 domains for improvement (hand hygiene, feeding, line insertion, line maintenance,

line removal, multi-disciplinary review of infections). Targets for practice change included: 33 percent reduction of NI, 75 percent hand hygiene compliance, and 66 percent Central Line Insertion Checklist compliance.

Results: In the 12 months preceding and post NI bundle implementation, our NICU population remained relatively constant (admissions, gestational age, TPN, central lines). Following implementation of the NI bundle, hand hygiene compliance peaked at 89 percent before patient contact and 80 percent after, while Central Line Insertion Checklist compliance rated 83 percent. In the 12 months preceding intervention, we had 21 NIs while 12 months post intervention; we reduced our NI to zero.

Implications for Practice: Reducing nosocomial infections through the ONIC process seems effective in our level II NICU setting.

The Use of Own Mother's Colostrum as a Potential Immune Therapy for Extremely Premature Infants

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Problem/Literature Review: Own mother's colostrum contains many immunologically-derived factors that protect the recipient infant against infection and have trophic, healing, and maturational effects on the intestinal mucosa. The colostrum produced by mothers who deliver extremely premature infants contains the highest concentrations of these protective factors, and is potentially an "immune therapy" for these immunodeficient infants in the first days of life. Unfortunately, clinical instability precludes enteral feedings for extremely premature infants during this period. Alternative methods for administering own mother's colostrum as a potential immune therapy during this critical period must be explored. Oropharyngeal administration is a feasible option.

Purpose for session: During this presentation, we will discuss the use of own mother's colostrum, administered via the oropharyngeal route, as a potential "immune therapy" to improve health outcomes for preterm infants. The potential mechanisms of action will be discussed. Compelling evidence from animal and human studies to support "oropharyngeal administration of colostrum" will be presented. The safety and efficacy of oropharyngeal colostrum, and "mouth care" or "oral care" with own mother's colostrum will be discussed and recent research (including methodology, data analysis and interpretation) will be presented. Clinical implications and future directions for multidisciplinary research will also be discussed.

Impacts of the NICU Microsystem on the Maternal Experience

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Maternal stress developed from caring for a child in the NICU can result in a variety of negative outcomes, including difficulty developing an attachment to the infant and an increased risk of postpartum depression. There remains a gap in our knowledge of how care systems influence patient experiences. The research question this project aims to answer is: What is the influence of the NICU microsystem on the

maternal experience? In a pilot study, the greatest source of influence on the experience was the relationship between the mother and the nurses within the unit. Being included in the care processes and using a family-centered approach arose as the greatest factor contributing to positive feelings. This research will be especially significant to neonatal nurses and unit managers as it will provide information on how care delivery can influence mothers' feelings and wellbeing. Using an institutional ethnographic framework, data were collected through participant observation, interviews with mothers in the NICU and textual artifacts to provide rich descriptions and triangulation of data. The goal is to make contributions that will provide positive NICU experiences in an effort to ultimately affect the quality of life for patients and families who experience significant health challenges.

Utilization of Specially Trained Neonatal Nurses in Optimizing Outcomes for Newborns with Brain Injury

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Background: Evolving research in newborn brain injury, monitoring, and treatment has led to the development of a neuro-focused care model driven by standardized protocols and guidelines to provide optimal care that will improve outcomes. The mission of the "Neurological Intensive Care Nursery (NICN) is to offer exceptional care by setting community standards, exceeding family expectations, and promoting increased knowledge through innovative research in an environment that optimizes family-centered care for infants."

Innovation: A dedicated team provides innovative, individualized, and developmentally sensitive care to critically ill newborns with complex medical conditions that place them at risk for neurologic injury. A core group of 22 neonatal intensive care unit nurses who are passionate and skilled in caring for babies with neurologic injury received additional education/training related to assessing the severity of hypoxic ischemic encephalopathy (HIE), monitoring and responding to physiologic changes during therapeutic hypothermia (TH), applying and interpreting aEEG tracings, and rapidly alerting the medical team to changes in the infant's neurologic status.

Outcomes: The NICN has led to earlier identification of at risk infants and earlier treatment/intervention/monitoring. Since its implementation in November 2012, the number of patients receiving TH for HIE has quadrupled, the average length of stay for patients receiving TH has decreased significantly reducing cost of care. Additionally, the average age in hours for the initiation of TH/monitoring has decreased.

Nemaline Rod Myopathy: What You Know Now. . . Would it have Changed Your Management Then?

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Baby Boy A was born at a community hospital by emergent caesarean section due to loss of fetal heart tones. He initially had a weak cry then went limp and apneic. He was given stimulation and PPV and due to decreased tone, perfusion and poor respiratory effort was intubated at 19 minutes of age. Apgars were 4, 2, and 5. He received normal saline and D₁₀ boluses for hypoperfusion and hypoglycemia. A blood

culture was drawn and antibiotics were started. The level III NICU was contacted for transport, evaluation, and treatment of this baby.

Upon admission to NICU he was placed on a cerebral function monitor due to concerns for HIE. Initial voltage was low but then increased to 5–10 micro-volts. With a discontinuous pattern on the continuous fetal monitoring (CFM) and an abnormal neuro exam, including hypotonia, no spontaneous respirations and little spontaneous movement, the decision was made to initiate therapeutic hypothermia. When cooling was complete an MRI of the brain was done that was essentially normal. The infant failed extubation twice. Neurology and Genetics were consulted. After numerous diagnostics, the diagnosis of Nemaline Rod Myopathy was made. The baby went home on a ventilator with a tracheostomy and gastrostomy tube.

A Text Mining Study: Thoughts of Japanese NICU Nurses about the Construction of Parent–Child Relationships

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The purpose of this research is to extract the attitudes of NICU nurses towards child–parent bonding by using statistical text-mining techniques. The participants were 13 NICU nurses; whose years of experience ranged from 3 to 25. Data were collected through semi-structured interviews, such as (1) how do you feel about child–parent bonding at the NICU? (2) what are the differences in parent–child relationships between acute stage and recovery stage? (3) how do you feel about the difficulties of establishing child–parent bonding? These data were recorded and rewritten by each sentence. The number of sentences was 356. Those data were analyzed by IBM SPSS Text Analysis for Surveys. As the results, descriptions related to the emotion of parents for birth as premature baby were categorized "acceptance," "apprehension," "reliance," "expression and deed," "pleasure," "guilt," "care-participation," "will to parenting," and "exhaustion." Descriptions of nurses' emotion towards parents, especially mothers, were categorized "self-immaturity," "agony," "difficulty of care," "painful." As the result of PCA, five axes of care policies were depicted, such as "to arrange the environments," "special consideration at terminal stage," "team collaboration for individual care," "to promote enjoyment of patients," and "to understand patients' emotional movement."

Incidence of Necrotizing Enterocolitis Related to Length to Establishment of Full Feeds and Intake Solution in Preterm Infants

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Background: There is solid evidence that exclusively breast-fed infants have lower rates of necrotizing enterocolitis (NEC) compared to partially or fully formula-fed infants. What has not been investigated fully is the incidence of NEC related to establishment of full feeds in preterm infants and the accompanying enteral feeding solution.

Method: Chart review was done on 233 preterm infants from a level III neonatal intensive care unit. SPSS was used to determine rates of

NEC relating to enteral solution and establishment of full enteral feeds from 0–45 days, and over 45 days.

Results: We found that there was no incidence of NEC in infants exclusively fed breast milk, or those whose feeds were fully established by 45 days of life. In partial or fully formula-fed infants, there was a 2.6 percent rate of NEC in infants whose feeding was not established by 45 days, and 1.3 percent of infants died of NEC before full feedings were established.

Conclusion: Our data proves the benefits of exclusive breast milk feeds and establishment of enteral feeds by 45 days. Continuing research will need to be done to determine exact feeding regimens and associated NEC rates.

How Cool is Cool! Evidence Based Practice for Whole Body Hypothermia in Neonates Suffering from Hypoxic Ischemic Events (HIE)

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Neurodevelopmental deficits that occur in the neonatal population can be devastating in childhood and effect quality of life for the infant and the entire family. According to Shankaran (2005), infants with moderate encephalopathy have a 10 percent risk of death, and those who survive have a 30 percent risk of disabilities. Sixty percent of infants with severe encephalopathy die, and many survivors are handicapped.

Data demonstrating reductions in brain temperature by 2°C to 5°C provide neuroprotection in newborns and diminishes the effects of brain ischemia. Brain cooling has shown to have favorable effects on multiple pathways contributing to brain injury, including excitatory amino acids the cerebral energy state, cerebral blood flow and metabolism, nitric oxide production, and apoptosis. Brain cooling is effective in reducing the extent of brain injury when initiated in less than 6 hours of life. Whole-body cooling provides homogeneous cooling to all brain structures, including peripheral and central brain regions.

This presentation will encompass how to cool, provide sedation and analgesia for shivering, treatment for seizures, video recording of seizure activity and understanding the bedside EEG.

A Key Member of the NICU Rounding Team

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Daily patient care rounds are an important part of patient care. Nurses have inconsistently been present during patient care rounds. They were not included in rounds and did not feel valued in the rounding process.

Method: A multidisciplinary task force was developed to create the process. They decided what information would be presented by the nurse and by the LIP (nurse practitioner and resident). Education consisted of a PowerPoint presentation with pre- and post-tests, a DVD of three practice rounding scenarios, and a practice scenario for the nurses to practice presenting to each other. A pilot was conducted before unit-wide implementation.

Results: Several PDSA cycles have been completed which led to a major revision in the presentation template and a change in the process for rounds presentation. Survey results will be provided.

Discussion: Many barriers have been identified during implementation of this process. Buy-in from multiple disciplines has been challenging. Sustaining this collaborative process will be critical as the staff prepares to move into a single patient room unit in the next year.

Reducing Unplanned Extubation of Endotracheal Tubes in the NICU

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Background: Respiratory distress syndrome is the major complication for preterm infants. For these infants, they are usually placed with an endotracheal tube and given ventilator therapy. From January to December 2011, the unplanned extubation rate reached a peak of 1.45 percent in the NICU. This is a serious safety issue as it threatens patients' lives and also prolongs their hospital stay.

Design and Methods: In order to improve this issue, we recommend the following strategies. First, we developed standards for caring and monitoring of the endotracheal tube. Every four hours, nurses had to check for discharge and ensure endotracheal tube adhesive tape is intact. Second, the ventilator pipes should be adjusted to correct position depending on the patient's posture. Third, on a weekly basis, the quality team members monitor if these guidelines were followed.

Findings: From January to June 2012, the unplanned extubation rate of endotracheal tube was significantly reduced to 0.58 percent.

Conclusions: The unplanned extubation of endotracheal tube deteriorates a patient's breathing condition and delays the usage of a ventilator. In conclusion, this project reveals that by following these best practices, the unplanned extubation rate of endotracheal tube can be reduced and improve the quality of nursing care in the NICU.

A Staff Nurse's Key Role in the Development of an Innovative Multidisciplinary Simulation-Based Educational Program for Delivery Room Resuscitation under Special Circumstances

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Effective and efficient neonatal resuscitation reduces mortality and adverse outcomes. NICU nurses and fellows are first-in-line for delivery-room (DR) resuscitations and their ability to provide rapid stabilization is dependent on advanced knowledge/skills and seamless communication/teamwork. Residency training changes have resulted in fellows entering their practice with reduced exposure to (clinical) resuscitation, limited attendance at high-risk deliveries, and fewer opportunities to perform life-saving procedures. Also, because of their relative infrequency; there is little opportunity for nurses/fellows to practice the resuscitation of infants with congenital malformations. Staff nurses and NNPs can spearhead the development of training programs to facilitate practice sessions for these highly complex resuscitations. The purpose of this presentation is to describe an innovative multidisciplinary simulation-based program, developed by a staff nurse, and a

NNP in collaboration with neonatologists, to enable nurses/fellows to practice DR resuscitation under special circumstances: diaphragmatic hernia, hydrops, hypovolemic shock, gastroschisis, meningomyelocele, and extreme prematurity. We present outcomes and highlight the staff nurse's key role in the planning/implementation of this program,

which may serve as a model for others to improve outcomes. Potential areas of future research, including use of a validated checklist to standardize DR resuscitation of infants with congenital malformations, will be included.