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Each year, more than 800,000 newborns in the United States are diagnosed with neonatal jaundice.¹

Some babies may not fully respond to current therapies and may require additional interventions, leaving them exposed to elevated levels of bilirubin for a long duration of time.²

It is unknown what levels of bilirubin start to trigger potentially toxic effects in an individual newborn. Left uncontrolled, elevated bilirubin can lead to neurologic dysfunction, encephalopathy, or irreversible brain damage.^{3,4}

In 2004, the American Academy of Pediatrics published guidelines for the management of hyperbilirubinemia.³ Since then, there have been only modest treatment advancements in jaundice. The current standard of care requires periods of isolation that can compromise the potential of the mother-infant bond.⁵

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Clinical Outcome of Complete Integration of Electronic Health Record System Technologies Inside the Neonatal Intensive Care Unit - Four 4-Year Evaluation

PEER REVIEWED

By Husam Salama, MD; Sufwan Alomar, MD; Hilal Al.Rifai, MD; Samawal Lutfi, MD; Cindhu Jacob, MD; George Jacob, MD; Afaf Shedad, MD; Tawa Olukade, MD

Introduction

Abbreviations: CLD: Chronic Lung Disease; CONS: Coagulase Negative Staph; CLABSI: Central Line-Associated Blood Stream Infection; EHRs: Electronic Health Record System; IVH: Intraventricular Hemorrhage; LOS: Late Onset Sepsis; NEC: Necrotizing Enterocolitis; ROP: Retinopathy of Prematurity; VLBW: Very Low Birth Weight; VAP: Ventilation Associated Pneumonia; ALOSMV: Average Length of Stay on Mechanical Ventilation; ALOS: Average Length of Stay in ICU; NICU: Neonatal Intensive Care Unit; ELBW: Extremely Low Birth Weight; EMR: Electronic Medical Records.

Key Words: NICU, Electronic Data entry, Cerner, clinical outcome, quality, health record, EHRs.

Acknowledgment: The authors would acknowledge the valuable work of the NICU Database, Women's Hospital at Hamad Medical Corporation.

Abstract

Objectives

To evaluate the impact of a complete transformation of patient medical records from the traditional paper-based system to an electronic, computerized-based system on the clinical outcomes of newborn infants admitted to NICU.

Methods

This is a retrospective observational comparative analysis of nine major neonatal clinical parameters. The study compared the outcomes of two eras, two years before and two years after implementing the new Electronic Health Record System (Cerner®) into a major tertiary NICU. The study focused on the following nine patient outcomes; mortality rate, infection rate, chronic lung disease, pneumothorax, brain hemorrhage, Retinopathy of Prematurity, necrotizing enterocolitis, Average Length of Stay inside the NICU, and the average number of days on mechanical ventilation. The data was collected to present three sets of results; general outcome of all newborns, outcomes of newborns less than 1500 grams birth weight and outcomes related to newborn infants born between 23 to 29 weeks gestation age.

Results

A total of 3,394 newborns admitted to NICU in pre-EHR era (2014 and 2015) was compared to 3,834 newborns admitted during post-EHR era (2015 and 2016), after exclusion of deaths occurred at the delivery room setting. Overall mortality rate was 4.45% versus 3.9% with a P-value of 0.003. An increase in the rate of CLD from 5.85% to 9.7% with a P-value of 0.011. A decrease in rate of pneumothorax was noted; 2.64% versus

“Objectives: To evaluate the impact of a complete transformation of patient medical records from the traditional paper-based system to an electronic, computerized-based system on the clinical outcomes of newborn infants admitted to NICU.”

2.45% with a P-value of 0.008. Mortality rate among VLBW increased from 15.9% vs 17.7%. Among babies born less than 1500 grams, the rate of necrotizing enterocolitis and cystic periventricular leukomalacia, was not significantly affected between the two eras. The Retinopathy of Prematurity rate was significantly reduced from 28% to 26% with a P-value of 0.0045. In the Extreme Low Birth Weight group, there was a decrease in the mortality rate from 23% to 18.6% with a P-value of 0.268, and an increase in CLD. However, infection control data showed marginal improvement, where CLABSI was 3.8% vs 3% with a P-value of 0.7, VAP 2.1% vs 1.6% with a P-value of 0.08, and CONS infection 2.1 vs 0.93% with a P-value of 0.03.

Conclusion

Complete transformation into EHRs was not accompanied with significant improvement in clinical outcomes in newborn infants admitted to the NICU. Health care policy makers may consider goals other than patient clinical outcome when they plan to implement the EHRs.

Introduction

The comprehensive transfer of medical records from a paper-based system to a computer-based system is sweeping medical practice in both governmental and private healthcare institutes. The main reasons are: to guarantee a safe place for patient documents, easy follow-up of patient records, adding more patient data that were not routinely recorded by health care givers, protection of patient records from illegal changes that may have medico legal implications and its role in research and auditing services.¹ However, there has been resistance toward accepting the electronic medical records by healthcare givers due to several genuine reasons including: longer time to enter the data, needs for extensive computer literacy, high cost, inefficiency, data entry errors, linking the electronic performance with the overall staff performance evaluation and less time spent on patient care.²⁻⁴ Other similar studies reported the use of EHRs inside the NICU to improve work flow, auditing purposes and generating of annual statistics. However, there was no emphasis on clinical outcome of newborn infants after the introduction of the EHR system.⁵

One of the major USA (EHRs) institutes endorsed its services for many reasons, non-including data from morbidity and

Table 1: Clinical Outcome of All Infants Born at Women's Hospital During the Study Period			
	2013-2014 (3,394)	2015-2016 (3,834)	P-Value
	%		
Mortality	4.45	3.9	0.003
CLD	5.85	9.7	0.011
Pneumothorax	2.65	2.45	0.008
IVH	8.45	11.1	0.070
ROP	23.6	23	0.696
Cystic PVL	1.75	2	0.170
NEC	1.5	1.25	0.073
Average Length of Stay in NICU	16.1 ±37	16.3±28	0.79
Average Length of Stay on Ventilation	6.2 ± 18	6.7 ± 16	0.21

Table 2. Clinical Outcome of Infants Born Less Than 1,500 Grams Women's Hospital During the Study Period			
	2013-2014 (547)	2015-2016 (667)	P-Value
	%		
Mortality	16.7	14	0.027
CLD	8.2	14.1	0.013
Pneumothorax	4.2	4.4	0.28
Late Onset Bacterial Sepsis	16.3	15.6	0.64
CONS	6.1	7.4	0.32
IVH	15.3	16.3	0.49
ROP	28	26	0.0045
Cystic PVL	2.1	3.2	0.07
NEC	6.6	5.1	0.20
Average Length of Stay in NICU	47.7± 53	43± 37	0.069

mortality among sick newborn babies inside the NICU.⁶

Virtually all studies, reviewed articles and published auditing results evaluating such systems inside the NICU did focus on the technical, logistic and/or fiscal impact on health care service.⁶⁻⁹

In this study, the authors are exploring the clinical impact of such modern technology on newborn morbidity and mortality inside the neonatal intensive care.

During 2013-2016 study period, four significant developments occurred inside our NICU; namely, on January 2014, the wide use of non-invasive ventilation through introducing new advanced ventilators, adding 35 more new beds in a new NICU expansion, creating a special

NICU mainly dedicated to caring for Extreme Low Birth Weight babies born at 23 to 27 weeks gestation age, and the introduction of Cerner® Electronic Health Record System. Cerner® Electronic Patient Registry was introduced to our institute in November 2014. Starting from January 2015, paper-based patient record were removed entirely from patient area, and were completely replaced by the EHRs.

Aims and Objectives

To estimate differences in mortality, major morbidity rates and key performance indicators inside NICU, namely, rate of CLABSI, VAP, days on Ventilator and hospital stay before and after introduction of EHRs.

Methodology

This was a retrospective cohort study comparing the outcomes of two eras, two years before and two years after total implementation of a new electronic medical record system (Cerner®) within state-run hospitals in Qatar. The study focused on nine patient outcomes: mortality rate, infection rate, Chronic Lung Disease, pneumothorax, brain hemorrhage, Retinopathy of Prematurity, necrotizing enterocolitis, Average Length of Stay in the NICU, and the Length of Stay on Mechanical Ventilation among all newborns admitted into the NICU within the studied periods. The data was collected to present three sets of results: general outcome of all newborns, outcome of newborns less than 1500 grams birth weight, and outcomes of newborn infants born at 22 to 29 weeks gestation age.

The data was retrieved from both our NICU, the Vermont Oxford Database and the Women's Hospital Medical Record Electronic Database. All newborns admitted into the NICU were eligible for study. The total sample size was 7,228 for the two periods, (2014 and 2015, n=3,394) and (2015 and 2016, n=3,834).

Statistical Calculation

The prevalence of outcomes was calculated and presented as absolute percentages. Length of days was expressed as means and standard deviation. The rates of nosocomial infections was calculated as number of cases divided by the number of patient days x 1000. Chi-square test for comparison of differences in proportions between the two periods was done using MedCalc's online 'Free statistical calculators', which "uses the "N-1" Chi-squared test as recommended by Campbell (2007) and Richardson (2011)".¹¹ Calculation was done using the sample proportions (%) and the sample sizes of the two periods being tested. Statistical significance was set at p<0.05. Medcalc.org comparison of means was used to compare the days of hospital stay and days of mechanical ventilation using student t-test.¹¹

Results

A total of 3,394 newborns admitted to the NICU during the pre-EHR era (2014 and 2015) was compared to 3,834 newborns admitted during post-era (2015 and 2016) after exclusion of deaths occurred at the delivery room setting (Table 1). The overall mortality rate was 4.45% versus 3.9%, with a P-value of 0.003. There was an increase in the rate of CLD from 5.85% to 9.7%, with a P-value of 0.011. A decrease in the rate of pneumothorax was noted; 2.64% versus 2.45% with a P-value of 0.008. The mortality rate

Table 3. Clinical Outcome of Infants Born at Gestation Age of 22-29 Weeks at Women's Hospital During the Study Period			
	2013-2014 (342)	2015-2016 (433)	P-Value
	%		
Mortality	23	18.6	0.0268
CLD	11.8	20.25	0.0130
Pneumothorax	5.1	5.85	0.2806
Late Onset Bacterial Sepsis	20.1	20.4	0.6420
CONS	8.2	10.4	0.3221
IVH	19.2	22.2	0.4930
ROP	35.6	33	0.0045
Cystic PVL	3.2	4.5	0.0705
NEC	8.4	8.4	0.2015
Average Length of Stay in NICU	58±63	52.5±40	0.139

Table 4. Infection Rate			
	Rate*		P-Value
	2013-2014	2015-2016	
CLABSI	3.8	3	0.7
VAP	2.1	1.6	0.08
LOS	3.7	2.2	0.04
CONS	2.1	0.93	0.03

* Rate = Number of cases / Number of patient days X 1000

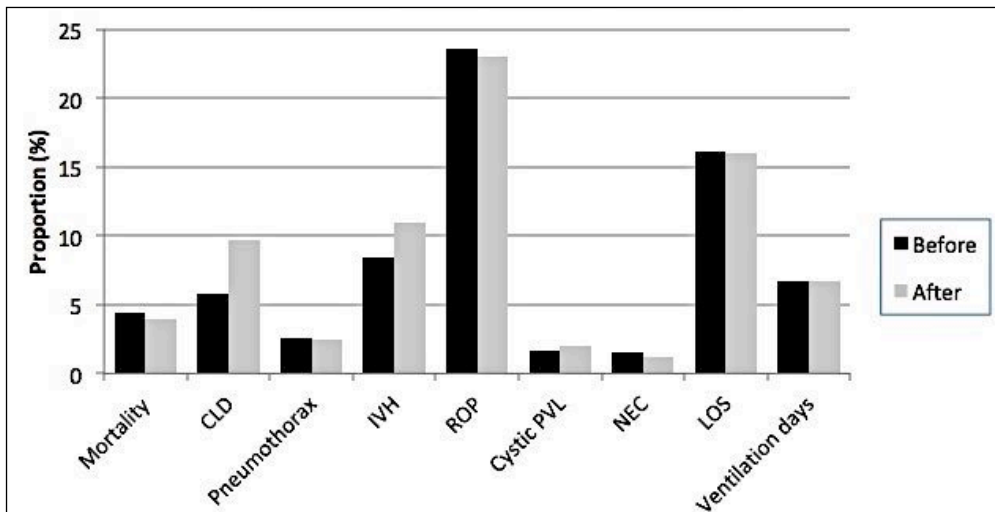


Figure 1. Overall Clinical Outcome Before and After EHS.

among VLBW decreased from 16.7% in pre-EHR era to 14% in post-EHR era. Among babies born less than 1,500 grams, rates of necrotizing enterocolitis and cystic periventricular leukomalacia, were not significantly affected (Table 2). Retinopathy of Prematurity rate was significantly reduced from 28% to 26%, with a P-value of 0.0045. In the Extreme Low Birth Weight group, there was a decrease in mortality rate from 23% to 18.6% with a P-value of 0.0268, and an increase in CLD rate (Table 3). However, infection control data showed improvement where CLABSI was 3.8% vs 3%, with a P-value of 0.7, VAP 2.1% vs 1.6%, with a P-value of 0.08, and CONS infection 2.1 vs 0.93%, with a P-value of 0.03 (Table 4).

Discussion

Several studies have been conducted in ambulatory services and less intensive areas, assessing the information flow and logistics of electronic health care records on the quality of work performance.^{12,13} These studies claimed that the patient-related outcomes were better in adult patients, with enhanced overall patient care, less ordered medications and lab requests. Cordero et al demonstrated the advantage of remote

“Based on the available literature,^{12,13} longer duration assessment is not an impact factor. In a cross-sectional study, Li Zhou et al, found no association between duration of using an EHR and improved performance with respect to quality of care. Intensifying the use of key EHR features, such as clinical decision support, may be needed to realize quality improvement from EHRs”

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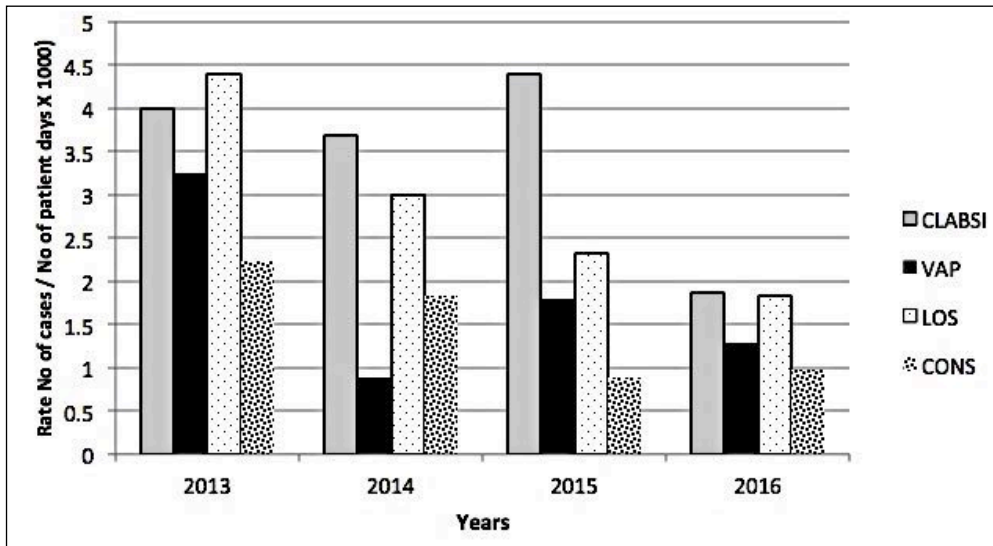


Figure 2. Infection Outcome: General Rate of Nosocomial Infection: (Before Cerner 2013 and 2014. After Cerner 2015 and 2016). Rate = Number of Cases / Number of Patient Days X 1000).

access, more panoramas of patient lab results, improvement in deciding the needs for more investigations and more physician workflow.⁸ In a cross-sectional study measuring the relationship between Electronic Health Record use and the quality of care delivered in ambulatory care practices, and how it varied according to duration of Electronic Health Record availability, the study compared the quality of care for 596 patients at the center using Electronic Medical Records for more than a decade¹¹ to a national sample of 996 patients treated at community hospitals, and found that the EHRs were associated with higher levels of overall patient care quality, especially in chronic disease management and preventative care, but not in acute care areas. Few studies could be identified in high intensity areas including Neonatal Intensive Care Units.⁴⁻⁸ However, virtually no study assessed the exact morbidities and mortality rate after implementing EHR, which is the ultimate objective of any healthcare development. There is a clear need for studies that reflect the impact of such technology advancements on direct patient outcome parameters, rather than developments surrounding sick newborn logistic and fiscal performance. The reason why there is a need for such studies is the high incidence of morbidities inside the NICU, and the long-term impact they have on the quality of life of NICU graduates.

Based on the available literature,^{12,13} longer duration assessment is not an impact factor. In a cross-sectional study, Li Zhou et al, found no association between duration of using an EHR and improved performance with respect to quality of care. Intensifying the use of key EHR features, such as clinical decision support, may be needed to realize quality improvement from EHRs.

One should acknowledge the dramatic improvement in the rate of infection when comparing the two eras.

In the current study, we observed an improvement in mortality rates, pneumothorax, ROP, and infection control parameters; such improvement was secondary to adopting more non-invasive respiratory care in the premature age group, strict guidelines regarding oxygen saturation level and early application of non-invasive ventilation. However, there was a retreat in CLD, IVH and PVL, which can be explained by more premature babies less than 25 weeks being admitted to NICU. There was no change in rate of NEC, LOS and ALOS MV.

The authors of this current study can claim that clinical comparison between the two eras is unique in the literature, and no similar studies are available reflecting NICU different clinical outcomes in

response to such changes. Nevertheless, we cannot exclusively link or associate our NICU outcome solely on the EHRs application. Within the capacity of this study, the authors can conclude that introducing EHRs to our NICU facility did not demonstrate a momentous improvement in morbidity and/or mortality rates inside our NICU. Healthcare policy makers are required to consider clinical outcomes when they endorse complete integration of EHRs.

Study limitation

Other factors that could possibly confound the outcomes observed in the two eras being compared were not controlled for in the analysis. As well, logistic regression of the variables was not possible as the data was retrieved from Vermont Oxford Database results concerning our hospital.

“Within the capacity of this study, the authors can conclude that introducing EHRs to our NICU facility did not demonstrate a momentous improvement in morbidity and or mortality rates inside our NICU. Healthcare policy makers are required to consider clinical outcomes when they endorse complete integration of EHRs.”

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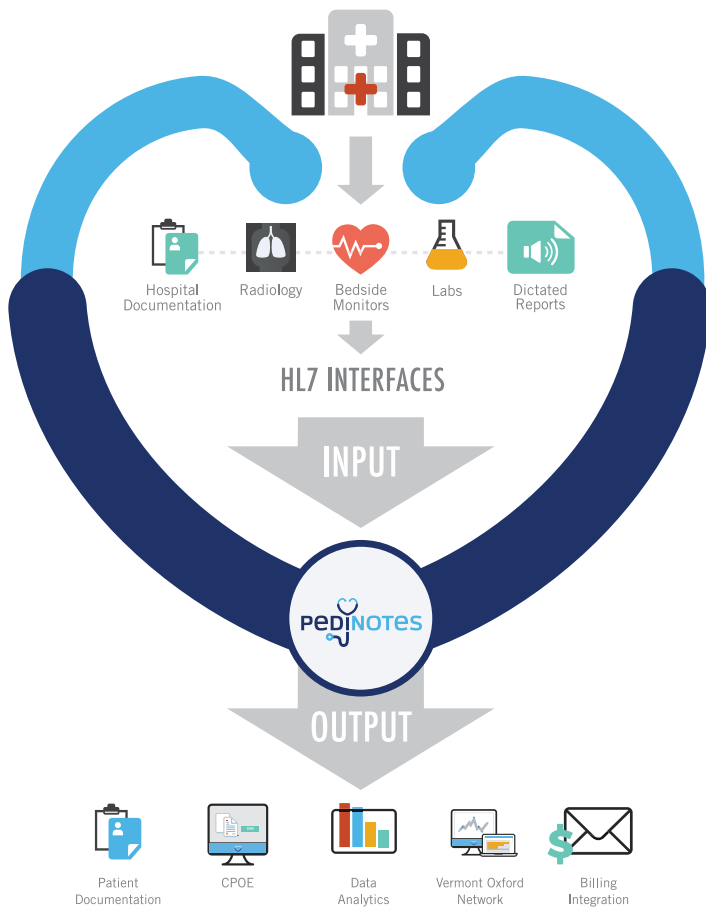
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Our Story PediNotes

Steve Spedale, MD, FAAP, is the director of neonatology for one of the country's largest women's hospitals. As an early adopter of electronic medical records in the NICU, Spedale recognized the need for improved technology not provided by the available EMRs. With that in mind, he began developing software add-ons independently to give him the tools he needed.



In 2011, Dr. Spedale realized his ideas could benefit other doctors and caregivers, so he built a development team to execute them. Together, they created PediNotes.

The technology received its first certification for meaningful use in 2013. PediNotes is anchored by the principle that once data is obtained, it should be readily available to anyone involved in the care of the patient. Focusing on the end user's experience to maximize efficiency, PediNotes provides an intuitive approach that helps you take better care of your patients.

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Open Letter from The National Coalition for Infant Health (NCfIH) - Establishing Exclusively Human Milk for Very Low Birthweight Babies as Our Nation's Standard of Care



Dear Colleagues:

The National Coalition for Infant Health (NCfIH) - applauds the development of nutritional guidelines for preterm infants by the American Academy of Pediatrics (AAP Section on Breastfeeding), the National Perinatal Association (NPA) and the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN). Evidence-based guidelines must be constructed in a manner that reflects the overwhelming body of evidence to establish exclusive human milk for very low birthweight babies as our nation's standard of care.

NCfIH (<http://www.infanthealth.org>) is collaborative of 150 professional, clinical, community health, and family support organizations focused on improving the lives of preterm infants from birth through age two. NCfIH's values include:

Safety - Premature infants are born vulnerable. Products, treatments and related public policies should prioritize these fragile infants' safety.

Access - Budget-driven health care policies should not preclude premature infants' access to preventative or necessary therapies.

Nutrition - Proper nutrition and full access to health care keep premature infants healthy after discharge from the NICU.

Equity - Prematurity and related vulnerabilities disproportionately impact minority and economically disadvantaged families. Restrictions on care and treatment should not worsen inherent disparities.

Based on evidenced-based research, evaluation of all relevant data along with the practical collective clinical expertise of our members, NCfIH advocates for:

- Access to an exclusive human milk diet for premature infants born at less than 1,250 grams.
- Increased emotional support resources for parents and caregivers suffering from PTSD/PPD.
- Access to RSV preventive treatment for all premature infants as indicated on the FDA approved label.
- Clear, evidence-based nutrition guidelines for pregnant and breastfeeding mothers.
- Safe, accurate medical devices and products designed for the special needs of NICU patients and other medically fragile infants.

For preterm infants born at less than 1,250 grams, the evidence for the use of an exclusively human milk diet devoid of foreign protein is conclusive.

Moreover, the definition of an exclusive human milk diet is exactly that: mom's milk and/or screened and pasteurized human donor milk plus a human milk-based fortifier.

NCfIH has evaluated 15 studies published since 2010 in major journals that examine the difference between feeding bovine vs. human milk in this small cohort. Thirteen of these studies were used in our analysis; two were outside of the scope of this review.

Importantly, two randomized head-to-head trials compared the difference between an exclusive human milk diet and a diet that included bovine-based formula and/or fortifier with a total of 260 infants.^{1,3}

The results of both studies demonstrated clinical and statistically important differences as indicated below. Moreover, when these studies were combined, as they had initially been designed to be, the findings were more conclusive, indicating a clear and direct relationship between the amount of exposure to bovine-based nutrition and an increased risk of significant morbidities of prematurity such as necrotizing enterocolitis and sepsis.⁷

These studies demonstrate:

1. Significant reductions in the incidence of all NEC and in the risk of surgical NEC^{1,2,3,8,9,10,11,12}
2. Decreased lengths of hospital stay^{2,9}
3. Reduction of TPN days^{3,4}
4. Reduced days of feeding intolerance and number of days to full feeds.²
5. Improved weight and length velocity with the proper feeding protocol and the use of a human milk-based fortifier^{5,6}
6. Lower mortality^{7,8}
7. Reduced incidence of late onset sepsis^{2,8}
8. Reduced incidence of ROP and BPD^{2,8}

Considering the evidence, introducing bovine milk-based substances in these infants is detrimental. A prerequisite of additional randomized controlled studies is equipoise. Further head-to-head trials utilizing bovine fortifiers and/or formula vs. exclusive human milk may be difficult to conduct in certain populations where the benefit of an exclusive human milk has been shown to be unequivocally superior.

Incremental costs of co-morbidities and interventions in these fragile infants can substantially increase the cost of NICU hospitalization. Aggregate costs include:^{2,10}

- Surgical NEC \$198,040
- Medical NEC \$74,004
- Late onset sepsis \$10,055
- BPD \$31,565
- ROP requiring surgery \$35,749
- PDA \$49,457

In addition to the aggregate costs noted above, an additional significant cost related to these infants may be the cost of total parenteral nutrition estimated at up to \$1,436 per day.¹³

Thus, despite the added cost of donor milk and human milk-derived fortifier, an exclusive human milk diet in very low birthweight babies is cost-effective.^{2,10}

A single-center retrospective study compared the benefits and costs of an exclusive human milk diet in infants less than or equal to 28 weeks gestation and or less than or equal to 1,500 grams vs. a combination of mother's milk fortified with cow milk-based fortifier and formula, or a diet of formula only. Primary outcomes were length of stay, feeding intolerance and time to full feeds. Secondary outcomes included the effect of the diet on the incidence of NEC and the cost-effectiveness of an exclusive human milk diet.

In those babies fed an exclusive human milk diet, there was a minimum of 4.5 fewer additional days of hospitalization resulting in \$15,750 savings per day, 9 fewer days on TPN, up to \$12,924 savings per infant and a reduction in medical and surgical NEC resulting in an average savings per infant of \$8,167. And for those parents who get to take their baby home sooner, the impact is simply priceless.

Although every effort is made to start feeding as soon as possible, good nutrition is essential, even if the baby is unable to be fed. It is key that early nutrition incorporates aggressive supplementation of calories, protein and essential fatty acids. Without these in the right balance, the body goes into starvation mode; and before feeding even begins, the intestine, the liver and other parts of the body are compromised. While an exclusively human diet with an exclusively human milk-based fortifier will minimize the number of TPN days, TPN is essential to the early nutrition of an at-risk baby and is a predicate of good feeding success.

Appropriate growth begins with a standardized and validated (and adequately labelled) donor milk with a minimum of 20 Cal per ounce.

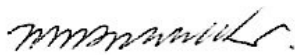
Adding human milk-based fortification and cream has been proven to enhance growth without compromising infant health through the introduction of bovine-based fortification.⁶

Indeed, even small amounts of bovine products added to human milk were shown to be detrimental with a dose-response relationship suggesting increased amounts of bovine products lead to worse outcomes.^{2,7}

An exclusive human milk diet is essential "medicine" for VLBW premature infants and we all agree fortification is required for proper growth. If we also agree to the former, utilizing a non-human fortifier or any other foreign additives in this population cannot be part of the conversation.

NCfIH welcomes the opportunity to discuss the forthcoming guidelines in person or via phone. Mitchell Goldstein, Medical Director for the National Coalition for Infant Health can be reached at 818-730-9303.

Sincerely,



Mitchell Goldstein, MD
Medical Director,
National Coalition for Infant Health

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"An exclusive human milk diet is essential "medicine" for VLBW premature infants and we all agree fortification is required for proper growth. If we also agree to the former, utilizing a non-human fortifier or any other foreign additives in this population cannot be part of the conversation."

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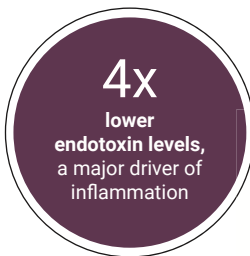
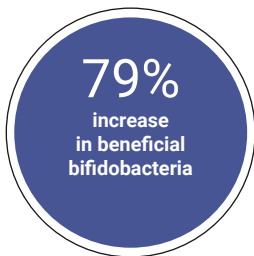
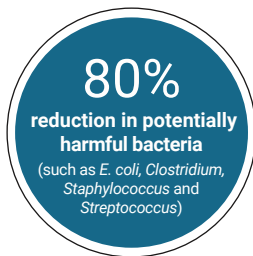
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Reference: 1. Frese SA et al. *mSphere*. 2017;2(6):e00501-17. F&R1030 3/18 ©2018 Evolve BioSystems, Inc.

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Twenty-Two Weeks: To Do or Not to Do?

PEER REVIEWED

By Shabih Manzar, MD

Summary

Infants born at periviable gestation, 22^{1/7}-23^{6/7}, are a challenge for the neonatal team. A plethora of controversial reports surround the recommendation on resuscitating these extreme preterm infants. We present a case which highlights on this controversy. The take home message is the paradigm shift in the limit of viability: 22 weeks is the new 24 weeks gestation.

Case

A periviable male infant was born to a 28 year old gravida 2, para 1 lady. She was brought to the delivery suite by the emergency medical team. The presenting complaints were abdominal pain and bleeding per vaginam. Her expected date of conception (EDC) corresponds to 22^{3/7} weeks gestation. All antenatal labs including HIV, Hepatitis B, and rapid plasma reagin were negative. There was no history of any sexually transmitted diseases. On examination, she was fully dilated, and blood was noted in the vagina. Within minutes of admission, she spontaneously delivered the infant. The infant was placed on warmer. The heart rate was 20 beats per minute. On examination, the eyes were fused and infant had gelatinous skin. Birth weight was 400 grams. After consultation with mother, a decision of providing comfort care was made. The infant died within 20 minutes of birth. Bereavement services were offered. Later, the Obstetrician reported 80% placental abruption.

Discussion

Intervention decision to resuscitate at 22 weeks of gestation is a dilemma. Increasing survival has been reported in recent years.¹⁻³ However, survival reports vary between hospitals.⁴ A report from Australia showed 5% of live births survived at 22 weeks, 46% at 23 weeks and 77% at 24 weeks.⁵ The National Institute of Child Health and Human Development (NICHD) website depicts survival calculator for these extreme premature infants.⁶ The lowest weight cutoff used is 401 grams.

Basing of variable survival statistics, the question is: should we resuscitate these babies and if we do how aggressive we should be? The American College of Obstetricians and Gynecologists (ACOG) and Society for Maternal-Fetal Medicine (SMFM) does not recommend neonatal resuscitation below 22 weeks gestation.⁷ American Academy of Pediatrics (AAP) looks at other factors in addition to gestational age

alone in recommending intervention. AAP suggests that a decision regarding resuscitation should be well-communicated and agreed on before birth, wait-and-see approach is not advisable. For infants less than 22 weeks gestation, AAP recommends comfort care.⁸ Hence, the decision to resuscitate babies born between 22^{1/7} and 23^{6/7} weeks remains a grey area.

As these extremely premature babies are at risk of high mortality, accounting these as live births potentially increases the incidence of neonatal mortality (NM). As noted in the case presented that baby had a heart rate at birth but was very immature to provide any resuscitation. AAP defines all live birth as: "the complete expulsion or extraction from the mother of a product of human conception, irrespective of the duration of pregnancy, which, after such expulsion or extraction, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, regardless of whether the umbilical cord has been cut or the placenta is attached. Heartbeats are to be distinguished from transient cardiac contractions; respirations are to be distinguished from fleeting respiratory efforts or gasps."⁹ Basing on this the death of this 22^{3/7} week baby is accounted as Neonatal mortality.

The report highlights that neonatal care providers should be conscious about the changing paradigm: 22 weeks is the new 24 weeks. An institutional policy is highly suggested in caring for these extreme premature infants.

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Further Reading

Up-To-Date: Ehrenkranz R, Mercurio MR. Periviable birth (Limit of viability). <https://www.uptodate.com/contents/periviable-birth-limit-of-viability>.

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The National Perinatal Association at The 31st Annual Gravens Conference on the Environment of Care for High Risk Newborns

By Cheryl A. Milford, EdS

Members of the NPA write a regular column in *Neonatology Today*.



The National Perinatal Association (NPA) board and members were honored to present their current work on education and advocacy at the 31st Annual Gravens Conference on the Environment of Care for High Risk Newborns. The focus of this year's Gravens Conference was "Social and Emotional Health of Babies, Families, and Staff," a topic of great interest to NPA as demonstrated in several recent projects and work products. NPA is a 40-year-old organization that was founded, in part, by Stanley Gravens, MD who was the first President of NPA.

The week in Clearwater Beach began with an NPA NICU Psychologists Retreat on Tuesday, February 26th, 2018. Twenty NICU psychologists from around the country met for a full day of discussion about the role of the

psychologist in the NICU, the training and competencies required, how to advocate and promote psychological services in the NICU and encouraging research on the efficacy of NICU psychologists in meeting the mental health needs of families and staff. The group learned about the implementation of intern and post-doc fellowships in NICU psychology at UCLA and Stanford. Fellows from both programs presented information about their experiences and the ongoing recruitment of interns and fellows for each institution. The group concluded its day by developing goals and objectives for moving forward in each area of interest and creating timelines for development of materials for publication.

Opening day of the *Gravens Conference* was Wednesday, February 28th and on Thursday, March 1st, Mike Hynan, PhD (NPA member and former Board member), Sue Hall, MD and Raylene Phillips, MD (both current NPA Board members), presented the opening plenary session by describing a Neonatal Intensive Parenting Unit (NIPU), which was based on a concept they published in the *Journal of Perinatology* in 2017. Developing ways to transform NICUs into NIPUs is an ongoing project of NPA, which includes a focus (in theory and practice) on the parent as the primary caregiver in the NICU and on the role of NICU staff in supporting parents in parenting their NICU baby. The presentation concluded with audience participation of John Lennon's song "Imagine" with words paraphrased to describe NPA's vision for NIPUs around the world. The NIPU, as a model of care, was very well received by the participants and collaboration with many professionals,

parents and health care institutions are emerging as a result of the presentation.

On Friday, March 2nd, Sage Saxton, PsyD presented an abstract on the work of the Training and Competencies subgroup of the NPA NICU Psychologists group. Her presentation highlighted the need for unique training and competency by those providing psychological services in the NICU. Sue Hall, MD also presented an abstract about her work in collaboration with graduate NICU parents to develop an online NICU staff education course that teaches NICU staff how to provide psychosocial care to NICU parents. The distinctiveness of this program is that parents' stories and perspectives are embedded in each module supporting the focus of the lesson.

NPA contributed to the list of workshops on Friday, March 2nd. As a follow-up to Thursday's plenary session about NIPUs, Mike Hynan, PhD, Sue Hall, MD and Raylene Phillips, MD lead a workshop on "How to Turn Your NICU Into a NIPU." Members of the NPA team joined Drs. Hynan, Hall and Phillips to facilitate workshop participants in using a NIPU check list to evaluate current practices in six areas of focus: family-centered developmental care, peer-to-peer support, mental health professionals, palliative care, discharge planning and staff education and support. The participants in each group assessed their own NICU on the specific areas and developed ideas to support integration of the NIPU concepts and practices into their institution. After group discussions, a spokesperson from each group presented the



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group’s ideas to the entire workshop. A great deal of networking and brainstorming occurred throughout the conference as a result of the workshop.

Also on Friday, a workshop on advocating and securing mental health providers in the NICU and related settings was presented by the NPA NICU Psychologists group led by Stephen Lassen, PhD, Chavis Patterson, PhD, Pamela Geller, PhD and Amy Baughcum, PhD. An overview of the emergence of mental health services in NICUs during the last 20 years was presented. Successful approaches to educating leaders in healthcare systems about the need for such services and how to obtain them were offered, with practical suggestions for job descriptions and billing codes for services. The participants offered their experiences and had numerous questions for the presenters. Many participants indicated that they were taking the information back to their institutions with the goal of obtaining a dedicated psychologist for their NICU.

On the last day of the conference, Saturday, March 3rd, NPA Board member, Vincent Smith, MD, MPH and Jonathan Litt, MD, MPH, ScD presented a plenary session on deciphering non-traditional family structure in the NICU. They presented the results of nine hours of

recorded interviews with LGBT parents about their expectations entering the NICU and their positive and negative experiences. In video clips, parents shared what they would like to tell staff and other parents about making the NICU a more accepting and comforting setting. The presenters gave recommendations for how to provide psychosocial support to parents who become parents in non-traditional ways. The results of these interviews provided participants with a new lens in which to view their interaction with all parents, but specifically non-traditional families.

The mission and vision of the National Perinatal Association is in complete alignment with the focus of the 31st Annual *Gravens Conference*. A great deal of work has been done in the past is currently being done by NPA members to create positive change in perinatal care in ways that will support the emotional and mental health and wellbeing of babies, parents and families.

We invite you to view the many opportunities available to join your efforts with those of NPA by going to www.nationalperinatal.org. You can become as actively engaged as you

choose by becoming a member, joining a workgroup, or making a donation.

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"Oh the Places You'll Go" **

By Michael Narvey, MD

1986 – Opening of the New NICU at Children's Hospital

***"Oh the Places you'll Go," by Dr. Seuss (originally published in 1990)

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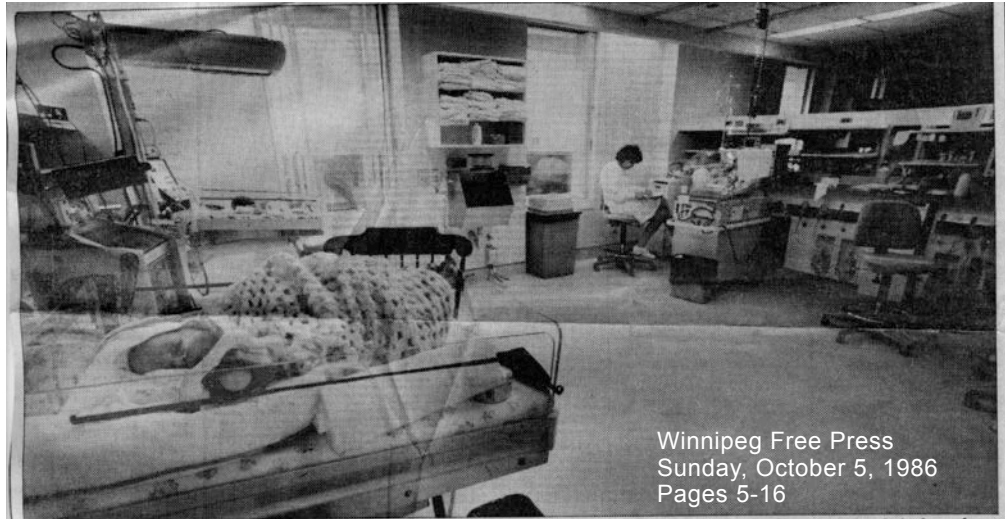
It is hard to be a Neonatologist who took the path through Pediatrics first, and not use a Dr. Seuss quote from time-to-time.

If your unit is anything like ours where you work, I imagine you feel as if you are bursting at the seams.

As the population grows, so do our patient volumes. I often quote the number 10% as being the number of patients we see out of all deliveries each year in our units. When I am asked why our numbers are so high, I counter that the answer is simple. For every extra 100 births, we get 10 admissions. It is easy though, to get lost in the chaos of managing a unit in such busy times, and not take a moment to look back and see how far we have come. What did life look like 30 years ago or 25 years ago? In Winnipeg, we are preparing to make a big move into a beautiful new facility in 2018. This will see us unify three units into one, which is no easy task but will mean a capacity of 60 beds compared to the 55 operational beds we have at the moment.

"What did life look like 30 years ago or 25 years ago?"

In 2017, were routinely resuscitating infants as young as 23 weeks, and now with weights under 500g at times. Whereas in the past, anyone under 1000g was considered quite high risk, now the anticipated survival for a



The new \$3.5-million neo-natal facility at Children's Hospital which opened three weeks ago is staffed by 60 nurses and technical people.

By Dave Haynes

Miracle babies

Neonatal unit at Children's Hospital now boasts a 90 per cent success rate

HAD THINGS worked as planned, little Clayton Halwas would have been born right around now.

But his mother Barb had some high blood pressure problems, and an ultrasound test showed other complications looming, so surgeons did a Caesarian section and brought Clayton into the world about 9 p.m. on July 14th — weighing just 685 grams and unable to even breathe on his own.

"He's still breathing a little bit fast," says Barb Halwas of her boy, but Clayton is out of danger and expected to live a normal, healthy life. Halwas and her husband Cliff know Clayton had good luck and technology on his side. "It's like my mom said, 'If he'd been born 10 years ago, they probably would have let you hold him until he died.'"

Fast-growing field

Ten, even five years ago, the odds of Clayton Halwas surviving a few minutes or hours beyond birth were minimal. Premature babies born under 1,000 grams (2.2 pounds) had a 15 per cent survival rate.

That survival rate now hovers around 90 per cent, and babies even smaller than Clayton are now routinely surviving. In the last couple of years, the nurses in the neonatal intensive care unit at the Children's Hospital have graduated babies born at 24 weeks and weighing less than 600 grams. Parents call it miraculous. Doctors and nurses admit it sometimes seems that way, but attribute most of the saved lives to incredible advances in what is now the fastest growing field in medicine.

"This was all, totally, in its infancy 20 years ago," says Dr. John Bowman, acting head of the neonatal intensive care unit.

The advances are no more obvious than with the neonatal ICU, whose staff cares for premature babies and sick full-term babies in the days and weeks after birth.

The 60-nurse staff, backed by specialists, technologists and support people, now works out of a spacious \$3.5-million facility stocked with state-of-the-art equipment. Until its opening three weeks

ago, the staff was handling the same caseload in an area maybe a fifth of the size.

Evelyn Morrissey, a registered nurse who has been caring for "preemies" for 18½ years, likes to take visitors down to the old neonatal ICU. In the early 1960s, a premature nursery was set up in a tiny ward room. "We used to have six babies in this room, just in isolettes. These babies were maybe two or three weeks premature, nothing like we have now. And we had an office here," says Morrissey, pointing to an even smaller room next door.

As technology started to develop, a ventilator (life-support) machine to help babies breathe was added, and the nursery expanded into the office. "So we had these two rooms we ran between."

By December 1969, the rooms were overloaded with equipment, dozens of extension cords running across the floors to run the monitoring and life-support equipment that continued to be introduced. "By then, we thought we were moving into heaven," says Morrissey, walking across the hallway, "because we were moving into this."

Nurses on edge

The new intensive-care nursery was somewhat larger, though still only the size of a rectangular schoolroom. It took about 10 years to again start running out of room and outlets, even with added shelving. The situation finally became critical in August, 1984, when babies were transferred to intensive care units outside the province, because all the ventilator units there and at the St. Boniface Hospital were occupied.

"For about a good year up to that day, we had been within minutes of having to do it," Morrissey recalls.

"But we'd be able to take a baby off a ventilator, we'd have a spot, or something would happen, you know. A baby we thought would need a ventilator didn't need one. We were always on edge."

Two more ventilator units were set up in an adjoining room last summer. But this past summer, Morrissey says, "again we were coming within minutes of having to fly babies out, because all our ventilator spots were taken."

Burnout common

The new unit, opened Sept. 10, has room for 18 babies, though only 12 beds will be used until more qualified nurses can be recruited. The hospital has authorized hiring at least eight more nurses (so two more beds can be opened), but the number of nurses training in the area is small and graduates are in demand across North America.

The numbers are limited largely by the nature of the job: it can be exhausting, physically and mentally. The turnover and burnout rates are high, though some like Morrissey thrive on it.

"It can't just be a 'job,'" she says. Head nurse Sybil Russell says: "You have to want to be challenged. You have to want to do a lot of things... be kept busy."

Both nurses expect the new facility will ease the strain. "When you have up to 50 people in one small room and 12 monitors going off, it can become extremely taxing," says Morrissey.

In the days following the move upstairs, a 580-gram baby was moved in. Tiny and raw, the veins and bones still visible through near-transparent skin, the baby is under constant supervision and kept warm, curiously, under a loose blanket of plastic kitchen wrap. Other various-sized babies, most

still weeks away from their expected birth dates, snore placidly on open, infant-warmer beds or in isolettes. Most are attached by lines to monitors that keep track of blood pressure, heart rate, body temperature, breathing rate, oxygen level and other vital signs.

Most also have intravenous tubes running into their bodies. One term baby, swollen and blistered by a metabolic disorder, is hooked up to five IV lines, with a machine setting the flow rate at a level so slow a nurse couldn't handle it.

No surgical gloves

The care is almost constant, with nurses either stationed by the beds or within earshot of the beeps and buzzes of monitors. A lot of the babies appear stable and healthy, but their conditions can change dramatically.

Doug and Lori Cluney know their twin girls, Valerie and Veronica, need that constant care. Born 12 weeks early on Sept. 5, and weighing just 1,130 and 1,060 grams respectively, the baby girls have had breathing problems, aortic ducts that wouldn't close, and one has some mysterious bleeding in the brain. A nurse has to tickle Veronica's toes sometimes to gently jolt her into breathing again. "They are in intensive care for a very good reason," says Lori Cluney.

Despite all the high-tech paraphernalia, the new unit has a relaxed feel to it. Some of the babies are just surviving, but the work areas are not utterly sterile. Frequent handwashing is required, but not surgical gloves. Masks are necessary only when staff have colds. And the baby's parents are encouraged to become as involved as possible.

"They come in whenever they want," says Russell. "Sometimes we have to encourage them to take

a rest period." Barb Halwas, for instance, visits her son "two or three times a day," doing what she can to help out. She was allowed to pick up Clayton and hold him for the first time three weeks ago.

Oxygen damage

Babies graduate from the ICU to an intermediate-care ward, eventually being taken home by their parents. The ICU nurses have a bottomless pit of photographs of healthy, growing babies. They hold a picnic this year for preemies and their parents.

Keeping a premature baby alive, however, sometimes exacts its toll. High doses of oxygen can result in eye damage and even blindness. Some infants have scarred lungs, which lead to chronic bronchitis. And a few leave with more serious handicaps.

But while the ability to save premature babies has increased dramatically in recent years, so has concern about raising a generation of children with chronic health and developmental problems. Still, recent large-scale studies have indicated that improved survival rates have not been matched by a similar rise in disabilities among so-called "high-risk" babies.

Acting neo-natal head Bowman has been working around sick children for more than three decades, but he still marvels at the staggering amounts of work and money needed for each baby. "One sick baby in here requires three highly-trained nurses, and they are the main reason the babies survive," says Bowman.

He adds: "The costs are enormous. One baby has been in our nursery for three months. Now at the per diem rate, which is about \$700 a day, three months is about \$65,000. I'm guessing, but the costs of nursing care, equipment, resources and everything that goes into this thing, and the number of people involved is probably well over \$1,000 a day. We're talking with some of these babies, the expenditure, the resources, well over \$100,000."

Bowman stops for a second, maybe realizing he's putting the wrong perspective on it, and adds: "An intact survivor, of course, is well worth it."

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28 week infant at 1000g is at or above 95%. Even in my short career, which began in 1998 in terms of Pediatrics, and then 2001 in Neonatology, our approach in terms of comfort with the smallest infants, has eased greatly. What inspired this post, though, was a series of newspaper clippings from 1986 and 1991 that made me take a moment to look up at the sky and mutter "huh." When you take a trip down memory lane and read these posts, I think you will agree we have come a LONG way, and (in truth), in a very short period of time.

This unit was built with 3.5 million dollars. Imagine how far that would go now. The unit had a capacity of 18 beds, but opened with only 12 and a nursing staff of 60 (compare that to 150 now!). They couldn't open more beds due to the lack of available nurses with sufficient skills.

My favorite comment to provide some perspective was that 5 to 10 years before this time, the estimated survival for infants under 1000g was 15%!

Have we ever come a long way in family-centred care. Can you imagine having a baby born now at 695g whose family wouldn't get to hold them till almost 3.5 months of age?! That is what happened in the case described in this article.

Did you know the old unit had 19 beds (was originally 9 babies), and expanded to 27 at this time?

It cost 3.1 million to build this unit.

The long and the short of it is that, yes, things are busy, and in fact, busier than they have ever been. Do not lose sight, however, wherever your practice is that you are part of a story for the ages. Things that were once

"My favorite comment to provide some perspective was that 5 to 10 years before this time, the estimated survival for infants under 1000g was 15%!"

1991 – Opening of the New Intermediate Care Nursery

Health Sciences Centre

HSC Chronicle

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Volume 4

Number 8

October/November 1991

New Intermediate Care Nursery provides leading neonatal care



The new Intermediate Care Nursery at Women's Hospital opened its doors to patients October 24. While construction took place, babies were housed in nurseries on T2 and T5. Above, Josie Falconer, R.N. (front) and Sr. Team Leader Heather Jung, prepare the infants for transport to the new nursery.



Moving day was welcomed by T1 nursery staff. The unit has more than doubled in square footage and now accommodates 27 infants compared to its previous capacity of 19. Above, Josie Falconer and Heather Jung wait for an elevator while moving the babies.

by Lydia Avery

The road home for premature babies has been made smoother with the recent opening of the new Intermediate Care Nursery at HSC's Women's Hospital.

Infants in the Intermediate Care Nursery need more care and observation than well babies, but do not require intensive care.

The \$3.1 million project, funded by Manitoba Health, included \$570,000 for new equipment and furnishings.

"It was a long time in the making, but the success of the new facility reflects the expertise and experience of all the people involved," Health Minister Donald Orchard told the audience assembled for the ribbon cutting ceremony on September 10.

The nursery has more than doubled its former size from 1,600 to 3,300 square feet and can now accommodate 27 infants compared to its previous capacity of 19. This represents a 30 per cent increase in beds.

Additional medical equipment purchased for the nursery will alleviate previous shortages and will enhance the level of support for infants. These purchases include six new isolettes, as well as eleven cardio-respiratory monitors, thus providing each patient station with its own monitor.

Funding from Manitoba Health has also enabled the hiring of additional nurses, ensuring a 3-to-1 ratio of nurses to patients. There has also been an increase in funding for unit assistants and unit clerks to help staff



Home at last, Josie Falconer settles in with one of T1's tiny patients. Approximately 650 premature babies are admitted to the Intermediate Care Nursery each year. Now, parents can look forward to their babies receiving care in one of Canada's leading neonatal facilities.

the expanded nursery. Behind the scenes, new medical gas, air conditioning, heating and electrical systems have been installed to accommodate the nursery's needs well into the future.

According to Dr. Molly Seshia, Head of Neonatology, the nursery expansion is in direct response to a growing demand for intermediate care. "Over the last 12 years, advances in medical care and improved technology and facilities have resulted in an increased survival rate of premature babies," says Seshia. "We admit 650 babies to the Intermediate Care Nurs-

ery each year. This number includes approximately 10 per cent of babies delivered at Women's Hospital as well as infants transferred from other locations."

By its very design and size, the new facility offers families increased privacy and space for visiting. Most patient stations are equipped with a curtain that can be pulled to give privacy to nursing mothers. A special overnight "parent room" gives new parents the opportunity to spend a 24-hour-cycle with baby before going home. During this time they can develop confidence in caring for their

infant under the expert guidance of nursing staff.

The unit also has its own medication room where preparation of medications can take place without disruption from other activities. There is also a visiting room for families.

"There's no doubt the new nursery will enable us to give even better service and to expand some of our programs" says Barbara Overly, Head Nurse for the Intermediate Care Nursery. "Our role in the Intermediate Care Nursery involves a lot of teaching and helping parents feel more comfortable about handling and caring for their new baby. The increased space makes this a lot easier," she points out.

Overly adds that grandparents and siblings will, for the first time, be able to visit at the bedside. "That makes a real difference to a family whose child may be here anywhere from a few days up to six months," she says.

"I think staff are relieved to finally see the changes and are glad to be able to do their jobs in a facility that supports, rather than challenges, the kind of care we want to deliver," Overly emphasizes.

The new nursery is a far cry from the old unit which was originally designed to accommodate nine babies. Over the years, as demand grew, the unit had an average of 19 patients. "There was not enough room for equipment, too few electrical outlets and very little space for parents to visit," says staff nurse Cheryl Taylor. "If you counted the nurses, physicians and support staff who worked there or

see Nursery continued on p. 4

 National
Perinatal
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The National Perinatal Association (NPA) is an interdisciplinary organization that gives voice to the needs of parents, babies and families and all those interested in their health and wellbeing. Within NPA, parents and professionals work together to create positive change in perinatal care through education, parent programs, professional guidelines and events.

www.nationalperinatal.org

Keep it confidential

by Karyn Fedun

When it comes to important items for staff in the Medical Information Department to observe, confidentiality of patient information heads the list.

Maintaining patient confidentiality is, however, not limited to Medical Information personnel alone. All of us who work at HSC should be conscious of the importance of confidentiality at all times.

How often have you overheard these or similar comments being made by staff:

"I hear the patient in room 235 has complications from the by-pass he had last week..."

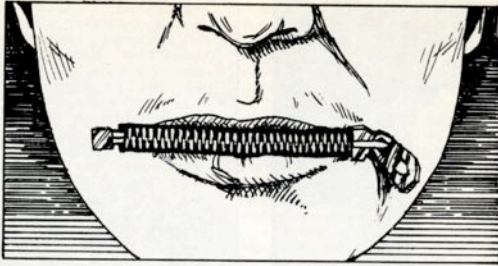
"Your uncle's x-ray report was sitting right there so I had a quick look..."

"Glad to see you made it to the cafeteria Mrs. Smith. How are the cancer treatments going?"

Are these innocent remarks or irresponsible breaches of confidentiality? During Health Information Awareness Week held November 18 to 22, these and other questions were answered by staff from Medical Information.

According to organizer Michele Lambert, Supervisor of Medical Information, the week was part of a national event to create awareness of the Medical Information profession and the services it provides. The week also served to promote the need to maintain confidentiality of patient information.

"Health Information Awareness Week 1991 revolved around the idea that information is the core of health care, and confidentiality is a key part



of that core," says Lambert. Along with posters and tent cards promoting the week, we featured displays in the Thorlakson concourse, with daily quizzes about the services provided by the Medical Information Department.

The principle of confidentiality is an important concern for everyone associated with the hospital says Evelyn Fondse, Director of Medical Information at HSC.

"You don't have to be a creator or keeper of a medical record to be aware of the principles of confidentiality," she explains. "It applies to anybody who has knowledge of a patient's social history, health history, financial picture or any multitude of things. Patients should expect a certain amount of privacy in an institution like this."

Confidentiality encompasses not only what is said, but where and when personal information is discussed. This is especially crucial to remember in an environment where there is a legiti-

mate need to share information vital to patient care.

"In a hospital it's easy to overlook the fact that while you're talking to a colleague about a case, there may be other people around who have no business hearing that information," Fondse cautions. "Such conversations should not take place in elevators, cafeterias or other public areas where they may be overheard by anyone."

To help ensure patient privacy, HSC has taken a number of measures. These include screening procedures for access to medical records, proper disposal techniques for confidential material, and policies that prohibit records from being removed from HSC premises.

New staff are made aware of the importance of confidentiality during the orientation sessions conducted by the Human Resources Department. "During the general introduction in the orientation, we talk about confidentiality and show a video entitled 'Well

Shut My Mouth". It gives very clear examples illustrating the need for confidentiality of information in hospitals," says Bob Russell, Director, Personnel Services at HSC.

At the orientation sessions, staff are also asked to read the HSC confidentiality policy and sign the Pledge of Confidentiality. "By signing the pledge, they are confirming that they have read the confidentiality policy and that they understand their employment may be terminated if they breach confidentiality," Russell adds.

The Pledge of Confidentiality is also signed by volunteers, students, contracted individuals, interns and researchers at HSC.

With very few cases of breach reported it appears HSC staff is keeping a lid on confidential information. It's a record Fondse would like to see continue and improve through events like Health Information Awareness Week and other initiatives.

"It doesn't hurt to keep reminding employees of the principle of maintaining confidentiality because many people don't see themselves as breaching confidentiality," she says. "We encourage HSC managers to remind their staff periodically about the importance of confidentiality. It's important for them to play an active role in letting people know when their behaviour is inappropriate."

For the record, the fictitious remarks you read at the beginning of this article represent breaches of confidentiality. If that comes as a surprise to you, it's time to stop talking and start reacquainting yourself with the HSC confidentiality policy. □

thought impossible or miracles, are now everyday events, and you have been part of it. For those of you who read this post, this will likely bring about a lot of nostalgia for you. Thirty years in medicine is not a long time, and we have accomplished so much along the way. For those of you who are just starting out, imagine where we will be in 30 years from now. I, for one, can't wait to read about it and wonder, where we will have gone by then.

"For those of you who read this post, this will likely bring about a lot of nostalgia for you. Thirty years in medicine is not a long time, and we have accomplished so much along the way. For those of you who are just starting out, imagine where we will be in 30 years from now. I, for one, can't wait to read about it and, wonder where we will have gone by then."

Nursery expansion enhances care



The official opening of the Intermediate Care Nursery was a happy occasion for everyone involved. Above, Ray McQuade, HSC Board Chairman (R) and Health Minister Donald Orchard, cut the ribbon at the opening ceremony.

continued from p. 1

provided a service to the unit at various times, we'd sometimes have as many as 30 people in this small area, not including the babies," Taylor observes.

"We recall only too well the problems which arose in the past from the overcrowded, cluttered nursery we had in those days," says Ray McQuade, HSC Chairman. "It was thanks to our devoted staff that the quality of care we provided was as good as it was. They struggled long and had to look after their young patients in surroundings which were far less than ideal."

When you walk into the new nursery, gone are the feelings of cramped quarters and the stress of people trying to work without bumping into each other. Instead the soft peach colored walls and teddy bear borders provide a warm welcome to a spacious, efficient unit.

Perhaps the Honorable Donald Orchard summed it up best when describing the nursery: "When you get the feeling of being at home in an institutional facility, as you do here, everyone wins—patients, parents and staff." □

Health Sciences Centre, Winnipeg, October/November 1991

Nursery design reflects expertise in planning

The participation of user staff in the planning of the Intermediate Care Nursery was integral to the development of a facility that would meet all the various needs.

Utilizing the expertise of members of the Intermediate Care Nursery User Group, a functional program was prepared, reflecting the objectives and views of medical, nursing and support staff.

The physical renovation of the nursery was carried out in a five-phase operation. The first four phases, which began in September 1990, dealt with relocation of the original occupants of the space annexed for the expansion. Actual work on the nursery began in March of this year.

During the nursery construction phase, patients and staff faced the major challenge of temporary housing in two locations. Their patience and co-operation were rewarded when the move into the new nursery finally took place October 24.

The Intermediate Care Nursery project was managed by Planning Department Project Officer, Laura Shea, who co-ordinated input from users, architects and engineers through the various stages of the project. During construction, site activities were co-ordinated by George MacDonald, Construction Officer, Planning Department. The commissioning of the new electrical and mechanical systems was completed in close co-operation with the Property Services and Maintenance Departments.

The User group included Dr. Molly Seshia, Head of Neonatology; Myrna Rourke, Director of Nursing, Women's Hospital; Barbara Overly, Head Nurse, Intermediate Care Nursery; Evelyn Garand, Supervisor, Children's Hospital Respiratory Therapy and Lorraine Kendall, staff nurse, Neonatal Intensive Care Unit and Max Herst of GBR Architects. The Group worked with Manitoba Health Services Commission staff to gain approval of the plans and operating budget. Engineers for the project were Scouten Mitchell Sigurdson & Associates Ltd. and the general contractor was Regent Construction Co. Ltd.

The skill, dedication and hard work of the User Group and others who were involved at various stages of the project, has provided Manitobans with a neonatal care facility that is a leader in the country.



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Clinical Trials (ClinicalTrials.gov)

Glove-Based Care in the NICU to Prevent Late Onset Sepsis (GloveCare)

This study is recruiting participants.

Sponsor: Hamilton Health Sciences Corporation

ClinicalTrials.gov Identifier: NCT03078335

First posted: March 13, 2017; **Last Update:** June 22, 2018

Actual Study Start Date: June 5, 2017

Estimated Study Completion Date: March 22, 2018

www.clinicaltrials.gov/ct2/show/NCT03078335?recrs=ab&cond=NICU&rank=2

Brief Summary: Babies that get an infection after 3 days of age while in the Neonatal Intensive Care Unit (NICU) is not related to their delivery, but to the hospital environment. Preventing these infections results in shorter hospital stays for babies, less risk of long-term health problems and less health care resources required to care for them. Handwashing alone doesn't remove all bacteria from the hands of healthcare workers, and studies have shown that infections in adults and children admitted to hospital decrease if health care providers use clean, non-sterile gloves when treating patients. The main focus of this study will be to find out if using gloves when caring for newborns in the NICU is better than washing hands alone. McMaster Children's Hospital and The Hospital for Sick Children will be the pilot sites to participate in a future larger study where some infants will be cared for using non-sterile gloves, and others will be cared for using the standard hand washing method.

Condition: Sepsis Newborn Infection

Detailed Description: Late Onset Sepsis (LOS) is defined as infection occurring after 72 hours of life in neonates admitted to the Neonatal Intensive Care Unit (NICU). LOS can lead to severe complications, including death and major neurologic sequelae, and contribute to increased length of stay and costs of care. These hospital acquired infections are largely preventable. Handwashing prior to any patient care is considered the cornerstone of prevention and is the standard of care in the NICU. Adherence to hand washing however, is difficult to achieve, with estimates of compliance among healthcare workers ranging from 30% to 60%. Observational studies in at-risk critically ill children suggest a reduction in hospital-acquired infections and central line associated bloodstream infections with glove-based care in addition to hand hygiene. One small single-centre randomized trial of glove based care versus hand hygiene alone to assess LOS rates in extremely premature infants in the NICU showed a reduction in gram positive infections and central line infections with glove-based care. We propose to test the effect of glove-based care in an adequately powered, rigorously designed and conducted, cluster randomized controlled trial (RCT) after completing a feasibility pilot study.

This pilot study will include all babies in the NICU being randomized to six months of glove-based care or standard of care, and then the following six months will be the opposite arm. All health care provider contact with the infant will require gloves in the intervention arm, but families of infants admitted to the NICU will not be required to wear gloves. The main outcome measured will be the number of episodes of infections in the blood, urinary tract, and cerebrospinal fluid comparing the glove intervention arm against the control arm. Invasive infections are an important challenge for infants admitted to the NICU and reducing this risk can improve the quality and quantity of neonatal survivors from the NICU.

Study Type: Interventional; **Interventional Model:** Crossover Assignment

Estimated Enrollment: 900

Intervention Model Description: This pilot study is a single centre NICU based cluster-randomized crossover trial, with two crossover periods each lasting six months, and a 2-week washout period in between.

Masking: Single (Outcomes Assessor)

Masking Description: The final adjudication of events will be completed by two of the investigators blinded to study arm, based on a summary report of each event after completion of the pilot.

Primary Purpose: Prevention

Arms:

- **Experimental:** Glove-based care - The intervention is the use of non-sterile gloves, after standard hand hygiene for all routine patient care needs.
- **Active Comparator:** Standard care - The control group will provide standard care, that is, hand hygiene before all patient, bed, and intravenous catheter contact.

Intervention/Treatment:

- **Other: Glove-Based Care** - Described in Experimental Arm: Glove based care
- **Other: Standard of Care** - Hand Hygiene - Hand Hygiene - hand washing with soap and water, or alcohol based hand rub

Primary Outcome Measures:

1. Late onset sepsis events [Time Frame: Weeks of admission to the NICU. Infection must occur at >72 hours of age, throughout neonatal admissions for the six month duration of each study arm]
The anticipated incidence of LOS is 10% of patients based on Canadian Neonatal Network retrospective data. Infection is defined as blood stream, urinary tract, or cerebrospinal fluid infection based on one or more positive cultures with a bacterial or fungal pathogen (two cultures required for Coagulase negative staphylococcus), at least two compatible signs and symptoms (including temperature instability, hemodynamic changes, respiratory distress and increased inflammatory markers), and the need for antimicrobial treatment.

Secondary Outcome Measures:

1. Time to first infection [Time Frame: Time from admission to NICU to discharge (days to months) throughout neonatal admissions for the 6-month duration of each study arm]] Time from admission to NICU to first infection in days
2. Length of Stay [Time Frame: Time from admission to discharge (days to months) throughout neonatal admissions for the 6 month duration of each study arm]] Time from admission to discharge (days)
3. All-cause mortality [Time Frame: Duration of study (1 year)] Number of deaths (number of patients who die during study)
4. Proportion colonized by antibiotic resistant organisms at any point during their NICU stay [Time Frame: Weeks of admission to NICU, for the duration of study (1 year)] Proportion of infants who become colonized with antibiotic resistant organisms during surveillance screening as part of routine care (number of patients)

Ages Eligible: Child; **Sexes Eligible:** All

Accepts Healthy Volunteers: Yes

Inclusion Criteria: Infants admitted to the NICU at participating sites for >2 days until discharge.

Exclusion Criteria: Babies requiring contact precautions due to other reasons (as glove based care would be occurring).

Location: McMaster Children's Hospital, Hamilton, Ontario, Canada

Contacts:

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Medical News, Products & Information

Early Diagnosis Can Save Babies' Lives: A Guide to Severe Combined Immunodeficiency Disease (SCID)

A new review provides guidance on a deadly, but rare, disease that is potentially curable if identified early. Severe Combined Immunodeficiency Disease (SCID), known as the "Bubble Boy Disease" in the 1970s, is treatable with a stem cell transplant, gene therapy and other treatments if identified at birth or soon after.

The review, published in *CMAJ (Canadian Medical Association Journal)*, is aimed at pediatricians, family physicians and other doctors who may treat newborns, including those who appear healthy at birth but begin to get severe, repeated infections requiring emergency department visits.

The death rate for Severe Combined Immunodeficiency Disease is at least 30%, with infection causing 60% of deaths in infants.

Ontario was the first jurisdiction in Canada to offer screening for severe combined immunodeficiency disease in 2013 as part of the heel prick test performed soon after birth. Screening has been expanded to the Maritime provinces and will be implemented in several other provinces.

"This review informs physicians who may treat newborns in their practice (e.g., family physicians, obstetricians, pediatricians) on how to approach patients and counsel families who are faced with an abnormal screen," writes Dr. Stuart Turvey, a Professor with the UBC Department of Pediatrics and an investigator, BC Children's Hospital, Vancouver, BC, with coauthors.

The review includes features to watch for in newborns with repeated illnesses, information on screening and diagnosis, and treatments for the disease, as well as the approach and support for parents of babies who may receive a positive screen, including false positives.

"The opportunity to identify severe combined immunodeficiency early in life has transformed outcomes for this otherwise fatal condition. Introducing this assay into newborn screening programs throughout Canada has the potential to save lives and prevent suffering of patients and families affected by this condition," the authors conclude.

The review was created by a pan-Canadian group of physicians from BC Children's Hospital, University of British Columbia, Vancouver, BC; University of Montreal and CHU Sainte-Justine, Montréal, Quebec; IWK Health Centre and Dalhousie University, Halifax, Nova Scotia; and The Hospital for Sick Children and the University of Toronto, Toronto, Ontario.

Rhinovirus and Risk for Bacterial Infection in Infants

There are ~ 400,000 febrile infants 1-90 days of age evaluated in the US every year. The investigators of this study combined their expertise in febrile infants and diagnostic technology to undertake this study which addresses one of the most common clinical questions they encounter, What does it mean when feverish infants are infected with rhinovirus?

They found that rhinovirus detection was common among well-appearing infants undergoing evaluation for fever. Detection of rhinovirus did not impact the risk of concurrent urinary tract infection at any age or invasive infection in infants 1-28 days. These data have implications for febrile infant management.

The research was published online in *Pediatrics* on January 18, 2018 as "Rhinovirus in Febrile Infants and Risk of Bacterial Infection."

Cervical Device Reduces Rate of Preterm Birth

"Effect of Cervical Pessary on Spontaneous Preterm Birth in Women With Singleton Pregnancies and Short Cervical Length - A Randomized Clinical Trial" by Gabriele Saccone, MD; Giuseppe Maria Maruotti, MD; Antonia Giudicepietro, MD; et al Pasquale Martinelli, MD; for the Italian Preterm Birth Prevention (IPP) Working Group - December 19, 2017

JAMA. 2017;318(23):2317-2324. doi:10.1001/jama.2017.18956

Bottom Line: Pregnant women with a short cervix who used a small silicone ring called a cervical pessary to keep their cervix closed had a lower rate of preterm birth at less than 34 weeks.

Why The Research Is Interesting: Preterm birth is a major cause of illness, disability and death for infants. A cervical pessary is intended to keep the cervix closed and to change the inclination of the cervical canal, but the results of randomized clinical trials have been contradictory.

Who and When: Three hundred women with a short cervix and without a history of sudden preterm births; the clinical trial was conducted from 2016-2017.

What: Half of the woman had a cervical pessary inserted and half did not (intervention); spontaneous preterm birth at less than 34 weeks of gestation (outcome)

How (Study Design): This was a randomized clinical trial. Randomized clinical trials (RCTs) allow for the strongest inferences to be made about the true effect of an intervention. However, not all RCT results can be replicated in real-world settings because patient characteristics or other variables may differ from those that were studied in the RCT.

Authors: Gabriele Saccone, MD, University of Naples Federico II, Naples, Italy and coauthors.

Results: Women who used a cervical pessary had a lower rate of spontaneous preterm birth.

Study Limitations: The trial was conducted at one facility and that raises questions about the generalizability of its findings.

Study Conclusions: Women with a short cervix and without a history of spontaneous preterm birth who used a cervical pessary had a lower rate of spontaneous preterm birth compared with women who did not use the device. The results must be confirmed in multicenter clinical trials.

Reduced Exposure to Bullying Could Reduce Mental Illness in Extreme Premies - Early Mental Health Support Could Also Prove Beneficial

Decreased exposure to bullying and family problems during childhood and adolescence could help reduce adult mental illness in Extremely Low Birth Weight ((ELBW) preemies, according to a new study from McMaster University.

Furthermore, early mental health support for extremely low birth weight survivors who are born at 2.2 pounds or less, and their parents could also prove beneficial.

The study, published October 3, 2017 in *The Journal of Child Psychology and Psychiatry*, looked at the impact of mental health risk factors on Extremely Low Birth Weight preemies during childhood and adolescence.

"In terms of major stresses in childhood and adolescence, preterm survivors appear to be impacted more than those born at normal birth weight," said Ryan J. Van Lieshout, Assistant Professor of Psychiatry and Behavioral neurosciences at McMaster University and the Albert Einstein/Irving Zucker Chair in Neuroscience.

"If we can find meaningful interventions for Extremely Low Birth Weight survivors and their parents, we can improve the lives of preterm survivors and potentially prevent the development of depression and anxiety in adulthood."

The study utilized the McMaster Extremely Low Birth Weight Cohort, which includes a group of 179 ELBW survivors and 145 normal birth weight controls born between 1977 and 1982, which has 40 years' worth of data.

The study showed that although these preemies were not necessarily exposed to a larger number of risk factors compared to their normal birth weight counterparts, these stresses appeared to have a greater impact on their mental health as adults.

Besides bullying by peers and a small circle of friends, researchers looked at a number of other risk factors, like maternal anxiety or depression and family dysfunction.

"We believe it may be helpful to monitor and provide support for the mental health of mothers of preemies, in particular, as for the purposes of this study, they were the primary caregiver," said Van Lieshout.

"There can also be family strain associated with raising a preemie and all the related medical care, which can lead to difficulties. Support for the family in a variety of forms might also be beneficial."

The paper builds on previous research that identified that ELBW survivors have an increased risk of mental illness in adulthood.

"We are concerned that being born really small and being exposed to all the stresses associated with preterm birth can lead to an amplification of normal stresses that predispose people to develop depression and anxiety later in life," said Van Lieshout.

He recommended future research focus on the timing and type of supports for risk factors that would create better mental health outcomes in preemies.

The study was supported by grants from the Canadian Institutes of Health Research and the U.S. National Institute of Child Health and Human Development.

Additional authors on the study came from the departments of psychiatry and behavioral neurosciences; pediatrics, and psychology, neuroscience and behavior at McMaster.

Rapid Whole-Genome Sequencing of NICU Patients Is Useful and Cost-Effective - Findings Reported at ASHG 2017 Annual Meeting

Rapid whole-genome sequencing (WGS) of acutely ill Neonatal Intensive Care Unit (NICU) patients in the first few days of life yields clinically useful diagnoses in many cases, and results in lower aggregate costs than the current standard of care, according to findings presented at the *American Society of Human Genetics (ASHG) 2017 Annual Meeting* in Orlando, FL.

Shimul Chowdhury, PhD, FACMG, Clinical Laboratory Director at the Rady Children's Institute for Genomic Medicine, and his colleagues focused their analysis on a broad swath of NICU patients for whom a genetic diagnosis might help inform treatment decisions and disease management. They studied the clinical utility and cost-effectiveness of sequencing infants and their parents.

"Newborns often don't fit traditional methods of diagnosis, as they may present with non-specific symptoms or display different signs from older children," said Dr. Chowdhury. In many such cases, he explained, sequencing can pinpoint the cause of illness, yielding a diagnosis that allows doctors to modify inpatient treatment and resulting in dramatically improved medical outcomes in both the short- and long-term.



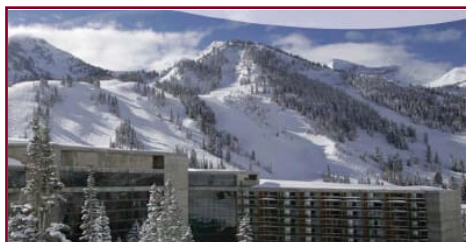
NEONATAL NURSE PRACTITIONER

St. Agnes Hospital, a large, community teaching hospital in Baltimore, Maryland is recruiting for a full-time neonatal nurse practitioner to work rotating days and nights in the NICU, well baby nursery and attending deliveries. St. Agnes has a level 3A NICU staffed by a group of four neonatologists and an experienced group of NNPs.

Please send CVs to:

Karen Broderick, MD

kbroderi@ascension.org



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Because of the potential for early intervention and immediate adjustment in care, the researchers used a rapid WGS procedure that took three to seven days from sample collection to delivering results to patients' families. The process can be further accelerated if medically necessary. In contrast, most clinical diagnostic tests take four to six weeks.

In 34 (35%) of the 98 patients enrolled in the study, WGS yielded a genetic diagnosis, and in 28 (80%) of those patients, that diagnosis led to changes in medical management, such as the use of medications targeted to the underlying disease, avoidance of unnecessary surgery, and guidance about palliative care. Cost-effectiveness analyses are ongoing, but among the first 42 infants sequenced, the researchers calculated a \$1.3 million net cost savings for that hospitalization versus the current standard of care.

"The cost savings were especially striking, given that sequencing costs are still high - even with those costs, we found that rapid WGS was not just clinically useful but economically prudent," Dr. Chowdhury said. "Given these benefits, we'd eventually like to see rapid WGS as a reimbursable first-tier test for a proportion of infants in the NICU."

Currently, the researchers are looking to expand their study and assess the effectiveness of their approach across health systems and populations. This summer they launched partnerships with children's hospitals in California and Minnesota, an effort that will involve scaling up the rapid WGS process to meet demand and yield new insights about its clinical utility, cost-effectiveness, and ease of implementation in different environments.

Dr. Chowdhury noted the important contribution of genetics research to their progress so far. "Translational research leading to improvements in the speed and accuracy of sequencing tests is so important to our work, and has a real impact on patients and their families," he said.

Dr. Chowdhury presented this research in October at the *American Society of Human Genetics 2017 Annual Meeting*, Orlando, Florida.

Preterm Babies May Suffer Setbacks in Auditory Brain Development, Speech

Preterm babies born early in the third trimester of pregnancy are likely to experience delays in the development of the auditory cortex, a brain region essential to hearing and understanding sound, a new study reveals. Such delays are associated with speech and language impairments at age two, the researchers found.

The findings are reported in *eNeuro*, a journal of the Society for Neuroscience.

"We have a pretty limited understanding of how the auditory brain develops in preterm infants," said University of Illinois speech and Hearing Science Professor Brian Monson, who led the study. "We know from previous research on full-term newborns that not only are fetuses hearing, but they're also listening and learning."

Ultrasound studies reveal, for example, that, beginning at least as early as 25 weeks into gestation, fetuses will blink or move in response to externally produced sounds, he said. Other research shows that newborns prefer to listen to sounds - such as music or speech - that they were exposed to in the womb over unfamiliar sounds. And electroencephalogram studies of the brains of preterm infants show electrical activity in the auditory cortex in response to sound.



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The Westin
Downtown Memphis

A multispecialty symposium designed to encompass state-of-the-art practices on how to keep the patent ductus arteriosus (PDA) open and the closure of the PDA in newborns. Special focus will be on the transcatheter PDA occlusion in extremely low birth weight (ELBW) infants.

The Symposium will feature prominent speakers in the fields of Neonatology, cardiology and cardiac surgery among others; debates on if, when, and how to close the PDA in ELBW infants, echo and catheter workshops, as well as panel discussions.

Registration is available online:

www.pdasymposium.org

Le Bonheur
Children's Hospital

"From these types of studies, we know that fetuses in the third trimester of gestation are hearing, learning and creating memories," Monson said. "It's pretty remarkable that such an immature system already has the ability to start distinguishing and learning."

To better understand how the auditory cortex matures in the last trimester of gestation, Monson and his colleagues turned to a large dataset collected at the St. Louis Children's Hospital Neonatal Intensive Care Unit between 2007 and 2010. The 90 premature infants in the study had undergone magnetic resonance imaging one to four times in the course of their stay in the NICU. Another 15 full-term babies were recruited from the Barnes-Jewish Hospital in St. Louis and scanned within the first four days of life. These scans were used as examples of uninterrupted fetal brain development, for comparison with the preterm babies.

The team used diffusion neuroimaging to study development of the auditory cortex in the infants' brains.

"This technique measures the diffusion of water in the brain tissues, which can tell you a lot about the development of neurons and axons," Monson said. As brain structures grow and mature, water diffusion in the gray matter and white matter also changes in recognizable patterns, allowing researchers to track how the tissue is developing, and at what rate, he said.

The team focused on the primary auditory cortex, which is the first cortical region to receive auditory signals from the ears via other parts of the brain, and the non-primary auditory cortex, which plays a more sophisticated role in processing those stimuli.

"We wanted to know: What is the relationship between these two regions? Do they mature at the same time, but at different rates? Do they mature at different times, but similar rates?" Monson said. "A different rate of maturation may render one tissue more vulnerable to injury or disruption associated with preterm birth."

The analysis revealed that by 26 weeks of gestation, the primary auditory cortex was in a much more advanced stage of development than the non-primary auditory cortex. Between 26 weeks and about 40 weeks - the latter the equivalent of full-term birth - the non-primary auditory cortex in the preterm infants matured quickly, partially catching up to the primary auditory cortex. Both regions appeared less developed at 40 weeks in the preterm infants than in the full-term babies.

The team also found an association between the delayed development of the non-primary auditory cortex in infancy and language delays in the children at age two, suggesting that disruptions to this part of the brain as a result of premature birth may contribute to the speech and language problems often seen later in life in preemies, Monson said.

"It's exciting to me that we may be able to use this technique to help predict later language ability in infants who are born preterm," he said. "I hope one day we also will be able to intervene for those infants who may be at greatest risk of language deficits, perhaps even before they begin to use words."

The research team also included scientists and physicians from Harvard Medical School, University College London and Washington University School of Medicine in St. Louis.

The National Institute of Child Health and Development, the National Institute of Neurological Disorders and Stroke and the National Institute of Mental Health supported this research.

UIC Researcher Using Imaging to Identify Women at Risk of Giving Birth Prematurely

Newswise — Ultrasound is traditionally used on pregnant women to study the anatomy, movement and blood flow of the developing fetus, but

April Medical Meeting Focus

35th Annual Conference - Advances in Therapeutics and Technology: Critical Care of Neonates, Children, and Adults Formerly: High Frequency Ventilation of Infants, Children & Adults

April 3-7, 2018; The Cliff Lodge and Spa in Snowbird, UT USA
<http://paclac.org/advances-in-care-conference/>

Conference Description: Educational and networking opportunities for healthcare professionals who provide care for critically ill neonatal, pediatric, and adult patients with a focus on advances in therapeutics and technologies. Includes featured speakers, workshops and abstract presentations on research on advances in these areas.

Meeting presented by the *Perinatal Advisory Council: Leadership, Advocacy, And Consultation.*

Special Panel Discussion: What is/should be the Role of Industry (representatives) in the Hospital and/or Your Practice by *Colleen Kraft, MD, FAAP*, President, AAP with *Don Null, MD* and *Mitchell Goldstein, MD*

Special Lectures:

- Respiratory Syncytial Virus Update 2018: Still a Threat by *Mitchell Goldstein, MD*
- Noninvasive / Less Invasive Ventilation Complications and Appropriate Patient Selection by *Donald M. Null, Jr., MD*
- Lung Growth and Development Early in Life by *Robert S. Tepper, MD, PhD*
- Technology Perspective of Neonatal and Pediatric Hospital Care Through a Rear-View Mirror by *Arun Pramanik, MD*
- How Do We Cope with CPOE (Computerized Physician Order Entry) for Pediatric Patients? by *Mitchell Goldstein, MD*
- Antibiotic Stewardship by *Arun Pramanik, MD*
- 21st Robert deLemos Memorial Lecture Management of Pulmonary Hypertension in Infants and Children Beyond the Neonatal Period by *Steven Abman, MD*
- Disturbances of the Coagulation During ECLS by *Andre Cap, MD, PhD*
- Quality Improvement in ICUs by *Jeffrey Gould, MD, MPH*
- Lung Ultrasound in Pediatric and Adult ARDS by *Stephen Derdak, DO*
- Why is HFVP so Successful and Where is it Going by *G. Sarduci*
- Use of Pulse Oximeter to Screen Critical Congenital Heart Disease by *Arun Pramanik, MD*

Presentations Moderated by:

- *Mitchell Goldstein, MD*
- *Donald Null, MD*
- *Stephen Derdak, DO*
- *Arun Pramanik, MD*

Presentation of:

- 26th Annual Jimmy Schulz Award
- 21st Annual Jack Emerson Award

University of Illinois at Chicago nurse researchers are using the imaging technique to identify women who are at risk of giving birth prematurely.

Each year in the U.S. more than 440,000 babies are born prematurely, defined as delivering a baby before the completion of 37 weeks of pregnancy. These premature births may cause numerous health problems, including behavior and neurological disorders, as well as

physical developments such as pneumonia and meningitis. They can also lead to longer hospital stays and account for nearly a \$30 billion cost to society.

UIC researchers, led by Barbara McFarlin, Professor of Nursing, have received a five-year \$2.84 million grant from the National Institute of Child Health and Human Development to develop techniques to accurately predict preterm birth.

“By recognizing which women are at risk, health care professionals could provide early interventions, treatments and closely monitor these treatments to prevent preterm birth or to improve health outcomes,” McFarlin said.

Eight hundred women will be divided into three groups in McFarlin’s latest study: women who have previously had a baby prematurely; women who at 20 weeks have a shortened cervix; and a low-risk control group. The women will undergo an ultrasound examination of the cervix twice during the study: once at 20 weeks of pregnancy, and then, four weeks later.

There currently is no way to predict premature birth, McFarlin said. However, in some cases, health care professionals know that a preterm birth is likely because of a shortened cervix (the lower part of the uterus). McFarlin and her engineering colleague, William O’Brien Jr., a research professor at the Urbana-Champaign campus, are taking ultrasonic detection of cervical changes to a microscopic level.

In previous studies conducted in pregnant rats, McFarlin used ultrasound to detect collagen tissue changes in the animals’ cervix. She then took those findings and expanded the study to include pregnant women. Using the same noninvasive procedure she used in the animal model, McFarlin detected collagen changes in the cervix before the cervix shortened in women destined to give birth prematurely.

“At 17 to 20 weeks of pregnancy, we were able to predict who was going to deliver preterm,” McFarlin said. “We found that before the length of the cervix shortens, the microscopic tissue structure has to change and the collagen remodels.”


In addition to conducting research using ultrasound, McFarlin will learn how the pregnant women respond to progesterone to prevent premature labor. Progesterone is the current standard of care for women who have previously delivered a baby preterm or who have a short cervix. Progesterone, a natural hormone, only reduces the incidences of prematurity by 40%, McFarlin said. “We want to find out

what occurs with the other women and why it does not work,” she said.

McFarlin will also be assisted by Mulubrhan Mogos at the UIC College of Nursing.

NICU STAFF EDUCATION

Caring for Babies and their Families: Providing Psychosocial Support to NICU Parents



An online course based on the

“Interdisciplinary Recommendations for Psychosocial Support for NICU Parents.”

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- Dr. Sue Hall

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TRANSFORM YOUR NICU

Upcoming Medical Meetings

NEOCON 2018 - Workshops aAEG and NIRS in Neonatology and Pediatric Intensive Care
Mar. 23-25, 2018; Munich, Germany
www.munich-neocon.com/

The 35th Annual Advances in Care Conference – Advances in Therapeutics and Technology: Critical Care of Neonates, Children and Adults
Apr. 3-9, 2018; Snowbird, UT USA
<http://paclac.org/advances-in-care-conference/>

Future of Neonatal Care – Advancing the Management of Newborns
Apr. 9-12, 2018; Vienna, Austria
<https://99nicu.org/meetup/>

Workshop on Neonatal-Perinatal Practice Strategies
Apr. 13-15, 2018; Scottsdale, AZ USA
shop.aap.org/2018-workshop-on-neonatal-perinatal-practice-strategies

11th International Conference Neonatal & Childhood Pulmonary Vascular Disease
Apr. 19-21, 2018; San Francisco, CA
www.ucsfcmecme.com/2018/MPD18002/info

14th European Conference on Pediatric and Neonatal Mechanical Ventilation
Apr. 25-28, 2018; Montreux, Switzerland
www.epnv-montreux.org

Neonatal Research Symposium
May 9-10, 2018; Philadelphia, PA USA
<http://chop.cloud-cme.com>

7th International Conference on Clinical Neonatology
May 26-26, 2018; Turin, Italy
www.mcascientificevents.eu/iccn2018

7th Annual Scientific Sessions of the Cardiac Neurodevelopmental Outcome Collaborative (CNOC) in Collaboration with Children’s Mercy Kansas City
Jun. 6-8, 2018; Kansas City, KS USA
www.cardiacneuro.org/upcoming/

International Neonatology Association Conference (INAC 2018)
Jun. 22-24, 2018; Ghent, Belgium
<http://2018.worldneonatology.com>

For additional meeting information visit: www.NeonatologyToday.net and click on Events tab.

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Neonatology Clinical Research Symposium

To honor Barbara Schmidt, MD, FRCP(C), MSC, *and* Haresh Kirpalani, BM, MRCP, FRCP, MSc

May 9 and 10, 2018

The Union League of Philadelphia
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