ARTICLES OF INTEREST – May 2022

Safety and efficacy of nafcillin for empiric therapy of late-onset sepsis in the NICU

In 2014, the Neonatal Antimicrobial Stewardship Program at Nationwide Children's Hospital recommended nafcillin over vancomycin for empirical therapy of possible late-onset sepsis (LOS) in infants without a history of methicillin-resistant Staphylococcus aureus (MRSA) colonization or infection. The authors reviewed 366 infants who received nafcillin or vancomycin for empirical treatment of possible LOS at 3 NICUs before and after implementation of the guideline. They found that nafcillin can be a safe alternative to vancomycin for empirical therapy of LOS among NICU infants who do not have a history of MRSA infection or colonization.

Oral versus intravenous sildenafil for pulmonary hypertension in neonates: a randomized trial

Sildenafil is the drug of choice for neonatal pulmonary hypertension in developing countries where inhaled nitric oxide is not available. This single center open-label randomized trial was done to compare the efficacy of oral versus intravenous (IV) sildenafil in infants with mild to moderate pulmonary hypertension. Forty infants born after 34 weeks of gestation with pulmonary arterial pressure (PAP) > 25 mm Hg measured by echocardiography within 72 h of birth were enrolled for the study. Oral and IV sildenafil had equal efficacy at reducing PAP in neonatal pulmonary hypertension, although IV sildenafil was associated with a greater complication rate.

Effects of freshly irradiated vs irradiated and stored red blood cell transfusion on cerebral oxygenation in preterm infants: randomized clinical trial

In a single center, double blinded, proof of concept randomized clinical trial conducted in New Zealand, preterm infants (<34 weeks) who were at least 14 days of age and had anemia, underwent nonurgent transfusions of freshly irradiated RBCs (on the day of transfusion) or RBC’s that were irradiated and stored for up to 14 days. Results of this trial showed that transfusion of freshly irradiated RBCs conferred a small advantage in cerebral oxygenation for at least 5 days after transfusion compared with transfusion of irradiated and stored RBC components.

Interventions to prevent bronchopulmonary dysplasia in preterm neonates an umbrella review of systematic reviews and meta-analyses
Meta-analyses of randomized clinical trials comparing interventions in preterm neonates that included BPD as an outcome, included a total of 154 systematic reviews evaluating 251 comparisons, of which 110 (71.4%) were high-quality systematic reviews. The studies showed that a multipronged approach of delivery room continuous positive airway pressure, early selective surfactant administration with less invasive surfactant administration, early hydrocortisone prophylaxis in high-risk neonates, inhaled corticosteroids, and volume-targeted ventilation for preterm neonates requiring invasive ventilation may decrease the combined risk of BPD or mortality at 36 weeks' PMA.

**Lung mechanics and respiratory morbidities in school-age children born moderate-to-late preterm**

This case-control study investigated lung mechanics in school-age children (5-10 years) born moderate-to-late preterm (MLPT, 32-37 weeks), compared to term-born children (>37 weeks). Lung function and bronchodilator response were assessed by impulse oscillometry (IOS) at two hospital-based specialized clinics. A structured questionnaire was employed to assess respiratory morbidities. The results showed no difference between case (MLPT; n=52), and control (term-born children; n=71) for IOS variables, bronchodilator response, and respiratory morbidities. The study concluded that lung mechanics parameters are similar in school-age children born MLPT and those born at term, suggesting a role of pulmonary plasticity.

**Body composition of extremely preterm infants fed protein-enriched, fortified milk: a randomized trial**

This is a masked randomized trial comparing fortified milk with and without additional protein in extremely preterm infants, 25-28 weeks gestation (n=56). Baseline characteristics were similar between high protein (extensively hydrolyzed, 0.75 g per 100 ml) and normal protein groups. Mean %body fat was similar between groups at 30-32 weeks PMA, 36 weeks PMA and 3 months corrected age. The higher protein group had higher weight (-0.1±1.2 vs. -0.8±1.3; p=0.03) and length z-scores (-0.8±1.3 vs. -1.5±1.3; p=0.02) from birth to 3 months corrected age (-0.9±1.1 vs. -1.5±1.1; p=0.04), and higher fat-free mass (FFM) z-scores at 36 weeks PMA. The authors concluded that extremely preterm infants fed protein-enriched, fortified human milk had increased FFM accretion, weight, and length.

**Behavioral economics in neonatology—balancing provider wellness and departmental finances**
Satyan Lakshminrusimha, Steven L Olsen and David A Lubarsky. *J Perinatol.*

This article reviews basic principles of behavioral economics and addresses the concern that current productivity incentives can set up a vicious cycle leading to reduced physician time per patient and provider burnout. The authors advocate switching to a staffing model that determines the adequate number of providers to effectively provide compassionate patient care along with non-clinical priorities and missions of the division. They conclude by stressing the importance of physician leaders/executives that understand and represent the frontline provider, promote transparency and mutual respect, and articulate and implement the vision of the healthcare organization.

**The effect of head positioning on brain tissue oxygenation in preterm infants: a randomized clinical trial study**

This randomized clinical trial included 39 infants who were placed supine and whose head position was changed to one of six randomized positions every 2 hours. After each head position change, brain tissue oxygenation was recorded by NIRS. The findings demonstrated a significant difference in brain tissue oxygen saturation among these positions, particularly when the head was rotated 45-60 degrees from
the midline to the right. The authors concluded that head positioning affected brain tissue oxygenation in preterm infants in the first 48 hours after birth and recommended, when possible, not to rotate the infant's head during the first 48 hours after birth while the head of the bed is at 0°.

Rapid point-of-care genotyping to avoid aminoglycoside-induced ototoxicity in neonatal intensive care

The MT-RNR1 m.1555A>G gene variant is associated with aminoglycoside-induced ototoxicity; however, treatment decisions for neonatal sepsis must be made before it is typically feasible to get gene testing results. This study reports on the implementation of a rapid point-of-care buccal swab gene test to identify neonates with the m.1555A>G variant. 751 neonates were recruited of which, 526 received antibiotic therapy. There was a 17% test failure rate leaving 424 patients with successful tests before starting antibiotics. Results were available in 26 minutes. Eight patients tested positive for the variant, and three patients had confirmation of the m.1555A>G variant. The mean time to start antibiotics was unchanged, and the 3 patients identified were treated with non-aminoglycoside therapy. The authors conclude that point-of-care gene testing can be integrated into clinical care without negatively affecting standard practice.

Therapeutic hypothermia for neonatal encephalopathy in low- and middle-income countries: a meta-analysis

This study is a systemic review with meta-analysis of randomized controlled trials of therapeutic hypothermia in low- and middle-income countries. Endpoints were mortality and combined death or severe disability. The authors identified 10 studies with 1293 neonates, but there was a high risk of bias as the studies were non-blinded. There were no differences between groups for mortality or combined death or severe disability. There were also no differences identified for sepsis, shock, renal injury, arrhythmia, and length of stay. Hypothermia was associated with higher risks of thrombocytopenia and bleeding. They conclude that cooling offers little to no benefit in low- and middle-income countries.

Relationship between impaired BMP signaling and clinical risk factors at early-stage vascular injury in the preterm infant

Given that infants with severe CLD develop pulmonary arterial hypertension, the authors sought to link bone morphogenetic protein (BMP) signaling to the earliest onset of pulmonary vascular using a neonatal mouse lung injury model. They identified impaired BMP signaling as a hallmark of early vascular disease in the injured neonatal lung which is linked to PDGF-receptor deficiency and decreased alveolar septation which could pharmacologically mitigated

OTHER NOTEWORTHY PUBLICATIONS – May, 2022

COVID-19
Changes in rates of adverse pregnancy outcomes during the COVID-19 pandemic: a cross-sectional study in the United States, 2019–2020
SARS-COV-2 associated respiratory failure in a preterm infant and the outcome after remdesivir (PDF) treatment (PDF)
Single-cell immunophenotyping of the fetal immune response to maternal SARS-CoV-2 infection in late gestation
United states preterm birth rate and COVID-19
Association of BNT162b2 COVID-19 vaccination during pregnancy with neonatal and early infant outcomes

Pediatrics
Safety and efficacy of nafcillin for empiric therapy of late-onset sepsis in the NICU
Omphalitis and concurrent serious bacterial infection
Remote stewardship for medically underserved nurseries: a stepped-wedge, cluster randomized study
25% dextrose versus 24% sucrose for heel lancing in preterm infants: a noninferiority RCT
Effect of early infant probiotic supplementation on eczema, asthma, and rhinitis at 7 years of age
Ultrasound for pediatric peripheral intravenous catheter insertion: a systematic review
Improving the timeliness and efficiency of discharge from the NICU
Reducing pediatric unplanned extubation across multiple ICUS using quality improvement

Journal of Pediatrics
Cautionary tales: the use of human milk in infants born preterm
Bifidobacterium infantis, necrotizing enterocolitis, death, and the role of parents in the neonatal intensive care unit
International variation in the management of patent ductus arteriosus and its association with infant outcomes: a survey and linked cohort study
Genome analysis in sick neonates and infants: high-yield phenotypes and contribution of small copy number variations
The role of chronic conditions in outcomes following noncardiac surgery in children with congenital heart disease
Economic evaluation of telemedicine consultations to reduce unnecessary neonatal care transfers
Bifidobacterium longum subsp. infantis EVC001 administration is associated with a significant reduction in the incidence of necrotizing enterocolitis in very low birth weight infants
Improving underweight mothers' essential newborn care during early infancy: a single-blinded, parallel-randomized, controlled trial
Ultrasound guided catheter tip location in neonates: a prospective cohort study
Quality of life of children born with a congenital heart defect
Examining clinical practice guidelines for male circumcision: a systematic review and critical appraisal using AGREE II

**Pediatric Research**

Visuopathy of prematurity: is retinopathy just the tip of the iceberg?  

Carbon dioxide levels in neonates: what are safe parameters?  

Detection of acute ventilatory problems via magnetic induction in a newborn animal model  

Blood transcriptomic markers of necrotizing enterocolitis in preterm pigs  

Preterm to term infant postmenstrual age reference intervals for thyroid-stimulating hormone and free thyroxine  

Lung mechanics and respiratory morbidities in school-age children born moderate-to-late preterm  

Neonatal acute kidney injury risk stratification score: STARZ study  

Parent–infant skin-to-skin contact reduces the electrical activity of the diaphragm and stabilizes respiratory function in preterm infants  

Detecting acute bilirubin encephalopathy in neonates based on multimodal MRI with deep learning  

Brain injury in preterm infants with surgical necrotizing enterocolitis: clinical and bowel pathological correlates  

Human milk feeding and cognitive outcome in preterm infants: the role of infection and NEC reduction  

Concordance of expert clinicians’ interpretations of the newborn’s true physiological state  

Body composition of extremely preterm infants fed protein-enriched, fortified milk: a randomized trial  

Degree of ventriculomegaly predicts school-aged functional outcomes in preterm infants with intraventricular hemorrhage  

Birth defect co-occurrence patterns in the Texas Birth Defects Registry  

**Archives of Disease in Childhood - Fetal & Neonatal Edition**

Review: Safe emergency neonatal airway management: current challenges and potential approaches  

Review: Neuroscience meets nurture: challenges of prematurity and the critical role of family-centred and developmental care as a key part of the neuroprotection care bundle  

Antenatal corticosteroids and neurodevelopmental outcomes in late preterm births  

Temporal trends in routine predischarge pulse oximetry screening: 6 years’ experience in a UK regional neonatal unit  

Assessment of optimal chest compression depth during neonatal cardiopulmonary resuscitation: a randomised controlled animal trial  
Outcomes of very preterm infants with neonatal hyperglycaemia: a systematic review and meta-analysis

Individualised decision making: interpretation of risk for extremely preterm infants—a survey of UK neonatal professionals

Comparison of three intraosseous access devices for resuscitation of term neonates: a randomised simulation study

Monitoring of carbon dioxide in ventilated neonates: a prospective observational study

Identification of treatment-warranted retinopathy of prematurity by neonatal nurse specialist

Implementation of an adapted Sepsis Risk Calculator algorithm to reduce antibiotic usage in the management of early onset neonatal sepsis: a multicentre initiative in Wales, UK

Comparison of intraosseous and intravenous epinephrine administration during resuscitation of asphyxiated newborn lambs

Mortality and significant neurosensory impairment in preterm infants: an international comparison

Neonates with mild hypoxic–ischaemic encephalopathy receiving supportive care versus therapeutic hypothermia in California

Neonatal-onset mitochondrial disease: clinical features, molecular diagnosis and prognosis
https://pubmed.ncbi.nlm.nih.gov/34625524

Discriminating necrotising enterocolitis and focal intestinal perforation

Images in Neonatal Medicine: Early recognition of rusty pipe syndrome to avoid disruption of breast feeding

Images in Neonatal Medicine: Ecthyma gangrenosum in a premature infant: rare but critical to recognise

Images in Neonatal Medicine: Vicarious excretion of contrast material in a neonate

**Journal of Perinatology**

Review: Infant mode of death in the neonatal intensive care unit: A systematic scoping review

Understanding the relative contributions of prematurity and congenital anomalies to neonatal mortality

Pulseless electrical activity and asystolic cardiac arrest in infants: identifying factors that influence outcomes

Detection and impact of genetic disease in a level IV neonatal intensive care unit

CDC LOCATE: discrepancies between self-reported level of maternal care and LOCATE-assessed level of maternal care among 463 birth facilities

Seven years later: state neonatal risk-appropriate care policy consistency with the 2012 American Academy of Pediatrics Policy
Familial clustering of birth risk for adverse childhood outcomes
The effect of severe maternal morbidity on infant costs and lengths of stay
Risk factors for hospital readmission among infants with prolonged neonatal intensive care stays
Five-year outcomes of premature infants randomized to high or standard loading dose caffeine
2% aqueous vs alcohol-based chlorhexidine for skin antisepsis in VLBW neonates undergoing peripheral venipuncture: a non-inferiority trial
Natural evolution of the patent ductus arteriosus in the extremely premature newborn and respiratory outcomes
Phenotyping respiratory decompensation following definitive closure of the patent ductus arteriosus in preterm infants
Targeted neonatal echocardiography service in neonatal intensive care in Manitoba, Canada
The effect of head positioning on brain tissue oxygenation in preterm infants: a randomized clinical trial study
Mortality in the neonatal intensive care unit: improving the accuracy of death reporting
Essentials of neonatal-perinatal medicine fellowship: innovations in medical education
Behavioral economics in neonatology—balancing provider wellness and departmental finances
Is treatment with oral risdiplam effective and well-tolerated for infants with spinal muscular atrophy type 1?

**Neonatology**
Review: Intranasal analgosedation for infants in the neonatal intensive care unit: a systematic review
Glucagon for neonatal hypoglycaemia: systematic review and meta-analysis
Commentary on “Sunlight for the prevention and treatment of hyperbilirubinemia in term and late-preterm neonates”
Therapeutic hypothermia for neonatal encephalopathy in low- and middle-income countries: a meta-analysis
Outcome prediction and inter-rater comparison of four brain magnetic resonance imaging scoring systems of infants with perinatal asphyxia and therapeutic hypothermia
Potential for CCR9+ IL-17+ regulatory T cell as a predictor of early necrotizing enterocolitis
Gestational age-dependent reference ranges for albumin levels in cord serum
Evaluation of the neonatal sequential organ failure assessment and mortality risk in preterm infants with necrotizing enterocolitis

Intranasal administration of extracellular vesicles mitigates apoptosis in a mouse model of neonatal hypoxic-ischemic brain injury

Neuroprotection in the striatum of hypoxic-ischemic piglets by simultaneous inhibition of dopamine D1 and adenosine A2A receptors

Prophylactic low-dose paracetamol administration for ductal closure and microstructural brain development in preterm infants
https://pubmed.ncbi.nlm.nih.gov/35176741

Population-based outcome data of extremely preterm infants in Germany during 2010–2017

Effect of maternal docosahexaenoic acid supplementation on very preterm infant growth: secondary outcome of a randomized clinical trial

Patient-ventilator synchrony in extremely premature neonates during non-invasive neurally adjusted ventilatory assist or synchronized intermittent positive airway pressure: a randomized crossover pilot trial

Estimation of optimal nasotracheal tube insertion depth in neonates based on fetal biometric measurements

**American Journal of Perinatology**
No new content

**Journal of Neonatal-Perinatal Medicine**
No new content

**Maternal Health, Neonatology and Perinatology**
Effects of inter-pregnancy intervals on preterm birth, low birth weight and perinatal deaths in urban South Ethiopia: a prospective cohort study

**Neoreviews**
Risk factors associated with perinatal relapse to opioid use disorder

Overview of congenital hypopituitarism for the neonatologist

Metabolic bone disease of prematurity

Congenital abnormalities in the infant of a mother with diabetes

Relative adrenal insufficiency in the preterm infant

Term infant with bilateral parenchymal brain hemorrhages

Bony occipital prominence in a neonate
Acute abdominal distention in a premature low-birthweight infant
Peripartum severe covid-19 pneumonia: fetal and neonatal implications
A case of respiratory decline in a premature infant
Pediatric advanced life support in a neonatal context

**JAMA Pediatrics**
Genetic testing in newborns moves from rare to routine application
Use of irradiated red blood cell transfusions in newborns to improve intracerebral saturation
Efficacy and safety of enteral recombinant human insulin in preterm infants a randomized clinical trial
Rapid point-of-care genotyping to avoid aminoglycoside-induced ototoxicity in neonatal intensive care
Effects of freshly irradiated vs irradiated and stored red blood cell transfusion on cerebral oxygenation in preterm infants: randomized clinical trial
Interventions to prevent bronchopulmonary dysplasia in preterm neonates an umbrella review of systematic reviews and meta-analyses

**BMC Pediatrics**
Medication errors in neonatal intensive care units: a multicenter qualitative study in the Palestinian practice
Early neonatal mortality is modulated by gestational age, birthweight and fetal heart rate abnormalities in the low resource setting in Tanzania – a five year review 2015–2019
Oral versus intravenous sildenafil for pulmonary hypertension in neonates: a randomized trial
Comparison of the effect of two methods of sucking on pacifier and mother's finger on oral feeding behavior in preterm infants: a randomized clinical trial
Securing peripheral intravenous catheters in babies without applying adhesive dressings to the skin: a proof-of-concept study
Serum neuron-specific enolase, magnetic resonance imaging, and electrophysiology for predicting neurodevelopmental outcomes of neonates with hypoxic-ischemic encephalopathy: a prospective study
A standardized implementation of multicenter quality improvement program of very low birth weight newborns could significantly reduce admission hypothermia and improve outcomes
Determinants of birth asphyxia among newborn live births in public hospitals of Gamo and Gofa zones, Southern Ethiopia
Acid base and blood gas analysis in term neonates immediately after birth with uncomplicated neonatal transition
Neonatal mortality and associated factors among neonates admitted to neonatal intensive care unit of Gandhi memorial hospital in Addis Ababa, Ethiopia, 2019

The effect of concurrent use of swaddle and sucrose on the intensity of pain during venous blood sampling in neonate: a clinical trial study

Hemodynamic parameters after Delayed Cord Clamping (DCC) in term neonates: a prospective observational study

Pediatric Critical Care Medicine
Real-Time ultrasound guidance for umbilical venous cannulation in neonates with congenital heart disease

New England Journal of Medicine
Preeclampsia
Treating hypertension in pregnancy
https://www.ncbi.nlm.nih.gov/pubmed/35363952

Lancet
Pre-eclampsia with paradoxical polyuria: diabetes insipidus in pregnancy
What can work and how? An overview of evidence-based interventions and delivery strategies to support health and human development from before conception to 20 years
Why Roe v. Wade must be defended

JAMA
Implementation of a standardized clinical definition of opioid withdrawal in the neonate: challenges and opportunities
Management of chronic hypertension during pregnancy
Comment & Response: Minimally invasive surfactant therapy vs sham treatment and death or bronchopulmonary dysplasia in preterm infants with respiratory distress syndrome
https://www.ncbi.nlm.nih.gov/pubmed/35471518

BMJ
US abortion law: Scientist says his work on fetal pain has been misrepresented
Unborn in the USA: what happened and what’s next for Roe v Wade and abortion rights?
**Pediatric Infectious Disease Journal**
Association of prenatal antibiotics and mode of birth with otolaryngology surgery in offspring: a national data linkage study

Antimicrobial stewardship at birth in preterm infants: not just about a decrease!

Fulminant sepsis caused by Leclercia Adecarboxylata in a premature neonate: case report and review of the literature

Spyramicine and trimethoprim-sulfamethoxazole combination to prevent mother-to-fetus transmission of Toxoplasma Gondii infection in pregnant women: a 28-years single-center experience

Elizabethkingia Anophelis: an important emerging cause of neonatal sepsis and meningitis in China

Effective approaches to combat vaccine hesitancy (PDF)

**Pediatric Cardiology**
No new content

**Pediatric Neurology**
No relevant content

**Obstetrics and Gynecology**
Maternal and neonatal morbidity after attempted operative vaginal delivery

Chromosomal microarray analysis compared with noninvasive prenatal testing in pregnancies with abnormal maternal serum screening

Abortion among physicians

Abortion and me

**American Journal of Obstetrics & Gynecology**
Vaginal progesterone vs intramuscular 17-hydroxyprogesterone caproate for prevention of recurrent preterm birth: a randomized controlled trial

Incidence of small-for-gestational-age infant birthweight following early intertwin fetal growth discordance in dichorionic and monochorionic twin pregnancies

Changes in e-cigarette and cigarette use during pregnancy and their association with small-for-gestational-age birth

**Hospital Pediatrics**
Racial and ethnic disparities in medical complexity and in-hospital death among US-born VLBW infants

A quality improvement project to reduce time to full enteral feeds for very low birth weight neonates
Neonatal opioid withdrawal syndrome: a comparison of as-needed pharmacotherapy

Placental transfusion during neonatal resuscitation in an asphyxiated preterm model

Dissemination of gram-positive bacteria to the lung of newborn mice increases local IL-6 and TNFalpha levels in lethal bacteremia

Relationship between impaired BMP signaling and clinical risk factors at early-stage vascular injury in the preterm infant

Cytokine receptor gp130 promotes postnatal proliferation of cardiomyocytes required for the normal functional development of the heart

A unique cerebellar pattern of microglia activation in a mouse model of encephalopathy of prematurity

The impact of mouse preterm birth induction by RU-486 on microglial activation and subsequent hypomyelination

Examining neurosteroid-analogue therapy in the preterm neonate for promoting hippocampal neurodevelopment

Fetal zone steroids show discrete effects on hyperoxia-induced attenuation of migration in cultured oligodendrocyte progenitor cells

Assessing the impact of gestational age of donors on the efficacy of amniotic epithelial cell-derived extracellular vesicles in experimental bronchopulmonary dysplasia