ARTICLES OF INTEREST – January 2019

Early caffeine administration and neurodevelopmental outcomes in preterm infants

The authors sought to determine the association between early (within 2 days of birth) versus late (received after 2 days of birth) caffeine exposure and neurodevelopmental outcomes in preterm infants <29 weeks' gestation. Of 2108 neonates who were eligible, 1545 were in the early-caffeine group and 563 were in the late-caffeine group. The primary outcome was significant neurodevelopmental impairment, defined as cerebral palsy, or a Bayley Scales of Infant and Toddler Development, Third Edition composite score of <70 on any component, hearing aid or cochlear implant, or bilateral visual impairment at 18 to 24 months' corrected age. The authors found that early caffeine therapy is associated with better neurodevelopmental outcomes compared with late caffeine therapy in preterm infants born at <29 weeks' gestation.

Initial oxygen use for preterm newborn resuscitation: a systematic review with meta-analysis

This systematic review and meta-analysis provides the scientific summary of initial Fio₂ in preterm newborns (<35 weeks' gestation) who receive respiratory support at birth. Ten randomized controlled studies and 4 cohort studies included 5697 patients. There were no statistically significant benefits of or harms from starting with lower compared with higher Fio₂ in short-term mortality, long-term mortality, neurodevelopmental impairment, or other key preterm morbidities. The authors concluded that the ideal initial Fio₂ for preterm newborns is still unknown, although the majority of newborns ≤32 weeks' gestation will require oxygen supplementation.

Prenatal exposure to selective serotonin reuptake inhibitors and serotonin norepinephrine reuptake inhibitors and risk for persistent pulmonary hypertension of the newborn: a systematic review, meta-analysis, and network meta-analysis

To evaluate the association between exposure to selective serotonin reuptake inhibitors and serotonin norepinephrine reuptake inhibitors during pregnancy and the risk for persistent pulmonary hypertension of the newborn (PPHN), the authors of this systematic review and meta-analysis identified 11 retrospective cohort studies and case-control studies. Random effect and network meta-analysis were used to interpret data. Incidence of PPHN was 2.9/1000 live births with a number needed to harm of 1000. PPHN risk was significantly higher with use of SSRI in any trimester and with exposure after 20th week. Sertraline ranked as most likely to have the lowest risk of PPHN.
High-dose human milk feedings decrease oxidative stress in premature infant

Given that high-volume human milk (HM) feedings decrease morbidity, the authors chose to determine the association between the oxidative stress marker, urinary F2–isoprostane, in predominantly (HM) and preterm formula (PF)-fed premature infants over the first 21 days of life. They found that median F2–isoprostane concentrations decreased significantly in the predominantly HM group but increased significantly over time in the predominantly PF group. These findings illustrate that HM feedings are associated with reduced oxidative stress compared to PF which may contribute to improved outcomes in breast milk fed infants.

Randomized trial of platelet-transfusion thresholds in neonates

In this multicenter RCT, authors used 2 different thresholds (50K vs. 25K) for “prophylactic” platelet transfusions in preterm infants <34 weeks (n=median BW 740g: median GA 2.6 weeks). Interestingly, they concluded that use of a higher threshold for transfusions resulted in a significantly higher rate of death or major bleeding within 28 days of birth. However, they excluded infants with a major bleeding within the previous 72 hours. Authors have not provided any data regarding outcomes after 28 days or pre-discharge.

Elevated midline head positioning of extremely low birth weight infants: effects on cardiopulmonary function and the incidence of periventricular-intraventricular hemorrhage.

This study randomized 90 ELBW infants to a supine, flat position and 90 ELBW infants to a supine, 30 degrees bed elevated position for 96 hours after birth. Compared to the flat group, the elevated bed group developed significantly fewer grade 4 hemorrhages (p=0.036) and had significantly higher survival to discharge (p=0.037)

Two-year neurodevelopmental outcomes of extremely preterm infants treated with early hydrocortisone: treatment effect according to gestational age at birth.

This double-blind, multicenter, randomized trial evaluated neurodevelopmental outcomes of surviving infants included in the PREMILOC trial. Infants (24 0/7 to 27 6/7 weeks gestational age) were randomized to receive either 10 days of low-dose hydrocortisone or placebo starting after birth and were assessed for neurodevelopmental impairment at 22 months corrected age. The authors found that for surviving infants in the 24-25 week subgroup (N=96), there was a significant improvement in global moderate to severe neurodevelopmental impairment ((hydrocortisone=2% versus placebo=18%) (p=0.02), risk difference 16 (95% CI -28% to -5%).

Brain imaging in preterm infants <32 weeks gestation: a clinical review and algorithm for the use of cranial ultrasound and qualitative brain MRI
Ibrahim J, Mir I, Chalak L. *Pediatr Res.*

Medline Embase database review was performed from 2000 to 2018 to account for the technical evolution of cranial ultrasound machines and introduction of MRI imaging in the NICU. Special attention was made with regard to detection of white matter injury, cerebellar hemorrhage, long term neurodevelopmental outcomes and impact on parental anxiety. Brain MRI was found to be more sensitive as well as had a high predictive value for CP and motor impairment. A hospital specific
A guideline algorithm for performing term equivalent MRI based on risk evaluation for < 32 week gestation was recommended.

*Developmental outcomes of preterm infants with bronchopulmonary dysplasia-associated pulmonary hypertension at 18–24 months of corrected age*


In a retrospective analysis of 394 infants (aged < 28 weeks of gestation) between 2005 and 2014, pulmonary hypertension was found to be a worsening factor of non-optimal growth and poor neurodevelopmental outcome in preterm infants with BPD at 18-24 months of corrected age using Bayley scales of infant and toddler development. Studies suggest close screening and developmental follow up to help optimize outcome of infants with BPD and pulmonary hypertension.

**OTHER NOTEWORTHY PUBLICATIONS – January, 2018**

*Pediatrics*

Home health care availability and discharge delays in children with medical complexity

Estimated non-reimbursed costs for care coordination for children with medical complexity

Neonatal head circumference in newborns with neonatal abstinence syndrome

Positive predictive value of administrative data for neonatal abstinence syndrome

Developmental outcomes in duarte galactosemia

Neonatal intubation practice and outcomes: an international registry study

Early caffeine administration and neurodevelopmental outcomes in preterm infants

Mupirocin for staphylococcus aureus decolonization of infants in neonatal intensive care units

Clinical practice guideline for the management of infantile hemangiomas

Room air for initiating term newborn resuscitation: a systematic review with meta-analysis

Initial oxygen use for preterm newborn resuscitation: a systematic review with meta-analysis

Efficacy and safety of Emla cream for pain control due to venipuncture in infants: a meta-analysis

Developmental dysplasia of the hip

In-hospital neonatal falls: an unintended consequence of efforts to improve breastfeeding

*Journal of Pediatrics*

Antenatal detection of treatable critical congenital heart disease is associated with lower morbidity and mortality

Body mass index is a better indicator of body composition than weight-for-length at age 1 month

Weaning of moderately preterm infants from the incubator to the crib: a randomized clinical trial https://www.ncbi.nlm.nih.gov/pubmed/30337189

Effects of prone sleeping on cerebral oxygenation in preterm infants https://www.ncbi.nlm.nih.gov/pubmed/30297295


Racial and ethnic disparities in the use of mother’s milk feeding for very low birth weight infants in Massachusetts https://www.ncbi.nlm.nih.gov/pubmed/30274926


Ambient noise production by high-frequency neonatal ventilators https://www.ncbi.nlm.nih.gov/pubmed/30268396

Detecting 22q11.2 deletion syndrome in newborns with low T cell receptor excision circles from severe combined immunodeficiency screening https://www.ncbi.nlm.nih.gov/pubmed/30268402

Robust increases in erythropoietin production by the hypoxic fetus is a response to protect the brain and other vital organs https://www.ncbi.nlm.nih.gov/pubmed/29895839


Prenatal exposure to perfluoroalkyl substances and adipocytokines: the HOME Study https://www.ncbi.nlm.nih.gov/pubmed/30250302

Prospective research in infants with mild encephalopathy identified in the first six hours of life: neurodevelopmental outcomes at 18–22 months https://www.ncbi.nlm.nih.gov/pubmed/30250303

Neonatal regulatory behavior problems are predicted by maternal early pregnancy overweight and obesity: findings from the prospective PREDO Study https://www.ncbi.nlm.nih.gov/pubmed/30305694
Neonatologist Performed Echocardiography (NPE) Special Edition
Education, training, and accreditation of neonatologist performed echocardiography in Europe-
framework for practice
Introduction to neonatologist-performed echocardiography
The role of neonatologist performed echocardiography in the assessment and management of neonatal shock
Tissue doppler velocity imaging and event timings in neonates: a guide to image acquisition, measurement, interpretation, and reference values
Application of neonatologist performed echocardiography in the assessment and management of persistent pulmonary hypertension of the newborn
Deformation imaging and rotational mechanics in neonates: a guide to image acquisition, measurement, interpretation, and reference values
Application of NPE in the assessment of a patent ductus arteriosus
Application of neonatologist performed echocardiography in the assessment and management of neonatal heart failure unrelated to congenital heart disease
Role of neonatologist-performed echocardiography in the assessment and management of patent ductus arteriosus physiology in the newborn

Archives of Disease in Childhood - Fetal & Neonatal Edition
Network meta-analysis explained
Using a composite morbidity score and cultural survey to explore characteristics of high proficiency neonatal intensive care units
Omphalocele: from diagnosis to growth and development at 2 years of age
Non-invasive prenatal testing of pregnancies at risk for phenylketonuria
Two-year neurodevelopmental outcomes of extremely preterm infants treated with early hydrocortisone: treatment effect according to gestational age at birth
Wide variation in severe neonatal morbidity among very preterm infants in European regions
Volume targeting levels and work of breathing in infants with evolving or established bronchopulmonary dysplasia
Preterm human milk macronutrient concentration is independent of gestational age at birth
Impact of delivered tidal volume on the occurrence of intraventricular haemorrhage in preterm infants during positive pressure ventilation in the delivery room
Morbidity and mortality with early pulmonary haemorrhage in preterm neonates
Treatment thresholds for intervention in post-hemorrhagic ventricular dilation: a randomized controlled trial

Development of a gastroschisis core outcome set

Delivery of positive end-expiratory pressure to preterm lambs using common resuscitation devices

Predictors of extubation readiness in preterm infants: a systematic review and meta-analysis

Heart rate changes during positive pressure ventilation after asphyxia-induced bradycardia in a porcine model of neonatal resuscitation

Supporting breathing of preterm infants at birth: a narrative review

Volume-targeted ventilation: one size does not fit all. Evidence-based recommendations for successful use

Möbius sequence with central hypoventilation in a neonate after failed elective medical termination of pregnancy

Saddle embolism in an extremely premature infant

Journal of Perinatology

Neonatal hypoglycemia: is there a neurodevelopmental impact in early childhood?
https://www.ncbi.nlm.nih.gov/pubmed/30305715

Can laryngeal mask airway be used for surfactant administration in neonates?

Discordant sex between fetal screening and postnatal phenotype requires evaluation

Impact of elective caesarean section on neonatal retrieval in Western Australia during a 12-year period
https://www.ncbi.nlm.nih.gov/pubmed/30341400

Outcomes following a comprehensive versus a selective approach for infants born at 22 weeks of gestation

Early hypoxemia burden is strongly associated with severe intracranial hemorrhage in preterm infants

Elevated midline head positioning of extremely low birth weight infants: effects on cardiopulmonary function and the incidence of periventricular-intraventricular hemorrhage

The impact of chlorhexidine gluconate bathing on skin bacterial burden of neonates admitted to the Neonatal Intensive Care Unit

Analysis of peak inflating pressure and inflating pressure limit during neonatal volume guaranteed ventilation
https://www.ncbi.nlm.nih.gov/pubmed/30232377

Urinary tract infection is common in VLBW infants

Factors influencing decision making in neonatology: inhaled nitric oxide in preterm infants

Does ultrasound guidance for peripherally inserted central catheter (PICC) insertion reduce the incidence of tip malposition? – A randomized trial
A pilot randomized blinded placebo-controlled trial of paracetamol for later treatment of a patent ductus arteriosus

Low rate of necrotizing enterocolitis in extremely low birth weight infants using a hospital-based preterm milk bank

Radiation exposure by digital radiographic imaging in very low birth weight infants

NICU human milk dose and health care use after NICU discharge in very low birth weight infants

Congenital solitary kidney size at birth could predict reduced eGFR levels later in life

Neonatal Intensive Care Unit discharge preparedness among families with limited english proficiency

Successful implementation of an intracranial hemorrhage (ICH) bundle in reducing severe ICH: a quality improvement project

Neonatology
Automated quantification of fragmented red blood cells: neonatal reference intervals and clinical disorders of neonatal intensive care unit patients with high values

Effect of delayed cord clamping on cerebral oxygenation in very preterm infants

Bilirubin production is increased in newborn mice exposed to isoflurane

Comparison of bubble CPAP devices using RAM cannula for extubation failure in very low birth weight infants: randomized and cohort studies

Effect of delayed cord clamping of term babies on neurodevelopment at 12 months: a randomized controlled trial

Evaluation of an intubation readiness score to assess neonatal sedation before intubation

Can fetal umbilical venous blood be a reliable source for admission complete blood count and culture in NICU patients?

Prognostic accuracy of heart rate variability analysis in neonatal encephalopathy: a systematic review

Whole blood gene expression reveals specific transcriptome changes in neonatal encephalopathy

Lung ultrasound for the differential diagnosis of respiratory distress in neonates

The value of autopsy in neonates in the 21st century

American Journal of Perinatology
Effect of cord blood magnesium level at birth on non-neurologic neonatal outcomes

Risk factors for neonatal hypoxic-ischemic encephalopathy in the absence of sentinel events
Neonatal outcomes based on duration of exposure to antenatal corticosteroids in indicated preterm deliveries
https://www.ncbi.nlm.nih.gov/pubmed/29702709

Mode of delivery in previable births

Hypertensive disorders of pregnancy and preterm birth rates among black women

Outcomes after neonatal seizures in infants less than 29 weeks' gestation: a population-based cohort study

Hypertensive disorders during pregnancy and risk of bronchopulmonary dysplasia in very preterm infants

Practice variation in antenatal steroid administration for anticipated late preterm birth: a physician survey

Normal point of care glucose values after birth in the well-baby nursery

**Journal of Neonatal-Perinatal Medicine**
The relationship of cervical microbiota diversity with race and disparities in preterm birth

**Maternal Health, Neonatology and Perinatology**
Successful treatment of severe arterial hypotension and anuria in a preterm infant with renal tubular dysgenesis– a case report

Predictors of early initiation of breastfeeding among Zimbabwean women: secondary analysis of ZDHS 2015

**Neoreviews**
Probiotics and human milk oligosaccharides in premature infants
http://neoreviews.aappublications.org/content/20/1/e1

Gastrointestinal, pancreatic, and hepatic manifestations of cystic fibrosis in the newborn
http://neoreviews.aappublications.org/content/20/1/e12

Macronutrient digestion and absorption in the preterm infant
http://neoreviews.aappublications.org/content/20/1/e25

Case 1: oral burns as a presentation of accidental organophosphorus poisoning in a neonate
http://neoreviews.aappublications.org/content/20/1/e37

Case 2: asymmetrical frontal bossing and refractory seizures in a newborn
http://neoreviews.aappublications.org/content/20/1/e41

Case 3: severe anemia in a term newborn
http://neoreviews.aappublications.org/content/20/1/e45

Strip of the month: recurrent late decelerations in a patient with HELLP syndrome
http://neoreviews.aappublications.org/content/20/1/e48

Neonate with a large facial swelling
http://neoreviews.aappublications.org/content/20/1/e56
JAMA Pediatrics
Association of nurse workload with missed nursing care in the neonatal intensive care unit
Sequential neuroimaging of the fetus and newborn with in utero Zika virus exposure
Safety and immunogenicity of early Bacillus Calmette-Guérin vaccination in infants who are preterm and/or have low birth weights: a systematic review and meta-analysis.

BMC Pediatrics
Developmental outcomes of preterm infants with bronchopulmonary dysplasia-associated pulmonary hypertension at 18–24 months of corrected age (PDF)
The association between antibiotics in the first year of life and child growth trajectory (PDF)
The influence of gestational age in the psychometric testing of the Bernese pain scale for neonates (PDF)
Risk factors associated with mortality in neonatal intrahepatic cholestasis caused by citrin deficiency (NICCD) and clinical implications (PDF)
Inhaled nitric oxide for neonates with persistent pulmonary hypertension of the newborn in the CINRGI study: time to treatment response (PDF)
Ultrasound of the infant hip: manual fixation is equivalent to Graf’s technique regarding image quality—a randomized trial (PDF)
Combination therapy with erythropoietin, magnesium sulfate and hypothermia for hypoxic-ischemic encephalopathy: an open-label pilot study to assess the safety and feasibility (PDF)
Treating extravasation injuries in infants and young children: a scoping review and survey of UK NHS practice (PDF)
Pattern and extent of off-label and unlicensed drug use in neonatal intensive care units in Iran (PDF)
Ontogeny of alkaline phosphatase activity in infant intestines and breast milk (PDF)

Pediatric Critical Care Medicine
Noninvasive ventilation during pediatric and neonatal critical care transport: a systematic review
Hemodynamic impact of oxygen desaturation during tracheal intubation among critically ill children with cyanotic and noncyanotic heart disease
Associations of perioperative renal oximetry via near-infrared spectroscopy, urinary biomarkers, and postoperative acute kidney injury in infants after congenital heart surgery: should creatinine continue to be the gold standard?
Accuracy of reported tidal volume during neonatal ventilation with airway leak: a lung model study
New England Journal of Medicine
Treating disease at the RNA level with oligonucleotides.
Randomized trial of platelet-transfusion thresholds in neonates
Platelet transfusions in neonates — less is more
Evolving board certification — glimpses of success
Ophthalmia neonatorum
Next-generation sequencing to diagnose suspected genetic disorders
RVU medicine, technology, and physician loneliness.
Separation of craniopagus twins by a multidisciplinary team.
A randomized trial of endometrial scratching before in vitro fertilization
Scratching the endometrium in in vitro fertilization — time to stop

Lancet

JAMA
Optimized aryloymycins may help address antibiotic resistance
Rethinking how antibiotics are prescribed incorporating the 4 moments of antibiotic decision making into clinical practice
Evaluation and management of penicillin allergy a review.

BMJ
How to get started in quality improvement
Acute maternal confusion and neonatal seizure postpartum

Pediatric Infectious Disease Journal
Human parechovirus 3 in infants; expanding our knowledge of adverse outcomes
Reduction of inappropriate antimicrobial prescriptions in a tertiary neonatal intensive care unit after antimicrobial stewardship care bundle implementation
Delayed sero-reversion in HIV-exposed uninfected infants
HIV viremia during pregnancy and neurodevelopment of HIV-exposed uninfected children in the context of universal antiretroviral therapy and breastfeeding: a prospective study
Population pharmacokinetics of intravenous linezolid in premature infants
The mission is remission: hope for controlling HIV replication without ART in early-treated perinatally HIV-infected children

**Pediatric Cardiology**
Incidence, risk factors, and comorbidities of vocal cord paralysis after surgical closure of a patent ductus arteriosus: a meta-analysis
Blalock–Taussig shunt size: should it be based on body weight or target branch pulmonary artery size?
Variation in anticoagulation practices in the congenital cardiac catheterization lab: results of a multinational PICES survey
Prenatal diagnosis of single ventricle physiology impacts on cardiac morbidity and mortality
Immediate postnatal ventricular performance is associated with mortality in hypoplastic left heart syndrome

**Pediatric Neurology**
Behavioral and physiological signs for pain assessment in preterm and term neonates during a nociception-specific response: a systematic review
Incidence of epilepsy and associated risk factors in perinatal ischemic stroke survivors

**Obstetrics and Gynecology**
Diagnostic validity of the proposed Eunice Kennedy Shriver national institute of child health and human development criteria for intrauterine inflammation or infection
Amnio-infusion compared with no intervention in women with second-trimester rupture of membranes: a randomized controlled trial
Prenatal marijuana use by self-report and umbilical cord sampling in a state with marijuana legalization
https://www.ncbi.nlm.nih.gov/pubmed/30531577
Planned mode of delivery of preterm twins and neonatal and 2-year outcomes
Draft opioid-prescribing guidelines for uncomplicated normal spontaneous vaginal birth
Evaluation of a quality improvement intervention that eliminated routine use of opioids after cesarean delivery
ACOG committee opinion no. 752: prenatal and perinatal human immunodeficiency virus testing
ACOG committee opinion no. 761 summary: cesarean delivery on maternal request

**American Journal of Obstetrics & Gynecology**
Zika virus and the nonmicrocephalic fetus: why we should still worry
Prenatal exposure to selective serotonin reuptake inhibitors and serotonin norepinephrine reuptake inhibitors and risk for persistent pulmonary hypertension of the newborn: a systematic review, meta-analysis, and network meta-analysis
Early preterm preeclampsia outcomes by intended mode of delivery
Gestational diabetes mellitus is associated with adverse outcomes in twin pregnancies
Maternal biomarkers for fetal heart failure in fetuses with congenital heart defects or arrhythmias

**BASIC SCIENCE SELECTIONS**
Genipin attenuates hyperoxia-induced lung injury and pulmonary hypertension via targeting glycogen synthase kinase-3 beta in neonatal rats

Synbiotics combined with glutamine stimulate brain development and the immune system in preterm pigs

Rapid cerebral metabolic shift during neonatal sepsis is attenuated by enteral colostrum supplementation in preterm pigs

Effect of vasopressin on a porcine model of persistent pulmonary hypertension of the newborn

Anti-secretogranin III therapy of oxygen-induced retinopathy with optimal safety

**ADDITIONAL JOURNAL SELECTIONS**
Longitudinal study of neonatal brain tissue volumes in preterm infants and their ability to predict neurodevelopmental outcome

Changes in neonatal regional brain volume associated with preterm birth and perinatal factors
Dose-dependent exacerbation of ventilation-induced lung injury by erythropoietin in preterm newborn lambs

Systemic multipotent adult progenitor cells improve long-term neurodevelopmental outcomes after preterm hypoxic-ischemic encephalopathy

Late-onset sepsis in preterm infants can be detected preclinically by fecal volatile organic compound analysis: a prospective, multicenter cohort study

Enteral docosahexaenoic acid and retinopathy of prematurity: a randomized clinical trial
https://www.ncbi.nlm.nih.gov/pubmed/30614004

High-dose human milk feedings decrease oxidative stress in premature infant

Enteral lactoferrin supplementation for very preterm infants: a randomized placebo-controlled trial

Inhibition of macrophage migration inhibitory factor attenuates inflammation and fetal kidney injury in a rat model of acute pancreatitis in pregnancy

Influence of human milk and parenteral lipid emulsions on serum fatty acid profiles in extremely preterm infants

Combination therapy with erythropoietin, magnesium sulfate and hypothermia for hypoxic-ischemic encephalopathy: an open-label pilot study to assess the safety and feasibility

Early life predictors of brain development at term-equivalent age in infants born across the gestational age spectrum

Early breast milk exposure modifies brain connectivity in preterm infants