ARTICLES OF INTEREST – May, 2017

Adults born preterm: a review of general health and system-specific outcomes.

In this review of adult outcomes of preterm infants, the authors summarize the risk of cardiopulmonary, metabolic, neurological and behavioral outcomes in adulthood for preterm infants compared to term infants. The authors note increased risks of long-term morbidities among adults born preterm and conclude that preterm birth should be considered a chronic condition and a history of gestational age and birth weight should be part of a routine medical history at all ages.

Intravenous injection of umbilical cord-derived mesenchymal stromal cells attenuates reactive gliosis and hypomyelination in a neonatal intraventricular hemorrhage model

In this study, the authors investigated the restorative effect on neonatal IVH by umbilical cord-derived mesenchymal stromal cells (UC-MSCs) in a neonatal IVH mouse model. UC-MSCs improved behavioral outcome of IVH in the mice. Histopathological analysis revealed that UC-MSCs significantly attenuated periventricular reactive gliosis, hypomyelination, and periventricular cell death observed after IVH. These results suggest that intravenous injection of UC-MSCs may be feasible for treatment of neonatal IVH in clinic.

Novel use of the Medtronic micro vascular plug for PDA closure in preterm infants

The authors describe a single institution experience with a new endovascular occlusion device used for transcatheter PDA closure in preterm infants. Eight neonates [gestational age 28 wks; 52 days old; 2550 g (median)] underwent closure with a Medtronic MVP. All devices were deployed via a 4F angled Glide catheter in prograde fashion under fluoroscopic and echocardiographic guidance. Complete closure was achieved in all patients with no procedural complications. One device embolized 9 days after deployment and was successfully retrieved. These findings validate the ability to close the PDA without arterial access in small infants.
Prophylactic early erythropoietin for neuroprotection in preterm infants: a meta-analysis

To investigate whether prophylactic recombinant human erythropoietin (rhEPO) administration in very preterm infants improves neurodevelopmental outcomes, the authors conducted a meta-analysis of four randomized controlled trials comprising 1133 infants. Prophylactic rhEPO improved the cognitive development of very preterm infants, as assessed by the MDI at a corrected age of 18 to 24 months, without affecting other neurodevelopmental outcomes. Current and future RCTs should investigate optimal dosing and timing of prophylactic rhEPO and plan for long-term neurodevelopmental follow-up.

Pentoxifylline inhibits TLR- and inflammasome-mediated in vitro inflammatory cytokine production in human blood with greater efficacy and potency in newborns

Pentoxifylline (PTX), a phosphodiesterase inhibitor that raises intracellular cAMP, was evaluated for inhibition of TLR-mediated inflammation in human newborn and adult blood samples. PTX, when added 2 h pre-, simultaneously to, or 2 h post-Toll-like receptor (TLR)-mediated inflammation (which contributes to neonatal sepsis), was found to inhibit cytokine production in a concentration dependent manner with greater efficacy and potency in newborn blood, thus demonstrating promise as a potential anti-inflammatory agent in neonates.

Outcome of babies with no detectable heart rate before 10 minutes of age, and the effect of gestation
Sproat T, Hearn R, & Harigopal S. *Arch Dis Child Fetal Neonatal Ed*.

This retrospective study evaluated 22 infants who received cardiac massage and had no heart rate before 10 minutes of life. Eight infants survived (6/11 term, 2/4 born between 32 to 37 weeks, and 0/7 born less than 32 weeks) and five had a normal neurodevelopmental outcome at 2 years’ age. In conclusion, the authors state that particularly for term infants, it may not be appropriate to discontinue resuscitation for infants with no heart rate before 10 minutes of age.

Association of patent ductus arteriosus ligation with death or neurodevelopmental impairment among extremely preterm infants

In this retrospective cohort study of preterm infants <28 weeks gestation from 2006-2012 with a hemodynamically significant patent ductus arteriosus (hsPDA) at 3 neonatal intensive care units in Canada, death or neurodevelopmental impairment (NDI) at 18 to 24 months was compared between infants who received surgical ligation compared to medical management for a hsPDA. After adjusting for both perinatal characteristics and potential confounders before ligation, surgical ligation was not associated with a lower or higher odds of death or NDI (aOR 0.83; 95% CI 0.52-1.32) but was associated with a lower odds of mortality (aOR 0.09; 95% CI 0.04-0.21). No differences in chronic lung disease or severe retinopathy of prematurity were seen when comparing the two treatment approaches for hsPDA.
Successful treatment of pneumatosis intestinalis with associated pneumoperitoneum and ileus with hyperbaric oxygen therapy
In this case report, the authors describe use of hyperbaric oxygen (HBO₂) in a 60 years old woman with pneumatosis intestinalis (PI). HBO₂ therapy is often used in adult patients for moderate to severe PI failing medical management. There are no reports of using HBO₂ in neonates with PI.

OTHER NOTEWORTHY PUBLICATIONS – May, 2017

**Pediatrics**
Effectiveness of vaccination during pregnancy to prevent infant pertussis
Implementation of “Helping Babies Breathe”: a 3-year experience in Tanzania
Epidemiology of cerebrospinal fluid cultures and time to detection in term infants
A family-centered rounds checklist, family engagement, and patient safety: a randomized trial
Supplemental iodide for preterm infants and developmental outcomes at 2 years: an rct
Current workforce of pediatric subspecialists in the United States
Factors associated with provider burnout in the NICU
Implementing education to reduce neonatal mortality in low-resource environments
Disaster preparedness in neonatal intensive care units
The breastfeeding-friendly pediatric office practice
Ethical conduct of research in children: pediatricians and their IRB (Part 1 of 2)
The next 7 great achievements in pediatric research
Maintenance of certification and the challenge of professionalism
Evaluating serial strategies for preventing wrong-patient orders in the NICU
Innovative use of the electronic health record to support harm reduction efforts

**Journal of Pediatrics**
Can lumbar puncture be deferred in febrile neonates with suspected UTI?
Ultrasound skin marking increases lumbar puncture success in infants
50 years ago in the journal of pediatrics: feeding studies in low-birth-weight infants
Tidal volume delivery during the anesthetic management of neonates is variable
Clinical and electroencephalographic characteristics of infantile-onset epilepsies caused by genetic mutations
Newborn dried blood spot polymerase chain reaction to identify infants with congenital cytomegalovirus-associated sensorineural hearing loss
Maternal chorioamnionitis and postneonatal respiratory tract infection in ex-preterm infants
Neurodevelopmental outcome in children after fetal cardiac intervention for aortic stenosis with evolving hypoplastic left heart syndrome
Early lipid infusions and unbound bilirubin in preterm neonates: a cause for concern?
Congenital self-healing Langerhans cell histiocytosis
Outcomes of lung transplantation for infants and children with genetic disorders of surfactant metabolism
Spontaneous umbilical cord hematoma
Mode of delivery and risk of celiac disease: risk of celiac disease and age at gluten introduction cohort study
Prevalence of concomitant acute bacterial meningitis in neonates with febrile urinary tract infection: a retrospective cross-sectional study
Impact of erythropoiesis-stimulating agents on behavioral measures in children born preterm
Neonatal hemochromatosis: Blitz diagnosis results in favorable outcome
Effects of soybean lipid infusion on unbound free fatty acids and unbound bilirubin in preterm infants

**Pediatric Research**
Safety, dosing, and pharmaceutical quality for studies that evaluate medicinal products (including biological products) in neonates (PDF)
https://www.nature.com/pr/journal/v81/n5/pdf/pr2016221a.pdf
Relevance of C5b9 immunostaining in the diagnosis of neonatal hemochromatosis (PDF)
https://www.nature.com/pr/journal/v81/n5/pdf/pr20178a.pdf
The establishment of cow’s milk protein allergy in infants is related with a deficit of regulatory T cells (Treg) and vitamin D
25-hydroxyvitamin D correlates with inflammatory markers in cord blood of healthy newborns
Effects of infant formula supplemented with prebiotics compared with synbiotics on growth up to the age of 12 mo: a randomized controlled trial
Sex-specific associations between cerebrovascular blood pressure autoregulation and cardiopulmonary injury in neonatal encephalopathy and therapeutic hypothermia

Growth after late-preterm birth and adult cognitive, academic, and mental health outcomes

Relationship between perfusion index and patent ductus arteriosus in preterm infants

Biomarkers of adiposity are elevated in preterm very-low-birth-weight infants at 1, 2, and 3 y of age

Former very preterm infants show alterations in plasma amino acid profiles at a preschool age

Caffeine administration modulates TGF-β signaling but does not attenuate blunted alveolarization in a hyperoxia-based mouse model of bronchopulmonary dysplasia

Neonatal mice with necrotizing enterocolitis-like injury develop thrombocytopenia despite increased megakaryopoiesis

The association between weight, height, and head circumference reconsidered

Expression of X-linked toll-like receptor 4 signaling genes in female vs. male neonates

Postnatal human enteric neuronal progenitors can migrate, differentiate, and proliferate in embryonic and postnatal aganglionic gut environments

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

Nasal CPAP for neonatal respiratory support in low and middle-income countries

Thin-for-gestational age infants are at increased risk of neurodevelopmental delay at 2 years

Initial stabilisation of preterm infants: a new resuscitation system with low imposed work of breathing for use with face mask or nasal prongs

Neonatal ventilation with a manikin model and two novel PEEP valves without an external gas source

Developmental problems in patients with oesophageal atresia: a longitudinal follow-up study

Neopuff T-piece resuscitator: does device design affect delivered ventilation?

Two-hourly versus 3-hourly feeding for very low birthweight infants: a randomised controlled trial

Enterostomy-related complications and growth following reversal in infants

Determinants of developmental outcomes in a very preterm Canadian cohort

Effect of antibiotic use on antimicrobial antibiotic resistance and late-onset neonatal infections over 25 years in an Australian tertiary neonatal unit
Ultrasound assessment of umbilical venous catheter migration in preterm infants: a prospective study

Influence of own mother's milk on bronchopulmonary dysplasia and costs

Oxygen saturation ranges for healthy newborns within 24 hours at 1800 m

A systematic review of administrative and clinical databases of infants admitted to neonatal units

The roles of drug therapy given via the endotracheal tube to neonates

Journal of Perinatology
Establishing an integrated human milk banking approach to strengthen newborn care (PDF)

Prognostic neurodevelopmental testing of preterm infants: do we need to change the paradigm?

Is the Bishop-score significant in predicting the success of labor induction in multiparous women?

Relationship between maternal hemodynamics and plasma natriuretic peptide concentrations during pregnancy complicated by preeclampsia and fetal growth restriction

Diabetes mellitus: an independent predictor of duration of prostaglandin labor induction

Maternal body mass index and spontaneous contractility of human myometrium in pregnancy

Utility of third trimester sonographic measurements for predicting SGA in cases of fetal gastroschisis

Blood pressure during pregnancy, neonatal size and altered body composition: the Healthy Start study

Lactoferrin concentration in breast milk of mothers of low-birth-weight newborns

Prediction of large for gestational age by various sonographic fetal weight estimation formulas—which should we use?

Hemodynamic effects of sodium bicarbonate administration

Anthropometric trends from 1997 to 2012 in infants born at less than or equal to 28 weeks’ gestation or less

The impact of integrated evaluation of hemodynamics using targeted neonatal echocardiography with indices of tissue oxygenation: a new approach

Utility of measuring direct bilirubin at first 72 h of age in neonates admitted to the neonatal intensive care unit

Early EEG power predicts MRI injury in infants with hypoxic-ischemic encephalopathy
Improved SNAPPE-II and CRIB II scores over a 15-year period
Assessment of human milk composition using mid-infrared analyzers requires calibration adjustment
Cerebral modulation of the autonomic nervous system in term infants
Cardiac output decreases and systemic vascular resistance increases in newborns placed in the left-lateral position
Impact of L-carnitine supplementation on metabolic profiles in premature infants
Pulmonary hypertension in preterm infants: results of a prospective screening program
The prevalence of feeding problems in children formerly treated in a neonatal intensive care unit
Vocal fold paralysis in preterm infants: prevalence and analysis of risk factors
Skin-to-skin contact after birth and the natural course of neurosteroid levels in healthy term newborns (PDF)
https://www.nature.com/jp/journal/v37/n5/pdf/jp2016268a.pdf
Erythropoietin monotherapy in perinatal asphyxia with moderate to severe encephalopathy: a randomized placebo-controlled trial
Effect of L-thyroxine supplementation on very low birth weight infants with transient hypothyroxinemia of prematurity at 3 years of age
Early postnatal illness severity scores predict neurodevelopmental impairments at 10 years of age in children born extremely preterm

**Neonatology**
Increased intestinal inflammation and digestive dysfunction in preterm pigs with severe necrotizing enterocolitis
Thoracoabdominal asynchrony is not associated with oxyhemoglobin saturation in recovering premature infants
Neonatal pneumothorax: a descriptive regional Danish study
Medications that increase osmolality and compromise the safety of enteral feeding in preterm infants
MRI differences associated with intrauterine growth restriction in preterm infants
Use of transcutaneous bilirubin to determine the need for phototherapy in resource-limited settings
Surfactant need by gestation for very preterm babies initiated on early nasal CPAP: a Danish observational multicentre study of 6,628 infants born 2000-2013
Umbilical venous catheter malposition is associated with necrotizing enterocolitis in premature infants

Associations of maternal leptin with neonatal adiposity differ according to pregravid weight

Is fat mass accretion of late preterm infants associated with insulin resistance?

Effects of breathing and apnea during sustained inflations in resuscitation of preterm infants

Patent ductus arteriosus treatment in very preterm infants: a European population-based cohort study (EPICE) on variation and outcomes

Three-dimensional imaging-based web application for predicting tracheal tube depth in preterm neonates

Overview of lung development in the newborn human

What should we do about low blood pressure in preterm infants

Surfactant for respiratory distress syndrome: new ideas on a familiar drug with innovative applications

Update on postnatal steroids

Current research on the epidemiology, pathogenesis, and management of necrotizing enterocolitis

How to save 1 million lives in a year in low- and middle-income countries

American Journal of Perinatology

Incidence of nasogastric and gastrostomy tube at discharge is reduced after implementing an oral feeding protocol in premature (< 30 weeks) infants

Evaluation of trichorionic versus dichorionic triplet gestations from 2005 to 2016 in a large, referral maternity center

Preeclampsia and the risk of bronchopulmonary dysplasia in preterm infants less than 32 weeks' gestation

Noninvasive neurally adjusted ventilatory assist in premature infants postextubation

Early treatment for neonatal abstinence syndrome: a palliative approach

Association of maternal obesity with child cerebral palsy or death

Simulation-based patient-specific multidisciplinary team training in preparation for the resuscitation and stabilization of conjoined twins

Diagnostic value of presepsin in detection of early-onset neonatal sepsis
https://www.ncbi.nlm.nih.gov/pubmed/27825177
Delivery outcomes after term induction of labor in small-for-gestational age fetuses
Transplacental passage of acetaminophen in term pregnancy
24/7 presence of medical staff in the labor ward; no day-night differences in perinatal and maternal outcomes
Umbilical artery lactate correlates with brain lactate in term infants

Journal of Neonatal-Perinatal Medicine
Neonatal outcomes following planned preterm delivery in diabetic mothers
Calcium chloride in neonatal parenteral nutrition: a 15 year experience
Just add water: accuracy of analysis of diluted human milk samples using mid-infrared spectroscopy
Early feeding tolerance in small for gestational age infants with normal versus abnormal antenatal Doppler characteristics
Assessment of serum apolipoprotein B and apolipoprotein A-1 and their ratio in healthy full term small for gestational age newborns
Optimal radiologic position of an umbilical venous catheter tip as determined by echocardiography in very low birth weight newborns
Peripheraly inserted central catheter in extremely preterm infants: characteristics and influencing factors
A comparison of the incidence of undiagnosed congenital heart disease in hospital born and home born children
Endothelin 1 as a predictor marker for bronchopulmonary dysplasia in preterm neonates with respiratory distress syndrome
Retinopathy of prematurity in Indonesia: incidence and risk factors
Group B streptococcus colonization and HIV in pregnancy: a cohort study in Nigeria
Perspectives and attitudes of pediatricians concerning post-discharge care practice of premature infants
Early onset necrotizing enterocolitis (NEC) in premature twins
Management of mixed type congenital mesoblastic nephroma: case series and review of the literature
A case of infant delirium in the neonatal intensive care unit
Maternal Health, Neonatology and Perinatology
A review of delivery room resuscitation in very low birth weight infants in a middle-income country (PDF)

Neoreviews
Late preterm and early term birth: at-risk populations and targets for reducing such early births
http://neoreviews.aappublications.org/content/18/5/e265
Pumpless extracorporeal support of the preterm infant: bridging fetal and postnatal physiology
http://neoreviews.aappublications.org/content/18/5/e277
Neonatal genomics: part 1—basics and definitions
http://neoreviews.aappublications.org/content/18/5/e283
Neonatal genomics: part 2—applications
http://neoreviews.aappublications.org/content/18/5/e295
Recomendaciones del vi consensoclínico de siben para la hipertensiónpulmonarpersistente del reciénnacido
http://neoreviews.aappublications.org/content/18/5/e327
Case 1: A term infant with respiratory distress
http://neoreviews.aappublications.org/content/18/5/e306
Case 2: Herpes simplex virus infection in a preterm infant and complications
http://neoreviews.aappublications.org/content/18/5/e309
Strip of the Month: A multiparous patient with twins requiring urgent operative-assisted vaginal delivery
http://neoreviews.aappublications.org/content/18/5/e312
Legal Briefs: Was the intracardiac thrombus secondary to an unnecessary umbilical venous catheter?
http://neoreviews.aappublications.org/content/18/5/e320
Newborn with a large exophytic mass on the head
http://neoreviews.aappublications.org/content/18/5/e323

JAMA Pediatrics
Association between family characteristics and the effect of timing of regular egg introduction in infant egg allergy
Association of risk of viremia, immunosuppression, serious clinical events, and mortality with increasing age in perinatally human immunodeficiency virus-infected youth
Estimated perinatal HIV infection among infants born in the United States, 2002-2013
Using systems of care and a public health approach to achieve zero perinatal HIV transmissions
Neurodevelopmental outcomes following surgical ligation for patent ductus arteriosus among extremely preterm infants: case closed?
Multiple skin changes on the lower back of a neonate
Bridging knowledge gaps to understand how Zika virus exposure and infection affect child development
BMC Pediatrics
Neonatal respiratory morbidity following exposure to chorioamnionitis
Impact of preterm birth on infant mortality for newborns with congenital heart defects: the EPICARD population-based cohort study
Interstitial pneumonia pattern on day 7 chest radiograph predicts bronchopulmonary dysplasia in preterm infants
Healthcare professionals’ and parents’ experiences of the confirmatory testing period: a qualitative study of the UK expanded newborn screening pilot
Chromosome microarray analysis in the investigation of children with congenital heart disease

Pediatric Critical Care Medicine
Acute decompensation in pediatric cardiac patients: outcomes after rapid response events
Diagnostic value of procalcitonin on early postoperative infection after pediatric cardiac surgery
The impact of neonatal simulations on trainees’ stress and performance: a parallel-group randomized trial
Videolaryngoscopy in neonates, infants, and children (PDF)
http://journals.lww.com/pccmjournal/Fulltext/2017/05000/Videolaryngoscopy_in_Neonates,_Infants,_and_11.aspx
IV versus subcutaneous enoxaparin in critically ill infants and children: comparison of dosing, anticoagulation quality, efficacy, and safety outcomes
https://www.ncbi.nlm.nih.gov/pubmed/28296662

New England Journal of Medicine
Physiological effects of chronic hypoxia

Lancet
Targeted enrichment sequencing in two midterm pregnancies with severe abnormalities on ultrasound
Tailored genetic testing provides answer to fetal anomaly

JAMA
A day in the life: NICU medical director tends to infants with neonatal abstinence syndrome
Facial rash, fever, and anemia in a newborn
BMJ
Etiology and clinical presentation of birth defects: population based study
Term admissions to neonatal units in England: a role for transitional care? A retrospective cohort study

Pediatric Infectious Disease Journal
Clinical and microbiologic characteristics of early-onset sepsis among very low birth weight infants: opportunities for antibiotic stewardship
Zika virus infection associated with congenital birth defects in a HIV-infected pregnant woman
Risk of pertussis in relation to degree of prematurity in children less than 2 years of age

Pediatric Cardiology
Effect of fenestration on early postoperative outcome in extracardiac fontan patients with different risk levels
Effects of triple cryoenergy application on lesion formation and coronary arteries in the developing myocardium
Microarray analysis of differential gene expression profile between human fetal and adult heart
Right ventricle-to-pulmonary artery shunt in pulmonary atresia with a ventricular septal defect: a word of caution
Subclinical decrease in myocardial function in asymptomatic infants of diabetic mothers: a tissue doppler study
Routine application of bloodless priming in neonatal cardiopulmonary bypass: a 3-year experience
Multicenter off-label use of nit-occlud coil in retrograde closure of small patent ductus arteriosus
https://www.ncbi.nlm.nih.gov/pubmed/28224170

Pediatric Neurology
Compound heterozygous variants in ROBO1 cause a neurodevelopmental disorder with absence of transverse pontine fibers and thinning of the anterior commissure and corpus callosum
Congenital toxoplasmosis
**Obstetrics and Gynecology**
Outcomes of twin pregnancies in women 45 years of age or older

Evaluation of introduction of a delayed cord clamping protocol for premature neonates in a high-volume maternity center

**American Journal of Obstetrics & Gynecology**
Reducing preterm birth by a statewide multifaceted program: an implementation study (PDF)

The systematic error in the estimation of fetal weight and the underestimation of fetal growth restriction

Development of customized fetal growth charts in twins

Fetal and neonatal outcomes of preterm infants born before 32 weeks of gestation according to antenatal vs postnatal assessments of restricted growth

Leading causes of preterm delivery as risk factors for intraventricular hemorrhage in very preterm infants: results of the EPIPAGE 2 cohort study

Is middle cerebral artery Doppler related to neonatal and 2-year infant outcome in early fetal growth restriction?

Maternal buprenorphine treatment and fetal neurobehavioral development

**BASIC SCIENCE SELECTIONS**
Vitamin A and retinoic acid combination attenuates neonatal hyperoxia-induced neurobehavioral impairment in adult mice

The differential effects of erythropoietin exposure to oxidative stress on microglia and astrocytes in vitro
Pathipati P & Ferriero DM. *Dev Neurosci.*

Prediction of cognitive and motor outcome of preterm infants based on automatic quantitative descriptors from neonatal MR brain images

Postnatal hyperoxia exposure durably impairs right ventricular function and mitochondrial biogenesis

Mir-29b supplementation decreases expression of matrix proteins and improves alveolarization in mice exposed to maternal inflammation and neonatal hyperoxia

Dietary human milk oligosaccharides but not prebiotic oligosaccharides increase circulating natural killer cell and mesenteric lymph node memory T cell populations in noninfected and rotavirus-infected neonatal piglets  

Early postnatal exposure to intermittent hypoxia in rodents is proinflammatory, impairs white matter integrity, and alters brain metabolism  

Newborn mice lacking the gene for Cyp1a1 are more susceptible to oxygen-mediated lung injury, and are rescued by postnatal beta-naphthoflavone administration: implications for bronchopulmonary dysplasia in premature infants  

**ADDITIONAL JOURNAL SELECTIONS**

Red blood cell transfusions can induce proinflammatory cytokines in preterm infants  

Association of cord blood chemokines and other biomarkers with neonatal complications following intrauterine inflammation  

Fetal-growth-restricted preterm infants display compromised autonomic cardiovascular control on the first postnatal day but not during infancy  

Favorable outcomes of preterm infants with parenteral nutrition-associated liver disease treated with intravenous fish oil-based lipid emulsion  

Vascular endothelial mitochondrial function predicts death or pulmonary outcomes in preterm infants  

Decrease in delivery room intubation rates after use of nasal intermittent positive pressure ventilation in the delivery room for resuscitation of very low birth weight infants  
Biniwale M & Wertheimer F. *Resuscitation*.  
Starting enteral nutrition with preterm single donor milk instead of formula affects time to full enteral feeding in very low birth weight infants

Neopuff T-piece resuscitator: does device design affect delivered ventilation?

Neonatal predictors of cognitive ability in adults born very preterm: a prospective cohort study