



Examples of University of Virginia Neonatology Research

Faculty: David Kaufman

Safety and Tolerability of Lactoferrin with Prebiotics (fructo-oligosaccharides) in preterm infants

Lactoferrin has demonstrated some benefit in preventing necrotizing enterocolitis and infection. In this preliminary trial, a preparation of LF+FOS is given to preterm infants and various outcomes assessed related to safety and tolerability. This trial is in preparation for a larger study evaluating efficacy of LF+FOS for preventing infection and NEC.

Faculty: Karen Fairchild

Study: Apnea, bradycardia, and desaturation events in VLBW infants

We have developed a system for computer analysis of common cardiorespiratory signals – impedance pneumography, heartrate, and pulse oximetry – to evaluate the maturity of respiratory drive in premature infants in the NICU. We have shown that this system is superior to the existing standard of care of nurses recording apnea events in the bedside chart based on monitor alarms. Currently we are studying the relationship of apnea, bradycardia, and desaturation events (separately and together) to adverse outcomes in VLBW infants.

Faculty: Brynne Sullivan, Karen Fairchild

Study: Predictive monitoring in NICU patients

Abnormal “Heart Rate Characteristics” (HRC), low heart rate variability and decelerations, are associated with neonatal sepsis. The HRC index (HeRO score) was developed at UVa and in a multicenter RCT of 3003 VLBW infants was associated with reduced mortality. More recent work is focused on analyzing cardiorespiratory data from bedside monitors, including SpO₂, to develop better algorithms for predicting short and longer-term outcomes. “POPS” or pulse ox predictive score from the first week after birth aims to predict all bad outcomes occurring days weeks or months later, and “POWS” or pulse ox warning score aims to predict impending acute illnesses, sepsis and NEC.

Faculty: Santina Zanelli

Study: Role of kainite receptors in modulation of synaptic transmission and seizure susceptibility to hypoxia in neonatal mice.

Seizures represent the most frequent neurological disorder of the newborn infant, and the goal of this research is to elucidate the role of kainite receptors in synaptic transmission and hypoxia-associated seizures.

Faculty: Jennifer Burnsed

Study: Memory and neuronal circuitry in mice after hypoxic-ischemia injury

This work is testing the hypothesis that the memory engram is disrupted by interictal spikes and chronically abnormal neuronal activity in the hippocampal-parahippocampal circuit related to neonatal HIE

Faculty: Karen Fairchild, John Kattwinkel

Study: “VentFirst”: Ventilating extremely preterm infants during delayed cord clamping

Delayed cord clamping (DCC) has been shown to be beneficial for preterm infants, and ensuring establishment of lung inflation prior to cord clamping may be even more beneficial. VentFirst is a multicenter RCT of standard DCC (30-60 seconds) with ventilatory assistance given after, versus prolonged DCC (120 seconds) with ventilatory assistance given before cord clamping, for infants <29 weeks GA, with the primary outcome being reduction in IVH.

Faculty: Sean Moore (Peds GI) and Jim Nataro (Pediatric ID) and David Kaufman

Study: **Stool microbiome in NEC and impact of lactoferrin**

Studies have suggested that there is a “bloom” of Enterobacter species in the stool prior to onset of NEC. Stool samples are being collected at regular intervals and analyzed for determination of microbiome characteristics to determine whether particular bacterial patterns are associated with NEC. The impact of lactoferrin supplementation on stool microbiome will also be studied.

Faculty: Jonathan Swanson

Study: **Remodulin for PPHN** (company-sponsored)

Determine whether adding Remodulin (prostacyclin) to iNO improves oxygenation in newborns with PPHN. Beginning enrollment in summer/fall 2017.

Faculty: Jonathan Swanson

Field: **Quality and cost benefit studies**

Assess the impact of QI interventions and the cost/benefit of various NICU therapies.

Faculty: Jennifer Charlton (Peds Renal) and Jonathan Swanson

Study: **Acute Kidney Injury in the Neonate**

The NICU is part of an international multi-center study (AWAKEN) evaluating AKI risk factors and prevalence in the NICU. Future studies will evaluate long term outcomes of those who develop AKI in the newborn period.

Faculty: Brooke Vergales

Study: **Breast milk feedback device** (company-sponsored)

Determine whether a device can accurately measure the volume of breast milk a preterm infant gets when nursing.

Faculty: Robert Sinkin

Field: **Bronchopulmonary dysplasia**

Dr. Sinkin’s clinical and research interests center on bronchopulmonary dysplasia (BPD) and therapies aimed at reducing the morbidity associated with the respiratory distress syndromes of premature and term babies, including pharmacologic intervention and ventilatory strategies to reduce BPD. He is also involved in efforts to critically assess neonatal care provision and determine the cost-benefit of neonatal interventions.