Pediatric RESEARCH

www.nature.com/pr

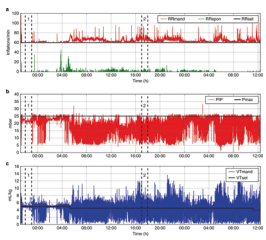
EDITOR'S FOCUS

Volume 89 No. 6 April 2021

Early Career Investigator

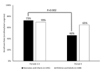
Congratulations to Kazumichi Fujioka, the Early Career Investigator for May 2021. Dr. Fujioka is an associate professor of pediatrics at Kobe University Graduate School of Medicine and chief of neonatology at Kobe University Hospital, Japan. He completed his medical school and fellowship in neonatal perinatal medicine at Kobe University and Kobe Children's Hospital. He received training in basic research at Kobe University, mentored by Masafumi Matsuo, and then at Stanford University School of Medicine, mentored by Ronald J. Wong and David K. Stevenson. In this issue, he and colleagues report that the bilirubin/albumin ratio significantly correlates with unbound bilirubin levels in preterm infants born at <35 weeks of gestation. Dr. Fujioka's advice to those interested in research is to take each task seriously, even when it is not of direct interest—in research, whether in clinical or basic science, experiences that seem irrelevant may eventually prove to be useful. See pages 1332 and 1428

Computational analysis of neonatal ventilator waveforms and loops



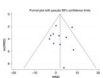
Advances in technology has enabled us to measure second-to-second ventilator data on pressures and volumes (high sampling). Sifting and summarizing these massive amounts of data that can benefit our patients is an important clinical objective. Chong and colleagues from Cambridge, United Kingdom, report the development of a Python package, Ventiliser, which includes an algorithm that automatically recognizes and characterizes ventilator inflations from ventilator pressure and flow data. Ventiliser, which can run on a personal computer, summarizes 24 h of data in 2 min, generating a table reporting indices of each breath and its subphases. It enables visualization of individual inflations as waveforms or loops. The software identified >97% of ventilator inflations and their subphases in an out-of-sample validation of manually annotated data. Ventiliser is a laudable first step toward making real-time data that can inform patient care available for clinicians at the bedside. In a related Comment, Mammel notes "At least now it is possible to look at the interaction between baby and ventilator differently, with fresh insight and new questions". See pages 1433 and 1340

Research consent rates before and during the COVID-19 pandemic



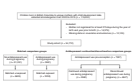
The COVID-19 pandemic has impacted our paradigm of family-centered care and clinical research activities. Van Driest et al., from Vanderbilt University Medical Center, report that consent rates for a clinical research study declined during the COVID-19 pandemic when compared with pre-pandemic rates. The authors surmise that the declining consent rates may be due to one-visitor policies, the increased stress and anxiety of hospitalization during a pandemic, and increased distrust of the medical system. They urge investigators, funders, and institutions to make a concerted effort to overcome barriers to recruitment due to the COVID-19 pandemic in order to meet study enrollment goals. The findings of this study should inform future clinical trials; the decreased consent rate should be taken into account when planning enrollment goals. In a related Comment, Raphael et al. review the importance of hospital visitation policies. See pages 1387 and 1334

Effects of physical therapy on lung function in children with asthma



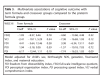
Asthma is a common childhood chronic respiratory disease for which treatment strategies include medications and physical therapy. Zhang et al., in a systematic review and meta-analysis, investigated the effects of physical therapy (including breathing exercises and inspiratory muscle training) on lung function in children with asthma. The review encompassed 18 eligible studies out of 6474 identified studies, of which 11 provided data for meta-analysis. The review's results suggest that physical training significantly improved forced vital capacity (% predicted) in children with asthma. The authors recommend further research on the effects of breathing exercises and inspiratory muscle training in asthma. The related Insights piece by EL-Khuffash et al. was the first to be featured in Pediatric Research's Science for Kids project. See pages 1344 and 1589

Prenatal antidepressant exposure and child development



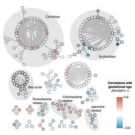
The relationship between prenatal antidepressant exposure and infant development has not been fully elucidated owing to non-optimal study design and failure to account for confounding. Whether the association of adverse neurodevelopmental outcome is due to prenatal drug exposure or to underlying maternal mood disturbances is a question for debate. Park et al. report a population-based retrospective cohort study from Canada ($n = 94{,}712$) in which they sought to separate confounding effects of prenatal antidepressant exposure from maternal mood disturbances. In this large population-based cohort, 3.9% ($n = 3611$) of children were prenatally exposed to antidepressants. The exposure was selectively associated with worse anxious behaviors and physical independence at kindergarten age, with no effects on other developmental domains. The authors rightly point out that the effects may be attributable to maternal mental illness or other unmeasured confounding. In a related Comment, Wood suggests that future studies on medication safety carefully define research questions with answers that support clinical and regulatory decision making. See pages 1521 and 1337

Early diet in preterm infants and later cognition



How important is achieving good nutrition in preterm infants in hospital and post-discharge? Apart from effects on anthropometrics, does it have an effect on long-term neurodevelopment? Embleton et al., from Newcastle, United Kingdom, report the findings of a 10-year follow-up of infants (92 children, mean 10.1 years of age) from a randomized controlled trial on enhanced preterm nutrition in which infants were randomized to 6 months of preterm formula or term formula from 36 weeks corrected age. The effects of post-discharge nutrition on childhood cognition were assessed using the short-form Wechsler Intelligence Scale for Children–III. The authors conclude that, although there was no long-term impact of post-discharge macronutrient enrichment on childhood cognition, greater weight and head growth in specific epochs were associated with better outcomes. In a related Comment, Lucas notes that the concept that early malnutrition adversely impacts cognitive development has historically been difficult to prove. See pages 1443 and 1342

Gestational age-dependent development of the neonatal metabolome



Mass spectrometry techniques allow us to measure the blood metabolome of preterm infants from dried blood spots collected at birth. Little is known about metabolomics in preterm infants and how it relates to maturational processes, including development and the gut microbiome. Ernst and colleagues report the results of a study in which samples underwent untargeted profiling using liquid chromatography-tandem mass spectrometry. The authors measured more than 9000 metabolites in 298 neonatal residual heel-prick dried blood spots. A total of 1459 (~16%) metabolites were significantly correlated with gestational age, whereas 83 metabolites explained, on average, 48% of the variance in gestational age. Gestational age-dependent normative metabolome data will enhance our understanding of pathophysiological processes in preterm infants. See page 1397