Translating Best Evidence into Best Care

EDITOR'S NOTE: Studies for this issue were identified using the Clinical Queries feature of PubMed, "hand" searching *JAMA Pediatrics*, *Pediatrics*, and *The Journal of Pediatrics*, and from customized EvidenceUpdates alerts.

EBM PEARL: THE 95% CONFIDENCE INTERVAL (CI), PART 1: The 95% CI for an effect measure (eg, a treatment effect, an adverse effect, a likelihood ratio) is a range of possible values in which the "true" effect has a 95% chance of residing. The effect measured in an experiment is the most likely "true" effect, with all the others contained in the 95% CI less likely and following a Gaussian curve around the measured effect. The 95% CI also is a measure of precision, where precision is a measure of uncertainty associated with the effect measure. The higher the precision, the more certainty, the closer the upper and lower 95% CI limits are to each other, and the "tighter" they are around the effect measure. If the 95% CI contains the value of no difference between experimental groups, the 2 groups are not statistically different from each other.

LITERATURE SEARCH PEARL: CITATION INDICES: A citation index is a bibliographic database that has many uses. The two most used indices in the health sciences are Scopus (scopus.com) and Web of Science (wokinfo.com). The classic use of a citation index is to identify which later articles cited earlier articles. Other uses include identifying articles published by a particular researcher, the number times an article is cited by other articles, and the number of times one researcher's articles are cited by other researchers' articles. Another a popular use is calculation of the journal Impact Factor, a measure of the how often the average article in a journal has been cited in a particular year. One journal can compare its Impact Factor with other journals in its field. Finally, citation indices can measure the h-index, a type of Impact Factor for individual researchers, which measures both productivity and scientific influence (based on number of citations).

—**Jordan Hupert, MD**

Filtered sunlight noninferior to conventional phototherapy

Slusher TM, Olusanya BO, Vreman HJ, Brearley AM, Vaucher YE, Lund TC, et al. A Randomized Trial of Phototherapy with Filtered Sunlight in African Neonates. *N Engl J Med*. 2015;373:1115-24.

Question Among term or near-term neonates, what is the efficacy of filtered sunlight, compared with conventional phototherapy, in hyperbilirubinemia resolution?

Design Randomized, controlled, noninferiority trial.

Setting Maternity hospital in Lagos, Nigeria.

Participants Term and late-preterm neonates.

Intervention Filtered sunlight compared with conventional phototherapy.

Outcomes Bilirubin increase of less than 0.2 mg/dl/hr or a serum bilirubin decrease. 10% noninferiority margin.

Main Results Filtered sunlight was efficacious on 93% (95% CI, 89 to 96) of treatment days that could be evaluated, as compared with 90% (95% CI, 86 to 93) for conventional phototherapy.

Conclusions Filtered sunlight was noninferior to conventional phototherapy.

Commentary Photons emitted by blue-to-green light (450 to 490 nm) can photo-alter bilirubin molecules, which deposit in the subcutaneous tissue and/or circulate in the vascular space.[1,2] The bioengineering novelty of this study was to take advantage of known principles of physics to filter the broad spectrum of sunlight using select window-tinting films to transmit only safe and efficacious blue light to lower total bilirubin levels. The investigators constructed special annexes that allowed for maternal care of their newborns with jaundice while being exposed to filtered sunlight phototherapy. A trans-disciplinary approach bridged challenges collecting data, adhering to a study design, and attaining data integrity. Clinicians and researchers should be attentive to these important technical and organizational issues. More importantly, effective replication and safe implementation of this novel approach in community settings require the clinical resources described by Slusher et al. Families of newborns at risk for acute bilirubin encephalopathy may require emergency access to exchange transfusion. However, in many countries, these families are not able to access well-organized, modern perinatal health services. Thus, there is a need to implement, as well as to encourage effective and preventive phototherapy at, or adjacent to, the local community birthing facility. At the same time, systems must be developed for timely transport to regionalized, expert, newborn care at perinatal centers.

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Rapid feed advancement appears protective in very low birth weight infants

Morgan J, Young L, McGuire W. Slow advancement of enteral feed volumes to prevent necrotising enterocolitis in very low birth weight infants. *Cochrane Database Syst Rev* 2015;10:CD001241.

Question Among very preterm (<32 weeks gestation) or very low birth weight (VLBW) infants (<1500 g), what is the therapeutic efficacy of slow, compared with fast enteral feed advancement, in decreasing the incidence and mortality of necrotizing enterocolitis (NEC)?

Design Meta-analysis of 9 randomized or quasi-randomized controlled trials.

Setting North America, India, Turkey and South Africa.

Participants Very preterm or VLBW infants.

Intervention Slow (15-24 ml/kg/day) vs fast (30-40 ml/kg/day) enteral feed advancement.

Outcomes Incidence of NEC and mortality.

Main results There was no statistically significant difference in the incidence of NEC: absolute risk increase (ARI), 0.4% (95% CI, -2.9% to 3.6%), or all-cause mortality: ARI, 2.8% (95% CI, -2.7% to 8.3%). Slow feed advancement was associated with delayed establishment of full enteral nutrition by one to five days, and increased risk of invasive infection: ARI, 7.3% (95% CI, 0.8% to 13.8%), number needed to harm, 14 (95% CI, 8 to 100).

Conclusions Fast advancement of feeds was not associated with increased incidence of NEC or death, and was protective against invasive infection in very preterm or VLBW infants.

Commentary Necrotizing enterocolitis is the most common gastrointestinal emergency in preterm infants and is typically associated with high rates of morbidity and mortality. In this feeding-advancement meta-analysis, most infants were more than 1000 g at birth. As very sick infants were excluded in 3 trials, as well as infants with intrauterine growth restriction, the conclusions of this study may not be applicable to infants most at risk for NEC. Patole et al found that centers with standardized feeding regimens had lower incidence of NEC.[1] This effect of standardized feeding regimens may have been due to increased awareness and early detection and management of stage 1 NEC, and not to variations in the regimen. Other factors affecting NEC incidence include breast feeding (protective)[2] and continuous versus bolus feeds. In a previous meta-analysis, Morgan et al observed delayed introduction of progressive enteral feeds beyond four days did not reduce the incidence of NEC in VLBW infants.[3] Clinical trials including extremely low birth weight (<1000 g) and infants with growth restriction will enhance our understanding of feeding-advancement rate effects on NEC incidence. Based on this meta-analysis, it would be reasonable to advance enteral feeds by 30-40 ml/kg/day in clinically stable VLBW infants.

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Air pollutants associated with astrocytoma and medulloblastoma

Danysh HE, Mitchell LE, Zhang K, Scheurer ME, Lupo PJ. Traffic-related air pollution and the incidence of childhood central nervous system tumors: Texas, 2001-2009. *Pediatr Blood Cancer*. 2015;62:1572-8.

Question What is the association among children with central nervous system (CNS) tumors and traffic-related air pollution?

Design Retrospective, population-based study.

Setting Texas.

Participants <15 years old, residing in Texas during 2001-2009.

Intervention Exposure and cancer linkage based on the Texas Cancer Registry and the 2005 US Environmental Protection Agency's Assessment System for Population Exposure Nationwide.

Outcomes CNS tumors diagnosed 2001-2009.

Main Results Medium and medium-high 1,3-butadiene concentrations had higher astrocytoma incidence rates: adjusted incidence rate ratio (aIRR), 1.46 (95% CI, 1.05 to 2.01) and 1.69 (95% CI, 1.22 to 2.33), respectively, compared with low concentrations. Medium diesel particulate matter concentrations had higher astrocytoma and medulloblastoma incidence rates: aIRR, 1.42 (95% CI, 1.05 to 1.94) and