

**Conclusions** In light of the increasing burden on physicians to provide preventive care, this study calls into question the value of hearing screening using pure-tone audiometry during well-child visits given the poor test characteristics and lack of follow-up after referral.

**Commentary** Pure-tone audiometry screening is one of the many components of usual well-child care for which there is little underlying scientific evidence. This study finds that many children do not follow-up with an audiologist after an abnormal hearing screen and that the accuracy of audiometry compared with a formal audiologic evaluation is poor. The story may be even worse if the actual diagnoses, which were not presented in this report, were considered. For example, some of these children may have had serous otitis media, which would likely simply resolve over time. This study raises important healthcare delivery questions. For example, many states require repeated hearing screens as part of well-child care for Medicaid-enrolled children. This report suggests that such policies may be a significant waste of limited healthcare resources. It should be noted that in contrast to pure-tone audiometry, newborn hearing screening has led to dramatic improvements in the diagnosis of significant hearing loss. Unfortunately, there have also been barriers to the timely follow-up after an abnormal newborn hearing screen.

Alex R. Kemper, MD, MPH, MS  
Duke University  
Durham, North Carolina

## Traumatic brain injury results in prolonged increase in risk of epilepsy in children

Christensen J, Pedersen MG, Pedersen CB, Sidenius P, Olsen J, Vestergaard M. Long-term risk of epilepsy after traumatic brain injury in children and young adults: a population-based cohort study. *Lancet* 2009;373:1105-10.

**Question** Among children with traumatic brain injury, how does the risk of epilepsy change over time?

**Design** Cohort study.

**Setting** Denmark.

**Participants** 1,605,216 people born between 1977 and 2002.

**Outcomes** Relative risks (RR) of epilepsy over time.

**Main Results** Risk of epilepsy was increased after a mild brain injury (RR 2.22, 95% CI 2.07–2.38), severe brain injury (7.40, 6.16–8.89), and skull fracture (2.17, 1.73–2.71). The risk was increased more than 10 years after mild brain injury (1.51, 1.24–1.85), severe brain injury (4.29, 2.04–9.00), and skull fracture (2.06, 1.37–3.11). RR increased with age at mild and severe injury and was especially high among people older than 15 years of age with mild (3.51, 2.90–4.26) and severe (12.24, 8.52–17.57) injury. The risk was slightly higher in women (2.49, 2.25–2.76) than in men (2.01, 1.83–2.22). Patients with a family history of epilepsy had a notably high risk of epilepsy after mild (5.75, 4.56–7.27) and severe brain injury (10.09, 4.20–24.26).

**Conclusions** The longlasting high risk of epilepsy after brain injury might provide a window for prevention of post-traumatic epilepsy.

**Commentary** Head trauma is an important cause of epilepsy and this study is an important contribution to our understanding of the problem. Using data from the Danish National Hospital Register, the investigators identified 78,572 persons who experienced at least one head injury and 17,470 persons with a diagnosis of epilepsy, of whom 1,017 persons had had a prior head injury, in a population of 1,605,216 persons born in Denmark. The relative risks of developing epilepsy in those with mild and severe head injury, with or without a family history of epilepsy, were compared with the risks of epilepsy in those without head injury at yearly time points after the injury and standardized for age, sex, and calendar year. Overall, the relative risks of epilepsy were found to be raised approximately two-fold (RR 2.2) after a mild and seven-fold after a severe head injury (RR 7.4). The risk of epilepsy increased with age and was highest for people older than 15 years at the time of injury for both mild (RR 3.5) and severe (12.2) head injuries. In children, the risk of posttraumatic epilepsy was highest in those aged 0-5 years after severe head injury (RR 7.2), and the risk following mild injury were similar for all aged 0-15. The rate of development of epilepsy was greatest in the few years immediately after head injury, with an over five-fold increase remaining for 2-3 years after a severe head injury, but the excess risk extended for 10 years after mild brain injury, longer than previously reported.<sup>1</sup> This study is of commendable size and completeness, with an excellent and sophisticated statistical design, and in our opinion should be considered the reference study in the field.

Aidan Neligan, MSc, MRCP  
Simon D. Shorvon, MA, MD, FRCP  
UCL Institute of Neurology, Queen Square  
London, United Kingdom

## Reference

1. Annegers JF, Hauser WA, Coan SP, Rocca WA. A population-based study of seizures after traumatic brain injuries. *N Engl J Med* 1998;338:20-4.

## Evidence is not yet clear on impact of pacifiers on breastfeeding

O'Connor NR, Tanabe KO, Siadaty MS, Hauck FR. Pacifiers and breastfeeding: a systematic review. *Arch Pediatr Adolesc Med* 2009;163:378-82.

**Question** Among infants who are breastfeeding, does the use of a pacifier increase the risk of decreased breastfeeding duration or exclusivity?

**Design** Systematic review.

**Data Sources** MEDLINE, CINAHL, the Cochrane Library, EMBASE, POPLINE, and bibliographies of identified articles.

**Study Selection and Assessment** 1098 reports were obtained through a search. 29 studies that fit inclusion criteria were included in the review (4 randomized controlled trials, 20 cohort studies, and 5 cross-sectional studies). Two independent reviewers abstracted data and scored these studies for quality; disagreements were settled through consensus with a third investigator.

**Main Exposure** Pacifier use.

**Main Outcome Measures** Breastfeeding duration or exclusivity.

**Main Results** Results from 4 randomized controlled trials revealed no difference in breastfeeding outcomes with different pacifier interventions (pacifier use during tube feeds, pacifier use at any time after delivery, an educational program for mothers emphasizing avoidance of pacifiers, and a UNICEF [United Nations Children's Fund]/World Health Organization Baby Friendly Hospital environment). Most observational studies reported an association between pacifier use and shortened duration of breastfeeding.

**Conclusions** The highest level of evidence does not support an adverse relationship between pacifier use and breastfeeding duration or exclusivity. The association between shortened duration of breastfeeding and pacifier use in observational studies likely reflects a number of other complex factors, such as breastfeeding difficulties or intent to wean. Ongoing quantitative and qualitative research is needed to better understand the relationship between pacifier use and breastfeeding.

**Commentary** This study attempts to answer a critically important dilemma for clinicians— what should we advise parents regarding pacifiers and breastfeeding? Pacifier use during naps and bedtime may reduce the risk of SIDS; however there are concerns that pacifiers may negatively impact breastfeeding. Although the authors conclude that “the highest level of evidence does not support an adverse relationship between pacifier use and breastfeeding duration or exclusivity,” the evidence that they present actually suggests that the jury is still out and begs for more high quality studies. Though their literature search yielded 29 articles, O'Connor et al based their conclusion largely upon 4 randomized controlled trials (RCT's) using a quality rating system that they developed for this review. It is not clear why the authors developed their own system rather than use existing quality rating systems (e.g. US Preventive Services Task Force, Jadad, etc.). According to the Grading of Recommendations Assessment Development and Evaluation group (GRADE)<sup>1</sup> who provide a system for assessing the strength of evidence for recommendations based on 4 key features: study design, quality, consistency, and directness, these RCTs actually provide low evidence for assessing the association between pacifier use and breastfeeding. None of the RCT interventions directly address pacifiers at nap or bedtime and each was compounded with other issues such as bottle usage, supplementation feeds, or indirect recommendations rather than the intervention itself. O'Connor et al also illustrated how

RCTs lacked consistency in interventions and outcomes. Though the authors emphasize the higher level of evidence provided by RCTs, many would consider observational studies a suitable and perhaps ideal study design to understand harms. Ultimately, this review points out the weakness of existing RCTs which provide low evidence for a recommendation, and as such it emphasizes the importance to look further into existing observational studies. Additionally, it offers suggestions to improve future research on this critically important topic.

Jeanne-Marie Guise, MD, MPH  
Oregon Health & Science University  
Portland, Oregon

## Reference

1. Atkins D, Best D, Briss PA, Eccles M, Falck-Ytter Y, Flottorp S, et al. for the GRADE Working Group. Grading quality of evidence and strength of recommendations. *BMJ* 2004;328:1490-4.

## Limited evidence supports use of laxatives for functional constipation in children

Pijpers MA, Tabbers MM, Benninga MA, Berger MY. Currently recommended treatments of childhood constipation are not evidence based: a systematic literature review on the effect of laxative treatment and dietary measures. *Arch Dis Child* 2009;94:117-31.

**Question** Among children with functional constipation, how effective are different laxatives and dietary measures for treatment of the constipation?

**Design** Systematic review.

**Data Sources** Medline and Embase databases were searched to identify studies evaluating the effect of a pharmacologic treatment or dietary intervention on functional constipation.

**Study Selection and Assessment** Of the 736 studies found, 28 met the inclusion criteria. The quality was assessed using a validated list of criteria. In total 10 studies were of high quality.

**Outcomes** Frequency of defecation per week and other related measures.

**Main Results** The included studies were clinically and statistically heterogeneous in design. Most laxatives were not compared with placebo. Compared with all other laxatives, polyethylene glycol (PEG) achieved more treatment success (pooled relative risk (RR): 1.47; 95% CI 1.23 to 1.76). Lactulose was less than or equally effective in increasing the defecation frequency compared with all other laxatives investigated. There was no difference in effect on defecation frequency between fiber and placebo (weighted standardized mean difference 0.35 bowel movements per week in favor of fibre, 95% CI 20.04 to 0.74).