mood and behavior in children. The study examined the effects of a combined trajectory of snoring, nighttime mouth breathing, and witnessed apneas in children under the age of 3 years on their behavioral outcomes at 4 and 7 years of age. The study population was broadly representative of the United Kingdom population and included approximately 11 000 children. This longitudinal cohort study of children finds that symptoms as early as 6 and 18 months had significant negative behavioral outcomes at 4 and 7 years of age, including hyperactivity and conduct, emotional, and peer difficulties. One weakness of this report was that it relied on self-reported measures of SDB which could not objectively confirm sleep apnea. However, these same screening questions have been validated in other polysomnographic studies of sleep apnea. In addition, primary snoring alone can have neurobehavioral effects in children. For pediatricians in general practice and subspecialty care, this information reinforces the importance of not only asking about snoring and symptoms of sleep disordered breathing but also of asking early in infancy and continuing to ask throughout childhood. With habitual snoring rates ranging from 10% to 21% across the ages of 6 to 81 months, screening for sleep disordered breathing should be a standard practice for overall health. More research still needs to be focused on the question of when and how it is best to intervene because even in cases when symptoms abated after 6 and 18 months of age, the behavior outcomes were found at 4 and 7 years of age.

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Zinc does not appear to have significant benefit in treatment of pneumonia

Basnet S, Shrestha PS, Sharma A, Mathisen M, Prasai R, Bhandari N, et al. A Randomized Controlled Trial of Zinc as Adjuvant Therapy for Severe Pneumonia in Young Children. *Pediatrics* 2012;129:701-8.

Question Among children hospitalized and treated with antibiotics for severe pneumonia, does the addition of zinc result in more rapid improvement?

Design Double-blind, randomized, placebo-controlled trial.

Setting Single children's hospital in Nepal.

Participants 610 children, aged 2 to 35 months, who presented with severe pneumonia defined by the World Health Organization as cough and/or difficult breathing combined with lower chest in-drawing.

Intervention In addition to standard antibiotic treatment, children were randomized to receive zinc (10 mg in 2- to 11-month-olds and 20 mg in older children) or placebo daily for up to 14 days.

Outcomes Time to cessation of severe pneumonia.

Main Results Zinc recipients recovered marginally faster, but this difference was not statistically significant (hazard ratio = 1.10, 95% CI, 0.94– 1.30). Similarly, the risk of treatment failure was slightly but not significantly lower in those who received zinc (risk ratio = 0.88, 95% CI, 0.71–1.10).

Conclusions Adjunct treatment with zinc reduced the time to cessation of severe pneumonia and the risk of treatment failure only marginally, if at all, in hospitalized children.

Commentary Globally, pediatric pneumonia remains a leading cause of morbidity and mortality, particularly in low-income countries, where micronutrient deficiencies are common. Undernutrition is associated with greater severity of infection, higher frequency of complications, and longer recovery periods. In this well-designed, randomized, placebo-controlled trial, Basnet et al evaluate the effect of zinc therapy among young children hospitalized with clinical pneumonia in Nepal receiving standard care. Case definitions were standardized and objective criteria were used to assess study outcomes. Baseline characteristics were comparable between groups. The majority of cases enrolled were non-severe. No clinically or statistically significant differences in outcomes were detected between treatment groups. There was also no strong evidence to suggest that outcomes were by modified by age, wheezing status, or other clinical findings. Yet, the results hint at a possible beneficial effect in cases with end-point consolidation. Overall, the findings indicate that zinc had no significant impact on treatment failure and recovery. The results do not rule out the possibility that zinc plays a role in the treatment of pneumonia in a subset of cases. The mechanisms that underlie the relationships between undernutrition and infection are not well-understood. It is not yet clear if the effects of zinc on immune responses and pneumonia outcomes are influenced by factors including zinc dosage, etiology and stage of infection, and child's age. Further research is needed to clarify zinc's role in the treatment of pneumonia and to determine if there are sub-populations of patients who are likely to benefit from its use.

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Text messaging increases receipt of influenza vaccine among low-income, urban children

Stockwell MS, Kharbanda E, Martinez R, Vargas CY, Vawdrey DK, Camargo S. Effect of a text messaging intervention on influenza vaccination in an urban, low-income pediatric and adolescent populationa randomized controlled trial. *JAMA* 2012;307:1702-8.

Question Among low-income, urban families, do targeted text message reminders to parents increase the receipt of influenza vaccination among their children?

Design Randomized, controlled trial.

Setting 4 community-based clinics in the US during the 2010–2011 influenza season.

Participants 9213 children and adolescents aged 6 months to 18 years (98% minority, 88% publicly insured, and 58% from Spanish-speaking families). 7574 participants had not received influenza vaccine prior to the intervention start date and were included in the primary analysis.

Intervention 5 weekly text messages providing educational information and instructions regarding Saturday clinics. Both groups received the usual care, an automated telephone reminder, and access to informational flyers posted at the study sites.

Outcomes Receipt of an influenza vaccine dose during the 2010–2011 influenza season (recorded in the immunization registry via an electronic health record). Receipt was secondarily assessed at an earlier fall review date prior to typical widespread influenza activity.

Main Results A higher proportion of children and adolescents in the intervention group (43.6%; n=1653) compared with the usual care group (39.9%; n=1509) had received influenza vaccine (difference, 3.7% [95% CI, 1.5%-5.9%]; number needed to treat [NNT], 28 [95% CI, 17-67]; *P*=.001). At the fall review date, more children in the intervention group had received influenza vaccine (27.1% vs 22.8%; *P*<.001; NNT, 24 [95% CI, 16-43]).

Conclusions Among children and adolescents in a low-income, urban population, a text messaging intervention compared with usual care was associated with an increased rate of influenza vaccination. However, the overall influenza vaccination rate remained low.

Commentary More than 65 million children and adolescents should be vaccinated for influenza each year, but only about one-half of them actually receive the preventive service. Patient reminder/recall systems can improve immunization delivery and have traditionally consisted of mailed letters/postcards or telephone calls made by office staff, but operationalizing practice-based reminder/recall is not easy for many practices and is often not done. In this report, Stockwell et al take advantage of a rapidly expanding application—text messaging, using a ubiquitous technology—the cellular telephone. The author's findings highlight the potential of this new preventive service tool. In the right setting with high quality information systems, text message reminders can target very large numbers of patients at relatively low cost. Although, multiple immunization reminder messages only led to a 4% difference between the intervention and control groups in the study, at a population level, an increase of this magnitude is nonetheless important. Text messaging can now be added to a list of potential communication "channels" to support immunization reminder and recall. It is likely that texting will soon become a routine component of immunization and other preventive services delivery.

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Pulse oximetry is a cost-effective addition in screening newborns for congenital heart defects

Roberts TE, Barton PM, Auguste PE, Middleton LJ, Furmston AT, Ewer AK. Pulse oximetry as a screening test for congenital heart defects in newborn infants: a cost-effectiveness analysis. *Arch Dis Child* 2012;97:221-6.

Question Among newborn infants, is pulse oximetry a cost-effective addition to the clinical examination in screening for congenital heart defects (CHDs)?

Design Model-based economic evaluation using accuracy and cost data from a primary study supplemented from published sources taking a National Health Service perspective.

Setting Six large maternity units in the United Kingdom.

Participants 20 055 newborn infants evaluated prior to hospital discharge.

Intervention Pulse oximetry.

Outcomes Cost effectiveness, based on incremental cost per timely diagnosis.

Main Results Pulse oximetry as an adjunct to clinical examination is twice as costly but provides a timely diagnosis to almost 30 additional cases of CHD per 100 000 live births compared with a modeled strategy of clinical examination alone. The incremental cost-effectiveness ratio for this strategy compared with clinical examination alone is approximately £24 000 per case of timely diagnosis in a population in which antenatal screening for CHDs already exists. The probabilistic sensitivity analysis suggests that at a willingness-to-pay threshold of £100 000, the probability of pulse oximetry as an adjunct to clinical examination being cost effective is more than 90%. Such a willingness-to-pay threshold is plausible if a newborn with timely diagnosis of a CHD gained just five quality-adjusted life years, even when treatment costs are taken into consideration.

Conclusions Pulse oximetry as an adjunct to current routine practice of clinical examination alone is likely to be considered a cost-effective strategy when currently accepted thresholds are considered.

Commentary There has been much recent interest in neonatal pulse oximetry screening for detection of critical congenital heart disease. It is now clear that such screening can detect otherwise undetected anomalies, some of which would lead to acute collapse in early infancy after ductal closure, which may be lethal, and if survived, increases surgical mortality. A recent systematic review included the results of 13 studies with 230 000 babies, the sensitivity of screening was 76.5%,[1] most of the false negatives being aortic arch obstructions without significant systemic desaturation. Other important