reports a positive likelihood ratio of 26.1 and a negative likelihood ratio of 0.04 for predicting and excluding sepsis, respectively, with universal PCR used in initial evaluation for sepsis in neonates not exposed to antibiotics. Both values are well beyond the commonly identified thresholds of 10 for ruling in and 0.1 for ruling out disease. Accuracy of universal PCR is greater than that of the commonly used diagnostic adjunct, C-reactive protein.[1,2] Still, the test did not identify all cases of culture-positive sepsis. Additionally, universal PCR was negative after antibiotic administration in nearly all neonates with sepsis. With the results of this study, universal PCR offers some clinical benefit over currently available tests that guide decision-making during initial sepsis evaluation in the neonatal intensive care unit. However, universal PCR cannot inform decision-making when sepsis evaluation is compromised by antibiotic exposure, arguably the clinical situation for which a discriminating test would be more useful.

Lisa Ross DeCamp, MD, MSPH
University of Michigan
Robert Wood Johnson Clinical Scholars Program
Ann Arbor, Michigan

References

1. Malik A, Hui CP, Pennie RA, Kirpalani H. Beyond the complete blood cell count and C-reactive protein: a systematic review of modern diagnostic tests for neonatal sepsis. Arch Pediatr Adolesc Med 2003;157:511-6.
2. Fowlie PW, Schmidt B. Diagnostic tests for bacterial infections from birth to 90 days-a systematic review. Arch Dis Child Fetal Neonatal Ed 1998;78: F92-8.

E-mail intervention decreases online health risk references among adolescents

Moreno MA, VanderStoep A, Parks MR, Zimmerman FJ, Kurth A, Christakis DA. Reducing at-risk adolescents' display of risk behavior on a social networking web site: A randomized controlled pilot intervention trial. Arch Pediatr Adolesc Med 2009;163:35-41.

Question Among at-risk adolescents who display references to sex and substance abuse on internet social networking sites (SNSs), will an online intervention reduce these references?

Design Randomized controlled intervention trial.

Setting www.MySpace.com

Participants A total of 190 self-described 18- to 20-year-olds with public MySpace profiles who met predefined criteria for being at-risk.

Intervention Single e-mail from self-identified physician.

Outcomes Web profiles were evaluated for references to sex and substance use and for security settings before and 3 months after the intervention.

Main Results Of 190 subjects, 58.4% were male. At baseline, 54.2% of subjects referenced sex and 85.3% referenced substance use on their social networking site profiles. The proportion of profiles in which references decreased to 0 was 13.7% in the intervention group versus 5.3% in the control group for sex ($P < .05$, number needed to treat = 12) and 26.0% versus 22% for substance use ($P < .61$). The proportion of profiles set to "private" at follow-up was 10.5% in the intervention group and 7.4% in the control group ($P < .45$). The proportion of profiles in which any of these 3 protective changes were made was 42.1% in the intervention group and 29.5% in the control group ($P < .07$).

Conclusions A brief e-mail intervention shows promise in reducing sexual references in the online SNS profiles of at-risk adolescents.

Commentary Although media exposure has long been investigated as a health influence, interactive media present opportunities to measure and intervene on risk behaviors. Internet SNSs have become an increasingly important venue for identity exploration and self-presentation among youth. This study investigated effects of online warning from a physician on public displays of sex or substance use among high-risk 18- to 20-year-olds. Of 1340 profiles, 109 displayed ≥3 references to sex or substances, including ≥1 reference each to tobacco and alcohol use. Half were randomly selected to receive a single cautionary e-mail from a physician. After 3 months, compared with control subjects, adjusted odds of having removed all references to risk behaviors in the e-mail group were 4.2 times higher for sex and 1.9 times higher for either removing risk references or making the profile private. For youth, individualized concerned communication from an online health authority appears to encourage reduction in online displays of health risks.

Michael Rich, MD, MPH
Center on Media and Child Health
Children's Hospital Boston
Boston, Massachussetts

Pulse oximetry before discharge from the nursery can increase detection of serious congenital heart disease

de-Wahl Granelli A, Wennergren M, Sandberg K, Mellander M, Bejlum C, Inganas L, et al. Impact of pulse oximetry screening on the detection of duct dependent congenital heart disease: A Swedish prospective screening study in 39 821 newborns. BMJ 2009;338:a3037.

Question Among newborns, what is the accuracy of pulse oximetry in screening for early detection of life-threatening congenital heart disease?

Design Prospective screening study.

Setting All 5 maternity units in West Götaland, Sweden, and the supraregional referral center for neonatal heart surgery.

Participants A total of 39 821 screened babies born between July 2004 and March 2007. Total duct-dependent circulation cohorts: West Götaland n = 60, other regions n = 100.

Intervention Pulse oximetry before discharge from newborn nurseries in West Götaland.

Outcomes Sensitivity, specificity, positive and negative predictive values, and likelihood ratio for pulse oximetry screening and for neonatal physical examination alone.

Main Results In West Götaland, 29 babies in well baby nurseries had duct-dependent circulation undetected before neonatal discharge examination. In 13 cases, pulse oximetry showed oxygen saturation ≤90%, and clinical staff were immediately told of the results. Of the remaining 16 cases, physical examination alone detected 10 (63%). Combining physical examination with pulse oximetry screening had a sensitivity of 82.8% (95% CI 64.2% to 95.2%) and detected 100% of the babies with duct-dependent lung circulation. Five cases were missed (all with aortic arch obstruction). The false-positive rate with pulse oximetry was substantially lower than that with physical examination alone (0.17% vs 1.90%, $P < .0001$), and 31/69 of the "false-positive" cases with pulse oximetry had other disease. The risk of leaving the hospital with undiagnosed duct-dependent circulation was 28% in other regions versus 8% in West Götaland ($P <$ .0025, relative risk 3.36 [95% CI 1.37 to 8.24]). In the other regions, 44% of babies with transposition of the great arteries left hospital undiagnosed versus 0/18 in West Götaland ($P <$ .0010), and severe acidosis at diagnosis was more common (33% vs 12%, $P < .0025$, relative risk 2.8 [1.3 to 6.0]). Excluding premature babies and Norwood surgery, babies discharged without diagnosis had higher mortality rates than those diagnosed in the hospital (18% vs 0.9%, $P < .0054$). No baby died of undiagnosed duct-dependent circulation in West Götaland versus 5 babies from the other regions.

Conclusions Introducing pulse oximetry screening before discharge improved total detection rate of duct-dependent circulation to 92%. Such screening seems cost neutral in the short term, but the probable prevention of neurologic morbidity and reduced need for preoperative neonatal intensive care suggest that such screening will be cost-effective in the long term.

Commentary Infants discharged from the birth hospital without identification of their critical congenital heart disease have increased mortality and morbidity rates compared with those who receive a diagnosis; universal neonatal pulse oximetry screening has been introduced as a means to identify a greater proportion of such infants. The authors of this study demonstrated a reduction in the proportion of infants discharged without a diagnosis from 28% (consistent with other data) to 8% with the introduction of screening. Other very large studies have similar results.[1] Saturation in a lower limb < 96% obtained from a new-generation motion artefact–resistant oximeter after 20 hours of age, when performed by adequately trained technicians for at least 360 seconds, appears to be a reliable indicator of duct-dependent right-sided heart disease.[2] A gradient of more than 3% between the right hand and a foot may be a useful indicator of left-sided disorders.[2] The 0.17% false-positive rate reported by de-Wahl Granelli et al seems reasonable if it can be reproduced in routine usage, which will be important to minimize the potential harm of parental stress. Even so, screening for a relatively rare condition will usually result in more false positive than true-positive results, and counselling must take this into account. Screening does not detect all critical congenital heart disease, particularly coarctation of the aorta as these authors again demonstrate, and infants presenting with clinical signs consistent with heart disease must still have consideration of this as a diagnostic possibility, even if previously screened. In 2005, a systematic review labeled pulse oximetry screening "promising"[3]; these new large studies suggest that the promise is being fulfilled.

Keith J. Barrington, MD
University of Montreal
Montreal, Quebec, Canada

References

1. Meberg A, Brngmann-Pieper S, Due R Jr., Eskedal L, Fagerli Ir, Farstad T, et al. First day of life pulse oximetry screening to detect congenital heart defects. J Pediatr 2008;152:761-5.
2. de Wahl Granelli A, Mellander M, Sunnegardh J, Sandberg K, Ostman-Smith I. Screening for duct-dependant congenital heart disease with pulse oximetry: a critical evaluation of strategies to maximize sensitivity. Acta Paediatr 2005;94:1590-6.
3. Knowles R, Griebsch I, Dezateux C, Brown J, Bull C, Wren C. Newborn screening for congenital heart defects: a systematic review and cost-effectiveness analysis. Health Technol Assess 2005;9:1-152.

Adjustment of cerebrospinal fluid cell counts for a traumatic lumbar puncture does not aid diagnosis of meningitis in neonates

Greenberg RG, Smith PB, Cotton CM, Moody MA, Clark RH, Benjamin DK. Traumatic lumbar punctures in neonates: test performance of the CSF WBC. Pediatr Infect Disease J 2008;27:1047-51.

Question Among neonates with suspected meningitis, does the cerebrospinal fluid (CSF) white blood cell count need to be adjusted for a traumatic lumbar puncture?

Design Cohort study performed between 1997 and 2004.

Setting One hundred fifty neonatal intensive care units in the United States.

Participants A total of 6374 neonates ≤30 days who underwent a lumbar puncture.

Intervention CSF white blood cell counts were adjusted downward for traumatic lumbar punctures (defined as CSF specimens with ≥500 red blood cells/mm^3) with several commonly used methods.

Outcomes Sensitivity, specificity, likelihood ratios, and area under the receiver operating characteristic curve of unadjusted and adjusted CSF white blood cell counts for predicting culture or Gram stain–positive meningitis in neonates with traumatic lumbar punctures.

Main Results Of the lumbar punctures, 2519 (39.5%) were traumatic. One hundred fourteen (1.8%) were culture- or Gram stain–positive for meningitis; 50 neonates with traumatic lumbar punctures had meningitis. The areas under