

Context Follow-up testing after an abnormal screening blood lead level is a key component in lead poisoning prevention.

Objectives To measure the proportion of children with elevated screening lead levels who have had follow-up testing and to determine the factors associated with such care.

Design Retrospective, observational cohort study.

Participants 3682 Michigan Medicaid-enrolled children age 6 years or younger who had a screening blood lead level of at least 10 µg/dL (0.48 µmol/L) between January 1, 2002, and June 30, 2003.

Main Outcome Measure Testing within 180 days of an elevated screening lead level.

Results Follow-up testing was received by 53.9% (95% confidence interval [CI], 52.2% to 55.5%) of the children. In multivariate analysis adjusting for age, screening blood lead level results, and local health department catchment area, the relative risk of follow-up testing was lower for Hispanic and other nonwhite children than for white children (0.91; 95% CI, 0.87 to 0.94), for children living in urban areas than in those living in rural areas (0.92; 95% CI, 0.89 to 0.96), and for children living in high-lead risk areas than in those living in low-lead risk areas (0.94; 95% CI, 0.92 to 0.96). Among children who did not have follow-up testing, 58.6% (95% CI, 56.3% to 61.0%) had at least 1 medical encounter in the 6-month period after the elevated screening blood lead level, including encounters for evaluation and management (39.3%; 95% CI, 36.9% to 41.6%) or preventive care (13.2%; 95% CI, 11.6% to 14.8%).

Conclusions The rate of follow-up testing after an abnormal screening blood lead level was low, and those children at increased risk for lead poisoning were less likely to receive follow-up testing. At least half of the children had a missed opportunity for follow-up testing. The observed disparities of care may increase the burden of cognitive impairment among at-risk children.

Comment There is currently little information about the follow-up testing that children receive after they are identified as having lead toxicity. In this well-designed retrospective cohort, Kemper et al demonstrated that 46% of the children who had elevated blood lead levels (≥ 10 µg/dL) did not receive appropriate follow-up testing. Moreover, the children at greatest risk for lead poisoning—nonwhite children, children living in urban areas/areas with high risk of exposure, and children living in areas with the greatest prevalence of elevated screening blood lead levels—were the least likely to receive follow-up testing. Whereas the use of a Michigan Medicaid database may limit the generalizability of the results to children from other states and other insurance carriers, the results are likely to reflect typical scenarios among those children at highest risk for lead toxicity.

This study highlights other deficiencies of our health system. By the time a child is identified as having an elevated blood lead level using the CDC criteria (≥ 10 µg/dL), he or she has already been exposed to levels associated with adverse

neurodevelopmental effects.^{1,2} Although it is inappropriate to wait until a child is unduly exposed, this study suggests that too often we fail even in secondary prevention efforts. A shift toward the primary prevention of childhood lead poisoning by screening high-risk, older housing and reducing allowable levels of lead in house dust, soil, and water is long overdue.

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Screening for children's exposure to environmental tobacco smoke in a pediatric primary care setting

Groner JA, Hoshaw-Woodard S, Koren G, Klein J, Castile R. *Arch Pediatr Adolesc Med* 2005;159:450-5

Context The American Academy of Pediatrics has recommended that pediatricians assess their patients' environmental tobacco smoke (ETS) exposure, but the specific questions most likely to identify children with high ETS exposure are not known. Cotinine, a nicotine metabolite present in hair, can be used to quantify months of ETS exposure.

Objective To develop a brief screening tool that will accurately predict ETS exposure as defined by a child's hair cotinine level.

Setting Columbus Children's Hospital Primary Care Center.

Participants A convenience sample of healthy children age 2 weeks to 3 years of both self-reported smokers and nonsmokers.

Interventions Screening questions regarding home ETS exposure.

Main Outcome Measure Performance of the screening questions compared with child hair cotinine levels.

Results Hair samples and questionnaire data were obtained from 291 children. Based on clinical applicability and statistical significance, 3 questions ("Does the mother smoke?," "Do others smoke?," and "Do others smoke inside?") were selected as a valid screening tool to determine children's ETS exposure risk. Maternal reports of smoking outside only or smoking only a few cigarettes per day had no impact on child hair cotinine levels.

Conclusions It was possible to derive a simple, specific, and valid screening tool that can be used in pediatric offices to identify children at risk for ETS exposure. Further research is needed to test this tool prospectively.

Comment Secondhand tobacco smoke exposure of children, and its associated morbidity and mortality, is completely preventable. Although the pediatric community is beginning to recognize its role in counseling families on this issue, many pediatricians remain reluctant to discuss tobacco use and secondhand smoke exposure.^{1,2} Two of the barriers cited are the lack of a simple, validated screening tool and the clinician's lack of training in brief, effective smoking cessation counseling techniques.³ The study of Groner et al, which uses hair cotinine levels to validate a set of screening questions, removes the first barrier. The next step is training pediatricians in brief, effective counseling skills and the use of community smoking cessation resources. All tobacco users should be advised to quit and to make their homes and cars smoke-free. Pediatricians can deliver this message and either provide counseling themselves or provide a referral to an appropriate cessation service (such as the national quit line, 1-800-QUIT-NOW).

There are limitations to using these screening questions in the research setting, however. Complete understanding of the metabolism of nicotine to cotinine has not been achieved, particularly in children and minority groups. There are indications that children metabolize many drugs differently than adults;⁴ similarly, there are several studies that have suggested the existence of "slow metabolizers" of nicotine and that these persons are more likely to be members of some minority groups.⁵ Groner et al's data from African-American subjects supports this finding. Our poor understanding of these differences makes the use of these screening questions to quantify exposure a challenge. Regardless, the screening questions developed by Groner and her team are entirely appropriate in the clinical setting and provide a much-needed tool.

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Amino-terminal pro-brain-type natriuretic peptide: Heart or lung disease in pediatric respiratory distress?

Cohen S, Springer C, Avital A, Perles Z, Rein AJ, Argaman Z, et al. *Pediatrics* 2005;115:1347-50

Context Brain natriuretic peptide (BNP) is secreted mainly by cardiac ventricular myocytes in response to stretching, and its plasma levels are related to left ventricular filling pressures. BNP has been found to be a good marker for cardiac dysfunction in adults. Its utility in children has not been as widely studied.

Objectives To determine whether plasma levels of amino-terminal pro-brain natriuretic peptide (N-BNP) could differentiate between heart failure and lung disease among infants with acute respiratory distress, and whether plasma levels of N-BNP could be used to monitor the effects of treatment in infants with heart failure.

Design Longitudinal cohort study.

Setting A university hospital in Jerusalem, Israel.

Participants Infants (age range, 1 to 36 months; median age, 10 months) who presented with respiratory distress underwent physical examination, plasma N-BNP measurement, and echocardiography within 24 hours after admission. Seventeen infants were finally diagnosed with acute heart failure, and 18 were diagnosed with acute lung disease. Thirteen healthy infants served as a control group.

Main Outcome Measure Plasma N-BNP levels.

Results Plasma N-BNP levels were significantly higher for the infants with heart failure (median, 18 452 pg/mL; range: 5375-99 700 pg/mL) than for the infants with lung disease (median, 311 pg/mL; range, 76 to 1341 pg/mL). Among the infants with heart failure, there was a significant difference in plasma N-BNP levels before and after treatment for congestive heart failure.

Conclusions In infants with respiratory distress, plasma N-BNP measurements can differentiate between acute heart failure and lung disease and can be used to monitor the effects of treatment in infants with heart failure.

Comment The objective of this study was to establish the utility of N-BNP in differentiating cardiac and pulmonary causes of respiratory distress in pediatric patients. In addition, the authors assessed the value of N-BNP levels in monitoring the response to treatment for congestive heart failure. The authors reported significantly higher N-BNP levels in infants with tachypnea due to underlying congestive heart failure compared with infants with acute respiratory disease and healthy controls. In this study the calculated N-BNP cutoff value differentiating cardiac from respiratory causes of tachypnea was 2940 pg/mL, with a test accuracy of 100%. This degree of accuracy demonstrates the advantage of using N-BNP instead of BNP as a marker of underlying cardiac disease in tachypneic infants. An earlier investigation of the utility of BNP in distinguishing cardiac from pulmonary causes of tachypnea in pediatric patients resulted in a cutoff value of 40 pg/mL with 87% accuracy.¹

Although this study represents the beginnings of a potentially clinically useful approach to the evaluation of tachypneic