LEAD NEUROTOXICITY

The interpretation of the literature on lead and child development is presented with open peer commentary from the Neuroepidemiology Unit, Children's Hospital, Harvard Medical School, Boston, and other centers. Discussions about association between lead and IQ have focussed on determinants of accuracy of estimation, with insufficient consideration of the influence of the experimental system on estimation. Inconsistencies in findings and controversy over the effect of lead on cognition could be due to differences in environmental characteristics, dose, timing, age, and genetic susceptibility, and may explain the failure to identify a lead-associated "behavioral signature." A clinical "process" approach to assessment should be modelled after studies of behavioral toxicity in animals. Neuropsychological tests conveying information about the process of a child's learning would be more sensitive and revealing than IQ test scores. Lead exposure may have attentional or motivational effects that reduce ability to accumulate knowledge tapped by IQ tests. (Bellinger DC. Interpreting the literature on lead and child development: The neglected role of the "experimental system." Neurotoxicol Teratol 1995;17:201-212).

COMMENT. Among the 10 commentaries appearing in the same issue, one from Columbia University, New York, stresses the need to consider behavior that may be affected by lead, in addition to IQ. Clinical reports suggest that lead-exposed children may be distractible and/or hyperactive, but few studies have examined the effects of lead on behavior using statistical controls. Lawsuits correlating a child's disability with a blood lead level are often lacking in proof of cause and effect. Conditions such as Pervasive Development Disorder, or speech articulation problems, offered as indications of lead effects, are unrelated to lead exposure. (Wasserman GA. Effects of early lead exposure: Time to integrate and broaden our efforts. Neurotoxicol Teratol 1995;17:243-244).

Fingerstick screening for lead poisoning was a reasonable alternative to venous testing in private practice, as evaluated at the Yale Study Center, New Haven, Conn, provided that specimen contamination was avoided, and medical and environmental interventions were based on confirmatory venous testing. (Schonfeld DJ et al. Arch Pediatr Adolesc Med Apr 1995;149:447-450).

Venous blood lead screening was offered to children 1 to 6 years of age attending the Emergency Departments of St Christopher's Hospital for Children and Children's Hospital of Philadelphia. Of 254 children attending these two centers, 65% had no record of previous lead screening in the previous 30 months, and 71% and 50%, respectively, had blood lead levels >10mcg/dL. (Wiley JF II et al. Lead poisoning: Low rates of screening and high prevalence among children seen in inner-city emergency departments. J Pediatr March 1995;126:392-5). The emergency department is an appropriate resource for lead screening of selected inner-city children, but preliminary fingerstick may be a more practical and less costly method.

Lead in soil and paint in well-maintained homes contributed little to the lead exposure of children in an urban population surrounding a closed lead smelter in Granite City, Illinois, and reported from the Institute for Evaluating Health Risks, Washington, DC, and the Illinois Department of Public Health, Edwardsville, IL. (Kimbrough R et al. Pediatrics April 1995;95:550-554). Indiscriminate removal of leaded paint and soil in residential areas should be discouraged, and the education of parents concerning removal of house dust, personal hygiene and good nutrition is of more practical benefit.