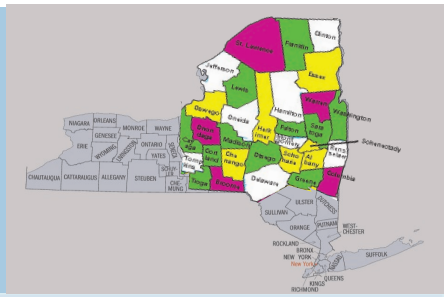
FALL-WINTER 2017 VOLUME 10, ISSUE 2

LEAD CENTERPOINT



Remembering Dr. Herbert L. Needleman

With sadness, we note the passing in July of this year of Dr. Herbert Needleman, who was a hero in the successful Public Health achievement of reducing the prevalence of lead poisoning in children.

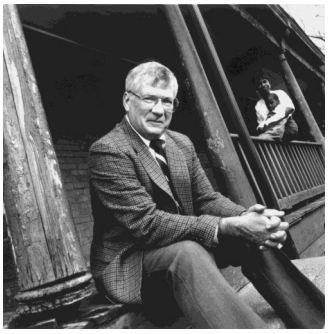


Photo: Copyright ©, Pittsburgh Post-Gazette, 2017, all rights reserved. Reprinted with permission.

Dr. Needleman was a Pediatrician and a Child Psychiatrist, who, in the 1960's, had first-hand experience treating children with lead encephalopathy — then a potentially fatal consequence of prolonged exposure to lead. At that time, it was thought that encephalopathy was the only manifestation of lead poisoning, but Dr. Needleman proposed that the effects of lead exposure might be dose and time dependent. He postulated that blood lead levels which were not high enough to cause encephalopathy were still dangerous.

It was known that when lead blood levels were elevated, lead would become deposited in bone and remain there for decades. In a break-through study, Dr. Needleman recruited the parents of first grade children to collect and donate their children's "baby teeth" when they would fall out naturally, so that he could measure the level of lead in the teeth (as a substitute for bone lead). He also asked the first grade teachers of those children to score the children (with no knowledge of the children's tooth lead measurements) on a variety of behaviors. In an article published in 1979 in the New England Journal of Medicine, study results showed clearly that children with high tooth lead levels had poorer attention, more evidence of hyperactive behavior, and more learning difficulties than those with lower tooth lead levels.

In subsequent research, Dr. Needleman demonstrated that these effects persisted — that is the damage done by early exposure to lead was irreversible. In following some of these children into adolescence and young adulthood, his research demonstrated an association with aggressive behavior and criminality in many of those who had early exposure to lead.

Dr. Needleman made the observation that the majority of childhood lead exposure in the US was related to ingestion of leaded paint found in older housing. Even though lead poisoning is "an equal opportunity" toxin, he pointed out that the most commonly affected children live in poverty with exposure to older housing in poor condition. He made the case that lead poisoning in children in our country is a social justice issue as well as a Public Health menace.

His advocacy will be missed.

Howard L. Weinberger, MD

Inspiring Advocacy

Travis Hobart MD

As we highlight in this newsletter, Dr. Herbert Needleman was a pioneer and a hero in the fight against childhood lead poisoning. Countless children growing up without exposure to this terrible toxin have him to thank. Yet, despite how far we've come, we still live in a society that leaves our children at risk of permanent brain damage from lead poisoning.[1] Political considerations too often interfere with public health, and it seems that science has increasingly been dismissed for political gain. In the case of lead poisoning, as with so many other public health threats, impoverished and vulnerable children most often suffer the consequences of public policies that ignore science.

Unfortunately, the history of lead is a precedent for how political and business interests can interfere with public health. More recently, we have seen the same kinds of tactics used by the fossil fuel industry to delay any implementation of smart climate change policy. Even though 97% of climate scientists agree[2] that climate change is caused by human activity, researchers at Yale and George Mason University have found that only 58% of the public believes that.[3] A trove of industry documents released last year indicated that Exxon-Mobil and its precursors knew of the dangers of climate change as early as 1957, and spent years trying to discredit, deny, and obfuscate the data. Given this concerted anti-science conspiracy, it is no wonder that some still believe climate change to be a "hoax" perpetrated by a hostile government rather than the careful collection of millions of scientific data points. Climate change is going to affect the most vulnerable of people. Poor regions globally and locally will have fewer resources with which to address the problems.

Yet we have reason for hope. We have seen that climate change is becoming more accepted by the general public. The Yale and George Mason publication cited above also indicates that the belief in anthropogenic climate change, at 58%, is at the highest level since researchers started measuring in 2008. In the case of lead poisoning, the publicity of the terrible events in Flint, Michigan has actually helped to spotlight the science. In the Flint case, there really was a government cover-up: of the scientific data that led to the disaster. Perhaps this assault against public health, along with the Indictments of those government officials responsible, helped encourage the resurgence of interest in lead poisoning. Reuters just published a report and map showing that many places in the U.S. indeed have higher rates of lead poisoning than Flint, MI.[4] This is no surprise to those of us who regularly see the data, but may be shocking to many.

Syracuse has seen recent attempts to improve our housing inspection laws, which have failed in part due to resistance from landlords.[5] These discussions continue, and I understand that progress is being made.

As our public spaces have become increasingly politically polarized, this issue has often been portrayed as a partisan issue. My charge to the throngs of faithful readers of our newsletter is to find ways to rise above this tendency. As physicians and public health professionals, we have an obligation to our patients and communities to use the best data in our decision making. Indeed, even the modern Hippocratic oath includes a recognition that each physician is "a member of society, with special obligations to all…fellow human beings" and that "prevention is preferable to cure".[6] We have an obligation to all human beings, even those who may not be our patients, and especially those who do not have the means or privilege to speak for themselves. Whether it be climate change or lead poisoning or something else of your choosing, we need to be the voice for science in the public interest. I know I will always try to use Dr. Needleman's persistence as an inspiration.

---

[1] Childhood Lead Poisoning Data, Statistics, and Surveillance. Centers for Disease Control and Prevention. Available at https://www.cdc.gov/nceh/lead/data/index.htm Accessed Nov 20, 2017. Last updated Sept 1, 2016.

[2] Cook, J. et al. Environ. Res. Lett. 8 (2013) 024024.

[3] Leiserowitz, A., Maibach, E., Roser-Renouf, C., Rosenthal, S., & Cutler, M. (2017). *Climate change in the American mind: May 2017*. Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication and George Mason University Center for Climate Change Communication.

[4] Pell, MB, Schneyer, J. "Reuters finds 3,810 U.S. areas with lead poisoning double Flint's". *Reuters.* Nov 14, 2017. Available at https://www.reuters.com/article/us-usa-lead-map/reuters-finds-3810-u-s-areas-with-lead-poisoning-double-flints-idUSKBN1DE1H2

[5] Baker, C. "Syracuse Common Council nixes rental inspection law in 5-4 vote" *Syracuse Post Standard.* Sept 12, 2016. Available at http://s.syracuse.com/CFqUhef

[6] "A Modern Hippocratic Oath by Dr. Louis Lasagna." Available at http://www.aapsonline.org/ethics/oaths.htm

Lead Testing Doesn't Stop at Age 1

Jennifer Lieberman BSN, RN

Preventing childhood lead toxicity remains a major public health priority within the United States, despite the numerous historical reductions and proactive movements to reduce blood lead levels in children [1]. According to NYSIIS statistics, in the year 2016, 59.27% of 1 year olds were tested for lead and only 51.12% of 2 year olds were tested [2]; only slightly more than half of the children in the appropriate age frame were tested. While there is accountability on the parent or guardian's end to ensure that they follow through with the proper testing for a child, it is imperative that all healthcare providers understand the importance of testing at both ages. Too often the remark is made that if a child's lead was not elevated at age 1, that no further testing is required. This, however, is highly inaccurate and non-compliant with NYS law. NYS Public Health Law NYCRR Title X, Part 67-1.2 outlines the requirement that all children aged 1 and aged 2, on or around their birthdays, respectively, must be tested for lead poisoning [3]. At each well child visit, commencing at age 6 months and extending into 6 years of age, routine screening and anticipatory guidance should be incorporated into the child's care, with further work-up as necessitated [4]. It should also be noted that any person demonstrating a risk for lead exposure needs to be tested for a blood lead level, regardless of age [5].

Children up to ages 1 and 2 are typically crawlers, with more hand to mouth time, while lacking the proper hand-washing techniques, and thus pose higher risks of lead poisoning. If a child is exposed to lead, their blood lead level (BLL) increases during the first two years with a peak at age 18-24 months [6]. Screening at both 1 and 2 years allows for identification of children who need not only medical management, but environmental and public health intervention [6]. Identification and elimination of major lead exposure sources is the key to preventing lead toxicity in children [6]. Accurately identifying a child that has a BLL at age 1 may allow for interventions to be implemented, preventing any further increases in lead levels and thereby toxic effects [6]. A child with a nonexistent or slightly elevated BLL at age 1 may have a significantly elevated BLL by the age of 2, accentuating the relevance of the 2 year rescreen [6]. Lead screening is also necessary for any child 6 years of age or younger who has never had a lead screening, to rule out any subclinically elevated BLLs during critical stages of development [4]. The bottom line? Lead testing once is not enough.

References

[1] American Academy of Pediatrics Council on Environmental Health, "Prevention of Childhood Lead Toxicity," *Pediatrics,* vol. 138, no. 1, 2016.

[2] Department of Health Albany County, *NYSIIS Statistics,* Albany, 2017.

[3] New York State Unified Court System, New York State Public Health Legal Manual: A Guide for Judges, Attorneys and Public Health Professionals, Albany: New York State Bar Association, 2011.

[4] New York State Department of Health, "NYS Regulations for Lead Poisoning Prevention and Control - NYCRR Title X, Part 67," 20 June 2009. [Online]. Available: www.health.ny.gov/regulations/nycrr/title_10.[Accessed 08 November 2017].

[5] Centers for Disease Control and Prevention, "Lead," 24 October 2017. [Online]. Available: www.cdc.gov/nceh/lead. [Accessed 08 November 2017].

[6] U.S Department of Health & Human Services, "Lead (Age, = 2 Years), Due for Screening," Agency for Healthcare Research and Quality, [Online]. Available: https://healthit.ahrq.gov [Accessed 08 November 2017].

LEAD CENTERPOINT

Central / Eastern New York Lead Poisoning Prevention Resource Center
Upstate Golisano Children's Hospital
SUNY Upstate
Department of Pediatrics, Room 5600
750 E. Adams Street
Syracuse, NY 13210

Address service requested

Resource Center Staff Update

We welcome two employees to the Central/Eastern New York Lead Poisoning Prevention Resource Center's staff.

Jennifer Lieberman, BSN, RN

Jennifer is the Program Coordinator for the 17 counties in the Eastern region of our service area. Jennifer is in her office at the Albany Medical Center on Mondays and Wednesdays. Her voice mail message gives instructions for reaching Dr. Schottler-Thal or other members of the staff at any time that there is an urgent question or concern.

In July 2017, we welcomed **LaShaun Jones** to our team as the Administrative Assistant for the Lead Poisoning Prevention Resource Center at the Upstate Golisano Children's Hospital in Syracuse. LaShaun keeps all connected and organized. We are happy to have her on our team.

Journal Reviews

Maureen Butler BSN, RN

Children's Lead Exposure: A Multimedia Modeling Analysis to Guide Public Health Decision Making. Zartarian V, Xue J, Tornero-Velez R, Brown J. *Environmental Health Perspectives 2017 Sep 12; 125(9):0970009.* It is not uncommon for children with elevated blood lead levels to have more than one source of lead identified in their environment. In Flint, MI and other locations, the drinking water has been indicated as a source of lead in addition to other exposures from soil, dust, food and air. This study was conducted to develop a coupled exposure dose model to determine the relationship between lead concentrations in drinking water and blood lead levels in children. The authors acknowledge that there is no acceptable blood lead level in children and it is anticipated that the CDC blood lead reference value may be lowered from 5.0 to 3.5 µg/dl.

Contact Information:

Central/Eastern New York
Lead Poisoning Prevention
Resource Center

Howard L. Weinberger MD, Medical Director
Travis Hobart MD, Assistant Medical Director
Maureen J. Butler BSN, RN, Program Coordinator
LaShaun Jones, Administrative Assistant
Upstate Golisano Children's Hospital
Department of Pediatrics
Room 5600
750 E. Adams Street
Syracuse, NY 13210
Phone: 315-464-7584
Fax: 315-464-6322
E -mail: ButlerMJ@upstate.edu

Carrin Schottler-Thal MD, Assistant Medical Director
Jennifer Lieberman BSN, RN, Program Coordinator
Albany Medical Center
391 Myrtle Avenue, Suite 3A
Albany, NY 12208
Phone: 518-262-8602
Fax: 518-262-5589

Karen L. Buchinger MLS, BSN, RN Newsletter Editor

Assessing Child Lead Poisoning Case Ascertainment in the US, 1999-2010. Roberts EM, Madrigal D, Valle J, King G, Kite L. *Pediatrics 2017 May; 139(5):e20164266* . Online version: https://pediatrics.aappublications.org/content/early/2017/04/25/peds.2016-4266
The authors compared prevalence estimates for blood lead levels ≥ 10.0 mcg/dl from actual numbers reported to the CDC from 1999-2010. The reporting rate was 64% when only those states and years for which reporting was complete were analyzed. Pediatric care providers in 23 of 39 reporting states identified fewer than half of the children with elevated blood lead levels in their area. The authors conclude that undertesting for blood lead levels is a significant problem in many states.

After the Screening: What Happens Next for Children with Elevated Blood Lead? Schmidt CW *Environmental Health Perspectives* 2017 Oct 24 . https://doi.org/10.1289/EHP2482
This article provides perspective on the continuing issue of childhood lead poisoning. Despite the steady decline of blood lead levels in children, the health effects of even lower blood lead levels are recognized. With that recognition comes the challenge to decide how to identify the needs of these children. Kim Dietrich, professor of epidemiology and environmental health at the University of Cincinnati, addresses the compounded effect of other stressors which lessens the likelihood of reversing cognitive damage as a child's elevated blood lead levels fall. Other socioeconomic family stressors that affect neurodevelopment include nutritional deficiencies, lower parental IQ, poor school infrastructure and lack of intellectual stimulation at home. Recommended strategies to target children with low to moderate lead exposure include improving iron and calcium intake which compete with lead absorption, identify and eliminate lead sources in a child's environment and address the behaviors that expose children to lead including pica behavior.

In Memoriam: Herbert L. Needleman. Birnbaum LS , Suk, WA, Landrigan PJ. *Environmental Health Perspectives*. 2017 Sept 19; 125(9):091601