

LIFESTAGES OF LEAD POISONING



AN NVCLPPP FACTSHEET BY

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Lead poisoning in early childhood can follow children throughout life, and impact their health and wellness at every stage. It causes long-term health outcomes that are 100% preventable.

To prevent lifelong health challenges:

- test children at ages 12 & 24 months or at least once before age 6
- link children with elevated blood lead levels to interventions



CHILDHOOD

School Readiness

Lead exposure as low as 2.5 micrograms per deciliter ($\mu\text{g}/\text{dL}$) of blood in early childhood is linked with low performance on assessments of school readiness, even as early as 4th grade. Reading and math scores are both impacted, but reading scores are hurt worse than math scores.¹

Cognition

Lead exposure during early childhood slows children's brain development and is more severe in children who are from low-income households and live in areas that have a high risk of lead contamination. In one study, this resulted in 9% less brain development among low-income children compared to their high-income counterparts.²



PUBERTY

Females

Early puberty in females, which has been linked to shortened adult height, increased depression and anxiety, and problems with bone growth, can be caused by very low lead exposure level ($< 1.2 \mu\text{g}/\text{dL}$). Females exposed to lead can start puberty as early as age 7 and menstruation can start before age 9.³

Males

Male children who have been exposed to lead experience growth delays, and reach sexual maturity 4 - 5 months later than those who have not been exposed to lead.⁴

For more information about lead poisoning and lead poisoning prevention, visit our website nvclppp.org. To speak to someone about lead poisoning prevention, or to schedule a presentation, please call **702-895-1040** and ask to speak with a NvCLPPP team member or email nvclppp@unlv.edu



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YOUNG ADULTS

Obesity

Young adults exposed to high levels of lead as young children had significantly higher rates of obesity than those with lower levels of lead exposure and people who were exposed to lead later in childhood. This is separate from height or weight alone.⁵

Unintentional Injury

Early exposure to lead, even at low and moderate levels, hurts the development of balance during adolescence and early adult years. Poor or undeveloped balance can lead to falls or other injuries at home or in the workplace.⁶



MIDDLE AGE

Mental Health

Childhood lead exposure is linked to increased symptoms of many mental health conditions in adults, even 40 years later.⁷ Linked disorders include substance use/abuse, conduct disorder, depression, anxiety, fears and phobias, obsessive compulsive disorder, mania, and some schizophrenia symptoms.⁷

Menopause

Lead stored in bone is released back into the bloodstream at higher rates during menopause than other lifestages. Postmenopausal women have significantly higher blood lead levels than pre-menopausal women, reintroducing lead toxicity and increasing the likelihood of poor outcomes due to lead seen in their senior years (detailed below).⁸



SENIORS

Dementia

Loss of bone density releases lead stored during childhood and causes increased blood lead levels which have been associated with slow reaction times and poor cognitive performance - particularly in post-menopausal women.⁹ Even with no increases in blood lead levels, having lead stored in the body is associated with decreased cognitive performance.¹⁰

Heart Disease

Elevated blood lead levels can cause high blood pressure and increased risk for cardiovascular problems, up to and including death from coronary heart disease and stroke.¹¹

Early Death

Seniors who had higher blood lead levels ($>20\mu\text{g}/\text{dL}$) as a child had a 46% higher mortality than those with lower exposure levels ($<10\mu\text{g}/\text{dL}$). This includes 68% higher cancer mortality among seniors with a history of lead exposure.⁹

By the time physical symptoms of lead poisoning appear, it may already be too late.

Get your child tested at ages 12 and 24 months.

REFERENCES

1. Miranda, M. L., Kim, D., Galeano, M. A. O., Paul, C. J., Hull, A. P., & Morgan, S. P. (2007). The relationship between early childhood blood lead levels and performance on end-of-grade tests. *Environmental health perspectives* 115(8): 1242 – 1247.
2. Marshall, A. T., Betts, S., Kan, E. C., McConnel, R., Lanphear, B. P., & Sowell, E. R. (2020). Association of lead-exposure risk and family income with childhood brain outcomes. *Nature medicine* 26: 91 – 97.
3. Choi, H. S. (2020). Relationships of lead, mercury and cadmium levels with the timing of menarche among Korean girls. *Child health nursing research* 26(1): 98 – 106.
4. Williams, P. L., Bellavia, A., Korrick, S. A., Burns, J. S., Lee, M. M., & Hauser, R. (2019). Blood lead levels and timing of male sexual maturity: A longitudinal study of Russian boys. *Environment international* 125: 470 – 477.
5. Kim, R., Hu, H., Rotnitzky, A., Bellinger, D., & Needleman, H. (1995). A longitudinal study of chronic lead exposure and physical growth in Boston children. *Environmental health perspectives* 103(10): 952 – 957.
6. Bhattacharya, A., Shukla, R., Dietrich, K. N., & Bornschein, R. L. (2006). Effect of early lead exposure on the maturation of children's postural balance: A longitudinal study. *Neurotoxicology and teratology* 28: 376 – 385.
7. Reuben, A., Schaefer, J. D., Moffitt, T. E., Broadbent, J., Harrington, H., & Caspi, A. (2019). Association of childhood lead exposure with adult personality traits and lifelong mental health. *JAMA psychiatry* 76(4): 418 – 425.
8. Latorre, F. G., Hernández-Avila, M., Orozco, J. T., Medina, C. A. A., Aro, A., & Hu, H. (2003). Relationship of blood and bone lead to menopause and bone mineral density among middle-age women in Mexico City. *Environmental medicine* 11(4): 631 – 636.
9. Needleman, H. (2004). Lead poisoning. *Annual reviews of medicine* 55: 209–222.
10. Payton, M., Riggs, K. M., Spiron, A., Weiss, S. T., & Hu, H. (1998). Relations of bone and blood lead to cognitive function: The VA normative aging study. *Neurotoxicology and teratology* 20(1): 19 – 27.
11. Navas-Acien, A., Guallar, E., Silbergeld, E. K., Rothenberg, S. J. (2007). Lead exposure and cardiovascular disease – A systematic review. *Environmental health perspectives* 115(3): 472 – 482.

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