

# Lead Poisoning: Prevention and Management in Primary Care

WNY Lead Poisoning Resource Center's Rochester Office



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MEDICINE *of* THE HIGHEST ORDER



# NYS Regional Lead Resource Centers



[www.health.ny.gov/environmental/lead/exposure/childhood/regional\\_lead\\_resource\\_centers.htm](http://www.health.ny.gov/environmental/lead/exposure/childhood/regional_lead_resource_centers.htm)

# When to Contact your Regional Lead Resource Center

Anytime you have questions about lead poisoning prevention, assessment, blood lead testing, clinical care and public health follow-up of children and pregnant people exposed to lead

Immediately when a child's confirmed venous BLL is  $\geq 70$   $\mu\text{g}/\text{dL}$

Within 24 hours when a child's venous BLL is 45-69  $\mu\text{g}/\text{dL}$

For a consultation when

- a child's BLL is 15-44  $\mu\text{g}/\text{dL}$  or
- a pregnant woman's BLL is  $\geq 5$   $\mu\text{g}/\text{dL}$

[www.health.ny.gov/environmental/lead/exposure/childhood/regional\\_lead\\_resource\\_centers.htm](http://www.health.ny.gov/environmental/lead/exposure/childhood/regional_lead_resource_centers.htm)

# Role of the Local Health Department

As of October 1, 2019 Local Health Departments are required to provide care coordination and environmental management to children with venous lead levels of 5  $\mu\text{g}/\text{dL}$  and above. Environmental inspections include the child's home and other locations where they spend significant time.

# NYS Requirements for Medical Providers



- **Provide anticipatory guidance to all parents of children < 6 years old**
- **Risk assessment at every well child visit (from 6 months to 6 years old)**
  - NYS questions can be tailored to patient population
  - Obtain a blood test if “yes” to any of the questions
- **Blood lead testing at age one and again at two**
- **Testing children of any age if lead exposure is suspected**
- **Test all foreign-born children up to 16 yrs old on arrival in the US and again 3-6 months after they obtain permanent residences**
- **Follow up of elevated levels**





# October 2019 Additions to NYS Regulations

## Action level lowered to 5 ug/dL from 15 ug/dL:

- Local health departments need to do home inspections and provide case management for any child with a venous BLL  $\geq$  5 ug/dL

## Additional practice requirements for all children:

- New risk assessment questions emphasizing:
  - Spending time in a building with increased lead in drinking water
  - Testing children with developmental disabilities who have behaviors (pica) putting them at risk of lead exposure no matter their age
- Need to inform parents of the test results
- Parents should routinely be provided with anticipatory guidance about lead exposure at all WCC visits

## New practice requirements for children with venous BLLs > 5 ug/dL:

- Assessment of nutritional status (iron, calcium, Vit C, Vit D) and refer to WIC or SNAP as needed
- Developmental screening with a standardized instrument and neurologic exam and for suspected delays refer to EI for children < 3 yrs old or the child's school district for children 3 yrs and older, and a pediatric developmental specialist.
- Changes to time frames for confirmatory and follow-up tests

# NYS Requirements for Prenatal Providers



Prenatal Providers are expected to:

- Give anticipatory guidance during pregnancy
- Do a risk assessment at first prenatal visit; blood lead test if at risk
- Provide risk reduction counseling if  $\geq 5 \mu\text{g/dL}$  BLL
- At the postpartum visit, advise all pregnant people about the major causes of lead poisoning in infants and the means of preventing exposure, and
- If the pregnant individual had a confirmed venous BLL  $5 \mu\text{g/dL}$  or greater during pregnancy, communicate with the pediatric provider to arrange for blood lead testing of the newborn before hospital discharge.



# Why Are We Still Talking About Lead Poisoning?

We have learned that:

- Many of the effects of lead exposure can occur at low levels of exposure
- Cumulative exposure over time predicts long-term outcomes
- There is no known threshold for adverse effects
- Effects of lead exposure early in life can be severe and permanent
- There is no effective treatment to overcome the adverse effects of lead poisoning. Chelation, performed for BLLs  $\geq 45 \mu\text{g/dL}$ , can reduce the body's lead burden, but it does not reverse the adverse effects of previous exposure.





# Uses of Lead

Lead is a naturally occurring element  
Lead has been used in hundreds  
of ways, including:

Pipes/plumbing  
Ammunition  
Pewter and bronze  
Leaded glass/crystal  
Building material  
Inks and dyes  
Sweetener

Cosmetics  
Traditional medicines  
Paints and glazes  
Gasoline anti-knock agent  
Radiation shields  
Car batteries  
Plastics



Lead has no use in the human body

All forms of lead are TOXIC to  
people and animals

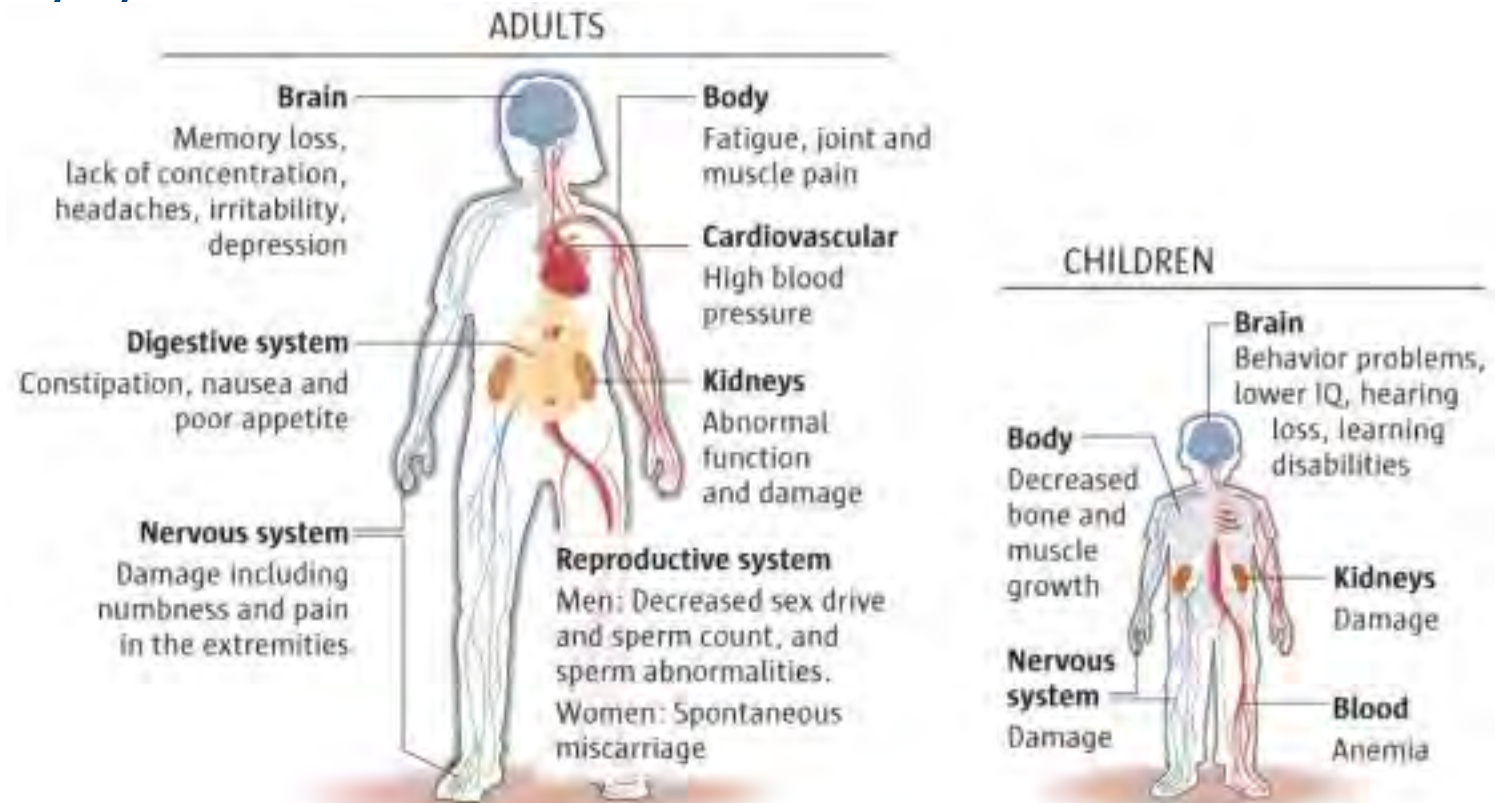


# Health Effects of Lead

At very high levels, lead can cause encephalopathy, seizures, coma or death.

Lead can also affect many body systems:

- Renal (hypertension)
- Hematologic
- Endocrine
- Gastrointestinal
- Reproductive
- Cardiovascular
- Skeletal
- Neurologic
- Auditory



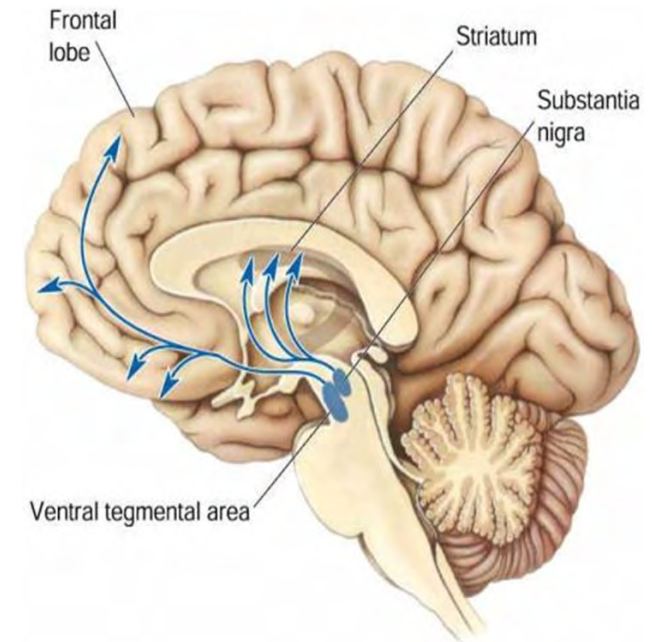
# Health Effects of Lead

Neurological effects at lower levels of exposure in childhood include:

- Irreversible loss of IQ
- Auditory processing difficulty
- Attention problems & distractibility (ADHD)
- Emotional dysregulation

Resulting in:

- Increased likelihood of dropping out
- Delinquency
- Incarceration



Dopamine neurotransmitters in the mesocorticolimbic system are highly sensitive to lead

# Health Effects of Lead on the Pregnant Individual, the Fetus and the Newborn

## Pregnancy and Lactation

- Pregnant people with iron deficiency may eat soil which may contain lead
- Lead stored in bones may be released during pregnancy and breastfeeding especially if the pregnant patient is low in calcium (primarily happens in the last 3 months of the pregnancy).
- Lead can be in breastmilk (but only 3% of maternal blood lead level)

Elevated lead levels in pregnancy have been associated with:

- Gestational Hypertension
- Miscarriage
- Low Birth Weight
- Impaired Neurodevelopment





# Lead is Still All Around Us



## Lead remains in the environment

- Housing – poorly maintained or when being renovated (paint & dust)
- Soils – from paint chips, industrial emissions and gasoline
- Plumbing –lead can be in pipes, solder, and plumbing fixtures
- Imported products: some canned goods, cosmetics, spices, toys, candy
- Occupational and hobby exposures



# Lead is Still All Around Us

## Certain populations are at high risk

- Children are uniquely vulnerable
- Pregnant women
- Low-income renters
- Families who experience the effects of institutional racism and/or generational poverty
- Refugee/immigrant/migrant families
- Increased exposure in warmer months



# Anticipatory Guidance

Lead Poisoning  
is a **Danger**  
for every baby and child

NYSDOH *Lead Poisoning is a Danger for Every Baby and Child*  
[health.ny.gov/publications/2594](http://health.ny.gov/publications/2594)



Here's what you should know.

NYSDOH *Are You Pregnant?*  
[health.ny.gov/publications/2593](http://health.ny.gov/publications/2593)

Are You  
**Pregnant?**

Learn how to  
Protect Yourself  
and Your Baby  
from  
LEAD  
POISONING



# Anticipatory Guidance for Parents

## How to Protect Your Child From Lead Poisoning

- Fix peeling lead paint and make home repairs safely
- Wash dust off hands, toys, bottles, windows and floors.
- Be careful not to bring lead home on clothes, toys, or jewelry
- Keep lead out of your food and tap water.
- Serve children foods that have calcium, iron, and vitamin C.

Details at [www.health.ny.gov/publications/2526.pdf](http://www.health.ny.gov/publications/2526.pdf)

# Anticipatory Guidance for Pregnant People

- Ask your doctor about a lead test
- Make sure you get your newborn tested for lead if you ever had an elevated blood level as a child or adult
- Eat foods rich in calcium, iron, and vitamin C to help your body from absorbing lead
- Use lead-free dishes and pots
- Avoid using traditional medicines, cosmetics, or spices from other countries
- Don't eat things that could have lead in them, such as clay, pottery, soil or paint chips.
- Be extra careful if you have jobs or hobbies that involve working with lead
- If your house or apartment was built before 1978, stay away from any repair work being done
- Make sure that any renovation, repair or repainting in your pre-1978 home uses lead-safe practices.

Details at [www.health.ny.gov/publications/2593.pdf](http://www.health.ny.gov/publications/2593.pdf)

# Risk Assessment

Health Care Providers must assess all children ages 6 months to 6 years at every well child visit for risk of lead exposure, and they must obtain a blood lead test if there is a positive response to any of the questions.

**Does your child need a lead test?** [health.ny.gov/publications/6670.pdf](https://health.ny.gov/publications/6670.pdf)

Prenatal Care Providers must assess at first prenatal visit and obtain a blood lead test if there is a positive response to any of the questions.

**Are You Pregnant?** [health.ny.gov/publications/2593.pdf](https://health.ny.gov/publications/2593.pdf)



# Childhood Blood Lead Testing Rates in New York State

Children born in 2018	9-17 Months Old Tested, %	18-35 Months Olds Tested, %	Tested $\geq$ 2x by 36 Months, %
NYC	82.1	75.4	66.6
NYS Excluding NYC	72.6	69.5	56.3
<b>Total NYS</b>	<b>76.9</b>	<b>72.2</b>	<b>61.0</b>

Source: NYS Community Health Indicator Reports  
[www.health.ny.gov/statistics/chac/indicators](http://www.health.ny.gov/statistics/chac/indicators)

# Barriers to Testing

**What do you see as the top three barriers to improving blood lead testing among young children? County Health Departments' #1 answers:**

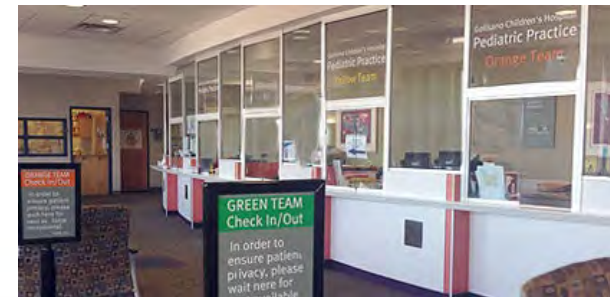
**Parents don't understand effects of lead on their children and importance of getting it checked**

**Health care providers don't emphasize importance of blood lead testing to parents**



# Strategies to Overcome Barriers

- **Parent Education/Awareness** – make use of NYS and other educational materials
- **Flagging Overdue Patients** (e.g. if patient misses 12 or 24 month visit)
- **Use of Electronic Medical Record (EMR) Reminders**
- **Use of point-of-care analyzer or blood sample drawn during patient visit and sent to lab** (so parents don't have to make an extra trip to a lab)
- **Consider testing routinely at 18 months** in addition to 12 & 24 months
- **Run reports in NYSIIS or EMR to identify patients who need testing**
- **Primary Care Medical Home Quality Measure /QARR Measure** - practice can earn PCMH status and get additional funding; insurers incentivized to assist practices improve testing (e.g. Kids Quality Agenda Performance Improvement Project)



# Point of Care BLL Testing Machines

A point of care blood lead testing machine allows for capillary testing in the office before the patient leaves.

If  $\geq 5 \mu\text{g/dL}$  then a confirmatory venous draw is needed.

Medical offices must:

- 1) Get a CLIA waiver from the NY State Department of Health's Wadsworth Center before starting use.
- 2) Have staff watch a NYSDOH webinar training session on the proper use of the machine and the reporting of results.
- 3) Reporting results to NYSDOH - Physician office labs that conduct lead testing must report all results to the New York State Department of Health in a timely manner. Contact the NYSDOH Lead Poisoning Prevention Program at [LPPP@health.ny.gov](mailto:LPPP@health.ny.gov) to be approved and enrolled to report blood lead test results to NYSDOH.



# Using the New York State Immunization Information System (NYSIIS)

The **New York State Immunization Information System (NYSIIS)** contains blood lead test results reported since 2004 for all NY children residing outside of NYC. Practices outside of NYC can use NYSIIS to look at individual patients or create practice-level reports:

- Blood Lead Reports
- Test Due List Report
- Follow Up Action Needed List Report
- Maximum Age Exceeded List Report
- Aggregate Clinical Performance Report

For more information on NYSIIS see -

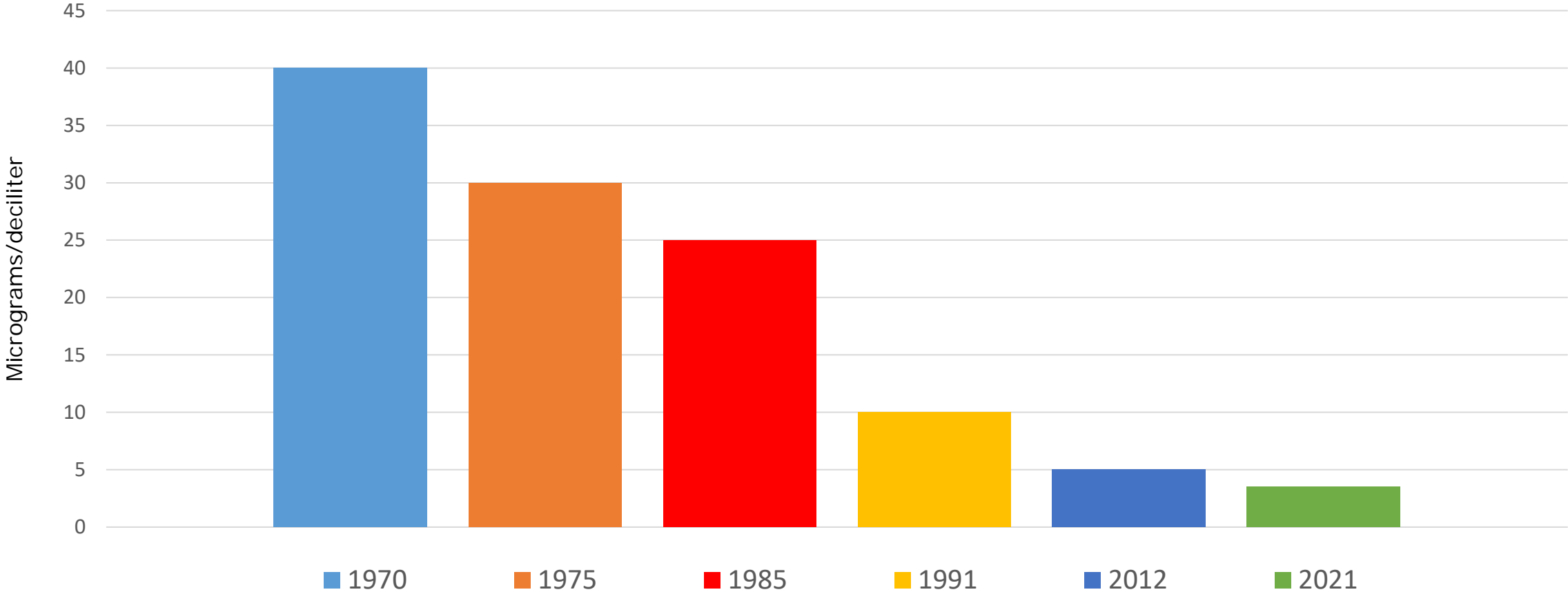
[www.health.ny.gov/prevention/immunization/information\\_system/providers/](http://www.health.ny.gov/prevention/immunization/information_system/providers/)



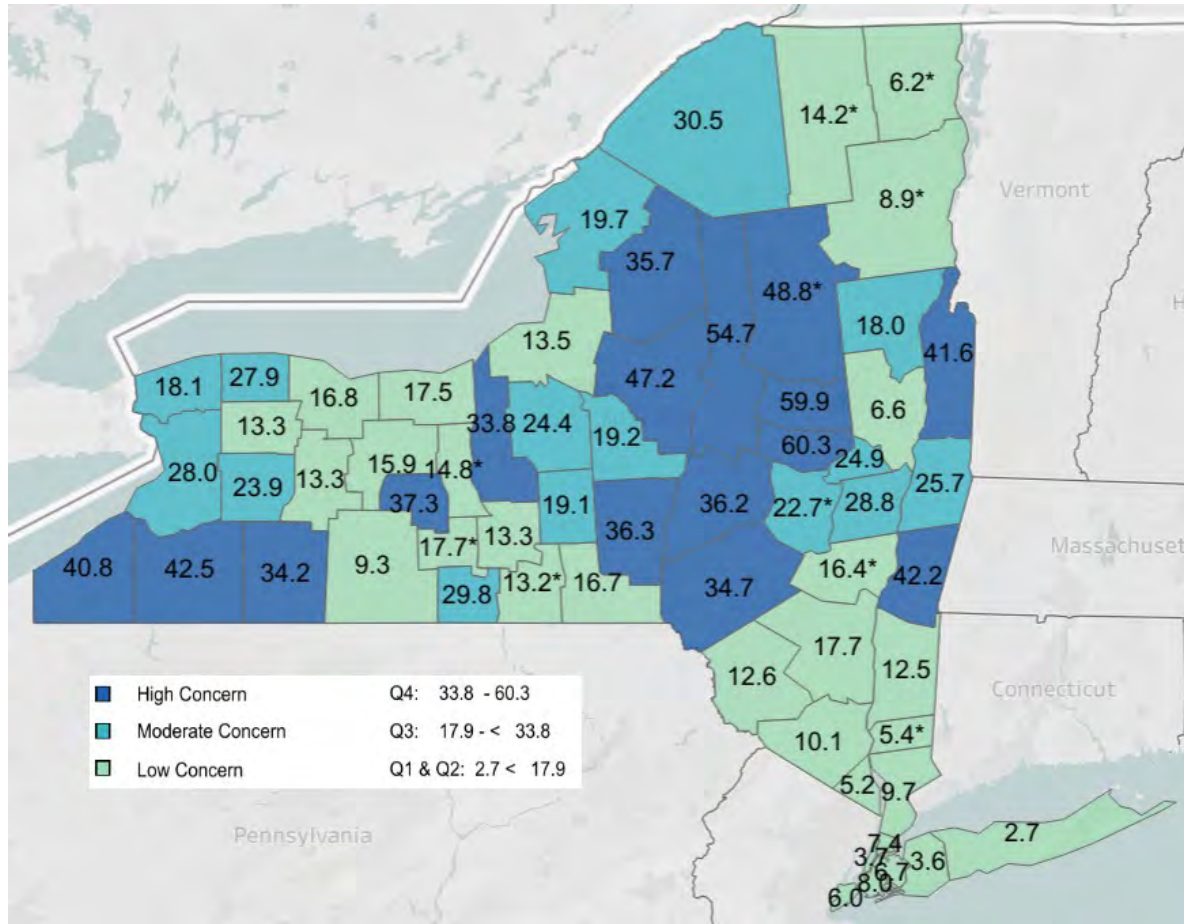


# What Is Considered An Elevated Blood Lead Level?

Cut-Offs Delineating Elevated Blood Lead Levels per CDC



# Elevated Blood Lead Levels in New York State



**Incidence of confirmed high blood lead level (5 ug/dL) - rate per 1,000 tested children aged <72 months, 2021**

**10.4 per 1000 tested**

\* the rate/percentage is unstable or unreliable

Data Source: 2017-20202016 NYS Child Health Lead Poisoning Prevention Program Data as of Oct, 2022

[https://apps.health.ny.gov/public/tabvis/PHIG\\_Public/chirs/reports/#county](https://apps.health.ny.gov/public/tabvis/PHIG_Public/chirs/reports/#county)

# Recommendations for Follow-Up on Children

BLL ( $\mu\text{g}/\text{dL}$ )	Confirmatory Test *	Follow-up Test
5 to <15	Within 3 months	Every 1 – 3 months
15 to <25	Within 1 week	Every month
25 to <45	Within 48 hours	Consult with RLRC
45 to <70	Within 24 hours	Consult with RLRC
$\geq 70$	Immediately	Consult with RLRC

\*if elevated capillary specimen

RLRC = Regional Lead Resource Center

([www.health.ny.gov/environmental/lead/exposure/childhood/regional\\_lead\\_resource\\_centers.htm](http://www.health.ny.gov/environmental/lead/exposure/childhood/regional_lead_resource_centers.htm))

# Recommendations for Follow-up Blood Lead Level (BLL) Testing in Pregnant and Lactating Women

BLL (µg/dl)	Recommendation for Follow-up after Receiving Test Results
<5	No follow-up testing is indicated.
5-14	Within 1 month: Obtain a maternal BLL or cord BLL at delivery and perform newborn follow-up testing.
15-24	Within 1 month and then every 2-3 months: More frequent testing may be indicated based on risk factor history. Obtain a maternal BLL or cord BLL at delivery and perform newborn follow-up testing.
25-44	Within 1-4 weeks and then every month: Obtain a maternal BLL or cord BLL at delivery and perform newborn follow-up testing. (The higher the BLL, the stronger the recommendation is for a consultation. Consult with your Regional Lead Resource Center.)
>45	Within 24 hours and then at frequent intervals depending on clinical interventions and trend in BLLs: Obtain a maternal BLL or cord BLL at delivery and perform newborn follow-up testing.

More at <https://www.health.ny.gov/publications/6624.pdf>

See also: CDC [www.cdc.gov/nceh/lead/publications/leadandpregnancy2010.pdf](http://www.cdc.gov/nceh/lead/publications/leadandpregnancy2010.pdf)

ACOG [www.acog.org/Clinical-Guidance-and-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Lead-Screening-During-Pregnancy-and-Lactation](http://www.acog.org/Clinical-Guidance-and-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Lead-Screening-During-Pregnancy-and-Lactation)



# What is Involved in a Home Inspection?

LHD or NYSDOH Regional Office will send an inspector to do visual and dust-wipe testing of the interior and exterior of any residence where the child spends more than 8 hours per week (parents' home, relatives' homes, babysitter's home, daycare). XRF testing of walls is also performed.

When violations are found, they must be repaired properly in a set amount of time, after which another inspection is done to clear the property.





# What About Treatment?

- There is no effective medical treatment for blood lead levels below 45 ug/dL
- For BLLs  $\geq$  45 ug/dL, lead chelation treatment should be instituted under direction of the Regional Lead Resource Center:
  - Oral chelation treatment for 19 days or
  - IV chelation for 5 days or
  - for BLLs  $\geq$  70 ug/dL, combination oral and IV chelation
- Young children should not return to the home until lead hazards have been abated, so alternative housing may be needed
- Care must be coordinated with health department and the PCP for follow up

# What About Treatment?

- Below blood lead levels of 45 ug/dL the intervention we need to focus on is eliminating sources of lead exposure
- In addition to removing sources of lead exposure, “positive exposures” can help buffer the impact of lead on the brain (reading, good nutrition to reduce lead absorption, developmental stimulation, support services when needed)



# Free Educational Material for You and Patients



The NYS DOH Lead Poisoning Prevention website has various educational materials in the form of posters, pamphlets, coloring books, stickers, etc., which you can order for free. Some are in multiple languages, and most are downloadable.

**Download:**

[www.health.ny.gov/environmental/lead/education\\_materials](http://www.health.ny.gov/environmental/lead/education_materials)

**Order Form:**

[https://www.health.ny.gov/forms/doh\\_publication\\_order\\_form.pdf](https://www.health.ny.gov/forms/doh_publication_order_form.pdf)

## Pregnant?

Tips to Protect Your  
New Baby from Lead



# Contact Us

## Western New York Lead Poisoning Resource Center Rochester Office

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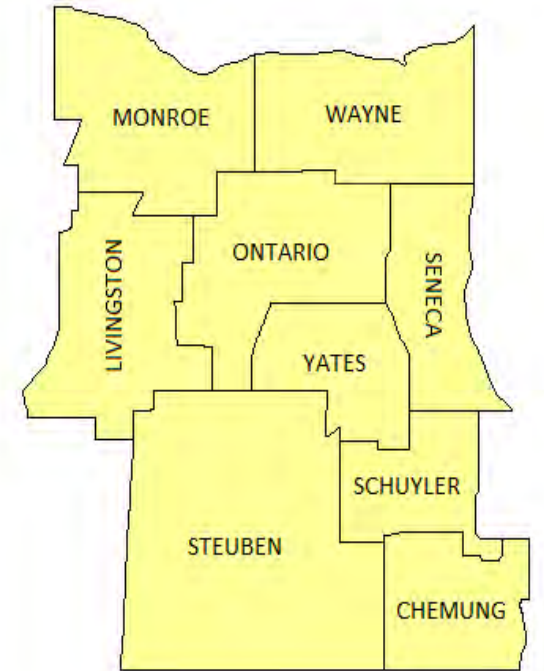
Jennifer Becker, MPH, CPH, Coordinator

**Phone: 585-276-3105**

**Toll Free: 877-352-5775**

**Web: [Golisano.urmc.edu/lead-poisoning](http://Golisano.urmc.edu/lead-poisoning)**

**Facebook too!**





# Thank you, Questions? And, Evaluation Please!



Please complete our brief evaluation and let us know if we can send you any materials!

<https://redcap.link/LeadURPCN>





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## MEDICINE

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