

A 1-year-old boy is brought to the pediatrician for a routine visit. He is an active child with a robust appetite and recently transitioned from breastfeeding to whole milk. He enjoys various table foods and likes chewing on his toys, which were passed down from his grandparents. The boy is crawling and learning to walk. The family moved into a house built in the 1940s several months ago and is in the process of renovating it. The boy's height, weight, and head circumference are at the 50th percentile for his age. Physical examination is normal. Capillary blood test results are as follows:

Hemoglobin	12.5 g/dL
Hematocrit	36.0%
Lead	12 µg/dL (normal <5 µg/dL)

Which of the following is the most appropriate next step in management of this patient?

- ☐ A. Abdominal x-ray
- ☐ B. Initiate chelation therapy with calcium disodium edetate (EDTA)
- ☐ C. Initiate chelation therapy with dimercaprol (British Anti-Lewisite)
- ☐ D. Initiate chelation therapy with dimercaptosuccinic acid (DMSA, Succimer)
- ☐ E. Measure hair lead level
- ☐ F. Measure venous lead level
- ☐ G. Remove the child from the house

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A 1-year-old boy is brought to the pediatrician for a routine visit. He is an active child with a robust appetite and recently transitioned from breastfeeding to whole milk. He enjoys various table foods and likes chewing on his toys, which were passed down from his grandparents. The boy is crawling and learning to walk. The family moved into a house built in the 1940s several months ago and is in the process of renovating it. The boy's height, weight, and head circumference are at the 50th percentile for his age. Physical examination is normal. Capillary blood test results are as follows:

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Which of the following is the most appropriate next step in management of this patient?

- ☐ A. Abdominal x-ray [3%]
- ☐ B. Initiate chelation therapy with calcium disodium edetate (EDTA) [15%]
- ☐ C. Initiate chelation therapy with dimercaprol (British Anti-Lewisite) [6%]
- ☐ D. Initiate chelation therapy with dimercaptosuccinic acid (DMSA, Succimer) [21%]
- ☐ E. Measure hair lead level [4%]
- ☒ F. Measure venous lead level [27%]
- ☐ G. Remove the child from the house [24%]

Proceed to Next Item

Explanation:

User Id: [REDACTED]

Approach to childhood lead poisoning

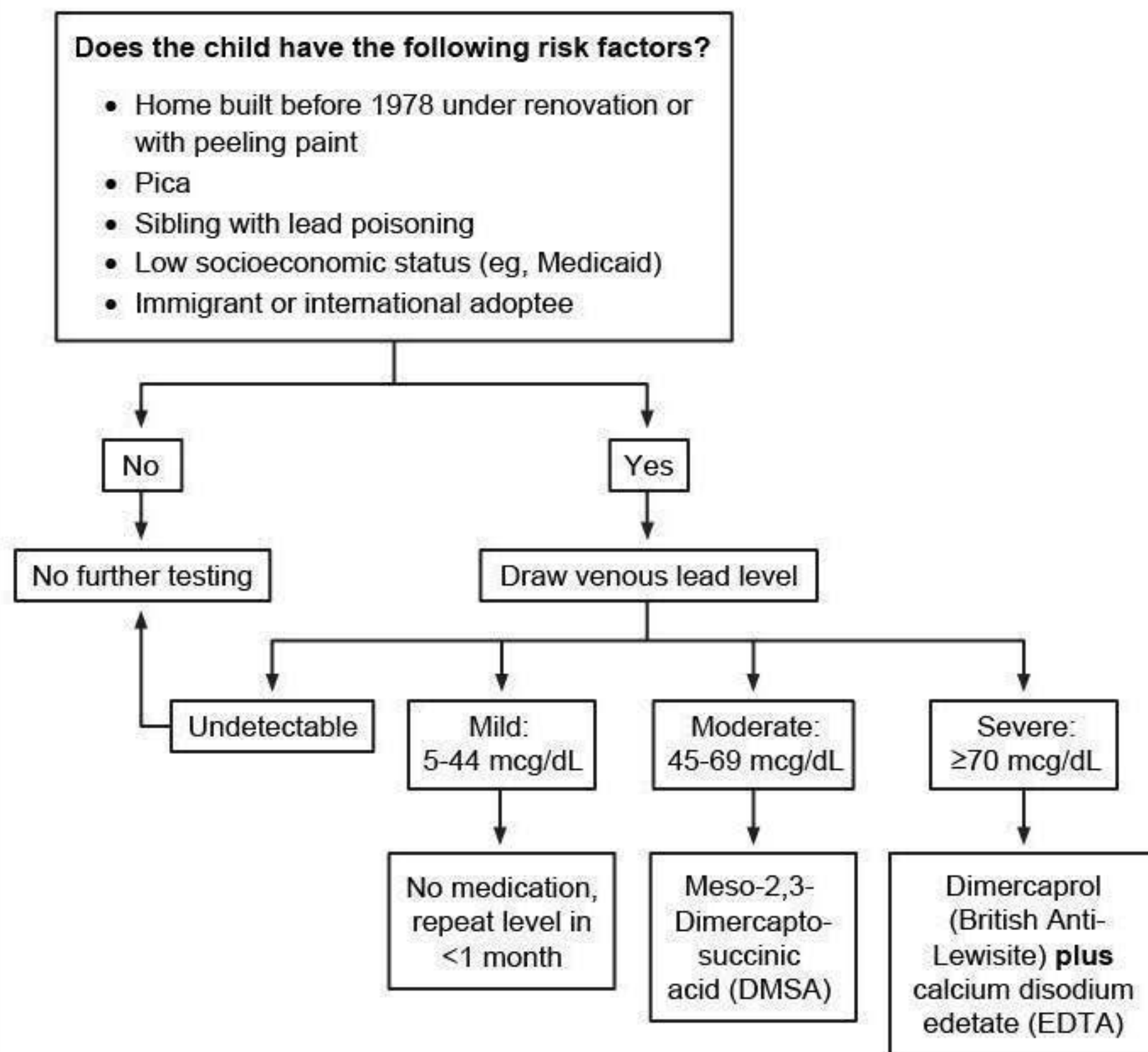
Does the child have the following risk factors?

- Home built before 1978 under renovation or with peeling paint

Explanation:

User Id: [REDACTED]

Approach to childhood lead poisoning



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Infants and toddlers are at high risk for foreign body ingestion as much of their normal play involves putting objects in their mouths. They are susceptible to lead poisoning if they live in a **home built before 1978**, especially if there is **peeling paint** or dust

Infants and toddlers are at high risk for foreign body ingestion as much of their normal play involves putting objects in their mouths. They are susceptible to lead poisoning if they live in a **home built before 1978**, especially if there is **peeling paint** or dust released during **renovation**. Other risk factors include lead piping, living near a battery recycling plant, having a parent who works with batteries or pottery, or having a playmate or sibling with a history of lead poisoning.

Targeted screening of high-risk populations is important, as most children with lead toxicity are initially **asymptomatic** but can have cognitive and behavioral problems that become apparent after school entry. Capillary (fingerstick) blood specimens are widely used in screening for lead poisoning, but false-positive results are common. Confirmatory **venous lead** measurement is required if a screening capillary lead level is $\geq 5 \mu\text{g/dL}$. Lead accumulates throughout the body, but measuring it in hair (**Choice E**), teeth, bone, or urine is not recommended.

(**Choice A**) Abdominal x-rays can be performed if there are moderately to severely elevated lead levels or gastrointestinal symptoms (**constipation**, abdominal pain, vomiting). Radiopaque lead flecks can sometimes be seen but are not routinely indicated for evaluation of lead ingestion.

(**Choices B, C, and D**) This child does not meet the threshold for chelation therapy (Flow chart). Although he is still at risk of **cognitive impairment**, **chelation therapy** is not routinely administered for lead levels $< 45 \mu\text{g/dL}$ due to lack of evidence for improved neurologic outcomes compared to removal from the lead-containing environment. Dimercaptosuccinic acid (DMSA, Succimer) is typically used when lead levels are 45-69 $\mu\text{g/dL}$. Dimercaprol (British Anti-Lewisite) plus calcium disodium edetate (EDTA) should be administered on an emergency basis for levels $\geq 70 \mu\text{g/dL}$ or **acute encephalopathy**.

(**Choice G**) Relocation to a lead-free environment would be the most important step in reducing ongoing exposure if the diagnosis of lead poisoning is confirmed by venous measurement.

Educational objective:

Many children with lead toxicity are asymptomatic and require screening if they live in a home built before 1978 or play with toys from older generations. Capillary (fingerstick) blood specimens are widely used for initial screening but can have false-positive results. Abnormal values must be confirmed by venous blood draw.

References:

1. **Lead exposure in children: prevention, detection, and management.**

or sibling with a history of lead poisoning.

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References:

1. [Lead exposure in children: prevention, detection, and management.](#)
2. [Lead poisoning in children.](#)
3. [A clinical study of the effects of lead poisoning on the intelligence and neurobehavioral abilities of children.](#)