Living on Earth
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Lead Series; The Silent Epidemic: - Part One

CURWOOD: It's Living on Earth. I'm Steve Curwood. More than 20 years ago the United States banned the use of the metal lead in gasoline and household paint. While overall exposure to lead in this country does seem to be dropping, there is still plenty of lead dust on the ground from its previous use in fuels and paints. And many homes still have significant amounts of lead pipes and paint inside. Adults are relatively immune to small exposures. But even minute amounts of lead can have devastating effects on the brains of young children, and there is evidence that millions of American children have been so poisoned. There are no obvious symptoms of low-level lead poisoning, but research shows exposed youngsters have much higher rates of learning disabilities, are far more likely to drop out of school, and are more prone to become delinquent. In a rebroadcast of our series on the silent lead epidemic, Deirdre Kennedy reports on how parents can help protect their children.

(News music intro. News announcer: "A government report released today says the nation's playground equipment is too often covered in dangerous lead-based paint...")

KENNEDY: When the Consumer Product Safety Commission reported last year that it found high lead levels in playgrounds across the country, it made news headlines and alarmed many parents.

ANNOUNCER: Researchers came to that conclusion after testing 26 playgrounds. One of those playgrounds is in San Francisco. Rita Williams is in the city tonight with a live report for us.

WILLIAMS: Dennis, parents have so many things to worry about...

KENNEDY: Most people know that children can be exposed to lead paint when they live in dilapidated housing. But investigators found that playgrounds can be just as dangerous. They said even if a child is only exposed to a tiny amount of lead, if the exposure is repeated, it can lead to lead poisoning in a short period of time. Consumer Product Safety Commission spokesperson Ann Brown.

BROWN: A child could have high blood lead levels by ingesting a paint chip about the size of the top of a pencil eraser for 15 to 30 days.

(Traffic in the background. A nail scrapes on metal)

STOERMER: That comes off pretty easily with a fingertip there.

KENNEDY: In San Francisco's Golden Gate Park, Hillary Stoermer chips flecks of paint off a jungle gym where hundreds of tiny little hands have rubbed away the surface paint. She's an industrial hygienist for San Francisco, one of the cities named as a hot spot for playground lead.

(Children laughing and whooping)

STOERMER: Here's where the classic kid picking the paint chip and putting it in their mouth comes into play.

(Playground noises in the background)

KENNEDY: Experts say very small children are more likely to get lead poisoned than older children because they put everything in their mouths.

(Child: "Hey!" Shouts more, unintelligible)

KENNEDY: Lead is sweet, so children tend to keep eating it once they discover it. But Hillary Stoermer says a child doesn't actually have to eat the lead to get it into his system.

STOERMER: The paint deteriorates. It chalks, it flakes off. And it ends up as dust. And they play on it, they get it on their clothes. So here, what you're mostly worried about is the kids actually touching it, getting it on their hands, and then boom, the hands go right in the mouth.

KENNEDY: Children's health advocates say parents can do a lot to protect their children's health just by carrying wet wipes and washing their kids' hands often. They can also ask their local health department to test playgrounds and other public sites for lead. Hillary Stoermer says the flaking paint in this playground doesn't have lead in it. But, she says, just because paint is brand new, that doesn't mean it's lead free. According to the Environmental Defense Fund, there's no limit on the amount of lead used in the industrial paint used on most of the nation's roadways and bridges. And it's deteriorating and releasing a fine lead dust into the atmosphere every day.

(Children yelling, laughing, screaming)

KENNEDY: Playgrounds are just one of the many places where a child can come in contact with lead. The National Lead Task Force estimates that more than half of the homes built before 1978 contain some lead paint. Lead can also be hidden in soil, plumbing, and pottery, and even in some traditional home remedies. Over the past 30 years, standards for lead exposure have been made tougher. Today, a child is considered in danger at just a sixth of the blood lead level that would have prompted concern a generation ago. But nobody really knows at what level lead begins to interfere with children's ability to learn and to adapt to their surroundings.

(Blocks hitting a hard surface)

DIETRICH: Let's see how I made a train. Ch-ch-ch-ch-ch-ch-ch-ch -- whoooo!

KENNEDY: Behavioral psychologist Ken Dietrich at the University of Cincinnati is testing a 2-year-old girl to see if she's developing normally.

DIETRICH: I like that train. I do.

KENNEDY: As she clumsily stacks blocks on top of each other, she looks like a normal shy toddler. But Dr. Dietrich says to a trained professional, she shows signs of severe lead poisoning.

DIETRICH: She showed very poor motor development. She had shown a decline in her cognitive development. And she also showed poor stability and balance on that day. Now, those sorts of changes in behavior aren't unique to lead. It could have been due to other factors. But her blood lead concentration was later found to be around 140 micrograms per deciliter when I tested her on that day, and we were dealing with a child that was neurobehaviorally symptomatic for lead poisoning.

KENNEDY: Such severe lead poisoning can cause convulsions, coma, and even death. This child was immediately hospitalized and treated with drugs to flush the lead out of her blood. But the effects of lead poisoning are irreversible. It can cause permanent damage to the brain and other organs, which becomes more severe depending on the length of exposure. Even in a rare severe case like this one, Dr. Dietrich says the only symptoms the girl's mother noticed were that she was

walking into objects and complaining of a sore tummy. It turns out the child had been eating paint chips inside her home for several months.

BOY: Hysterical. Pedestrian, Mathe -- math --

KENNEDY: In Pittsburgh, a teenage boy reads a vocabulary list as part of a study by lead researcher Dr. Herbert Needleman.

BOY: Almanac --

KENNEDY: Dr. Needleman has been studying the long-term effects of less severe lead poisoning on learning and social skills.

BOY: Instigator --

KENNEDY: He's found that children with moderate blood lead levels are seven times more likely to drop out of high school. Dr. Needleman is also studying a possible link between lead poisoning and delinquency in teenagers.

NEEDLEMAN: Mothers have observed, I hear regularly in the clinic, that her child was an angel, got lead poison, and now she can't manage him.

KENNEDY: To test his theory, Dr. Needleman x-rayed the bones of 301 12-year-old boys. Lead can be stored in the bones for decades, and can be an indicator of past exposure. Dr. Needleman found out that boys with high bone lead were more likely to have problems getting along in school and at home.

NEEDLEMAN: Children with higher lead in their bone had more attention disorders, had more aggressive behavior, and were more likely to be delinquent. So we think this means that our hunch was right. That lead is related to the amount of delinquency in our society.

KENNEDY: Dr. Needleman believes that once lead gets into the brain it can affect a child's ability to tell right from wrong.

NEEDLEMAN: One of the essential functions of the brain is to mediate between the stimulus and the response. In other words, you see something that you want and the response would be go get it. But the human brain says no, that's not allowed by law or by custom. So that we have to learn to slow down our responses and think about the consequences and lead appears to interfere with that very important function.

KENNEDY: Dr. Needleman's conclusions are still controversial among people who work in the field. And his results have yet to be replicated. Some lead experts say the group he tested was too small, and they question his definition of delinquency.

(Children shouting)

KENNEDY: But whether lead poisoning leads to delinquency or it just makes it harder for children to learn, childhood lead experts agree that it's one more factor that robs children of the opportunity to reach their full potential. Karen Cohen of San Francisco's Lead Poisoning Prevention Program.

COHEN: If you think back on your own school education, we have many people who failed schools. But those were just children who failed school. We didn't have any names for it. We didn't have any learning disabilities defined. They just didn't do well in school. Now we're at the era where we have

labels for things, and children get diagnosed with different types of learning disabilities. And we know that lead has to be one of the contributing factors to that.

KENNEDY: The only way parents can really know if their children are being exposed to lead is to have them tested. Health experts recommend testing at 12 months and then at 2 years. Many city and county health departments provide free or low-cost blood testing, and they can also help parents track down the source of the lead exposure. For Living on Earth, I'm Deirdre Kennedy in San Francisco.

(Children continue shouting and laughing)

CURWOOD: Next week, our series on lead poisoning continues. We'll have a report on how children can be exposed to lead during home renovations, and what landlords and home sellers must tell you about potential lead hazards.

(Music up and under)

CURWOOD: It's NPR's Living on Earth. I'm Steve Curwood.

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Lead Series; The Silent Epidemic: - Part Two (of 3)

CURWOOD: It's Living on Earth. I'm Steve Curwood.

The metal lead can poison large areas through improper waste handling, industrial emissions, or as fallout from leaded gasoline. But most often, the way people get acute lead poisoning is through exposure to old paint right at home. The stereotype is of a poor child eating a paint chip in a dilapidated housing project. But plenty of cases of poisoning come from lead dust, particles too small to notice. And while children living in low-income homes run a greater risk of poisoning this way, thousands who live in more affluent homes are also at risk. In Part 2 of the rebroadcast of our series, The Silent Epidemic, Deirdre Kennedy reports on how one young family learned about lead poisoning the hard way.

(Woman: "Can you open up that ravioli?" Man: "That's potato salad." Child: "Can I do it, Dad?")

KENNEDY: Linda and Dan Hodges live with their 5 children in what looks like a picture book Victorian house near the San Francisco Bay. When they went shopping for their first home, they had a particular dream house in mind.

L. HODGES: I wanted a Victorian. And I wanted 5 bedrooms, formal dining room, and a fireplace. And when we saw this house we couldn't believe it. We were just thrilled.

KENNEDY: The house the Hodges bought was a 110-year-old fixer-upper. They knew they had a lot of work to do, but they didn't bargain for what they got.

L. HODGES: We had moved our kids into what we thought was our dream come true, and it ended up being our worst nightmare. It was terrible.

KENNEDY: Their nightmare came to life about 3 months after they moved in. Almost by accident, a friend suggested that they have their house checked out for lead.

L. HODGES: We had a Halloween party. We were giving, you know, the nickel tour. And Doug, who works for the lead abatement program, came to the party. And he said "you know, you should probably have the house tested." And the guy came out, and the minute he started testing, it was off the charts and they came back with the results right away saying we had near hazardous waste levels outside in the soil, and lead everywhere in the house. And we had no idea. You can't see it.

KENNEDY: What the Hodges didn't know was that a previous owner sandblasted the outside of the house, sending a fine lead dust raining down into the soil. When the Hodges moved in their children were age 3 to 10 years old. Within weeks their youngest child Zachary's blood lead was around 25 micrograms per deciliter, more than twice the level of concern for children.

(Child making noises: "Hm hm hm hm hm hm...")

KENNEDY: But Dan Hodges says, like most lead poisoned youngsters, Zachary didn't show any obvious symptoms.

D. HODGES: That's the thing -- that's the most scary. By the time you start seeing any signs, there's usually permanent damage already been done. And so, hopefully we've caught it before any permanent damage was done.

L. HODGES: We were very, very lucky. Because we weren't educated. We just thought oh, lead, our kids don't eat paint chips. You know, we didn't know we were breathing it in.

KENNEDY: The Hodges had an emergency lead clean-up and containment done. They moved out of their home while a crew used solvents and a special high- tech vacuum cleaner to remove the fine lead particles. Then, specially trained contractors sealed up the old lead paint and covered the leaded soil in their back yard with concrete and wood chips.

(Child in background: "Hey, you pushed me down. Don't push me down.")

KENNEDY: The lead remediation cost the Hodges about $20,000, which they paid for with an interest-free emergency government loan. Their lead problem is finally contained, but, they say, after their ordeal they're not taking any chances.

L. HODGES: Zack?

ZACHARY: What?

L. HODGES: You need to wash that plum before you eat it. Because it fell, was it on the ground?

ZACHARY: Yes.

L. HODGES: Okay. It needs to be washed.

But we're watching them, you know, every minute. And then you want them to be able to play outside, but then there's all the dust and you worry and it's just -- oh, it's always on your mind. You know, you're living in it.

KENNEDY: Like many more affluent parents, the Hodges didn't think their children were at risk for lead poisoning. Because they didn't think they lived in the kind of neighborhood where kids got lead poisoning. What parents don't realize is that a vintage mansion may have more lead than a modest

home built in the 1980s. Alice Chang Kaufman, a lawyer with the Environmental Law Foundation, says in houses built before the 1950s, it's not uncommon for the underlying paint to be up to 50 percent lead.

CHANG KAUFMAN: People thought lead was great in paint. It made the paint more durable. Any building that is relatively old is going to have lead paint somewhere, unless it's at any point been sanded right down to the walls and repainted.

KENNEDY: But unless it's done by a qualified contractor, sanding down the lead can be worse than leaving it alone. That's how the Hodges' home became a lead nightmare in the first place. Under a new Federal law, owners of homes built before 1978 must tell buyers and renters about known lead hazards on their property and provide them with a pamphlet about lead poisoning. But only a few states and cities actually require property owners to test for lead hazards or to fix them.

(Water runs from a tap)

KENNEDY: Paint is the main source of lead poisoning in children, but there are many other sources, including tap water. In Roman times plumbing was made of pure lead. In fact, the word plumb comes from the Latin word for lead. These days lead in drinking water is a problem for about 1 in 6 homes in the United States. It can leach out of old municipal water tanks or lead pipes in older homes. It can even come from lead solder in copper plumbing installed until a decade ago. Lead can also come from faucets.

(Water boiling; a teakettle whistles)

KENNEDY: Alice Chang Kauffman says water absorbs lead when it's been sitting in lead-contaminated pipes for several hours. Unlike germs, lead can't be boiled out of drinking water, but she says you can help reduce the amount of lead by letting the water run for a minute or more before using it. Groups like the Environmental Law Foundation also provide inexpensive home kits to test for lead in water, soil, paint, and imported ceramics.

CHANG KAUFMAN: I certainly would advise -- certainly somebody who's buying a home, and probably somebody who's renting a home if they have children -- to check the place out before buying it. To conduct lead tests to find out if there's a problem. Because once you've discovered lead problems in a house, it can be very costly to take care of.

(Machinery; sanders or saws?)

KENNEDY: Now that Dan and Linda Hodges have gotten their own lead problem under control, they're facing another hazard: the same one threatening residents across America. Lead dust blowing into their yard from their neighbors' renovations.

D. HODGES: And they're working on that house next door.

L. HODGES: I'm worried about that.

D. HODGES: Yeah, right. Because they have lead and asbestos over there, and I'm not sure how aware they are of it. And, you know, we've done so much work to help protect ourselves from our house, and then to have all that construction going on next door, you know, with dust being stirred up and things. I just wonder what our exposure risk is for that.

KENNEDY: For Living on Earth, I'm Deirdre Kennedy in San Francisco.

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Lead Series; The Silent Epidemic: Workplace Contact

CURWOOD: It's Living on Earth. I'm Steve Curwood.
Even though lead is now illegal in house paint and gasoline, thousands of people in the US come in close contact with dangerous lead fumes and dust on the job, sometimes without even knowing it. State and Federal rules are supposed to protect workers from toxic materials, but some employers continue to provide their workers with little or no protections against lead poisoning. In the final part of the rebroadcast of our series, Deirdre Kennedy takes us to where the silent epidemic of lead poisoning can be found in the workplace.

(Cooking utensils being brushed against each other)

KENNEDY: Luis Zavala spends his days cooking and doing chores at his home in San Jose, California. He quit his job as an automobile radiator repairman last year when he became too sick to work. Luis is a Nicaraguan immigrant who's lived in California for 11 years.

(Zavala converses with family)

KENNEDY: He now relies on his daughter Erica for everything, including driving him to the doctor's and translating.

L. ZAVALA: [Speaks in Spanish]
E. ZAVALA: He started feeling dizzy, and then his neck hurted, and now he forgets a lot of things. He has noticed, too, that you know, that he doesn't sleep. He only sleeps, like, 3 hours.

KENNEDY: At the age of 53, Luis may be permanently disabled from the effects of lead poisoning.

(Luis speaks in Spanish)

KENNEDY: Luis also has pains in his back and arms that make it hard for him to move. His symptoms are typical of long-term lead poisoning. At low levels, lead poisoning in adults can cause anemia, gastrointestinal problems, and loss of sexual function. At more advanced stages it can cause kidney failure, coma, and even death. But like many workers who suffer the gradual effects of lead poisoning, Luis didn't know it was lead until a Santa Clara County Health Worker came to his radiator shop and told him he should get a blood lead test. It turned out his blood lead levels were dangerously high, 58 micrograms per deciliter, just below the level of mandatory hospitalization. For 9 years Luis was the sole employee of a small auto shop. Every day he used a blowtorch to melt lead solder to patch holes in radiators. He says his workplace had no windows, no ventilation, and no protective equipment except for gloves.

L. ZAVALA: [Speaks in Spanish]
E. ZAVALA: He doesn't know, he was never told nothing before. He even told his employer, like a couple times, to buy a fan or something to suck up the air, because the air was so clogged up, like, you know, cloudy. But his employer, you know, ignored that.

KENNEDY: Under Federal law, workers who are diagnosed with lead poisoning must be moved to another job or receive full-paid leave until their lead levels go down. But Luis didn't know he was protected under the law, so he just quit. He's now living on disability, and even if his lead levels come down, he may never fully recover.

(Hissing sounds)

KENNEDY: At RadiatorLand in Santa Clara, workers flush out car radiators and vats of chemicals. This shop couldn't be more different than the one where Luis worked.

POSADA: And then over here is a carburetor ventilation system.

KENNEDY: The company's owner, Carlos Posada, says his shop meets all state and Federal standards and then some. He says he spent thousands of dollars making sure his employees have adequate ventilation, protective gear, and proper changing rooms. His workers get their blood lead levels tested regularly, and he monitors the air quality inside his shop. But, Posada says, many radiator shops don't bother coming up to code, betting that they'll never get caught.

POSADA: Most shops, if no one's knocking on their door bugging them, they'll play ignorant, and literally at the lives of their employees, so it's really sad.

KENNEDY: Posada says he has to charge his customers a few more dollars than other shops, but he says it's worth the extra cost.

POSADA: Economic times are really tight right now, and everybody wants to stretch that dollar. But you've got to ask yourself at what expense, and if your employees are in the community, it really doesn't make any sense. These people are in contact with you and also your children, so you want everybody to just live and work in a safe working environment.

(More hissing sounds)

KENNEDY: Adults who work around lead risk more than just their own health. Barbara Materna, an industrial hygienist with the State of California, says they can also take lead home to their children on their clothes, shoes, and hair. They even risk the health of their unborn children.

MATERNA: Lead has reproductive effects on both women and men, so it can affect sperm quality. If the mother is exposed, there are effects on the menstrual cycle and her fertility and that sort of thing. Also, if the woman is exposed, her blood lead level is the same as any fetus that she's carrying.

KENNEDY: Federal health officials estimate that about 30% of lead-poisoned workers also have children who are lead poisoned. In 1996, 25 states reported nearly 27,000 adults with dangerous lead levels. Researchers believe most of them were exposed at work. Health experts say the real number of lead poisoned adults is probably much higher. As with Luis's case, the symptoms of lead poisoning can often look like other conditions, and doctors rarely think to ask if patients work around lead. Some other industries that involve lead exposure are battery manufacturing, gun firing ranges, and foundries.

(A paint brush sweeps)

KENNEDY: But the industry affecting the highest number of people by far is painting. Up until the 1950s, paint contained as much as 50% lead by weight. Painters used to actually grind the lead into the paint by hand, and that lead is still on millions of buildings across the United States. Frances Doherty owns a painting company in San Francisco.

DOHERTY: It gave good adherence, good color. It was -- it's great. Your paint jobs lasted a whole lot longer than they do now. I had a client tell me, "Oh gosh, I got my house painted 20 years ago and it lasted for, you know, 15, 20 years."

KENNEDY: Even once it's painted over, that lead hazard doesn't go away. Painters can disturb old lead paint when they sand, scrape, wash, or burn off layers of paint. Poor safety practices by painters can hurt not only the workers but also the building's occupants and even neighbors.

(Scraping sounds)

KENNEDY: On San Francisco's Nob Hill, Doherty's painters are prepping a Victorian building. They were called in after state inspectors pulled another team off the job and fined the homeowner thousands of dollars as part of a crackdown on illegal contractors. Frances Doherty says in a city like San Francisco, where 95% of the houses have lead paint, reputable contractors just can't afford to take chances.

DOHERTY: Any job we do, we presume it to be lead. Then, if it doesn't, then fine, you've just got a clean job.

KENNEDY: Frances Doherty switched to safe painting practices about 6 years ago, after her newborn son turned out to have elevated blood lead levels. She realized she was exposed to the lead paint while she was pregnant. Frances Doherty's painters no longer use high-power washers or torches to get old lead paint off buildings: two practices that can disperse lead paint into the air and soil. Now they use a special vacuum cleaner to suck up the lead dust.

(A vacuum cleaner sucks)

KENNEDY: Her workers wear respirators. She even makes them use hand wipes before they eat. Under a new Federal law, states must provide training and certification for such painting contractors. But there's still a big gap between the laws and the reality, since just about anyone with a paint brush can call herself a painter, even where state laws require a license.

L. ZAVALA: [Speaks in Spanish]
KENNEDY: Researchers at the Labor Department say there are fewer adults around like Luis Zavala. They'd like to think that's because more workers are being educated about lead poisoning. But they say it could just be that fewer people are being tested. Until more businesses comply with Federal laws and start to get their workers tested, unprotected workers like Luis will continue to suffer the debilitating effects of lead poisoning.

(Zavala and cooking implements)

KENNEDY: For Living on Earth, I'm Deirdre Kennedy in San Francisco.

(Cooking sounds continue)

CURWOOD: For more information on lead and childhood lead poisoning, you can call the National Safety Council's Lead Information Center at 800-LEAD-FYI. That's 800-532-3394.

(Music up and under)

CURWOOD: Our series Lead: The Silent Epidemic was edited by Peter Thomson.