Christine and Erik Johnson of Minneapolis were thrust into the role of detectives when they learned in November 2006 that their 9-month-old son, Coen, had a blood lead level about five times the national average for children under 5. His 2-year-old sister, Nora, had a lead level that was almost triple the average.

The Johnsons were mystified because earlier that year their house got a clean bill of health. Their county housing department verified that the couple had cut lead exposure hazards in their 84-year-old home by taking steps such as replacing old windows covered in lead paint, a major source of lead poisoning in the U.S.

After the toddlers’ blood tests came back, a health department official referred the Johnsons to Bill Radosevich, a national expert on lead in consumer products. He helped inspect their home with a lead-screening device, an X-ray fluorescence analyzer.

They were astonished at what he found. More than 15 items screened positive for lead, including a pasta bowl, a decorative belt on Nora’s jeans, the vinyl lining of a diaper bag in which she carried her toys, and some of the toys themselves. Particularly high in lead content were the tires on a toddler-sized wagon that Coen played with daily, turning it on its side so that he could grab its wheels and delight in watching them spin.

After they removed the items, tests showed a drop in the children’s lead levels. It’s difficult to know what role the lead-tainted items played in their children’s test results, but the Johnsons are relieved. Christine just wishes the government and industry had been more vigilant. “We shouldn’t have to be the ones doing the testing to make sure our toys and dishes don’t contain lead,” she says.

As the Johnsons discovered, lead hazards in consumer products aren’t limited to the millions of toys recalled so far this year. Four months of reporting and testing by CONSUMER REPORTS found that lead is in an array of everyday items and that the system that should protect consumers has gaping holes. Here’s what we found:

• Our lab tests detected lead at widely varying levels in samples of dishware, jewelry, glue stick caps, vinyl backpacks, children’s ceramic tea sets, and other toys and items not on any federal recall list.
• Samples of a Fisher-Price blood pressure cuff that is part of a toy medical kit had surface lead in worrisome amounts. Parents should remove this toy from use.
• Many consumer products are allowed to contain some lead, but most don’t need to because there are almost always safer alternatives.
• For children, recent studies suggest developmental problems can occur at blood lead levels below what the government now considers elevated. That argues for lowering the level, some experts say.
• For older Americans, a portion of memory loss and other neurocognitive problems associated with “normal” aging...
might be linked to our lifetime dose of lead, according to recent studies.

Brian Schwartz, M.D., a Johns Hopkins University professor of environmental health sciences, epidemiology, and medicine who led the research, says, “Over the past 60 years, people were dosed with a lot of lead and we’re only beginning to understand what that did to them.”

**OUR TEST FINDINGS**

With the holiday shopping season here, American toy companies are trying to assure anxious parents that lead contamination problems are limited. “I think you can be confident toys are safe as long as you get rid of toys that are recalled,” says Joan Lawrence, vice president of the Toy Industry Association.

But our tests found cause for concern. We screened products from stores and consumers’ homes in the New York metropolitan area using home lead testing kits and an X-ray fluorescence analyzer.

We focused on products made with materials more likely to contain lead, such as brightly painted items, on which lead is used as an inexpensive pigment. Special attention was paid to children’s products.

Items screening positive underwent further testing in our labs and in an outside lab to measure total lead—the amount on the surface as well as embedded. Total lead is important, but surface lead, or “accessible” lead, is of more immediate concern. We used a variety of methods to measure accessible lead and simulate the exposure a child might get from touching or mouthing an item.

Our tests found high total lead levels in three new samples of a red toy blood pressure cuff from classic Fisher-Price Medical Kits purchased in the New York metropolitan area using home lead testing kits and an X-ray fluorescence analyzer.

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We detected the highest concentration of total lead, more than 10,000 parts per million, in a cuff that a child had regularly played with for the past two years. There are no federal accessible-lead regulations for this kind of item. So we tested for accessible lead in this product by adapting a Consumer Product Safety Commission wipe-test method used for products such as vinyl lunch boxes, which have materials similar to the cuff. We assumed that a child would touch the product at least 30 times daily. Based on the levels of accessible lead we measured, we estimated that the child could receive a dose of more than 15 micrograms per day. That amount could raise blood lead levels to 10 micrograms per deciliter, the level currently defined as elevated. Consumers Union alerted Fisher-Price and asked the CPSC to investigate this product based on safety concerns. Fisher-Price declined to comment.

Other plastic children’s products we tested had high levels of total lead content, although our tests indicated that negligible amounts would be accessible to children through touching or mouthing new items. Those included orange caps from seven Elmer’s Glue Sticks with designs from “Dora the Explorer,” “Go, Diego, Go!” and “SpongeBob SquarePants,” and three Jordan Kids’ backpacks shaped like ducks. There is no federal standard for lead in plastics, but the amount of lead detected in the glue stick caps was more than three times the 600 parts per million allowable for paint in the U.S.

If you own those items, Consumers Union recommends that you remove them from use. Experience with lead-tainted vinyl miniblinds in recent years suggests that exposure to sunlight and heat can cause some plastic items to release embedded lead over time. It’s not known how the products we tested will age.

Brass keys can be another source of potential lead exposure, as Katrina Barron of South Bend, Ind., recently found. When her daughter Aurora’s blood test revealed an elevated blood lead level of 11 micrograms per deciliter in July 2007, a local health department investigation identified Katrina’s house and office keys as one potential source of exposure.

“Almost every time I’m in the supermarket checkout line, I see parents dangling their keys for babies to play with, but now I know enough to warn them not to,” says Barron.

**THE RESURGENCE OF LEAD**

The appearance of lead in toys, jewelry, and even baby bibs has come after years of progress in reducing lead hazards across the country. Some of the reasons involve the malleability of the metal for fashioning products, the growth of imported goods, and even recycling.

For example, lead has appeared in millions of pieces of inexpensive jewelry marketed to children and teenagers. Many jewelry items with lead content of 90 percent or more have come from China and appear to be made from recycled lead battery waste and electronics boards, according to recent studies led by Jeffrey Weidenhamer, a chemistry professor at Ashland University in Ohio. “Recycling is great, but not when you’re turning lead waste into children’s jewelry,” he says.

Lead is also found as a stabilizer in plastics. But there are safer alternatives: Tin, for example, is a less toxic ingredient.

The federal Centers for Disease Control and Prevention reported in 2005 that in some areas of the country, more than a third of children identified as having elevated blood lead levels have been exposed to items made of or decorated with lead. From paint to toys, “every little bit counts because once lead is in the body, it’s very difficult to remove it,” says Mary Jean Brown, chief of the CDC’s lead poi-
soning prevention branch.

Americans’ exposure to lead over much of the past century was driven by two products in particular: paint and gasoline. By the late 1980s, those two industries had each used about 6 million tons of lead in the U.S., the toxic residue of which still lingers. More than a third of the nation’s housing stock still contains some lead paint, and one out of four homes with children age 6 or younger has significant lead hazards in paint, dust, and soil, according to estimates.

Since the federal government banned lead in gasoline and house paint beginning in the 1970s, the average blood lead level in children under age 6 has dropped about 90 percent. Even so, based on the latest data available from the National Center for Health Statistics, 460,000 children under age 5, or 2.4 percent, have elevated levels. High levels are defined by the CDC as 10 micrograms or more per deciliter of blood. That’s down from 60 micrograms in the 1960s, when health officials were focused on preventing potentially fatal lead poisoning, which can occur at higher levels.

Now 10 micrograms is the level that generally triggers some form of intervention by doctors or public health officials. The Environmental Protection Agency recommends that all children have blood lead level tests at age 1 and again at age 2.

In an adult, blood lead levels typically reflect only a small portion of total lead exposure. So someone with a relatively low level of lead in the blood might have a bone lead level that is proportionally 1,000 times greater, reflecting lifetime exposure. The body treats the metal like calcium, so when demand for that mineral increases, lead may be absorbed back into the bloodstream.

Results of a 2006 study published in Circulation: Journal of the American Heart Association indicate that an increase in an adult’s blood lead level from about 1.9 micrograms per deciliter to 3.7 micrograms per deciliter increases the risk of dying of a stroke by about 2.5 times. “People know that lead exposure is dangerous for children, but I don’t think they fully appreciate that it is extremely hazardous for adults,” says Ellen Silbergeld, professor of environmental health sciences at Johns Hopkins Bloomberg School of Public Health and co-author of the study.

Critics say federal watchdogs have not been doing their job. The CPSC has “been neutered to the point of uselessness,” says Ann Brown, the agency’s chairman from 1994 to 2001. “It just makes me shiver to think this is the agency that is supposed to be protecting our kids,” she says. Nancy Nord, acting chairman of the CPSC, defended her agency in September before a congressional subcommittee, saying, “The CPSC has been and continues to be ever vigilant and assertive in this ongoing war against children’s exposure to lead in products under our jurisdiction.”

Even the CDC advisory committee on lead poisoning prevention may have been subjected to political pressure, according to a report issued by U.S. Rep. Edward Markey (D-Mass.) in the fall of 2002. The report concluded that committee nominations of scientists renowned for their work on lead poisoning were being rejected in favor of people tied to the lead industry.

At that time, the agency was considering whether the definition of an “elevated” blood lead level should be lower than 10

### Testing the test kits

Three of the five home lead-testing kits we tried were useful though limited screening tools if you are worried about specific items in your home. The kits detect surface, or “accessible,” lead. They don’t detect lead embedded below the surface. If an item tests positive, remove it from use. For exact lead levels, have it screened professionally.

**Homax Lead Check, $8; Lead Check Household Lead Test Kit, $18.45**

These two kits consist of cigarette-shaped swabs, made by the same company, that turn pink when they detect lead. They were the easiest to use and identified accessible lead in toys, ceramic dishware, and vinyl or plastic. If lead concentrations are low, these swabs can take up to 2 hours to change color, but in our tests high concentrations produced immediate results. The eight-swab Lead Check Household Lead Test Kit pack is a better bargain than the Homax two-swab pack. Its packaging was less susceptible to being crushed.

**Lead Inspector, $13**

Swabs turn yellow, brown, gray, or black if lead is detected. It can take up to 10 minutes for a color change to occur at low lead levels. The kit, with eight tests, identified accessible lead and might be a good choice for painted metal jewelry. It also might be superior for pink or red items, because if those shades of paint bled onto a Lead Check swab, it might falsely appear to be positive. Have good ventilation and wear gloves to protect skin from chemicals.

**First Alert, $13**

The four test swabs provided are similar in design to those used in Lead Inspector. But we experienced some false negatives for accessible lead.

**Pro-Lab Lead Surface, $10**

This kit was less sensitive and more difficult to use. Two small pieces of treated paper are cut to create six tests. The paper is moistened and rubbed on the object, but we found the paper often fell apart before the 2-minute rubbing time was over.
micrograms per deciliter, the standard set in 1991. Recent studies suggest that the greatest incremental damage to children’s brains appears to occur below the prevailing 10 micrograms standard, with evidence of harm at levels as low as 2.5 micrograms per deciliter.

Two-thirds of the typical nine-point decline in IQ experienced by children with blood lead levels between 10 and 30 micrograms might actually occur at levels below 10 micrograms, according to a July 2005 study by an international group of lead researchers. The Johnsons’ pediatrician, aware of such research, recommended action when Coen’s lead blood level came in at 9 micrograms per deciliter and Nora’s came in at 7. “A lot of parents are simply told their kids’ tests are ‘normal’ if they’re below 10,” says Christine Johnson.

WHAT’S A SAFE LEVEL?

Consumers Union and a growing number of scientists and public health officials argue that the CDC should change its official definition of an elevated blood level to 5 micrograms per deciliter. “This is important because official governmental acknowledgment that these lower blood lead levels are harmful may influence regulations,” says Joel Forman, M.D., an associate professor of pediatrics at Mt. Sinai School of Medicine in New York. He also is a member of a CDC work group and the American Academy of Pediatrics Committee on Environmental Health.

The CDC’s advisory committee on lead poisoning prevention in August 2005 said it was keeping the status quo because reducing the level would be arbitrary and benefits were uncertain.

If the CDC lowered its standard to 5 micrograms per deciliter, the number of American children under 5 classified as having elevated levels would rise to about 1.8 million, a fourfold increase. “The impact on legal liability claims against the lead industry is obvious,” says Gerald Markowitz, a professor of history at John Jay College and co-author of “Deceit and Denial,” a book about industrial pollution.

A Rhode Island jury in 2006 determined that three companies involved in making lead pigments found in paints and coatings used throughout the state knew for decades that lead was hazardous and continued to sell their products, contributing to a public health hazard. The state has proposed an abatement plan under which Sherwin Williams, NL Industries, and Millennium Holdings could face costs of up to $2.4 billion to cover an effort to eliminate lead paint hazards in 240,000 homes. They are appealing the trial court decision. Bonnie Campbell, spokeswoman for the companies in the suit, would not comment.

Given lead’s potential for harm, Consumers Union believes manufacturers should eliminate its use or reduce it to the smallest trace amounts.

“There is no safe dose of lead,” says David Jacobs, former director of the U.S. Department of Housing and Urban Development’s Office of Healthy Homes and Lead Hazard Control. “Manufacturers and regulators should be working to eliminate the unnecessary use of lead in consumer products so that we can avoid yet another wave of lead exposure that’s entirely preventable.”

What you can do

Reduce lead exposure in your home. Evaluate lead risks in your home if you live in pre-1978 housing, whether or not you have children. The main concerns are deteriorating paint, dust, soil, and water. Go to epa.gov/lead and click on Lead Professionals. For more information on lead abatement, go to www.centerforhealthyhousing.org.

Have children tested for lead. The Environmental Protection Agency recommends all children be tested at ages 1 and 2. Some pediatricians also recommend testing at annual checkups under age 6.

Check recall lists. Go to www.cpsc.gov for photos and descriptions of toys and other products recalled due to lead contamination. Follow manufacturers’ instructions for returning the products. For more tips on preventing exposure, go to www.ConsumerReports.org and check out our safety blog.

Consume adequate calcium and iron. People whose diets don’t contain sufficient amounts absorb more lead.