

Boomers exposed to higher levels of lead
Study suggests link to mental decline in elderly.

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Are you old enough to remember when gas stations began selling "unleaded" gasoline?

If so, you're among the half or more of Americans who grew up exposed to levels of environmental lead that are far higher than they are today. The danger to today's children posed by tainted toys imported from China, serious as it is, pales by comparison.

Currently, blood lead levels exceeding 10 micrograms per deciliter in young children are considered elevated, and trigger concern about long-term neurological effects as well as a home investigation by the health department.

But higher levels, up to 20 micrograms per deciliter, were the average for the entire population in the 1960s, according to Dr. Brian Schwartz, principal investigator for the Baltimore Memory Study at Johns Hopkins University.

Putting leaded gas in the tank may have boosted octane and prevented engine knock. But it also was "a great way to distribute lead throughout the environment" as it came out of the tailpipes, Schwartz says.

Lead use in gasoline peaked in 1969, when more than 200,000 tons of the heavy metal were exhausted into the atmosphere. Use steadily declined under federal law starting in 1973 until lead was phased out completely in 1996.

Average blood lead levels in people dropped as well during this period, declining to about 2 micrograms per deciliter by the early 1990s.

In a public health success story, the percentage of preschoolers with elevated blood lead (by today's standards), dropped by more than 90 percent within two decades.

But the question remains: What effect did that heavy exposure have on all the people born in the preceding decades?

Schwartz's study, one of only a handful to look at the effects of chronic lead exposure on adults, suggests that exposure during the leaded-gas era is a significant cause of the mental decline currently seen as "normal aging" in elderly people.

The study used the technology for detecting lead paint in older homes, X-ray fluorescence, to measure the amount of lead accumulated in the shin bones of volunteer subjects from the Baltimore area. The amount of lead in shin bones, and other "hard" bones, is an indication of long-term exposure because it leaves the bone very slowly.

Schwartz says the study's 1,100 recruits had all been born between 1930 and 1950, which means they had been alive and inhaling lead from exhaust fumes for 20 to 40 years before lead content of gas peaked.

Investigators for the Baltimore Memory Study tested seven different brain functions in their subjects, including language, processing speed, hand-eye coordination and verbal and visual memory.

Then they compared the results of those tests with the levels of accumulated lead measured in the shin bones. On every test, high levels of lead correlated with lower levels of brain function.

Schwartz says the results, published last year in the journal *Neurology*, challenge the current notion of normal aging of the human brain, since much of what we believe in that regard is based on people who had been exposed to high levels of lead.

"What we think of as normal aging may be the effects of lead exposure on memory and cognition," he says.

Hugh Hendrie, a research scientist at the Indiana University Center for Aging Research, says Schwartz's hypothesis is plausible, given the past widespread exposure to lead and what's known about its toxic effect on the central nervous system.

"It makes a lot of sense," he says. "I could certainly believe that lead could be a major player."

But Hendrie, lead author of an influential study last year that found connections between cardiovascular risk and mental decline, cautions that it's difficult to separate the effect of lead from overlapping factors, such as educational levels and economic status.

As a matter of simple curiosity, however, it's hard not to wonder how all the baby boomers would be today if industry had used readily available, less toxic alternatives to boost octane.

Smarter?

Less compulsive?

More even-tempered?

"We'll never know the answer to that," says Schwartz, a physician.

More important, Schwartz says, is avoiding the blunder. He notes that some countries are considering allowing manganese to be added to gasoline to boost performance.

"Manganese is an even more powerful neurotoxin than lead," he says. "And as we move toward more coal-fired power generation we're distributing more mercury into the air.

"We're susceptible to making the same mistake again."