

How dangerous is Lead?

The fatal dose (for adults) is estimated at 500 mg (500,000 mcg) of absorbed lead. About 99% of the amount of lead taken into the body of an adult will leave in the waste within a couple of weeks, but under conditions of continued exposure, not all of the lead that enters the body will be eliminated, and this may result in accumulation of lead in body tissues, especially bone. Both past and current elevated exposures to lead increase patient risks for lead effects. **Only about 32% of the lead taken into the body of a child (<6 years old) will be excreted.**

What is a "Tolerable Dose?"

The tolerable dose is the maximum amount of lead a person can absorb without an increase in their blood lead level. (This corresponds to the amount a healthy body can eliminate, so none is accumulated.) The World Health Organization (WHO) has determined and recommends a maximum tolerable dose (for adults) is 50 micrograms (mcg) per kilogram (kg) of body weight per week - **for children it's 25!**

$50 \text{ mcg/kg} \times 1 \text{ kg} / 2.2 \text{ lbs} = 22.8 \text{ mcg/lb per week}$
 $\times 1 \text{ week} / 7 \text{ days} = 3.25 \text{ mcg/lb of body weight per day.}$

If you weigh 200 lb = 650 mcg in 24 hours

If you weigh 150 lb = 487 mcg in 24 hours

If you weigh 100 lb = 325 mcg in 24 hours

For a child weighing 50 lbs = 81 mcg in 24 hours

What is lead "poisoning" compared to lead "exposure"?

Lead exposure refers to the entry of lead into the body, through ingestion, inhalation, the skin or the placenta. Lead poisoning occurs when there are adverse health effects due to lead in the body.

Are there signs or symptoms of lead poisoning to look for?

Symptoms of acute lead poisoning in adults include: nausea, diarrhea, vomiting, headache, confusion, stupor, kidney failure, metallic taste, blue line on the gum margins, anemia, peripheral neuropathy, and convulsions.

Symptoms of chronic lead toxicity include: poor appetite, weight loss, anemia, high blood pressure, irritability, insomnia, memory problems, decreased libido, infertility, abdominal pain, gout, kidney problems.

In childhood, lead poisoning may be asymptomatic. There may be elevated levels of lead in the blood but symptoms are delayed. Subtle behavioral, cognitive and neurological deficits (developmental syndrome) become evident many years after the exposure to lead, including hyperkinetic and aggressive behavior disorders and learning regression.

How Can I Find Out How Much Lead I Have Absorbed?

The half-life of lead in adult human blood has been estimated to be from 28 to 36 days. The Biological Exposure Index (BEI) is a guidance value indicating likely adverse health effects.

The BEI for blood lead is 30 mcg/dL. (ACGIH 2005) Testing BLL (Blood Lead Level) is NOT part of a routine physical – you need to specifically request it from your doctor.

Children are more sensitive to the health effects of lead than adults. No safe blood lead level in children (< 6 years old) has been determined.

BLL (Blood Lead Level) less than 10 mcg/dL is considered acceptable for adults.

- BLL 10 to 19 indicates some exposure – retest in a month.
- BLL 20 to 44 indicates more serious exposure – retest in a week.
- BLL 45 to 69 indicates chelation therapy may be needed.
- BLL above 70 mcg/dL may require hospitalization.

Under certain circumstances, inert lead (previously stored in bones and teeth) will leave the bones and reenter the blood and soft tissue organs. This increases during periods of pregnancy, lactation, menopause, physiologic stress, chronic disease, hyperthyroidism, kidney disease, broken bones, and advanced age, all of which are exacerbated by calcium deficiency.

How Am I Exposed to Lead During Shooting?

Lead enters the body by being inhaled, ingested or absorbed through the skin. Skin absorption is very inefficient unless the skin is damaged. Only an average of 6-15% of ingested lead is absorbed by adults. **Children (<6 years old) absorb 50% of ingested lead!**

Lead also holds a large static charge. While this ability to hold a charge is one of the reasons lead makes such a good battery, it also helps lead stick to the skin, clothes and other surfaces. This becomes a continuous source of re-exposure.

Inhalation of lead fumes and dusts should be considered as a major route of entry - from 50 to 70% of the particles that reach the respiratory tract are absorbed. Inhaled lead particles (0.1-10 microns) remain in the lungs for 1.5-3 days.

The most significant potential source of airborne lead at a firing line is caused by the hot flames of burning gunpowder acting on the exposed lead base of a projectile. The metallic lead in the projectile can also become airborne lead particles through heat from friction between the bore of the firearm and an unjacketed lead projectile. Primers also contain lead. Downrange, lead may become airborne from splatter caused by projectiles hitting backstops, floors, walls or baffles.

Dry sweeping to collect brass stirs lead dust on a range floor back into the air!

What Steps Does the Club take to Minimize My Exposure or Effects of Exposure?

- Eating and drinking are prohibited in the range!
- No brooms allowed in the range!
- D-Lead hand soap is available in the Club restrooms and kitchen. Hand wipes are available by the range exit door!

- The range cleaning schedule and procedures are being updated!
- The range ventilation system and overall range design upgrades are intended to meet anticipated standards.

What Steps Can I Take to Minimize My Own/My Family's Exposure or Effects of Exposure?

- Wash hands, forearms, and face with D-Lead soap before eating, drinking, smoking, or having contact with other people.
- Change clothes and shoes (and bag them) before leaving any firing range, or before entering your car or family's living quarters.
- Wash clothes used at any firing range separately from family's clothing. D-Lead makes a laundry detergent specifically for removing lead from clothes!
- Lead absorption from the gut appears to be blocked by calcium, iron, and zinc. A diet or supplements rich in these reduce your risk. Lead molecules will attach at sites in body cells which these mineral nutrients would otherwise fill.
- Stay hydrated before shooting - kidneys remove 25-50% of lead.
- Don't fast before shooting. Adults who have just eaten absorb as little as 6% of ingested lead, vs. 60-80% for those who had not eaten for a day.

Somerset County Fish and Game Protective Association



What Shooters Need to Know About

LEAD

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For references used in the preparation of this brochure see:

<http://www.njpistol.net/BE-FAQ.asp#lead>