



Preventing Lead Exposure at Indoor Shooting Ranges

The local indoor shooting range is a safe venue for recreational shooting practice and an important training center for peacekeeping personnel such as law enforcement and the military. If you use or work at an indoor shooting range, you are probably exposed to airborne lead created when using lead ammunition. Once lead enters the body, it is known to cause harmful health effects and there is no safe level of blood lead for humans. Family members are also at risk. Lead dust that settles on the hair, skin, clothing or shoes can accidentally be brought home and expose children and other family members. The developing brains of children are especially vulnerable to the toxic effects of lead. Lead poisoning is preventable. It is important to understand the sources of lead in the shooting range and to know ways to protect yourself and your family.

Who is at risk?

- Range workers
- Target or hobby shooters
- Members of a shooting team
- Law enforcement
- Families of those who use the range

What are the sources of lead at your range?

AT THE FIRING LINE: Most ammunition contains lead. It can be found in the primer (lead styphnate or lead azide) at the base of the bullet. When a pistol, rifle, or shotgun is fired using lead ammunition, the primer ignites and releases very small lead particles into the air. Lead particles and fumes are also released when heated gunpowder reaches the base of the projectile and from the friction produced as the projectile passes through the gun barrel.

DOWN RANGE: Lead particles become airborne from splatter caused by bullets hitting the target, backstops, floors, walls or baffles.

RANGE MAINTENANCE: Maintenance activities may cause settled lead dust to become airborne. Dry sweeping is a particularly hazardous practice that will significantly increase airborne lead levels.

HANDLING SPENT AMMUNITION: Recovering lead bullets from traps and emptying bullet trays can release dust into the air and contaminate hands. Handling spent cartridges and cleaning firearms can do the same.

Lead dust and fumes emitted into the air are a hazard. A building's regular HVAC system may not adequately remove airborne lead particles and these particles can be inhaled. Lead dust can also settle on food, water, cloths, shoes, nearby surfaces and even travel to other rooms. You can ingest lead when you touch a lead-contaminated surface, then eat, drink or smoke. Lead dust is hard to see and can be tracked out of the range area on shoes and clothing. This can lead to contamination of your vehicle and home and can expose members of your household.

How can lead harm me and my family?

Lead gets into the body by breathing it in or ingesting it. When lead enters the bloodstream, it circulates throughout the body. Some is excreted through the kidneys and gut; the rest is primarily stored in the bones. Stored lead is released back into the bloodstream over time, usually for years. Absorbed lead affects many important parts of the body to include the brain, nerves, red blood cells, kidneys, heart and reproductive organs. Depending on how high the blood level is and for how long, either immediate or long-term lead poisoning may occur. Most people do not know they have been poisoned and most have no symptoms or mild symptoms. Early symptoms of lead poisoning include, irritability, mood swings, sleep problems, stomach pain, vomiting, headaches, and fatigue.



Getting a blood lead test is a good way to see if lead poisoning is occurring in you or your family.

During pregnancy, lead easily crosses the placenta and can affect the fetus. Children younger than six years old are very susceptible to the harmful effects of lead and are at high risk for exposure given their normal hand-to-mouth behavior. Exposure can result in serious, permanent health effects such as lower IQ, learning and attention problems and behavioral problems. Young children in North Carolina have been diagnosed with lead poisoning after exposure to a shooting range and because of a parent pressing bullets at home.

Tips to prevent lead exposure:

- Use jacketed or lead-free bullets and no-lead primer,
- Make sure the firing range has a good ventilation system to carry gun smoke away from the shooter and remove airborne lead at the firing line. General exhaust ventilation is not adequate. Indoor firing ranges should ensure supplied air moves steadily across all shooters' faces and directly down range where it is exhausted, filtered and discharged. A separate system exclusively for the range is recommended,
- Never eat, drink or smoke inside a firing range,
- Wash your hands, forearms and face after shooting, picking up spent ammunition, cleaning guns, reloading and before eating drinking, smoking or contact with other people,
- Change cloths and shoes before leaving the firing range,

- Wash your range cloths separately from your family's clothing,
- If you participate in range cleaning, it is very important to use the right methods so you won't stir up lead dust and breath it in. DON'T SHOVEL or DRY SWEEP. Alternative methods include wet mopping or using a HEPA vacuum system. Regular range cleaning is important to prevent dust build up,
- If you participate in range cleaning or reclaiming activities, these tasks are likely to have the highest lead exposure levels and will require special protective equipment such as a NIOSH-approved respirator, full-body work clothing, gloves, head and foot covering and goggles.

Bullet casting and reloading:

These practices produce fumes and tiny lead dust particles that can be inhaled or ingested. Safety precautions include:

- Only cast or reload in properly ventilated work spaces,
- Never cast or load bullets inside the home,
- Never let children in work area,
- Wash hands and face after doing casting and reloading; and,
- Do not eat, drink or smoke when casting or reloading.

FOR MORE INFORMATION: Please call the Occupational and Environmental Epidemiology Branch at the NC Division of Public Health at 919-707-5900; ASK OSH (NC OSHA) at 919-807-2875; or see National Institute of Occupational Safety and Health webpage on ranges: www.cdc.gov/niosh/topics/ranges/default.html

REFERENCES: National Shooting Sports Foundation (2011). Lead management and OSHA compliance for indoor shooting ranges; OSHA (2018). OSHA Factsheet, Protecting workers from lead hazards at indoor firing ranges; Louisiana Dept of Health, Prevent lead exposure in indoor shooting and firing ranges.



State of North Carolina • Department of Health and Human Services •
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