

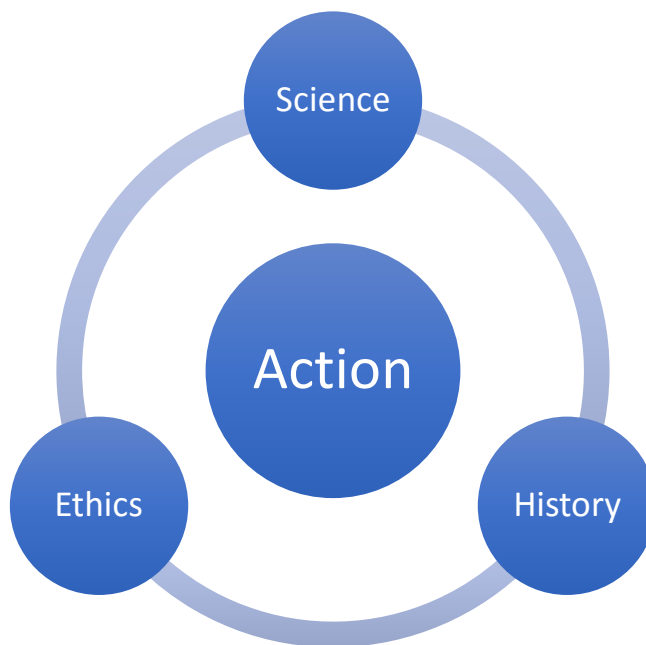
## Connecting the Dots for – *Health and Safety at Shooting Ranges*

### Action

Educate firearms shooters about the hazards of lead for health and safety.

### Science & Facts

- 20 million recreational firearm shooters, plus law enforcement and military people
- 16,000-18000 firing ranges across the US
- CDC – “NO safe level of lead exposure”
- Harms Nervous system – decreases IQ
- Shooters take lead home & expose family members, particularly children



### Ethics

- Shooters have a right to safe, health, and lead free environment

### History

- Handheld guns that used lead projectiles were developed in the 15<sup>th</sup> century
- Ammunition uses lead containing primers

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More info: NIOSH - <https://www.cdc.gov/niosh/docs/2009-136/default.html>

## Connecting the Dots for – *Health and Safety at Shooting Ranges*

### Introduction

Law enforcement, hunters, military personnel, recreational shooters, and range workers are potentially exposed to lead and associated health hazards. Across the US there are over 1 million law enforcement personnel that train regularly at indoor shooting ranges. In addition, there are an estimated 20 million recreational firearm shooters. There are an estimated 16,000-18,000 firing ranges across the US. Shooters are exposed to lead which can also be taken home to expose their family. Shooters have a right to environment free of lead to ensure the health and safety of themselves and their family.

### Action

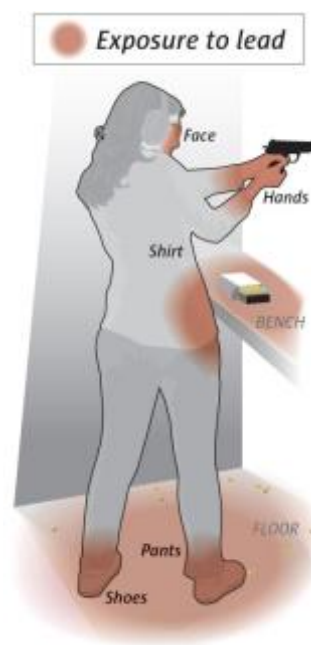
- 1) Educate firearms shooters about the hazards of lead for improved health and safety.
- 2) Pass a law that states that you must be over 21 to buy or use ammunition that uses lead bullets.

### Science

People using guns at shooting ranges often receive few of the protections required by state regulatory agencies for lead exposure. The U.S. Centers for Disease Control and Prevention (CDC) has stated that there is no safe level of lead exposure and has defined an elevated blood lead level (BLL) for children as any BLL greater than 5 µg/dL. However, adults are also affected by low levels of lead exposure.

### Exposure

There are two populations that are exposed to lead at most shooting ranges: workers that clean and maintain the site and the shooters. Employers and workers are required to follow the general regulations of the Occupational Safety and Health Administration (OSHA) which have not been updated in over 40 years. The shooters are not required to use any protection from lead exposure. Lead-containing dust and vapors are generated from lead in the primer as well as from the use of unjacketed lead bullets, which generates lead dust and fumes. The lead fumes are released near the bullet chamber of the gun and the lead fumes are inhaled. The lead-containing dust and fumes are released as the bullet exits the gun. This dust can contaminate a shooter's skin and clothing, which if not properly handled, can be taken home and expose family members, including children, to lead.

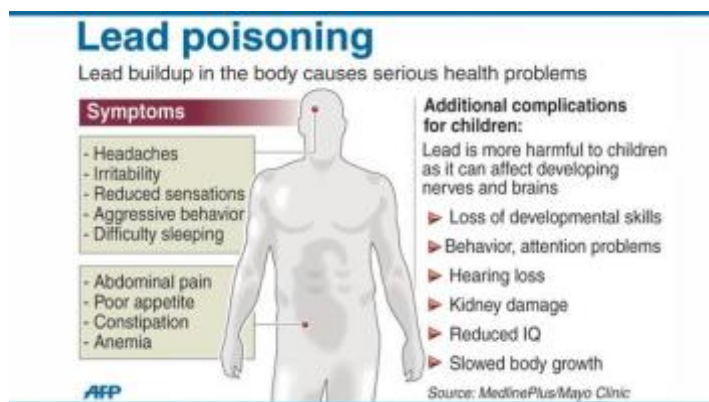


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## Health Effects

The scientific and medical communities have full documented the low level health effects of lead exposure. The CDC states that there is no safe level of lead exposure. The health effects for adult lead exposure include subtle cognitive disabilities, aggressive behavior, irritability,



reproductive effects as well many other effects. Women of childbearing age store lead in their bodies and contaminate the developing infant. Young children are particularly vulnerable because of their small size, meaning that a small exposure translates into a big dose of lead. Lead also substituted for calcium so that children because of their need for calcium as they grow, absorb 50% of the lead they ingest compared to adult absorption of only 10%. The many scientific and medical facts of vulnerability of people to lead exposure indicates that protective measures are necessary and cost effective.

## **History**

Shooting or practice ranges are as old as the development of weapons. The first military training exercises occurred at least in the period of the Greeks and Romans. With time and leisure marksmanship evolved into sport with legendary William Tell using an arrow to shoot and apple off his son's head. Black Powder or now called Gun Powder was invented by Chinese Alchemists in 9<sup>th</sup> century which ushered in guns and the modern use of explosives. The first handheld guns that used lead projectiles was developed in the 15<sup>th</sup> century. Lead based ammunition continues to be a critical part of the development of evermore sophisticated hand held guns and firearms. When a gun is fired small amounts of lead are emitted from lead based ammunition which expose the shooter to lead contamination as well as their clothing. There are now over 20 million people in the US that use 20,000 shoot ranges. Workers at gun ranges are covered by outdated OSHA regulations and shooters are not protected by any regulation.

## **Ethics**

Assuming adequate and appropriate education about the hazards and risks of using lead based ammunition, adults can make their own decisions about using a shooting range. There are however two more vulnerable population: women of child bearing age and children under 21 years of age. Women with elevated blood lead levels have the additional risk of storing lead in the bones that can be released during pregnancy and adversely affect the developing fetus. Children have a right to reach and maintain their full potential in an environment free of lead. Children at shooting range or exposed to lead that adults carry home on the clothing or shoes

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risk being exposed to hazardous amounts of lead. Even young adults are vulnerable to lead exposure as their brains do not stop developing until about 25 years of age. The health effects of lead last a life time. We know a great deal about the health effects of lead, thus knowledgeable adults have an obligation to protect vulnerable people and the environment from lead exposure.

### **Current Regulation**

Workers at shooting ranges must comply with lead and noise exposure regulation standards set by the Occupational Safety and Health Administration (OSHA). The OSHA lead exposure regulations were developed decades ago and do not take into account recent scientific or medical knowledge on the health effects of lead. Current OSHA regulations require that workers must be removed from the worker place only when blood reach 50-60 ug/dL.

### **References and Web sites**

NIOSH Alert: Preventing Occupational Exposure to Lead and Noise at Indoor Firing Ranges. DHHS (NIOSH) Publication Number 2009-136. <https://www.cdc.gov/niosh/docs/2009-136/default.html> (accessed August 3, 2017)

The History of Shooting Sports. Washington Post 1995 USA Shooting Media Guide - <http://www.washingtonpost.com/wp-srv/sports/olympics/longterm/shooting/shthist.htm>

Loaded with lead: How gun ranges poison workers and shooters. 5 Part exposé by Seattle Times By CHRISTINE WILLMSEN, LEWIS KAMB and JUSTIN MAYO OCT. 17, 2014. <http://projects.seattletimes.com/2014/loaded-with-lead/1/> (accessed October 3, 2017)

Kosnett MJ, Wedeen RP, Rothenberg SJ, Hipkins KL, Materna BL, Schwartz BS, Hu H, Woolf A. [2007]. Recommendations for Medical Management of Adult Lead Exposure. Environmental Health Perspectives, 115(3):463-471. [http://www.ehponline.org/members/2006/9784/9784.html].

Occupational Safety and Health Administration. Lead. <https://www.osha.gov/SLTC/lead/>

Gilbert, SG and Weiss, BA. "Rationale for Lowering the Blood Lead Action Level From 10 to 2 µg/dL". Neurotoxicology 27, 5 (2006): 693-701.

Gilbert, SG. Ethical, legal, and social issues: our children's future. Neurotoxicology, Vol 26/4 pp 521-530, 2005. (doi 10.1016/j.neuro.2004.12.006).