

Lead Exposure Through Eating Wild Game



People generally reject the idea of injecting toxic substances into food, except when it involves hunting wild game. Perhaps surprising to nonhunters, up to 95% of hunters use lead projectiles,¹ despite nonlead projectiles offering a suitable alternative (Figure).² The use of nonlead projectiles eliminates lead exposure experienced through eating wild game. Hunters are not averse to using lead-free projectiles: when hunters were given free copper projectiles, 77% used these nontoxic projectiles.³ Physicians are in a unique position to explain the risks of lead exposure to hunting patients and their families and also explain the option of using nonlead projectiles.

Eighty percent of ground meat packages of wild-harvested deer contain lead⁴ and this lead is bioavailable.⁵ Eating meat harvested with lead projectiles increases serum lead levels,^{6,7} and while it has been suggested that the tissue from around the wound channel can be discarded to reduce lead exposure,⁸ there are an average of 356 metal fragments in a deer carcass after being shot with a lead projectile from a rifle.⁹ This is an impossible number of fragments to pick out by hand, especially because some of these fragments are microscopic.⁹ Regularly eating game birds harvested with lead shot may exceed World Health Organization lead intake limits,¹⁰ and regular consumption of large game shot with lead bullets using a rifle is likely to exceed World Health Organization lead intake limits.¹ It is important to keep in mind that the California condor nearly went extinct largely from lead poisoning as a result of scavenging lead-shot carrion.¹¹ Medically, it is clear that eating wild game harvested with lead projectiles increases lead serum levels.

As lead is one of the few substances that does not have a safe level of exposure, it is important to prevent all lead exposure. Lead has negative consequences for nearly every major physiologic system, with the central nervous system being the system classically impacted. Very low levels of lead exposure result in neurologic impairments,¹² and as many as 7.7% of children that eat wild game harvested with

lead bullets will experience a reduction of one IQ point.¹³ That magnitude of a reduction in IQ translates into a decreased lifetime earnings value of between £1319 (2042 USD) and £11,967 (18,528 USD).¹⁴

Particularly because there are readily available suitable projectile alternatives to lead, such as copper,² limiting the use of lead projectiles for hunting is reasonable, and California has moved to ban all lead projectiles for hunting by 2019.¹⁵ Physicians need to be proactive in sharing with their patients the risks of potential lead exposure through eating wild game. Often when I explain to hunters the risks associated with lead exposure, especially when considering their

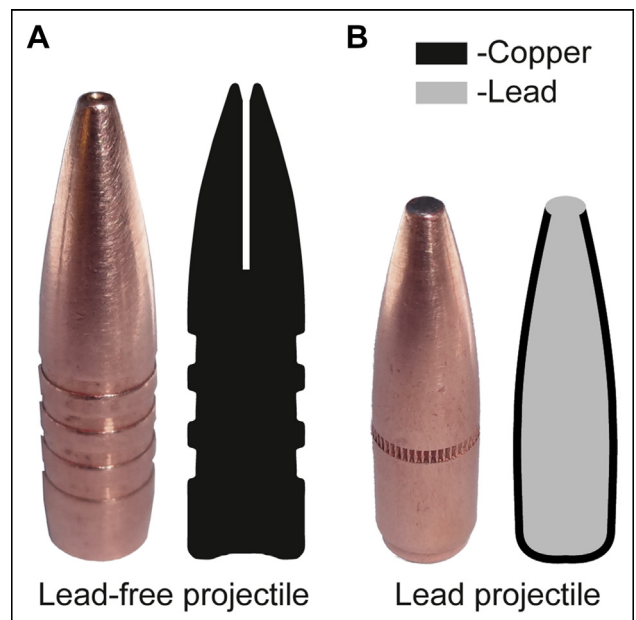


Figure Examples of 0.30-caliber, 165-grain lead and lead-free rifle projectiles and illustrations of projectile cross-section. A typical solid-copper projectile (A) is longer than a copper-jacketed lead projectile (B) for the same caliber because of the greater density of lead than copper. Both projectiles are designed to expand on impact; however, the lead projectile typically disintegrates into hundreds of fragments while the copper projectile retains nearly all of its mass. These lead fragments are the source of lead ingested when eating wild game. Nearly all lead hunting projectiles have a copper jacket to reduce lead fouling of the firearm barrel, which occurs with pure lead projectiles.

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children, their response is, “I have been hunting for years and I am fine.” My response to them is, “but just imagine how smart you could have been.”

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