Health New Zealand
Te Whatu Ora

Health Advice for Indoor Shooters

Lead poisoning occurs when blood lead levels are higher than is considered safe for health. Under the Health Act 1956, blood lead levels greater than or equal to 0.48umol/L must be notified to the Medical Officer of Health by your doctor. This level is considered potentially unsafe for members of the public, particularly children and pregnant women, because lead can interfere with the development and functioning of the brain and other organs in developing children.

Symptoms

The symptoms of lead poisoning may go unnoticed until blood lead levels are very high because they are very common and non-specific. Symptoms can include the following:

- Effects on the brain – mood change (depression, irritability), memory loss, sleep disturbance, headaches, difficulty concentrating, tingling and numbness in fingers and hands.
- Effects on the digestive system – lack of appetite, nausea, diarrhoea, constipation, stomach pains and weight loss.
- Other effects – kidney damage, reduction in sperm quality and number, miscarriage and anaemia.

When to seek health advice

- If you have any symptoms, please ensure that you see your doctor. Your symptoms may not be due to lead poisoning but you should tell your doctor of any lead exposures that you may have experienced, including indoor shooting, so that your doctor can decide whether or not you should have a blood test for lead.
- If your blood lead level is raised, the Medical Officer of Health is notified by the laboratory. An officer from public health will ring you and work through a questionnaire with you to find out how you are coming into contact with lead.
- Using the results of the questionnaire, a public health officer will offer you advice on how to reduce your exposures to lead. We will also work with you and your doctor to manage your blood lead level until it returns to normal. When we find that a number of people are being exposed to lead from the same place, we will offer advice on how the exposure may be reduced so that others are not exposed in the future.

Causes

At home

In the Northern Region, the main causes of lead poisoning in people who are not exposed to lead at work are

indoor shooting; casting of lead bullets, fish sinkers and diving weights; paint-stripping on houses built pre-1980s; and consumption of herbal medicines and Ayurvedic medicines which contain lead. Non-occupational sources of lead exposure are investigated by the public health service.

At work

Various occupations involve exposures to lead and cases of occupational lead poisoning are investigated by the Ministry of Business, Innovation and Employment. Examples of occupations where lead exposure may occur include: painting, smelting, plumbing, panel beating, battery manufacture, soldering, and radiator repairs.

Why indoor shooters are at higher risk

Research has shown that users of indoor firing ranges are at risk of exposure to high levels of lead. Cases of lead poisoning investigated by public health have also shown that indoor shooting is often associated with raised blood lead levels. This is generally because lead fumes and dust generated by shooting may be breathed into the lungs or swallowed, and then adsorbed into the blood. Lead contamination from hands may be transmitted to food items and cigarettes - where it can be swallowed. Lead dust may also be taken home on clothing worn at the shooting range and result in others being exposed at home. It is particularly important not to carry lead home on your body and clothing to an environment occupied by pregnant women and children aged six and younger (who are particularly sensitive to lead poisoning).

Prevention

A number of things may be done to reduce your exposure to lead. There are things that you should do as an individual, and these are listed below. There are also things that those who manage the firing range should do, such as (1) ensuring adequate ventilation so that lead contaminated air flows away from shooters and is extracted safely, (2) ensuring adequate hand washing facilities are available, and (3) ensuring that lead dust that accumulates via shooting is regularly removed using a HEPA filter vacuum cleaner or by wet mopping – these methods prevent lead dust being spread further or breathed in by those doing the cleaning.

Monitoring

If you are a shooter who attends an indoor shooting club frequently e.g. one or more times per week, you should have your blood lead level monitored by your doctor at least once a year. This should be done during the shooting season when blood lead levels are likely to be highest. If your lead level is raised, public health will ring you and help you to identify and manage your exposures to lead.

Hygiene

After shooting you may have lead residues on your hands, other exposed parts of the body, your clothes, and your shooting gear. If these are not cleaned, they will be an ongoing source of lead which you may breathe in or swallow. To avoid ongoing contamination, you should wash your hands after shooting, particularly before eating, drinking or smoking. Contaminated clothing should be put in a plastic bag for transporting home and stored and laundered separately from other clothing. Shooting vests and mats should be washed regularly using a phosphate detergent, and washed and stored separately from other garments. Avoid shaking contaminated garments (which releases lead dust). Hair may be covered during shooting or should be washed as soon as possible after shooting. It is particularly important not to carry lead home on your body and clothing if pregnant women and children may be exposed to lead.

Personal Protective Equipment (PPE)

Some shooting clubs advise the use of masks and other personal protective equipment (PPE) when shooting.

Nutrition

Diet and eating patterns can help in reducing the amount of lead absorbed into your body. Eating before shooting may help reduce lead levels because studies have shown that full stomachs are less able to absorb lead. Foods rich in calcium and iron help reduce the amount of lead that is absorbed from the gut into the bloodstream. Adequate vitamin C levels are also important in increasing iron absorption. Following the diet recommended by the Ministry of Health's *Food and Nutrition Guidelines*[1] will minimise lead absorption by providing adequate levels of these nutrients.

Shooting behaviours

The more frequently you shoot, the more lead you are likely to be exposed to, and exposure will also depend on where and how you shoot, PPE worn, ventilation, and any other activities or behaviours that affect dust levels. Casting of bullets is a particular concern due to personal handling of lead and lead-contaminated equipment; and inhaling lead fumes.

Range cleaning

If you are involved in range cleaning and maintenance, your risk of lead poisoning will be increased due to higher exposures to lead, particularly if these activities result in dust being generated. Follow the advice above and use HEPA filter vacuums, wet mopping and PPE when cleaning.

References

1. http://www.moh.govt.nz/foodandnutrition

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