Lead and Health

What is lead?

Lead is a heavy metal that occurs naturally in the environment. Lead is not required for any normal bodily function. Everyone is exposed to very small amounts of lead in the environment, but certain activities, occupations and areas contaminated with lead can expose people to higher amounts. It enters bodies through breathing air or by swallowing food or objects contaminated with lead. Once in the body, lead circulates in the blood into soft tissues and organs such as liver, kidneys, brain, muscles and heart. If it is not excreted, it can be stored in the bones. Lead can cause a variety of health problems depending on the amount and duration of lead exposure, the age of the person and whether they have other health conditions.

Where is it found?

In Australia, the amount of lead around us has greatly decreased due to the removal of lead from petrol, house paint and other goods. Lead is still used in many industries and the most common source of lead exposure in Australia is at workplaces involving the use of lead compounds. Workers can bring lead residues into their home on their work clothes, skin, hair and equipment after contact with lead.

Around the home, lead may be found in some older pre-Cyclone Tracy houses particularly in the water from old lead pipes, old lead paint chips or dust, curtain weights, imported items such as food or drink containers, jewellery, traditional medicines and cosmetics, solder and brass plumbing fittings and soil contaminated with old lead car batteries. Activities and hobbies that may involve lead include: hunting or eating game shot with lead shot, making or handling lead fishing sinkers or lead ammunition, home renovations, car/boat restoration, soldering, stained glass making and exposure to lead containing fuels (Avgas and some racing fuels). Leaded fuel for road vehicles was phased out in Australia in 2002. However, Avgas is a lead containing aviation fuel still commonly used for piston-engine airplanes. Elevated blood lead levels from volatile substance abuse with Avgas are reported in the NT.

Who is at risk?

Those working in lead risk work are at risk of elevated blood lead levels. Occupations include mining, aviation and radiator repair. Those who are involved with volatile substance abuse with lead containing substances such as avgas are also at risk. Most elevated blood levels are due to longer term exposure to small amounts of lead.

Children absorb up to five times the amount of lead than adults do. Children under 5 years of age are particularly at risk of harmful effects of lead as lead exposure can permanently damage the brain and impair intellectual development. They are especially vulnerable to lead exposure because they frequently put their hands, and held objects into their mouth. Women who are pregnant or those who are breastfeeding are at risk of passing lead onto their child. Iron deficiency can increase the amount of lead absorbed by the body.

Signs and symptoms

Lead exposure can affect people differently and symptoms often depend on the age of the person, whether they have other health conditions, type and duration of exposure.

Blood lead level	Associated health effects
5-10 mcg/dL	Health effects are unclear but may be associated with behavioural problems and adolescent growth delays; decreased foetal growth during pregnancy
10-20 mcg/dL	Increased blood pressure, behavioural problems and learning difficulties in children, abnormal kidney function
40 mcg/dL or more	Early blood abnormalities (anaemia), reduced kidney function, problems with brain function such as mood changes, headache, irritability, forgetfulness, weakness
60 mcg/dL or more	Long term kidney damage, sperm abnormalities, abnormal brain and nerve function – including headache, confusion, seizures or coma.
70-100 mcg/dL (children) 100-120 mcg/dL (adults)	Severely abnormal brain function – irritability, agitation, confusion, seizures, uncoordinated movement, drowsiness, coma. Levels over 100 mcg/dL typically cause death.

Who should be tested for lead exposure?

A blood lead test should be done if there is a concern a person has been exposed to lead. For example, they have been involved in lead-related activities or behaviours that put them at increased risk of lead exposure (e.g. people who work with lead or children who swallow items such as soil). Work Health and Safety Regulations require that those who work in 'lead risk work' are regularly tested for elevated blood lead levels. If a person has a blood lead level greater than 5 mcg/dl, the source of lead exposure should be investigated and reduced, particularly if the person is a child or pregnant woman.

What is the management of elevated blood lead levels?

The key aim is to find the likely source of lead and take actions to remove or reduce future exposure. Environmental risk assessment and testing can be undertaken when there is no obvious source of lead or when there is wider public health concern. Testing of family members or people who may have also been exposed to lead should be considered. The frequency of blood lead level monitoring is dependent on the blood lead level. When blood lead levels are extremely high, admission to hospital for chelation therapy is recommended to rapidly decrease the amount of lead in the body. Monitoring of blood lead levels will continue until levels are deemed safe or until the lead exposure is removed.

Prevention

Removing lead sources is the most effective way to prevent lead exposure. Lead containing items can be substituted (e.g. replace lead shot with steel shot) or avoided. Lead related hobbies or activities should be carried out with care and appropriate safety regulations and practices should be followed to prevent swallowing/breathing in lead and contaminating surrounding areas. Pregnant or breastfeeding women and children under five should avoid being present in work areas during renovation activities. Parents should ensure that children do not have access to peeling paint or chewable surfaces painted with lead-based paint, such as old toys or old furniture (including cots). Washing hands is important in preventing the ingestion of lead.

Related information

Elevated blood lead level - NT Health, https://health.nt.gov.au/health-conditions-and-disease-information/elevated-blood-lead-level

Lead risk notification - NT WorkSafe, https://worksafe.nt.gov.au/notify-nt-worksafe/lead-risk-notification

Work Health and Safety Regulations 2011 related to lead risk work - Work Health and Safety Regulations 2011

Managing individual exposure to lead in Australia https://www.nhmrc.gov.au/about-us/publications/managing-individual-exposure-lead-australia#block-views-block-file-attachments-content-block-1

National Health and Medical Research Council. 2015. NHMRC Information Paper: Evidence on the Effects of Lead on Human Health Evidence on the effects of lead on human health | NHMRC

Contact

For more information contact the Public Health Unit's Centre for Disease Control in your region.

The full list of contacts of contacts can be found at NT Health.

Location	Address	Phone	Fax	Email
Darwin	Ground Floor, Building 4 Royal Darwin Hospital Rocklands Drive Tiwi NT 0810	(08) 8922 8044 1800 008 002	(08) 8922 8310	CDCSurveillance.DARWIN@nt.gov.au
Katherine	O'Keef House Katherine Hospital Gorge Road Katherine NT 0850	(08) 8973 9049	(08) 8973 9048	CDC.Katherine@nt.gov.au
Tennant Creek	Schmidt Street Tennant Creek NT 0860	(08) 8962 4259	(08) 8962 4420	CDC.Barkly@nt.gov.au
Alice Springs	Disease Control Unit Lower Ground Floor Eurilpa House, 25 Todd Street Alice Springs NT 0870	(08) 8951 7540	(08) 8951 7900	CDC.alicesprings@nt.gov.au
Nhulunbuy	Corner Mathew Flinders Way and Chesterfield Court Nhulunbuy NT 0880	(08) 8987 0357	(08) 8987 0500	CDCGove.DoH@nt.gov.au