



Health Effects of Lead

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- The Health effects
 - History of how that knowledge developed
 - Make some points

What are the health effects?

At very high levels

- Damage to most organs – kidneys, central nervous and blood systems.
- Death can occur at extremely high levels.
- Lead toxicity now rare in developed countries

Chronic exposure to lower levels of lead

- renal toxicity – kidney damage;
- disturbances in cardiac conduction and rhythm and increase in blood pressure;
- hepatic damage – liver damage;
- anaemia and other haematological (blood) effects;
- reproductive and developmental toxicity;
- gastrointestinal disturbances.

Major Public Health concern

- In particular, the epidemiological evidence indicates that chronic exposure to low levels of environmental lead can adversely affect cognitive development in children
- IARC – 2A classified as *probably* carcinogenic (definite evidence in animals, some in humans)

Historically...

- Romans knew – lead pipes and lead wine vats
- Mediaeval times / Renaissance – artists & paint
- During Industrial Revolution – metalworkers
 - Chronic lead poisoning
 - well described late 19th century
 - Lead colic (Stomach pains)
 - Anaemia (low blood count)
 - Nervous system and kidney problems
 - High blood pressure, effects on pregnancy

20th Century

- Knowledge translation into legislation was slow
 - People advocating for controls
- Lead added to petrol mid century (immediate problems among workers reported)
- Occupational protection; PPE, wetting dust,
- 2nd half of century started to measure blood levels and try to define safe blood levels
- Lead in paint and petrol removed
- WHO reducing the water lead level during time

Last 15 years

- A level below which lead exposure does not reduce IQ in children, has not been determined
- Low level chronic exposure to micro-doses in adults is still associated with small health effects; kidney, heart, neurological disorders
- 2011 WHO said *it is not possible to establish a tolerable intake that would be considered health protective*

Environmental exposures and adverse health effects

- Evidence often poor or weak or uncertain
 - trihalomethanes
- Some quite recent
 - PM 2.5 μ m (air quality)
- May be a threshold effect Fluoride
 - >1.5ppm
- May have some biological usefulness
 - Calcium and magnesium in water

But...

- There is no uncertainty
 - Meets criteria for causality
 - Consistent, temporal, does response, plausible
- The evidence is not weak
 - Lead is bad for people
- This is not recent knowledge

- There is no threshold (2011)
 - Any lead is bad for you
- It has no benefits / uses in humans
- The effect on CNS is irreversible
- The size of the effect may not be huge at low levels
 - Small effects on large number of people are significant at population level

Bottom Line

- It has to go
- There is no defence for continuous exposure
- No point in discussing relativity
- No point in discussing effect size
- No point in discussing past exposures
- Irelands last challenge lead water pipes
- Public Buildings versus vulnerable public
- Best public health results - legislation

Most sensitive receptor

- Protect the most sensitive population
- Those with developing nervous systems
- Foetus
- Bottle-fed babies
 - Absorb more lead and consumes more liquid
- Young children

Information for consumers

- HSE / EPA Position Paper
- Frequently Asked Questions
- Summary of the Health Position
- Specific advice for schools and crèches



Thank You