



The Lead Education and Abatement Design Group
Working to eliminate lead poisoning globally and to protect the
environment from lead in all its uses: past, current and new uses
ABN 25 819 463 114

Consumer Products and Lead Exposures: Vision for a Lead-Safe World. Incorporating the presentation given by Michelle Calvert at 'Eliminating Childhood Lead Toxicity in Australia - A Little is Still Too Much'

NB: The following numbers at the start of each paragraph relate to the slide numbers in O'Brien for LANv12n4 http://www.lead.org.au/lanv12n4/Consumer_Products_and_Lead_Exposures.ppt

1. *Consumer products and lead exposures, by Elizabeth O'Brien, Manager, Global Lead Advice & Support Service (GLASS), NSW*

Incorporating the presentation given by Michelle Calvert at "Eliminating Childhood Lead Toxicity in Australia – A Little is Still Too Much" Forum at Macquarie University on 5th June 2012.

2. My vision (Elizabeth's vision) is for a lead-safe world, and I intend to work towards achieving this before I hit 85, which is 29 years from yesterday, and the clock is running.

A compatible vision – that lead be only used to make lead acid batteries, which themselves will be recycled to make more batteries, safely – is bound to be out there somewhere in the lead industry, and I plan to engage with the lead industry and government until that dream is manifested.

3. All the evidence I've read suggests that a 'little lead' is still too much for adults, as well as for children. Blood lead levels above 2 ug/dL reduce IQ, and change children's learning behaviour; in adults, the major problem is the increased risk of early death. US research by Lustberg and Silbergeld, 2002, predicts that some 30 million Americans are at risk from early death from lead due to having exceeded a blood lead level of 20 µg/dL at least once in their adulthood.

And from The Los Angeles Times, 2 Oct 2006, I read:

"A study published in the American Heart Association Journal "Circulation" tracked 13,946 adults for 12 years, comparing lead levels and cause of death. It found that those with a level between 3.6 µg/dL and 10 µg/dL were two and a half times more likely to die of a heart attack than those with very low levels [under 1.9 µg/dL], 89% more likely to die of stroke, and 55% more likely to die of cardiovascular disease."

4. To me, it is logical that if you want to achieve lower blood lead levels (in public and occupational health), then standards for lead in consumer products, in food and drinking water and 'environmental media', will also need to be made more stringent.

'Environmental media' are soil, dust, sediment, recreational waters, waste waters, sludge, solid waste, sewage for application to agricultural land, air, marine waters, groundwater, and bore water.

Because I believe that 2 (as in 2 ug/dL) should be the new 10, I propose that regulators work on a 'rule of thumb' that any current standard for lead in food, water, and environmental media be set at one fifth the current standard.

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5. If the blood lead action levels for both children and adults are made more stringent, then the lead levels permitted in all products and the action levels for lead abatement have to become more stringent. This shouldn't just apply to consumer products intended for *children*, such as toys, and clothing. Other issues handled by consumer agencies need to have more stringent action levels: for example, property sale and rental, control and licensing of building and demolition contractors and the paint lead level, which, if exceeded, triggers lead-safe paint removal or management methods.

6. Consumer products containing lead generally affect people of all ages; what is different is the *pathway* of exposure: in children, it is generally hand-to-mouth activity, in adults it is generally inhalation. Skin absorption is generally a minor pathway for all ages.

7. Since reading Professor Winder's 'History of Lead,' and Gilfillan's book, 'Rome's Ruin by Lead Poison', I've been fascinated by the history of lead and consumer products, and especially the fact that so many of them are still out there or even still in trade, where people can come in contact with the lead they contain, today.

8. The Sumerians used leaded lipstick and eye makeup.

9. Well-to-do Romans added lead to wine, to bread and to water via leaded pipes, as well as using leaded pewter plates, cups and utensils - not knowing it would make the wealthiest among them, the leaders, insane and barren – thus bringing about their downfall.

10. Beethoven's chronic illness was from lead poisoning, which probably also contributed to his death at age 57 in 1827. His life-long lead exposure likely came from a range of sources including his favourite food - fish from the Danube,

11. and he used his saliva-wetted finger to make beautiful noises on the mechanically-spinning different sized lead crystal bowl rims of a musical instrument he loved to play called the armonica. Beethoven loved to drink, and many wealthy people at the time used lead-based sugar compounds to sweeten their wine. The pencils Beethoven used would have been true lead pencils (not graphite). As his hearing worsened he would hold one end of a pencil in his mouth and rest the other end on the piano to "hear" the music being played.

12. In 1828, Goya also likely died of lead poisoning, after going deaf and deranged. He heated and mixed lead pigments to make his own oil paints. This later painting of his "dark period" is 'Saturn devouring one of his Children' - which is especially interesting considering that **Saturnine** is a medical term meaning: "Of or affected by lead-poisoning."

13. One of Professor Winder's rather macabre examples of death by lead is that of prostitutes in England and perhaps France in the nineteenth century, eating lead as an abortifacient, for career-destroying pregnancies, all-the-while thinking that the foetus took all the lead, but actually lead poisoning themselves too - which had the side "benefit" that they gave themselves anaemia – for white skin, considered desirable by the clients.

Have we learned from history? Not enough. **The** mistake of the twentieth century, according to Professor Carl Shy, was adding lead to petrol.

14. Lead in consumer products are typically a greater hazard to workers (including waste and recycling workers) than to consumers, and as Professor Winder drums in to his Occupational Safety students, primary prevention is based on the Hierarchy of Controls. Primary prevention, of course, is preventing lead poisoning occurring in the first place.

The 'Hierarchy of Controls' concept dictates that the best measure to take for any lead hazard, is to "substitute the lead hazard with another of lower risk." If only they'd instituted the 'Hierarchy of Controls' in 1921 when workers began to hallucinate, believe they could fly and then commit suicide, in what became known as the 'House of Butterflies' – the Ethyl plant where the lead additive for petrol was first made.

15 Replacing lead in petrol at that time with a safer alternative, would have saved society an estimated US\$2.4 trillion **per annum**, according to a United Nations study.

"A comprehensive study has confirmed that the phase out of leaded petrol contributes US\$2.4 trillion (4% global GDP) to the global economy; this monetary saving is calculated by measuring social benefits such as heightened IQ levels and reduced criminality, as well as health savings from afflictions such as cardiovascular disease. This global effort to end the use of leaded petrol also translates to 1.2 million fewer deaths per year." [Reference: <http://www.unep.org/transport/PCFV/news/hatfield.asp>]

16 Primary prevention policies such as substituting non-lead alternatives in consumer products, is the thinking behind the Perth Declaration's. Let's take a quick look at how that's going.

17 Lead as a colorant or to add weight to food, folk medicines, herbal remedies, illicit drugs and cosmetics: these uses of lead are probably banned in most jurisdictions, yet examples abound because poverty has not been eradicated and lead is the cheapest pigment or weight that can be added, as it is so easily retrieved

18. from discarded used lead acid batteries, etc – even a child can do it.

19. Lead in paint

The US was the first country, in 1978, to limit lead in house paint to such a low level as 600 parts per million (ppm). Australian residential paint was limited to 1000 ppm in 1997 and remains with that limit today. However, in 2010, Australia set a global precedent by banning the addition of lead compounds to paints of all kinds except artists' paints (automotive, industrial, residential, road-marking, etc) and no country has yet matched that ban. No country has banned lead or other heavy metals in artists' paints.

Sadly, 2.5 billion people still live in countries where there is no limit on the amount of lead in any kind of paint, which is equivalent to Australia's residential paint standard prior to 1970 and our industrial paint standard prior to 2010. In 1962 a Sydney boy died from eating house paint that was later tested as containing 84% lead.

Such astronomical amounts of lead in unregulated paint is the reason the Global Alliance to Eliminate Lead in Paint was set up by the WHO and the UN Environment Programme, in 2009.

The US EPA's residential lead paint management policies, are world's best practice, and point the way to an eventual global ban on lead in all paints, and in the management of historical lead paint. Measures include blood lead testing for all children under Medicaid between the ages of 1 year and 6 years, a new 90 ppm lead limit for new house paint, 5000 ppm lead trigger level for paint abatement, lead certification of contractors and inspectors, and mandatory disclosure of lead hazards in housing for rent or purchase.

20. Pesticides

Lead arsenate pesticide, according to the internet, is still manufactured in China, and has probably not been banned outside of Western countries.

Again, the US leads the way in notifying people purchasing or living on land previously sprayed or contaminated with lead arsenate. A recent double murder trial in Kentucky was delayed in order to investigate whether the defendant was poisoned by lead, arsenic or other pesticides manufactured near where he lived as a child.

21. Petrol

Without a doubt, eliminating leaded petrol is the most important way to lower a population's blood lead level, as seen in this US graph, as lead in gasoline dropped, blood leads plummeted.

22. A global ban on leaded petrol was the motivation for the first leaded consumer product action taken by the United Nations. In 2002 Rio+10 Summit agreed to setting up the Partnership for Clean Fuels and Vehicles (PCFV) which has as its primary goal the elimination of leaded petrol.

As of June 2011, there remained 6 countries still selling leaded petrol but as one of the Partners, The LEAD Group, has gained the cooperation of one Australian lead mining company this year, such that their Australian lead is no longer being used to make leaded petrol.

Leaded petrol vehicle emissions fallout lives on in our soils, building dusts (house dust etc) and in building cavities (cavity dust or ceiling dust), and in our waterways as contaminated sediments – both ceiling dusts and harbour sediments have been found to contain “mineable” levels of lead – i.e., sufficient lead, more than 1.5% to justify recycling building cavity / ceiling dust or sediment for the lead content. This petrol lead, if not first safely removed, is released back in to the environment each time a building is demolished or into the water and aquatic biota when a waterway is dredged. Petrol lead is the most widespread cause of lead-contaminated soil and lead is the most common contaminant found in soil.

23. Soldered Food Cans

Lead-soldered food cans are not banned in Australia and are probably not banned in most non-Western countries, although their use has declined with new canning technologies.

24-28. Control of lead in children's consumer products

24 Australia and most other countries have banned lead toys for children, although lead toys are still on sale in India and no doubt other countries.

25 In recognition of the fact that children are exposed to lead in more than just toys and children's clothing, the US has legislated a lead limit for children's products. Because of their high product lead testing rates, more leaded children's products have been recalled in the US than in any other country.

26 Leaded jewellery has a long history and a recent US child fatality caused the largest product recall (highest number of items sold and then recalled) in history – 150 million leaded heart charms.

27. Hopefully, with the new blood lead reference level the US leaded ceramics standard will be made more stringent. It is only after other jurisdictions make changes to their standards that Australia changes our standards.

28. Other consumer products and waste and recycling

Most leaded ammunition is never recycled, as it disintegrates during flight and is so hard to retrieve.

29. For flat non-vegetated terrain such as outdoor shooting ranges, an Australian invention is available for bullet retrieval and lead recycling – the Green Machine.

30. European legislation is leading the push for lead-free electronics and electrical appliances, and the changeover to flatscreens is slowly ending the era of leaded cathode ray tube (CRT) TVs and computer monitors. Their recycling is usually done lead-safely in Western countries, but causes mass lead and other heavy metal poisoning in poorer countries, where most Western CRTs are recycled.

The basic problem with leaded products is that putting them into an environment is easy, collecting them is not.

The larger the item, the more collectable and recyclable it is. It is, in this sense, easier to deal with. The items are visible – some are highly visible, like lead flashing or radiation shielding – and can be more easily isolated from human contact, although in poorer countries, the black market is dominant in lead recycling activities.

31. Cigarettes

It will surprise some people to learn that cigarettes contain lead, although the lead is not purposefully added. When leaded petrol is finally banned, I predict that cigarettes will move up to first place as the most effective disseminator of lead to humans.

Lead workers who smoke typically have twice the blood lead level of non-smoking colleagues that they work beside. Children of people who smoke in cars and homes always have a higher blood lead level than children of non-smokers.

Warning labels on cigarette packets should suggest that smokers get blood lead testing whenever they're having their blood pressure checked.

It is a delusion that if you smoke outside, you're not doing any harm. You are contributing to lead in the environment.

Lead in a product should legally require a health warning, especially if it is *Intentional addition of lead*, as with California's Proposition 95, which requires health warnings for even low levels of lead, whether accessible or not, such as the lead in PVC cabling and mirror backings.

A specific warning on, for instance, leaded electronics solder, should stop it being used as plumbing solder, whereas currently leaded solder is not sold with any warning in Australia.

32. Such warning regulations are also essential for some non-leaded products which can be used to create lead hazards e.g., paint sanders, heat guns, angle grinders, sandpaper and blowtorches.

What needs to be done?

First, national blood lead level surveys for all ages.

When I look at the USA, I see that their motivation to regulate and manage lead, derives from their practice of periodically testing for blood lead levels in their population.

Carrying out national blood lead level surveys of all ages is the essential first step in lead management. *If you don't know what you've got, you won't know what to do about it.* Or, as Professor Mark Taylor says: "to government, no data equals no problem."

33. Second, returning to the theme of all the lead in the world eventually being used *only* for the production of lead acid batteries, watch the battery use in these three slides of global lead use in:

1970,

34. 1990

35. Lead use 1990s

We need to stop the sale of lead for use in products where the lead is highly dispersible and difficult to retrieve.

36. The first of these products is, of course, leaded petrol, followed by lead in paint. Next would come PVC, chemicals, folk medicines, cosmetics, explosives, brake pads, lubricants, solder, leaded putty, ammunition, sinkers, jewellery, wire, wheel weights, curtain weights, bottle tops, wine bottle lead foils, etc.

37. A new on-line Substitution Portal, 'Subsport' is a database of substitutes for various chemicals, including 451 lead-based chemicals.

One case study on the site lists substitutes for lead in sugar refining. Can all of you here add as many lead substitute case studies as you can, so that the site becomes really useful?

38. A further step would be to assist lead-importing countries to introduce lead recycling initiatives and to ensure that the only leaded products that are manufactured are those for which there are programs in place to collect and recycle the products.

Australia currently does not permit the export of used lead acid batteries for recycling, because with the opening of the Renewed Metals Technology (RMT) plant at Wagga Wagga, there is now sufficient capacity that we no longer need to recycle some of our batteries in New Zealand, has closed. Why can't Australia exercise more control over lead exports where it is needed more?

Controlling the use of Australian lead which is exported

I would like Australian lead ore or concentrate to **not** be permitted to be exported to any country where the lead will be used for the most dispersive uses of lead, i.e., petrol and paint/ink; but we also should be able to license lead exports such that our lead cannot be used for uses that are not permitted in Australia: e.g. lead arsenate, leaded cosmetics, leaded foodstuffs and folk medicines.

A further step would be to assist lead-importing countries to introduce lead recycling initiatives and to ensure that the only leaded products that are manufactured are those for which there are programs in place to collect and recycle the products.

Thirdly, we need regulation of consumer products and lead abatement activities. Regulation is essential, no matter how much you tell yourself, "She'll be right, mate." When State Governments began to license asbestos removal contractors, in public perception, asbestos was elevated to a hazard that could not be ignored.

39. In the US, Federal lead paint removal and inspector licensing has put lead on a par with asbestos. Every country needs this licensing, and for countries like Australia where buildings were built for ventilation and have thus accumulated fine respirable air pollution fallout, ceiling dust removal contractor licensing is also essential.

Lead batteries are not the only use of lead in vehicles. Vehicles contain up to 17 lead products and sometimes even the battery is not removed prior to recycling the vehicle.

40. While most people believe that the most polluting period of a vehicle's life occurs while it is being driven, this is far from the truth.

41. When you consider that fossil fuels are a finite resource and we're on the downside of the peak oil graph and

42 a car causes more pollution before it's ever driven than in its entire lifetime of driving, then you can't help but realize that we need to switch to the manufacture of vehicles powered by renewable energy, with an emphasis on mass transit and we need to stop making vehicles which run on petroleum fuels.

As well as the focus in the transition economy being on mass transit vehicles and renewable energy, reduced air travel and vehicle kilometres travelled (VKT) per person and reduced consumerism generally (growing your own organic food or buying locally grown food) will be the order of the day. This is an intergenerational equity and an environmental justice issue: on one hand about using up finite resources by making more motor vehicles until there's no more oil to run the extractive and manufacturing industries, or the vehicles; and on the other, by leaving a planet for future generations which is littered with lead pollution and dead motor vehicles.

43 Instead, if like me you really like coffee, then start growing your own, (that's coffee on the left) as well as herbs, and

44 replace the lead flashing on your roof with non-lead flashing, clear all other lead sources from the roof rain collection area and plumbing, and install a rainwater tank; and obtain non-lead contaminated soil and plant all your favourite vegetables and

45 especially plant fruit trees – because they take so long to fruit, and

46 learn to tend them without lead arsenate or petroleum pesticides or fertilizers,

47 but with a little forward planning.

48 And ride your bike more and don't buy a new car ever again!

If all the used lead in the world were gathered up, and lead battery technology improved, there would be sufficient lead to make batteries for mass transit vehicles powered by renewable energy and for other lead acid battery-powered engines and devices - for ever.

49. This is the future of road transport.

50. This is the future of air travel.

51. And so as not to waste all the old aircraft when the fuel to fly them runs out, here's a plan to use the carcasses for mass transit.

52. And here's another solar mass transit option: a solar roadway – we'd just have to divert all the oil we have left to making the solar panels!!

53. These are not all just pipedreams: here's a partially solar-powered gondola lift.

54. By the time the aliens fly by, rather than this: pear-shaped Earth], let's show them

55this: a well-informed, well-regulated, lead-knowledgable World - a Lead-Safe World.

56 As a first step The LEAD Group has embarked on developing a new set of partnerships – for our Lead-Safe World Project – to be sponsored by organisations who are making a difference – selling non-lead products or providing lead-safe services or training.

Check www.lead safeworld.com regularly for updates.

Today we have two founding partners,

57-58. The National Painting and Decorating Institute (NPD)

59. and ADRA. Next month - how many lead-safe product and service providers will have joined us?

We'll begin with business partners in our region and expand out in future steps, to provide invaluable links and straightforward actionable information for people on every continent, until we've covered the planet.

60. Of course the site will feature one consumer product that every home should have - a LEAD Group DIY-sampling lab analysis lead kit for testing consumer products and all environmental media for lead!

61. Acknowledgements

References and Suggested Reading/Videos:

Cradle to the Grave, Umweltund Prognose-Institut Heidelberg, 1993. [Slides re: "The Environmental Cost of One Car"]

<http://leest1.wordpress.com/2011/05/17/peak-oil-2/> [Slide peak oil graph]

Video of the danger of lead from Painters.edu.au (NPDI website), there are 5 videos available:

<http://www.painters.edu.au/Training-Resources/Lead-Paint.htm>

Green Machine in action:

<http://www.lead.org.au/lanv7n1/L71-10.html>

E waste Report:

<http://www.lead.org.au/bblp/bblp.html>