



**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

## **The Problems Schools and Childcare Centres have with Lead**

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### **The health effects of lead**

Research over the last two decades has found that lower and lower levels of lead have unacceptable effects on sensitive populations such as children. For this reason, and because lead is among the most widespread of all toxins, lead has been declared the number one priority of internationally cooperative lead risk reduction activities by the OECD (Organisation for Economic Cooperation and Development). Lead tops the list of 20 Priority Toxins from the US ATSDR (Agency for Toxic Substances and Disease Registry). In the United States, childhood lead poisoning is the number one environmental health problem today.

The health effects of lead extend beyond effects on IQ. Effects on learning behaviour affect educational outcome and are long term (see overhead projections 1-3).

To conclude this section on the health effects of lead, lead has unacceptable effects, especially on children, at even low blood lead levels which is why the National Health and Medical Research Council (NHMRC) declared in 1987 that blood lead levels should be as low as reasonably achievable, and in June 1993 that the goal for all Australians was to have a blood lead level less than 10 µg/dL [micrograms per decilitre] with particular urgency in reaching this level in 0 - 4 year olds. In November of 1993 the "NHMRC set a target date for the reduction of lead in all Australians to less than 15 µg/dL by the end of 1998, with the exception of occupational exposures. Strategies in place to achieve this first target should be such as to result in blood lead levels in 90% of children between 1 - 4 years below 10 µg/dL by the end of 1998.

### **Lead in Schools and Childcare Centres - Case Studies and Guidelines**

No-one has done the research which would show whether, generally, children are at greater risk of exposure to lead from their child-care centre/school than from their home, due to lack of government funding for such research proposals. Nor has any case of childhood lead poisoning been proven to have solely been the result of the child's attendance at a particular school or centre (such a conclusion would cost several thousands dollars to prove and the proof may need corroborative evidence). However, we are at the stage in Australia where it's simply a matter of time before a compensation claim is made against a learning or child-care institution. It would be just as difficult for an institution to prove that their lead hazards were **not** responsible for the lead poisoning of a child, due to the ubiquitousness of lead.

In the late 1970's it was wrongly thought that school-aged children were the most at risk of childhood lead poisoning and it has taken much effort to shift the priorities for preventative activities to the more at-risk 6 - 48 month olds. But the testing of school children's blood lead levels in 4 schools in and around Sydney in 1978 at least had the effect, eventually, of bringing about the introduction of unleaded petrol in 1985 with a resultant gradual decline in **average** blood lead levels of the whole population.

Another blood lead study in the 1980s in Sydney found that children's blood lead levels were higher the closer they were to the city (the nexus of traffic) and the older their suburb (with resultant high soil and dust lead levels).

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The next important study of blood lead levels in Sydney was the Mort Bay Study of 50 children in Balmain in 1992, which found that, in this typical yuppie inner Sydney suburb 50% of the 9 - 48 month olds had a blood lead level above 10 µg/dL while 12% had a blood lead level above 15 µg/dL. Insufficient children had been tested to make any conclusions about whether the lead was sourced in the children's homes or their child-care centres, but the following trends were noted.

"Five of the 26 children who attended a form of childcare, spent more than 50% of their waking hours away from home, however, all 5 had blood lead levels below 10 µg/dL.

"It is important to note that 4 of the 6 children with blood lead levels above 15 µg/dL spent nearly 100% of their waking hours at home."

But even if the general urban trend is that the more time a child spends at home - the higher their blood lead level, there can always be exceptions. So, when a group of parents from a childcare centre in the Rocks, a stone's throw from the Harbour Bridge, started testing their children's blood lead levels, it quickly became apparent to the company, that they needed to act swiftly to remove a range of lead hazards built up over decades from the two major sources - paint and petrol. Swift remedial action saved this centre from losing customers, but at another inner city school, after preliminary testing the response seems to have been to hide their head in the sand and then wonder why class sizes were falling. In the inner city the general community awareness is now too high for this kind of approach to be successful and any school which consults with parents and openly tests for lead contamination and responds appropriately using safe remediation techniques, will reap the benefits of gaining the trust and cooperation of parents.

The next case study is from a point source lead-contaminated community, and is a sad reflection of the power of a lead industry to split community opinion through the simple fact that many who live in the community work for the company. This is not a phenomenon which one has to deal with in the typical lead-contaminated urban community, so I'll only describe it to make clear the point that the school attended can definitely be correlated with the blood lead level of children. In 1992, three schools around the Pasmenco Lead Zinc Smelter at Boolaroo near Newcastle were tested for their lead contamination. The closest school to the smelter, Boolaroo public school had the highest contamination with lead in soil up to 11 times the recommended level of 300 ppm (parts per million). When parents asked for their children to be shifted to Speers Point school a kilometre away the Education Dept refused and other parents verbally abused the unhappy parents in the playground. Even though blood lead testing by Rosemary Aldrich's team at Newcastle Environmental Toxicology Unit, found in 1993 that children who lived at Boolaroo and attended school at Boolaroo had an average blood lead level of 15 µg/dL, those who lived at Boolaroo and attended school outside the area, averaged 9.5 µg/dL. (See overhead projection 4). Arguments still rage between the Education Dept and the parents as to whether the school contamination is entirely to blame, or whether it's simply that parents who are content to send their children to a contaminated school are more likely to keep their houses in less hygienic conditions.

Sensibly, after finally gaining funding, the Broken Hill Lead Management Project, has already tested soil and paint lead levels in every school and child-care centre in the heavily contaminated lead mining town of Broken Hill. A further audit of dust lead levels and dust accumulation rates will take place shortly, to be followed by recommendations made by the Environment Protection Agency to the Dept of Education, including consultation for the Dept of Public Works which carries out cyclic maintenance in schools. One major remediation effort will be the planting of sufficient arid vegetation to stop ground level transport of contaminated dirt in the windy season, which especially impacts on pre-schoolers blood lead level.

With over 1000 carcinogens in vehicle exhausts, it's no wonder that the issue of the siting of new childcare centres on busy roads is creating so much controversy.

Recently, draft guidelines for Local Approvals of Childcare Centres have been prepared by the Local Government Association. Under these guidelines environmental site assessment must be provided by the applicant and must demonstrate that the site is a safe distance from hazardous industries and "safe from any other environmental health hazards such as high lead levels." This second point raises the question of whether air, or soil and dust samples will be used to determine the level of lead hazard. Air samples alone will not be adequate if there has been a build up of lead at the site and the soil is contaminated. Children using the centre still risk lead poisoning, particularly those between ages 1 and 2 with their high amount of hand to mouth activity.

The guidelines also state that "Sites such as old service stations are inappropriate for the establishment of child care centres." Although clearly a desperately needed guideline for child care centre approval the appalling situation of existing childcare centres on old service station sites needs to be rectified.

Paul Ellercamp, the chair of the Kirrawee Precinct Committee in Sutherland Shire in southern Sydney, stated that two childcare centres were approved on old petrol station sites in the Sutherland Shire. One case was not approved by the Sutherland Council only to be approved by the Land and Environment Court, and the second was approved by the Council. It is located in an industrial area with astroturf placed over the tarmac. "Not even a new shelter was provided for the kids who are now consigned to this place every day, alongside the roar of trucks and cars and amidst their fumes, in the baking sun."

A recent press release from the Sutherland Shire Council relating to the location of child care centres did not mention banning them on the sites of old petrol stations. Their concern appeared to be mainly with locating child care centres on busy roads. Although this concern is to be applauded, their proposal to use air lead as a determinant of planning approval (even if taken in 'peak hours of traffic') misses the point. The vast majority of old petrol station underground fuel storage tanks are known to leak, thus contaminating soil and groundwater with volatile organic compounds as well as lead.

There are no specific rules to assist authorities assess the lead or other toxin contamination of a site.

Sutherland Shire Council recently adopted a resolution (an interim measure until a formal policy can be adopted) saying it would no longer approve child care centres on heavily trafficked roads until a full risk analysis of lead and other airborne contaminants has been completed. We hope they won't be missing soil and dust lead. If the lead is already there, the airborne lead is just adding to the contamination. Lead is just one reason not to have child-care centres on busy roads. For the full story, the Total Chemical Committee's fact sheet on "Air Pollution from Motor Vehicles in Sydney" can be purchased from the Total Environment Centre.

Most recently, Hornsby Council has made a landmark decision to **not** approve a new child-care centre because it was on a busy road. I look forward to the day, when residual lead contamination of paint, soil and dust is a criterion for approval or otherwise of new child-care facilities.

While not mentioning lead specifically, the Locational Requirements for approval of new child-care centres by Brisbane City Council, state that it is desirable for centres to be located on roads carrying less than 15,000 vehicles per day...and should be located so as to ensure that the children and staff are not exposed to air of unacceptable quality. The stipulation that "Maximum concentrations of air pollutants should not exceed those recommended by the NHMRC" might be adequate if the NHMRC's ambient air lead standard was not (arguably) ten times higher than is justified by the new lower blood lead goal.

Brisbane City Council guidelines do improve somewhat on the draft Local Govt Guidelines for NSW, by also stating that "The site that is the subject of a child care centre application is not to have soils that are contaminated by pollutants which represent a health or safety risk to children."

On the subject of research into lead risks at schools, a school on a busy road at Strathfield, and several other schools are being tested by Brian Gulson's team of researchers from the CSIRO Division of Exploration and Mining, who are attempting to determine the extent of lead contamination of classrooms by lead from petrol, and its impact on children's blood lead levels.

## **The Benefits of Pro-Active Government Policies on Lead**

It has long been acknowledged in the United States that if the Government takes pro-active steps to prevent childhood lead poisoning in publicly or government-owned, -funded, -quality-assured or -insured premises frequented by children then they will save money, not only on compensation pay-outs, but on medical expenses and special education costs for all the children who's health and learning potential were unnecessarily affected by this entirely preventable disease. This policy of prevention has only recently begun to permeate the policies of Australian governments, even though the benefits massively outweigh the costs in dollar value, and are in many cases, obvious.

## Responding to lead problems has a multitude of benefits, including:

- ◇ smarter children with less attention deficits, greater reading ability, more success at school;
- ◇ improved personal and institution hygiene which guards against illness (especially infections and asthma) and poisoning by other toxins such as pesticides;
- ◇ improved nutrition in order to decrease the absorption of lead, will also ensure lower rates of anaemia and other nutrition-induced health effects;
- ◇ safe removal of old paint in order to decrease lead hazards in the classroom / playground, and repainting creates a more aesthetic school / childcare environment;
- ◇ covering bare soil in order to limit the common soil exposure route for lead poisoning of children, contributes to the greening of the child's environment;
- ◇ if child-care premises and schools are made lead-safe, governments set a good example to the rest of the community in taking responsibility for a preventable health problem;
- ◇ if child-care premises and schools are made lead-safe, parents can feel confident that their government cares about the educational outcome of the institutions it funds or assures the quality of, or approves. Also, parents can confidently discount the educational/child-care institution as a source of lead, should their child become lead-poisoned;
- ◇ legislation for compulsory lead-safe certification of child-care premises enables Local Councils to feel secure when they give approval for new child-care centres;
- ◇ legislation to ensure that all schools, child-care centres (and all publicly owned buildings frequented by children) are lead-safe, encourages the development of a lead abatement industry thus reducing unemployment;
- ◇ inclusion of lead-safety as a criterion in Commonwealth Department of Community Services quality assurance certification for child-care/educational premises, gives parents confidence in the quality assurance process;
- ◇ legislation to make it a requirement of entrance to child-care outside the home, or pre-school, that the child have a blood lead test, **if the centre is in a high-risk area (eg in inner Sydney or around lead mining or smelting operations)**. This requirement would ensure that blood lead testing in high-risk areas becomes as common as immunisation (also required), thus raising community awareness of the benefits of blood lead testing. Additionally centres can protect themselves against false claims such as, that the centre was responsible for the elevation of a child's blood lead level after the child began attending the centre;
- ◇ legislation to make mandatory the certification of lead abatement contractors and assessors gives consumers faith that their government is looking after consumers' interests;
- ◇ phasing out lead from petrol makes clear the need to legislate to control for other toxins in vehicle emissions;
- ◇ taxing the production of lead either from mining or secondary smelting (recycling) creates a fund for lead abatement of publicly owned housing and educational institutions, and for low socio-economic housing and encourages research into alternatives to lead in products where lead is not essential;
- ◇ legislation to reduce the ambient lead in air standard protects the health and learning potential of residents around lead mines and lead smelters, as well as children living or spending large amounts of time within 10-20 metres of busy roads, and gives everyone the confidence that the health of a minority is not being sacrificed for the sake of export dollars; [Write to state and federal health and environment ministers to ask why the ambient lead in air standard has not been revised since 1979, even though the blood lead standard has dropped to one third of its 1979 level, and the proposed Californian air lead standard is one tenth of our current standard.]
- ◇ if governments set action guidelines for soil lead levels, soil lead testing then becomes worth doing, and everyone knows what to do about contaminated soil;

- ◇ solving lead problems makes communities and governments better at solving problems of other toxins and issues of environmental justice generally. Indeed, the recently published "International Action Plan for Preventing Lead Poisoning" states that "Lead poisoning has been recognised as a core environmental justice issue in the US almost from the beginning of the movement";

## What Can be Done at Schools and Childcare Centres?

Due to the failings of government, actions by parents in the management of lead, become the most important factor in whether a child is lead poisoned or not. In schools and childcare centres, the paid workers act *in loco parentis* ie, in place of parents, and hopefully with the high level of motivation which is required to ensure that children are not lead poisoned and that they thus will reach their learning potential.

### Management of Lead:

#### Lead Flow Chart for Children

**Petrol** ↘

**Paint** → **Surfaces** → **Hands** → **Mouth** → **Blood** → **Bones & Teeth**

**Industry** ↗

#### Actions Teachers and Carers Can take to Cut the Flow of Lead in the Lead Flow Chart

Whether the source is petrol, paint or industry, the major pathway of childhood lead poisoning is via children's hand to mouth activity in areas of high lead contamination of soil and dust, or during leaded paint removal. Therefore, if you are responsible for children between the ages of 6 months and 4 years (the highest risk group for lead poisoning and the most sensitive population to its effects), or for children aged 4-7 years (the second most at-risk population), or for children of any age with pica (ie who eat non-food items, eg some developmentally delayed children) you should consider the following effective preventative actions:

#### **Petrol → Surfaces**

- ◇ Raise awareness amongst staff and parents that everyone should check whether their car can use unleaded petrol;
- ◇ Encourage the reduced use of cars at your school or centre, by holding a Car-free day or organising such things as ride-sharing and walking buses (one adult in charge of walking several children who live close to each other, to the centre or school), etc;
- ◇ Encourage low polluting practices such as insisting that parents turn off their car engines when dropping off or picking up students, if the process is going to take more than 30 seconds. The fumes outside schools or centres can be radically diminished in this way.
- ◇ Consider ways of protecting children from traffic fumes (and noise) if the school or child-care centre is within 10-20 m of major roads, eg; double glazing windows on the road side and only opening the windows away from the roadway, for fresh air, having children sleep, eat and play as far away from the road as possible by using the protection afforded by the building, brick fencing or dense vegetation;
- ◇ Nominate your school or child-care centre to be part of the CSIRO study into the extent of lead contamination from petrol and its impact on blood lead levels. Lobby government agencies for the necessary funding for the study.

## **Paint → Surfaces**

- ◇ Test for lead in any pre-1970 deteriorated paint;
- ◇ Use barrier methods and consistent clean-up until safe removal can be organised during cyclic maintenance;
- ◇ Ensure that the Education Department or your school or centre management negotiate a contract with a professional renovator with experience in lead abatement to remove lead paint hazards, guaranteeing no dispersal of lead, and approved disposal of debris;
- ◇ Protect children, women of reproductive capacity and pets from renovation works by carrying out the renovation / decontamination work opportunistically (ie on holidays or weekends).

## **Industry → Surfaces**

- ◇ Schools and child-care near lead industry should be subject to planning restrictions, and only permitted to remain if testing finds, especially air lead levels, sufficiently low for protection of human health;
- ◇ Work with the community to raise awareness about childhood lead poisoning, and lead by example in the management of lead if your school or childcare centre is around lead industry.

## **Surfaces → Hands**

- ◇ Arrange a lead hazard assessment of the premises if the building is pre-1970, or is near a busy road or a lead industry. The assessment should be carried out by a domestic lead risk assessor, who understands the habits and sensitivities of children, not an industrial lead risk assessor who is used to protecting the health of workers or other adults. Take the advice of the assessor in immediately removing lead hazards by safe methods, and then in developing cleaning and ground maintenance routines which ensure there is no recontamination, eg:
  - ◇ Wet down and then remove old carpets, replace with washable hard surfaces;
  - ◇ Wet wipe all hard surfaces children may contact, at least fortnightly, preferably twice weekly;
  - ◇ Stop track-in of dust;
  - ◇ Cover bare soil;
  - ◇ Mop paths, verandahs;
- ◇ Before purchasing a property for use as a child-care centre, if it is likely to be lead contaminated, have a lead assessment done and negotiate a fair price for the property, taking into account the cost of removing lead hazards.

## **Hands → Mouth**

- ◇ Institute or review current hygiene procedures to ensure the following occurs:
  - ◇ Wash children's hands or oversee their washing constantly, especially before eating and napping;
  - ◇ Use a brush to clean under fingernails;
  - ◇ Don't allow children to eat away from the table;
  - ◇ Pin dummies to clothing;
  - ◇ Ensure supervision sufficient to prevent children eating old paint or contaminated soil;

## **Mouth → Blood**

- ◇ Institute or review current nutrition policy to:

- ◇ Ensure adequate iron, calcium and zinc in the diet;
- ◇ Stick to the good food pyramid;
- ◇ Ensure children have frequent small meals, especially before playing in the morning or after nap-time.
- ◇ Provide breakfast if you suspect that some children arrive at the centre without having eaten breakfast.

### **Blood → Bones and Teeth**

- ◇ Fruits with lots of pectin eg apples and pears, MAY reduce blood lead levels. Eating them certainly can't hurt.

### **Where to get further advice**

A Lead Reference Centre was promised for Sydney by the outgoing Environment Minister Chris Hartcher, by early 1995. The latest estimate of its opening date is 1st July 1995. In the meantime you can try ringing the Environment Protection Authority in NSW on 131 555, or the federal Environment Protection Agency on 1 800 803 772.

The Community Lead Information Centre, run by The LEAD Group has an excellent library and telephone counselling and advice service, plus a quarterly newsletter "LEAD Action News." They can be contacted on (02) 9716 0014.

The May 1995 edition of CHOICE Magazine has a very worthwhile article on lead.