Lead poisoning in children

The case history of lead poisoning presented by Pascal Lavoie and Benoit Bailey[1] illustrates the surreal state of political responses to this issue in Canada today.

The authors assert that lead poisoning is now rare in Canada,[1] but there are almost no current data on this problem. The last national pediatric blood lead survey of Canadian children took place in 1978,[2] and the few regional surveys conducted in Canada since then have revealed elevated blood lead levels in 2% to 11% of children tested.[3,4] Lack of reporting of a problem does not prove its absence.

While paint is the primary source of lead exposure in Canada,[5] there are other significant sources, including household drinking water (via lead plumbing fixtures), contaminated soil, maternal stores, consumer products and game contaminated with lead shot.

Today, in 2004, there is still no Canadian standard for "safe" interior lead dust levels in housing. At the 1997 G-8 Summit in Denver, Canada was an official signatory to the Declaration on Children's Environmental Health, which called for further reductions in maternal and child exposure to lead. Now, 7 years later, Health Canada's Consumer Product Safety group is finally developing a lead risk reduction strategy to address the hazards of lead in consumer products.[6] However, scant attention has been paid to lead exposure through housing.

In 1994 the Health Canada report on blood lead intervention levels and strategies[7] recommended that "investigations be carried out to assess the existence and extent of undue exposure to lead in paint in dwellings in Canadian cities." Ten years later this recommendation has still not been followed.

We need to do more to protect future generations of Canadians than simply identify lead-poisoned children on a case-by-case basis. We need a national system for collecting, monitoring and reporting data on pediatric lead poisoning, and then we must act to eliminate the problem.

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Pascal Lavoie and Benoit Bailey[1] report that paint scrapings from the home of a young child with elevated blood lead levels were less than 0.5% dry weight, which is considered "lead-free" in Canada. However, far from being "lead-free," 0.5% lead is the same as 5000 parts per million, plenty high enough to elevate a child's blood lead level. The "lead-free" standard in the United States is 600 parts per million, established by regulation in the late 1970s.[2] Canadian paint manufacturers have generally followed the US standard, but as of March 2004 Canada had yet to pass regulations,[3] proposed in 2003, that would see the adoption of the standard that the United States put in place over 25 years ago.[4]

Another useful comparison is the residential soil replacement guideline in Ontario. Soil with a lead concentration over 200 parts per million is considered unsafe for children because it can contribute to elevated blood lead levels.[5] It is certainly advisable to look for other sources of lead in a child's environment, but when there is clear evidence of pica, you don't need to look further than the paint in a home built in the 1950s. Indeed, houses built until the late 1970s should be similarly suspect. Nor can we rely on the effectiveness of standards established under Canada's antiquated *Hazardous Products Act*.[6]

The global dimensions of the problems of environmental lead exposure are summarized by Tong and associates.[7] Although the problem is even worse in developing countries, lead remains a concern worldwide. The long history of lead use in a wide variety of applications has created a vast reservoir (including paint), and awareness and preventive action are needed to minimize exposure.

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[One of the authors responds:]

Lead exposure in children is equivalent to alcohol exposure during pregnancy: there is no safe dose. No threshold value (below which lead has no apparent effect) has been identified.[1] Warren Bell and Kelly O'Grady are certainly right in saying that we have no recent data on lead levels in Canadian children. When we mentioned in our article that lead poisoning was rare in Canada,[2] we should have specified that this statement refers to cases requiring chelation therapy. Through discussions with medical toxicology colleagues working in Toronto and Montréal, I was able to identify only 7 cases in the past 10 years in which children required chelation for lead poisoning in those 2 cities: 3 children who were poisoned by unknown sources,[3] 2 children who had recently immigrated to Canada and were most likely poisoned in their countries of origin, 1 autistic child with pica and the case presented recently in *CMAJ*.[2] Others may have existed but not come to the attention of medical toxicologists, but in those cases the levels were probably above the intervention level of 0.48 mmol/L but below the recognized chelation threshold of 2.17 mmol/L.[4]

We chose to present the case of the 4-year-old boy in *CMAJ* to illustrate that lead poisoning can occur if a child with pica eats paint with lead levels below those set by Canadian law. Many physicians think that such paint is lead free, but, as Kathleen Cooper points out, this is not the case. Blood lead level should be determined for any child with pica, regardless of the age of the child's home, because eating a large quantity of chips of so-called "lead-free" paint can result in lead levels that require intervention with or without chelation.

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Possible causes of cognitive decline

Two things came to mind from reading the report by Jessica Simon and associates,[1] which thoroughly documents the cause of cognitive decline, seizure and stroke in a 52-year-old man as a rare genetic variation. My questions are inspired in part by the negative family history and the necessary supposition of de novo mutation. Was the patient tested for elevation of homocysteine? This marker is associated with geneti-