

The Future For Our Children

The Need to Establish a Sustainable Energy Future

Presentation regarding the Future For Our Children
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Introduction

Good evening and thank you for the opportunity of addressing Port Hope Council. My name is Alexandra McKee-Bennett. I have been a nurse for 24 years with my clinical focus on maternal/child health. I am also a midwife and practiced for two years in the United Kingdom where I received my education, and in Zaire and Zambia prior to returning to Toronto, where I was involved in implementing, over a five year period, Family Centred Maternity Care at Women's College Hospital.

During this time frame, the hospital was recognised as a Centre of Excellence by the World Health Organization. There are only two hospitals to receive this recognition in North America. The other hospital is Johns Hopkins in Baltimore, USA.

1. My focus therefore will be on the need to protect the health of children. To inform and educate the politicians to ensure they do recognise that preventing ill health and injury is infinitely more desirable and cost-effective than trying to address the diseases and their escalating health costs.
2. We need to recognise that children are entitled to grow and live in healthy environments, in the spirit of the Convention on the Rights of the Child of November 1989, then emphasized at the United Nations General Assembly Special Session on Children in May 2002 and at the World Summit on Sustainable Development (WSSD) in September 2002. We need to be aware that protecting children's health and environment is crucial to the sustainable development of not only Canada but our world.

I am increasingly concerned about the effects on children's health of unsafe and unhealthy environments. I understand that developing human organisms, especially during embryonic and foetal periods and early years of life, are often particularly susceptible, and are more exposed than adults, to many environmental factors, such as polluted air, chemicals, contaminated and polluted water, food and soil, ionizing radiation risks, including risks related to transport of nuclear products and nuclear waste. Male and female children also differ in susceptibility and have different risks in terms of exposure to these environmental risks.

In the 1998/99 National Population Health Survey, 10% of Ontario children aged four to nineteen and 7% of Ontario adults reported having been diagnosed with asthma by a physician. In Kingston, childhood asthma rates were 16%, in Guelph, 11%.

A study written by Dr. Theresa To, of the Institute for Clinical Studies at the Hospital for Sick Children, found in the last five years that childhood asthma has increased by an alarming 35%. This now becomes a health care expense of \$5.42 million OHIP dollars, compared to \$1.7 million dollars for health care expenses on the non-asthma children over the five year health study. It is important to also understand these costs only include outpatient care by physicians and diagnostic tests. The costs for drugs to manage their asthma and the emergency room and hospitalization are huge.

Driving to my new home in Port Hope, I pass the “Nuclear Power = Clean Air” sign outside the Darlington plant.

Pretty, quaint Port Hope, home of Ontario's best preserved main street, and home to the worlds' only urban Uranium Refinery located on Lake Ontario, the drinking water source for over six million people.

In Port Hope, we measure uranium in our air, water and soil.

- We are told it is safe to live here,
- We are told the 60 kilograms of Uranium emissions in 2003 were “absorbed”,
- We are told the 1 kilogram of Uranium in water emissions is very small,
- We are told the Ammonia in air released in the centre of our historic town and waterfront, all 9.3 tonnes is not very harmful,
- We are told the Nitrous Oxide released into the air, 113 tonnes, is within MOE standards,
- We are told the Fluoride released into the air totals 507 kilograms.

Now remember, I am a health care professional hearing these statements. I am very aware that sunlight (UV) and volatile organic compounds (VOC) and Nitrous Oxides (NOx) react, creating ground level ozone. Do children in Port Hope suffer from asthma? Indeed they do. Children are at a higher risk from ground level ozone, because they breathe faster, and spend more active time outdoors. Ground level ozone affects the body's respiratory system and causes inflammation of the airways that can persist for up to 18 hours after exposure ceases. There is evidence that exposure heightens the sensitivity of asthmatics to allergens. Ammonia is also well documented to cause respiratory system inflammation.

In 1982, Dr. Phyllis Mullenix, PH. D., a pharmacologist and toxicologist by training was Head of the Toxicology Department at the Forsyth Dental Centre, a world renowned dental research institute affiliated with the Harvard Medical School. Dr. Mullenix was asked to perform a test related to neurotoxicity of Fluoride. She is considered one of the foremost experts on the neurotoxicity of Fluoride compounds. Her 1995 paper in neurotoxicity and Teratology was the first laboratory study to demonstrate in vivo that central nervous system (CNS) function was vulnerable to Fluoride, that the effects on behavior changes common to weanling and adult exposures were different from those after prenatal exposure. Whereas prenatal exposure created many behaviors as seen in drug-induced hyperactivity, weanling and adult exposures led to behavior-specific changes more related to cognitive deficits. Brain histology was not examined in this study, but findings suggested that the effects on behavior were consistent with interrupted hippocampal development (a brain region generally linked with memory).

Establishing a threshold dose for effects on the CNS, in rats or humans, was not the intent of Dr. Mullenix's initial investigation. Yet, one fact relevant to human exposure emerged quite clear. When rats consumed 75-125 ppm and humans 5-10 ppm Fluoride in their respective drinking waters, the result was equivalent ranges of plasma Fluoride levels. This range is observed with some treatments for osteoporosis, and it is exceeded ten times over, one hour after children receive topical applications of some dental Fluoride gels.

Thus, humans are being exposed to levels of Fluoride we know alters behavior in rats.

Dr. Mullenix's rat study flagged potential for motor dysfunction, ten deficits and/or learning disabilities in humans. Soon thereafter, two epidemiological studies Fluoride, 1995-1996) from China showing ten deficits in children over-exposed to Fluoride via drinking water or soot from burning coal. A review (International Clinical Psychopharmacology, 1994) listed case reports of CNS effects in humans excessively exposed to Fluoride, information that spans almost 60 years. A common theme appeared in the reported effects: Impaired memory and concentration; lethargy; headache; depression and confusion. The same theme was echoed in once classified reports about workers from the Manhattan Project. The fuel for the Manhattan project was refined in Port Hope.

Recent Human Studies published in August, 2004 issue of the journal, Toxicology, is the latest by a team of Chinese and Swedish scientist headed up by Dr. Zee-Zong Guan, a neurotoxicologist who has investigated the impact of Fluoride on the brain (from 1986 to present) more thoroughly than any other scientist in the world. His discovered neuron receptors called (nAChRs) in the brain are important for functional processes, including cognitive and memory functions. These receptors are decreased greatly by Fluoride exposure. The nAChRs are found to be involved in a complex range of CNS disorders including Alzheimer's disease, Parkinson's disease, Schizophrenia, Tourette's syndrome, anxiety, depression and epilepsy.

This finding has been proved by Dr. Agneta Nordberg in 2001, "A consistent, significant loss of nAChRs has been observed in cortical autopsy brain tissue from Alzheimers patients relative to age-matched healthy subjects." ¹

Important studies on children's intelligence published by Dr. Q. Xiang in 2003 ²: "Higher drinking water Fluoride levels were significantly associated with higher rates of mental retardation (I.Q. < 70) and borderline intelligence (I.Q. 70-79)... In endemic Fluorosis areas, drinking water Fluoride levels greater than 1.0 mg/L may adversely affect the development of children's intelligence." ²

Three years earlier J. Calderon published findings on Fluoride exposure on reaction time and visuospatial organization in children. "After controlling by significant confounders, urinary Fluoride correlated positively with reaction time and inversely with the scores in visuospatial organization. An increase in reaction time could affect the attention process, also the low scores in visuospatial organization could be affecting the reading and writing abilities in these children." ³

In 2003, Port Hope had 507 kilograms of Fluorides released into the air by Cameco over its people including its children and its water source, Lake Ontario. Due to the fact that Port Hope has a higher than average population of youth under the age of 19, and seniors in Ontario, this has grave health impacts to our population, and poses an enormous burden on our local health care system.

In February of 2004, Dr. Eric Mintz, an Epidemiologist, critiqued the June 2002 Mortality Study for Port Hope. ⁴ During the 42 year study period (1956-1997) there were marked elevations of cancer incidence. ⁵

I will report only on the health impacts on children.

“Many of the diseases that might be of concern in Port Hope are normally rare ones like brain cancer and leukemia.” ⁵

“Since children generally have greater exposures and shorter induction times, the childhood data is of particular interest.” ⁵

“Brain cancer was found to be highly elevated in Port Hope children during the period of 1971-1985, 5 times the Provincial average.” ⁵ “Children generally have greater exposures and shorter latency periods that the brain cancer excesses were greatest in children and appeared earlier is supportive of a real excess that is environmental related.” ⁵ Ionizing radiation has been associated with brain cancer in research published worldwide.

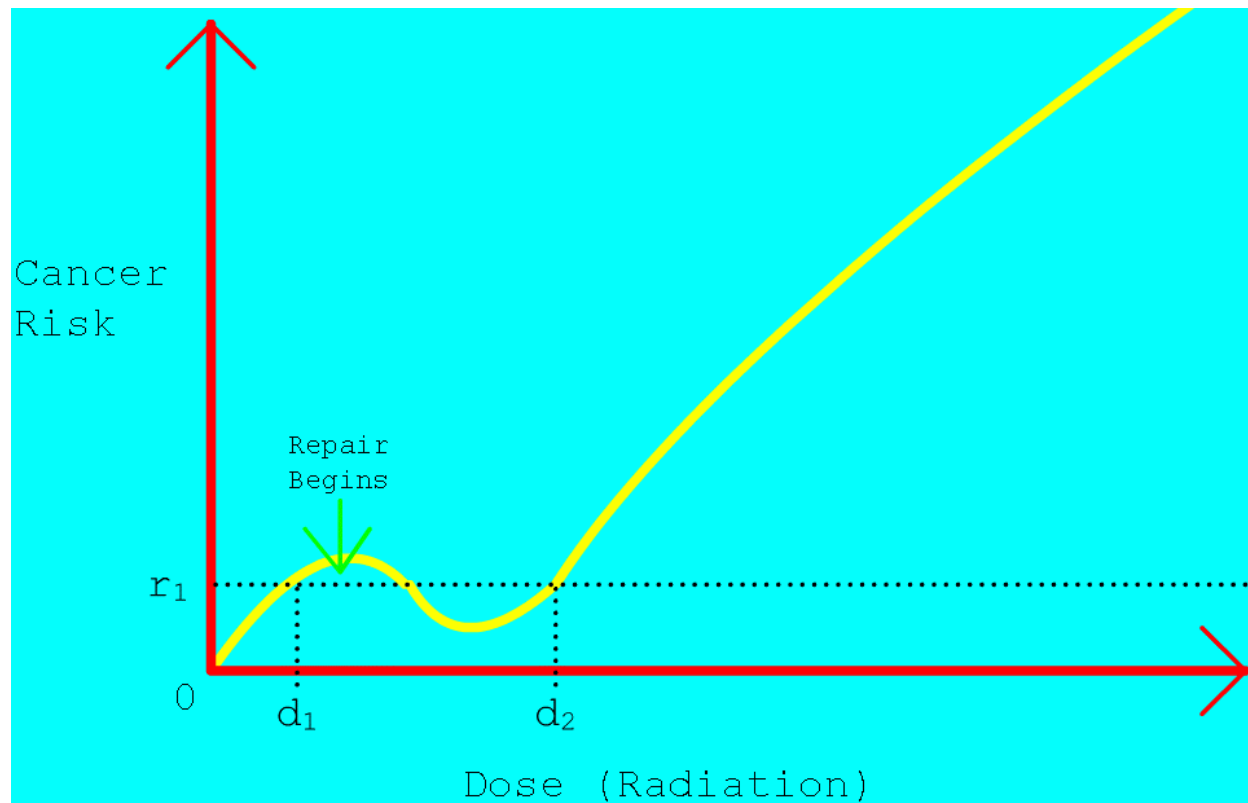
“For all childhood cancers there was a 48% increase over expected rates and for childhood leukemia a 63% elevation over what might be expected.” ⁵ It is important to understand that these rates reflect mortalities (fatal outcomes) and would not reflect survival rates. The fact that they are elevated in Port Hope is a cause of concern and is worthy of further study. Port Hope is the sacrifice zone for the Nuclear Industry in Canada.

The Petkau Effect:

Dr. Abram Petkau discovered that at 26 rads per minute (fast dose rate) it required a total dose of 3,500 rads to destroy a cell membrane. However, at 0.001 rad per minute (slow dose rate), it required only 0.7 rads to destroy the cell membrane. The mechanism at the slow dose rate is the production of free radicals of oxygen (O₂ with a negative electrical charge) by the ionizing effect of the radiation.

The sparsely distributed free radicals generated at the slow dose rate have a better probability of reaching and reacting with the cell wall than do the densely crowded free radicals produced by fast dose rates.

This discovery was made by Dr. Abram Petkau at the Atomic Energy of Canada Ltd. Whiteshell Nuclear Research Establishment, in Manitoba, Canada in 1972! ⁶

Biphasic dose response curve of Burlakova and Busby:

The idea that cell killing can occur at high dose has been used to explain dose-response relationships at high dose, particularly for alpha particle effects and the 'hot particle' effects. In the latter, it is argued that the high doses in the region of hot particles are less likely to result in cancer due to cell killing.

The result of animal studies on beagle dogs and mice appear to show these biphasic effects in the low-dose region (Busby, 1995) as do the results of recent mortality studies of radiation workers in the U.K.

Informed Consent:

Informed consent is a person's agreement to allow something to happen after the person has been informed of all the risks involved and the alternatives

July 29, 2004 Correspondence:

From Kevin Bundy, Acting Director, Radiation Protection and Environmental Compliance Division, CNSC:

Question:

What is the Canadian Drinking Water Standard for both municipal water and well water for Uranium Oxide and Uranium Trioxide?

Answer:

There are no specific drinking water standards for uranium oxide and uranium trioxide. However, the Canadian Council of Ministers of the Environment produces GUIDELINES for drinking water quality in Canada, these are recommendations only. The guideline for uranium is 20 micrograms per litre.

Question:

What health studies have been performed by the CNSC on Uranium emissions per cubic metre of air in a community setting?

Answer:

The CNSC has not conducted these types of health studies.

Question:

What are the maximum volumes of Uranium particulate allowed in the air for the residents closest to the facilities in Blind River and Port Hope?

Answer:

CNSC has an action level of 1 microgram of Uranium per cubic metre specified in the facility licensing manual of these facilities.

Question:

Are Uranium Oxide and Uranium Trioxide the only Uranium compounds released by your licensee discharges to Air and Water?

Answer:

Uranium compounds in the form of oxides and nitrates are discharged from both Cameco facilities, and in the form of fluorides from Cameco Port Hope Facility.

Question:

Does the Uranium particulate accumulate in the soil in the community and if so by how many parts per million per year?

Answer:

There is no clear understanding currently whether the rate of uranium accumulation in Port Hope soils due to Cameco operations is less than the rate of uranium loss from the soils due to leaching and other processes. Some experimental data by MOE indicated the increase of uranium soil concentrations in close proximity to the Port Hope facility over period 1996-2002 at the rate of approximately 1.5 ppm per year.

Question:

What is the CNSC specified maximum volume of uranium compounds in the soil?

Answer:

This has been established by the Ontario MOE as 300 ppm. ...based on uranium toxicity for vegetation was used for development of the MOE proposed ambient Air Quality Standard for Uranium in 2000. However, we do not know whether the standard has been finally approved or recommended.

The Precautionary Principle:

“The precautionary principle suggests that when we are unsure about the risks of a certain industrial process or its pollutants we should not allow it to proceed until we can be sure that it is safe.

”Certain areas of scientific discovery, particularly cell biology and the study of the immune system, have made tremendous progress since the inception of the nuclear power program. This is illustrated in particular by the fact that the risk model within which the nuclear program currently operates was drawn up before the discovery of DNA. Given this level of scientific insecurity it would seem advisable in the interests of public health to apply the precautionary principle to the operation of nuclear stations and to prevent them from releasing further radioactive emissions until they can prove conclusively, and in accordance with the most recent physiological discoveries, that they are safe.”

Page 23, Section 4.4.3

ECRR 2003 Recommendations of the European Committee on Radiation Risk
Health Effects of Ionising Radiation Exposure at Low Dose for Radiation
Protection Purposes
Regulators Edition: Brussels, 2003

I will close with these final thoughts:

“Nuclear energy illustrates the enormity of our ignorance about the biophysical processes at work on the planet. Nature cannot be shoehorned into human, political, and economic agendas. Nuclear power should fill us with humility and teach us that crude technological muscle power is a tremendous hazard in the real world.”

- Dr. David J. Suzuki

References:

- [1]. Nordberg - *Biological Psychiatry* 2001; Vol. 49; pp. 200-10
- [2]. Xiang, Q. et al. (2003) Effect of Fluoride in Drinking Water on Children's Intelligence; *Fluoride* Vol. 36: 84-94
- [3]. Calderon, J. et al. (2000) Influence of Fluoride Exposure on Reaction Time and Visuospatial Organization in Children; *Epidemiology* Issue 11(4); S153
- [4]. *Cancer and General Mortality in Port Hope 1956-1997* Published by Canadian Nuclear Safety Commission, June 2002
- [5]. Dr. Eric Mintz (2004) *June 2002 Mortality Study Critique*
- [6]. *The Petkau Effect*, Revised Edition, 1990, by Ralph Graeb, Translated from German by Phil Hill, and published by Four Walls Eight Windows, New York, 1994. ISBN: 1-56858-019-3.

Handouts:

Asthma in Ontario and Canada

Source: Peel Region website

Link: <http://www.region.peel.on.ca/health/health-status-report/pdfs-2002/hs-report-2002-2.pdf>

Click on Asthma in Ontario and Canada bookmark, or go to page 8 and 9.