Children’s Environmental Health Network

The Children's Environmental Health Network is a national multi-disciplinary organization whose mission is to protect the developing child from environmental health hazards and promote a healthier environment.

Childhood Leukemia

What is childhood leukemia?

Leukemia, which is cancer of the bone marrow and blood, is the most common of childhood cancers, accounting for approximately 25% to 33% of cases. In children, the majority of leukemias are rapidly developing in nature (acute). Acute lymphocytic (or lymphoblastic) leukemia (ALL) comprises about 75% of new leukemia diagnoses in children, and acute myelogenous (or myeloid) leukemia (AML) makes up the bulk of the remaining cases. Chronic myelogenous (or myeloid) leukemia (CML) and other forms, such as hybrid leukemias or juvenile myelomonocytic leukemia (JMML), are much less common in children.

Trends in childhood leukemia

The rates of childhood ALL and AML have increased between 1992 and 2006, but the good news is that many cases of childhood leukemia are now treatable. For instance, 80% of children with ALL survive the disease 5 years after being diagnosed. However, cancer, and specifically leukemia, is the leading cause of disease-related childhood death in the U.S., and the 2nd leading cause of death overall, for children aged 5 to 14.

The precise cause of most cases of childhood leukemia is not known. However, scientists have found a few risk factors linked to this group of diseases. Certain genetic conditions increase risk, as does exposure to some environmental risk factors, such as radiation and specific chemicals.

Children’s unique vulnerability

Children are uniquely vulnerable to adverse effects from exposure to toxic chemicals because:

- Their organ systems are still developing, and may be vulnerable to long term damage from disruption of this development. In addition, immature metabolisms and immune systems may not be ready to effectively contend with a toxic exposure.
- For their body size, children drink and eat more, and breathe in more air, than adults.
- Normal childhood behaviors, including crawling and putting their hands and other objects in their mouths, increase the risk of exposure to certain chemicals.

FOR MORE INFORMATION AND REFERENCES:  www.cehn.org/cancer  ●  http://circle.berkeley.edu
Environmental risk factors

In addition to known genetic risk factors, a number of prenatal or early childhood environmental exposures may be associated with increased risk for childhood leukemia, including:

- **Radiation**
  Exposure to high levels of radiation is linked to increased risk of AML. Evidence of increased risk among children chronically exposed to lower levels of radiation is variable.

- **Pesticides**
  There is consistent evidence for increased risk of childhood leukemia in children prenatally exposed to pesticides. Some studies have also linked early childhood exposure to household insecticides and parental exposure to pesticides before pregnancy with increased risk of childhood leukemia.

- **Tobacco smoke**
  Paternal smoking before pregnancy, maternal smoking, and an infant’s secondhand smoke exposure from all sources after birth, have all been associated with an increased risk of childhood leukemia.

- **Paints and solvents**
  Solvents are found in many commonly used substances such as adhesives, paint thinner, glue, nail polish remover, and gasoline. Research findings indicate that frequent prenatal and early childhood exposure to paints and solvents may be linked with childhood leukemia.

Tips to reduce exposure

- Practice Integrated Pest Management (IPM) techniques in your home or business to reduce pesticide exposure. See our Eco-Healthy Child Care® Pesticides factsheet and additional resources for more information on IPM.

- Have private drinking water wells’ contaminant levels checked. EPA has excellent information about this: http://water.epa.gov/drink/info/well/index.cfm.

- Encourage children to wash their hands often, especially after playing outdoors or on the ground or floor.

- Wet mop your floors regularly to control house dust, a source of chemical exposure.

- Keep paints and solvents out of reach. Use them when children are not present and take proper precautions.

- If you are regularly exposed to paints and solvents at work, make sure there is proper ventilation and that you use proper personal protective equipment.

- Give up smoking prior to trying to start a family. Avoid exposures to all sources of tobacco smoke—direct or secondhand—before, during, and after pregnancy.

**Childhood Leukemia Resources**

- Pediatric Environmental Health Specialty Units: http://goec.org/PEHSU/index.html
- National Cancer Institute, NIH: http://www.cancer.gov/cancertopics/wyntk/leukemia
- American Cancer Society, Leukemia in Children: http://www.cancer.org/cancer/leukemiainchildren/index
- St. Jude Children’s Research Hospital: www.stjude.org
- Leukemia & Lymphoma Society: http://www.lls.org/#/

The Children’s Environmental Health Network is partnered with UC Berkeley’s Center for Integrative Research on Childhood Leukemia and the Environment (CIRCLE). CIRCLE’s ongoing research projects focus on how prenatal and early childhood environmental exposures, gene interactions and genetic influences, may contribute to childhood leukemia. Visit their website at: http://circle.berkeley.edu.

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