Electromagnetic Fields

What are electromagnetic fields (EMFs)?

Electromagnetic fields or EMFs, are a type of energy that occurs naturally and is also created through the use of electrical appliances and equipment. Radiowaves, microwaves, visible light, ultra-violet light and X-rays are all forms of electromagnetic energy. EMFs are made up of two components: the electric and the magnetic field.

The term EMFs is often used to refer to extremely low-frequency (ELF) electromagnetic fields. These are the ones created during use and transmission of electricity. They are also called power-frequency fields.

When am I exposed to EMFs?

Typical exposures of EMFs in Canadian homes, working environments and in the community are very low. Levels of EMFs in the environment are most often measured in milligauss (mG) which is the strength of the magnetic field. Background levels of magnetic fields in urban areas are 1 mG or less.

You are exposed to EMFs when electricity runs through power lines, household wiring, lighting and electrical appliances that are plugged into the wall. Electrical equipment can create very intense fields very close to the equipment. Transmission lines create a more dispersed field. The closer you are to an electric wire or electrical equipment, including a transformer, the higher your exposure will be.

What are the health effects from EMFs?

The overall risk from exposures to EMFs for people living and working in Toronto is very small. The evidence available does not suggest that exposure to EMFs at levels normally found in Canadian living and working environments is harmful.

Studies have looked at many different possible effects of EMFs. The information available shows that EMFs probably do not cause heart disease or breast cancer.

In 2002, the International Agency for Research on Cancer (IARC) classified the magnetic component of EMF as a possible carcinogen. This classification was based on studies that showed an association between higher levels of magnetic fields in the home and the rate of childhood leukemia. However, the data available are still insufficient to draw a firm conclusion on the cancer causing effects of EMFs. Areas of uncertainty include: understanding how EMFs could cause cancer; the type of exposure that might be important (short periods of exposure to high levels or long periods of exposure to low levels); and not enough evidence in experiments with animals.
Fact Sheet

What can I do to reduce my level of exposure?

There are simple ways to reduce your exposure. Electric and magnetic fields decrease rapidly as you move away from the source. This means that increasing the distance between you and a source of EMFs (power lines or electrical appliances) will easily reduce your level of exposure to EMFs.

In your home:
You can arrange furniture and activity areas so that you do not spend a lot of time where EMFs are highest. Places where EMFs are usually the highest include:

- The electrical distribution lines
- The main circuit box
- Major energy consuming appliances (such as fridge, stoves, TV, computers)

Reducing electricity use and unplugging non-essential electrical appliances when they are not in use you may also reduce the levels of EMFs in your environment.

At the office:

- Where possible, keep major equipment such as photocopiers and printers away from your immediate work area.
- Keep at least 50 cm from you computer monitor. Older monitors, especially CRT monitors, typically emit higher levels of EMFs than newer flat screen monitors.

In the community:

- Spend less time close to large sources of EMFs such as under high-voltage transmission lines (hydro corridors) and transformers.

Where can I get more information?

You can read the following reports available on the Toronto Public Health’s website:

- Electromagnetic Fields and Hydro Corridors
- An Assessment of Health Implications Associated with Exposures to Electromagnetic Fields in and next to Hydro Corridors in the City of Toronto

Contact Toronto Public Health: 416-338-7600

Other sources of information:

Links to sites external to Toronto Public Health are provided as a convenience and their inclusion does not imply that Toronto Public Health endorses or accepts any responsibility for the content or use of these sites.

- Canadian Cancer Society: Electromagnetic fields (http://www.cancer.ca/ccs/internet/standard/0,3182,3543__langId-en,00.html)
- World Health Organization: Electromagnetic fields (http://www.who.int/peh-emf/)