

# CAUT Health and Safety Fact Sheet



## Electromagnetic fields

ISSUE 22

Electromagnetic fields (EMF's) are a serious health and safety threat in the workplace, in the home and in communities, because they have unintended side effects on human and animal health. We still have much to learn about EMF's but a precautionary approach should be taken.

### What are EMF's?

Electromagnetic fields or EMF's, are a type of energy that occurs naturally and is also created through the use of electrical appliances and equipment.<sup>1</sup> EMF's are made up of two components: the electric and the magnetic field.

Ionizing radiation, a very high frequency radiation which can produce things like x-rays, is known to cause cancer, as are some types of high frequency radiation such as ultra-violet light. Recent studies raise concerns about lower levels of exposure to electromagnetic fields from power lines or radio frequencies from the use of cell phones.

Provincial and federal occupational health and safety legislation requires employers to ensure that any equipment used in the workplace does not pose a hazard to workers or others.

### Electromagnetic HyperSensitivity

Some people have developed electromagnetic hypersensitivity (EHS). The most common symptoms are skin itch/rash/burning/tingling, confusion, poor concentration, memory loss, fatigue, weakness, poor sleep, headache, body pain, chest pain, or heart problems (palpitations, arrhythmia, blood pressure). Less common symptoms are nausea, panic attacks, depression, insomnia, seizures, ear pain, ringing in the ears, paralysis, numbness, dizziness, vertigo, or balance problems.<sup>2</sup>

Exposure to electromagnetic fields can be through occupational exposure or in the home and community

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## Exposure

Exposure to electromagnetic fields can be through occupational exposure or in the home and community. Although communication, electrical, and health care workers may be at greatest risk, those who use computers and cell phones are also at risk.

Electrical appliances such as vacuums, televisions, fluorescent lighting, electrical wiring and cordless phones in the home or workplace, as well as power lines and antennas in the community can all produce exposure to EMF's.

## Health Effects

Dr. Magda Havas, in the Environmental and Resource Studies at Trent University, specializes in the study of EMF's. Her research, in collaboration with the international community, is showing stronger evidence that increasing exposure to compact fluorescent lights (CFL's), cell and cordless phones and radio frequency radiation from the towers used to facilitate radiowave transmission is having a widespread effect on health. Even shopping in large box stores can bring on the symptoms of EHS because of the lighting. It can cause confusion and short-term memory loss – sometimes known as “brain fog”.

She estimates<sup>3</sup> that on Canadian university campuses as many as 7,000 academic staff and 346,500 students may have moderate EHS and up to 600 academic staff and 29,700 students may have severe EHS due to equipment, as well as cell phone and WiFi antennas

on campus to provide wireless services.

The Communications Workers of America's factsheet “Microwave & Radio Frequency Radiation” notes exposure to non-ionizing radio frequency radiation (including microwaves and radar) penetrates the body, causing exposed molecules to move about and collide with one another causing friction and heat. This is known as the thermal effect, and depending on the tissue or organ that is exposed, may or may not be reversible. Eye and testicular damage may be caused by microwave radiation. Health effects can occur at sub-thermal levels as well and for this we have no federal guidelines to protect our health.

An Expert Panel Report prepared at the request of the Royal Society of Canada for Health Canada 1999 states that “There are documented biological effects of RF fields that even a low, non-thermal exposure levels....could potentially be associated with adverse health effects.”

## Children

It has been found that children and teenagers are particularly susceptible to the effects of exposure to EMF's. As children's skulls are much thinner than adults, their immune systems are not fully developed, and their cells are reproducing more rapidly, they are more vulnerable to radiation penetration.<sup>4</sup> Organizations such

as WHO and Toronto Public Health, recommend that children be exposed as little as possible to cell phones and wireless computers. There has been a growing trend in the European Union, India and South America to ban the sale of cell phones to minors, and there is an increase in countries posting warnings about the health hazards of cell phone use. Children are also more sensitive to extremely low frequency electromagnetic fields.

The Canadian Cancer Society<sup>5</sup> notes there may be a link to

### Radio Frequency Radiation (RFR)



#### 1. First-Hand Exposure

- Mobile Phones: cell & cordless
- Wireless Computers



#### 2. Second-Hand Exposure

- Air: Antennas
- Wires

increasing numbers of childhood leukemia and exposure to EMF's. They recommend that the time children play near power lines be limited.

## Cell phones

There is growing evidence that consistent use of cell phones increases the risk of brain and other cancers, and children and teens may be at greatest risk. If you use a cell phone, take the following precautions:

- use landlines at home and at work
- minimize their use
- maximize the distance from the head (use speaker phone)

- change side of head
- use outdoors or near antennas
- do not use in roaming mode
- do not use on planes, trains, buses or cars
- do not keep in pocket or under pillow
- discourage use by children and pregnant women
- do not use DECT phones (cordless phones that radiate 24/7)

## Protection

As with any hazard, the best protection is prevention and exercising your right to refuse unsafe work. The Commission of the European Communities<sup>6</sup> has recognized EMF's as an occupational health and safety hazard, and is working towards a standard approach for adopting stricter rules regarding use and exposure.

In order to protect workers, exposure in the workplace needs to be measured. Monitoring radio frequency radiation, low frequency electric and magnetic fields, dirty electricity, and contact current in those jobs where workers are constantly touching electronic equipment (computers, sewing machines, power tools for example) should be a top priority. Documenting exposure and identifying the source are key to providing a safe workplace.

If you must work with or in the vicinity of EMF's, here are some precautions you should take:

- metal objects like filing cabinets can shield you from radio frequency radiation – be sure that they are not positioned to ricochet this radiation at you
- radiation-emitting equipment should be placed as far from people as possible

- workers should be separated from the source
- personal protective equipment such as protective clothing and eyewear should be provided and utilized
- comprehensive training for potentially hazardous working conditions
- medical surveillance programs

## Research

Studying the effects of electromagnetic fields has become a rapidly growing field. WHO established the International Electromagnetic Fields Project in 1996 to investigate potential health risks associated with EMF producing technology. A review of this research, published in 2007, is available on their website.

It is important for this research to continue as it not only helps to identify hazards but should also lead to manufacturing safer products.

## Antennas on campuses

Increasing numbers of faculty and students complaining of fatigue and other symptoms of EMF exposure have raised concern



over the number and location of wireless antennas on campus. They are often on top of heavily populated buildings, including student residences. The workplace Joint Health and Safety Committee should be involved in assessing the need for and placement of these towers.

## Sources

Canadian Cancer Society  
www.cancer.ca

Communications Workers of America www.cwa-union.org

Dr. David Fancy, Brock University

International Agency for Research on Cancer www.iarc.fr

## Notes

1 Toronto Public Health  
www.toronto.ca/health/emfs.htm;  
World Health Organization  
www.who.int

2 EMF's – an emerging health issue, Magda Havas, B.Sc. PhD, CAUT Health and Safety Conference 2008

3 EMF's – (same as footnote 4)

4 Magda Havas, "EMF's – an emerging health issue", Paper presented at the CAUT Health and Safety Conference, November 2008

5 Canadian Cancer Society, Electromagnetic Fields  
www.cancer.ca

6 Proposal for a Directive of the European Parliament and of the Council amending Directive 2004/40/EC (electromagnetic fields), Brussels, 26.10.2007 COM(2007) 669 final

Illustration: Dr. Magda Havas, Trent University (page 2)  
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