



IT'S YOUR HEALTH



Safety of Cell Phones and Cell Phone Towers

The Issue

With the growing popularity of hand-held cellular phones (or cell phones), questions have been raised about the safety of being exposed to the radiofrequency (RF) electromagnetic energy they emit. Some members of the public have also expressed concern about the possible health effects caused by living near cellular base stations, which are often called cell phone towers.

Background

Cell phones are portable devices that transmit and receive radio signals from a network of fixed, low-power, base stations. The base stations are usually located on rooftops, towers and utility poles. The transmitting power of a cell phone varies, depending on the type of network and its distance from the base station. The power generally increases the further you move away from the nearest base station.

The number of cell phone users in Canada rose from 100,000 in 1987 to more than 21 million by the end of 2008. To meet the demand for new wireless services, cellular base stations have been put up across the country. Along with the rapid increase in cell phone use, there have also

been some alarming media reports and Web sites suggesting there may be a link between certain health problems and cell phone use and/or living near base stations. As a result, some members of the general public are concerned about potential health effects from long-term exposure to RF energy.

The RF electromagnetic energy given off by cell phones and base stations is a type of non-ionizing radiation. It is similar to the type of energy used in AM/FM radio and TV broadcast signals. Unlike ionizing radiation (as emitted by X-ray machines), RF energy from cell phones and other wireless devices cannot break chemical bonds. This means it is unlikely to damage your body's genetic material.

Health Risks from Cell Phones and Base Stations

Some of the RF energy emitted by cell phones is absorbed in your body. The amount of energy you absorb depends on many factors, such as how close you hold the cell phone to your body and how strong the signal is. So far, the weight of evidence from animal, cell culture and human studies does not indicate that the energy emitted by cell phones is strong enough to cause serious health effects.

Some scientists have reported that cell phone use may cause changes in brain activity, in reaction times, or in the time it takes to fall asleep, but these findings have not yet been confirmed.

Public exposure to RF energy from base stations is at a much lower level than that from cell phones. As long as exposures respect the limits set in Health Canada's Guidelines, Health Canada has determined that there is no scientific reason to consider base stations dangerous to the public.

Cell phones are designed to operate at the minimum power necessary to connect and maintain a quality call. As a result, the intensity of the RF energy from cell phones is well below a level that would cause health concerns. In addition, cell phones and base stations in Canada must meet regulatory requirements that limit the amount of RF energy they emit. See the section below on "The Government of Canada's Role" for further details.

Although the RF energy from cell phones poses no confirmed health risks, cell phone use is not entirely risk-free. Studies have shown that:

- Using cell phones or other wireless devices can be distracting. Your risk of serious injury may increase if you use these devices while driving, walking, cycling, or doing any other activity that requires concentration for personal safety.
- Cell phones may interfere with medical devices such as cardiac pacemakers, defibrillators, and hearing aids.
- Cell phones may also interfere with other sensitive electronic equipment, such as aircraft communication and navigation systems.

Minimizing Your Risk

If you are concerned, you may choose to reduce your RF exposure by limiting the length of cell phone calls or using "hands-free" devices that keep the cell phone further away from your head and body. Since children are typically more sensitive to many known environmental agents, parents who are concerned about possible long-term risks from RF exposure may wish to take extra precautions by limiting their children's use of cell phones.

Precautions to limit public exposure to RF energy from base stations are unnecessary because worst-case exposure levels are typically thousands of times below those specified in health-based exposure standards.

The Government of Canada's Role

Health Canada's role is to protect the health of Canadians, so it is the Department's responsibility to research and investigate any possible health effects associated with exposure to electromagnetic energy, such as that coming from cell phones and base stations. Health Canada has developed guidelines for safe human exposure to RF energy, which are commonly known as Safety Code 6. Some of these guidelines have been adopted by Industry Canada and are included in their regulatory documents on radiocommunication licensing and operational requirements.

Health Canada's RF exposure guideline document is one of a series of codes that specify the requirements for the safe use of radiation-emitting devices. It sets out safety requirements for the installation and use of RF devices that operate in the frequency range from 3 kHz to 300 GHz, including cell phones and base stations.

The limits specified in Health Canada's RF exposure guideline document are based on an ongoing review of published scientific studies on the health impacts of RF energy. Using data from these studies, Health Canada set the general public exposure limits 50 times lower than the threshold for potentially adverse health effects. As long as exposures respect these guidelines, Health Canada has determined that there is no scientific reason to consider cell phone towers dangerous to the public.

Health Canada has conducted its own research to determine whether RF energy could cause damage to DNA or changes to certain genes. The exposure levels used in these studies included those that were well above the limits specified in Health Canada's RF exposure guidelines. Based on Health Canada's research, no effects from RF exposure were seen.

Cell phones are regulated by Industry Canada. This Department also oversees the licensing and placement of cell phone towers (base stations), considers the effects on the environment and local land use before towers are installed, and ensures that these towers comply with their regulatory requirements. Industry Canada has adopted part of Health Canada's RF exposure guidelines for protecting the general public and ensures that exposures from cell phones and cell phone towers do not exceed the specified limits.

Health Canada continues to monitor the science regarding RF exposure. If there is convincing scientific evidence in the future showing that exposure from cell phones and cell phone towers is harmful, Health Canada will take immediate action, such as advising Industry Canada to review its policies



IT'S YOUR HEALTH



and regulations with respect to these devices.

Need More Info?

See the following Health Canada Web sections:

Health Canada's Consumer and Clinical Radiation Protection Bureau, at:

www.hc-sc.gc.ca/ahc-asc/branch-dirgen/hecs-dgsesc/psp-ppf/ccrpb-bpcrpcc-eng.php

Health Canada's RF exposure guidelines (Safety Code 6):

www.hc-sc.gc.ca/ewh-semt/pubs/radiation/99ehd-dhm237/index-eng.php

Base Stations, at: www.hc-sc.gc.ca/ewh-semt/radiation/cons/stations/

Also, see the following:

Health Canada and Industry Canada FAQ on Radio Frequency Fields, at:

www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08792.html

Industry Canada, Consumer Trends Update - The Expansion of Cell Phone Services, at:

www.ic.gc.ca/eic/site/oca-bc.nsf/eng/ca02267.html

Industry Canada's Guidelines for the Protection of the General Public in Compliance with Safety Code 6, at:

www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf05990.html

Industry Canada's Radio Standards Specification 102, at:

www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01904.html

Industry Canada's Client Procedures Circular CPC-2-0-03, at:

www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08777.html

World Health Organization, Electromagnetic fields and public health: mobile telephones and their base stations, at: www.who.int/mediacentre/factsheets/fs193/en/

World Health Organization, Electromagnetic fields and public health: base stations and wireless technologies, at: www.who.int/mediacentre/factsheets/fs304/en/index.html

For additional articles on health and safety issues go to the It's Your Health Web section at: www.healthcanada.gc.ca/iyh

You can also call toll free at 1-866-225-0709

or TTY at 1-800-267-1245*