



# Cell phones, cell phone towers and other antenna installations

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Cell phones and antenna installations (such as cell phone towers) are used every day to enable the wireless communication needs of Canadians. This page provides information to help address questions that have been raised about their safety and concerns of possible health effects of living near cell phone towers.

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## About cell phones, cell phone towers and other antenna installations

Cell phones and antenna installations use low levels of radiofrequency electromagnetic fields (EMF) to transmit and receive information. The radiofrequency EMF given off by cell phones and cell phone towers are 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), radiofrequency EMF from cell phones, towers and other wireless communication devices do not have enough energy to break chemical bonds in your body.

Cell phones and antenna installations must meet Canadian requirements that limit the level of radiofrequency EMF that they emit.

### Cell phones

Cell phones send and receive radio signals from a network of fixed, low-power, cell phone towers (or base stations). Cell phones are designed to operate at the minimum power necessary to connect and maintain a quality call.

The amount of radiofrequency energy you are exposed to while using a cell phone depends on many factors, such as how close you hold the cell phone to your body and the strength of the signal. The transmitting power of a cell phone varies, depending on the type of network and its distance from the cell phone tower. The power generally increases the further you move away from the nearest cell phone tower.

### Antenna installations

Antenna installations are usually located on rooftops, towers and utility poles. Antenna installations operate at a higher power than cell phones but the radiofrequency EMF they emit is at a much further distance from the body. This means that a person's exposure level from a cell tower is much lower than their exposure level from using a cell phone.

## About 5G technology

5G is the term used to describe the 5th generation of wireless communication technology that will be used by newer mobile devices and antenna installations. 5G will operate using both the frequencies used by current mobile devices (e.g., 3G and 4G) as well as frequencies above 6GHz, also known as millimetre waves.

Millimetre waves have already been used for a number of years in many applications, such as security-screening units at airports, police radar, remote sensors and technology in medicine. Very few wireless communication devices are currently 5G enabled, but these types of devices will increase as 5G networks roll out in Canada.

Similar to current 3G and 4G technologies, 5G devices will need to meet the Canadian radiofrequency exposure requirements before they can be sold in Canada. Antenna installation operators using 5G technology will continue to have the same compliance obligations for radiofrequency exposure. Furthermore, compliance with the Canadian radiofrequency exposure requirements will continue to be an ongoing obligation.

## Health effects

Based on the available scientific evidence, there are no health risks from exposures to the low levels of radiofrequency EMF emitted by cell phones and antenna installations.

There have been thousands of scientific studies carried out to evaluate the safety of radiofrequency EMF. In fact, the evidence from these studies establishes two adverse health effects that can occur at levels above the Canadian limits:

- tissue heating (such as the warming of your skin)
- nerve stimulation (which can cause a tingling sensation in your skin)

The occurrence of these health effects depends upon a combination of:

- the intensity of radiofrequency EMF exposure
- the frequency of the radiofrequency EMF exposure
- the exposure duration

## Misinformation and health concerns

Misinformation and opinions on the health risks from exposure to radiofrequency EMF are increasing on social media and on the internet. Most recently, there have been claims linking the deployment of 5G networks to the novel coronavirus ([COVID-19](#)). There is no scientific basis for these claims. The [World Health Organization \(WHO\)](#) and the [International Commission on Non-Ionizing Radiation Protection](#) have also communicated this message.

Another frequent concern is the potential for radiofrequency EMF to increase risks of cancer. The scientific evidence does not support a link between exposure to radiofrequency EMF and cancer at the levels permitted by Canadian exposure guidelines. While there have been some studies reporting an increase in incidence of brain cancer among long-term, heavy cell phone users, other studies conducted in many countries around the world, including studies assessing brain cancer trends among large populations, do not find changes in brain cancer incidence. This is despite widespread use of cell phones over the past 25 years.

## Assessing the science

While some internet or social media sources refer to specific scientific publications, no single scientific study, considered in isolation, can prove or disprove the existence of an adverse health effect.

There are criteria that scientists use in order to establish scientific evidence for the existence of an adverse health effect. The evidence needs to be reproducible to ensure the results were not random or due to other factors. The evidence needs to be consistent across studies; for example, the evidence is stronger if different types of studies (epidemiology and laboratory) point to the same conclusion. The evidence needs to be evaluated in its totality, meaning that both positive and negative results are evaluated on their own merit and then evaluated as a whole. Finally, the evidence needs to be generally accepted by the broader scientific community.

There are thousands of studies on the health effects of radiofrequency. You can access many of them through the following links:

- [International Commission on Non-Ionizing Radiation Protection - publications](#)
- [EMF Portal](#)
- [Electromagnetic field literature search engine](#)

Health Canada continues to monitor all domestic and international scientific evidence on radiofrequency EMF and health. Should new scientific evidence emerge to demonstrate that exposure to radiofrequency EMF at levels below the Canadian limits is a health concern, the Government of Canada would take action to protect the health and safety of Canadians.

## The Government of Canada activities

Health Canada conducts research on the potential health effects of radiofrequency EMF, reviews relevant studies performed by other scientists around the world on an ongoing basis, and develops human exposure guidelines to radiofrequency EMF, known as [Safety Code 6](#).

[Innovation, Science and Economic Development Canada \(ISED\)](#) regulates wireless communication equipment such as cell phones and antenna installations. To ensure that public exposures to radiofrequency EMF fall within acceptable guidelines, ISED has developed regulatory standards that require compliance with the human exposure limits outlined in Safety Code 6.

The Government of Canada has funded extramural scientific research on radiofrequency EMF and health through the Canadian Institutes for Health Research (CIHR).

## Related links

- [Contact us](#)
- [What is 5G?](#)
- [Safety Code 6](#)
- [About radiation](#)
- [International EMF Project](#)
- [Extremely low frequency EMF](#)
- [Radiofrequency energy and safety](#)
- [Fact sheet - What is Safety Code 6?](#)

- [International Agency for Research on Cancer](#)
- [International Commission on Non-Ionizing Radiation Protection](#)

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