

Addressing Safety Concerns with Wireless Networks and Electro-Magnetic Fields

Introduction

Cellular and wireless networks have become commonplace in our environment. They afford people the ability to connect to a computer network without the need for hard-wired connections. While cellular networks are created and managed by telecommunications companies, wireless networks can be implemented and managed by individuals and as such; have become pervasive in many homes and most organizations. Laptops are most commonly used while connecting to wireless routers. In many places like city centres, airports, cafes, schools and universities, public access to wireless networks is now the expectation from the general public, customers, and students.

The Greater Victoria School District supports wireless access to our computer network for staff and students. When connected through the wireless network, it allows students the ability to access many of the same software learning applications and to the internet as if they were connected to the hard-wired network and allows teachers and staff the mobility to work beyond the reaches of a fixed cable. It better enables students to collaborate with each other on research and shared projects. Wireless networking also allows us to integrate student owned devices with greater ease onto our computer network in a safe and reliable fashion. By allowing students to use their own devices, it provides an opportunity to offer greater access without the need and expense of increasing the number of fixed computers and the infrastructure that is required to support them.

Many schools districts within BC and all across Canada have implemented wireless networking as part of their strategy for improving the delivery of services and programs to their staff and students. It provides flexibility in how technology is delivered and presents opportunities for reducing the financial burden associate with hard-wired infrastructure.

Potential health risks in using wireless networks

Electromagnetic fields (EMF) are a natural occurrence in nature and occur all around us, although with advances in technology and consumer demand for connectivity and wireless access, EMFs have increased steadily. Technology associated with EMFs is not new. Television and radio broadcasts, and radar are examples of long standing technologies that utilize EMFs.

Since exposure to electric and magnetic fields occur regularly in our environment, there are concerns within the general public with their well being and personal safety, and within the context of this paper, specifically from exposure through wireless networks. The concern is understandable as there are perceived risks from a number of perspectives. These might include a lack of understanding around

EMFs and/or related technology; a feeling of loss or no control over their own environment; a sense of involuntary exposure to EMFs all around us; the potential for dramatic health outcomes in extreme cases to exposure of EMFs; and the perceived lack of personal benefits.

What do the experts say?

Since exposure to EMFs is not a new occurrence and since EMFs have been used alongside technology for many decades, the science and research around exposure to EMFs and health risks is also not new.

Health Canada has been tasked to establish limits for safe human exposure to RF energy and EMFs in Canada. Industry Canada, our national telecommunications regulator requires that EMFs fall below Health Canada's RF exposure limits. Health Canada states that...

“Based upon the evidence to date and the weight of evidence from ongoing scientific literature reviewed by Health Canada scientists, the Department is confident that Canada’s RF exposure limits remain current and valid. At present, there is no scientific basis for the premise of chronic and/or cumulative health risks from RF energy at levels below the limits outlined in Safety Code 6”

“As long as exposure is below these established limits, there is no convincing scientific evidence that this equipment is dangerous to schoolchildren or to Canadians in general.”

The World Health Organization is a United Nations agency with the mandate to act as the directing and coordinating authority on international health work, promoting technical co-operation, assisting Governments in strengthening health services, and working towards the prevention and control of epidemic, endemic, and other diseases. WHO established an extensive program to monitor the EMF scientific literature and to evaluate the health effects from exposure to EMFs. As a result of their research and after following extensive international reviews, WHO states that...

“From all evidence accumulated so far, no adverse short- or long-term health effects have been shown to occur from the RF signals produced by base stations. Since wireless networks produce generally lower RF signals than base stations, no adverse health effects are expected from exposure to them.”

“Considering the very low exposure levels and research results collected to date, there is no convincing scientific evidence that the weak RF signals from base stations and wireless networks cause adverse health effects.”

The Health Protection Agency is tasked with protecting public health in the United Kingdom. In regards to EMFs, they state that...

“there is no consistent evidence to date that WiFi (wireless fidelity) and WLAN (wireless local area networks) adversely affect the health of the general population and that there is no reason why schools and others should not use WiFi equipment.”

Summary

The use of wireless networks within the Greater Victoria School District fall within the guidelines and standards established by Health Canada, which have thresholds thousands of times below what is considered a health risk to children and staff. These specified limits for public exposure apply to everyone, including children and pregnant women and allow for continuous 24/7 exposure.

We accept the finding set by Health Canada and other regulatory agencies although we will continue to regularly monitor the research and findings around EMFs, and any potential health risks concerning the usage of wireless networks.

Statements from regulatory agencies, which have been tasked with the responsibility for assessing risks and establishing appropriate parameters concerning the safe use of technology and public health

Health Canada

Health Canada establishes limits for safe human exposure to RF energy in Canada. These limits are referred to as “Safety Code 6 (2009)” and have been established after reviewing the results of all peer-reviewed scientific studies, on an ongoing basis, and employing a weight-of-evidence approach when evaluating the possible health risks of RF energy. These specified limits for public exposure apply to everyone, including the elderly, individuals with health concerns, **children, and pregnant women and allow for continuous 24/7 exposure**. They are similar to those in other science-based international guidelines.

Canada’s national telecommunications regulator, Industry Canada, requires that levels of radiofrequency energy coming from cell phones and cell phone towers fall below Health Canada’s RF exposure limits. In the United States, the Federal Communications Commission (FCC) regulates the levels of radiofrequency energy.

The typical levels of RF energy that you find coming from base stations, including cell phone towers, are **thousands of times below the limits** for public exposure.

Health Canada scientists continually review scientific studies in this area to ensure safety guidelines are sufficient for the protection of the health and safety of Canadians. Health Canada also continues to participate in international standards development and advisory bodies and undertakes its own focused research to support the development of its safety recommendations.

Health Canada continues to reassure Canadians that the **radiofrequency energy emitted from Wi-Fi equipment is extremely low and is not associated with any health problems**.

Based on scientific evidence, Health Canada has determined that exposure to low-level radiofrequency energy, such as that from Wi-Fi equipment, is **not dangerous to the public**.

As long as exposure is below these established limits, **there is no convincing scientific evidence that this equipment is dangerous to schoolchildren or to Canadians in general**.

The World Health Organization (WHO)

The World Health Organization is a United Nations agency with the mandate to act as the directing and coordinating authority on international health work, promoting technical co-operation, assisting Governments in strengthening health services, and working towards the prevention and control of epidemic, endemic, and other diseases.

Recent surveys have indicated that RF exposures from base stations and wireless technologies in publically accessible areas (including schools and hospitals) are normally thousands of times below international standards. In fact, due to their lower frequency, at similar RF exposure levels, the body absorbs up to five times more of the signal from FM radio and television than from base stations. Further, radio and television broadcast stations have been in operation for the past 50 or more years without any adverse health consequences being established.

Over the past 15 years, studies examining a potential relationship between RF transmitters and cancer have been published. These studies have not provided evidence that RF exposure from the transmitters increases the risk of cancer. Likewise, long-term animal studies have not established an increased risk of cancer from exposure to RF fields, even at levels that are higher than produced by base stations and wireless networks.

From all evidence accumulated so far, no adverse short- or long-term health effects have been shown to occur from the RF signals produced by base stations. Since wireless networks produce generally lower RF signals than base stations, no adverse health effects are expected from exposure to them.

International exposure guidelines by the International Commission on Non-Ionizing Radiation Protection (ICNIRP, 1998) and the Institute of Electrical and Electronic Engineers (IEEE, 2005) have been developed to provide protection against established effects from RF fields.

In response to public concern, WHO has established a program, *the International EMF Project* to monitor the EMF scientific literature, to evaluate the health effects from exposure to EMF in the range of 0 to 300 GHz, to provide advice about possible EMF hazards and to identify suitable mitigation measures. Following extensive international reviews, the International EMF Project has promoted research to fill gaps in knowledge. In response, national governments and research institutes have funded over \$250 millions on EMF research over the past 10 years. While no health effects are expected from exposure to RF fields from base stations and wireless networks, research is still being promoted by WHO to determine whether there are any health consequences from the higher RF exposures from mobile phones. They have stated that although extensive research has been conducted into possible health effects of exposure to many parts of the frequency spectrum, all reviews conducted so far have indicated that exposures are below the limits recommended in the ICNIRP (1998) EMF guidelines, covering the full frequency range from 0-300 GHz, and do not produce any known adverse health effect.

Considering the very low exposure levels and research results collected to date, there is no convincing scientific evidence that the weak RF signals from base stations and wireless networks cause adverse health effects.

International Commission on Non-Ionizing Radiation Protection (ICNIRP)

In 1992, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) was established as a successor to the IRPA/INIRC. The functions of the Commission are to investigate the hazards that may be associated with the different forms of NIR (non-ionizing radiation), develop international guidelines on NIR exposure limits, and deal with all aspects of NIR protection. The ICNIRP has developed a document entitled “Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz)”. The main objective of this publication is to establish guidelines for limiting EMF exposure that will provide protection against known adverse health effects.

Health Protection Agency

The Health Protection Agency states that “if a person spends one year in a Wi-Fi hotspot, they will receive the same dose of radio waves as if they had made a 20-minute call on a mobile phone”.

The Health Protection Agency has also stated that “there is no consistent evidence to date that WiFi and WLAN adversely affect the health of the general population” and that “there is no reason why schools and others should not use WiFi equipment”.