

Should Wi-Fi be used in classrooms?

By Lynn Quiring

Part 2

Effects of wireless radio frequency radiation

Although no studies have been done on Wi-Fi *per se*, there is a generous amount of research that has been carried out on cell phones, cell-phone towers, and masts. Since the Wi-Fi signal is the same type of radiation (only the frequency is different) one can assume with reasonable assurance that the effects of exposure to Wi-Fi will follow the same pattern of exposure to cell phones and cell-phone towers.

Here's an example of what can happen. Let's say one works in a classroom or office where wireless access, or Wi-Fi, is used. In other words, we are continually exposed to a constant bombardment of electromagnetic radiation waves. Over time, sitting or working in this classroom or office, the cells of the body gradually lose their energy and consequently their ability to communicate. What if the function of a particular group of cells was to maintain the integrity of the blood-brain barrier? The blood-brain barrier is an intricate membrane that keeps harmful substances and toxins from contacting sensitive brain tissue. But what if the cells of the blood-brain barrier can't communicate or don't work any longer? The barrier would break down and this would allow harmful substances to enter. Those substances would then come in contact with sensitive brain cells. The result would be injured and damaged brain cells. This is just one example of how a particular group of cells can be adversely affected by electromagnetic radiation. In fact, studies have shown that placing a call on a cell phone for just two minutes can disable the blood-brain barrier. The same case could be made for the immune system and any other major "system" of the body since different cellular groups perform different functions to keep us healthy.

There are more than a dozen studies linking an increased risk for brain cancer and acoustic neuroma (tumor of the auditory nerve) to radio frequency radiation from cell phones and cordless phones.

Even the World Health Organization (WHO) is concerned about the effects of radio frequency radiation on children's health. In a recent WHO publication they wrote:

"The possible adverse health effects in children associated with radio frequency fields have not been fully investigated."

"Because there are suggestions that RF (radio frequency) exposure may be more hazardous for the fetus and child due to their greater susceptibility, prudent avoidance is one approach to keeping children's exposure as low as possible."

"Further research is needed to clarify the potential risks of ELF-EMF and radio frequency fields for children's health."

Neurobehavioural effects of inhabitants living near a cell-phone tower base station have also been studied. The following neuropsychiatric complaints were reported: headache (23.5%), memory changes (28.2%), dizziness (18.8%), tremors (9.4%), depressive symptoms (21.7%), and sleep disturbances (23.5%). In addition, tests of attention and short-term auditory memory were significantly lower in the exposed participants than in control groups.

Obviously, people living close to cell-phone towers have an increased risk for developing

neurobehavioural problems.

If indeed neurobehavioural symptoms are produced by radio frequency radiation, and these frequencies are continually emitted throughout our schools, what might this suggest about the abnormal behaviour of students in the classroom? Might parents be inclined and persuaded to medicate their children so that these undesirable symptoms can be controlled? If so, how many of these children would be medicated unnecessarily? Studies now show that the frequencies such as those emitted by cell phones cause abnormal brain hyperactivity. Such artificially induced hyperactivity would cause an unnecessary risk and expense to students who would be placed on some form of pharmaceutical intervention to aid in controlling these symptoms.

But what about the teachers and staff members who continue to work in the same building for many, many years? For these workers and teachers, the exposure in their building from Wi-Fi networks and radio frequency radiation is continual.

Learning issues

When the disruption of cell communication occurs, cells can't "talk" to each other. When cells can't communicate, cognition is affected, the ability to learn is affected, the ability to retain information is affected, and behavioural problems can occur.

Radio frequency radiation is also a stressor to the body. When the stress response occurs from exposure to electromagnetic frequencies, the body responds by releasing stress proteins, also known as heat shock proteins, to minimize the ensuing damage. The release of heat shock proteins is just one stress response mechanism that has been identified. Other mechanisms include the triggering of adrenal hormones like adrenaline. Continual stress is not healthy as it can eventually fatigue the adrenal gland, suppress the immune system, and lead to fatigue causing difficulty in concentration. Sleep disturbances may also occur.

Evidence also exists that radio frequencies produced by such devices as cell phones, Wi-Fi, computers, televisions, etc., can trigger skin reactions. Microwave frequencies can trigger the release of chemicals from mast cells. Mast cells in the skin will break open and release chemicals that cause the symptoms of allergic skin reactions. One of the chemicals released by

mast cells is histamine. Histamine is often responsible for the symptoms of allergies such as runny nose, watery eyes, inflammation, and difficulty breathing. Histamine also constricts the airway, leading to or worsening, the symptoms of asthma. It is of interest to note that the rate of asthma in children has doubled since 1980 and asthma now affects one in ten children. The cell phone was introduced in 1983 and has seen explosive growth in use in the last decade. Could there be a correlation between the rising rates of asthma, an immune system problem, and the escalating use of cell phones and wireless technology? Certainly, one could anticipate that chronic exposure to these radio waves over time can lead to chronic inflammatory responses.

Electromagnetic radiation connected to autism

A recent study has now suggested a direct link between autism and electromagnetic radiation. It appears that EMR may accelerate autistic spectrum disorders. It is noteworthy that the increasing rates of autism parallel the growth of the cell phone and wireless industry. This appears to occur as a result of the trapping of heavy metals within the cell and the inability of the body to excrete the toxic metals present that are often introduced into the body through vaccinations. Heavy metals are neurotoxic. When this excretory process is prohibited, these heavy metals, such as mercury, lead, beryllium, and aluminum, damage nerve structures and interfere in inter-cellular communication. This leads to neurological problems and conditions like those found in autism spectrum disorders. This particular study has shown that when electromagnetic radiation is largely eliminated, the efficiency of heavy metal detoxification and removal was dramatically increased. In other words, the body was able to excrete and eliminate heavy metals when it had not been able to do so previously. This leads to the suggestion that (1) we need to reduce or eliminate electromagnetic radiation from any child's environment, and (2) measures need to be taken to repair the damage that has already been done by electromagnetic radiation. Although this study looked specifically at autism, the same case could be made for attention-deficit disorders and related conditions.

Occupational hazard for teachers and school staff

Children will attend school in a particular building for a finite number of years and then move on. For a child, the length of time spent in a particular building or location is predetermined. Therefore their exposure levels to this form of radiation will probably change. But what about the teachers and staff members who continue to work in the same building for many, many

years? For these workers and teachers, the exposure in their building from Wi-Fi networks and radio frequency radiation is continual. What are the effects of this exposure after years and years of time? Will teaching in a Wi-Fi enabled school become an occupational hazard like that of an electrician? These are questions that must and should be answered before, rather than after, any installation of radiation-generating equipment is placed in service.

Wi-Fi in European schools

The European Environment Agency is calling for immediate steps to be taken to reduce exposure to Wi-Fi, cell phones, and cell phone towers and masts. Recent international scientific reviews have concluded that electromagnetic radiation safety limits are "thousands of times too lenient" and one official British report came to the conclusion that the development of cancer from cell phone use could not be ruled out.

Sir William Stewart, chairman of the Health Protection Agency in the UK, is calling for a formal investigation into the hazards of using wireless networks in schools. He's asking that students be monitored for health problems from the networks. Joining him in health concerns over Wi-Fi installations in schools, the Professional Association of Teachers, is calling for the Secretary of State for Education in the UK to begin an official inquiry into the issue.

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Dr. Gerd Oberfeld, head of environmental health and medicine in the province of Salzburg, Austria, calls the installation of Wi-Fi "dangerous." In fact, the government in Salzburg has been advising schools not to install Wi-Fi for well over a year now and is considering a complete ban on Wi-Fi networks.

In 2004, the International Association of Fire Fighters (IAFF) voiced its opinion on cell-phone towers and antennas by opposing the installation of cell-phone antennas on or near fire stations until a credible study can be done to establish their safety. In studying the available science, the IAFF found over 49 references that led them to conclude that they should oppose the placement of cell-phone antennas on fire stations.

What about Wi-Max

The latest development in the world of digital communication is something called Wi-Max. Wi-Max is intended for use as a network for

large metropolitan areas. Where Wi-Fi is limited to a range of about 100-300 feet, Wi-Max can provide broadband wireless access up to 30 miles from fixed-base stations and 3-10 miles from mobile base stations. It's been described as Wi-Fi on steroids. It's used in much the same way as Wi-Fi and will soon become the standard for Internet access. Imagine the implications. Whole metropolitan cities blanketed with Wi-Max wireless coverage. How convenient and "connected" do we really need to be?

Conclusion

We currently have no studies that are specific to Wi-Fi. However, when assessing the safety issue, we can and should look at technologies that are similar and relevant to Wi-Fi to draw our conclusions. This would seem appropriate since Wi-Fi operates in the same manner as other more heavily studied similar technology and the basic mechanism of harm from all wireless technology is the same.

There are countless reports and studies raising caution signals about the effects on human health from exposure to cell-phone radiation, cell-phone towers, Wi-Fi, and wireless technology in general. The fact remains that wireless technology is a potential carcinogen. So was tobacco. So was asbestos. So were X-rays.

What can you do?

Don't let your children use a cell phone. Don't live near a cell-phone tower. Don't use wireless Internet connections or cordless phones in your home. Provide good nutrition to your children in the form of lots of fruits and vegetables. Everyone needs lots of antioxidants to protect themselves from the free radicals being produced by these high levels of radiation. Good quality water is a must, too.

Get involved in your child's school. Get on the school board. Ask questions regarding the use of Wi-Fi in the school. Object to the installation of such equipment if and when the possibility is discussed.

School districts today are under ever-increasing financial pressures. Lease money is being provided by the wireless industry to install cell-phone antennas on school buildings. Once again, this is an unneeded and unnecessary exposure risk for our young people.

Two-time Nobel Prize nominee, Dr. Gerald Hyland, a physicist, had this to say about cell-phone towers. "Existing safety guidelines for cell phone towers are completely inadequate. Quite justifiably, the public remains skeptical of attempts by government and industry to reassure them that all is well, particularly given the unethical way in which they often operate symbiotically so as to promote their own vested interests."

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References available on request.

Coming in November...

- "Call for immediate hardwiring of schools," Una St Clair-Moniz, Citizens for Safe Technology Society.
- An article by Jim Waugh, *Living Safely with Electromagnetic Radiation: A Complete Guide for Protecting Your Health*, Castle Mountain Publishing, North Vancouver.

