TORONTO

STAFF REPORT
INFORMATION ONLY

Cell Phone Use by Children and Youth

Date:	May 29, 2008
To:	Board of Health
From:	Medical Officer of Health
Wards:	All
Reference Number:	

SUMMARY

The Board of Health and Toronto City Council recently endorsed a Prudent Avoidance Policy that will help ensure that public exposure to radiofrequencies (RFs) from cell phone towers is 100 times below the current Health Canada exposure standard known as Safety Code 6. This policy does not address public exposure to RFs from the use of telecommunication devices such as cell phones. RF exposure from using a cell phone can be considerably higher than environmental exposure to RFs from local cell phone towers or antennas. Cell phone use has risen consistently in the last decade in Canada. In particular, the number of children who use cell phones has increased greatly. This report responds to the Board of Health's request for further information on the use of cell phones by children and youth and their consequent exposure to RF energy.

The 2007 Toronto Public Health (TPH) report titled "Update and Review of Research on Radiofrequencies: Implications for a Prudent Avoidance Policy in Toronto" summarized research about RF exposure and potential health impacts in people. Considerable research has been done to explore the health impacts from cell phone use in adults. There are gaps in knowledge however, regarding exposure and health impacts in children. The research that is available suggests that children are likely more vulnerable than adults.

Many international reports and scientific experts in the field view the limitations and uncertainty of current research as warranting precautionary recommendations around children's use of cell phones. There are currently no specific Canadian recommendations with regard to cell phone use by children. Some jurisdictions in Europe recommend that children decrease their exposure to RF by strictly limiting their use of cellular phones and some have strongly recommended that use be avoided completely. TPH has broadened its precautionary messages and advice on cell phone use. The focus is on messages for parents and teens to limit use of cell phones by children where possible.

Financial Impact

These recommendations will have no financial impact beyond what has already been approved in the current year's budget.

DECISION HISTORY

At its meeting of May 15, 2006, the Board of Health requested that the Medical Officer of Health, in collaboration with the Chief Planner and Executive Director, City Planning, report on the incorporation of the Toronto Public Health Prudent Avoidance Policy into the City of Toronto Telecommunication Tower and Antenna Protocol and report on any health risks arising from the concentration of telecommunication towers. (http://www.toronto.ca/legdocs/2006/minutes/committees/hl/hl060515.pdf).

In 2007, TPH reviewed the most recent research and concluded that there are still uncertainties in the science regarding the potential health risks associated with long-term exposures to RF. This review also yielded recent information with regards to RF exposure during the use of telecommunication devices both in adults and children.

At its meeting of December 4, 2007, the Board of Health adopted the Prudent Avoidance Policy and requested that further information be provided concerning children's health and cell phone use.

ISSUE BACKGROUND

In response to the uncertainty and concerns for health related to RF exposure, the Board of Health and Toronto City Council have adopted a Prudent Avoidance policy in Toronto. This policy will be applied to evaluate all future applications for cell phone tower siting in the city such that public exposure to radiofrequencies (RFs) from cell phone towers is 100 times below the current Health Canada exposure standard known as Safety Code 6. This policy does not address the public's exposure to RFs from the use of telecommunication devices, such as cell phones.

The marked increase in cell phone towers in the city also indicates an increase in the use of cell phones themselves. As the general population has increased its use of cell phones, young people have also started to use cell phones more frequently, and at an increasingly younger age.

Toronto Public Health staff recently updated and summarized the scientific literature on exposure and health effects from RFs, including the evidence examining adult exposure to RF resulting from cell phone use (see "Update and Review of Research on Radiofrequencies: Implications for a Prudent Avoidance Policy in Toronto" http://www.toronto.ca/health). While there is considerable evidence looking at impacts on

adults, there is a gap in the research when RF exposure and effects in children are examined.

COMMENT

Cell phones operate using energy or radiation of a particular wavelength that is known as radiofrequency (RFs). RFs are energy waves that are part of the electromagnetic spectrum that includes infrared radiation, visible light and ultraviolet rays. People are exposed to many sources of RF, such as from radio and television broadcast antennas, wireless telecommunication structures, cordless phones, pagers, some remote control devices, wireless Internet services and most commonly, from using cell phones.

Individuals who live close to cell phone towers are exposed to continuous low level RFs over the entire body. By comparison, RF exposure from using a cell phone is many times greater than from a cell phone base station, but it is localized to a small region of a person's head and occurs over a relatively short time span, since exposure stops when the cell phone is no longer in use or is turned off.

Cell Phone Use in Canada

The use of wireless telecommunication devices has increased dramatically in Toronto as in the rest of Canada. Canadians lag behind other countries in how commonly they own and use cell phones. Industry Canada reported in 2006 that from 1997 to 2004 the number of Canadian households that had a cell phone for personal use increased from 22 to 59%. Although cell phone use continues to be most common among those with higher income, this trend to greater use of cell phones was most pronounced among households in the lowest income quartile.

Statistics Canada has not compiled data on use of cell phones among children[1], however they do indicate that cell phone ownership has increased the most and is highest among young adults ages 18 to 34. Younger adult cell phone users are also more likely to use their phones for longer periods. With the increased popularity of cell phones, a younger demographic of users has emerged, and cell phones are in increasingly common use by children and youth ages 10 to 19 years. A 2005 survey by the Media Awareness Network reported that 46% of Canadian youth in Grade 11 said they owned a cell phone compared to 6% of children in Grade 4. Responses to the 2005/2006 Census at School by Statistics Canada from secondary school age youth, however, indicate that using a cell phone is 4th in preferred ways of communicating with friends. The most common modes of communication by youth are internet chatting (36%), in person (32%), telephone (landline) (about 18%), cell phone (7%), text messaging (2%) and lastly, e-mail (2%).

[1] Definitions for the age of children differ depending on the agency. Statistics Canada typically defines children as persons ages 0-17 years. The National Cancer Institute of Canada statistics on cancer in children include diagnoses in people 0 to 19 years of age. These definitions include what others would term youth or adolescents. Unless otherwise specified, the term children used in this report can include individuals up to age 19.

While cell phones clearly improve the convenience of communication and can contribute to safety, especially for children, there is still much that is to be determined about the ways in which Canadian children use their phones. The impact of this new phenomenon in children has not been extensively researched and the potential for health risks in children who use cell phones is not yet understood.

Research on Children's Sensitivity to RFs

In May 2000, a report by the Independent Expert Group on Mobile Phones (IEGMP) in the U.K., chaired by Sir William Stewart, (also known as The Stewart Report), was the first to draw greater attention to the possibly higher sensitivity of children to RF radiation from cell phones. Despite an abundance of research examining the impacts of RF waves on human health, however, very little of it has been devoted to examining the specific susceptibility, exposure to and responses of children.

Work is underway, largely through several studies in Europe, to address the research gaps and help resolve unanswered questions. The focus of research has been on assessing the potential for impacts on the developing brain and determining whether children absorb a greater dose of RF compared to adults because of age-related changes in anatomy and biophysical or biochemical properties.

A number of anatomical features in the young child, such as smaller head and brain size, thinner cranial bones and skin, thinner, more elastic ears, lower blood cell volume, as well as greater conductivity of nerve cells, have all been proposed as potentially contributing to greater absorption of RF in the child's head compared to the adult's.

Research on Health Impacts of RFs in Children

Studies of animals chronically exposed to RF radiation beginning at a young age have not shown increases in tumours, cancer incidence or alterations in immunological factors. Some epidemiological studies assessing impacts in communities near radio and television transmitters have observed increased rates of leukemia in children and adults. The U.K.-based Link Mobile Telecommunications and Health Research Programme (MTHR) is currently conducting research to explore cancer in children under five from exposure to RFs from cellular base stations but does not yet have results.

While research is underway looking at brain tumours cases in children and adolescents who use cell phones in Denmark, Norway, Sweden, Switzerland, this important study does not yet have published results (Feychting, 2006). Research into cancer effects in the young using cell phones is difficult because cancer cases, including brain tumours, are rare health effects in children. In addition, young people have only recently begun to commonly use cell phones and as a result, it has not been possible to study the impacts, such as cancer, that require a long period of time between exposure and diagnosis. On the other hand, there have been many studies looking at whether cancer appears in adults using cell phones. So far, research indicates that brain tumour risks are not higher in

adults with short or medium term use of a cell phone. There is still not enough data to adequately assess the risks of using a phone over longer periods, however a few studies have shown greater risks for certain brain tumours in adults who used cell phones for more than ten years. It is not known yet whether any of these scientific findings can be generalized to children. INTERPHONE-Kids is a proposed international case-control study of cancers in children, youth and young adults (ages 7 to 25 years) that has strong support and would extend the work already mentioned (Johnston, 2006).

It is well understood that children are at highest risk from agents known to cause brain and nervous system cancers because their nervous systems are still developing. It is still too early to say with any certainty, however, if the research confirms that long term use of cell phones increases the risks of brain tumours, we would expect to also find children to be more susceptible to these impacts than adults, especially since current generations will be more exposed than any other that has come before.

A very small number of studies have looked at the impacts on cognitive function or mental processing in children using cell phones. A small experimental study conducted in the U.K. examined the impacts on cognitive function among children ages 10 to 12 years old exposed to RFs from a mobile phone handset for 30 minutes. While children tended to react faster and with greater accuracy with RF exposure (compared to no exposure) the result was not statistically significant. A small study of children ages 10 to 14 years from Finland assessed reaction time and short-term memory with eight cognitive tests after RF exposure for 50 minutes from a cell phone. There were no significant differences in reaction times or accuracy linked to exposure. An Australian cohort study of about 300 12 to 13 year olds, is currently underway to explore whether RF exposure from use of cell phones impacts on the teens' cognitive ability, blood pressure, or hearing (Australian Centre for RF Bioeffects Research, 2008). This study should help us to better understand impacts in this age group which generally coincides with the years of first uptake of cell phone use.

Finally, recent findings from the Danish National Birth Cohort study indicate an association between mothers' cell phone use during pregnancy and greater likelihood for behavioural problems in their children at age 7 (Divan et al., 2008). Children who used cell phones regularly and had also had possible prenatal exposure tended to be identified more often as having a range of behaviour problems. The authors conclude that their findings should be interpreted with caution. They have no clear explanation for why this potential exposure to RFs from cell phones might have led to such impacts, however, ongoing research by this team and by other researchers should help to clarify if the associations are real or related to other unmeasured risk factors.

Other Jurisdictions Promote Precaution in Children's Cell Phone Use

In 2004, the U.K. National Radiological Protection Board (NRPB) agreed with the conclusions of the 2000 Stewart report and emphasized the importance of precautionary measures to protect children by recommending that parents not allow children under age 8 to use mobile phones. The WHO and some European countries have also adopted

guidelines to protect health with regards to cell phone use by the public. There are currently no Canadian jurisdictions with guidelines pertaining to precautions around cell phone use for either adults or children.

The WHO suggests precautionary measures should be taken if individuals are concerned about their own personal well being. These precautions include limiting the length of calls or using a “hands-free” device, such as a headset or ear piece, to keep the cell phone away from the head and body. The German official radiation protection body has recommended that all people limit their personal exposure to radiation, including non-ionizing, and suggests using landlines instead of mobile phones. Some countries, such as Denmark, are working in collaboration with the cell phone sector to produce information materials concerning cell phone use and health. Other countries have simply translated the WHO recommendations and made them available for their citizens.

Some jurisdictions have specific recommendations related to children. The British Department of Health has created a pamphlet informing its citizens about the potential health effects of cell phone use and includes specific recommendations for children and young people. They recommend the use of cell phones for essential purposes only and to keep all calls short, since talking for long periods increases exposure. Both the Belgian Federal Public Service and the Health General Directorate in France recommend that children and pregnant women should limit use of cell phones and use landlines whenever possible. They also recommend avoiding the use of cell phones when the signal is low and during high speed travel when power to the cell phone is at its peak. Finally, they recommend that these vulnerable subgroups use a headset when possible to avoid exposure to the nervous system.

Most recently the Russian National Committee on Non-Ionizing Radiation Protection has stated publicly that children’s health is under threat as a result of their use of cellular phones. In addition, stringent recommendations exist under the sanitary rules of the Russian Ministry of Health that maintain that individuals under the age of 18 should not use cellular phones.

In 2006, the Toronto District School Board (TDSB) announced a policy that prohibits the use of cell phones while students are on TDSB property. At the time, this policy was implemented to limit the possibility of disruptions to classes and potentially inappropriate uses of cell phones rather than being based on concerns for exposure and health impacts. After receiving communication from the Board of Health about the City’s Prudent Avoidance Policy on telecommunications towers and antennas the TDSB has resolved to err on the side of caution because of the uncertainty of the health risk evidence for RFs and has shown support for prudent avoidance where it relates to cell phone tower siting.

Conclusions

The existing evidence of RF exposure, absorption and impacts on children is very limited and does not clearly confirm that children are more susceptible. However, in light of the limitations of the research, we cannot rule out the possibility that children require greater

protection from RF exposure. In 2005, TPH began to promote parents' awareness of the need to minimize children's use of cell phones among other important practices, through the "Playing it Safe" resource, which was produced with partners in the Canadian Partnership for Children's Health and the Environment (CPCHE). Given that cell phones are in increasingly common use by children and youth ages 10 to 19 years, it is prudent to continue to direct messages to the public so as to avoid unnecessary exposure to RFs among young people. Toronto Public Health has since expanded its precautionary advice on cell phone use that is geared to the public, with a focus on messages for parents and teens. Consistent with messages from the British Department of Health, Toronto Public Health is recommending that children, especially pre-adolescent children, use landlines whenever possible, keeping the use of cell phones for essential purposes only, limiting the length of cell phone calls and using headsets or hands-free options, whenever possible.

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