



Questions and Answers About Wireless (RF) Radiation

Q. What is wireless radiation?

A. Non-ionizing radio-frequency (RF) radiation, also known as microwave or wireless radiation, is one form of man-made electromagnetic radiation. Current technologies use RF radiation to send and receive data wirelessly. Common RF radiation sources are radio and television transmissions, cell towers and antennas, cell phones, cordless phones, baby monitors, wireless computer networks (WLAN), smart utility meters and all other wireless devices.

Q. Are there health impacts associated with wireless, or RF radiation?

A. Until recently, it was generally accepted that a device using RF radiation only posed a health risk if it generated enough heat to raise the temperature of body tissue – referred to as a thermal effect. In 2016, the results of a multi-year, \$25M study from the National Toxicology Program revealed that RF radiation can cause biological harm at levels far below the actual heating of tissue. This study confirmed the findings of the World Health Organization which classified RF radiation as a possible human carcinogen. Thousands of other peer-reviewed academic studies from around the world have corroborated these findings.

Besides cancer, other health impacts associated with exposure to RF radiation include interference with normal brain development in fetuses, damage to reproductive systems, genetic damage, neurological problems and learning deficits, behavioral issues, sleep disruption and electromagnetic hypersensitivity.

Given our incomplete knowledge of the health effects associated with chronic, low level exposure to RF radiation, the employment of the Precautionary Principle* seems entirely appropriate and necessary for schools, where children spend about half of their waking hours each day.

** The Precautionary Principle states that “when there is an indication of harm to health or the environment, precautionary measures should be taken, even if some cause and effect*

relationships are not yet fully established scientifically.” This principle guides governments around the world when considering regulation of chemicals, products and technologies.

Q. Are children more vulnerable to RF radiation?

A. Children are always more vulnerable to threats in their environment due to their immature and rapidly developing bodies and their typical behaviors. A growing body of scientific research confirms this vulnerability. Some key findings include:

Children have more stem cells which are shown to be especially sensitive to RF radiation, and because they are still growing, their cells are dividing more rapidly.

A child’s head shows absorption (or penetration) rates of RF radiation at approximately twice that of an adult.

Children today will have a longer lifetime exposure and have most of their lives in front of them. A time lag of 10-20 years to develop cancer will impact them more significantly in the prime years of their lives.

RF radiation has become ubiquitous in young children’s lives, as companies design and manufacture wireless devices that are intended for use by children, even before birth and as newborns.

Q. Does the use of wireless devices in schools create high levels of RF radiation?

A. Schools may employ commercial routers to accommodate the large number of users in a classroom. These routers can be more powerful than home models and close proximity to the router can greatly increase exposure.

Typical WLAN or WiFi installations in schools generate constant, pulsed RF radiation even when no wireless devices are being used. Teachers and students add to (or amplify) this when they are downloading and uploading information.

The level of RF radiation at tables of 6 or 8 children when they are all using the internet can easily exceed levels deemed safe by experts.

Radiation can be blocked or reflected by metal objects and then absorbed or reflected by people in the room. This causes “hot” and “cold” spots in the classroom, making it impossible to get an accurate exposure reading in a classroom with multiple users.

Q. What are other countries doing to protect children from wireless radiation in schools?

A. **2007** - The Bavarian Parliament (Germany) recommends the use of wired networks in all Bavarian schools due to health concerns and had each single school informed about this recommendation by the state secretary.

2011 - The Council of Europe recommends WiFi be banned from schools. The Council of Europe has 47 member states and is highly influential in policymaking. Its scientific panel concludes that standards for WiFi and other wireless devices are “entirely inadequate” and “strongly recommends that schools do not install wireless internet connections that create pervasive and prolonged EMF exposures for children.”

2015 - The Israeli government bans WiFi in kindergartens and restricts hours of use in schools. "Israel is a world leader in research on the health effects of non-ionizing radiation," said Linda Birnbaum, Director of the US National Institute of Environmental Health Sciences. "If some of the studies turn out to be harbingers of things to come, we may have major health consequences from the nearly ubiquitous presence of wireless equipment."

Q. Are there other reasons or cost effective options for providing wired internet access to school children?

A. Wired connections are more protective of children’s privacy and more secure than wireless because they are more difficult to “hack.” Wired connections are faster than wireless if high-speed gigabit Ethernet connections are used.

Newer technologies already exist and more are in development for hardwiring classrooms at a comparable or even reduced cost compared to wireless installations.

This document is part of **The ChildSafe School Program** created by Grassroots Environmental Education, a science-based non-profit organization.

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