

Q&A –health concerns about cell towers

Q: What are cell phone base stations, and are there health hazards associated with living, working, playing or going to school near one?

A: Cell phones are low-power, single-channel, two-way radios. When you talk on a cell phone, you are talking to a nearby base station. That base station then routes your call into the regular land-line phone system or to another base station. Cell phones and base stations produce radio-frequency (RF) radiation and expose people near them to that energy. However, because both the phones and the base stations are short-range low-power transmitters, the RF radiation exposure levels from them are generally very low.

Q: Are there possible health risks from cell phone base station antennas?

A: First, it is important to be aware of the difference between antennas, which produce the RF radiation, and the towers, which are the structures that hold the antennas. It is the antennas that people need to keep their distance from, not the towers. Because antennas are the source of the RF energy, there is a greater potential exposure to RF radiation from cell phone antennas, because the antennas of cell phones deliver much of their RF energy to very small volumes of the user's body. Base station antennas (the antennas on tops of towers) do not create such 'hot spots' unless you are standing directly in front of one. So, potential safety issues concerning cell phone antennas do not generally apply to base station antennas.

Q: Do the differences between base station antennas and other types of radio and TV broadcast antennas matter when evaluating their potential impacts on human health?

A: FM and VHF-TV broadcast antennas send out 100 to 5,000 times more power than cell phone base antennas, but usually are mounted on much higher towers to reduce human exposure to the radiation levels produced.

Q: Are there safety guidelines for placement of cell phone base station antennas?

A: There are both national and international safety guidelines for human exposure to the RF energy produced by cell phone base station antennas. The most widely accepted standards are those developed by the Institute of Electrical and Electronics Engineers and American National Standards Institute (ANSI/IEEE), the International Commission on Non-Ionizing Radiation Protection (ICNIRP), the National Council on Radiation Protection and Measurements (NCRP), and the U.S. Federal Communications Commission (FCC).

Q: How do these guidelines affect the design and placement of cell phone towers?

A: Cell phone towers are designed to place antennas high enough to keep human exposure to RF energy under the recommended limits. For example, a cell phone base station mounted 33 feet (approximately 10 meters) above the ground and operated at the maximum possible intensity will produce ground-level power densities far below all the safety guidelines. It is important to note that the guidelines and standards themselves are set far below the level where potentially hazardous effects have been seen.

Q: Is it safe to live or work on the top floor of a building that has a cell phone base station on it?

A: Cell phone base station antennas radiate very little energy straight down. In addition, the roof of the building will absorb large amounts of any downward-directed RF energy. If desired, lead shielding can be installed on the roof to further block RF energy. Current worst-case calculations by the FCC show that power density on the top floor of a building with a base station antenna atop it meets all current RF safety guidelines.

This information was compiled from the Medical College of Wisconsin's report on Electromagnetic Fields and Human Health, by John Moulder, Ph.D., Professor of Radiation Oncology.