

# **Report identifies research to bolster knowledge of health effects of wireless communication devices**

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The rapid increase in the use of wireless communication devices in recent years has been accompanied by a significant amount of research into potential health effects from high exposure to radiofrequency (RF) energy emitted by these devices. A new National Research Council report, requested by the U.S. Food and Drug Administration, identifies research that could further extend understanding of long-term low exposure to these devices.

The committee that wrote the report identified research needs and gaps based on presentations made by international experts and discussion sessions with attendees at a three-day workshop last August that evaluated disciplines and topics such as measurement of RF energy and exposure, studies on human populations, human laboratory measurements, and animal and cell biology.

In the report, research needs are defined as studies that, in the near term, could increase understanding of any potential adverse effects of RF energy on humans. Gaps are defined as research studies that are of lower priority or that should not be carried out until the results of current research studies are evaluated. The committee did not evaluate potential health effects or recommend how the identified research needs should be met.

One research need the committee identified is studies of any potential

health consequences from multiple, long-term, low-intensity RF exposure as opposed to most of the present data that evaluates acute effects on healthy adults during short exposures to RF fields. For instance, measuring the amount of RF energy received by juveniles, children, pregnant women, and fetuses from wireless devices and RF base station antennas could help define exposure ranges for various populations.

Although it is unknown whether children are more susceptible to RF exposure, they may be at increased risk because of their developing organ and tissue systems. Additionally, Specific Absorption Rates (SAR) for children are likely to be higher than for adults, because exposure wavelength is closer to the whole-body resonance frequency for shorter individuals. The current generation of children will also experience a longer period of RF field exposure from mobile phone use than adults, because they will most likely start using them at an early age. The report notes that several surveys have shown a steep increase in mobile phone ownership among children, but virtually no relevant studies of human populations at present examine health effects in this population.

The evolving types of antennas for hand-held wireless communication devices also should be analyzed for the amount of RF energy they deliver to different parts of the body so the data would be available for use in future studies, the committee said. Studies to understand the effects of RF energy irradiation from cell phone antennas on the human head have already been conducted. However, for most of these studies, the research has assumed that cell phones have pull-out linear rod antennas and are held against a person's ear. Many newer telephones use built-in antennas for which additional SAR data are needed, the report says. Also, wireless technology is now used in laptop computers and hand-held texting and Web-surfing devices, in which the antennas are close to other parts of the body.

Other research needs identified by the committee include:

- Completing a prospective study of adults in a general population and a retrospective group with medium to high occupational exposures.
- Conducting human laboratory studies that focus on possible effects of RF electromagnetic fields on neural networks and the brain's electrical activity.
- Completing human population studies of children and pregnant women, including childhood cancers and brain cancer.
- Evaluating effects of RF doses at the microscopic level.
- Characterizing radiated electromagnetic fields for typical multiple-element base station antennas and exposures to affected individuals.

Source: The National Academies

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