


[Bulletin Home](#)

Featured Article

[Virtual Colonoscopy Identifies Large Polyps](#)

Cancer Research Highlights

[Extra Copies of Chromosome Affects HER2 Test Results](#)
[Vaccine Prevents HER2 Tumors in Mice](#)
[Genetic Factors Tied to Blood Cancer Risk](#)
[Most Cancer Clinical Trials Go Unpublished](#)

Director's Update

[Understanding the Media's Power to Influence Tobacco Use and Control](#)

NIH Goes Tobacco-free

Legislative Update

[NCI Expert Testifies on Biospecimen Policies](#)

FDA Update

[FDA Approves Anti-nausea Patch, Expands Indication of HPV Vaccine](#)

A Closer Look

[Cell Phones and Brain Cancer: What We Know \(and Don't Know\)](#)

Funding Opportunities

Featured Clinical Trial

[New Drug for Patients with Metastatic or Inoperable Kidney Cancer](#)

Notes

[Patricia Steeg Receives 2008 Brinker Award](#)
[NCI Patient Education Materials Receive Awards](#)
[SBIR to Showcase Products and Research](#)
[New Clinical Trial Reporting Requirements Coming in 2009](#)
[Disparities Summit Report Available](#)

Profiles in Cancer Research

[Dr. Ana Maria Lopez](#)

Bulletin Archive

About the Bulletin

Page Options

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A Closer Look

Cell Phones and Brain Cancer: What We Know (and Don't Know)

Concerns about the potential health effects of using cellular telephones were back in the news this summer. But these concerns - and specifically the suggestion that using a cell phone may increase a person's risk of developing brain cancer - are not supported by a growing body of research on the subject.

More than a dozen studies have explored the relationship between the use of cell phones and malignant or benign brain tumors. The majority of these have found little or no overall increased risk of brain tumors within the first 10 years of use. Studies now in the pipeline will yield information on longer-term use, as well as the first results involving children.

"We now have studies covering up to 10 years of cell phone usage, and we're still not seeing any convincing evidence of an increased brain cancer risk," said Dr. Peter Inskip of NCI's [Division of Cancer Epidemiology and Genetics](#), who led one of the first studies on the subject. He recently briefed NCI's National Cancer Advisory Board on what is known and not known about cell phones and cancer.

A major unanswered question is how cell phones might contribute to cancer. Cell phones emit radiofrequency energy, which is a form of electromagnetic radiation. While exposure to high levels of radio frequency energy can heat body tissues, the amount of radiofrequency energy produced by cell phones is too low to cause significant heating of tissue.

"The biological mechanism by which radiofrequency radiation might cause cancers is unknown and entirely a matter of speculation," said Dr. Inskip.

The controversy over cell phones and cancer started on national television in 1993, when Larry King interviewed a man who said that his wife's fatal brain tumor had been caused by her cell phone. The issue received considerable attention in the media, and cell phone stocks plummeted temporarily. Within a week, Congress had asked NCI and other agencies to investigate.

Dr. Inskip was at the time preparing a study to attempt to identify causes of brain cancer, and he added a component to assess cell phone usage. The results, reported in the [New England Journal of Medicine](#) in 2001, showed no evidence of an association between recent cell phone use and brain cancer. The conclusion was supported by two other reports published at about the same time.

Since then, most studies have not found a link between cell phones and cancer. The studies have been launched largely in response to people's concerns that any negative health effects from this new technology would be a major public health issue. In the United States alone, there were more than 255 million cell phone subscribers last year, up from 110 million users in 2000 and 208 million in 2005.

Given this dramatic growth, researchers have looked for increases in the incidence of brain cancer in the U.S. population and found none. There was no upturn in the incidence of brain or other nervous system cancers between 1987 and 2005, according to data from NCI's [Surveillance, Epidemiology, and End Results](#) program.

Another avenue of research has focused on people who were exposed to increased levels of radiofrequency energy in the workplace. Two such studies - one of [employees](#) in a factory manufacturing cell phones and the other of veteran [Navy radar technicians](#) exposed during the Korean War - showed no evidence of increased cancer risk.

Because cell phone technology is so new and has changed over time, larger studies are needed to answer questions about longer-term use. Answers may come from a series of multinational studies collectively known as the INTERPHONE study. While the combined analysis is not yet complete, some of the 13 participating countries have pooled their data and reported little or no effect on the risk of brain tumors.

Several European countries are also examining cell phone use in children and adolescents diagnosed with brain cancer. Children may be at greater risk of health effects than adults because their nervous systems are still developing at the time of exposure. In addition, young people may accumulate many years of exposure during their lifetimes.

For the future, it will be important to look for the consistency of results both within and across studies, said Dr. Inskip. "With more data and the ability to look at data in many different ways, some positive results are

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likely to occur simply by chance," he added.

Of all the potential health risks associated with cell phones that have been examined so far, the most convincing evidence concerns the risk of motor vehicle accidents among people distracted by using their cell phone while driving, Dr. Inskip noted.

—Edward R. Winstead

For a list of published studies and more information see NCI's fact sheet on [Cellular Telephone Use and Cancer Risk](#).

[< Previous Section](#) | [Next Section >](#)

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