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BUSINESS

Do Cellphones Really Cause Brain Cancer? We Have Answers.

A government study of the effects of RF radiation on male rats found small increases in brain and heart tumors



Does cellphone use lead to cancer? Experts say it isn't likely, but nagging questions remain. Above, phone cases at the Mobile World Congress in Barcelona last month. PHOTO: YVES HERMAN/REUTERS

By *Ryan Knutson*

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Does talking on a cellphone increase your risk of getting a brain tumor? Many health experts say it's unlikely, and if it is possible, the increase is probably small.

Yet there has been just enough research over the years to keep the debate alive. Last month, the U.S. government released results from the largest government study to date on the question. And the findings, from the National Toxicology Program, were.... a mixed bag.

What did they find?

The study found a small increase in tumors in the hearts and brains of male rats—the same type (called gliomas and schwannomas) that have been observed in heavy cellphone users—but it didn't find an increase in female

rats or mice. Researchers observed some DNA damage, but they said they weren't sure if it was connected to exposure to radio-frequency radiation, known as RF. They also observed a decrease in a type of kidney disease. Rats exposed to RF energy lived longer than those that weren't.

Why is this still unknown, more than three decades after cellphones hit the market?

- It's hard to study.
- Brain tumors take a long time to develop, so any risk might not be visible yet.
- The effect, if there is one, could be small, meaning it's hard to tell if observations in studies are just random or signs of a real hazard.

Why is it so hard to study?

- Epidemiologic studies ask people with brain tumors how much they used their phones and on which side of their heads, but people often don't accurately remember how they used their phones.
- Animals, including humans, absorb different amounts of cellphone radio-frequency radiation. How much depends on their size and weight, their distance from the cell tower and from the phone itself, and the wireless provider's frequency.
- The only agreed-upon health effect of RF—the same technology used in microwave ovens—is that at high levels it creates heat. The heat limits how much RF energy rodents can receive during studies. The trick is to avoid overheating the rodents while giving them doses large enough to suss out possible effects.

What do the studies show?

The record is mixed. Some studies have shown heavy cellphone use results in a greater chance of brain tumor, while others haven't.

The U.S. government's position, determined largely by the Food and Drug Administration, is that the weight of the evidence shows there isn't a cancer risk from cellphones.

Are more Americans getting brain tumors?

No. Overall brain-tumor rates have been flat since 2000, despite a major increase in cellphone use. But some researchers point to small increases in

certain subsets. Americans talk on their phones on average about 12 hours a month, according to the wireless industry trade group CTIA.

So why do people still care?

Cellphones are the most ubiquitous electronic device on the planet. In the U.S., there are more active cellphones than people. Human RF exposure has changed dramatically in a short period.

Some people are concerned children might be affected differently than adults, and some researchers worry there could be other unforeseen effects, such as on fertility.

What's the back story?

Here's a quick—and very abridged—timeline:

1973 The modern cellphone is invented by Motorola, goes on sale in the 1980s.

1993 David Reynard goes on “Larry King Live” and talks about his lawsuit against the cellphone industry, saying he believes his wife’s fatal tumor was caused by her phone. Wireless stocks tank. Mr. Reynard’s suit is later dismissed.

1993 Wireless industry trade group CTIA launches \$25 million research effort to help answer tumor question.

1999 The CTIA effort ends. George Carlo, who led it, says research corroborates health concerns; the Food and Drug Administration asks the National Toxicology Program to design a rodent study.

2004-2007 The FDA says its own studies, financed by the cellphone industry, found no link to negative effects.

2011 The World Health Organization classifies RF as a “possible” carcinogen, an ambiguous designation that means there is some evidence of harm but not enough to be sure.

2016 The National Toxicology Program releases partial results of its rat study, including findings of small increases in brain and heart tumors in male rats. Draft conclusions were released in February.

How can I protect myself if I'm concerned?

The short answer is, keep the phone at a slight distance from your body. Even a few inches makes a big difference. Use headphones when talking on the phone. Don't keep the device in your pants pocket all day. The California Department of Public Health has other suggestions.

How much RF do I absorb when talking on the phone?

That depends on the type of phone you use, how close you hold it to your body and your distance from a cell tower.

The farther from the tower—or the worse the signal—the more RF you’ll absorb, because the phone has to work harder to push the signal.

Get The Signal?

Cellphones are tested for safety based on the heating effects of RF (radio frequency) radiation. Each test produces a SAR (Specific Absorption Rate) score, representing the amount of RF absorption in the body. The FCC says lower SAR isn’t necessarily safer. To measure SAR, phones are held against a human-form model filled with a solution emulating human tissue.

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Cellphones are tested for RF emissions using mannequins filled with fluid. To comply with RF limits, cellphones should always be kept a few millimeters away from the body. The distance is disclosed in user manuals.

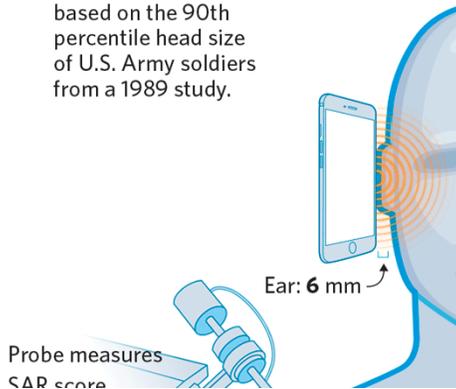
Who is going to determine the answer?

Ultimately, it could be the courts. More than 50 complaints have been consolidated with a lawsuit snaking its way through the U.S. District Court for the District of Columbia. The lead case, Murray v. Motorola, was filed in 2001.

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HEAD

The dimensions are based on the 90th percentile head size of U.S. Army soldiers from a 1989 study.



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