



Got Cell Phone Radiation On Your Mind?

For decades there has been concern as to whether cell phones cause an increased risk of local brain tumors, with no consensus among researchers and scientists. The Federal Communications Commission (FCC) and the Food and Drug Administration (FDA), the agencies with regulatory authority over radiofrequency emissions in the U.S., have both concluded that there are no demonstrable health hazards from using a wireless phone. Indeed, the FCC's website states that "[t]here is no scientific evidence that proves that wireless phone usage can lead to cancer or a variety of other problems ...". The FDA's website similarly states that "[t]he weight of scientific evidence has not linked cell phones with any health problems". However, a pair of recently published long-term epidemiologic reviews found positive correlations between cell phone use and tumors in the brain, notably among people using cell phones for longer than 10 years.

These studies echo previous findings which concluded that there was an increased risk of tumor growth while other research has been done explicitly showing damage to human cells from cell phone radiation. Still other experiments have shown that damage to tissues from cell phones can be minimized by natural anti-oxidants. So what are we to think about a correlation between cell phone use and tumors in the brain? Sometimes when attempting to sort out matters shrouded in controversy, you just have to go back to the basics.

Unfortunately, even the basics are under debate in this topic. Linda Ehlreich, a researcher with 30 years of experience in environmental epidemiology who testified before the Senate Subcommittee on "Cell Phone Safety" in 2009, defined cell phones as utilizing radio waves and having a low enough absorption factor so that they cannot cause DNA damage and therefore they do not technically emit "radiation". Likewise, an epidemiologic review of evidence on mobile phones published last year in Sweden is quoted as "[o]verall the studies to date do not demonstrate an increased risk within approximately 10 years of use for any tumor of the brain or any other head tumor" and criticized studies with positive correlations as having "key methodological problems ... with regard to ... inaccuracy and bias in recall of phone use". Such research seems to be consistent with the direction of opinion taken by the U.S. regulatory federal agencies, as evidenced

by their official position. However, some studies reviewing cell phone use beyond 10 years have found correlations with tumors like astrocytomas, gliomas and acoustic neuromas. So we may be left wondering about the reviews themselves. Perhaps the negative correlation research done for less than 10 years was looking at too short a time period? Are some studies with positive correlations being marginalized because of stringent requirements of criteria for peer-review data collection?

The adage comes to mind: "If you're afraid of getting a rotten apple from the barrel, go to the tree". Thus instead of considering long-term studies of exposure and trying to assess subsequent effects, we could instead consider less problematic studies with fewer variables, where conclusions can be made in a more direct fashion. Thankfully, such research has been done using cell phone radiation on human tissue and rats in laboratories. These studies are specifically aimed at measuring the direct impact of cell phone use. Many have focused on the male reproductive organs and several have shown that mobile phone radiation induces DNA damage in human sperm by increasing production of reactive oxygen species (ROS), which are the therapeutic targets of interventions like anti-oxidants.

This is important because ROS function as free radicals in the body, which are a group of highly reactive molecules consisting of unpaired electrons in the outer orbit. ROS are continuously neutralized by anti-oxidants present in body tissues. Whenever production of ROS exceeds the scavenging capacity of anti-oxidants, it leads to oxidative stress and damage to body tissues by injuring DNA, which ultimately leads to the disruption of genes, or genomic instability. Thus it may come as no surprise that ROS production is actually increased in cancer cells. Elevated ROS levels have also been shown to elicit constant activation of transcription and growth factors which continue to escalate during tumor progression. Thus, ROS are thought to play multiple roles in tumor initiation, progression and maintenance. Indeed, last year a study even illustrated the pathophysiology of cell phone radiation, identifying plasma membranes as targets of the electromagnetic waves.

With this evidence, we may leave the statisticians and epidemiologists grappling over study inclusion criteria and whether or not they can include Mr. Jones, because he couldn't recall exactly



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how many days he was on the cell phone over the last decade. We know that cell phone radiation can damage living cells, which can then cause even more damage and undesirable outcomes.

The good news is that there has also been research done on how to prevent cell phone induced oxidative stress and many of the therapies are commonly prescribed by naturopathic physicians. Ginkgo biloba, a botanical medicine commonly prescribed for memory improvement, was shown to preserve anti-oxidant enzyme activity in the brains of rats exposed to cell phone electromagnetic radiation. A second study done on rats injured from cell phone radiation used melatonin, an agent used in oncology and sleep disorders, and showed it likewise significantly prevented oxidative damage to the brain. Yet another study compared the protective effects of melatonin against caffeic acid phenethyl ester (CAPE), a major component of honeybee propolis, in terms of protecting rat kidneys from renal tubular injury. This study was conducted in 2005 and likewise demonstrated a greater increase of ROS among control groups that were exposed to cell phone radiation than among animals receiving therapy, which had anti-oxidant levels increased. However, melatonin showed more potent effects and comparative benefit than CAPE. Despite this superiority of melatonin in the comparative study, two other articles published that year highlighted the anti-oxidant benefits of CAPE in rats against cell phone induced oxidative stress: one study focused on the kidneys and the other on the lungs. Yet another option which has been studied, certified as effective, and patented is the "MRET Shield", an "Electromagnetic Radiation Shielding Material and Device", available through BioPro Technology. Readers can find information about the MRET Shield online at the company's website, including studies showing how it significantly reduced the level of discernable changes in the physiologic state from exposure to cell phone radiation.

Beyond anti-oxidant supplementation, there are still other ways people can reduce the impacts of cell phone radiation. A commendable 42 page synopsis on the topic of cell phone radiation safety has been published this year by the Environmental Working Group and is available online for free download. This report found that Bluetooth headsets and wired hands free kits exposed the heads of users to less radiation than mobile phones operated at the head, though the hands free kits exhibit a

low constant exposure. They also posted a comparison of 1,000 cell phones for highest specific energy absorption rate (SAR) on the internet where users are able to search for specific models as a way to limit their exposure. "Of note, while the Bluetooth headset reduces radiation exposure to the head, transmission strength from the phone itself is not decreased" and users that keep an activated phone in their pocket are exposing their internal organs to the radiation. Thus it may be advisable to keep activated cell phones away from the body and use a 'speaker' option.

The comprehensive Environmental Working Group review also suggests that perhaps Big Brother wasn't watching closely this time. They report that many of the older conflicting cell phone radiation studies were often done for a duration of less than 3 years and that in the 1980s federal regulators did not require safety studies. Furthermore, apparently FCC guidelines permit 20 times the level of radiation exposure to the head than the rest of the body, allow an industry suggested 4 times greater SAR than the comparative threshold set by the U.S. Environmental Protection Agency (EPA) – which was based on biological effects observed in animal experimentation, and still remain in effect today, despite being made 17 years ago.

Though the controversy is unlikely to resolve anytime soon over the issue of cell phone radiation safety, readers can take precautionary measures to better minimize their risk of associated complications. Naturopathic physicians or other qualified healthcare professionals can help ensure people get the optimal amounts of anti-oxidants and people have the ability to shop for phones that have the lowest possible radiation emission. However, if this debate has irrecoverably shaken your confidence in modern technological forms of communication, there is another resource you should be aware of: people that will buy your old cell phone!! Therecyclingfactory.com and greenphone.com will each cover shipping and pay for your phone. But if you go this route be sure you have other communication options lined up, remember, the passenger pigeon won't be coming back.

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