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PRO:

Numerous peer-reviewed studies have found that cell phone use is not associated with an increased risk of brain tumors. An Oct. 20, 2011 study of 358,403 Danish citizens – the largest study of its kind to date – concluded that "there was no association between tumors of the central nervous system or brain and long term (10 years +) use of mobile phones." A July 27, 2011 study found that there was no association between cell phone use and brain tumor risks among children and adolescents. Numerous other studies published from 2001-2013 have similarly concluded that there is no association between cell phone use and the development of brain tumors.

Radiofrequency radiation from cell phones is non-ionizing and is not powerful enough to cause cancer. Ionizing radiation, including x-rays and ultraviolet light, produces molecules called ions that have either too many or too few electrons. Ions are known to damage DNA and cause cancer. Cell phone radiation, like radio, TV, and visible light radiation, is non-ionizing and lacks sufficient energy to add or remove electrons from molecules, and therefore it cannot ionize and cause cancer. According to the authors of a 2005 peer-reviewed study of 3.7 million Swedish residents, a "biologic mechanism that could explain any possible carcinogenic effect from radiofrequency radiation has not been identified."

Cell phone radiation levels are tested and certified to remain within levels deemed safe by the Federal Communications Commission (FCC). The FCC sets the maximum amount of thermal radiation (heat) that cell phones are permitted to emit. This limit is measured as the amount of radiation absorbed by a user and is known as the specific absorption rate (SAR). In 1996 the SAR for cell phone radiation was set at a maximum of 1.6 watts of energy absorbed per kilogram of body weight. Manufacturers of cell phones must test their products to ensure that they meet this standard. Random tests of phones on the market by FCC scientists further ensure that radiation levels meet FCC guidelines.

Studies have shown an association between cell phone use and a decreased risk of certain brain tumors. According to a peer-reviewed Dec. 2006 study of 420,095 cell phone users in Denmark, the results showed a "reduced brain tumor risk" among long-term subscribers. Two other peer-reviewed studies also found that cell phone users had a slightly decreased risk of developing brain tumors. A July 20, 2005 Danish study found a "decreased risk for high-grade glioma," a malignant brain tumor, and a 2005 Swedish study also found a "decreased odds ratio" for developing glioma as well as meningioma, another type of brain tumor.

US government agencies conclude there is no scientific evidence proving that cell phones cause cancer or other health problems. The Federal Communications

Commission (FCC), US Government Accountability Office (GAO), and the US Food and Drug Administration (FDA), have all concluded that there is no evidence in the scientific literature proving that cell phones cause brain tumors or other health problems. According to the FDA, "attempts to replicate and confirm the few studies that did show a connection [between cell phone radiation and head tumors] have failed."

There has been no rise in the rate of brain cancers despite a massive increase in the use of cell phones. If cell phones were causing cancer we could expect a significant rise in the rate of brain and other related cancers. According to the National Cancer Institute, there was no increase in the incidence of brain or other nervous system cancers between the years 1987 and 2005 despite the fact that cell phone use dramatically increased during those same years. Between 2004 and 2010 there was still no significant change in the incidence rate of brain tumors. Between 2004 and 2010 there was a slight increase from 209 cases to 221.8 cases per 100,000 people, but this slight increase was attributed to better tracking and recording of cases. During the same time period, cell phone use increased 62.7% from 182,140,362 subscribers in 2004 to 296,285,629 in 2010.

Like cell phones, other devices including radios, televisions, cordless phones, and pagers all safely transmit signals using RF radiation. Radio has used RF radiation since at least 1893 and television has used it since at least 1939. The safe, long-term use of those RF-using devices helps prove that cell phones are also safe.

Use of a cell phone while driving is not inherently unsafe. Many activities that distract drivers are much more dangerous than talking on a phone. Research shows that cell phone use is a factor in less than 1% of accidents and that adjusting the radio or CD player, talking with passengers, or eating, and drinking while driving are all responsible for more accidents than cell phones.

Cell phones increase personal safety by providing an easy means of contacting others during an emergency. According to the Wireless Association (CTIA), more than 400,000 wireless 911 calls are made every day. According to an American Association of Retired Persons (AARP) poll, 56% of people over the age of 65 cite safety as a reason they have a cell phone.

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CON:

Numerous peer-reviewed studies have shown an association between cell phone use and the development of brain tumors. According to a Mar. 2008 meta-analysis of cell phone studies there is a "consistent pattern" connecting cell phone use and an increased risk of developing glioma, a type of brain tumor. A Mar. 31, 2009 study found that long term cell phone use (10 years +) "approximately doubles the risk" of being diagnosed with glioma on the same side of the head where the cell phone is held. In Apr. 2013 another study of Swedish cell phone users also found an association between cell phone use and the development of glioma and acoustic neuroma - a benign tumor formation on the nerve near the ear. Other studies published from 2005-2013 have similarly concluded that there is an association between cell phone use and increased risk of developing brain and head tumors.

The International Agency for Research on Cancer (IARC) has classified cell phone radiation as a possible carcinogen. On May 31, 2011, the International Agency for Research on Cancer (IARC) of the World Health Organization (WHO) issued a press release announcing it had added cell phone radiation to its list of physical agents that are "possibly carcinogenic to humans" (group 2B agents). The classification was made after a working group of 31 scientists completed a review of previously published studies and found "limited evidence of carcinogenicity" from the radiofrequency electromagnetic fields emitted by wireless phones, radio, television, and radar.

Due to the relatively recent adoption of cell phones, the long-term safety of the technology cannot be determined conclusively and caution is warranted. Research on glioma brain tumors shows the average latency period is 20-30 years. Although cell phones were introduced in 1983, it was not until 2003 that over 50% of the US population had a wireless subscription, so the 20 year mark for mass cell phone use has not yet been reached. The May 17, 2010 INTERPHONE study, the largest study ever to examine possible links between cell phones and brain tumors, concluded that overall there was "no increase in risk" for glioma or meningioma brain tumors, but the average user in the study had less than eight years of cell phone exposure. In his review of the INTERPHONE study results, Dr. Rodolfo Saracci stated that "none of today's established carcinogens, including tobacco, could have been firmly identified as increasing risk in the first 10 years or so since first exposure."

Cell phones emit radiofrequency (RF) radiation, and RF radiation has been shown to damage DNA. A peer-reviewed Jan. 2012 study in the Journal of Neuro-Oncology tested the effects of cell phone RF radiation on the brain cells of mice and concluded that the radiation "may damage DNA and change gene expression in brain cells." An Aug. 2009 meta-study found that RF radiation "can alter the genetic material of exposed cells." A

2004 European Union-funded study also found that cell phone radiation can damage genes.

Children may have an increased risk of adverse health effects from cell phone radiation. According to American Academy of Pediatrics President Dr. Robert Block, when cell phones are used by children, "the average RF energy deposition is two times higher in the brain and 10 times higher in the bone marrow of the skull," than for adults. A July 2008 peer-reviewed study shows that children under the age of eight absorb twice the amount of radiation into their brain tissue as adults due to their lower skull thickness.

Radiation from cell phones can damage sperm. Cell phone storage in front pockets has been linked to poor fertility and higher chances of miscarriage and childhood cancer. According to the Cleveland Clinic Center for Reproductive Medicine, semen quality "tended to decline as daily cell phone use increased." According to a May-June 2012 meta-study in the Journal of Andrology, "men using mobile phones have decreased sperm concentration" in addition to "decreased viability" of their sperm.

Prenatal exposure to radiation from cell phones may increase the risk of ADHD and other behavior problems in children. According to a peer-reviewed Nov. 2008 study in the journal Epidemiology, exposure to cell phone radiation while in the womb "was associated with behavior difficulties such as emotional and hyperactivity problems around the age of school entry." A Dec. 2010 study replicated those findings. A peer-reviewed Mar. 15, 2012 study found that mice exposed to cell phone radiation in the womb "were hyperactive and had impaired memory" as adults.

Cell phone radiation may disrupt the functioning of pacemakers. A 2005 study in the International Journal of Cardiology found that mobile phones may have "adverse effects" on pacemaker functions under certain conditions. According to the US Food and Drug Administration (FDA), radiofrequency energy from cell phones can create electromagnetic interference (EMI) that may disrupt the functioning of pacemakers, especially if the cell phone is placed close to the heart. The American Heart Association includes cell phones on its list of "devices that may interfere with pacemakers."

Using a cell phone while driving, even with a hands-free device, is unsafe and makes accidents more likely. The National Highway Traffic Safety Administration (NHTSA) estimates that driving distractions, including the use of cell phones, contribute to 25% of all traffic crashes. According to researchers at the University of Utah people who drive while talking on their cell phones are as impaired as drunk drivers with a blood alcohol level of 0.08%.