

# OPTIMAL HEALTH UNIVERSITY™

Presented by Dr. Wayne Terai

## The Latest Research on Cell Phone Radiation

*Chances are you are one of the over 4 billion people who use a cell phone. You may have heard a lot of conflicting information about the effect of cell phone radiation on your health — one report claims that the radiation is perfectly harmless, while another warns that cell phone use is a one-way ticket to brain cancer.*

*Dr. Terai recognizes that cell phones are an immensely useful part of modern life. However, they may affect our bodies in ways we do not yet fully understand. Dr. Terai encourages patients to take a look at the research, and learn a few strategies to decrease the potential risk of cell phones.*



### A Radiation Primer

Electromagnetic radiation — energy in the form of electric and magnetic waves combined — comes from a variety of sources. Some of these sources, such as X-ray machines and certain nuclear wastes, produce high-energy radiation that is powerful enough to tear apart cellular DNA. This is why electromagnetic radiation is linked to cancer and other illnesses.

Cell phones, on the other hand, emit radiation with a much lower level of energy (as do radio and television transmissions). This type of radiation has generally been considered benign. However, some studies link cell phone use to the same health problems often blamed on much stronger forms of radiation.

One hypothesis is that the radiation from cell phones in close proximity to the body heats tissue enough to produce damaging free radicals (*Environmental Working Group* 2009).

Dr. Terai reminds patients that the technology behind cell phones is two decades old — still young enough that its long-term health risks are uncertain. Furthermore, many studies have focused on the effects of just a few

years of cell phone use. The EU's Scientific Committee on Emerging and Newly Identified Health Risks recently called for additional studies on the potential risks of long-term (more than ten years) exposure to cell phone radiation — and the research community is responding.

### Brain Cancer Connection?

The just-released results of the Interphone study give new insight into the relationship between cell phone radiation and brain cancer. This 10-year analysis, the most extensive ever of its kind, was conducted by the International Agency for Research on Cancer. The study spanned 13 countries, 6,420 cancer and tumor cases and 7,658 healthy control subjects.

Interphone researchers found no overall relationship between cell phone use and cancer. However, the top 10 percent of users — those with 30 minutes of daily talk time or more — showed a 40 percent greater risk of developing glioma, a relatively common and incurable type of brain cancer. These patients consistently reported that they used their phones on the side of the head where the tumors were located (*Int J Epidemiol* 2010;39:675-94).

Years of cumulative use may matter as

well — another report published last year indicated that ten or more years of cell phone use double the risk of a brain tumor on the side of the head on which the phone is used (*Surg Neurol* 2009;72:205-14).

What is it about the electromagnetic radiation from cell phones that might cause cancer? One investigation suggests that this type of radiation transforms the proteins in brain cells in a way that interferes with normal cell division (*Biochem J* 2007;405:559-68). Another shows genes as well as cell proteins altered by just one hour of radiation from a cell phone (*Proteomics* 2006;6:4769-80).

### A Problem With the Evidence

The Interphone researchers point out that it is difficult to conclude that heavy cell phone use caused subjects' brain cancer because the study relied on individual recall of cell phone use, which could be inaccurate. This problem is identified in many studies seeking a relationship between cell phone use and cancer (*Epidemiology* 2009;20:639-52).

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## Reduce Your Cell Phone Radiation Risk

Although there is still much to learn about the health effects of cell phone radiation, there are enough potential risks that the doctor advises caution. Of course, the safest option would be to abstain completely from cell phone use except in emergency situations. But, let's face it: this is not a realistic option for many people. If you fit into this category, focus on limiting exposure to cell phone radiation. The doctor suggests the following precautions:

- Reduce your cell phone use. Use landlines whenever feasible, and power off your cell phone whenever possible.
- Keep your cell phone away from your body. Use a headset or the speakerphone option to avoid holding the phone against your head. Text messaging also keeps the phone safely away from your brain and produces less radiation than making a call.
- If your phone indicates a weak signal, don't use it. It will emit higher levels of electromagnetic rays as it strains to connect with a distant tower.
- Choose a lower-radiation cell phone model — radiation can vary by a factor of eight from model to model. See [www.ewg.org/cellphone-radiation](http://www.ewg.org/cellphone-radiation) for a comparison of radiation levels for over 1,000 phones.
- Consider some of the shielding devices available to apply to your cell phone to block radiation.
- Do not sleep with your phone in your bed, or very close to your bed. Power the phone off at night.
- Do not allow children to use cell phones. Their thinner skulls and immature immune systems make them particularly vulnerable to the potential health risks of electromagnetic radiation.

Relying on people's memories of cell phone use may also explain the wide discrepancy in study results. For instance, one large-scale trial actually found that regular cell phone users had a **lower** rate of a form of brain cancer called meningioma (*Int J Epidemiol* 2008;37:1304-13).

### Parotid Gland Tumors

Brain cancer is a condition commonly studied in relationship to cell phone use because of the proximity of the device to this part of the body. Similarly, some scientists suspect a link between cell phones and tumors of the parotid gland, a salivary gland located behind the jawbone. These tumors can cause extreme pain during salivation as well as facial pain and paralysis.

So far, no scientific evidence demonstrates an overall association between cell phone use and parotid gland tumors. However, one study reveals an elevated risk among certain users, such as those who use their phones very frequently in rural areas with weak signals, which requires the phone emit more radiation to work (*Am J Epidemiol* 2008;167:457-67).

### Fertility Concerns

Men who carry cell phones in their pants pockets or on a belt clip may be interested in the possible effects on their sperm count and quality. The tissue of the testes is particularly vulnerable to the effects of heat.

A scientific article in the journal *Fertility and Sterility* reports that cell phone exposure decreases sperm count, viability and activity (*Fertil Steril* 2008;89:124-28). Sperm are also vulnerable to DNA damage from the type of radiation produced by cell phones, potentially resulting in not only decreased fertility but also miscarriage or health complications in offspring (*PLoS ONE* 2009;4:e6446).

Women of childbearing age may also need to watch their use of cell phones. A survey of the mothers of over 13,000 children correlated behavioral problems with prenatal cell phone exposure (*Epidemiology* 2008;19:523-9).

### Other Conditions

Several less serious but bothersome conditions may also result from cell



phone use. In a Danish study of over 400,000 cell phone users, those who had used cell phones for 14 years or longer had a 10 to 20 percent higher rate of hospitalization for migraines and vertigo (*PLoS One* 2009;4:e4389).

In neighboring Sweden, adolescents who regularly use cell phones reported elevated levels of sleep disorders, concentration problems, anxiety, headaches, stress and fatigue (*Environ Health* 2008;7:18).

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