CAN CELL PHONES CAUSE CANCER?

In 2005, lawsuits were filed against cell phone manufacturers in Georgia, Louisiana, Maryland, New York, and Pennsylvania. These lawsuits alleged that there may be a link between cell phone use and brain cancer and accused the manufacturers of failing to adequately protect users from radiation. Is there any truth to this claim?

Nonionizing Radiation

Cell phones transfer messages by sending and receiving electromagnetic waves. The electromagnetic spectrum includes low-energy waves, such as radio waves, and high-energy waves, such as X rays and gamma rays. High-energy electromagnetic waves are *ionizing*, which means they have enough energy to remove an electron from its orbit. Ionizing electromagnetic radiation can damage living tissue and cause DNA mutations, which is why exposure to X rays should be limited.

Cell phones use radio frequencies (RFs) ranging from about 1800 to 2200 MHz. These *nonionizing* waves do not alter the molecular structure of living tissue. They can cause the atoms in a molecule to vibrate but do not have enough energy to remove electrons from their orbits. At high enough levels, however, nonionizing radiation can cause biological damage by heating living tissue. But the amount of heat that a cell phone's radiation generates is very small, much smaller than the energy generated in a microwave oven.

What Do the Studies Say?

The effects of nonionizing radiation on the human body are not fully known. Several studies have been conducted to determine whether there is any possible link between cell phone use and brain cancer. Scientists conducting these studies have attempted to determine whether the risk of brain cancer is greater for cell phone users than for nonusers. Even if a link is found, it is not necessarily a cause-and-effect link. In other words, even if cell phone users *do* have a higher risk of cancer, cell phone use is not necessarily the cause.

Further, several issues complicate the research. In the past, scientists had to estimate RF exposure based on interviews with patients. (Scientists are now using RF meters to measure the amount of exposure, so newer studies will be more accurate in this regard.) Also, cell