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Tuesday, Oct. 26, 2010

Cell-Phone Safety: What the FCC Didn't Test

By Michael Scherer / Washington

We are a nation grown numb to the seemingly endless fine print that accompanies our purchases. But every now and then a product is sold with a warning that should command attention. Consider the little-noticed bit of legalese that comes in the safety manual for Apple's iPhone 4: "When using iPhone near your body for voice calls or for wireless data transmission over a cellular network, keep iPhone at least 15 mm (5/8 inch) away from the body, and only use carrying cases, belt clips, or holders that do not have metal parts and that maintain at least 15 mm (5/8 inch) separation between iPhone and the body," the warning reads.

Similar warnings against carrying cellular and smart phones in a closely sewn pocket show up throughout the industry. The safety manual for Research in Motion's BlackBerry 9000 phone tells users that they may violate Federal Communications Commission (FCC) guidelines for radio-frequency energy exposure by carrying the phone outside a holster and within 0.98 inches (2.5 cm) of their body. The safety manual of the Motorola W180 phone tells users to always keep the active device one full inch away from their body, if not using a company-approved "clip, holder, holster, case or body harness." (See the top 10 iPhone applications of 2009.)

Skeptics of the safety of cellular phones have seized upon these warnings as evidence that the ubiquitous devices may be exposing Americans to far more radiation than regulators measure. "Nobody is watching," says Devra Davis, the author of a new book called *Disconnect: The Truth About Cell Phone Radiation, What the Industry Has Done to Hide It, and How to Protect Your Family*. "Is the law broken if something is so complicated that nobody notices?" (See the all-time top 100 gadgets.)

The answer, like the fine-print warnings themselves, is complicated, and likely has as much to do with corporate concerns over legal compliance as it does with health, given the current body of scientific knowledge. "The companies want to legally protect themselves," says Robert Cleveland Jr., a former FCC official who worked on setting the current cellular-phone radio-frequency standard. (See a cell-phone radiation report card for several major phones.)

The warnings stem from an odd quirk in federal testing procedures designed to ensure the safety of cellular phones. In 2001, the FCC released a set of guidelines for manufacturers that required all cell phones sold in the U.S. to emit a specific absorption rate (SAR) of not more than 1.6 watts of radio-frequency energy per kilogram of body tissue, a standard deemed safe given the state of scientific knowledge about thermal harm from radio-frequency waves. The standard was considered a so-called worst-case scenario, accounting for the energy emitted when the phone was transmitting at full power all of its various signals — such as Bluetooth, wi-fi and cellular.

But the FCC testing regulations notably chose not to simulate a situation in which the phone was broadcasting at full power while inside a shirt or pants pocket flush against the body, an odd oversight given the known habits of many cellular-phone users. As a matter of physics, radio-frequency energy generally increases sharply as distance is reduced. "The exposure is definitely related to distance," says Cleveland. (Comment on this story.)

According to the 2001 FCC guidelines, testing of the device in a "body-worn" configuration should be done with the device in a belt clip or holster. If a belt clip or holster was not supplied with the phone, the FCC told testers to assume a separation distance of between 0.59 inches and 0.98 inches (1.5 cm to 2.5 cm) from the body during a test.

"Clearly if it's tested in a holster, it's only guaranteed to be compliant if it's used with a holster," says one current FCC official familiar with these issues, who asked not to be identified by name. "Clearly a lot of people weren't aware of this, and it probably does need to be addressed." Some phones come with a holster included, while others, including Apple's iPhone 4, are not sold with holsters.

Read "How Safe Is Your Cell Phone?

See a photographic history of the cell phone.

A spokeswoman for Apple, Natalie Harrison, provided a statement in response to questions about the iPhone warning. "iPhone's radio-frequency energy is well within the limits set by the Federal Communications Commission of the U.S., Industry Canada of Canada and other countries," she said. Representatives for Motorola and Research in Motion did not respond to requests for comment.

John Walls, a spokesman for CTIA, a trade group representing the wireless industry, confirmed that the warnings arose from the FCC testing guidance. "Because they test at

the waist in the holster, any reference to use guidelines or advice incorporates the buffer the holster provides," Wall wrote in an e-mail to TIME. (See cell phones and other products in TIME's 20 back-to-school gadgets.)

So should you be worried about putting your phone in your pocket? The answer depends largely on how much faith you put in the current state of scientific research about radio-frequency energy.

Both U.S. and international regulatory bodies like the World Health Organization have found that available scientific evidence does not demonstrate an increased health risk due to the radiation that is emitted by cellular phones. But these statements, which are based on large studies looking for increases in conditions like brain cancer, do not rule out the possibility that future studies might reach a different conclusion, as more data is collected over longer periods of time and the general use of cellular phones increases. (See photos from inside an X-ray studio.)

The FCC notes on its websites that studies linking radio-frequency exposure and cancer "have been inconclusive." The Food and Drug Administration (FDA), which has primary responsibility for monitoring the health science of cellular phones, has stated that it cannot rule out the possibility of a health risk from phones, but if such a risk exists, "it is probably small." One recent study found that people who used their phones most often and for the longest period of time — 30 minutes a day or more on average for at least 10 years — had a substantially higher risk of developing some form of brain cancer, but the study also found that those who rarely used cellular phones had a lower risk than those who used only corded phones. (Read about one study's muddled findings on cell phones and cancer.)

The FDA recommends that those concerned about these health risks can either reduce the amount of time spent using a cell phone or "use speaker mode or a headset to place more distance between your head and the cell phone." If using a hands-free headset, the FDA recommends keeping a distance between your phone and your body, either by holding the phone in your hand, where it is likely to be less of a hazard, or in an approved body-worn accessory like a holster.

Given the current testing guidelines, it is impossible to know if any phone currently sold in the U.S. would exceed 1.6 watts per kilogram if worn in a pocket flush with the skin, or by how much. But the fine-print warnings suggest manufacturers are aware of the possibility. The BlackBerry 9000 warning, for instance, states that users should "use only accessories equipped with an integrated belt clip that are supplied or approved by Research In Motion" to "maintain compliance" with FCC guidelines. (Comment on this story.)

In a recent update to its online advisory on cell-phone radiation, the FCC noted, "Many people mistakenly assume that using a cell phone with a lower reported SAR value necessarily decreases a user's exposure to RF emissions, or is somehow 'safer' than using a cell phone with a high SAR value."

The posting went on to explain that any given phone could have several different emissions levels in various configurations, and that FCC testing is only designed to ensure that the phone does not exceed 1.6 watts per kilogram of exposure in a "most severe, worst case (and highest power) operating conditions." The Web posting, however, did not explain why FCC testing fails to account for the worst-case (and quite common) scenario of a cell-phone user who wears a phone against the skin inside a pocket.