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Radiowave Effects on Humans
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Damaging effect to the human body by radio waves will result if the waves are intense enough to heat up the body. The extreme example is what happens to meat put in a microwave oven.

If a person's body is immersed in a strong radiowave field the electrons and ions in the body try to oscillate in unison with the radiowaves. This means energy is extracted from the radio wave and converted to tiny oscillatory motions of electrically-charged components of the body. The more the motion, the higher the body temperature.

In the Soviet Union, regulations require that workers not be exposed to radiowave radiation in excess of 10 microwatts per square centimeter. One hundred times this radiation level (i.e., 1 milliwatt per square centimeter) will create slight temperature increase in humans, the rise being about the same as results from normal light physical activity. Prolonged exposure to this intensity of radiowave radiation probably causes permanent damage. Exposure to 10 to 100 milliwatts definitely causes damage to the eyes; it cooks the eye lens enough to cause cataracts.

Scientists and the government agencies charged with protecting human health in Western countries are unwilling, so far, to agree with claims by their eastern European and Soviet counterparts that very low microwave levels (10 microwatt to 1

milliwatt) are dangerous. However, they admit that it is an open question.

One reason the question is unanswered is that the energy absorbed by a human from radio waves depends upon the relationship between the size of the human and the frequency of the radio waves. Just as a TV antenna of the right length and orientation picks up the best signal (the most energy) from a transmitted wave, so it is with a human being. It appears that the cranial cavity of a mammal will resonate at specific radio frequencies determined by the size of the brain cavity. At these resonant frequencies the human head will absorb vastly more radiowave energy than it will at other nearby frequencies.

An adult's head will resonate at a frequency between 350 and 400 MHz (megahertz). Being smaller, a child's head will resonate at a higher frequency, somewhere between 600 and 850 MHz. Since each individual may have his or her own resonant frequency, a particular frequency radiowave might affect one person more than another. Consequently, testing on humans--even if people are willing to let this happen--can be rather complicated.

Aside from the question of permanent damage by absorption of too much radiowave energy, there is the issue of how much radiation it takes to temporarily modify human behavior or mental ability. It is suspected that a microwave signal modulated (i.e., pulsed) at the frequencies where human brainwaves operate (1 to 20 Hz) may affect mental processes, even if the radiation is too weak to create substantial heating of the brain.

Quite obviously it is a complicated issue to determine the effects of radiowaves upon humans and other animals. Just knowing the strength of the radio signal a person is immersed in is not enough. Critically important may be the frequency match between the signal and the person's body and whether or not the signal is modulated at a frequency that could match up to a person's brainwave pattern.

Complicating matters even further is the finding that mammals can be made to "hear" pulses of radiowave emission. Pulses at frequencies within a mammal's hearing range can cause periodic healings of the head. These create pressure pulses in the ear that are interpreted as sound. Further, some studies have indicated radiowave effects upon cell processes that could affect the nervous system, the cardiovascular system and immunity to disease. The effects are not necessarily all bad: certain cancers are being successfully treated with radiowaves, and the future of even greater success looks bright.

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