

Radio Wave Packet

by

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SOME BIOLOGICAL EFFECTS OF RADIO WAVES

| Power density ($\mu\text{W}/\text{cm}^2$) | Reported Biological Effects | References |
|--|--|---------------------------------|
| 0.00000000000001 | Altered genetic structure in E. Coli | Belyaev 1996 |
| 0.0000000001 | Threshold of human sensitivity | Kositsky 2001 |
| 0.000000001 | Altered EEG in human subjects | Bise 1978 |
| 0.0000000027 | Growth stimulation in Vicius fabus | Brauer 1950 |
| 0.00000001 | Effects on immune system in mice | Bundyuk 1994 |
| 0.00000002 | Stimulation of ovulation in chickens | Kondra 1970 |
| 0.000005 | Effect on cell growth in yeast | Grundler 1992 |
| 0.00001 | Conditioned “avoidance” reflex in rats | Kositsky 2001 |
| 0.000027 | Premature aging of pine needles | Selga 1996 |
| 0.001 | 100 Yards from a Cellular Phone | |
| 0.002 | Sleep disorders, abnormal blood pressure, nervousness, weakness, fatigue, limb pain, joint pain, digestive problems, fewer schoolchildren promoted—controlled study near a shortwave transmitter | Altpeter 1995, 1997 |
| 0.0027 | Growth inhibition in Vicius fabus | Brauer 1950 |
| 0.0027 to 0.065 | Smaller tree growth rings | Balodis 1996 |
| 0.007 | 50 Feet from a Cordless Phone | |
| 0.01 | Human sensation | Kolbun 1987 |
| 0.016 | 1 Mile from a Cellular Tower | |
| 0.06 | Altered EEG, disturbed carbohydrate metabolism, enlarged adrenals, altered adrenal hormone levels, structural changes in liver, spleen, testes, and brain—in white rats and rabbits | Dumanskij 1974 |
| 0.06 | Slowing of the heart, change in EEG in rabbits | Serkyuk, reported in McRee 1980 |
| 0.05 | 10 Feet from a Wireless Computer | |
| 0.1 | Increase in melatonin in cows | Stark 1997 |
| 0.1 to 1.8 | Decreased life span, impaired reproduction, structural and developmental abnormalities in duckweed plants | Magone 1996 |
| 0.13 | Decreased cell growth (human epithelial amnion cells) | Kwee 1997 |
| 0.168 | Irreversible sterility in mice | Magras 1997 |
| 0.2 to 8.0 | Childhood leukemia near transmitters | Hocking 1996 |
| 0.3 | Impaired motor function, reaction time, memory and attention of schoolchildren, and altered sex ratio of children (fewer boys) | Kolodynski 1996 |
| 0.6 | Change in calcium ion efflux from brain tissue | Dutta 1986 |
| 0.6 | Cardiac arrhythmias and sometimes cardiac arrest (frogs) | Frey 1968 |
| 0–4 | Altered white blood cell activity in schoolchildren | Chiang 1989 |
| 1.0 | Headache, dizziness, irritability, fatigue, weakness, insomnia, chest pain, difficulty breathing, indigestion (humans—occupational exposure) | Simonenko 1998 |
| 1.0 | Stimulation of white cells in guinea pigs | Shandala 1978 |
| 2.5 | Breakdown of blood-brain barrier (used a digital cellular phone to provide the radiation) | Salford 1997 |
| 5.0 | Leukemia, skin melanoma and bladder cancer near TV and FM transmitter | Dolk 1997 |

| | | |
|---------------------------------|---|---|
| 2.0 (lower threshold not known) | “Microwave hearing”—clicking, buzzing, chirping, hissing, or high-pitched tones | Frey 1963, 1969, 1971, 1973, 1988, Justeson 1979, Olsen 1980, Wieske 1963, Lin 1978 |
| 5.0 | Biochemical and histological changes in liver, heart, kidney, and brain tissue | Belokrinitskiy 1982 |
| 10.0 | Damaged mitochondria, nucleus of cells in hippocampus of brain | Belokrinitskiy 1982a |
| 10~0 | Impaired memory and visual reaction time in people living near transmitters | Chiang 1989 |
| 10.0 | Decreased size of litter, increased number of stillborns in mice | Il’Chevich (reported in McRee 1980) |
| 10.0 | Redistribution of metals in the lungs, brain, heart, liver, kidney, muscles, spleen, bones, skin, blood | Shutenko 1981 |
| 1000.0 | FCC Exposure Limit | |

INTERNATIONAL RADIO WAVE EXPOSURE STANDARDS

| Country | Exposure level ($\mu\text{W}/\text{cm}^2$) |
|--|--|
| New South Wales, Australia | 0.001 |
| Salzburg, Austria (for pulsed transmissions) | 0.1 |
| Russia | 2–10 |
| Bulgaria | 2–10 |
| Hungary | 2–10 |
| Switzerland | 2–10 |
| China | 7–10 |
| Italy | 10 |
| Auckland, New Zealand | 50 |
| Australia | 200 |
| New Zealand | 200–1000 |
| Japan | 200–1000 |
| Germany | 200–1000 |
| United States | 200–1000 |
| Canada | 200–1000 |
| United Kingdom | 1000–10,000 |

RADIO WAVE SICKNESS

Symptoms

Insomnia, headaches, dizziness, nausea, memory loss, difficulty concentrating, irritability, respiratory illness (bronchitis, sinusitis, pneumonia), flu-like illness, asthma, fatigue, weakness, pressure or pain in the chest, increase in blood pressure, altered pulse rate (usually slowed), pressure behind the eyes, other eye problems, swollen throat, dry lips or mouth, dehydration, sweating, fever, shortness of breath, muscle spasms, tremors, pain in the legs or the soles of the feet, testicular or pelvic pain, joint pain, pains that move around the body, nosebleeds, internal bleeding, hair loss, digestive problems, skin rash, ringing in the ears, impaired sense of smell, pain in the teeth (especially with metallic fillings)

Scientific Studies

Clinical studies of workers exposed on the job

| | | |
|---------------------------|------|--|
| Sadchikova | 1960 | 525 workers exposed to microwave generating equipment |
| Sadchikova | 1974 | 1180 workers |
| Klimkova-Deutschova | 1974 | 530 workers from 29 places of employment |
| Baranski and Edelwejn | 1975 | Workers in the Military Institute of Aviation Medicine, Warsaw |
| Zalyubovskaya and Kiselev | 1978 | Study of 72 engineers and technicians |
| Bachurin | 1979 | 100 television, radio and other workers |
| Sadchikova | 1980 | 50 industrial workers |
| Chiang | 1981 | 841 workers in 11 factories |
| Gorbach | 1982 | 142 workers exposed to microwave equipment |
| Trinos | 1982 | 2247 workers at two industrial plants |
| Markarov | 1995 | 53 workers exposed to low-dose radio waves |

Epidemiological studies

| | | |
|-------------------|------------|--|
| Lilienfeld | 1978 | Employees in the American embassy in Moscow |
| Flakiewicz | 1992 | Residents near a long wave transmitter at Konstantynow, Poland |
| Altpeter | 1995, 1997 | Residents who lived near a shortwave radio station at Schwarzenburg, Switzerland |
| Kolodynski et al. | 1996 | Residents near an early warning radar station at Skrunda, Latvia |
| Hocking | 1998 | Users of cellular telephones—includes several reports of strokes |
| Mild | 1998 | Users of cellular telephones |

Reports to the Cellular Phone Taskforce

Since digital cellular phones (and towers) came to the United States in November 1996, the symptoms of radio wave sickness have become epidemic in all major cities and near most wireless facilities. The above list of symptoms includes the symptoms reported throughout the scientific literature, plus some new ones based on what we are hearing and experiencing, from throughout the world.

History of This Illness

The term “radio wave sickness” was first used by Russian doctors to describe an occupational illness developed by large numbers of workers exposed to microwave or radiofrequency radiation. The symptoms were called “neurasthenic.” “Neurasthenia” was an older term for this group of symptoms, which was coined by an American physician, George Beard, in 1868, to describe a new type of illness that followed the building of the railroads and the telegraph system in this country. The illness was particularly common among telegraph, and later among telephone operators. The term “neurasthenia” fell out of fashion in the twentieth century in this country, when this cluster of symptoms, or a large number of them, began to be referred to as “anxiety” symptoms, presumably of purely psychological origin. Illness by radio waves has been rediscovered, and is now classed with illness caused by electricity in general, under the term “electrical sensitivity.” There have been four international scientific conferences held in recent years on electrical sensitivity—one in Austria, two in Denmark, and one, for medical doctors, in Dallas, Texas. Two books exist on the subject, by Grant (1995) and Bergqvist (1997).

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For a much more extensive review of the literature on this subject, see *Microwaving Our Planet: The Environmental Impact of the Wireless Revolution*, Arthur Firstenberg, 1997, \$18 from the Cellular Phone Taskforce, P.O. Box 100404, Brooklyn, New York 11210, or P.O. Box 1337, Mendocino, CA 95460.