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Cordless Phones and Malignant Brain Tumours

Cordless phones depend on the same microwaves that power cell phones and other wireless telecommunication and may be far more hazardous. [Dr. Mae-Wan Ho](#)

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Cordless phones at least as dangerous as mobile phones

Cancer researchers in Sweden found strong links between malignant brain tumours and using cordless phones, which are comparable to those for using mobile phones [1, 2].

The cancer research team led by Lennart Hardell at the University of Orebro showed that people who have used mobile phones or cordless phones for more than 2 000 h are all at greatly increased risks of getting malignant brain tumours.

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The odds of getting malignant brain tumours compared with those who have never used these phones - expressed as odds ratio, OR – was 5.9 times for analogue mobile phones (older type of mobile phones), 3.7 times for digital mobile phones and 2.3 times for cordless phones. (OR of 1 indicates no increased risk compared to non-users; OR<1 indicates decreased risk; and OR>1 indicates increased risk.)

For all malignant brain tumours in people who have used the phones for more than ten years, the ORs were 3.0 and 2.8 for analogue and digital mobile phones respectively, and 3.3 for cordless phones. For high-grade astrocytomas (malignant tumour of the astrocyte, a glial cell), the corresponding ORs increased further to 3.7, 3.8, and 3.9 respectively.

The risk of malignant brain tumours is increased for *any* phone use, regardless of how many years or hours of use. The ORs for analogue and digital mobile phones were 1.5 and 1.3 respectively, and for cordless phone, 1.3. When considering malignant tumours on the same side of the head the phone is used, the ORs rose to 2.1, 1.8, and 1.7 respectively for malignant tumours, and to 2.4, 2.3 and 2.0 respectively for high-grade astrocytomas. This is yet another indication that the tumours are associated with exposure.

These latest results were obtained by analysing the pooled data from two case control studies that yielded similar findings earlier. Pooling the data gave more cases and hence more reliable results. Altogether, there were 905 cases of malignant brain tumours, and 2 162 controls subjects matched for age and sex, and living in the same area of Sweden.

The Swedish researchers are the first team to have studied cordless phones, which depend on the same wireless technology and microwave telecommunication as mobile phones. Although cordless phone were first introduced in 1980, it did not become widely available in Sweden until the digital system was introduced in the early 1990s, and in the United States in 2000 [3]. So, while mobile phones and transmitters were grabbing the headlines (see Box), cordless phones have been silently invading our homes and workplaces.

Mobile phone links to cancers and other illnesses

The link between mobile phones and transmitters to cancers and other serious illnesses were recently confirmed [4, 5] ([Cancer Risks from Microwaves Confirmed](#), [Drowning in a Sea of Microwaves](#), *SiS* 34). Mobile phone transmitters are suspects in the disappearance of birds and bees [6, 7] ([Mobile Phones & Vanishing Birds](#), [Mobile Phones and Vanishing Bees](#), *SiS* 34). Numerous laboratory studies have reported effects on a wide range of biological and biochemical functions in animals, tissues, and cells [8, 9] ([Mobile Phones & Brain Damage](#), *SiS* 24; [Confirmed: Mobile Phones Break DNA & Scramble Genomes](#), *SiS* 25), and even an enzyme solution was affected [10] ([Mobile Phone Turns Enzyme Solution into A Gel](#), *SiS* 25).

The latest to hit the press is the association between mobile phone use and tumours of the salivary gland on the same side of the head located close to where the phone is placed [11],



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and sleep disorders in people using the phone close to bedtime [12, 13], which impairs the body's ability to repair daily wear and tear. This affected subjects regardless of whether they think they are 'electro-sensitive' or not.

Nor are microwave radiation the only part of the electromagnetic spectrum that has biological effects. Evidence has been accumulating since the 1950s that the entire electromagnetic spectrum may affect living organisms, and at intensities far below that which heats up the tissues [14] ([Electromagnetic Fields, Leukaemia and DNA Damage](#), *SiS* 24). Such [Non-Thermal Effects](#) (*SiS* 17 [15]) are at the centre of the continuing controversy over the failure of regulatory guidelines to protect the public. The permitted exposure levels are set far too high, based on those that would not heat up the tissues, but are thousands, if not millions of times those known to have biological effects.

The reason organisms are sensitive to very weak electromagnetic fields is because the body itself depends on internal electric and electromagnetic fields to intercommunicate and coordinate its functions and movements [16, 17] ([The Rainbow and the Worm - The Physics of Organisms 2nd Edition](#) and [Quantum Jazz](#), *SiS* 32). But this fundamental physics of organisms has so far eluded much of the mainstream scientific community [18] ([The Excluded Biology](#), *SiS* 17) wedded to obsolete theories that present the organism as a mechanical contraption of molecular nuts and bolts.

The focus on mobile phones has distracted attention from the cordless phone, which has insinuated itself into positions where they could cause the most harm. Cordless phones are typically placed on the desktop or at the bedside, where people are maximally exposed to radiation intensities hundreds and thousands of times stronger than those from nearby cell phone transmitters sufficient to cause cancers. And they are emitting continuously 24 hours a day. Anecdotal evidence has been emerging of people suffering illnesses such as chronic fatigue and sleep disturbance [19], which are very similar to those from mobile phones. An experiment carried out at Landau University in Germany showed that bees failed to return to the hives when cordless phone base stations are placed in them [7].

Experts demand health warning on cordless phones

The current digital enhanced cordless telephone (DECT) sold in Europe consists of one or more handsets that communicate with a base station via radio waves in the microwave range. The base station emits (broadcasts) microwave radiation at full power pulses 100 times a second as long as it is plugged into the wall socket. There have been calls for health warning on DECTs [19, 20], if not an outright ban (see later).

DECTs or similar phones are now widely used throughout the world. Independent measurements have been carried out on the power of the microwaves emitted, the most thorough by Thomas Haumann (Umweltanalytik und Baubiologie, Essen, Germany) and Peter Sierck (Environmental Testing & Technology, Inc., Encinatas, California, USA) in 2002 [21]

They found a maximum power density of over 600 000 $\mu\text{W}/\text{m}^2$ at the normal distance of 1 foot (0.3 m) if the base station is placed on an office desk or bedside table. The peak radiation values in the same room are higher than those from any mobile phone transmitters that are located near residential buildings. The background level (in the absence of the DECT base station) was $<0.3 \mu\text{W}/\text{m}^2$.

The DFHSS (Digital Frequency Hopping Spread Spectrum) phone sold in the US was almost identical to the DECT in Europe. Both are pulsed at 100 Hz. The DFHSS runs on the frequency range of 2 450 MHz and DECT on 1 880 MHz.

The detailed measurements on the DFHSS base station are comparable to those made on DECT base stations in Germany in 1996 (see Table 1 [21]).

Table 1: 2.4 GHz cordless phone base station power density levels in the same room

Distance	US GIGASET (2.4 GHz)*	GERMANY GIGASET (DECT)**
	DFHSS (Digital Frequency Hopping Spread Spectrum) digital pulsed 100 Hz frequency range 2450 MHz	DECT (Digital Enhanced Cordless Telecommunication) digital pulsed 100 Hz frequency range 1880 MHz
30 centimeter - 12.5"	673,000 $\mu\text{W}/\text{m}^2$	405,000 $\mu\text{W}/\text{m}^2$
50 centimeter - 19.8"	280,000 $\mu\text{W}/\text{m}^2$	146,000 $\mu\text{W}/\text{m}^2$
1 meter - 39.4"	72,000 $\mu\text{W}/\text{m}^2$	36,000 $\mu\text{W}/\text{m}^2$
2 meter - 78.8"	23,000 $\mu\text{W}/\text{m}^2$	9,100 $\mu\text{W}/\text{m}^2$

*this study, **OEKO-TEST 1996

The maximum power density levels in the entire house were also quite high (see Table 2 [21]), compared with radiation levels in homes near mobile phone transmission towers, about 10-1 000 $\mu\text{W}/\text{m}^2$ measured in the UK [23].

Table 2: 2.4 GHz cordless phone base station power density levels in the house

Room	Power Density (maximum pulse peak value)
Office with phone	33,800 $\mu\text{W}/\text{m}^2$
Master bedroom	13,500 $\mu\text{W}/\text{m}^2$
Bedroom 2	5,400 $\mu\text{W}/\text{m}^2$
Bedroom 3	680 $\mu\text{W}/\text{m}^2$
Living room	140 $\mu\text{W}/\text{m}^2$
Family room	50 $\mu\text{W}/\text{m}^2$
Outside	9 $\mu\text{W}/\text{m}^2$

These power density levels are legal and considered 'safe', according to current regulatory guidelines, which are 10 000 to over 1 000 000 times those recommended by expert bodies on the basis of studies demonstrating biological effects at power densities orders or magnitude

below the legal limits.

Table 3: Comparison of Standard Threshold Values and Recommendations

Comparison of Standard Threshold Values and Recommendations (electromagnetic fields, non ionizing radiation)		Total Power Density
Standards, > 2,000 MHz (e.g.)		
	FCC/ANSI - USA	10,000,000 $\mu\text{W}/\text{m}^2$
	Germany, England, Finland and Japan	10,000,000 $\mu\text{W}/\text{m}^2$
	Belgium	1,200,000 $\mu\text{W}/\text{m}^2$
	Switzerland and Italy	90,000 $\mu\text{W}/\text{m}^2$
Recommendations / References (e.g.)		
	Ecolog Study, Germany (ECOLOG 2000)	10,000 $\mu\text{W}/\text{m}^2$
Cellular tower radiation - high exposure level, 95. percentile (HAUMANN 2002)		6,300 $\mu\text{W}/\text{m}^2$
	Salzburg, Austria (RESOLUTION 2000)	1,000 $\mu\text{W}/\text{m}^2$
	EU Parliament (STOA 2001)	100 $\mu\text{W}/\text{m}^2$
Cellular tower radiation – background level, 20. percentile (HAUMANN 2002)		15 $\mu\text{W}/\text{m}^2$
	Low exposure, Oeko-Test (OEKO TEST 2001)	10 $\mu\text{W}/\text{m}^2$
	Nighttime exposure, Baubiology Standard (SBM 2000)	0.1 $\mu\text{W}/\text{m}^2$
	Natural cosmic microwave radiation (MAES 2000)	< 0.000001 $\mu\text{W}/\text{m}^2$

Many European physicians, environmental professionals and toxicologists signed a Resolution calling for the immediate stop of the DECT technology, which was delivered to the Germany Environment Minister Mr. Jurgen Trittin in October 1999 [24].

DECT microwaves are potentially more harmful than those of other wireless technologies because the microwaves are delivered at maximum power density all the time, even when the phone is not in use; it is pulsed at 100 Hz well within the range of typical biochemical rhythms within the body, and users are typically exposed at maximum levels either throughout their working day or during their sleep. Chronic exposure to such a powerful, pulsed form of the radiation from DECT base stations is more harmful than either acute exposure or exposure to a constant (non-pulsed) radiation. Pulsed radiation, in which the electric component changes from zero to full power almost instantaneously induces a much more powerful magnetic field that can fully penetrate the body (to induce a correspondingly large electric current) than the more slowly changing non-pulsed field.

Wireless broadband routers also strong emitters of microwaves

Wireless broadband routers ('Home Hubs') and modems are also strong emitters of microwaves, and like DECT base stations, emit constantly at full power density.

People who have installed broadband in their homes and workplaces recently should beware; even though you have not asked for the wireless option, and you are not using wireless, the router is likely to be actively emitting microwaves, *unless you specifically disable it*. Similarly, if your computer comes with the wireless modem and you are not going to use wireless, you need to disable the wireless option.

Low radiation cordless phone now available

Cordless phones need not have such high power, nor do they need to be on all the time, as one cordless phone maker has shown. Orchid has responded to people's health concerns by redesigning the cordless phone. The company has now produced its third generation 'low radiation' DECT that emits nothing when the phone is not in use and when in use, adjusts the power output depending on how far away the base station is from the handset. Thus, if the call is made up to several metres from the base station, the power output is automatically reduced by as much as 75 percent. In addition, there is a switch to permanently reduce the power output by 75 percent regardless of the distance, for people who are electrosensitive. The company Rowtex Limited has taken over the sales and distribution of all Orchid Low Radiation cordless phones in the UK, see www.lowradiation.net.

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