

## Mobile Phones Present Risks, Especially To Children

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Public health: The hidden menace of mobile phones

Research into the link between regular handset use and disease reveals the risks rise significantly after 10 years, despite official assurances that they are safe. Geoffrey Lean reports

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Using a mobile phone for more than 10 years increases the risk of getting brain cancer, according to the most comprehensive study of the risks yet published.

The study - which contradicts official pronouncements that there is no danger of getting the disease - found that people who have had the phones for a decade or more are twice as likely to get a malignant tumour on the side of the brain where they hold the handset.

The scientists who conducted the research say using a mobile for just an hour every working day during that period is enough to increase the risk - and that the international standard used to protect users from the radiation emitted is "not safe" and "needs to be revised".

They conclude that "caution is needed in the use of mobile phones" and believe children, who are especially vulnerable, should be discouraged from using them at all.

The study, published in the latest issue of the peer-reviewed journal Occupational Environmental Medicine, is important because it pulls together research on people who have used the phones for long enough to contract the disease.

Cancers take at least 10 years - and normally much longer - to develop but, as mobile phones have spread so recently and rapidly, relatively few people have been using them that long.

Official assurances that the phones are safe have been based on research

that has, at best, included only a few people who have been exposed to the radiation for long enough to get the disease, and are therefore of little or no value in assessing the real risk.

Last month, Britain's largest investigation into the health risks of the technology, the £8.8m Mobile Telecommunications and Health Research (MTHR) programme - funded by "government and industry sources" - reported that "mobile phones have not been found to be associated with any biological or adverse health effects".

But its chairman, Professor Lawrie Challis, admitted that only a small proportion of the research had covered people who had used the phones for more than a decade. He warned: "We cannot rule out the possibility at this stage that cancer could appear in a few years' time."

He said the investigation had discovered "a very slight hint" of increased numbers of brain tumours among those exposed for more than 10 years, and called for more research.

The new study - headed by two Swedes, Professor Lennart Hardell of the University Hospital in Orebro and Professor Kjell Hansson Mild of Umea University, who also serves on the MTHR programme's management committee - goes some way to meeting the deficiency.

The scientists pulled together the results of the 11 studies that have so far investigated the occurrence of tumours in people who have used phones for more than a decade, drawing on research in Sweden, Denmark, Finland, Japan, Germany, the United States and Britain. They found almost all had discovered an increased risk, especially on the side of the head where people listened to their handsets.

Five of the six studies of malignant gliomas, cancers of the glial cells that support and protect the nerve cells, found an increased risk. The only one that did not still found an increase in benign gliomas. Four of the five studies that looked at acoustic neuromas - benign but often disabling tumours on the auditory nerve, which usually cause deafness - found them. The exception was based on only two cases of the disease, but still found that long-term users had larger tumours than other people.

The scientists assembled the findings of all the studies to analyse them collectively. This revealed that people who have used their phones for a decade or more are 20 per cent more likely to contract acoustic neuromas, and 30 per cent more likely to get malignant gliomas.

The risk is even greater on the side of the head the handset is used: long-term users were twice as likely to get the gliomas, and two and a half times more likely to get the acoustic neuromas there than other people.

The scientists conclude: "Results from present studies on use of mobile phones for more than 10 years give a consistent pattern of an increased risk for acoustic neuroma and glioma." They add that "an increased risk for other types of brain tumours cannot be ruled out".

Professors Hardell and Mild have also themselves carried out some of the most extensive original work into tumours among long-term mobile phone users and have come up with even more alarming results. Their research suggests they are more than three times more likely to get malignant gliomas than other people, and nearly five times more likely to get them on the side of the head where they held the phone. For acoustic neuromas

they found a threefold and three-and-a-half-fold increased risk respectively.

They have also carried out the only study into the effects of the long-term use of cordless phones, and found this also increased both kinds of tumours. Their research suggests that using a mobile or cordless phone for just 2,000 hours - less than an hour every working day for 10 years - is enough to augment the risk.

Professor Mild told The Independent on Sunday: "I find it quite strange to see so many official presentations saying that there is no risk. There are strong indications that something happens after 10 years." He stressed that brain cancers are rare: they account for less than 2 per cent of primary tumours in Britain, though they are disproportionately deadly, causing 7 per cent of the years of life lost to the disease. "Every cancer is one too many," he said.

He said he uses a mobile phone as little as possible, and urges others to use hands-free equipment and make only short calls, reserving longer ones for landlines. He also said that mobiles should not be given to children, whose thinner skulls and developing nervous systems make them particularly vulnerable.

The danger may be even greater than the new study suggests for, as Professor Mild says, 10 years is the "minimum" period needed by cancers to develop. As they normally take much longer, very many more would be likely to strike long-term users after 15, 20 or 30 years - which leads some to fear that an epidemic of the disease could develop in the coming decades, particularly among today's young people.

On the other hand, the professor points out that the amount of radiation emitted by phones has decreased greatly since the first ones came on the market more than a decade ago, which suggests that exposures and risks should also be falling. But he still recommended choosing phones that give out as little radiation as possible (see below), and pointed out that people are now also exposed to many other sources of radiation, such as masts and Wi-Fi systems, though these emit much less than mobile handsets.

Britain's official Health Protection Agency - which has taken a cautious view of claims that radiation from mobile phones, their masts and Wi-Fi installations can damage health - admits that the study "may be indicative" of a risk, but says that "such analyses cannot be conclusive".

The Mobile Operators Association said: "This is not new data for the World Health Organisation and the many independent expert scientific committees who state that there are no established health risks from using mobile phones that comply with international guidelines."

Both sides agree that there is need for more research. Professor Mild said a possible link between mobile phones and Alzheimer's disease should also be examined, since "we have indications that it might be a problem" as well as a possible link with Parkinson's disease, "which can't be ruled out".

In the meantime, the scientists want a revision of the emission standard for mobiles and other sources of radiation, which they describe as "inappropriate" and "not safe". The international standard is designed merely to prevent harmful heating of living tissue or induced electrical currents in the body - and does not take the risk of getting cancer into account.

Professors Hansen and Mild serve on the international BioInitiative Working Group of leading scientists and public health experts, which this summer produced a report warning that the standard was "thousands of times too lenient".

The BioInitiative report added: "It has been established beyond reasonable doubt that some adverse health effects occur at far lower levels of exposure... some at several thousand times below the existing safety limits." It also warned that unless this is corrected there could be "public health problems of a global nature".

Case study: 'Mobiles are the smoking of the 21st century; they need health warnings'

Neil Whitfield, a 49-year-old father of six, developed an acoustic neuroma in 2001 after years of heavy mobile phone use, on the left side of the head, to which he had held his handset. He says he had no family history of the disease and that when he asked a specialist what had caused it, the doctor had asked him if he used a mobile.

"I was on it four hours a day, easily" he says. "When I held it to my head, I could feel my ear getting warm."

He adds that he completely lost his hearing in his left ear and was off work for 12 months. Unable to go back to his old job in marketing, he became a teacher, suffering a £20,000 drop in income.

"It has had a devastating effect on my family," he says. "Mobile phones are the smoking of the 21st century; they should have health warnings on them. You would never buy a child a pack of cigarettes, but we give them mobiles which could cause them harm."

Warning: your model might be dangerous

Exposure to radiation, shown as Specific Absorption Rate (SAR) levels, varies widely in different models. Manufacturers and the Government have ignored the Stewart report that urges they be clearly marked on phones and boxes. They are thus hard to find, though the Carphone Warehouse catalogue includes them. An easily accessible list of phones and radiation exposures is published in Germany, where low-radiation models, defined as having SAR of 0.6 or under, are encouraged.

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1: Occup Environ Med. 2007 Sep;64(9):626-32. Epub 2007 Apr 4.

Long-term use of cellular phones and brain tumours: increased risk associated with use for > or =10 years.

Hardell L, Carlberg M, Söderqvist F, Mild KH, Morgan LL.  
Department of Oncology, University Hospital, Örebro, Sweden.  
[lennart.hardell@orebroll.se](mailto:lennart.hardell@orebroll.se)

AIM: To evaluate brain tumour risk among long-term users of cellular telephones. METHODS: Two cohort studies and 16 case-control studies on this topic were identified. Data were scrutinised for use of mobile phone for > or =10 years and ipsilateral exposure if presented. RESULTS: The cohort study was of limited value due to methodological shortcomings in the study. Of the 16 case-control studies, 11 gave results

for > or =10 years' use or latency period. Most of these results were based on low numbers. An association with acoustic neuroma was found in four studies in the group with at least 10 years' use of a mobile phone. No risk was found in one study, but the tumour size was significantly larger among users. Six studies gave results for malignant brain tumours in that latency group. All gave increased odd ratios (OR), especially for ipsilateral exposure. In a meta-analysis, ipsilateral cell phone use for acoustic neuroma was OR = 2.4 (95% CI 1.1 to 5.3) and OR = 2.0, (1.2 to 3.4) for glioma using a tumour latency period of > or =10 years. CONCLUSIONS: Results from present studies on use of mobile phones for > or =10 years give a consistent pattern of increased risk for acoustic neuroma and glioma. The risk is highest for ipsilateral exposure.

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Subjective symptoms, sleeping problems, and cognitive performance in subjects living near mobile phone base stations.

Hutter HP, Moshammer H, Wallner P, Kundi M.  
Institute of Environmental Health, Medical University of Vienna, Vienna, Austria. [hans-peter.hutter@univie.ac.at](mailto:hans-peter.hutter@univie.ac.at)

BACKGROUND: The erection of mobile telephone base stations in inhabited areas has raised concerns about possible health effects caused by emitted microwaves. METHODS: In a cross-sectional study of randomly selected inhabitants living in urban and rural areas for more than one year near to 10 selected base stations, 365 subjects were investigated. Several cognitive tests were performed, and wellbeing and sleep quality were assessed. Field strength of high-frequency electromagnetic fields (HF-EMF) was measured in the bedrooms of 336 households. RESULTS: Total HF-EMF and exposure related to mobile telecommunication were far below recommended levels (max. 4.1 mW/m<sup>2</sup>). Distance from antennae was 24-600 m in the rural area and 20-250 m in the urban area. Average power density was slightly higher in the rural area (0.05 mW/m<sup>2</sup>) than in the urban area (0.02 mW/m<sup>2</sup>). Despite the influence of confounding variables, including fear of adverse effects from exposure to HF-EMF from the base station, there was a significant relation of some symptoms to measured power density; this was highest for headaches. Perceptual speed increased, while accuracy decreased insignificantly with increasing exposure levels. There was no significant effect on sleep quality. CONCLUSION: Despite very low exposure to HF-EMF, effects on wellbeing and performance cannot be ruled out, as shown by recently obtained experimental results; however, mechanisms of action at these low levels are unknown.

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