Cancer Council Western Australia
A non-government, community-supported organisation

Mobile phones and cancer

Origin of the myth

All *radiation* causes cancer. It is no surprise that radiation has a bad reputation. High-energy radiation (ionising radiation) - such as x-rays, and (gamma) γ-rays (which are emitted by nuclear explosions) - has been shown to cause cancer, genetic defects and weaken the immune system.

It makes sense therefore that the media, and public perception, has extended this bad reputation to low-energy radiation (non-ionising radiation) – such as extremely-low-frequency (ELF) radiation (electricity), radiofrequency (RF) radiation and microwaves. Major sources of public concern have been powerlines, mobile phones and their base stations.[1]

High-energy radiation (ionising radiation) alters (ionises) chemical and molecular bonds and can damage molecules such as DNA (genetic material in cells). This is the cause of cancers and genetic defects. Low-energy radiation (non-ionising radiation) does not have the right frequency or sufficient energy to ionise molecules. There is little basis for the theory that it can damage DNA.[1]

Concerns have been raised about the normal mobile phone, which has the antenna in the handset. In these phones, the antenna is very close to the user's head during normal use of the telephone and there is concern about the level of microwave emissions to which the brain is being exposed.

Current evidence

Mobile phones

Many studies have been conducted on mobile phone use and its link to cancers of the head and brain – such as meningioma, glioma and acoustic neuroma. Brain function – such as changes in cognitive performance or brain activity – has also been examined.

A report by the World Health Organization released in 2006 reviewed research conducted and found *no association* between the RF and microwave radiation released by phones and increased risk of cancer.[2]

The Mobile Telecommunications and Health Research (MTHR) programme (an independent body in the UK) released a report in 2007. The report summarised research completed by MTHR in the context of international research. MTHR concluded that there was no evidence for mobile phones increasing cancer in the short term (less than ten years), or affecting brain function.[3]

A major study on the effects of mobile phones was conducted in Denmark on a population of 420,095 people. Cancer incidence (number of new cancers) - which is recorded on a Danish cancer registry was compared in mobile phone users and non-users. Reports released in 2001 and 2006 showed that the incidence of cancer is not any higher amongst mobile phone users than non users.[4, 5]

Base stations

Mobile phone base stations include radio antennae that communicate with the handsets. These emit radio frequency (RF) waves at high power levels. The strength of the RF field is the greatest near its source, and drops off greatly with distance. Hence the antennas are positioned high up and surrounds are often fenced off. Public access is highly regulated where field strength may exceed safety limits.[6-8]

The strength of the RF fields must comply with safety limits imposed by the Australian Communications and Media Authority. These limits are based on the ARPANSA recommendations. RF signal levels in all areas of public access are within guidelines, by a factor of 100 or more.[9]

A review by the World Health Organization on the effects of RF fields from base stations showed no increase in the incidence of cancer in both animals and humans.[8]

Summary

Current scientific evidence suggests that there is no link between mobile phone use or base stations and cancer. However, research to date has not been able to examine the long term effects of mobile phone use, as mobile technology is relatively new. Much like the effects of smoking were not known in the early days of research, the short term data available on mobile phones, base stations and cancer means that the long term effects are not yet known. The possibility of adverse effects arising from this technology cannot be ruled out, but is looking less likely as the research accumulates.

References

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