



This Information Sheet will discuss the current evidence on the effect of exposure to and use of mobile phones and possible links to cancer. This is an area of research that is complex and often unclear. This Information Sheet will give a brief outline of the issues, the current evidence, and suggests some advice.

Key message

There is no clear evidence, at this time, that short-term mobile phone use can cause cancer. This is an area that is changing fast, and the research is ongoing. Therefore the Cancer Society advises people to limit exposure to the radiofrequency fields that are given out by mobile and cordless phones when practically possible.

Electromagnetic fields

Electromagnetic fields surround us every day, almost everywhere on the planet. Electromagnetic fields vary in the amount of energy they contain; ionising radiation (extremely high frequency) such as gamma rays and X-rays have enough energy to break the bonds between molecules and can cause cancer. Other forms, such as electrical power supply (extremely low frequency fields) and radio waves (radiofrequency waves) do not have enough energy to cause such damage to cells.¹

Electric fields are created by differences in voltage: the higher the voltage, the stronger the field.

Magnetic fields are created when electric current flows: the greater the current, the stronger the magnetic field. An electric field will exist even when there is no current flowing. If current does flow, the strength of the magnetic field will vary with power consumption, but the electric field strength will be constant.²

Extremely low frequency fields are produced by common electrical appliances and electrical power supply. Intermediate frequency fields are produced by computer screens and security systems. Radiofrequency fields are higher frequency and are commonly produced by radio, mobile and cordless phones, televisions, microwave ovens and radio transmitters.

Mobile phones and the link with cancer

Over the last century, exposure to man-made electromagnetic fields has steadily increased. Today, people are using more electrical appliances in their homes, new technologies are available and changes to the way we live and communicate are taking place.

The main known effect of being exposed to electromagnetic fields at very high levels is heating—this is how a microwave oven works. However, the levels of radiofrequency fields that most people are exposed to are much lower than microwaves. The most common source of exposure to radiofrequency fields is from use of mobile (cell) and cordless phones.

At this time, it is unclear in what ways radiofrequency waves could damage tissues and cells to cause something like cancer. Ongoing research is looking for possible biological mechanisms that could cause changes to cell structure by radiofrequency waves. Over the last 30 or 40 years there has been extensive study done into the possible long-term effects of exposure to electromagnetic fields. To date, much of this research has been either inconclusive or only weakly suggestive of any link. More recent studies have looked specifically at mobile phone use and possible links with various forms of cancer. While the results have been inconclusive and at times conflicting, there appears to be no clear link between cell phone use and cancer.

One frequent criticism of these studies is that there has not been a long enough time between the start of people using such phones regularly to running the trials. Most cancers take 10 years or more to develop so any increase in people developing cancer may not be noticeable yet as few people have used mobile phones for that length of time³. Also, the technology has changed rapidly over the last decade so previous study results may be less relevant to today's practices.

Until such time as there is clear evidence, the Cancer Society recommends that a careful approach be taken.^{4, 5, 6} There are several ways in which exposure to radiofrequency fields can be reduced:

- Use the phone (mobile and cordless) when you have a good signal, which allows the phone to transmit at reduced power.
- Spend as little time on each call as possible.
- Use hands-free kits (not wireless) when possible.
- Use a landline phone, for example not a cordless phone, whenever possible.
- Children may be more susceptible to radiofrequency waves as their nervous systems are still developing. Therefore, young children should not use mobile phones unless they really have to.
- As more research is conducted, hopefully, there will be better understanding about any possible long term effects of mobile phones.

For further information

National Radiation Laboratory, NZ
<http://www.nrl.moh.govt.nz/faq/cellphonesandcellsites.asp>

Health Protection Agency, UK
http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1195733769169

Cancer Research, UK
<http://www.cancerhelp.org.uk/about-cancer/cancer-questions/do-mobile-phones-cause-cancer>

References

1. WHO Regional Office for Europe, *Electromagnetic fields in Local authorities, health and environment briefing pamphlet series*. 1999, World Health Organisation.
2. WHO. *What are electromagnetic fields?* 2010 [cited 2010 10 April]; Available from: <http://www.who.int/peh-emf/about/WhatisEMF/en>.
3. MTHR Programme Management Committee, *Mobile Telecommunications and Health Research Programme: Report 2007*. 2007, Health Protection Agency: UK.
4. Department of Health, *Mobile phones and health*. 2006: UK.
5. Ahlbom, A., et al., *Epidemiology of health effects of radiofrequency exposure*. Environmental health perspectives, 2004. 112(17): p. 1741.
6. *Health Protection Agency. Health Advice on Mobile Phones*. 2010 [cited 2010 May 7]; Available from: http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1195733769169.