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## Electromagnetic fields (EMF) and health issues

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### Summary

- Electromagnetic fields (EMF) are generated in the vicinity of power lines, mobile phones, mobile phone towers, broadcast towers and similar transmitters.
  - Whether or not EMF can harm human health is a controversial issue.
  - Scientific evidence does not demonstrate a causal link between typical exposures to EMF and adverse health effects.
  - The Victorian Department of Human Services recommends that heavy exposure to EMF be avoided, if possible.
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Electromagnetic fields (EMF) are generated in the vicinity of power lines, mobile phones, mobile phone towers, broadcast towers and similar transmitters. Whether or not EMF can harm human health is a controversial issue. One EMF source to have received significant media attention is the high-voltage power line.

Various studies have comprehensively investigated power lines and cancers (such as leukaemia) to see if there is a causal link. Some researchers maintain that EMF generated by power lines have frequencies which are too low to influence living cells or harm DNA. Other researchers disagree. They suggest that EMF from power lines can cause significant changes in a biological system via electric fields induced in the body. Scientific standards have been developed to limit public exposure to power-frequency EMF, so that induced currents are below those that occur naturally in the body.

### Two decades of debate

In 1979, researchers investigating childhood leukaemia in Denver, Colorado (USA) found an association between high-current configuration electrical wiring near the home and an increased risk of childhood cancer (Wertheimer and Leeper). This initial work, however, did not measure electromagnetic fields, relying instead on distances from power lines and the type of wiring. Since then, researchers across the world have investigated power lines. To date, serious limitations have been identified in nearly all studies on power lines and cancer. It has not been possible to confirm whether or not there is a real association between EMF and cancer.

### UK findings are inconclusive

The National Radiological Protection Board (NRPB) in the United Kingdom recently released a report which found some evidence that EMF exposures higher than 0.4 microtesla ( $\mu\text{T}$ ) are associated with a doubling of the risk of leukaemia in children. The review found no evidence of any increased risk of cancer in adults. However, the NRPB was careful to explain that no causal link was found, and recommended that further studies are needed. The evidence for the effect was inconclusive because the key studies in the review might have suffered from selection bias or random variation.

### No proof of harm

Despite the evidence for an increased risk of leukaemia in children exposed to higher than  $0.4\mu\text{T}$  of EMF, a range of experimental studies have failed to provide clear supporting evidence for the claim that EMF can be harmful to health, including:

- No clear evidence that EMF affects biological processes.
- No evidence that EMF can change living cells or is genotoxic (harmful to DNA).
- No convincing evidence from animal studies to support the claim that EMF increases the risk of cancer.

### Victorian government policy

The Victorian Department of Human Services supports the view that current guidelines on EMF and power lines are adequate, since the EMF generated by power lines is well below the recommended maximum limit of

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exposure. However, it is advisable to avoid heavy exposure, if possible.

### **Where to get help**

- Your doctor
- Department of Health, Radiation Safety Team Tel. 1300 767 469

### **Things to remember**

- Electromagnetic fields (EMF) are generated in the vicinity of power lines, mobile phones, mobile phone towers, broadcast towers and similar transmitters.
- Whether or not EMF can harm human health is a controversial issue.
- Scientific evidence does not demonstrate a causal link between typical exposures to EMF and adverse health effects.
- The Victorian Department of Human Services recommends that heavy exposure to EMF be avoided, if possible.

**This page has been produced in consultation with and approved by:**

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