Mobile phones and your health
Summary

- The current international consensus is that mobile phones don’t cause cancer or promote the accelerated growth of existing tumours.
- Cancer can take many years, even decades, to develop. Population studies so far have only monitored the health effects following a few years of mobile phone use.
- Using a mobile phone while driving significantly increases the risk of traffic accidents. Talking on a hand-held mobile phone while driving is illegal in all states and territories of Australia.

Because mobile phone use is so widespread (it was estimated in 2011 that there were around five billion mobile phone users), public concerns about the possible health effects of mobile phones receive a lot of coverage in the media. Because so many people use mobile phones, medical researchers are concerned that any associated health risks, even small ones, could cause significant public health problems.

It is important to understand the risks and possible effects of mobile phone use, and make up your own mind about how you use your mobile phone.

Health concerns over mobile phone use

Mobile phones communicate with base stations using radiofrequency (RF) radiation. If RF radiation is high enough, it has a “thermal” effect, which means it raises body temperature. There are concerns that the low levels of RF radiation emitted by mobile phones could cause health problems such as headaches or brain tumours.

Research into mobile phones and health risks

Intensive international research has found no conclusive or convincing evidence that mobile phones are damaging to health in the short or long term. However, in May 2011, the World Health Organization (WHO) classified RF radiation as ‘possibly carcinogenic for humans, based on an increased risk for glioma, a type of brain cancer’.

The release of this WHO statement prompted many people to call for a ‘precautionary approach’ to mobile phone use. Research is ongoing.

Radiation in relation to mobile phone use

Radiation is a combination of electrical and magnetic energy that travels through space at the speed of light. It is also referred to as electromagnetic radiation (EMR).

Radiation is classified into two broad groups:
- ionising radiation (IR) – which is capable of causing changes in atoms or molecules in the body that can result in tissue damage such as cancer. Examples of IR include x-rays and gamma rays
- non-ionising radiation (NIR) – which doesn’t cause these changes, but can prompt molecules to vibrate. This can lead to rises in temperature, as well as other effects. Examples of NIR include ultraviolet radiation in sunlight, visible light, light bulbs, infrared radiation, microwave energy and radiofrequency energy.

How the mobile phone system works

The mobile phone system works like a two-way radio, and includes the individual handset and the base stations. Base station antennae are mounted high off the ground (on a tower or roof) to get the widest coverage. A mobile phone has a radio receiver and a transmitter.

When you make a call, your phone uses radiofrequency (RF) radiation via its antenna to ‘talk’ to a nearby base station. Once the base station has received your signal, your call is directed through the landline phone system.

Mobile phone base stations emit relatively constant levels of RF radiation. The handsets emit levels of RF radiation that vary depending on three things:
- how long you use the phone
- how close you hold the phone to your body
- how close you are to the base station. If the link to the base station is weak, the handset increases its radiation level to compensate.

The levels of RF radiation from the handset, to which your head is exposed, are around 100 to 1,000 times more intense than exposure from base stations.
Australian mobile phone system regulations

It is estimated that the RF radiation from a mobile phone held against your ear will heat a localised area of your face and, to a lesser extent, your brain, by a fraction of a degree. This is less than the heating caused by, for example, exercise. However, high levels of RF radiation overheat body tissues and cause damage.

The Australian exposure limits for RF radiation from mobile phones is set far below the level at which any meaningful heating occurs. All mobile phones in Australia must meet the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) Standard RPS 3, which is enforced by the Australian Communication and Media Authority (ACMA).

Research into mobile phones and your health

There have been many studies throughout the world on RF radiation and its effects on the body. There is a big difference between a biological effect – an effect on the body – and a health effect.

For example, RF radiation from a mobile phone has the biological effect of raising the temperature in a localised area of the brain by a fraction of a degree. This biological effect doesn’t automatically carry any health risks. The human body is equipped to deal with very wide variations in temperature without experiencing harm.

Mobile phone use and cancer

Because RF radiation is a form of non-ionising radiation, it cannot cause cancer. There is no other known biological way that RF radiation could be carcinogenic.

Mobile phones and other possible health effects

While research continues into whether or not mobile phone use causes health problems apart from cancer, no negative health implications have yet been found.

Mobile phone use can also have other indirect health effects. For example:

- Electronic equipment – it is possible for RF radiation to interfere with medical electronic equipment if the equipment is vulnerable to the field. Handsets should be turned off in hospital buildings.
- Road accidents – studies show that using a mobile phone while driving greatly increases the risk of traffic accidents. Talking on a hand-held mobile phone while driving is illegal in all states and territories of Australia.

Precautions to reduce mobile phone radiation exposure

Evidence so far suggests that mobile phones aren’t harmful, but long-term risks and consequences are yet to be clarified.

If you are concerned, you can reduce your exposure to RF radiation by:

- choosing a mobile phone model that has a low specific absorption rate (SAR), which refers to the amount of RF radiation absorbed by body tissues
- using a landline phone if one is available
- keeping your mobile phone calls short
- using a hands-free kit
- not carrying your mobile phone close to your body when it is switched on
- being wary of claims that protective devices or ‘shields’ can reduce your exposure to RF radiation – there is no evidence to suggest these devices work. In fact, they can increase RF radiation, because the phone will automatically increase its RF output to combat the effects of the shield to get the best level of communication.

Where to get help

- Your doctor
- Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) Tel. (03) 9433 2211
- Australian Communication and Media Authority (ACMA) Tel. (03) 9963 6800

Things to remember

- The current international consensus is that mobile phones don’t cause cancer or promote the accelerated growth of existing tumours.
- Cancer can take many years, even decades, to develop. Population studies so far have only monitored the health effects following a few years of mobile phone use.
- Using a mobile phone while driving significantly increases the risk of traffic accidents. Talking on a hand-held mobile phone while driving is illegal in all states and territories of Australia.

References

- Mobile phones and health 2004: Report by the Board of NRPB, 2004, Documents of the NRPB, vol. 15, no. 5, Radiation Protection Division, Health
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More information

Environmental health

The following content is displayed as Tabs. Once you have activated a link navigate to the end of the list to view its associated content. The activated link is defined as Active Tab

- Environmental health basics
- House and garden
- Chemical and metal pollutants
- Air and water quality
- Food quality and safety
- Technology and man-made risks
- Bushfires, floods and extreme weather
- Climate change
- Public health and disease control

Environmental health basics

- After a flood – animal and insect related hazards
  When returning to a flood-affected area, remember that wild animals, including rats, mice, snakes or spiders, may be trapped in your home, shed or garden.

- Air pollution
  Around 75 per cent of Melbourne's air pollution is caused by vehicle emissions.

- Allergies explained
  Allergy occurs when the body overreacts to a 'trigger' that is harmless to most people.

- Disease clusters
  Disease clusters are rare but can cause community concern about the possible effects of exposure to environmental hazards.

- Emergencies - floods
  You and your family should work out an emergency plan in case of flood.

- Food safety and storage
  High-risk food should be kept at 5 ºC or below, and above 60 ºC to avoid the temperature danger zone and food poisoning.

- Hazardous waste
  It can be dangerous to dispose of hazardous wastes through regular rubbish collections.

- Smoke and your health - science summary (video)

House and garden

- Asbestos and your health
  When asbestos fibres become airborne, people working with asbestos may inhale particles which remain in their lungs.

- Asbestos in the home
  Asbestos fibres breathed into the lungs can cause a range of health problems including lung cancer and mesothelioma.

- Bedbugs
  Bedbugs have highly developed mouth parts that can pierce skin.

- Edible gardens - saving water
  Saving water in the garden not only saves money, but also helps protect the environment.

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- Gardening safety
  Gardening is an enjoyable form of exercise, but you need to take care...

- Gas heating - health and safety issues
  If you service your gas heater regularly and use it correctly, it will be safe and economical to use...

- Greywater - recycling water at home
  When handled properly, greywater can be safely reused for the garden...

- Hazardous waste
  It can be dangerous to dispose of hazardous wastes through regular rubbish collections...

- Mosquitoes - protect your home a checklist
  Use this simple checklist and take action to prevent mosquitoes from entering your home. The best protection from mosquito-borne diseases is to avoid mosquito bites...

- Mould and your health
  The way to control indoor mould growth is to control the source of moisture...

- Passive smoking
  Passive smoking means breathing other people's second-hand tobacco smoke. Passive smoking increases the risk of serious illness in both children and adults...

- Pest control in the home
  If you use pesticides to control pests around the house, make sure you use as little as possible...

- Pest control services
  If you have pest problems that you cannot manage yourself, you may need to hire an authorised pest control operator...

- Sewage overflows at home
  Sewage contains harmful microorganisms such as bacteria, viruses and protozoa...

- Wood fires and breathing problems
  The smoke from wood fires can affect air quality and may affect people's health...

### Chemical and metal pollutants

- Hazardous waste
  It can be dangerous to dispose of hazardous wastes through regular rubbish collections...

- Arsenic mine tailings and health
  Mine tailings near goldmines may contain high levels of arsenic...

- Cadmium
  Low-level exposure to cadmium over a long period of time may cause health effects because cadmium can accumulate in the body...

- Chemicals and spray drift
  Sprayed chemicals can drift over neighbouring properties or water sources, and can affect human health, animals or the environment...

- Copper chrome arsenic (CCA) treated timber
  CCA treated timber should not be used to build children’s play equipment, patios, new garden furniture, decks or handrails...

- Farm safety and handling agrochemicals
  To reduce risks on the farm, use hazardous chemicals according to manufacturer guidelines or replace them with less dangerous options...

- Lead exposure and your health
  Long-term exposure to low levels of lead may produce symptoms including irritability, lack of energy and loss of appetite...

- Look after your health at harvest time
  Farmer health, wellbeing and safety are often neglected when facing the pressures of harvest. Simple safety measures can dramatically reduce the risk of injury and illness...

- Mercury exposure and poisoning

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Preventing or minimising exposure to mercury in your environment is the best way to reduce the risk of mercury poisoning...

- **Mercury in fish**
  
Pregnant women and young children should limit consumption of fish that contain high levels of mercury...

- **Pest control in the home**
  
If you use pesticides to control pests around the house, make sure you use as little as possible...

- **Pest control services**
  
If you have pest problems that you cannot manage yourself, you may need to hire an authorised pest control operator...

### Air and water quality

- **Air pollution**
  
Around 75 per cent of Melbourne's air pollution is caused by vehicle emissions...

- **Beaches and water quality**
  
Water quality of natural water sources, such as beaches and rivers, can vary greatly. Keeping a lookout for poor water quality (such as water that is discoloured, murky or smells unpleasant) will help...

- **Cleaning up ash after a fire**
  
After a fire, many homes may be affected by ash residue from smoke. This ash can be harmful, particularly for children or people with heart or lung conditions. This factsheet has tips and advice for...

- **Dental care - fluoride**
  
Flouride in your drinking water is like a constant 'repair kit' for your teeth...

- **Greywater - recycling water at home**
  
When handled properly, greywater can be safely reused for the garden...

- **Harmful algal blooms**
  
Some types of blue-green algae produce toxins that can harm humans and animals when swallowed, inhaled or touched. People and pets should not enter the water at locations affected by blue-green algae...

- **Healthy swimming (video)**
  
We can keep our pools safe, healthy, and most importantly fun...

- **Legionnaires' disease**
  
Legionnaires' disease is a rare form of pneumonia...

- **Look after your health at harvest time**
  
Farmer health, wellbeing and safety are often neglected when facing the pressures of harvest. Simple safety measures can dramatically reduce the risk of injury and illness...

- **Passive smoking**
  
Passive smoking means breathing other people's second-hand tobacco smoke. Passive smoking increases the risk of serious illness in both children and adults...

- **Smoke and your health - protect your health (video)**
  
Smoke and your health - science summary (video)

- **Swimming - keeping the water clean**
  
There are simple steps for all visitors to follow to keep pool water clean for healthy swimming...

- **Water from natural resources**
  
Drinking untreated water, such as creek water, bore water and sometimes even rainwater can lead to illnesses including gastroenteritis...

- **Water quality in tanks, bores and dams**
  
Make sure your private drinking water supply is safe...

- **Wood fires and breathing problems**
  
The smoke from wood fires can affect air quality and may affect people's health...

### Food quality and safety
• Avoid food poisoning - Cook Safe (video)
  Learn how to prepare and cook food safely at home...
• Avoid food poisoning - Store Safe (video)
  Learn how to store food safely in your fridge at home...
• Eggs
  The humble egg is a powerhouse of nutritional goodness. Eggs are full of things your body needs. They are a great source of protein, antioxidants, vitamins and minerals (such as vitamin A, vitamin D...)
• Fishing - eat your catch with care
  People who fish in the Lower Yarra and Maribyrnong rivers need to be careful about eating their catch because of the risk of chemical exposure...
• Food allergy and intolerance
  Food allergy is an immune response, while food intolerance is a chemical reaction...
• Food - pesticides and other chemicals
  Chemicals such as pesticides, antibiotics and hormones are used to boost food production and ensure adequate food supply...
• Food poisoning - prevention
  You can minimise the risk of food poisoning by taking simple precautions...
• Food safety and storage
  High-risk food should be kept at 5 °C or below, and above 60 °C to avoid the temperature danger zone and food poisoning...
• Travel health and safety tips (slide show)
  We all love travelling to new and exotic places, but unfortunately illnesses and unforeseen events can ruin the trip of a lifetime. With a little effort, take a few of these simple precautions to make...

Technology and man-made risks
• Asbestos and your health
  When asbestos fibres become airborne, people working with asbestos may inhale particles which remain in their lungs...
• Cancer and asbestos
  Long-term exposure to asbestos is a cause of lung cancer and other serious illnesses...
• Electromagnetic fields (EMF) and health issues
  The effect of electromagnetic fields (EMF) from power lines and other sources is a controversial issue...
• Legionnaires' disease
  Legionnaires' disease is a rare form of pneumonia...
• Mobile phones and your health
  Using a mobile phone while driving greatly increases the risk of traffic accidents...

Bushfires, floods and extreme weather
• After a flood – animal and insect related hazards
  When returning to a flood-affected area, remember that wild animals, including rats, mice, snakes or spiders, may be trapped in your home, shed or garden...
• Bushfire aftermath - safety tips
  Houses, sheds and other buildings or structures burnt in a bushfire can leave potential health hazards...
• Bushfire preparation advice
  Being prepared for a bushfire helps you cope better in an emergency...
• Bushfires and water tanks
  Debris, smoke, ash and dead animals from a bushfire can contaminate water tanks...
• Bushfire smoke
  Bushfire smoke can reduce air quality in rural and urban areas, and may affect people's health...
• Cleaning up ash after a fire
  After a fire, many homes may be affected by ash residue from smoke. This ash can be harmful, particularly for children or people with heart or lung conditions. This factsheet has tips and advice for...

• Emergencies - floods
  You and your family should work out an emergency plan in case of flood...

• Extreme heat (video)
  Extreme heat can affect anyone, including the young and healthy...

• Heat stress and heat-related illness
  Heat kills more Australians than any natural disaster. Find out how you can treat and prevent heat-related illness...

• How to cope and stay safe in extreme heat
  Know the effects of extreme heat, who is at risk and how you can prepare yourself and others...

• Mould and your health
  The way to control indoor mould growth is to control the source of moisture...

• Sewage overflows at home
  Sewage contains harmful microorganisms such as bacteria, viruses and protozoa...

• Smoke from planned burns
  Bushfire smoke can reduce air quality in rural and urban areas, and may affect people’s health. Planned burns are an important part of reducing the risk of bushfires...

• Survive the heat
  How to cope and stay safe in extreme heat...

• Talking to children about bushfire risk
  Children can be affected by information regarding bushfire risk and they may become concerned about issues of safety. Talking to children openly in a way that suits their age, while also involving...

Climate change

• Beaches and water quality
  Water quality of natural water sources, such as beaches and rivers, can vary greatly. Keeping a lookout for poor water quality (such as water that is discoloured, murky or smells unpleasant) will help...

• Climate change and health
  The effects of climate change will have a serious impact on the physical and mental health of people around the world...

• Climate change - what you can do
  There are many things you can do to tackle climate change and live a more sustainable lifestyle...

• Edible gardens - saving water
  Saving water in the garden not only saves money, but also helps protect the environment...

• Urban flash floods - FAQs
  Urban flash flooding can happen quickly and without warning. Heavy rain causes runoff to collect in dips, car parks and roads, and there is a risk of contamination, injury and disease...

Public health and disease control

• Disease clusters
  Disease clusters are rare but can cause community concern about the possible effects of exposure to environmental hazards...

• Harmful algal blooms
  Some types of blue-green algae produce toxins that can harm humans and animals when swallowed, inhaled or touched. People and pets should not enter the water at locations affected by blue-green algae...

• Healthy swimming (video)
  We can keep our pools safe, healthy, and most importantly fun...

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• Mosquitoes can carry diseases
  You can reduce the risk of mosquito bites if you get rid of potential mosquito breeding sites around your home...

• Mosquitoes - mozzie-proof your holiday a checklist
  Use this simple checklist and take action to prevent mosquitoes from spoiling your holiday. Mosquitoes can carry diseases be prepared and avoid mosquito bites.

• Mosquitoes - protect your home a checklist
  Use this simple checklist and take action to prevent mosquitoes from entering your home. The best protection from mosquito-borne diseases is to avoid mosquito bites.

• Needlestick injury
  A needlestick injury means the skin is accidentally punctured by a used needle. Diseases that could be transmitted by a needle or needlestick injury include human immunodeficiency virus (HIV).

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Related Information

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Related information on other websites

• Electromagnetic fields and public health: mobile phones – World Health Organization
• Health Protection Agency UK
• International Agency for Research on Cancer.

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