

Mobiles' mixed signals

Researchers at Swinburne University are investigating the effect of mobile phones on the brain, reports **Geoff Maslen.**

NEWs headlines continue to alarm parents with warnings about the dangers mobile phones might have on the health of students.

Over the years, reports from around the globe have claimed that frequent use of mobile phones can cause headaches, nausea, problems with concentration and even brain tumours. With an estimated 1.6 billion phones worldwide being pressed to ears, researchers have stepped up their efforts to resolve the issue.

At Swinburne University of Technology, Professor Rodney Croft heads a team at the Australian Centre for Radiofrequency Bioeffects Research. The group is investigating the impact of mobile phones on different age groups.

But Professor Croft suspects the greatest danger mobile phones pose is their use by motorists while driving their cars.

"In the past, there have been reports about a mobile-phone health crisis," Professor Croft says. "But when further studies were done without the earlier limitations, the effects disappeared."

Professor Croft says consistent results have been reported about

low-level effects on the brain when mobile phones are being used. Except the effects are quite small and only appear to lead to a slight increase in the brain's alpha waves.

If electrode are placed on a person's scalp, it is possible to measure so-called "brainwaves" and produce a series of wavy lines on a graph known as an electroencephalogram or EEG. Different waves appear depending on the state the brain is in and are variously called beta, alpha, delta and theta.

Professor Croft says the brain's alpha state is subject to huge changes — closing the eyes can have a big effect as does opening them. These changes are many times larger than those that researchers report when subjects are using a mobile phone. "Given that huge fluctuations in alpha are normal, and the reports on the effects of mobile phones are so much smaller than even normal

alpha variations, it doesn't seem important," he says. "Although interesting from a scientific point of view, in terms of the effects on a person's health it doesn't seem to be very relevant."

The Swinburne scientists have just finished a study in which 110 volunteers were each subject to an EEG assessment while holding a mobile phone to their ear. Each person sat in a comfortable chair for a few minutes with electrodes attached to the scalp while they held the phone.

On the first occasion, the phone was switched on and the person exposed to a radio frequency of 250 milliwatts but the second time, the phone was switched off. In

neither case did the subject know whether the phone was on or off.

The experiment confirmed that a mobile phone turned on does appear to enhance the brain's alpha state. But Professor Croft says there was no indication as to whether the effect was positive or negative in terms of health.

"The issue now is to work out what this means, so we are extending the experiment to include children aged from 13 to 15 and another older group aged from 55 to 75," he says.

"The aim is to see

if there are differences according to age."

But there are questions about the long-term consequences of regularly using mobile phones. Professor Croft says the effect of radio frequency waves on animals over an extended period has not shown any harmful results.

"This is where epidemiology research comes in, where studies are made of long-term trends across populations," he says. "So far, smaller studies suggest there is nothing to worry about with mobile phone exposure of less than 10 years but the impact over a longer period has still to be determined and that is why the Interphone project is so exciting."

The Interphone project is a collaborative effort between researchers in 13 countries, including Australia, Britain, Canada, France, Italy, Japan and New Zealand. To increase the chances of finding a risk to mobile phone use, if it exists, the study is mainly focused on people aged from 30 to 59 who have tumours.

They are reported to have had the highest mobile phone use five to 10 years ago and include people from regions within the participating



countries with the longest and highest use of mobile phones. Some 8000 people with brain or head tumours have been taking part in the study. Reports from individual countries so far suggest that mobile phones do not contribute to the development of cancers, but a final report of the investigation has yet to be made.

The problem with any research into mobile phones is that exposure to radio frequency radiation depends on many factors working in combination. These include the model of the phone used, the length of the calls, how often calls are made and the way the phone is held against the head.

For Professor Croft and his team, research at his centre has been boosted with the opening last month of a state-of-the-art radio frequency laboratory that was previously located at Telstra's Clayton site. The telecommunications company and the university shared the costs of moving the laboratory and building a new site for it at Swinburne

Professor Croft says the new laboratory will play a crucial role in the research to determine whether mobile phone emissions have a harmful effect on the human brain.

The purpose-built laboratory has an anechoic chamber that absorbs sound and radio waves, allowing the testing of different radio-frequency device characteristics without interference from reflected radio waves.

The Swinburne centre is hosting an event later this month that will give teachers and students the opportunity to learn about the latest telecommunications health research internationally, and to discuss issues with leading national and international researchers.

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