



Australian Centre for Radiofrequency Bioeffects Research (ACRBR)

**“ACRBR Position Statement on
Khurana, Teo, Kundi, Hardell & Carlberg, 2009”**



July 28, 2009

ACRBR Commentary on Khurana et al (2009)

In March this year Khurana, Teo, Kundi, Hardell & Carlberg published a literature review that investigated possible associations of long term mobile phone use and brain tumours (Khurana et al., *Surgical Neurology*, March 26, 2009). The paper attracted considerable media interest here in Australia, where the issue was broadcast on such programs as Channel 9's "60 Minutes", and ABC's "Lateline". Given the wide publicity, it is possible that the use of this paper in the media may have misled audiences about this issue, thus the ACRBR has put together these brief comments on the paper.

Summary of Khurana et al (2009)

The paper reports on a number of issues pertaining to the debate on whether mobile phones cause brain tumours. These include:

- A meta-analysis of the epidemiological literature relating to brain tumours and mobile phone use of > 10 years, where it is reported that there is an overall association between mobile phone use and glioma, but not acoustic neuroma nor meningioma;
- A meta-analysis of the epidemiological literature relating to brain tumours and mobile phone use of > 10 years on the same side of the head as the tumours, where it is reported that such use is associated with increased risk of glioma and acoustic neuroma, but not meningioma;
- A report of the Central Brain Tumor Registry of the United States (CBTRUS) incidence rates from some regions of the USA, where Khurana et al report that, although there are issues to do with comparing recent and older brain tumour incidence rates, they think there might be an increase;
- A brief review of the BioInitiative Report, where it is claimed that the Report has shown many negative health effects of low level EMF exposure; and
- A brief review of the current literature relating to experimental research (i.e. research more able to demonstrate causation) that has addressed the issue of low level EMF and health, arguing that it shows there are negative health consequences of mobile phone exposure.

1/ A meta-analysis of the epidemiological literature on associations of brain tumours and mobile phone use of ≥ 10 years

Although the focus of the paper relates to tumours that are reported to be on the same side of the head (ipsilateral) as patients used their mobile phones, Khurana et al. also conduct a meta-analysis regardless of tumour laterality. Here they report that there is an overall association between mobile phone use and glioma, but not acoustic neuroma nor meningioma, for those who used a mobile phone for ≥ 10 years.

However the methods section suggests that this analysis is not appropriate, as they have excluded research that did not look at laterality, which makes the data incomplete. Further, there are few details of how the meta-analysis was conducted. This is particularly important as such meta-analyses generally require the assumption of homogeneity to be met in order for the results to be meaningful (and no test of homogeneity is provided).

2/ A meta-analysis of the epidemiological literature on associations of brain tumours and mobile phone use of ≥ 10 years on the same side of the head as the tumours

This is the focus of the paper, where it is reported that there is an increased risk of glioma and acoustic neuroma (but not meningioma) for those who reported using a mobile phone for ≥ 10 years on the same side of the head as the tumour.

As the literature has convincingly demonstrated that there is no such association for shorter latencies, this would indeed be an important finding. However, this analysis suffers from the same lack of detail as described above, and so no conclusions can be drawn from this analysis. It may also be noted that as a meta-analysis, this does not present new data, but rather a different analysis of data that has already been reported. This should have been able to increase the number of cases in the analysis in order to provide a more precise measure of association. This could have been very useful as the number of cases in each study who reported using a mobile phone on the same side of the head as their brain tumour is very small, again making individual studies inconclusive.

3/ A report of CBTRUS brain tumour incidence rates from the USA

Given that the use of mobile telephony has increased dramatically since the 1980s, if mobile phones were indeed causing brain tumours then one would expect that brain tumour incidence rates would also be increasing. So far such increases in incidence rates have not been found. Khurana et al consider a data set concerning this from a sample of the USA population (CBTRUS 2007-2008 Report), acknowledge that the data does not suggest there is such an increase in malignant brain tumours¹, but then go on to say that they still believe there is an increase in benign brain tumour incidence rates.

This latter statement is particularly important because it was taken by the media to support the hypothesis that mobile phones cause cancer. However, it is important to note that these figures are only from a relatively small sample, and are not consistent with the figures released from the substantially larger International Agency for Research on Cancer (IARC) World Cancer Report 2008. That is, IARC estimate that there is no actual increase in cancers, but rather that due to recent improvements in diagnostic techniques that slightly more cancers (in the vicinity of 1% annually) are detected. The technique that has resulted in the detection of more brain tumours is magnetic resonance imaging (MRI).

Another issue that may relate to the increase in the CBTRUS incidence rates is that a new law came into force in 2004 in the USA (US Public Law 107-260). This law resulted in increased surveillance of benign tumours, and may explain why the CBTRUS figures do not represent international trends. The ACRBR thus agrees with IARC that current data are “not showing any excess risk of brain cancers and other neoplasms associated with the use of mobile phones”.

4/ A brief review of the BioInitiative Report

Khurana et al provide a brief review of the BioInitiative Report, which is a web-based report that does not follow normal scientific peer-review procedures² and claims that there is substantial evidence showing mobile phones are harmful. If this was an accurate report of the state of science, then this would indeed suggest that mobile phones are harmful.

However Khurana et al. do not provide a balanced appraisal of the BioInitiative Report, a report which is not consistent with the current state of science as espoused by leading independent expert committees (such as the World Health Organisation; www.who.int/peh-emf/en/). A more detailed critique of that report can be found on the ACRBR website (www.acrbr.org.au/FAQ.aspx). The interested reader may also wish to consult other independent critiques of the report, such as by the Health Council of the Netherlands (www.gezondheidsraad.nl/en/publications/bioinitiative-report).

5/ A brief review of the current literature pertaining to experimental research (i.e. research more able to demonstrate causation) that has addressed the issue of low level EMF and health

Khurana et al. argue that this literature shows there are negative health consequences of mobile phone exposure. However, as per the BioInitiative Report (see above), this does not provide a balanced appraisal of the literature, and reaches conclusions that contradict those of major international expert committees. The current state of science is that there have not been any consistent demonstrations of health effects resulting from mobile phone-like exposures (see the World Health Organisation for more information on this; www.who.int/peh-emf/en/).

Part of the difficulty may arise from the authors' failure to appreciate science as a body of research, where instead they have focused on particular studies that reported health effects without regard for relevant conflicting data. This strategy is unusual given that the authors acknowledge at one point that there have not been consistent findings of harm (i.e. "although the literature is inconsistent in terms of experimental reproducibility", page 7), but then they ignore this variability and conclude that reported effects are real, regardless of whether other studies have found the opposite.

This is particularly important as science operates in a probabilistic fashion, with all results referred to as *relatively* likely or unlikely. This method is typically set up so that 1 in 20 results that are reported will *appear* to be real, but may actually be due to chance alone. Thus without considering the other research that fails to find an effect, it is a little like concluding that you are magic because you can toss a coin 4 times and get heads each time (i.e. it would not seem so remarkable if one considered the other 15 experiments where you tried to do this but failed).

Conclusions

In summary, the ACRBR believes it is important to recognize that Khurana et al. do not present any new data that is relevant to the mobile phone health debate. The pre-existing data they consider are not synthesised in a meaningful fashion. Many of the conclusions made in the paper contradict those made by international expert committees, without providing adequate reasons for rejecting the standard view. On the contrary, we believe that the standard view of science, which is that there is currently no evidence that mobile phones have any negative health effects (as espoused by such groups as the World Health Organisation; see above), is an accurate reflection of the literature to date.

¹ Note that 'benign' and 'malignant' are not always applicable to the particular brain tumours reported in this literature. For example, acoustic neuromas are typically referred to as benign, but can also have fatal consequences. For more information on such distinctions, please visit <http://brain.mgh.harvard.edu/PatientGuide.htm>.

² It should be noted that some BioInitiative Report authors have also released individual papers that have followed normal peer review processes (for example, Carpenter & Sage, *Rev Environ Health* 2008, 23(2):91-117). As there are commonalities between aspects of the BioInitiative Report and these papers, the interested reader may wish to consult the latter for a peer-reviewed discussion of some of the issues addressed in the present Position Statement.