

# EMR and Health

Regular report on electromagnetic radiation, health and well-being

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## Australian study criticised

An Australian study claims mobile phone use does not increase the risk of brain tumours—but this may not be the whole truth.

A recent Australian study, published late last year, claims to provide evidence that mobile phone use does not increase the risk of brain tumours. However, design flaws in the study suggest that these results may not be a true indication of the risks.

The study was conducted by staff from ARPANSA (Australian Radiation Protection and Nuclear Safety Agency) and ACEBR (Australian Centre for Electromagnetic Bioeffects Research) — which has a track record of producing no-effects research.

The study examined the incidence of brain tumours diagnosed in four time periods: 1982–1992, 1993–2002 and 2003–2013. Then it compared the actual number of brain tumours with the estimated number of brain tumours, based on observations.

The authors concluded, 'There has been no increase in any brain tumour histological type or glioma location that can be attributed to mobile phones.'

According to commentators, the study has a serious design flaw: in restricting its analysis to people aged 20 to 59, it may have overlooked the majority of brain tumour cases, which are most commonly found in people aged around and over 60.



The 'paper has an methodological mistake in the research hypothesis,' said Dr Oleg Grigoriev, Chairman, Russian National Committee on Non-Ionizing Radiation Protection (RusCNIRP).

The study is 'biased' says Dr Joel Moskowitz, Director of the Center for Family and Community Health at the University of California in Berkeley.

'The analysis by Karipidis is seriously flawed because he excluded the age group with the majority of brain tumors,' said Dr Louis Slesin, author of *Microwave News*. 'This makes no sense. When I asked for an explanation, no one wanted to talk about it.'

Dr Ken Karipides from ARPANSA defended the study, saying that the age range was chosen to be consistent with that used in the Interphone Mobile Phone study (published in 2010). He said, 'Our paper mentions the effect of advances in diagnostic techniques (CT MRI) having a role in the increasing incidence of brain tumour sub-types. Cases older than 60 would be more affected by these diagnostic issues and were not included as their inclusion would reduce the chance of seeing mobile phone related changes to tumour incidence.'

(Continued on page 2)

## In This Issue

NSW bans mobiles in primary schools	3
Italy to publicise mobile phone risks	4
Social media:when less is more	5
Thunderstorm Asthma	4-5
Mobiles & self-esteem	5
EHS recognised by court	6
Brain damage	6
Mobiles and adrenals	6
Screen time linked to learning delays	7
Optus Rollout	7
Smart phones: ergonomic risk	8
Smart phones & chemicals	8



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# NSW bans mobiles in primary schools

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The NSW government is banning the use of mobile devices in primary schools from term one 2019.

The Premier Gladys Berejiklian and Education Minister Rob Stokes announced the new measures in December 2018, following an independent review into the non-educational use of mobile devices in NSW schools, conducted by child psychologist Dr Michael Carr-Gregg.

The review found a rising incidence of online bullying, inappropriate sharing of explicit images between students, predatory behaviour from strangers and unnecessary distractions for students.

As a result, primary schools will ban the use of mobile phones during school hours and high schools will be able to choose whether to ban phones or to restrict their use at school.

“We’ll work with schools to implement the changes recommended in the report, helping them manage the risks and rewards of using mobile phones inside the school gates,” Mr Stokes said. “These changes are about keeping our schools safe and protecting the welfare of our students when they’re in our care.”

The government has undertaken to consider other recommendations in the report.

Some schools have already introduced bans on students’ use of mobile phones.

Sydney’s Newington College now requires students to keep mobile phones in lockers during the school day because of research showing increased risks of stress, memory problems and students developing a warped view of reality.

Deniliquin High School and Tara Anglican School for Girls introduced mobile phone bans in 2018 and Shore has had a ban in place since 2005.

*NSW Department of Education, media release, 13.12.2018; SMH 23.11.18*

*(Continued from page 1)*

Whether or not this paper observed an increased rate of brain tumours, there is evidence that long-term mobile phone use has been shown to be a risk factor for several types of brain tumours.

‘I believe that the science show us that mobile phones users who use the mobile phone up to their head in excess of 30 mins per day and continue to use it this way for 10 years or more move in a high risk category for getting a brain cancer,’ said Mr Vic Leech, a former radiation health physicist with 45 years experience in radiation protection.

‘Even the Interphone study, an industry funded study, showed risk amongst the heavy users (> 30 mins per day). A follow-up study, the CERENAT study showed risk of brain cancer amongst the heavy users (>50 mins per day). Both these mobile phone epidemiological studies are consistent in that they always showed increased risk despite having many flaws.

‘In summary, research shows us for certain brain tumours:

- the higher the cumulative hours of Mobile phone (MP) use, the higher the risk;
- the longer the time from when first using a MP, the higher the risk;
- the higher the power, the higher the risk;
- the younger you are, the higher the risk;
- the tumour occurring on the same side of brain as the handedness (ipsilateral) of the user, the higher the risk’

‘If a mobile phone is used for more than 10 years there is a statistically significant risk. Hence, we need to get people to change their habits when using these radiation devices and adopt a precautionary approach.

‘Bottom line : mobile phones can give you a brain tumour,’ he said.

‘Karipides, K et al, ‘Mobile phone use and incidence of brain tumour histological types, grading or anatomical location: a population-based ecological study, BMJ Open, 2018.

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# Italy to publicise mobile phone risks

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A court has ordered three Italian ministries to launch an information campaign about mobile phone radiation.

In a landmark decision, the Regional Administrative Court of Lazio has ordered the Italian Ministry of the Environment, Ministry of Health and Ministry of Education to disseminate information to the public about how to use mobile and cordless phones more safely. The Judgement was issued on 13 November last year, but was only made public on 15 January.

The Court order requires the Ministries to 'adopt an information campaign, aimed at the entire population, concerning the identification of the correct methods of use of mobile telephones (mobile phones and cordless phones) and information on health risks and for the environment connected to an improper use of such devices.'<sup>1</sup>

In a joint press release of 16 January, the three ministries said they 'welcome the judicial decision, convinced of the need to raise awareness on the issue and to promote preventative measures.'<sup>2</sup>

The court's decision was the result of a legal battle between the Association for the Prevention and Fight against Electrosmog (APPLE) and the Ministries of Economic Development, Education, and the Environment. The Association argued that the public should be informed of the risks to health (both long- and short-term) and of precautions that can reduce exposure, particularly to children.

The campaign is to be implemented within six months and the information is to be disseminated so as to reach a wide audience.

1. <https://www.giustizia-amministrativa.it/cdsintra/cdsintra/AmministrazionePortale/DocumentViewer/index.html?ddocname=4JM4PKAARND2ZYHVSOSK2FIQIQ&q=>
2. [https://translate.google.com/translate?sl=it&tl=en&u=http%3A%2F%2Fwww.salute.gov.it%2Fportale%2Fnews%2Fp3\\_2\\_4\\_1\\_1.jsp%3Flingua%3Ditaliano%26menu%3Dsalastampa%26p%3Dcomunicatistampa%26id%3D5131](https://translate.google.com/translate?sl=it&tl=en&u=http%3A%2F%2Fwww.salute.gov.it%2Fportale%2Fnews%2Fp3_2_4_1_1.jsp%3Flingua%3Ditaliano%26menu%3Dsalastampa%26p%3Dcomunicatistampa%26id%3D5131)

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*the Ministries must 'adopt an information campaign ... concerning the identification of the correct methods of use of mobile telephones ... and information on health risks'*

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## Social Media—when less is more

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Reducing use of social media can improve people's happiness, according to a new study from the US.

Researchers from the Universities of Stanford and New York conducted an experiment on over two and a half thousand volunteers who agreed to deactivate their Facebook accounts for four weeks.

The researchers found that four weeks without Facebook had some profound and positive effects on the volunteers. Not surprisingly, it increased the amount of time they spent engaging in other activities, such as watching TV or socialising with family and friends. It also increased their sense of well-being.

The study also showed that going without Facebook reduced the amount of time people spent online, including their use of other forms of social media. Interestingly, after the experiment finished, participants continued to spend less time using Facebook than they had before the four-week trial.

Hunt, A et al, 'The Welfare Effects of Social Media', National Bureau of Economic Research, <https://www.nber.org/papers/w25514/http://web.stanford.edu/~gentzkow/research/facebook.pdf>

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# Thunderstorm Asthma

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by Diana Crumpler

Thunderstorm asthma is a comparatively new phenomenon involving an acute asthma attack triggered by conditions prevailing during a certain type of local thunderstorm. So many people may be affected that emergency services and hospitals are overwhelmed. Rather than a history of asthma – indeed, for many this is their first asthma attack – the greatest risk factor is a history of seasonal hayfever triggered by allergy to grass pollens.

Pollen grains are relatively large. Trapped in the upper respiratory tract they then trigger the localised symptoms of classical hayfever in sensitised individuals. Under unusual weather conditions, grass pollens may be swept up into cloud masses as a storm builds up. Here they absorb moisture, which causes the pollen grains to burst, releasing large quantities of micro granules. Brought down to ground level by the storm winds, they are now small enough to be breathed unimpeded into the lungs, thereby triggering an acute asthma attack in those at risk because of pre-existing pollen allergy, albeit usually manifested as hayfever.

The first epidemic thunderstorm asthma event occurred in Birmingham, UK, over 6-7 July 1983. It was followed by similar outbreaks in Melbourne in November 1987 and November 1989, by which time it was apparent that medicine had a new phenomenon to cope with. Wagga Wagga, NSW, in October 1997 also recorded the world's fifth epidemic thunderstorm asthma event. Melbourne remains the thunderstorm asthma capital of the world, having been host to four of the ten recorded outbreaks. The 21 November 2016 epidemic was so severe that at least nine people died, as did at least five in Kuwait the following month.

So far, so good. Medical science, however, makes no attempt to explain the recent advent of thunderstorm asthma. Although uncommon, the atmospheric conditions that breed thunderstorm asthma must have existed throughout all time. What has now changed in either the ambient environment or in the human response to enable a new specific illness?

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*'could the ever-increasing electrification of the biosphere also be a co-factor in the genesis of thunderstorm asthma?'*

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An analogy with hayfever itself may perhaps be relevant. Hayfever was unknown to medical science before 1819, when it was first described in *The Lancet*. A disease of post-industrial genesis, hayfever remained uncommon in parts of rural Scotland until well into the twentieth century. It was also unknown in Japan, which industrialised later than Britain, until 1950. Rare in the early stages of industrialisation, hayfever is now so common that a daily pollen count is presented with the news. The evidence thus suggests that synthetic chemical exposure is the sensitising factor that prompts the immune system to mount an inflammatory response against a historically innocuous natural substance.

This puts hayfever on a par with numerous other non-communicable diseases and conditions hitherto unknown but now endemic in industrialised societies: neurodegenerative diseases such as Parkinson's (first documented 1817), ALS (1849), and Alzheimer's (1906); neurodevelopmental disorders such as ADHD (1902) and autism (1941); autoimmune diseases like multiple sclerosis (1861), lupus (1930), rheumatoid arthritis (said to have exploded from nowhere in the mid-to-late nineteenth century); and coronary heart disease (1912). All are of post-Industrial onset with either a known or suspected chemical and/or electromagnetic aetiology.

What, then, is the new co-factor responsible for the late twentieth century genesis of thunderstorm asthma – for the transformation of a relatively mild condition into one with deadly potential? Could it involve some electromagnetic factor? Perhaps even electrical sensitivity? Thunderstorms are, after all, gross electrical events.

Electromagnetic hypersensitivity (EHS) was first documented among radar workers in 1932. From the 1980s onward it was reported with increasing frequency among the general population, often concomitant with multiple chemical sensitivity (MCS). EHS sufferers react adversely to a range of frequencies across the electromagnetic spectrum. Mobile phones and Wi-Fi are problematic for many and 5G, its frequency so high and wavelength so short that it penetrates existing shielding, promises to be a disaster for not only the EHS community but for many in wider society as well.

Depending on individual susceptibility and predisposition, EHS reactions may include headache; seizures; oedema; paralysis; cognitive impairment; cystitis; gastrointestinal symptoms; cardiac problems; haemorrhaging; photosensitivity and intense burning pain; and asthma. An early paper on EHS included the case study of a young man who suffered an asthma attack and ran off the road after driving under high tension power lines. Walking back to get help, he died when his asthma worsened after again passing beneath the power lines.<sup>1</sup>

Electromagnetically sensitive individuals may also react to changes in the ambient electrical environment, including those associated with thunderstorms, impending earthquakes, and positive ion-charged drying winds such as the Santa Ana and Chinook in North America, el Sharev in Israel, the Föhn in Germany, and those which blow from the Australian inland.

Screen dermatitis is an EHS sub-set characterised by severe dermatological reactions.<sup>2</sup> It first emerged in the 1980s concurrent with the introduction of video display terminals and numerous other electrotechnologies to the work environment.

Screen dermatitis, a new phenomenon in the 1980s. The rapid escalation of systemic electromagnetic hypersensitivity in the 1980s. The first epidemic thunderstorm asthma event in 1983. Is the timing coincidental? Or could the ever-increasing electrification of the biosphere also be a co-factor in the genesis of thunderstorm asthma? Could electrical (both natural and man-made) and chemical (i.e. pollens) factors be operating synergistically, as they do in so many other environmentally induced disorders? Could electrical sensitivity also be involved? Perhaps a not improbable concept given evidence suggesting that a significant portion of Western societies is already affected: estimates of EHS in countries taking the matter seriously range from 2.7% in Scandinavia to 8% in Germany.

The notion of electromagnetism as a co-factor in thunderstorm asthma must, for the moment, remain speculative. To adequately account for its genesis there must, however, be some environmental factor other than pollen involved, and the timing of its emergence as a new disease entity, along with the electrical nature of thunderstorms, suggests that this may perhaps be a notion worthy of further consideration.

#### References

Choy VS, Monro JA & Smith CW. "Electrical sensitivities in allergy patients." *Clinical Ecology* vol. 4, no 1, pp 93-102.

Johansson, Olle et al. "Skin changes in patients claiming to suffer from 'screen dermatitis: a two-case open-field provocation study.'" *Experimental Dermatology* 1994; 3: 234-238.

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## Mobiles and self-esteem

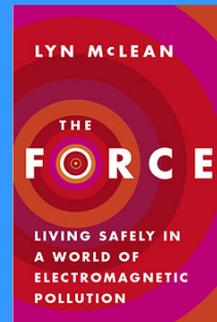
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Over half of today's teenagers admit addiction to their mobile devices. Ever wondered why addiction rates are so high?

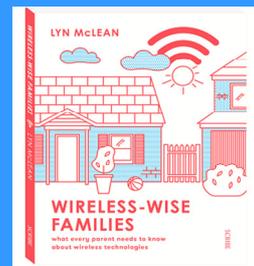
To see just what drives mobile phone addiction, researchers from China gave a battery of tests to 653 college students aged around 20. They found that addiction was related to low self-esteem and that two of the factors underlying this were social anxiety and interpersonal sensitivity.

You, Z et al, *Psychiatry Res* 6:271-531, Dec 2018.

### Books by Lyn McLean



#### 'The Force'



#### 'Wireless-wise Families'



#### 'Wireless-wise Kids'

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## EHS recognised by court

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A Spanish court has recognised that an employee's electrohypersensitivity (EHS) is a work-related condition.

The plaintiff was a Senior Systems and Telecommunications Technician for the Endesa-Enel-Group in the city of Zaragoza. In 2009, he began to develop symptoms of limbic dysfunction when exposed to electromagnetic fields from electrical and wireless sources such as Wi-Fi, mobile telecommunications, WiMAX, computers, power lines and electrical transformers. In 2014, he was diagnosed with EHS, which was considered to be a *common illness*.

However, according to a recent court judgement, the plaintiff's EHS no longer considered a common illness but a work-related condition. The *Juzgado de lo Social* (Labour Court) No. 1 of Zaragoza ruled that the sole and exclusive cause of the electrohypersensitivity suffered by the Endesa employee was his work activity ([Ruling 203/2018](#)). This judgement was ratified by the High Court of Justice of Aragon ([Ruling 691/2018](#)).

This is the first time that a Spanish court has recognised the occupational nature of an employee's temporary disabilities derived from electrohypersensitivity.

According to commentator Joaquin Sanz, 'The ruling is significant ruling because it highlights the importance of protecting particularly sensitive employees and applying Article 25 of the General Law on the Prevention of Occupational Risks.'

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## Brain damage

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Mobile phone radiation produced harmful effects on rats' brains in a study from Turkey. Researchers studied 28 rats who were exposed or nonexposed to mobile phone radiation for two hours a day for six months.

They found that compared to unexposed rats, the exposed rats had higher levels of DNA damage, oxidative stress and higher levels of lipid peroxidation (oxidative damage to the lipids in cell membranes that causes cell damage).

Alkis, ME et al, 'Effect of 900-, 1800-, and 2100-MHz radiofrequency radiation on DNA and oxidative stress in brain,' *Electromagn Biol Med*, Jan 22:1-16, 2019.

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## Mobiles and adrenals

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Mobile phone radiation can have a harmful effect on the adrenal glands, according to a study from Iran. Scientists exposed rats to mobile phone signals for six hours a day for four to eight weeks then examined the animals' adrenal glands and brains.

Exposed animals had increased levels of Adrenocorticotrophic hormone (ACTH), which regulates the stress hormone cortisol, and increased levels of cortisol. There was evidence of a thickening of one of the layers of the adrenal cortex and cells in this layer were larger than normal. Structural changes were also observed in brain tissue.

As a result of their findings, the authors advised people to limit their exposure as much as possible.

Shahabi S et al, 'Exposure to cell phone radiofrequency changes corticotrophin hormone levels and histology of the brain and adrenal glands in male Wistar rat,' *Iran J Basic Med Sci*, 21(12):1269-74, Dec 2018.

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*'This is the first time that a Spanish court has recognised the occupational nature of an employee's temporary disabilities derived from electrohypersensitivity'*

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## Screen time linked to learning delays

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Too much screen time could prevent children from being adequately prepared to learn at school, say researchers from the University of Calgary in Canada, in a paper published in January.

'Our study shows that preschool kids who get too much screen time, on video games, internet-connected devices, television screens, and other digital mediums are among those showing delays and deficits in learning by the time they enter school at the age of five,' said lead author, Dr Sheri Madigan.

Madigan and her colleagues examined the association between screen time and early childhood development in 2,500 Alberta homes between 2011 and 2016. Families were asked to report on the number of hours their children spent in front of screen-based devices. The authors found that the children who were monitored spent, on average, 2.4, 3.6 and 1.6 hours of screen time per day at two, three and five years of age, respectively.

They also found an association between children's excessive screen time and negative physical, behavioural and cognitive outcomes. Children with excessive screen time were failing to meet developmental milestones in language and communication, problem-solving, and fine and gross motor skills.

'What sets this study apart from previous research is that we looked specifically at the lasting impacts of screen time. Specifically, how screen time when children are two years of age impacts development at three years, and how screen time at three years impacts development when kids are five,' says Madigan, who holds a Canada Research Chair in the Determinants of Child Development. 'What these findings tell us is that one reason there may be disparities in learning and behaviour at school entry is because some kids are in front of their screens far too often in early childhood.'

According to the authors, the study's findings can help health-care professionals guide parents on the appropriate screen time limits for their children. They recommend implementing a family media plan. This involves controlling the number of hours spent in front of screens but it can also include establishing device-free zones (such as the dinner table) and baskets where everybody puts their devices at certain points of the day, to make room for family connection.

Madigan, S et al, 'Association Between Screen Time and Children's Performance on a Developmental Screening Test', *JAMA Pediatr*, January 28, 2019. doi:10.1001/jamapediatrics.2018.505

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## OPTUS rollout

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Optus is racing ahead with its rollout of fifth generation wireless technology. It currently has 5G sites in Canberra and Sydney and plans to have 47 more sites online by March 2019. By March 2020, it expects to have 1200 sites in action.

You can see the suburbs where Optus 5G is enabled here: <https://www.optus.com.au/shop/broadband/5g>

[https://www.telecompaper.com/news/optus-to-deploy-1200-5g-sites-by-march-2020-launches-5g-home-broadband-service--1278482?utm\\_source=headlines\\_-\\_english&utm\\_medium=email&utm\\_campaign=31-01-2019&utm\\_content=textlink](https://www.telecompaper.com/news/optus-to-deploy-1200-5g-sites-by-march-2020-launches-5g-home-broadband-service--1278482?utm_source=headlines_-_english&utm_medium=email&utm_campaign=31-01-2019&utm_content=textlink)

### Mobile phone protection

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Pro Tubez airtube headsets - latest generation of airtube headsets - keep the phone away from the head

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## Smart phones an ergonomic risk

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Using a smart phone doesn't just affect expose a person to radiation, it can cause musculoskeletal problems as well.

In a study published late last year, researchers from Australia and Thailand assessed the impact of smart phone use on the body. To do this, they recruited 30 young adults between the ages of 18 and 25 who used a smart phone for at least two hours a day. The volunteers completed a questionnaire and used a smart phone while being videoed and this was later was assessed by various ergonomic experts.

The study found that all the participants had 'high ergonomic risk levels' when they used their mobile phones. They also found a correlation between smart phone use and pain of the neck and upper back.

'Smart-phone use may increase ergonomic risks of posture and muscle use, which can lead to musculoskeletal complaints and disorders,' the authors said.

Practitioners treating neck and shoulder pain should take patients' smart phone us into account, they said.

Suwalee Namwongsa et al, 'Ergonomic risk assessment of smartphone users using the Rapid Upper Limb Assessment (RULA) tool', PLOS one, <https://doi.org/10.1371/journal.pone.0203394>

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## Mobile phones and chemicals

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Scientists from Canada have found, for the first time, that electronic devices such as mobile phones, may be a source of exposure for dangerous organophosphate esters (OPEs). These chemicals are toxic to the brain and have been linked with fertility problems and thyroid cancer.

The study was conducted by Congqiao Yang, from the Department of Earth Sciences at the University of Toronto. Investigators took wipes of various surfaces in the homes of 54 women and of the palms of the women's hands.

They found a high correlation between the OPEs on the women's mobile phones and those in their urine. The results are consistent with the the women acquiring OPEs either through their skin or through touching the mouths, the authors said.

'Our results showed that exposure of some OPEs in these women can be explained by levels found on their cell phones. The results do not allow us to distinguish between whether the cell phone is acting as a source of OPEs or rather a time- and space integrated indicator of OPE exposure; likely both explanations are reasonable,' the authors said.

Yang, C et al, 'Are cell phones an indicator of personal exposure to organophosphate flame retardants and plasticizers?', *Environment International* (2018). [DOI: 10.1016/j.envint.2018.10.021](https://doi.org/10.1016/j.envint.2018.10.021)

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