

# Aanbevelingen aan autoriteiten en publiek

## Advies Hoge Gezondheidsraad (FOD Volksgezondheid) nr 9404, mei 2019

*(“This report aims at providing both authorities and the public with recommendations...”)*

1. Een persoon die zichzelf en, dit geldt vooral voor vrouwen, zijn/haar nakomelingen wil beschermen, moet een reeks maatregelen overwegen met betrekking tot blootstelling aan niet-ioniserende straling gelinkt aan hoogspanningsleidingen, communicatie en elektronica.
2. Niet-ioniserende microgolfstraling blijkt te werken door spanningskanaalafhankelijke calciumkanaal activering om biologische effecten op niet-thermische niveaus te veroorzaken.
3. Blootstelling van moeders aan elektromagnetische velden met mobiele telefoonfrequentie wordt geassocieerd met gedrags- en spraakproblemen bij kinderen.
4. Het gebruik van mobiele en draadloze telefoons wordt geassocieerd met een verhoogd risico op glioom en akoestisch neuroom.
5. De Hoge Gezondheidsraad verwijst naar een wetenschappelijke studie, die speciaal is opgezet rond het feit dat er dikwijls wordt gezegd dat er “wetenschappelijk geen consensus is”. De hier geciteerde wetenschappelijke studie (referentie 5) heeft alle wetenschappelijke studies onderzocht, en gekeken waarom sommige studies zeggen dat er geen verhoogd risico is op hersentumoren. Hun conclusie is, *“Our analysis of the literature studies and of the results from meta-analyses of the significant data alone shows an **almost doubling of the risk of head tumours** induced by long-term mobile phone use or latency.”*

De Hoge Gezondheidsraad citeert uit deze studie “Geblindeerde protocollen (vrij van fouten, vertekening en financiële conditioneringsfactoren!), leveren positieve resultaten op die een **oorzakelijk verband aantonen** tussen langdurig mobiele telefoon gebruik of latentietijd en een statistisch **significante toename van het risico op ipsilaterale hoofdtumoren**, met biologische plausibiliteit. De meta-analyses, waarbij alleen gegevens over ipsilaterale tumoren bij proefpersonen die sinds of ten minste 10 jaar gebruik maken van mobiele telefoons zijn onderzocht, laten **grote en statistisch significante toenames** zien van het risico op ipsilaterale hersengliomen en akoestische neuromen.”

Puntjes 1-4 van de vorige bladzijde, en de tweede helft van puntje 5, zijn letterlijke citaten uit :

**Advies Hoge Gezondheidsraad (FOD Volksgezondheid) nr 9404, mei 2019<sup>1</sup>**

*Dit is een verzameling citaten waarbij ik enkel de zaken citeer die te maken hebben met niet-ioniserende straling (dus mobiele telefonie, WIFI, 2G-3G-4G-5G).*

FYSISCH-CHEMISCHE MILIEUHYGIËNE (BEPERKING VAN DE BLOOTSTELLING AAN MUTAGENE OF HORMOONVERSTORENDE AGENTIA) EN HET BELANG VAN BLOOTSTELLING OP JONGE LEEFTIJD

*“In this scientific advisory report, which offers guidance to public health policy-makers, the Superior Health Council of Belgium provides insights in the underlying causes of the high incidence of diseases of civilization in Western countries. **This report aims at providing both authorities and the public with recommendations contributing to an effective prevention of diseases of civilization.**”*

*(...) “Risico's in verband met kankerverwekkende, mutagene en hormoonverstorende stoffen zijn vaak ongewenste effecten van maatschappelijke ontwikkelingen. De beheersing van deze risico's impliceert dus beheersing van, in deze gevallen, technologische en maatschappelijke ontwikkelingen. De toepassing van fysisch chemische milieuhygiëne kan leiden tot, maar mag niet gelijkgesteld worden met het verbieden van producten of technologieën en zal waarschijnlijk vaker leiden tot het opleggen van een gewijzigde versie van de ALARA-benadering (as low as reasonably achievable / zo laag als redelijkerwijs mogelijk is). Gewijzigd in die zin dat de blootstellingen niet alleen zo laag mogelijk moeten zijn, maar ook zo laat in het leven als mogelijk, zo kort mogelijk en zo min mogelijk, gezien het belang van blootstellingen op jonge leeftijd en van lage-dosiseffecten.”*

*(...) “**Een persoon die zichzelf en, dit geldt vooral voor vrouwen, zijn/haar nakomelingen wil beschermen, moet een reeks maatregelen overwegen met betrekking tot:**”*

*(...)“**Blootstelling aan niet-ioniserende straling gelinkt aan hoogspanningsleidingen, communicatie en elektronica***

*Blootstelling op korte afstand aan hoogspanningsleidingen werd geassocieerd met leukemie bij kinderen (Tabrizi et al., 2015; Schuz, 2011). **Niet-ioniserende microgolfstraling bleek te werken door spanningskanaalafhankelijke calciumkanaal activering om biologische effecten op niet-thermische niveaus te veroorzaken** (Anghileri et al., 2006; Pall et al., 2015<sup>2</sup>). **Blootstelling van moeders aan elektromagnetische velden met mobiele telefoonfrequentie werd geassocieerd met gedrags- en spraakproblemen bij kinderen** (Birks et al., 2017<sup>3</sup>; Zarei et al., 2015). **Het gebruik van mobiele en draadloze telefoons werd geassocieerd met een verhoogd risico op glioom en akoestisch neuroom** (Hardell et al., 2013)<sup>4</sup>. **Volgens Levis et al. (2011)<sup>5</sup> leveren geblindeerde protocollen, vrij van fouten, vertekening en financiële conditioneringsfactoren, positieve resultaten op die een oorzakelijk verband aantonen tussen langdurig mobiele telefoon gebruik of latentietijd en een statistisch significante toename van het risico op ipsilaterale hoofd tumoren, met biologische plausibiliteit. De meta-analyses (inclusief die van Levis et al., 2011), waarbij alleen gegevens over ipsilaterale tumoren bij proefpersonen die sinds of ten minste 10 jaar gebruik maken van mobiele telefoons zijn onderzocht, laten grote en statistisch significante toenames zien van het risico op ipsilaterale hersengliomen en akoestische neuromen** (Levis et al., 2011).”*

<sup>1</sup> [https://www.health.belgium.be/sites/default/files/uploads/fields/fpshealth\\_theme\\_file/190617\\_hgr-9404\\_fys\\_chem\\_env\\_hygiene\\_vcabdem\\_0.pdf](https://www.health.belgium.be/sites/default/files/uploads/fields/fpshealth_theme_file/190617_hgr-9404_fys_chem_env_hygiene_vcabdem_0.pdf)

<sup>2</sup> <https://www.ncbi.nlm.nih.gov/pubmed/25879308>

<sup>3</sup> <https://www.sciencedirect.com/science/article/pii/S0160412016307383>

<sup>4</sup> <https://www.degruyter.com/view/j/reveh.2013.28.issue-2-3/reveh-2013-0006/reveh-2013-0006.xml>

<sup>5</sup> <https://www.ncbi.nlm.nih.gov/pubmed/21679472>

(2) <https://www.ncbi.nlm.nih.gov/pubmed/25879308>

Rev Environ Health. 2015;30(2):99-116. doi: 10.1515/reveh-2015-0001.

## Scientific evidence contradicts findings and assumptions of Canadian Safety Panel 6: microwaves act through voltage-gated calcium channel activation to induce biological impacts at non-thermal levels, supporting a paradigm shift for microwave/lower frequency electromagnetic field action.

Pall ML.

### Abstract

This review considers a paradigm shift on microwave electromagnetic field (EMF) action from only thermal effects to action via voltage-gated calcium channel (VGCC) activation. Microwave/lower frequency EMFs were shown in two dozen studies to act via VGCC activation because all effects studied were blocked by calcium channel blockers. This mode of action was further supported by hundreds of studies showing microwave changes in calcium fluxes and intracellular calcium [Ca<sup>2+</sup>]<sub>i</sub> signaling. The biophysical properties of VGCCs/similar channels make them particularly sensitive to low intensity, non-thermal EMF exposures. Non-thermal studies have shown that in most cases pulsed fields are more active than are non-pulsed fields and that exposures within certain intensity windows have much larger biological effects than do either lower or higher intensity exposures; these are both consistent with a VGCC role but inconsistent with only a heating/thermal role.

Downstream effects of VGCC activation include calcium signaling, elevated nitric oxide (NO), NO signaling, peroxynitrite, free radical formation, and oxidative stress. Downstream effects explain repeatedly reported biological responses to non-thermal exposures: oxidative stress; single and double strand breaks in cellular DNA; cancer; male and female infertility; lowered melatonin/sleep disruption; cardiac changes including tachycardia, arrhythmia, and sudden cardiac death; diverse neuropsychiatric effects including depression; and therapeutic effects. Non-VGCC non-thermal mechanisms may occur, but none have been shown to have effects in mammals. Biologically relevant safety standards can be developed through studies of cell lines/cell cultures with high levels of different VGCCs, measuring their responses to different EMF exposures. The 2014 Canadian Report by a panel of experts only recognizes thermal effects regarding safety standards for non-ionizing radiation exposures. Its position is therefore contradicted by each of the observations above. The Report is assessed here in several ways including through Karl Popper's assessment of strength of evidence. Popper argues that the strongest type of evidence is evidence that falsifies a theory; second strongest is a test of "risky prediction"; the weakest confirms a prediction that the theory could be correct but in no way rules out alternative theories. All of the evidence supporting the Report's conclusion that only thermal effects need be considered are of the weakest type, confirming prediction but not ruling out alternatives. In contrast, there are thousands of studies apparently falsifying their position. The Report argues that there are no biophysically viable mechanisms for non-thermal effects (shown to be false, see above). It claims that there are many "inconsistencies" in the literature causing them to throw out large numbers of studies; however, the one area where it apparently documents this claim, that of genotoxicity, shows no inconsistencies; rather it shows that various cell types, fields and end points produce different responses, as should be expected. The Report claims that cataract formation is produced by thermal effects but ignores studies falsifying this claim and also studies showing [Ca<sup>2+</sup>]<sub>i</sub> and VGCC roles. It is time for a paradigm shift away from only thermal effects toward VGCC activation and consequent downstream effects.

(3) <https://www.sciencedirect.com/science/article/pii/S0160412016307383>



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## Maternal cell phone use during pregnancy and child behavioral problems in five birth cohorts

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### Highlights

- Largest study to date to use prenatal cell phone use data collected prospectively.
- High prenatal cell phone use linked to hyperactivity/inattention problems in child.
- No prenatal cell phone use linked to low risk for any behavioral problems in child.



(4) <https://www.degruyter.com/view/j/reveh.2013.28.issue-2-3/reveh-2013-0006/reveh-2013-0006.xml>

## Using the Hill viewpoints from 1965 for evaluating strengths of evidence of the risk for brain tumors associated with use of mobile and cordless phones<sup>1)</sup>

Lennart Hardell  / Michael Carlberg

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### Abstract

**Background:** Wireless phones, i.e., mobile phones and cordless phones, emit radiofrequency electromagnetic fields (RF-EMF) when used. An increased risk of brain tumors is a major concern. The International Agency for Research on Cancer (IARC) at the World Health Organization (WHO) evaluated the carcinogenic effect to humans from RF-EMF in May 2011. It was concluded that RF-EMF is a group 2B, i.e., a "possible", human carcinogen. Bradford Hill gave a presidential address at the British Royal Society of Medicine in 1965 on the association or causation that provides a helpful framework for evaluation of the brain tumor risk from RF-EMF.

**Methods:** All nine issues on causation according to Hill were evaluated. Regarding wireless phones, only studies with long-term use were included. In addition, laboratory studies and data on the incidence of brain tumors were considered.

**Results:** The criteria on strength, consistency, specificity, temporality, and biologic gradient for evidence of increased risk for glioma and acoustic neuroma were fulfilled. Additional evidence came from plausibility and analogy based on laboratory studies. Regarding coherence, several studies show increasing incidence of brain tumors, especially in the most exposed area. Support for the experiment came from antioxidants that can alleviate the generation of reactive oxygen species involved in biologic effects, although a direct mechanism for brain tumor carcinogenesis has not been shown. In addition, the finding of no increased risk for brain tumors in subjects using the mobile phone only in a car with an external antenna is supportive evidence. Hill did not consider all the needed nine viewpoints to be essential requirements.

**Conclusion:** Based on the Hill criteria, glioma and acoustic neuroma should be considered to be caused by RF-EMF emissions from wireless phones and regarded as carcinogenic to humans, classifying it as group 1 according to the IARC classification. Current guidelines for exposure need to be urgently revised.

(5) <https://www.ncbi.nlm.nih.gov/pubmed/21679472>

*Environ Health*. 2011 Jun 17;10:59. doi: 10.1186/1476-069X-10-59.

## Mobile phones and head tumours. The discrepancies in cause-effect relationships in the epidemiological studies - how do they arise?

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 Author information

### Abstract

**BACKGROUND:** Whether or not there is a relationship between use of mobile phones (analogue and digital cellars, and cordless) and head tumour risk (brain tumours, acoustic neuromas, and salivary gland tumours) is still a matter of debate; progress requires a critical analysis of the methodological elements necessary for an impartial evaluation of contradictory studies.

**METHODS:** A close examination of the protocols and results from all case-control and cohort studies, pooled- and meta-analyses on head tumour risk for mobile phone users was carried out, and for each study the elements necessary for evaluating its reliability were identified. In addition, new meta-analyses of the literature data were undertaken. These were limited to subjects with mobile phone latency time compatible with the progression of the examined tumours, and with analysis of the laterality of head tumour localisation corresponding to the habitual laterality of mobile phone use.

**RESULTS:** Blind protocols, free from errors, bias, and financial conditioning factors, give positive results that reveal a cause-effect relationship between long-term mobile phone use or latency and statistically significant increase of ipsilateral head tumour risk, with biological plausibility. Non-blind protocols, which instead are affected by errors, bias, and financial conditioning factors, give negative results with systematic underestimate of such risk. However, also in these studies a statistically significant increase in risk of ipsilateral head tumours is quite common after more than 10 years of mobile phone use or latency. The meta-analyses, our included, examining only data on ipsilateral tumours in subjects using mobile phones since or for at least 10 years, show large and statistically significant increases in risk of ipsilateral brain gliomas and acoustic neuromas.

**CONCLUSIONS:** Our analysis of the literature studies and of the results from meta-analyses of the significant data alone shows an almost doubling of the risk of head tumours induced by long-term mobile phone use or latency.