

California Medical Association
House of Delegates Resolution Wireless Standards Reevaluation
2014 Resolution 107- 14

PASSED
Date Adopted Dec 7, 2014

Resolved 1 That CMA supports efforts to reevaluate microwave safety exposure levels associated with wireless communication devices, including consideration of adverse non-thermal biologic and health effects from non-ionizing electromagnetic radiation used in wireless communications; and be it further

Resolved 2 That CMA support efforts to implement new safety exposure limits for wireless devices to levels that do not cause human or environmental harm based on scientific research.

CALIFORNIA MEDICAL ASSOCIATION HOUSE OF DELEGATES 2014
Wireless Communications Public Safety Standards Reevaluation
Introduced by Cindy Lee Russell, M.D. AND Ken Yew, M.D.

Whereas there are over 6 billion active cell phones worldwide and dependence of wireless communication networks is rapidly expanding including cell phones, cell towers, wireless routers for home use, medical devices and utility smart meters; and (1)

Whereas scientists are increasingly identifying EMF from wireless devices as a new form of environmental pollution with a growing body of peer reviewed scientific evidence finding significant adverse health and biologic effects on living organisms with exposure to low levels of non-ionizing microwaves currently approved and used in wireless communication, and

Whereas peer reviewed research has demonstrated adverse biological effects of wireless EMF including single and double stranded DNA breaks, creation of reactive oxygen species, immune dysfunction, cognitive processing effects, stress protein synthesis in the brain, altered brain development, sleep and memory disturbances, ADHD, abnormal behavior, sperm dysfunction, and brain tumors; and (2-55)

Whereas there is a long latency period of years to decades to study and identify adverse health effects such as brain cancer, neurodegenerative damage and autism; and

Whereas children's brains are developmentally immature until adolescence, their skulls are thinner and the brain is considerably more vulnerable to toxin exposure , and (23,24)

Whereas the World Health Organization in 2011 designated wireless communications including cell phones to be a possible carcinogenic, and (63)

Whereas many scientists, researchers, public health officials and agencies conclude that wireless electromagnetic frequency (EMF) standards established by the Federal Communications Commission are outdated as they are based only on heat effects which damage to the organism and not biological effects of non –ionizing EMF microwave radiation which are scientifically demonstrated at levels hundreds of times less than current safety exposure limits and thus current standards are inadequate to protect public health; and (49-51)(57)

Whereas the American Academy of Pediatrics in 2013 has asked for reassessment of exposure to radiofrequency electromagnetic fields limits and policies that protect children's health and well-being throughout their lifetimes and reflect current use patterns (58)

RESOLVED; that the CMA understands that existing public safety limits for microwave EMF devices are outdated and inadequate to protect public health thus endorses efforts of the Federal Communications Commission to reevaluate its safety standards to include consideration of adverse non thermal biologic and health effects from non ionizing electromagnetic radiation used in wireless communications; and be it further

RESOLVED; that the CMA supports efforts to implement microwave safety exposure limits to levels that do not cause human or environmental harm based on scientific research, and be it further

RESOLVED; that the CMA set up a task force to determine adequate precautionary recommendations for the use of cell phones and wireless devices for schools and children

References Wireless Communications Public Safety Standards Reevaluation

- 1) More People Have Cell Phones Than Toilets, U.N. Study Shows. Time. March 25, 2013. <http://newsfeed.time.com/2013/03/25/more-people-have-cell-phones-than-toilets-u-n-study-shows/>
- 2) Acute low-intensity microwave exposure increases DNA single-strand breaks in rat brain cells. Lai H, Singh, NP Bioelectromagnetics 1995;16(3):207-10 WEB <http://www.ncbi.nlm.nih.gov/pubmed/7677797>
- 3) Behavioral Effects of Microwaves . Neurobehavioral Toxicology: 1980 Spring;2(1): 49-58 Sern S. WEB <http://www.ncbi.nlm.nih.gov/pubmed/7442919>
- 4) Microwave Radiation Absorption: Behavioral Effects. Health Physiology: 1991 Jul;6(1):29-40 D'Andrea JA. WEB <http://www.ncbi.nlm.nih.gov/pubmed/2061046?ordinalpos=1&itool=PPMCLayout.PPMCAAppController.PPMCArticlePage.PPMCPubmedRA&linkpos=2>
- 5) Nerve Cell Damage in Mammalian Brain after Exposure to Microwaves from GSM Mobile Phones. Safford L. Environmental Health Perspectives Volume 111, Number 7, June 2003 WEB <http://ehp.niehs.nih.gov/members/2003/6039/6039.html> <http://ehp.niehs.nih.gov/papers/012903.html>
- 6) The effects of broad-band electromagnetic field exposure on mice (Mus musculus). Journal of Environmental Science and Health, Part A: Toxic/Hazardous Substances and Environmental Engineering. Volume 35, Issue 3, 2000. <http://www.informaworld.com/smpp/content~db=all~content=a906773614>
- 7) Electromagnetic Fields and DNA Damage. Phillips J. Pathophysiology 16 (2009) 79-88. <http://www.scribd.com/doc/21750937/EMF-Cell-Phone-DNA-Damage>
- 8) Single- and double-strand DNA breaks in rat brain cells after acute exposure to radiofrequency electromagnetic radiation. Lai H, Singh NP, Int J Radiat Biol 69(4):513-521, 1996. http://www.researchgate.net/publication/14573695_Single-_and_double-strand_DNA_breaks_in_rat_brain_cells_after_acute_exposure_to_radiofrequency_electromagnetic_radiation
- 9) DNA Strand Breaks in Rat Brain Cells Exposed to Low level Microwave Radiation. Behari J. <http://www.ursi.org/proceedings/procGA08/papers/K02bp2.pdf>
- 10) Long Term Exposure to Microwave Radiation Provokes Cancer Growth: Evidences from Radars and Mobile Communication Systems. Kyrylenko S . Experimental Oncology. March 2011. <http://exp-oncology.com.ua/article/1845/long-term-exposure-to-microwave-radiation-provokes-cancer-growth-evidences-from-radars-and-mobile-communication-systems>
- 11) ELECTROMAGNETIC FIELDS: Conference, Hearing Call Up Cell Phone Use. Environ Health

- Perspect. Nov 2009; 117(11): A486. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2801166/>
- 12) EMF's and DNA Effects: Potential Mechanism Elucidated-Science Selections. Hood E. Environmental Health Perspectives, May 2004. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1316056/>
- 13) Association between vestibular schwannomas and mobile phone use. Moon S. Tumour Biol. Jan 2014; 35(1): 581–587. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3907669/>
- 14) Long-term use of cellular phones and brain tumors: increased risk associated with use for > or =10 years. Hardell L, Carlsberg M. Occupational Environmental Medicine 2007, Sept; 64(9):626-32 <http://www.ncbi.nlm.nih.gov/pubmed/17409179>
- 15) Meta-analysis of long-term mobile phone use and the association with brain tumors. Hardell L International Journal of Oncology. May 2008 vol 32 Number 5. http://www.spandidos-publications.com/ijo/article.jsp?article_id=ijo_32_5_1097
- 16) Cell phone Use and Acoustic Neuroma: The Need for Standardized Questionnaires and access to Industry Data. Surgical Neurology. Volume 72, issue 3, pages 216-222 (Sept 2009) Yueh-Ying Han. http://www.researchgate.net/publication/24241041_Cell_phone_use_and_acoustic_neuroma_the_need_for_standardized_questionnaires_and_access_to_industry_data
- 17) Exposure to Wireless Phone Emissions and Serum Bets-Trace Proteins. Hardell L. Soderqvist F. International Journal Molecular Medicine. 2010 August; 26(2):301-306. <http://www.biomedsearch.com/nih/Exposure-to-wireless-phone-emissions/20596612.html>
- 18) Mobile Phone Use and the Risk for Malignant Brain Tumors: A Case Control Study on Deceased Cases and Controls . Hardell L, Carlsberg M, Neuroepidemiology: 2010 June 15;35(2): 109-114. http://www.avaate.org/IMG/pdf/Hardell_et_al_Neuroepidemiology_2010.pdf
- 19) Case-control study of the association between malignant brain tumours diagnosed between 2007 and 2009 and mobile and cordless phone use. Hardell L . Int J Oncol. 2013 Dec;43(6):1833-45. <http://www.ncbi.nlm.nih.gov/pubmed/24064953>
- 20) Mobile Phones, Cordless Phones and the Risk for Brain Tumors. Hardell L, Carlberg M. International Journal of Oncology, 2009 Jul;35(1):5-17 PMID: 19513546 http://www.spandidos-publications.com/ijo/article.jsp?article_id=ijo_35_1_5
- 21) Oxidative damage in chemical teratogenesis. Wells PG . Mutat Res. 1997 Dec 12;396(1-2):65-78.<http://www.ncbi.nlm.nih.gov/pubmed/9434860>
- 22) Swedish review strengthens grounds for concluding that radiation from cellular and cordless phones is a probable human carcinogen. Dr. Devra Davis. Pathophysiology. Volume 20, issue 2, Pages 123–129, April 2013
- 23) Critical periods of vulnerability for the developing nervous system: evidence from humans and animal models. Environ Health Perspect. Rice D. 108(suppl 3):511–533 (2000). <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.281.957>
- 24) Critical periods of vulnerability for the developing nervous system: evidence from humans and animal models. Environ Health Perspect. Rice D. 108(suppl 3):511–533 (2000). <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.281.957>
- 25) Electromagnetic noise inhibits radiofrequency radiation-induced DNA damage and reactive oxygen species increase in human lens epithelial cells. Yao K . Mol Vis. 2008 May 19;14:964-9. <http://www.ncbi.nlm.nih.gov/pubmed/18509546>
- 26) Neuronal Death and Oxidative Stress in the Developing Brain. Chrysanthy Ikonomidou. ANTIOXIDANTS & REDOX SIGNALING Volume 00, Number 0, 2011. <https://neurology.wisc.edu/publications/2010%20Pubs/Ikonomidou-5.pdf>
- 27) Reactive oxygen species elevation and recovery in Drosophila bodies and ovaries following short-term and long-term exposure to DECT base EMF. Manta AK . Electromagn Biol Med. 2014 Jun;33(2):118-31. <http://www.ncbi.nlm.nih.gov/pubmed/23781995>
- 28) Protective effects of melatonin and caffeic acid phenethyl ester against retinal oxidative stress in long-term use of mobile phone: a comparative study. Ozguner F . Mol Cell Biochem. 2006 Jan;282(1-2):83-8. <http://www.ncbi.nlm.nih.gov/pubmed/16317515>
- 29) Autism-relevant social abnormalities in mice exposed perinatally to extremely low frequency electromagnetic fields. <http://www.ncbi.nlm.nih.gov/pubmed/24970316>

- 30) Drosophila oogenesis as a bio-marker responding to EMF sources. Margaritis LH . *Electromagn Biol Med*. 2014 Sep;33(3):165-89. <http://www.ncbi.nlm.nih.gov/pubmed/23915130>
- 31) Exposure to 1800 MHz radiofrequency electromagnetic radiation induces oxidative DNA base damage in a mouse spermatocyte-derived cell line. Liu C . *Toxicol Lett*. 2013 Mar 27;218(1):2-9. <http://www.ncbi.nlm.nih.gov/pubmed/23333639>
- 32) [Metabolic changes in cells under electromagnetic radiation of mobile communication systems]. Iakimenko. IL. *Ukr Biokhim Zh*. 2011 Mar-Apr;83(2):20-8. <http://www.ncbi.nlm.nih.gov/pubmed/21851043>
- 33) Non-thermal activation of the hsp27/p38MAPK stress pathway by mobile phone radiation in human endothelial cells: molecular mechanism for cancer- and blood-brain barrier-related effects. Leszczynski D . *Differentiation*. 2002 May;70(2-3):120-9. <http://www.ncbi.nlm.nih.gov/pubmed/12076339>
- 34) Effect of 900 MHz radiofrequency radiation on oxidative stress in rat brain and serum. Bilgici B . *Electromagn Biol Med*. 2013 Mar;32(1):20-9. <http://www.ncbi.nlm.nih.gov/pubmed/23301880>
- 35) Behavior and memory evaluation of Wistar rats exposed to 1.8 GHz radiofrequency electromagnetic radiation. Júnior LC . *Neurol Res*. 2014 Sep;36(9):800-3. <http://www.ncbi.nlm.nih.gov/pubmed/24620965>
- 36) Effect of radio-frequency electromagnetic radiations (RF-EMR) on passive avoidance behaviour and hippocampal morphology in Wistar rats. Narayanan SN . *Ups J Med Sci*. 2010 May;115(2):91-6. <http://www.ncbi.nlm.nih.gov/pubmed/20095879>
- 37) Analysis of emotionality and locomotion in radio-frequency electromagnetic radiation exposed rats. Narayanan SN . *Neurol Sci*. 2013 Jul;34(7):1117-24. <http://www.ncbi.nlm.nih.gov/pubmed/22976773>
- 38) Evaluation of oxidant stress and antioxidant defense in discrete brain regions of rats exposed to 900 MHz radiation. Bratisl Lek Listy. 2014;115(5):260-6. <http://www.ncbi.nlm.nih.gov/pubmed/25174055>
- 39) Fetal Radiofrequency Radiation Exposure From 800-1900 Mhz-Rated Cellular Telephones Affects Neurodevelopment and Behavior in Mice. Aldid, T. *Nature. Scientific Reports* 2, Article number: 312. Feb 18, 2013. <http://www.nature.com/srep/2012/120315/srep00312/full/srep00312.html>
- 40) Cell phone radiation exposure on brain and associated biological systems. Kesari KK . *Indian J Exp Biol*. 2013 Mar;51(3):187-200. <http://www.ncbi.nlm.nih.gov/pubmed/23678539>
- 41) Disturbance of the immune system by electromagnetic fields-A potentially underlying cause for cellular damage and tissue repair reduction which could lead to disease and impairment. Johansson O . *Pathophysiology*. 2009 Aug;16(2-3):157-77. Epub 2009 Apr 23. <http://www.ncbi.nlm.nih.gov/pubmed/19398310>
- 42) Cell phone use and behavioural problems in young children. Divan HA , . *J Epidemiol Community Health*. 2012 Jun;66(6):524-9. <http://www.ncbi.nlm.nih.gov/pubmed/21138897>
- 43) Prenatal and postnatal exposure to cell phone use and behavioral problems in children. Divan HA . *Epidemiology*. 2008 Jul;19(4):523-9. <http://www.ncbi.nlm.nih.gov/pubmed/18467962>
- 44) Maternal cell phone and cordless phone use during pregnancy and behaviour problems in 5-year-old children. Guxens M . *J Epidemiol Community Health*. 2013 May;67(5):432-8. <http://www.ncbi.nlm.nih.gov/pubmed/23386674>
- 45) Radio frequency electromagnetic radiation (RF-EMR) from GSM (0.9/1.8GHz) mobile phones induces oxidative stress and reduces sperm motility in rats. Mailankot M . *Clinics (Sao Paulo)*. 2009;64(6):561-5. <http://www.ncbi.nlm.nih.gov/pubmed/19578660>
- 46) Effects of the exposure to mobile phones on male reproduction: a review of the literature. La Vignera S . *J Androl*. 2012 May-Jun;33(3):350-6. <http://www.ncbi.nlm.nih.gov/pubmed/21799142>
- 47) Effects of radiofrequency electromagnetic waves (RF-EMW) from cellular phones on human ejaculated semen: an in vitro pilot study. Agarwal A . *Fertil Steril*. 2009 Oct;92(4):1318-25. <http://www.ncbi.nlm.nih.gov/pubmed/18804757>

- 48) Bioinitiative 2012. <http://www.bioinitiative.org/conclusions/>
- 49) Autism and EMF/RFR? Plausibility of a Pathophysiological Link-Part I. Pathophysiology Volume 20, Issue 3 , 191-209, June 2013. Herbert M, Sage C (2013) . [http://www.pathophysiologyjournal.com/article/S0928-4680\(13\)00037-0/fulltext](http://www.pathophysiologyjournal.com/article/S0928-4680(13)00037-0/fulltext)
- 50) Autism and EMF/RFR? Plausibility of a Pathophysiological Link-Part II. Pathophysiology Volume 20, Issue 3 , 211-234, June 2013. Herbert M, Sage C (2013) <http://apps.fcc.gov/ecfs/document/view?id=7520958031>
- 51) BioInitiative Report: A Rationale for Biologically-based Public Exposure Standards for Electromagnetic Radiation. December 31, 2012. BioInitiative Working Group, Cindy Sage and David O. Carpenter. <http://www.bioinitiative.org/>
- 52) Epidemiological Evidence for a Health Risk from Mobile Phone Base Stations. International Journal of Occupational Environmental Health: 16-3, Jul/Sep 2010, p263-267. Khurana V, Hardell L . http://www.brain-surgery.us/Khurana_et_al_IJOEH-Base_Station_RV.pdf
- 53) Shallow Minds: How the Internet and Wi-Fi in Schools Can Affect Learning. Cindy Lee Russell, MD. Oct 2013 issue SCCMA Bulletin. http://issuu.com/18621/docs/bulletin_1013_web or <http://www.sccma-mcms.org/Portals/19/assets/docs/Wi-Fi%20in%20Schools%20rev.pdf> for full references
- 54) Autism Rising Part 1. Dr. Cindy Russell. May/June SCCMA Bulletin 2014 <http://www.sccma-mcms.org/NewsEvents/BulletinMemberMagazine.aspx> or <http://www.sccma-mcms.org/Portals/19/Autism%20Rising%20Part%201.pdf>
- 55) Autism Rising Part 2 . Dr. Cindy Russell. SCMA Bulletin 2014 <http://www.sccma-mcms.org/NewsEvents/BulletinMemberMagazine.aspx> or <http://www.sccma-mcms.org/Portals/19/assets/docs/Autism%20Rising%20Part%202%20rev.pdf>
- 56) Scientific panel on electromagnetic field health risks: consensus points, recommendations, and rationales. Fragopoulou A . Rev Environ Health. 2010 Oct-Dec;25(4):307-17. <http://www.ncbi.nlm.nih.gov/pubmed/21268443>
- 57) Letter American Academy of Pediatrics to FDA on “Reassessment of Exposure to Radiofrequency Electromagnetic Fields Limits and Policies” published in the Federal Register on June 4, 2013. <http://apps.fcc.gov/ecfs/document/view?id=7520941318>
- 58) Wired vs Wireless in Classrooms. Letter to Los Angeles Unified School District. Feb 2013 from Martha Herbert, Assistant Professor Pediatric Neurology, Harvard Medical School. <http://apps.fcc.gov/ecfs/document/view?id=7520940748>
- 59) The precautionary principle in environmental science. D Kriebel . Environ Health Perspect. Sep 2001; 109(9): 871–876.<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1240435/>
- 60) Environmental Working Group Cell Phone Report <http://www.scribd.com/doc/19576223/EWGs-Cell-Phone-Radiation-Report>
- 61) WiFi in schools proven dangerous. <https://www.youtube.com/watch?v=KN7VetsCR2I&feature=related>
- 62) Electromagnetic fields and public health: mobile phones. <http://www.who.int/mediacentre/factsheets/fs193/en/>