

| Author, Date, etc | Reference or Review on Epidemiology |
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| <p>Antoniazzi D1988-07 mw cns PMID3154341</p> | <p>1: G Ital Med Lav 1988 Jul-Sep;10(4-5):193-200 [Evaluation of various psychologic parameters in a group of workers occupationally exposed to radiofrequency] [Article in Italian] Antoniazzi D, Marraccini P, Giorgi I, Biazzini L, Vittadini G. Dipartimento di Medicina Preventiva, Occupazionale e di Comunita, Universita di Pavia. In this study effects on psyche caused by a protract exposure to radiofrequency are examined. 13 women, occupationally exposed to radiofrequency, were subjected to a series of psychological tests in order to verify possible psychological troubles. Results seem to demonstrate a significant presence of troubles concerning social relations, anxiety and depression. MeSH Terms: Adult Affective Symptoms/etiology* Affective Symptoms/epidemiology English Abstract Female Human Occupational Diseases/etiology* Occupational Diseases/epidemiology Radio Waves/adverse effects* PMID: 3154341</p> |
| <p>Bortkiewicz A 2001-- mw ph PMID11761657</p> | <p>1: Med Pr. 2001;52(2):101-6. [A study on the biological effects of exposure mobile-phone frequency EMF] [Article in Polish] Bortkiewicz A. Zakladu Fizjologii Pracy i Ergonomii, Instytutu Medycyny Pracy, Lodzi. Together with a growing number of cellular telephone users increases the interest in the effect of electromagnetic fields (EMF) emitted by them on live organisms. The surveys on subjective complaints of cellular telephone users carried out in Sweden, Norway, UK, USA, New Zealand and Australia showed that head ache is the major complain, and it is more pronounced with analogue than digital telephones. Apart from head ache, fatigue and general ill-being, muscular pains and nausea are reported. Human experimental studies reveal that EMF emitted by cellular telephones may be responsible for periodical increase in arterial blood pressure, changes in electric activity of the brain. However, no changes in secretion of cerebral pituitary hormones: adrenocorticotrophic hormone (ACTH), thyroid stimulating hormone (TSH), growth hormone, prolactin (PRL), lactogenic hormone (LH), follicle-stimulating hormone (FSH) and melatonin. The animal experimental studies indicated that exposure to EMF of the microwave frequency activates the endogenous opioid system in the brain, while the studies of the brain neurotransmitter activity have not produced univocal results, some of them showed decline, others increase in acetylcholinesterase activity. In vitro studies reveal that EMF even below maximum permissible levels may induce changes in the blood-brain permeability barrier and disorders in active transport of Na+, K+ ions and release of Ca++ ions by cellular membranes. The studies carried out thus far have not produced clear-cut results, but they indicate that EMF of the microwave frequency, including the frequency emitted by cellular telephones may be responsible for various measurable biological effects. It is essential to find out whether these effects may affect human health. Publication Types: Review Review, Tutorial MeSH Terms: Blood-Brain Barrier/physiology Brain Diseases/epidemiology Brain Diseases/etiology* Electromagnetic Fields/adverse effects* English Abstract Headache/epidemiology Headache/etiology* Human Hypertension/epidemiology Hypertension/etiology* Telephone* PMID: 11761657</p> |
| <p>Carlo GL 2000-07 mw can rev PMID11104486</p> | <p>1: MedGenMed 2000 Jul 11;;E40 Scientific progress - wireless phones and brain cancer: current state of the science. Carlo GL, Jenrow RS. Wireless Technology Research, Washington, DC, USA. CONTEXT: The current science is not definitive about health risks from wireless phones; however, the legitimate questions about safety that have arisen from recent studies make claims of absolute safety no longer supportable. OBJECTIVE: The objective of this paper is to outline for primary care providers the results of the most current research on the possible impact of wireless phone use on human health. Presented are study results from Wireless Technology Research (WTR) program, the 7-year, \$27 million effort funded by the wireless industry in the United States, that represents the world's most comprehensive research effort addressing this issue to date. Science-based recommendations for consumer interventions and future research are presented. DATA SOURCES: Original studies performed under the WTR program as well as other relevant research from around the world. STUDY SELECTION: This article presents a synopsis of the peer-reviewed in vitro and in vivo laboratory research, and the peer-reviewed epidemiology studies supported by the WTR, as well as a summary of other relevant work. DATA EXTRACTION: Only peer-reviewed scientific studies are presented, primarily WTR-sponsored research. In addition, results of the WTR literature surveillance program, which identified other relevant toxicology and epidemiology studies on an ongoing basis, are presented. These studies are presented in the context of their usefulness in providing intervention recommendations for consumers. DATA SYNTHESIS: Following a qualitative synthesis of specific relevant non-WTR research and a</p> |

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| | <p>critical assessment of the WTR results, the following represents the current state of scientific understanding relevant to the public health impact of wireless phones: laboratory studies appear to have confirmed that radio frequency radiation from wireless phone antennas is insufficient to cause DNA breakage; however, this same radiation appears to cause genetic damage in human blood as measured through the formation of micronuclei. An increase in the rate of brain cancer mortality among hand-held cellular phone users as compared to car phone users, though not statistically significant, was observed in the WTR cohort study. A statistically significant increase in the risk of neuro-epithelial brain tumors was observed among cellular phone users in another case-control study.</p> <p>CONCLUSIONS: As new data emerge, our understanding of this complex problem will improve; however, at present there is a critical need for ongoing and open evaluation of the public health impact of new science, and communication of this science and derivative intervention options to those who are potentially affected. Publication Types: Review Review, Tutorial MeSH Terms: Brain Neoplasms/etiology* Brain Neoplasms/epidemiology Human Neoplasms, Radiation-Induced/etiology* Neoplasms, Radiation-Induced/epidemiology Peer Review Research/statistics & numerical data Research/organization & administration Risk Assessment/statistics & numerical data Telecommunications/utilization* United States/epidemiology PMID: 11104486</p> |
| <p>Chia SE 2000-11 mw ph PMID11102297</p> | <p>1: Environ Health Perspect 2000 Nov;108(11):1059-62 Erratum in: Environ Health Perspect 2001 Feb;109(2):A65 Comment in: Environ Health Perspect. 2001 Mar;109(3):A110. Prevalence of headache among handheld cellular telephone users in Singapore: a community study. Chia SE, Chia HP, Tan JS. Department of Community, Occupational & Family Medicine, National University of Singapore, Singapore, Republic of Singapore. cofcse@nus.edu.sg We carried out a cross-sectional community study in Singapore to determine the prevalence of specific central nervous system (CNS) symptoms among hand-held cellular telephone (HP) users compared to nonusers and to study the association of risk factors and CNS symptoms among HP users. A total of 808 men and women between 12 and 70 years of age, who lived in one community, were selected using one-stage cluster random sampling and responses to a structured questionnaire. The prevalence of HP users was 44.8%. Headache was the most prevalent symptom among HP users compared to non-HP users, with an adjusted prevalence rate ratio of 1.31 [95% confidence interval, 1.00-1.70]. There is a significant increase in the prevalence of headache with increasing duration of usage (in minutes per day). Prevalence of headache was reduced by more than 20% among those who used hand-free equipment for their cellular telephones as compared to those who never use the equipment. The use of HPs is not associated with a significant increase of CNS symptoms other than headache. MeSH Terms: Adolescence Adult Aged Central Nervous System Diseases/etiology Child Cross-Sectional Studies Environmental Exposure Environmental Health Female Headache/etiology* Headache/epidemiology Human Male Microwaves/adverse effects* Middle Age Risk Factors Singapore/epidemiology Telephone* PMID: 11102297</p> |
| <p>Fabbro-Peray P 2001-05 rf can PMID11405325</p> | <p>1: Cancer Causes Control 2001 Apr;12(3):201-12 Environmental risk factors for non-Hodgkin's lymphoma: a population-based case-control study in Languedoc-Roussillon, France. Fabbro-Peray P, Daures JP, Rossi JF. Departement de l'Information Medicale, Hjpital Gaston Doumergue-5, Nimes, France. OBJECTIVE: To investigate the occupational and environmental risk factors related to non-Hodgkin's lymphoma (NHL). METHODS: A case-control study was performed during the 1992-1996 period in Languedoc-Roussillon, southern France. Four hundred and forty-five cases of histologically diagnosed NHL were declared. One thousand and twenty-five randomly selected population controls were interviewed about their medical histories; occupational exposures, such as chemicals, pesticides, and electromagnetic radiation; and toxic habits. RESULTS: The following factors were independently and significantly related to NHL as a result of the multivariate analysis: a previous hematopoietic malignancy (ORa = 11.5, 95% CI 2.4-55.4), a history of hives (ORa = 1.7, 95% CI 1.2-2.2), benzene exposure > 810 days (ORa = 4.6, 95% CI 1.1-19.2), daily welding (ORa = 2.5, 95% CI 1.2-5.0), and activity of radio operator (ORa = 3.1, 95% CI 1.4-6.6). To be an agricultural professional seemed slightly related to NHL in reference to non-professionals (ORa = 1.5, 95% CI 1.0-2.1). All of these results have also been adjusted for age, gender, education level, and urban setting. CONCLUSIONS: As some of the reported associations were based on a very small proportion of exposed subjects, further investigations are necessary to confirm our results. However, the findings suggest that factors related to altered immune functions such as a history of hematopoietic malignancy, history of hives, occupational exposure to benzene, or being an agricultural professional might increase the risk of NHL. Currently, underlying mechanisms for these associations are still unclear, and further investigations focused on interactions between immunity alterations and different chemicals would be of great interest. MeSH</p> |

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| | <p>Terms: Adult Aged Case-Control Studies Confounding Factors (Epidemiology) Electromagnetic Fields/adverse effects* Environmental Exposure/adverse effects* Female France/epidemiology Human Logistic Models Lymphoma, Non-Hodgkin/etiology* Lymphoma, Non-Hodgkin/epidemiology* Lymphoma, Non-Hodgkin/chemically induced Male Middle Age Multivariate Analysis Occupational Diseases/etiology* Occupational Diseases/epidemiology* Occupational Diseases/chemically induced Odds Ratio Questionnaires Risk Factors Smoking/adverse effects Support, Non-U.S. Gov't PMID: 11405325</p> |
| <p>Friedell PE 2000-12 mw can PMID11335851</p> | <p>1: MedGenMed 2000 Dec 1;2(6):E1-3 In response - case control study on radiology work, medical X-ray investigations and use of cellular phones as risk factors for brain tumors. Friedell PE. Publication Types: Letter MeSH Terms: Brain Neoplasms/epidemiology* Electromagnetics* Human Radiation Risk Factors Telephone* PMID: 11335851</p> |
| <p>Goldsmith JR 1995-01 mw PMID9990158</p> | <p>1: Int J Occup Environ Health 1995 Jan;1(1):47-57 Epidemiologic Evidence of Radiofrequency Radiation (Microwave) Effects on Health in Military, Broadcasting, and Occupational Studies. Goldsmith JR. Epidemiology and Health Services Evaluation Unit, Section on Occupational and Environmental Epidemiology, Faculty of Health Sciences, Ben Gurion University of the Negev, POB 653 Beer Sheva, Israel 84 320. In this opinion piece, the author brings together and discusses the collective relevance of possible health effects of microwave or radar exposure in military, broadcasting, and occupational circumstances, with a view to assuring optimal protective practices. Sources of the information presented include 1) historical data, 2) experiences of Polish soldiers, 3) a study of U.S. naval personnel using radar in the Korean War, 4) preliminary findings of exposures to the Skruna, Latvia, transmitter, 5) data obtained near Hawaiian broadcasting facilities, 6) occupational studies of electronic and electrical workers, including ham radio operators, 7) reproductive outcomes among physiotherapists using short-wave and microwave diathermy, and 8) U.S. foreign service personnel exposed at Embassies in Eastern Europe. Some of the data are available in the peer-reviewed literature, others in abstracts, reports, or other non-peer-reviewed forms. Some were obtained under Freedom of Information statutes and are incomplete. For some of these, there is reason to believe that further evidence desired by the investigator was not obtained. Some are case-referent studies, but most are not. Some are ecological, and all are retrospective. Few have reliable dose estimations, and none has accurate dosage information on each subject. None includes evidence of tissue heating or any short-term effect. Possible outcomes considered included 1) blood count changes, 2) evidence of somatic mutation, 3) impairment of reproductive outcomes, especially increased spontaneous abortion, and 4) increase in cancer incidence and mortality, especially of the hematopoietic system, brain, and breast. The author presents evidence that sufficient microwave exposures are associated with all four of these outcomes, concluding that the possible effects and their timings with respect to exposure are qualitatively similar to those on ionizing radiation. A prudent course of action would be to provide more protection for those exposed than required by present regulations. No systematic effort to include negative studies is made; thus this review has a positive reporting bias. PMID: 9990158 [PubMed - as supplied by publisher]</p> |
| <p>Goldsmith JR 1997-12 mw PMID9467086</p> | <p>1: Environ Health Perspect 1997 Dec;105 Suppl 6:1579-87 Epidemiologic evidence relevant to radar (microwave) effects. Goldsmith JR. Department of Epidemiology and Health Services Evaluation, Ben-Gurion University of the Negev, Beer Sheva, Israel. gjohn@bgumail.bgu.ac.il Public and occupational exposures to microwave (RF) are of two main types. The first type of exposures are those connected with military and industrial uses and, to some extent broadcast exposures. It is this type that most of the data cited in this study draw upon. The second type, cellular telephones and their associated broadcast requirements, have raised concerns about current exposures because of their increasingly widespread use. Four types of effects were originally reported in multiple studies: increased spontaneous abortion, shifts in red and white blood cell counts, increased somatic mutation rates in lymphocytes, and increased childhood, testicular, and other cancers. In addition, there is evidence of generalized increased disability rates from a variety of causes in one study and symptoms of sensitivity reactions and lenticular opacity in at least one other. These findings suggest that RF exposures are potentially carcinogenic and have other health effects. Therefore, prudent avoidance of unneeded exposures is recommended as a precautionary measure. Epidemiologic studies of occupational groups such as military users and air traffic controllers should have high priority because their exposures can be reasonably well characterized and the effects reported are suitable for epidemiologic monitoring. Additional community studies are needed. Publication Types: Review Review, Tutorial MeSH Terms: Abortion, Spontaneous/etiology Abortion, Spontaneous/epidemiology Brain Neoplasms/etiology Brain Neoplasms/epidemiology Environmental Exposure/adverse effects* Female Human Leukemia/etiology Leukemia/epidemiology Leukocytes/radiation effects</p> |

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| | Microwaves/adverse effects* Mutation/radiation effects Occupational Exposure/adverse effects* Pregnancy PMID: 9467086 |
| Hallberg O 2002-01 RF FM melanoma PMID12071358 | 1: Arch Environ Health 2002 Jan-Feb;57(1):32-40 Melanoma incidence and frequency modulation (FM) broadcasting. Hallberg O, Johansson O. Department of Neuroscience, Karolinska Institute, Stockholm, Sweden. The incidence of melanoma has been increasing steadily in many countries since 1960, but the underlying mechanism causing this increase remains elusive. The incidence of melanoma has been linked to the distance to frequency modulation (FM) broadcasting towers. In the current study, the authors sought to determine if there was also a related link on a larger scale for entire countries. Exposure-time-specific incidence was extracted from exposure and incidence data from 4 different countries, and this was compared with reported age-specific incidence of melanoma. Geographic differences in melanoma incidence were compared with the magnitude of this environmental stress. The exposure-time-specific incidence from all 4 countries became almost identical, and they were approximately equal to the reported age-specific incidence of melanoma. A correlation between melanoma incidence and the number of locally receivable FM transmitters was found. The authors concluded that melanoma is associated with exposure to FM broadcasting. MeSH Terms: Environmental Exposure Human Melanoma/etiology Melanoma/epidemiology* Neoplasms, Radiation-Induced/etiology Neoplasms, Radiation-Induced/epidemiology* Radio Waves/adverse effects* Regression Analysis Scandinavia/epidemiology Skin Neoplasms/etiology Skin Neoplasms/epidemiology* Support, Non-U.S. Gov't United States/epidemiology PMID: 12071358 |
| Hansson Mild K 2003-07 mw ph can PMID12792811 | 1: Int J Mol Med. 2003 Jul;12(1):67-72. Mobile telephones and cancer: Is there really no evidence of an association? (Review). Hansson Mild K, Hardell L, Kundi M, Mattsson MO. National Institute for Working Life, S-907 13 Umea, Sweden. Two Swedish epidemiological studies have shown an association between the use of mobile telephones, mainly of the analogue type, and brain tumours. These findings have been corroborated in a Finnish study. Supportive evidence has also come from studies in USA, but these investigations, as well as a Danish study, are inconclusive due to e.g., few exposed subjects, short latency periods and methodological shortcomings. The Swedish Radiation Protection Authority (SSI) engaged two epidemiologists from a private company to conduct a review of the literature. They claimed that use of mobile telephones is not associated with increased risk for brain tumours. Their conclusion was, however, based on an unbalanced view of current literature in favour of studies showing no association. These circumstances are further explored in this communication. PMID: 12792811 [PubMed - in process] |
| Hardell L 1998-12 mw rf can PMID9824648 | 1: Int J Oncol 1998 Dec;13(6):1299-303 Case-control study on risk factors for testicular cancer. Hardell L, Nasman A, Ohlson CG, Fredrikson M. Department of Oncology, Orebro Medical Center, S-701 85 Orebro, Sweden. Occupational exposures were assessed in a case-control study on testicular cancer using self administered questionnaires. Answers were obtained for 148 (91%) cases and 314 (87%) controls. Of the cases 101 had seminoma and 47 had embryonal testicular cancer. Occupational plastics work yielded odds ratio (OR) 2.9 with 95% confidence interval (CI) 1.3-6.5. Increased risk was found for embryonal cancer regarding farming (OR 3.1; CI 1.03-9.1) and contact with farm animals (OR 3.3; CI 1.00-10.9), but not for seminoma. For all testicular cancer exposure to insects repellents, mostly containing N,N-diethyl-m-toluamide (DEET) gave OR 1.7; CI 1.03-2.8, with a dose-response effect. Somewhat increased risks were found for amateur radio operators (OR 2.2; CI 0.7-6.6), work with radar equipment (OR 2.0; CI 0.3-14.2) and engineers in electronics and telecommunication industry (OR 2.3; CI 0.8-6.7) based on few exposed subjects, however. Video display unit work gave OR 1.5; CI 0.98-2.3 and for exposure 480 working days (median number) the risk increased further to OR 1.8; CI 1.1-3.2. Because of low numbers of exposed subjects in some calculations some of these results might be spurious and need to be further studied. MeSH Terms: Adult Aged Case-Control Studies Human Male Middle Age Multivariate Analysis Occupational Exposure* Odds Ratio Polyvinyl Chloride/adverse effects Questionnaires Risk Factors Support, Non-U.S. Gov't Testicular Neoplasms/etiology* Testicular Neoplasms/epidemiology Substances: Polyvinyl Chloride PMID: 9824648 |
| Hardell L 2003-03 mw ph can PMID12629278 | 1: Neuroepidemiology 2003 Mar-Apr;22(2):124-9 Vestibular schwannoma, tinnitus and cellular telephones. Hardell L, Hansson Mild K, Sandstrom M, Carlberg M, Hallquist A, Pahlson A. Department of Oncology, aUniversity Hospital, Orebro, Sweden. Cases with tinnitus after using analogue cellular telephones are presented. An increased odds ratio of 3.45, 95% confidence interval (CI) 1.77-6.76, was found for vestibular schwannoma (VS) associated with the use of analogue cell phones. During the time period 1960-1998, the age-standardized incidence of VS in Sweden significantly increased yearly by +2.53% (CI 1.71-3.35). A significant increase in the incidence |

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| | of VS was only found for the latter of the two time periods 1960-1979 and 1980-1998. For all other brain tumors taken together, the incidence significantly increased yearly by +0.80% (CI 0.59-1.02) for the time period 1960-1998, although the increase was only significant for benign tumors other than VS during 1960-1979. Copyright 2003 S. Karger AG, Basel PMID: 12629278 [PubMed - in process] |
| Hocking B 1995-01 mw PMID7840101 | 1: Am J Epidemiol 1995 Feb 1;141(3):273-4 Comment on: Am J Epidemiol. 1993 Nov 15;138(10):775-86. Re: "Miscarriages among female physical therapists who report using radio- and microwave-frequency electromagnetic radiation". Hocking B, Joyner K. Publication Types: Comment Letter MeSH Terms: Abortion, Spontaneous/etiology* Female Human Microwaves/adverse effects* Occupational Exposure* Physical Therapy Techniques* Pregnancy PMID: 7840101 |
| Hocking B 1998-01 rf-mw PMID9440406 | 1: Am J Epidemiol 1998 Jan 1;147(1):90-1 Comment on: Am J Epidemiol. 1997 Jan 1;145(1):1-9 Am J Epidemiol. 1997 Jan 1;145(1):10-7 Re: "Cancer incidence near radio and television transmitters in Great Britain. I. Sutton Coldfield transmitter. II. All high power transmitters". Hocking B, Gordon I, Hatfield G, Grain H. Publication Types: Comment Letter MeSH Terms: Adolescence Adult Aged Electromagnetic Fields/adverse effects* Great Britain/epidemiology Human Incidence Middle Age Neoplasms/etiology* Neoplasms/epidemiology Radio* Television* PMID: 9440406 |
| Hocking B 1999-02 rf-mw tv PMID10083700 | 1: Aust N Z J Public Health 1999 Feb;23(1):104-5 Comment in: Aust N Z J Public Health. 1999 Oct;23(5):553-5. Aust N Z J Public Health. 2000 Apr;24(2):216-7. Comment on: Aust N Z J Public Health. 1998;22(3 Suppl):360-7. Childhood leukaemia and TV towers revisited. Hocking B, Gordon I, Hatfield GE. Publication Types: Comment Letter MeSH Terms: Child, Preschool Data Interpretation, Statistical Dose-Response Relationship, Radiation Environmental Exposure/adverse effects* Human Incidence Leukemia/etiology* Leukemia/epidemiology New South Wales/epidemiology Poisson Distribution Radio Waves/adverse effects* Television* PMID: 10083700 |
| Hocking B 1999-12 rf-mw tv PMID10585907 | 1: Environ Health Perspect 1999 Dec;107(12):A596-7 Comments on "A critical review of epidemiologic studies of radiofrequency exposure and human cancers". Hocking B. Comments on Elwood's article: A critical review of epidemiologic studies of radiofrequency exposure and human cancers. Environ Health Perspect 107(suppl 1):155-168 (1999). Publication Types: Letter MeSH Terms: Australia Human Incidence Neoplasms, Radiation-Induced/epidemiology* PMID: 10585907 |
| Milham S 1988-01 rf can PMID3422125 | 1: Am J Epidemiol 1988 Jan;127(1):50-4Related Articles, Links Increased mortality in amateur radio operators due to lymphatic and hematopoietic malignancies. Milham S Jr. Epidemiology Section, Washington State Department of Social and Health Services, Olympia 98504. To search for potentially carcinogenic effects of electromagnetic field exposures, the author conducted a population-based study of mortality in US amateur radio operators. Ascertainment of Washington State and California amateur radio operators (67,829 persons) was done through the 1984 US Federal Communications Commission Amateur Radio Station and/or Operator License file. A total of 2,485 deaths were located for the period from January 1, 1979 through December 31, 1984, in a population of amateur radio operators which accumulated 232,499 person-years at risk. The all-cause standardized mortality ratio (SMR) was 71, but a statistically significant increased mortality was seen for cancers of the other lymphatic tissues (SMR = 162), a rubric which includes multiple myeloma and non-Hodgkin's lymphomas. The all-leukemia standardized mortality ratio was slightly, but nonsignificantly, elevated (SMR = 124). However, mortality due to acute myeloid leukemia was significantly elevated (SMR = 176). MeSH Terms: California Electromagnetic Fields/adverse effects* Electromagnetics/adverse effects* Hobbies* Human Leukemia/mortality* Leukemia, Myelocytic, Acute/mortality Leukemia, Radiation-Induced/mortality Lymphoma/mortality* Male Middle Age Multiple Myeloma/mortality Neoplasms, Radiation-Induced/mortality Radio* Risk Factors Support, U.S. Gov't, P.H.S. Washington Grant support: 84-0600/PHS PMID: 3422125 |
| Oftedal G 2000-05 mw ph PMID10912374 | 1: Occup Med (Lond). 2000 May;50(4):237-45. Symptoms experienced in connection with mobile phone use. Oftedal G, Wilen J, Sandstrom M, Mild KH. SINTEF Unimed, Trondheim, Norway. gunnhild.oftedal@phys.ntnu.no Many people in Norway and Sweden reported headaches, fatigue, and other symptoms experienced in connection with the use of a mobile phone (MP). Therefore, we initiated a cross-sectional epidemiological study among 17,000 people, all using an MP in their job. Thirty-one percent of the respondents in Norway and 13% of those in Sweden had experienced at least one symptom in connection with MP use. Next to the |

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| | <p>sensations of warmth on the ear and behind/around the ear, burning sensations in the facial skin and headaches were most commonly reported. Most symptoms usually began during or within half an hour after the call and lasted for up to 2 h. Relatively few had consulted a physician or been on sick leave because of the symptoms, but about 45% among those with an MP attributed symptom had taken steps to reduce the symptom. These results suggest an awareness of the symptoms, but not necessarily a serious health problem. MeSH Terms: Acute Disease Adult Aged Chronic Disease Cross-Sectional Studies Environmental Exposure/adverse effects* Fatigue/epidemiology Fatigue/etiology* Female Headache/epidemiology Headache/etiology* Human Male Middle Age Norway/epidemiology Patient Acceptance of Health Care/statistics & numerical data* Questionnaires Self Disclosure Sick Leave/statistics & numerical data Support, Non-U.S. Gov't Sweden/epidemiology Telephone* PMID: 10912374</p> |
| <p>Richter E 2000-07 mw can PMID10926722</p> | <p>1: Int J Occup Environ Health 2000 Jul-Sep;6(3):187-93 Cancer in radar technicians exposed to radiofrequency/microwave radiation: sentinel episodes. Richter E, Berman T, Ben-Michael E, Laster R, Westin JB. Unit of Occupational and Environmental Medicine, Hebrew University-Hadassah Medical School, Jerusalem POB 12272, Israel. elir@cc.huji.ac.il Controversy exists concerning the health risks from exposures to radiofrequency/microwave irradiation (RF/MW). The authors report exposure-effect relationships in sentinel patients and their co-workers, who were technicians with high levels of exposure to RF/MW radiation. Information about exposures of patients with sentinel tumors was obtained from interviews, medical records, and technical sources. One patient was a member of a cohort of 25 workers with six tumors. The authors estimated relative risks for cancer in this group and latency periods for a larger group of self-reported individuals. Index patients with melanoma of the eye, testicular cancer, nasopharyngioma, non-Hodgkin's lymphoma, and breast cancer were in the 20-37-year age group. Information about work conditions suggested prolonged exposures to high levels of RF/MW radiation that produced risks for the entire body. Clusters involved many different types of tumors. Latency periods were extremely brief in index patients and a larger self-reported group. The findings suggest that young persons exposed to high levels of RF/MW radiation for long periods in settings where preventive measures were lax were at increased risk for cancer. Very short latency periods suggest high risks from high-level exposures. Calculations derived from a linear model of dose-response suggest the need to prevent exposures in the range of 10-100 microw/cm(2). MeSH Terms: Adult Allied Health Personnel* Cluster Analysis Dose-Response Relationship, Radiation Environmental Monitoring Female Human Linear Models Male Microwaves/adverse effects* Neoplasms, Radiation-Induced/etiology* Neoplasms, Radiation-Induced/epidemiology Occupational Exposure/analysis Occupational Exposure/adverse effects* Questionnaires Radio Waves/adverse effects* Radiometry Risk Risk Assessment Risk Factors Sentinel Surveillance Time Factors PMID: 10926722</p> |
| <p>Roosli M 2003-06 mw rf rev PMID12836129</p> | <p>1: Gesundheitswesen. 2003 Jun;65(6):378-92. [Radio and microwave frequency radiation and health - an analysis of the literature] [Article in German] Roosli M, Rapp R, Braun-Fahrlander C. Institut für Sozial- und Präventivmedizin der Universität Basel. Roeoesli@ispm.unibe.ch This paper gives an overview of present scientific knowledge in health research on the effects from radio and microwave frequency radiation, at levels to which the general population is typically exposed. The review is based on human experimental and epidemiological studies investigating the effects of radiation in the frequency range between 100 kHz and 10 GHz. The relevant studies were identified via systematic searches of the databases Medline and ISI Web of Science. The review concludes that the existing scientific knowledge base is too limited to draw final conclusions on the health risk from exposure in the low-dose range. Only few studies have investigated the effect of long-term exposure on the general population in the normal environment. Accordingly, little can be predicted regarding long-term health risks. Various studies observed an increased risk for tumours in the hematopoietic and lymphatic tissue of people living in the proximity of TV and radio broadcast transmitters. However, methodological limitations to these studies have been identified and their findings are controversial. In studies of a possible association between brain tumours and mobile phone use, the average period mobile phones use was short compared to the known latency period of brain tumours. Although these studies did not establish an overall increased risk of brain tumours associated with mobile phone use, there were some indications of an association. Immediate effects associated with mobile phone use have been observed in human experimental studies that cannot be explained by conventional thermal mechanisms. The observed effects are within the normal physiological range and are therefore hard to interpret with respect to an increased risk to health. However, it can be concluded that mechanisms other than the established thermal mechanisms exist. Because of the present fragmentary scientific database, a</p> |

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| | precautionary approach when dealing with radio and microwave frequency radiation is recommended for the individual and the general population. PMID: 12836129 [PubMed - in process] |
| Santini R 2000-07 mw ph PMID10965528 | 1: Pathol Biol (Paris) 2000 Jul;48(6):525-8 [Danger of cellular telephones and their relay stations] [Article in French] Santini R, Seigne M, Bonhomme-Faivre L. Cellular phones and their base stations emit pulsed microwaves in the environment. Cellular phone users are exposed in the near field and, under this condition, a large part of the electromagnetic energy is absorbed by the head, leading to an increased brain temperature. The general population is exposed under far field conditions to an electromagnetic intensity depending on the distance from the base station, passive re-emitters, the number of communications maintained by the base station and their position in relation to antennae (in front of the antenna or behind). Biological effects have been reported, such as radiofrequency sickness, electroencephalographic and blood pressure changes and also cancer risks in humans and animals exposed to microwave irradiation. Some European countries (Italy, France, Belgium, etc.) have taken measures to protect their populations. Publication Types: Editorial MeSH Terms: Blood Pressure/radiation effects Body Temperature Brain/radiation effects* Electroencephalography/radiation effects English Abstract Environmental Exposure*/legislation & jurisprudence Equipment Failure Europe/epidemiology Heat Human Microwaves/adverse effects* Neoplasms, Radiation-Induced/etiology Neoplasms, Radiation-Induced/epidemiology Pacemaker, Artificial Radiation* Syndrome Telephone* PMID: 10965528 |
| Santini R 2001-04 mw ph PMID11367556 | 1: Pathol Biol (Paris) 2001 Apr;49(3):222-6 [Symptoms reported by mobile cellular telephone users] [Article in French] Santini R, Seigne M, Bonhomme-Faivre L, Bouffet S, Defrasne E, Sage M. Institut national des sciences appliquees, laboratoire de biochimie-pharmacologie, batiment 406, 20, avenue Albert Einstein, 69621 Villeurbanne, France. A survey study, using questionnaire, was conducted in 161 students and workers in a French engineering school on symptoms experienced during use of digital cellular phones. A significant increase in concentration difficulty ($p < 0.05$) was reported by users of 1800-MHz (DCS) cellular phones compared to 900-MHz (GSM) phone users. In users of cellular phones, women significantly ($p < 0.05$) complained more often of sleep disturbance than men. This sex difference for sleep complaint is not observed between women and men non-users of cellular phone. The use of both cellular phones and VDT significantly ($p < 0.05$) increased concentration difficulty. Digital cellular phone users also significantly ($p < 0.05$) more often complained of discomfort, warmth, and picking on the ear during phone conversation in relation with calling duration per day and number of calls per day. The complaint of warmth on the ear might be a signal to users for stopping the call. MeSH Terms: Academies and Institutes Adult Comparative Study Computer Terminals Confusion/etiology* Confusion/epidemiology Ear, External Engineering English Abstract Female France Human Incidence Male Microwaves/adverse effects* Paresthesia/etiology* Paresthesia/epidemiology Questionnaires Sex Factors Sleep Disorders/etiology* Sleep Disorders/epidemiology Students/psychology Telephone*/instrumentation PMID: 11367556 |
| Stang A 2001-01 mw rf ph can PMID11138823 | 1: Epidemiology 2001 Jan;12(1):7-12 Comment in: Epidemiology. 2001 Jan;12(1):1-4. The possible role of radiofrequency radiation in the development of uveal melanoma. Stang A, Anastassiou G, Ahrens W, Bromen K, Bornfeld N, Jockel KH. Institute for Medical Informatics, Biometry and Epidemiology, Medical Faculty, University of Essen, Germany. There are few epidemiologic studies dealing with electromagnetic radiation and uveal melanoma. The majority of these studies are exploratory and are based on job and industry titles only. We conducted a hospital-based and population-based case-control study of uveal melanoma and occupational exposures to different sources of electromagnetic radiation, including radiofrequency radiation. We then pooled these results. We interviewed a total of 118 female and male cases with uveal melanoma and 475 controls matching on sex, age, and study regions. Exposure to radiofrequency-transmitting devices was rated as (a) no radiofrequency radiation exposure, (b) possible exposure to mobile phones, or (c) probable/certain exposure to mobile phones. Exposures were rated independently by two of the authors who did not know case or control status. We used conditional logistic regression to calculate odds ratios (ORs) and 95% confidence intervals (95% CIs). We found an elevated risk for exposure to radiofrequency-transmitting devices (exposure to radio sets, OR = 3.0, 95% CI = 1.4-6.3; probable/certain exposure to mobile phones, OR = 4.2, 95% CI = 1.2-14.5). Other sources of electromagnetic radiation such as high-voltage lines, electrical machines, complex electrical environments, visual display terminals, or radar units were not associated with uveal melanoma. This is the first study describing an association between radiofrequency radiation exposure and uveal melanoma. Several methodologic limitations prevent our results from providing clear evidence on the hypothesized association. MeSH Terms: |

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| | <p>Adolescence Adult Aged Case-Control Studies Electromagnetic Fields/adverse effects* Female Germany/epidemiology Human Male Melanoma/etiology* Melanoma/epidemiology Middle Age Neoplasms, Radiation-Induced/etiology* Neoplasms, Radiation-Induced/epidemiology Occupational Diseases/etiology* Occupational Diseases/epidemiology Occupational Exposure/adverse effects* Risk Factors Support, Non-U.S. Gov't Uveal Neoplasms/etiology* Uveal Neoplasms/epidemiology PMID: 11138823</p> |
| <p>Szmigielski S 1996-02 mw can PMID8717316</p> | <p>1: Sci Total Environ 1996 Feb 2;180(1):9-17 Cancer morbidity in subjects occupationally exposed to high frequency (radiofrequency and microwave) electromagnetic radiation. Szmigielski S. Department of Biological Effect of Non-Ionizing Radiations, Center for Radiobiology and Radiation Safety at the Military Institute of Hygiene and Epidemiology, Warsaw, Poland. Cancer morbidity was registered in the whole population of military career personnel in Poland during a period of 15 years (1971-1985). Subjects exposed occupationally to radiofrequencies (RF) and microwaves (MW) were selected from the population on the basis of their service records and documented exposures at service posts. The population size varied slightly from year to year with a mean count of about 128,000 persons each year; each year about 3700 of them (2.98%) were considered as occupationally exposed to RF/MW. All subjects (exposed and non-exposed to RF/MW) were divided into age groups (20-29, 30-39, 40-49 and 50-59). All newly registered cases of cancer were divided into 12 types based on localisation of the malignancy; for neoplasms of the haemopoietic system and lymphatic organs an additional analysis based on diagnosis was performed. Morbidity rates (per 100,000 subjects annually) were calculated for all of the above localisations and types of malignancies both for the whole population and for the age groups. The mean value of 15 annual rates during 1971-1985 represented the respective morbidity rate for the whole period. Morbidity rates in the non-exposed groups of personnel were used as 'expected' (E) rates for the exposed subjects, while the real morbidity rates counted in the RF/MW-exposed personnel served as 'observed' (O) rates. This allowed the calculation of the observed/expected ratio (OER) representing the odds ratio for the exposed groups. The cancer morbidity rate for RF/MW-exposed personnel for all age groups (20-59 years) reached 119.1 per 100,000 annually (57.6 in non-exposed) with an OER of 2.07, significant at P < 0.05. The difference between observed and expected values results from higher morbidity rates due to neoplasms of the alimentary tract (OER = 3.19-3.24), brain tumours (OER = 1.91) and malignancies of the haemopoietic system and lymphatic organs (OER = 6.31). Among malignancies of the haemopoietic/lymphatic systems, the largest differences in morbidity rates between exposed and non-exposed personnel were found for chronic myelocytic leukaemia (OER = 13.9), acute myeloblastic leukaemia (OER = 8.62) and non-Hodgkin lymphomas (OER = 5.82). MeSH Terms: Adult Electromagnetic Fields* Human Incidence Microwaves* Middle Age Military Personnel Neoplasms, Radiation-Induced/epidemiology* Occupational Exposure* Poland/epidemiology Radio Waves* Support, Non-U.S. Gov't PMID: 8717316</p> |
| <p>Thornqvist S 1991-09 lfmf can PMID1911402</p> | <p>1: Br J Ind Med 1991 Sep;48(9):597-603 Comment in: Br J Ind Med. 1992 May;49(5):375. Incidence of leukaemia and brain tumours in some "electrical occupations". Tornqvist S, Knave B, Ahlbom A, Persson T. Department of Neuromedicine, National Institute of Occupational Health, Solna, Sweden. A 19 year follow up study was conducted to explore the association between occupations expected to be exposed to electromagnetic fields and the occurrence of leukaemia and brain tumours. Incidence of cancer between 1961-79 was calculated and the standardised morbidity ratio (SMR) with a 95% confidence interval (95% CI) was related to that of all Swedish working men. For all the selected "electrical occupations" the SMRs for total leukaemia and brain tumours were near unity. Increased risks were noted for all leukaemia among electrical/electronic engineers and technicians, (SMR 1.3; 95% CI 1.0-1.7) as well as in the sub-groups of telegraph/telephone (2.1; 1.1-3.6) and machine (2.6; 1.0-5.8) industries. Risk for chronic lymphoid leukaemia was increased in the same occupational category (1.7; 1.1-2.5) and in the sub-group of machine industry (4.8; 1.0-14.0), as well as for all linesmen (2.0; 1.0-3.5) and power linesmen (2.8; 1.1-5.7). Risk for acute myeloid leukaemia was increased among all miners (2.2; 1.0-4.1) and miners working in iron/ore mines (5.7; 2.1-12.4). Increased risk for all brain tumours (2.9; 1.2-5.9) and glioblastomas (3.4; 1.1-8.0) appeared among assemblers and repairmen in radio and TV industry. Raised risk for all brain tumours was seen for all welders (1.3; 1.0-1.7) and welders in iron/steel works (3.2; 1.0-7.4) and risk for glioblastomas was also increased for all welders (1.5; 1.1-2.1). No major changes in relative risk estimates were noted after the exclusion of persons who were over 65 at the time of diagnosis.(ABSTRACT TRUNCATED AT 250 WORDS) MeSH Terms: Adult Brain Neoplasms/etiology* Brain Neoplasms/epidemiology Electromagnetic Fields/adverse effects* Follow-Up Studies Human Leukemia/etiology*</p> |

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| | Leukemia/epidemiology Male Middle Age Occupational Diseases/etiology* Occupational Exposure* Support, Non-U.S. Gov't Sweden/epidemiology PMID: 1911402 |
| Tynes T 1996-03 rf can PMID8740732 | 1: Cancer Causes Control 1996 Mar;7(2):197-204 Incidence of breast cancer in Norwegian female radio and telegraph operators. Tynes T, Hannevik M, Andersen A, Vistnes AI, Haldorsen T. Cancer Registry of Norway, Oslo, Norway. Exposure to electromagnetic fields may cause breast cancer in women if it increases susceptibility to sex-hormone-related cancer by diminishing the pineal gland's production of melatonin. We have studied breast cancer incidence in female radio and telegraph operators with potential exposure to light at night, radio frequency (405 kHz-25 MHz), and, to some extent, extremely low frequency fields (50 Hz). We linked the Norwegian Telecom cohort of female radio and telegraph operators working at sea to the Cancer Registry of Norway to study incident cases of breast cancer. The cohort consisted of 2,619 women who were certified to work as radio and telegraph operators between 1920 and 1980. Cancer incidence was analyzed on the basis of the standardized incidence ratio (SIR), with the Norwegian female population as the comparison group. The incidence of all cancers was close to unity (SIR = 1.2). An excess risk was seen for breast cancer (SIR = 1.5). Analysis of a nested case-control study within the cohort showed an association between breast cancer in women aged 50+ years and shift work. In a model with adjustment for age, calendar year, and year of first birth, the rate ratio for breast cancer associated with being a radio and telegraph operator--in comparison with all Norwegian women born 1935 or later--analyzed with Poisson regression, was 1.5 after adjustment for fertility factors. These results support a possible association between work as a radio and telegraph operator and breast cancer. Future epidemiologic studies on breast cancer in women aged 50 and over, should address possible disturbances of chronobiological parameters by environmental factors. MeSH Terms: Adult Breast Neoplasms/epidemiology* Case-Control Studies Cohort Studies Electromagnetic Fields Female Human Incidence Middle Age Norway/epidemiology Occupational Diseases/epidemiology* Radio* Regression Analysis Risk Factors Time Factors PMID: 8740732 |
| Wilén J 2003-04 mw ph cns PMID12669297 | 1: Bioelectromagnetics 2003 Apr;24(3):152-9 Subjective symptoms among mobile phone users-A consequence of absorption of radiofrequency fields? Wilén J, Sandstrom M, Hansson Mild K. National Institute for Working Life, Umea, Sweden. In a previous epidemiological study, where we studied the prevalence of subjective symptoms among mobile phone (MP) users, we found as an interesting side finding that the prevalence of many of the subjective symptoms increased with increasing calling time and number of calls per day. In this extrapolative study, we have selected 2402 people from the epidemiological study who used any of the four most common GSM MP. We used the information about the prevalence of symptoms, calling time per day, and number of calls per day and combined it with measurements of the Specific Absorption Rate (SAR). We defined three volumes in the head and measured the maximum SAR averaged over a cube of 1 g tissue (SAR(1g)) in each volume. Two new exposure parameters Specific Absorption per Day (SAD) and Specific Absorption per Call (SAC) have been devised and are obtained as combinations of SAR, calling time per day, and number of calls per day, respectively. The results indicates that SAR values >0.5 W/kg may be an important factor for the prevalence of some of the symptoms, especially in combination with long calling times per day. Bioelectromagnetics 24:152-159, 2003. Copyright 2003 Wiley-Liss, Inc. PMID: 12669297 [PubMed - in process] |