

Source: UC Berkeley School of Public Health.

<https://www.saferemr.com/2014/06/joint-statement-on-pregnancy-and.html>

Tuesday, August 5, 2025

Pregnancy & Wireless Radiation Risks

More than 50 recent studies have found adverse effects from prenatal exposure to wireless radiation in humans and six other species

Radiofrequency Electromagnetic Field Emissions and Neurodevelopmental Outcomes in Infants: A Prospective Cohort Study

Setia M S, Natesan R, Samant P, et al. (July 10, 2025) Radiofrequency Electromagnetic Field Emissions and Neurodevelopmental Outcomes in Infants: A Prospective Cohort Study. Cureus 17(7): e87671. doi:10.7759/cureus.87671.

Abstract

Purpose It has been argued that children are particularly at risk of developing health effects due to the emitted radiofrequency electromagnetic fields (RF-EMF). We designed this cohort to measure the association between exposure to RF-EMF radiation and neurodevelopmental changes in neonates and infants.

Methods We present an analysis of 261 observations from a cohort of 105 neonates. The cohort was formed of pregnant women, and the neonates born to these women were followed for a period of one year. We assessed the level of radiation in the house using the Selective Radiation Meter 3006 (Narda Worldwide, Germany) and neurodevelopment using the Ages and Stages Questionnaire® (ASQ®)-3. We used random effects models for multiple observations in the same individual, and the main explanatory variable was household radiation levels (divided into tertiles as low/medium/high).

Results The median (interquartile range (IQR)) range of radiation in all the households was 8.66 (IQR: 1.58, 23.11) mW/m². It was 0.62 (IQR: 0.43, 1.58) mW/m² in the lowest tertile, 8.66 (IQR: 5.00, 10.78) mW/m² in the middle tertile, and 32.36 (IQR: 23.11, 45.60) mW/m² in the highest tertile (p=0.0001). The mean scores were significantly lower in the middle and higher tertiles of LOR for the gross motor, fine motor, and problem-solving domains. The odds of children classified as 'monitor/refer' was significantly higher in the 'high radiation group' compared with 'low radiation group' for the fine motor (adjusted odds ratio (aOR): 2.74, 95% CI: 1.10, 6.78; p=0.03) and problem-solving domains (aOR: 3.67, 95% CI: 1.41, 9.55; p=0.008). We also found that low birth weight babies were significantly more likely to be classified as 'monitor/refer' for fine motor (aOR: 4.19, 95% CI: 1.73, 10.14; p=0.001), and problem solving (aOR: 2.57, 95% CI: 1.08, 6.13; p=0.033) domains.

Conclusions Even after adjusting for low birth weight, we found that higher levels of radiation were associated with poorer outcomes for cognitive domains of development such as problem solving, and personal-social areas. Thus, there is a need to monitor the neuro-development of children in whom the RF-EMF radiations are expected to be higher (such as very close to cell phone towers, too many gadgets in the house).

Excerpts

"In this cohort study, we found that mean ASQ scores were, in general, lower in the highest radiation tertile for all five domains; and specifically, significantly lower for the gross motor, fine motor, and problem-solving domains. Poor development outcomes (such as monitor/refer) for the fine motor, problem-solving, and personal-social domains were associated with higher levels of radiation in the house. In addition, low birth weight was also significantly associated with poor development outcomes for fine motor and problem-solving. Finally, even though mean scores for the social-emotional domain were high in the higher radiation groups, the difference was not statistically significant."

"There are potential limitations in the present analysis. In this study, the focus was on the association between the levels of electromagnetic field radiation and neurodevelopmental outcomes in neonates and infants. Other studies have included prenatal cell phone use and exposure as the exposure variable; we did not include these in the present analysis. We also did not assess the parent-child interaction as another potential confounder. The EMF radiation in the house may not only be due to that from cell phone towers but also due to cordless phones, WiFi devices, and Bluetooth gadgets. Since we measured the radiation in the house, this would have included the EMF from all these. It is quite likely that a home far away from the tower may still have higher EMF radiation due to these gadgets. However, the measurement was only at baseline, and this may have led to some misclassification. As described earlier, some authors have not found an association between cell phone use, while others have found inconsistencies in the relationship. Most other authors have used other scales, such as the Bayley Scales of Infant Development or scales that were developed by the researcher. We have used the Ages and Stages Questionnaire, both for the developmental domain and the social-emotional domain. ASQ is useful for screening and not a diagnostic instrument. We also do not claim causality in these findings. These are interim results of the cohort, and we are still following the cohort. We intend to publish future results on the neurodevelopmental outcomes. These outcomes will include the Bayley Scales of Infant Development and the Stanford-Binet test for intelligence. We did not use any imputation methods for missing observations and just used the random effects models with available observations. Though we had enough power to detect the difference in scores, some of the events were few (particularly social-emotional and communication domains). Thus, we may be underpowered at this point of analysis for these outcomes. Nonetheless, actual measurement of RF-EMF radiation in the house (which represents the actual exposure levels), a cohort design, and the use of random effects logistic regression models are the potential strengths of the study. These models are useful for longitudinal data, and one additional advantage of random effects models is their use in longitudinal data when observations are present at different time points [42,43].

Conclusions

These preliminary findings are an important contribution to the literature on the association between RF-EMF radiation and neurodevelopment in neonates and infants. The results have to be interpreted taking into account the limitations that have been mentioned. We used random effects models, which account for both within-subject and between-subject correlation, and are useful for time-varying variables. These models are useful for longitudinal data where the outcomes may vary with each observation. Even after adjusting for low birth weight, we found that higher levels of radiation were associated with poorer outcomes for cognitive domains of development such as the problem-solving and personal-social areas.

Low birth weight was associated with poorer outcomes for the motor development domains (gross motor and fine motor). It is quite likely that obvious gross motor delays may be identified by parents and caregivers; however, cognitive development domains require specialist monitoring. Thus, there may be a need to consider monitoring of neurodevelopmental outcomes in children in whom RF-EMF radiations are expected to be higher (such as very close to cell phone towers and too many gadgets in the house)."

Open access: <https://www.cureus.com/articles/381425-radiofrequency-electromagnetic-field-emissions-and-neurodevelopmental-outcomes-in-infants-a-prospective-cohort-study#!/>

--

Electromagnetic fields exposure on fetal and childhood abnormalities: Systematic review and meta-analysis

Kashani ZA, Pakzad R, Fakari FR, Haghparast MS, Abdi F, Kiani Z, Talebi A, Haghgoo SM.
Electromagnetic fields exposure on fetal and childhood abnormalities: Systematic review and meta-analysis. Open Med (Wars). 2023 May 12;18(1):20230697. doi: 10.1515/med-2023-0697

Abstract

Today, in the modern world, people are often exposed to electromagnetic waves, which can have undesirable effects on cell components that lead to differentiation and abnormalities in cell proliferation, deoxyribonucleic acid (DNA) damage, chromosomal abnormalities, cancers, and birth defects. This study aimed to investigate the effect of electromagnetic waves on fetal and childhood abnormalities. PubMed, Scopus, Web of Science, ProQuest, Cochrane Library, and Google Scholar were searched on 1 January 2023. The Cochran's Q-test and I^2 statistics were applied to assess heterogeneity, a random-effects model was used to estimate the pooled odds ratio (OR), standardized mean difference (SMD), and mean difference for different outcomes, and a meta-regression method was utilized to investigate the factors affecting heterogeneity between studies. A total of 14 studies were included in the analysis, and the outcomes investigated were: change in gene expression, oxidant parameters, antioxidant parameters, and DNA damage parameters in the umbilical cord blood of the fetus and fetal developmental disorders, cancers, and childhood development disorders. Totally, the events of fetal and childhood abnormalities were more common in parents who have been exposed to EMFs compared to those who have not (SMD and 95% confidence interval [CI], 0.25 [0.15-0.35]; I^2 , 91%). Moreover, fetal developmental disorders (OR, 1.34; CI, 1.17-1.52; I^2 , 0%); cancer (OR, 1.14; CI, 1.05-1.23; I^2 , 60.1%); childhood development disorders (OR, 2.10; CI, 1.00-3.21; I^2 , 0%); changes in gene expression (mean difference [MD], 1.02; CI, 0.67-1.37; I^2 , 93%); oxidant parameters (MD, 0.94; CI, 0.70-1.18; I^2 , 61.3%); and DNA damage parameters (MD, 1.01; CI, 0.17-1.86; I^2 , 91.6%) in parents who have been exposed to EMFs were more than those in parents who have not. According to meta-regression, publication year has a significant effect on heterogeneity (coefficient: 0.033; 0.009-0.057). Maternal exposure to electromagnetic fields, especially in the first trimester of pregnancy, due to the high level of stem cells and their high sensitivity to this radiation, the biochemical parameters of the umbilical cord blood examined was shown increased oxidative stress reactions, changes in protein gene expression, DNA damage, and increased embryonic abnormalities. In addition, parental exposure to ionizing and non-ionizing radiation can lead to the enhancement of different cell-based cancers and developmental disorders such as speech problems in childhood.

Conclusions

Studies are associated with mothers' exposure to EMFs during pregnancy and non-ionizing radiation (RF and ELF-EMFs) with fetal complications such as significant enhancement of oxidant factors, decrease of antioxidant factors, and increase in DNA damage parameters, as well as changes in expression proteins in cord blood genes. On the other hand, close maternal exposure in prenatal and postnatal (residence or

occupational exposure) with EMFs of high voltages power lines more than 1 mG or 50 Hz with congenital anomalies (CNS defect, spina bifida) and fetal developmental disorders (such as reduced embryonic bud length) and neurodevelopmental disorders in childhood (e.g., speech problems in children) are associated. Moreover, parents' exposure to ionizing and non-ionizing radiation (X-ray, ELF-EMF, and RF examinations) before and after birth is also associated with enhancement of the risk of cancers (such as rhabdomyosarcoma, ALL, brain tumors, and neuroectoderm) in childhood and adolescence. However, due to the limitations of studies, such as inaccurate measurement of exposure to ELF-EMF (e.g., interviews based on participants' reminders) or inaccurate measure of the actual rate of exposure to EMF or case–control model of most studies, the effects of EMF on fetal and childhood abnormalities should be interpreted with caution. Considering the widespread exposure to non-ionizing radiation, a little enhancement of exposure to EMF could lead to unacceptable health consequences for future generations. Although the number of epidemiological studies examining the undesirable effects of EMF exposure in humans is limited, the findings of this study should prompt further research on this significant environmental danger for pregnant women.

Open access paper: <https://www.degruyter.com/document/doi/10.1515/med-2023-0697/html?lang=en>

--

Impacts of smartphone radiation on pregnancy: A systematic review

Imteyaz El Jarrah, Mohammad Rababa. Heliyon. Impacts of smartphone radiation on pregnancy: A systematic review. 2022 Feb;8(2):e08915. doi: 10.1016/j.heliyon.2022.e08915.

Abstract

Introduction: The COVID-19 pandemic has impacted all aspects of people's lives, with many tasks and services now being delivered online in the aim of reducing contact and preventing further transmission of the disease. This has resulted in the increase in the use of portable electronic devices (i.e., mobile phones, smartphones, laptops), which emit different frequencies of electromagnetic field (EMF) radiation. However, the evidence on the harmful impacts of EMF radiation exposure on the human body, particularly on the abdomen of the female body during pregnancy, is scarce. Further, the related studies in the literature have yet to be systematically reviewed. If unmanaged, the absorption of EMF radiation by the maternal abdomen during pregnancy is associated with serious birth and infant outcomes.

Purpose: This study aimed to systematically review the published studies on the direct effects of EMF radiation emitted from mobile phones on pregnancy, birth, and infant outcomes.

Methods: After a systematic search using the PRISMA guidelines, a total of 18 articles were retrieved from 5 databases. Studies which addressed the negative outcomes of EMF radiation exposure on mothers, adults, and children's health were included. The research articles were then sorted based on whether their findings were related to the impacts of EMF on physiological or pregnancy outcomes.

Results: The findings of this review showed that EMF radiation exposure is associated with hormonal, thermal, and cardiovascular changes among adults. However, the reviewed studies did not consider the impacts of EMF radiation exposure on pregnancy outcomes specifically, which makes it difficult to draw conclusions from this review. Only four of the reviewed studies were conducted among pregnant women. These studies reported that EMF radiation exposure during pregnancy is associated with miscarriages and fluctuations in the fetal temperature and heart rate variability, as well as infant anthropometric measures.

Conclusions: More research should be conducted to identify the specific impacts of EMF radiation exposure on pregnancy, birth, and infant outcomes. Healthcare providers and researchers are recommended to collaborate to improve public health through public education and updated organizational policies to limit these environmental risks by encouraging the use of safe technologies.

Conclusion

The current review found EMF radiation exposure to be linked to hormonal, thermal, and cardiovascular changes in adults. EMF radiation exposure has also been linked with miscarriages and alternations in fetal temperature, HRV, and infant anthropometric measurements. A thorough review of each of the selected studies revealed that further research is needed to find conclusive evidence regarding the impacts of EMF radiation exposure on maternal physiological status and pregnancy, birth, and infant outcomes. This gap in the literature needs to be addressed for the development of effective strategies for safe pregnancy. Follow-up studies conducted among pregnant women who use mobile phones during pregnancy are highly recommended. Healthcare providers need to take into consideration the potential maternal and fetal health status changes that are associated with mobile phone use. Fetal temperature, HRV, and anthropometric measures need to be assessed on a regular basis. Health care providers may use this evidence to encourage pregnant women to use their mobile phones in ways which decrease the risks of harm to the woman and the fetus. Women may set limits on their use, keep mobile phones away from their bodies, or use device with very low-frequency EMF radiation.

Open access paper: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8823972/>

--

Mobile Phone Use During Pregnancy: Which Association With Fetal Growth?

Nathalie Boileau, François Margueritte, Tristan Gauthier, Nedjma Boukeffa, Pierre-Marie Preux, Anaïs Labrunie, Yves Aubard. Mobile Phone Use During Pregnancy: Which Association With Fetal Growth? J Gynecol Obstet Hum Reprod. 2020 Jul 2;101852. doi: 10.1016/j.jogoh.2020.101852.

Abstract

Introduction: Few studies have investigated the effect of electromagnetic waves on the human fetus whereas nowadays mobile phone use is ubiquitous. The aim of this study was to evaluate the association between mobile phone use by pregnant women and fetal development during pregnancy in the general population.

Material and methods: Data came from the NéHaVi cohort ("prospective follow-up, from intrauterine development to the age of 18 years, for children born in Haute-Vienne"), a prospective, longitudinal, multicenter (three maternity units in Haute-Vienne) observational cohort focusing on children born between April 2014 and April 2017. Main objective was to investigate the association of mobile phone use on fetal growth. Univariate and multivariate models were generated adjusted for the socioprofessional category variables of the mother, and other variables likely to influence fetal growth.

Results: For the analysis 1,378 medical charts were considered from which 1,368 mothers (99.3%) used their mobile phones during pregnancy. Mean phone time was 29.8 minutes (range: 0.0 - 240.0 minutes) per day. After adjustment, newborns whose mothers used their mobile phones for more than 30 minutes/day were significantly more likely to have an AUDIPOG score $\leq$ 10th percentile than those whose mothers used their mobile phones for less than 5 minutes/day during pregnancy (aOR = 1.54 [1.03; 2.31], $p = 0.0374$). For women using their cell phones 5 to 15 min and 15 to 30 min, there wasn't a significant association with an AUDIPOG score $\leq$ 10th, respectively aOR = 0.98 [0.58; 1.65] and aOR = 1.68 [0.99; 2.82].

Conclusion: Using a mobile phone for calls for more than 30 minutes per day during pregnancy may have a negative impact on fetal growth. A prospective study should be performed to further evaluate this potential link.

<https://pubmed.ncbi.nlm.nih.gov/32623065/>

--

Maternal Cell Phone Use During Pregnancy Increased Preterm Births

Tsarna E, Reedijk M, Birks LE, Guxens M, Ballester F, Ha M, Jiménez-Zabala A, Kheifets L, Lertxundi A, Lim HR, Olsen J, Safont LG, Sudan M, Cardis E, Vrijheid M, Vrijkotte T, Huss A, Vermeulen R. Maternal Cell Phone Use During Pregnancy, Pregnancy Duration And Fetal Growth In Four Birth Cohorts. *Am J Epidemiol.* 2019 Jul 1;188(7):1270-1280. doi: 10.1093/aje/kwz092.

Abstract

Previous studies evaluating potential effects of prenatal exposure to radiofrequency fields from cell phones on birth outcomes are inconsistent. We explored if maternal cell phone use was associated with pregnancy duration and fetal growth.

We used information from 55,507 pregnant women and their children from Denmark (1996-2002; DNBC), the Netherlands (2003-2004; ABCD), Spain (2003-2008; INMA) and Korea (2006-2011; MOCEH). Based on self-reported number of cell phone calls per day, exposure was grouped as none, low (reference level), intermediate, and high. We examined pregnancy duration (gestational age at birth, preterm/postterm birth), fetal growth (birth weight ratio, small/large for gestational age), and birth weight, low and high birth weight, and meta-analyzed cohort specific estimates.

The intermediate exposure group had higher risk of giving birth at lower gestational age (Hazard Ratio=1.04, 95% CI 1.01, 1.07), and exposure-response relationships were found for shorter pregnancy duration ($P<0.001$) and preterm birth ($P=0.003$). We observed no association with fetal growth or birth weight. In conclusion, maternal cell phone use during pregnancy may be associated with shorter pregnancy duration and increased risk for preterm birth.

Results should be interpreted with caution, as they may reflect stress during pregnancy or other residual confounding, rather than direct effect of cell phone exposure.

<https://www.ncbi.nlm.nih.gov/pubmed/30995291>

Excerpts

Exposure to RF-EMF [radio frequency electromagnetic fields] during pregnancy could affect the growth and development of the fetus and the pregnancy duration either due to direct radiation of the fetus and the placenta, or indirectly as a result of altered maternal physiology ...

... During calling and texting abdominal exposure is low and modeling studies estimate that exposure levels of the human fetus are very low (9–12), although an experimental study on humans has shown that abdominal RF-EMF exposure may affect the placenta function (13). In addition, an association between RF-EMF exposure and thyroid dysfunction has been indicated in animal studies (14,15)....

... A cohort study from Turkey (N=500) retrospectively assessed cell phone use and reported shorter pregnancy duration and increased risk for preterm birth (16). In a cohort study from Iran (N=1,200), no association with birth weight was found (17). In a much larger sample from Norway (N=100,231), no association was found between cell phone use and low birth weight, preterm birth, or small for gestational age (SGA) (18)....

The mothers from DNBC and ABCD reported their frequency of cell phone calls during pregnancy 7 years postnatally. In INMA and MOCEH, similar questionnaires were given to the mothers during pregnancy. To be consistent with previous analyses within these cohorts (29), we classified exposure in four categories (none, low, intermediate, high), based on available information regarding daily frequency of cell phone calls during pregnancy (Table 2)....

Table 2 footnote: In DNBC, ABCD, and INMA cohorts, none exposure corresponds to no calls per day,

low exposure to 0-1 calls per day, intermediate exposure to 2-3 calls per day, and high exposure to 4 or more calls per day. In MOCEH cohort, none exposure corresponds to no calls per day, low exposure to 0-2 calls per day, intermediate exposure to 3-5 calls per day, and high exposure to 6 or more calls per day.

... the OR [odds ratio] for preterm birth gained statistical significance in the highly exposed group within the cohorts with prospective exposure assessment (OR=2.03, 95% CI 1.22, 3.39) (Web Tables 8 and 10). In the analysis with binary exposure, we observed an increased risk of giving birth at lower gestational age (HR=1.04, 95% CI 1.02, 1.07), and increased odds for preterm birth (OR=1.16, 95% CI 1.05, 1.29) for the mothers that used their cell phone more often during pregnancy (Web Tables 8 and 11). The estimates for all the other outcomes were not different from unity (Web Table 11)....

In our study, we observed an association of maternal cell phone use during pregnancy with pregnancy duration, but not with fetal growth. Since fetal exposure is very low during cell phone calls (9–12), for the interpretation of these results we considered the potential effect of RF-EMF on maternal head and neck structures, as well as indirect pathways related to the use of cell phones rather than the radiation per se. Animal studies have suggested that RF-EMF exposure may result in minor thyroid gland dysfunction (14,15). Additionally, higher preconception thyroid stimulating hormone (TSH) levels and subclinical hypothyroidism during pregnancy have been associated with higher risk for miscarriage and preterm birth (46–49). Thus, the increased risk for giving birth preterm among heavier users of cell phones that we observed could be mediated by mild thyroid dysfunction. However, the association of RF-EMF exposure from cell phone use with thyroid function is not established, and large-scale epidemiological studies on the topic are lacking. Increased oxidative stress has been also considered (50). However, it is not clear whether the elevation of radical oxygen species resulting from local RF-EMF exposure is of such an extent in humans that it could trigger systematic responses affecting the birth outcomes. Causal pathways involving local radiation of parts of the human body other than maternal head and neck structures were not considered, as this exposure would not be reflected in the number of cell phone calls per day....

The exposure variable was based only on the number of cell phone calls per day; duration of calling was not taken into account, as it was available only in MOCEH. Furthermore, the number of cell phone calls per day during pregnancy was self-reported in all cohorts, and was validated only in MOCEH (59). Thus, misclassification of exposure should have attenuated the observed association, under our assumption that misclassification was predominantly non-differential (60–62). We expect that misclassification was much larger in the older cohorts (DNBC and ABCD), as the number of cell phone calls per day was reported seven years postnatal. Therefore, the estimates in DNBC and ABCD cohorts should be more biased towards the null in comparison to INMA and MOCEH cohorts....

In conclusion, in our study more frequent maternal cell phone use during pregnancy was associated with shorter pregnancy duration, resulting in increased risk for preterm birth. No association with fetal growth and birth weight was observed. Study results make strong effects unlikely and should be interpreted with caution, as they may reflect an effect of stress during pregnancy or other residual confounding, rather than a direct effect of RF-EMF exposure.

My note: See [Thyroid Cancer and Mobile Phone Use](#) for studies that examine the effects of cell phone use on the thyroid gland.

--

Prenatal maternal cell phone use linked to lower child cognition at 5 years of age: 3 birth cohorts

Sudan M, Birks LE, Aurrekoetxea JJ, Ferrero A, Gallastegi M, Guxens M, Ha M, Lim H, Olsen J, González-Safont L, Vrijheid M, Kheifets L. Maternal cell phone use during pregnancy and child cognition at age 5 years in 3 birth cohorts. *Environ Int.* 2018 Nov;120:155-162. doi: 10.1016/j.envint.2018.07.043.

Highlights

- Prenatal maternal cell phone use may be related to child cognition.
- Cognition scores are slightly lower in relation to higher frequency use, although imprecise.

- The causal mechanisms are unknown at this time.
- The association is likely affected by social and behavioral factors.

Abstract

BACKGROUND: There have been few studies of children's cognitive development in relation to mothers' cell phone use, and most were limited to outcomes at age 3 years or younger. We examined the relationship between maternal cell phone use during pregnancy and cognitive performance in 5-year old children.

METHODS: This study included data from 3 birth cohorts: the Danish National Birth Cohort (DNBC) (n = 1209), Spanish Environment and Childhood Project (INMA) (n = 1383), and Korean Mothers and Children's Environment Health Study (MOCEH) (n = 497). All cohorts collected information about maternal cell phone use during pregnancy and cognitive performance in children at age 5. We performed linear regression to compute mean differences (MD) and 95% confidence intervals (CI) in children's general, verbal, and non-verbal cognition scores comparing frequency of maternal prenatal cell phone use with adjustments for numerous potential confounding factors. Models were computed separately for each cohort and using pooled data in meta-analysis.

RESULTS: No associations were detected between frequency of prenatal cell phone use and children's cognition scores. Scores tended to be lower in the highest frequency of use category; MD (95% CI) in general cognition scores were 0.78 (-0.76, 2.33) for none, 0.11 (-0.81, 1.03) for medium, and -0.41 (-1.54, 0.73) for high compared to low frequency of use. This pattern was seen across all cognitive dimensions, but the results were imprecise overall.

CONCLUSION: We observed patterns of lower mean cognition scores among children in relation to high frequency maternal prenatal cell phone use. The causal nature and mechanism of this relationship remain unknown.

<https://www.ncbi.nlm.nih.gov/pubmed/30096609>

Excerpt

In this investigation of maternal cell phone use during pregnancy and cognition in children, we observed a pattern of slightly lower mean cognition scores among children at age 5 years in relation to high frequency maternal prenatal cell phone use in pooled data from three different birth cohorts. Patterns were consistent across cognitive dimensions, but the results were imprecise. We cannot conclude that our results reflect an effect of RF from cell phones, nor do our results indicate that maternal cell phone use directly influences child cognition as we still lack a known mechanism for how cell phone exposure may impact cognitive function. Although the magnitude of the mean differences in cognition scores that we observed were slight, and 1- or 2-point differences in scores are unlikely to have a considerable impact on individuals, there may be considerable costs to society associated with a negative shift of population IQ, especially if it is due to a very common exposure (Trasande et al., 2005). Thus, with the ubiquity of cell phone use among parents and children alike, it is clearly important to continue investigations into the possible health and cognitive effects of this exposure, with more studies examining associations related to frequency and duration of cell phone use and additional specific exposure parameters.

--

Effect of radiofrequency radiation on reproductive health (Review)

Singh R, Nath R, Mathur AK, Sharma RS. Effect of radiofrequency radiation on reproductive health. Indian J Med Res. 2018 Dec; 148(Suppl 1): S92–S99. doi: 10.4103/ijmr.IJMR_1056_18.

Abstract

The development of cellular phone system has greatly increased the extent and magnitude of radiofrequency radiation (RFR) exposure. The RFR emitted from mobile phone and mobile phone base stations exerts thermal and non-thermal effects. The short-term and long-term exposure to RFR may have adverse effect on humans as well as animals. Most laboratory studies have indicated a direct link between exposure to RFR and adverse biological effects. Several in vitro studies have reported that RFR induces various types of cancer and DNA or chromosomal damage. On the other hand, some animal studies have not reported adverse effects of this radiation. The present review summarizes information available on the possible effects of RFR on the reproductive health.

Open access paper: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6469375/>

--

Neurodevelopment for first 3 years following prenatal mobile phone use and lead exposure

Choi K, Ha M, Ha H, Park H, Kim Y, Hong Y, et al. Neurodevelopment for the first three years following prenatal mobile phone use, radio frequency radiation and lead exposure. *Environmental Research*, 156:810-817, July 2017.

Highlights

- RFR exposure was measured by mobile phone use questionnaire and 24-h personal exposure meter among pregnant women.
- Child neurodevelopment was assessed by trained examiners at 6, 12, 24, and 36 months of age.
- Associations were not observed between prenatal exposure to RFR and child neurodevelopment during the first three years.
- A potential combined effect of prenatal exposure to lead and mobile phone use was suggested.

Abstract

Background Studies examining prenatal exposure to mobile phone use and its effect on child neurodevelopment show different results, according to child's developmental stages.

Objectives To examine neurodevelopment in children up to 36 months of age, following prenatal mobile phone use and radiofrequency radiation (RFR) exposure, in relation to prenatal lead exposure.

Methods We analyzed 1198 mother-child pairs from a prospective cohort study (the Mothers and Children's Environmental Health Study). Questionnaires were provided to pregnant women at ≤20 weeks of gestation to assess mobile phone call frequency and duration. A personal exposure meter (PEM) was used to measure RFR exposure for 24 h in 210 pregnant women. Maternal blood lead level (BLL) was measured during pregnancy. Child neurodevelopment was assessed using the Korean version of the Bayley Scales of Infant Development-Revised at 6, 12, 24, and 36 months of age. Logistic regression analysis applied to groups classified by trajectory analysis showing neurodevelopmental patterns over time.

Results The psychomotor development index (PDI) and the mental development index (MDI) at 6, 12, 24, and 36 months of age were not significantly associated with maternal mobile phone use during pregnancy. However, among children exposed to high maternal BLL in utero, there was a significantly increased risk of having a low PDI up to 36 months of age, in relation to an increasing average calling time (p-trend=0.008). There was also a risk of having decreasing MDI up to 36 months of age, in relation to an increasing average calling time or frequency during pregnancy (p-trend=0.05 and 0.007 for time and frequency, respectively). There was no significant association between child neurodevelopment and prenatal RFR exposure measured by PEM in all subjects or in groups stratified by maternal BLL during pregnancy.

Conclusions We found no association between prenatal exposure to RFR and child neurodevelopment

during the first three years of life; however, a potential combined effect of prenatal exposure to lead and mobile phone use was suggested.

<https://www.ncbi.nlm.nih.gov/pubmed/28511138>

--

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

Birks L, Guxens M, Papadopoulou E, Alexander, Ballester F, Estarlich M et al. Maternal cell phone use during pregnancy and child behavioral problems in five birth cohorts. *Environ Int.* 2017 Jul;104:122-131. doi: 10.1016/j.envint.2017.03.024.

"This is the largest study to date to evaluate these associations and to show mostly consistent results across cohorts with retrospectively and prospectively assessed maternal cell phone use."

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.
- Analysis adjusted for many confounders, but associations cannot be judged causal.
- Future research should adjust for parenting style, maternal hyperactivity, and more.

Abstract

Introduction Previous studies have reported associations between prenatal cell phone use and child behavioral problems, but findings have been inconsistent and based on retrospective assessment of cell phone use. This study aimed to assess this association in a multi-national analysis, using data from three cohorts with prospective data on prenatal cell phone use, together with previously published data from two cohorts with retrospectively collected cell phone use data.

Methods We used individual participant data from 83,884 mother-child pairs in the five cohorts from Denmark (1996–2002), Korea (2006–2011), the Netherlands (2003–2004), Norway (2004–2008), and Spain (2003–2008). We categorized cell phone use into none, low, medium, and high, based on frequency of calls during pregnancy reported by the mothers. Child behavioral problems (reported by mothers using the Strengths and Difficulties Questionnaire or Child Behavior Checklist) were classified in the borderline/clinical and clinical ranges using validated cut-offs in children aged 5–7 years. Cohort specific risk estimates were meta-analyzed.

Results Overall, 38.8% of mothers, mostly from the Danish cohort, reported no cell phone use during pregnancy and these mothers were less likely to have a child with overall behavioral, hyperactivity/inattention or emotional problems. Evidence for a trend of increasing risk of child behavioral problems through the maternal cell phone use categories was observed for hyperactivity/inattention problems (OR for problems in the clinical range: 1.11, 95% CI 1.01, 1.22; 1.28, 95% CI 1.12, 1.48, among children of medium and high users, respectively). This association was fairly consistent across cohorts and between cohorts with retrospectively and prospectively collected cell phone use data.

Conclusions Maternal cell phone use during pregnancy may be associated with an increased risk for behavioral problems, particularly hyperactivity/inattention problems, in the offspring. The interpretation of these results is unclear as uncontrolled confounding may influence both maternal cell phone use and child behavioral problems.

Open access paper: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5506372/>

--

A review on electromagnetic fields and the reproductive system

Asghari A, Khaki AA, Rajabzadeh A, Khaki A. A review on electromagnetic fields (EMFs) and the reproductive system. Electron Physician. 2016 Jul 25;8(7):2655-62. doi: 10.19082/2655.

Abstract

Environmental factors, such as electromagnetic waves, induce biological and genetic effects. One of the most important physiological systems involved with electromagnetic fields (EMFs) is the genital system. This paper reviews the effects of EMFs on human reproductive organs, female animals, fetus development and the importance of two types of natural antioxidants, i.e., vitamin E and fennel. The studies presented in this review referred to the effects of different exposures to EMFs on the reproductive system, and we tried to show the role of natural antioxidants in reducing the effects of the exposures. Many studies have been done on the effects of ionizing and non-ionizing electromagnetic waves on the cell line of spermatogenesis, sexual hormones, and the structure of the testes. Also, about the hormonal cycle, folliculogenesis and female infertility related to EMF have been given more consideration. In particular, attention is directed to pregnant women due to the importance of their fetuses. However, in addition to the studies conducted on animals, further epidemiological research should be conducted.

Conclusions

Many studies have shown that electromagnetic fields can have destructive effects on sex hormones, gonadal function, fetal development, and pregnancy. So people must be aware of the negative effects of EMFs. Although the impact of the waves varied at different frequencies, it is better to stay as far away as possible from their origin because of the risks associated with exposures to these waves. In addition, people can use natural antioxidants to help reduce the effects of these waves.

Open Access Paper: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5014506/>

--

Recent studies that found adverse effects from prenatal exposure to wireless radiation (Updated: July 30, 2024)

Humans

behavioral problems: <https://www.ncbi.nlm.nih.gov/pubmed/28392066>
behavioral problems: <http://www.ncbi.nlm.nih.gov/pubmed/21138897>
behavioral problems (lead interaction): <https://www.ncbi.nlm.nih.gov/pubmed/23555766>
cognitive development: <https://www.ncbi.nlm.nih.gov/pubmed/30096609>
fetal growth: <https://pubmed.ncbi.nlm.nih.gov/32623065/>
fetal growth: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10921072/>
headaches: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3674098/pdf/nihms470908.pdf>
hearing loss: <http://www.ncbi.nlm.nih.gov/pubmed/23574412>
miscarriage: <http://bit.ly/1lwye5z>
neurodevelopment (interaction w/ lead exposure): <https://www.ncbi.nlm.nih.gov/pubmed/28511138>
preterm birth: <http://www.ncbi.nlm.nih.gov/pubmed/23905441>
preterm birth: <https://www.ncbi.nlm.nih.gov/pubmed/30995291>
spontaneous abortion: <http://www.ncbi.nlm.nih.gov/pubmed/25937931>
spontaneous abortion: <http://www.ncbi.nlm.nih.gov/pubmed/25877464>

Rats

blood, brain & behavior: <https://www.ncbi.nlm.nih.gov/pubmed/28288806>
bone & muscle tissue: <http://www.ncbi.nlm.nih.gov/pubmed/26959616>
brain: <https://pubmed.ncbi.nlm.nih.gov/32476377/>
brain: <http://www.ncbi.nlm.nih.gov/pubmed/24604340>
brain: <http://www.ncbi.nlm.nih.gov/pubmed/23906636>
brain: <http://www.ncbi.nlm.nih.gov/pubmed/23935717>
brain: <http://www.ncbi.nlm.nih.gov/pubmed/22676902>
brain: <http://www.ncbi.nlm.nih.gov/pubmed/27544572> (DECT cordless phone)
brain: <https://pubmed.ncbi.nlm.nih.gov/32476377/>
brain: <https://www.frontiersin.org/articles/10.3389/fnagi.2020.00162/full>
brain: <https://pubmed.ncbi.nlm.nih.gov/36374647/>
brain & behavior: <https://www.ncbi.nlm.nih.gov/pubmed/31927574>
brain & behavior: <https://www.nature.com/articles/s41598-024-68103-5>
brain & liver: <http://www.ncbi.nlm.nih.gov/pubmed/24580725>
cochlea: <http://www.ncbi.nlm.nih.gov/pubmed/24784924>
heart: <https://pubmed.ncbi.nlm.nih.gov/36383165/>
kidney: <http://www.ncbi.nlm.nih.gov/pubmed/25084839>
kidney: <http://www.ncbi.nlm.nih.gov/pubmed/26905323>
liver: <http://www.ncbi.nlm.nih.gov/pubmed/26084117>
liver: <http://www.ncbi.nlm.nih.gov/pubmed/27427155>
liver: <https://www.ncbi.nlm.nih.gov/pubmed/31801129>
liver: <https://actavet.vfu.cz/90/3/0315/>
low birth weight: <https://www.ncbi.nlm.nih.gov/pubmed/30243215> (NTP study)
neurodevelopment: <https://www.ncbi.nlm.nih.gov/pubmed/28458069>
neurodevelopment: <https://www.ncbi.nlm.nih.gov/pubmed/29397508>
neurodevelopment: <https://pubmed.ncbi.nlm.nih.gov/35112244/>
ovarian reserve: <https://www.ncbi.nlm.nih.gov/pubmed/31820670>
testes: <http://www.ncbi.nlm.nih.gov/pubmed/24095929>
testes: <https://pubmed.ncbi.nlm.nih.gov/34854072/>

Mice

behavior: <https://www.ncbi.nlm.nih.gov/pubmed/25359903>
brain: <https://www.ncbi.nlm.nih.gov/pubmed/27787231>
brain & behavior: <http://www.ncbi.nlm.nih.gov/pubmed/22428084> (Yale study)
cerebellum, hippocampus, heart, kidney & liver: <https://www.ncbi.nlm.nih.gov/pubmed/28434276>

Chicks

brain & behavior: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4902983/>
cardiovascular: [https://www.isisn.org/BR17\(1\)2020/383-398-17\(1\)2020BR20-34.pdf](https://www.isisn.org/BR17(1)2020/383-398-17(1)2020BR20-34.pdf)
kidneys: <https://doi.org/10.7860/JCDR/2022/58391.16862>

Rabbits

blood: <http://www.ncbi.nlm.nih.gov/pubmed/23526187>
metabolic activity: <https://pubmed.ncbi.nlm.nih.gov/35904122/>

Frogs

behavior: <http://www.ncbi.nlm.nih.gov/pubmed/27017260>

Zebrafish

sensorimotor function: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0235869>

--

Feb 9, 2016

French cell phone manufacturer warns pregnant women and teens about cell phone radiation

The French phone manufacturer WIKO states in their manual for the Pulp 4G smartphone (pp. 21-22):

"The maximum SAR value tested on this device when used in its normal position at the ear is 0.114 W/kg and 0.387 W/kg when used close to the body, at a minimum distance of 1.5 cm. It complies with the rules on exposure to radio frequencies when used in its normal position at the ear or at a minimum distance of 1.5 cm from the body. The device uses a high-quality network connection for transmitting files, data and messages. On occasion, the transmission of files or messages may be delayed until the connection is available. When this is the case, be sure to follow the instructions regarding the separation distance for establishing the transmission. If you use a case, belt-clip or holder for carrying the phone, it must not contain any metal and should be kept at a minimum distance of 1.5 cm from your body.

*The SAR limit for mobile devices is 2.0 watts / kilogram (W/kg) averaged over ten grams of body tissue. SAR values may vary according to the standards for reporting information that are in force in different countries. [My note: This standard is used in France and many other countries. In the U.S. the limit is 1.6 watts / kilogram averaged over one gram of body tissue.]

Tips for Reducing Exposure Levels

We recommend that you use your phone in good reception conditions in order to reduce the amount of radiation received. It is advisable to limit the amount of time you use the phone in underground car parks and when travelling by car or train, etc.

Reception conditions are indicated by the bars that are displayed on your phone: the more bars there are, the better the reception quality.

We recommend that you use the hands-free kit to reduce exposure to radiation.

To reduce the adverse effects of prolonged radiation exposure, we advise teenagers to hold the phone away from their lower abdomen, and that pregnant women hold the phone at a distance from their stomach."<http://data.wikomobile.com/documents/fichiers/f404d5a6f9dbd799184f05010cac9cd2.pdf#page=21>

--

July 1, 2015

Doctors Caution Pregnant Women About Wireless Radiation Health Risks

Over one hundred medical doctors and scientific experts from around the world agree: the risks of exposure to RF radiation from wireless devices for pregnant women and their unborn children are real, and women have a Right To Know.

NEW YORK, July 1, 2015 /PRNewswire/ -- More than one hundred medical doctors, scientists and public

health experts from around the world have signed a [Joint Statement](#) advising pregnant women to take simple precautions to protect themselves and their babies from wireless radiation. The Statement is part of a national right-to-know campaign called the [BabySafe Project](#) created by two non-profit organizations to inform pregnant women about the issue.

"The wireless world may be convenient, but it's not without risks," says Patricia Wood, Executive Director of Grassroots Environmental Education and co-creator of the BabySafe Project. "When more than one hundred of the world's leading medical doctors and researchers on wireless radiation say we have enough evidence for women to take protective action, we think women should know about it."

The project is based on recent scientific studies suggesting that radiation from wireless devices is capable of interfering with the tiny electrical impulses that help synapses connect in a developing brain. Researchers at Yale University have been able to demonstrate that the brains of laboratory mice exposed to pulsed radio frequency radiation *in utero* were wired differently from those of the mice who were not exposed, resulting in behavioral differences that include poorer memory and symptoms that resemble ADHD in children.

The [Yale study](#) builds on more than twenty years of research and hundreds of independent, peer-reviewed studies showing that exposure to radiation from wireless devices can have non-thermal, biological effects on humans, including DNA strand breaks and other impacts not previously known.

The authors of many of those studies are among those calling for precautions.

"The fetus is perhaps the most vulnerable to these types of insults, when the brain is just forming, when all of the organ systems are just beginning to develop," says Dr. Hugh Taylor, Chief of Obstetrics and Gynecology, Yale-New Haven Hospital, Professor of Women's Health at Yale University, and lead author of the study. "There's essentially no downside to being cautious and protecting your baby. Why not do it?"

SOURCE Grassroots Environmental Education

<http://bit.ly/1GMY4Nk>

--

June 3, 2014

The following joint statement on pregnancy and wireless radiation is part of the Baby Safe Project, a new public awareness initiative designed to inform women about the links between pregnancy and wireless radiation. The statement was signed by 44 physicians and scientists from 13 nations, and by 13 educators who have studied wireless radiation health effects.

The project is a joint initiative of two environmental health non-profit organizations: [Grassroots Environmental Education](#) and [Environmental Health Trust](#).

A video of the press conference that launched the Baby Safe Project and supplementary resources are available at <http://bit.ly/1kqJUur/>.

Dr. Hugh Taylor from the Yale University School of Medicine, Dr. Devra Davis from the Environmental Health Trust, and Dr. Maya Shetreat-Klein, a pediatric neurologist who treats autistic children, made presentations at the press conference and answered questions from journalists.

Dr. Taylor discussed his peer-reviewed, experimental research on pregnant mice that were exposed to cell phone radiation. In his study prenatal exposure to cell phone radiation resulted in decreased memory and increased hyperactivity in the offspring. A dose-response relationship was observed between the amount of fetal exposure to cell phone radiation and altered brain activity in the offspring. Dr. Taylor recommends that pregnant women limit their exposure to cell phone radiation.

Dr. Davis discussed the history of tobacco and asbestos in the U.S. to argue for a precautionary approach to reducing risks from "possibly carcinogenic" environmental exposures like wireless radiation (as determined by the World Health Organization). She summarized peer-reviewed, experimental research on prenatal exposure to microwave radiation conducted by Dr. Nesrin Seyhan which found DNA damage in mice and by Dr. Suleyman Kaplan which found damage to brain cells in the hippocampus as well as adverse behavioral effects in the offspring. Dr. Davis provided recommendations on how to reduce exposure to cell phone and Wi-Fi radiation.

Dr. Shetreat-Klein discussed peer-reviewed observational research that found prenatal exposure to wireless radiation associated with adverse behavioral changes in children. She advises pregnant women to keep cell phones away from their bodies.

In response to audience questions, Dr. Davis discussed the need for research funding. She mentioned that the Environmental Health Trust and Dr. Joel Moskowitz at Berkeley are calling for an annual, one dollar fee per cell phone to be devoted to training and research on wireless radiation and health. Dr. Taylor reported that his patients appreciate receiving precautionary information regarding the need to reduce exposure to wireless radiation during pregnancy. Dr. Davis discussed recommendations from the U.S. General Accountability Office and the American Academy of Pediatrics that call on the FCC to test cell phones in a realistic manner. Finally, Dr. Davis discussed the potential product liability faced by the cell phone industry due to adverse health impacts, an issue which she addressed in her book on cell phone radiation, ***Disconnect***.

Joint Statement on Pregnancy and Wireless Radiation

We join together as physicians, scientists and educators to express our concern about the risk that wireless radiation poses to pregnancy and to urge pregnant women to limit their exposures.

We recognize that the exquisitely delicate systems that direct the development of human life are vulnerable to environmental insults, and that even minute exposures during critical windows of development may have serious and life-long consequences.

We know that the scientific process demands a thorough and exhaustive examination of the possible impact of wireless radiation on health; however, we believe substantial evidence of risk, rather than absolute proof of harm, must be the trigger for action to protect public health.

We call on the research community to conduct more studies to identify the mechanisms by which a fetus could be affected by wireless radiation exposures. We call on our elected leaders to support such research and to advance policies and regulations that limit exposures for pregnant women. We call on industry to implement and explore technologies and designs that will reduce radiation exposures until such research is carried out.

We affirm our role as health and science professionals to inform the public about the potential dangers associated with early-life exposures to wireless radiation, and invite all professionals engaged in obstetric, pediatric, and environmental health advocacy to join us in our quest to ensure the safety and health of future generations.

Signatories (Affiliations listed for identification purposes only)

Mikko Ahonen, PhD, University of Tampere, Finland

Jennifer Armstrong, MD, Ottawa Environmental Health

Martin Blank, PhD, Associate Professor of Physiology and Cellular Biophysics, Columbia University

David Brown, PhD, Public Health Toxicologist, Environment and Human Health, Inc.

Lois Brustman, MD, Maternal-Fetal Medicine Specialist, St. Luke's - Roosevelt Hospital Center

Sheila Bushkin-Bedient, MD, Concerned Health Professionals of New York

David Carpenter, MD, School of Public Health, University at Albany

Richard Clapp, DSc, MPH, Professor Emeritus of Environmental Health, Boston University

Devra Davis, PhD, MPH, Visiting Scholar, University of California at Berkeley

Alvaro Augusto de Salles, PhD, Federal University of Rio Grande do Sul, Brazil

Larysa Dyrszka, MD, Pediatrician, New York

Dr. Elizabeth Evans, MA, (Cantab) MBBS (London), DRCOG, UK

Beatrice Golomb, MD, PhD, Professor of Medicine, UC San Diego School of Medicine

Oleg Gregoriev, DrSc, PhD, Chairman, Russian National Committee on Non-Ionizing Radiation

Magda Havas, PhD, Associate Professor of Environmental & Resource Studies, Trent University, Ontario, Canada

Gunnar Heuser, MD, University of California at Los Angeles (retired)

Olle Johansson, PhD, Department of Neuroscience, Karolinska Institute, Sweden

Cynthia Johnson-McKay, MD, Columbia University

Süleyman Kaplan, PhD, Ondokuz Mayıs University, Samsun, Turkey

Henry Lai, PhD, Bioelectromagnetics Research Laboratory, University of Washington

Michael Lerner, PhD, President, Commonweal

Luana Licata, PhD, University of Rome Tor Vergata

Don Maisch, PhD, www.emfacts.com, Australia

Asish Mehta, MD, MCh, DNB, Neurological Surgeon Mumbai, India

Anthony Miller, MD, School of Public Health, University of Toronto, Canada

Joel Moskowitz, PhD, School of Public Health, University of California at Berkeley

Hildor Palsdottir, PhD, School of Medicine, New York University

Janet Perlman, MD, MPH, University of California at Berkeley
Rachel Naomi Remen, MD, School of Medicine, University of California at San Francisco
Lisa Ridgway, MD, Pediatrician
Aviva Romm, MD, Family Physician, Boston
Annie Sasco, MD, DrPH, University of Bordeaux, France
Stephen Sinatra, MD, FACC, CNS, CBT
Maya Shetreat-Klein, MD, Pediatric Neurologist, Bronx, New York
Colin L. Soskolne, PhD, University of Canberra, Australia
Ken Spaeth, MD, MPH, Hofstra University, North Shore--LIJ Health System
Yael Stein, MD, Hebrew University – Hadassah Medical Center, Jerusalem, Israel
Anne Steinemann, PhD, University of California at San Diego
Hugh Taylor, MD, Chief of Obstetrics and Gynecology, Yale-New Haven Hospital
Leonardo Trasande, MD, Institute of Environmental Medicine, Langone Medical Center, New York University
Lucy Waletzky, MD, Psychiatrist, Sleepy Hollow, New York
John Wargo, PhD, Professor of Risk Analysis, Environmental Policy, and Political Science, Yale University
John West, MD, Surgeon, RadNet
Jingduan Yang, MD, Myrna Brind Center of Integrative Medicine at Thomas Jefferson University Hospital, Philadelphia

Wafaa Aborashed, Bay Area Healthy 880 Communities
Nancy Alderman, Environment and Human Health, Inc.
Mary Beth Brangan & James Heddle, Ecological Options Network (EON)
Giorgio Cinciripini, Italian Network of No-Electrosmog NGOs
Frank Clegg, Canadians For Safe Technology
Desiree Jaworski, Center for Safer Wireless
B. Blake Levitt, former *New York Times* contributor, medical/science journalist, author
Ellen Marks, California Brain Tumor Association
L. Lloyd Morgan, Environmental Health Trust
Janet Newton, EMRadiation Institute
Camilla Rees, MBA, ElectromagneticHealth.org

Cindy Sage, MA, Sage Associates; Co-Editor, BioInitiative 2012 Report

--

For more information about wireless radiation reproductive health effects and effects on children

The Baby Safe Project. "What You Need to Know about Wireless Radiation and Your Baby"
<http://bit.ly/babysafetips>

The Baby Safe Project
<http://bit.ly/1rDKjiq>

Environmental Health Trust
<http://bit.ly/1kjkARP>

Electromagnetic Radiation Safety
<http://www.saferemr.com/2015/09/effect-of-mobile-phones-on-sperm.html>

Physicians for Safe Technology
<https://mdsafetech.org/baby-safe/>

Related news releases from Electromagnetic Radiation Safety

Cell Phone Use and Prenatal Exposure to Cell Phone Radiation May Cause Headaches in Children
<http://www.prlog.org/12269207>

Children's Cell Phone Use May Increase Their Risk of ADHD
<http://www.prlog.org/12110138>

MOBI-KIDS: Childhood Brain Tumor Risk & Mobile Phone Use Study
<http://www.saferemr.com/2013/05/mobi-kids-childhood-brain-tumor-risk.html>

Media: Children's Cell Phone Use
<http://www.saferemr.com/2013/01/media-coverage-childrens-cell-phone.html>

Cell Phone Radiation, Pregnancy, and Sperm
<http://www.prlog.org/12026867>

Cell Phone Radiation Damages Sperm
<http://www.prlog.org/11911996>

Magnetic Field Exposure Before Birth May Contribute to Childhood Obesity
<http://www.prlog.org/1193609>

Belgium Adopts New Regulations to Promote Cell Phone Radiation Safety
<http://www.prlog.org/12231532>

French Health Agency Recommends Children and Vulnerable Groups Reduce Cell Phone Radiation Exposure
<http://www.prlog.org/12226630>