

How to Protect Your Family

Choose wired over wireless

- Get a corded landline phone and forward cell phones to it.
- Use corded plug-in (non-wireless) connections for printer, mouse, internet, gaming, and routers, etc.—with all wireless functions OFF.

Safeguard sleep

- Stop use of and power off computers, tablets and phones one hour (or longer) before bedtime.
- Do not sleep with a cell phone, tablet or laptop.

Maximize distance from self and others

- Radiation decreases as you move away from the source.
- Locate devices away from laps, bras and pockets, as the radiation can damage sperm and may be linked to breast cancer.
- Use air tube headset or use speaker phone at maximum distance from head and body.

Protect children

- Children are particularly vulnerable and should not use cell phones except in an emergency.
- If children are using a phone or other device for work or play, select all 3 of the following settings to turn off the radiation from cell phones and wireless devices: Airplane mode ON, and Wi-Fi OFF, and Bluetooth OFF.
- Don't use a mobile device while a child is on your lap or in your arms.

Power off in vehicles

- Mobile devices distract drivers, emit more intense radiation during travel, and metal surroundings create radiation hot-zones.

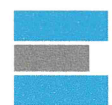
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Doctors' Advice to Patients & Families

Wireless & Health: Simple Precautions Make Sense



This pamphlet reviews
precautionary advice
by Doctors and governments to
reduce exposure to wireless radiation.

 **ENVIRONMENTAL
HEALTH TRUST**

Brought to you by: Physicians, biomedical scientists, and neurosurgeons—including Charles Teo, MD; Martha Herbert, MD, PhD; Anthony B. Miller, MD; Süleyman Kaplan, PhD; Annie J. Sasco, MD, PhD; Stephen T. Sinatra, MD; Dr. Erica Mallery-Blythe, BMBS; Devra Lee Davis, PhD, MPH

Wireless Radiation Exposures

Wireless devices—such as tablets, laptops, game consoles, baby monitors, and wifi routers—all emit the same type of wireless microwave radiation as cell phones. Children, pregnant women, and men hoping to father healthy children are more vulnerable to this exposure.

The Child Brain and Skull Absorb up to Ten Times More Invisible Wireless Radiation than the Adult

(Gandhi et al., 2012)



Cell phone radiation absorbed into brain, skull, and eyes of 6-year-old

(Fernandez et al., 2015)

New anatomically based research shows radiation absorption.

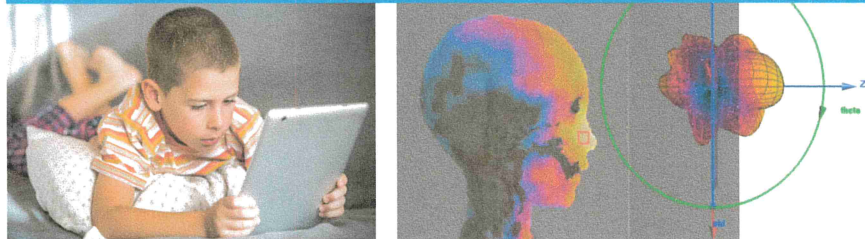
Increased Cancer Risk

Wireless radiofrequency radiation was classified as a Class 2B “Possible Human Carcinogen” by the World Health Organization’s International Agency for Research on Cancer in 2011. Evidence *has increased* since 2011, indicating that cell phone and wireless radiation should be classified as a “probable carcinogen” because of increased brain cancer (Davis et al., 2015).

Those exposed at younger ages show up to eight times more brain cancer risk.

Radiation Absorption from Tablet into a 6-Year-Old’s Brain

(in this image: white & yellow areas are the highest absorption)



Federal University of Rio Grande do Sul, UFRGS Ferreira and de Salles (2015)

Wireless Exposure Damages Brains



Animals prenatally exposed to cell phone radiation develop damaged and fewer brain cells.

How Wireless Impacts Children’s Health

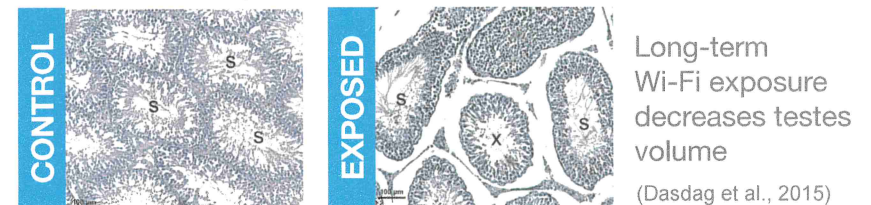
Accumulating research shows that wireless microwave radiation affects fetal brain development, the immune system and reproductive function. *Even very low doses* of wireless radiation affect brain metabolism and electrical activity.

Yale University researchers found that when pregnant mice were exposed to radiation from a simulated operating phone, their offspring had impaired memory, increased hyperactivity and altered brains. Several research studies show wireless impairs brain development at various ages.

The Reproductive System

Numerous studies indicate that wireless exposures decrease sperm quantity and quality (including altered DNA) and damage testes and ovaries.

Testes Damaged by Wi-Fi Equipment Radiation



Government Protections Worldwide

Over 20 countries—including France, Belgium, Israel and the European Union—have taken policy actions to “reduce exposure to children,” addressing cell phones, laptops, cell towers and Wi-Fi in schools in order to protect public health.

detailed references available at EHTrust.org

Reported Biological Effects from Radiofrequency Radiation at Low-Intensity Exposure (Cell Tower, Wi-Fi, Wireless Laptop and 'Smart' Meter RF Intensities)

Power Density (Microwatts/centimeter ² - uW/cm ²)		Reference
As low as (10 ⁻¹³) or 100 femtowatts/cm ²	Super-low intensity RFR effects at MW resonant frequencies resulted in changes in genes; problems with chromatin conformation (DNA)	Belyaev, 1997
5 picowatts/cm ² (10 ⁻¹²)	Changed growth rates in yeast cells	Grundler, 1992
0.1 nanowatt/cm ² (10 ⁻¹⁰) or 100 picowatts/cm ²	Super-low intensity RFR effects at MW resonant frequencies resulted in changes in genes; problems with chromatin condensation (DNA) intensities comparable to base stations	Belyaev, 1997
0.00034 uW/cm ²	Chronic exposure to mobile phone pulsed RF significantly reduced sperm count,	Behari, 2006
0.0005 uW/cm ²	RFR decreased cell proliferation at 960 MHz GSM 217 Hz for 30-min exposure	Velizarov, 1999
0.0006 - 0.0128 uW/cm ²	Fatigue, depressive tendency, sleeping disorders, concentration difficulties, cardio-vascular problems reported with exposure to GSM 900/1800 MHz cell phone signal at base station level exposures.	Oberfeld, 2004
0.003 - 0.02 uW/cm ²	In children and adolescents (8-17 yrs) short-term exposure caused headache, irritation, concentration difficulties in school.	Heinrich, 2010
0.003 to 0.05 uW/cm ²	In children and adolescents (8-17 yrs) short-term exposure caused conduct problems in school (behavioral problems)	Thomas, 2010
0.005 uW/cm ²	In adults (30-60 yrs) chronic exposure caused sleep disturbances, (but not significantly increased across the entire population)	Mohler, 2010
0.005 - 0.04 uW/cm ²	Adults exposed to short-term cell phone radiation reported headaches, concentration difficulties (differences not significant, but elevated)	Thomas, 2008
0.006 - 0.01 uW/cm ²	Chronic exposure to base station RF (whole-body) in humans showed increased stress hormones; dopamine levels substantially decreased; higher levels of adrenaline and nor-adrenaline; dose-response seen; produced chronic physiological stress in cells even after 1.5 years.	Buchner, 2012
0.01 - 0.11 uW/cm ²	RFR from cell towers caused fatigue, headaches, sleeping problems	Navarro, 2003

Stress proteins, HSP, disrupted immune function	Brain tumors and blood-brain barrier
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0.01 - 0.05 uW/cm ²	Adults (18-91 yrs) with short-term exposure to GSM cell phone radiation reported headache, neurological problems, sleep and concentration problems.	Hutter, 2006
0.005 - 0.04 uW/cm ²	Adults exposed to short-term cell phone radiation reported headaches, concentration difficulties (differences not significant, but elevated)	Thomas, 2008
0.015 - 0.21 uW/cm ²	Adults exposed to short-term GSM 900 radiation reported changes in mental state (e.g., calmness) but limitations of study on language descriptors prevented refined word choices (stupified, zoned-out)	Augner, 2009
0.05 - 0.1 uW/cm ²	RFR linked to adverse neurological, cardio symptoms and cancer risk	Khurana, 2010
0.05 - 0.1 uW/cm ²	RFR related to headache, concentration and sleeping problems, fatigue	Kundi, 2009
0.07 - 0.1 uW/cm ²	Sperm head abnormalities in mice exposed for 6-months to base station level RF/MW. Sperm head abnormalities occurred in 39% to 46% exposed mice (only 2% in controls) abnormalities was also found to be dose dependent. The implications of the pin-head and banana-shaped sperm head. The occurrence of sperm head observed increase occurrence of sperm head abnormalities on the reproductive health of humans living in close proximity to GSM base stations were discussed."	Otitoloju, 2010
0.38 uW/cm ²	RFR affected calcium metabolism in heart cells	Schwartz, 1990
0.8 - 10 uW/cm ²	RFR caused emotional behavior changes, free-radical damage by super-weak MWs	Akoev, 2002
0.13 uW/cm ²	RFR from 3G cell towers decreased cognition, well-being	Zwamborn, 2003
0.16 uW/cm ²	Motor function, memory and attention of school children affected (Latvia)	Kolodynski, 1996
0.168 - 1.053 uW/cm ²	Irreversible infertility in mice after 5 generations of exposure to RFR from an 'antenna park'	Magras & Zenos, 1997
0.2 - 8 uW/cm ²	RFR caused a two-fold increase in leukemia in children	Hocking, 1996
0.2 - 8 uW/cm ²	RFR decreased survival in children with leukemia	Hocking, 2000
0.21 - 1.28 uW/cm ²	Adolescents and adults exposed only 45 min to UMTS cell phone radiation reported increases in headaches.	Riddervold, 2008

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0.5 uW/cm ²	Significant degeneration of seminiferous epithelium in mice at 2.45 GHz, 30-40 min.	Saunders, 1981
0.5 - 1.0 uW/cm ²	Wi-Fi level laptop exposure for 4-hr resulted in decrease in sperm viability, DNA fragmentation with sperm samples placed in petri dishes under a laptop connected via Wi-Fi to the internet.	Avendano, 2012
1.0 uW/cm ²	RFR induced pathological leakage of the blood-brain barrier	Persson, 1997
1.0 uW/cm ²	RFR caused significant effect on immune function in mice	Fesenko, 1999
1.0 uW/cm ²	RFR affected function of the immune system	Novoselova, 1999
1.0 uW/cm ²	Short-term (50 min) exposure in electrosensitive patients, caused loss of well-being after GSM and especially UMTS cell phone radiation exposure	ElTiti, 2007
1.3 - 5.7 uW/cm ²	RFR associated with a doubling of leukemia in adults	Dolk, 1997
1.25 uW/cm ²	RFR exposure affected kidney development in rats (in-utero exposure)	Pyrpasopoulou, 2004
1.5 uW/cm ²	RFR reduced memory function in rats	Nittby, 2007
2 uW/cm ²	RFR induced double-strand DNA damage in rat brain cells	Kesari, 2008
2.5 uW/cm ²	RFR affected calcium concentrations in heart muscle cells	Wolke, 1996
2 - 4 uW/cm ²	Altered cell membranes; acetylcholine-induced ion channel disruption	D'Inzeo, 1988
4 uW/cm ²	RFR caused changes in hippocampus (brain memory and learning)	Tattersall, 2001
4 - 15 uW/cm ²	Memory impairment, slowed motor skills and retarded learning in children	Chiang, 1989
5 uW/cm ²	RFR caused drop in NK lymphocytes (immune function decreased)	Boscolo, 2001
5.25 uW/cm ²	20 minutes of RFR at cell tower frequencies induced cell stress response	Kwee, 2001
5 - 10 uW/cm ²	RFR caused impaired nervous system activity	Dumansky, 1974
6 uW/cm ²	RFR induced DNA damage in cells	Phillips, 1998

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8.75 uW/cm ²	RFR at 900 MHz for 2-12 hours caused DNA breaks in leukemia cells	Marinelli, 2004
10 uW/cm ²	Changes in behavior (avoidance) after 0.5 hour exposure to pulsed RFR	Navakatikian, 1994
10 - 100 uW/cm ²	Increased risk in radar operators of cancer; very short latency period; dose response to exposure level of RFR reported.	Richter, 2000
12.5 uW/cm ²	RFR caused calcium efflux in cells - can affect many critical cell functions	Dutta, 1989
13.5 uW/cm ²	RFR affected human lymphocytes - induced stress response in cells	Sarimov, 2004
20 uW/cm ²	Increase in serum cortisol (a stress hormone)	Mann, 1998
28.2 uW/cm ²	RFR increased free radical production in rat cells	Yurekli, 2006
37.5 uW/cm ²	Immune system effects - elevation of PFC count (antibody producing cells)	Veyret, 1991
45 uW/cm ²	Pulsed RFR affected serum testosterone levels in mice	Forgacs, 2006
50 uW/cm ²	Cell phone RFR caused a pathological leakage of the blood-brain barrier in 1 hour	Salford, 2003
50 uW/cm ²	An 18% reduction in REM sleep (important to memory and learning functions)	Mann, 1996
60 uW/cm ²	RFR caused structural changes in cells of mouse embryos	Somozy, 1991
60 uW/cm ²	Pulsed RFR affected immune function in white blood cells	Stankiewicz, 2006
60 uW/cm ²	Cortex of the brain was activated by 15 minutes of 902 MHz cell phone	Lebedeva, 2000
65 uW/cm ²	RFR affected genes related to cancer	Ivaschuk, 1999
92.5 uW/cm ²	RFR caused genetic changes in human white blood cells	Belyaev, 2005
100 uW/cm ²	Changes in immune function	Elekes, 1996
100 uW/cm ²	A 24.3% drop in testosterone after 6 hours of CW RFR exposure	Navakatikian, 1994
120 uW/cm ²	A pathological leakage in the blood-brain barrier with 915 MHz cell RF	Salford, 1994

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Power Density (Microwatts/centimeter ² - uW/cm ²)		Reference
500 uW/cm ²	Intestinal epithelial cells exposed to 2.45 GHz pulsed at 16 Hz showed changes in intercellular calcium.	Somozy, 1993
500 uW/cm ²	A 24.6% drop in testosterone and 23.2% drop in insulin after 12 hrs of pulsed RFR exposure.	Navakatikian, 1994
STANDARDS		
530 - 600 uW/cm ²	Limit for uncontrolled public exposure to 800-900 MHz	ANSI/IEEE and FCC
1000 uW/cm ²	PCS STANDARD for public exposure (as of September 1,1997)	FCC, 1996
5000 uW/cm ²	PCS STANDARD for occupational exposure (as of September 1, 1997)	FCC, 1996
BACKGROUND LEVELS		
0.003 uW/cm ²	Background RF levels in US cities and suburbs in the 1990s	Mantiply, 1997
0.05 uW/cm ²	Median ambient power density in cities in Sweden (30-2000 MHz)	Hamnerius, 2000
0.1 - 10 uW/cm ²	Ambient power density within 100-200' of cell site in US (data from 2000)	Sage, 2000

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SAR (Watts/Kilogram)		Reference
0.000064 - 0.000078 W/Kg	Well-being and cognitive function affected in humans exposed to GSM-UMTS cell phone frequencies; RF levels similar near cell sites	TNO Physics and
0.00015 - 0.003 W/Kg	Calcium ion movement in isolated frog heart tissue is increased 18% (P<.01) and by 21% (P<.05) by weak RF field modulated at 16 Hz	Schwartz, 1990
0.000021 - 0.0021 W/Kg	Changes in cell cycle; cell proliferation (960 MHz GSM mobile phone)	Kwee, 1997
0.0003 - 0.06 W/Kg	Neurobehavioral disorders in offspring of pregnant mice exposed in utero to cell phones - dose-response impaired glutamatergic synaptic transmission onto layer V pyramidal neurons of the prefrontal cortex. Hyperactivity and impaired memory function in offspring. Altered brain development.	Aldad, 2012
0.0016 - 0.0044 W/Kg	Very low power 700 MHz CW affects excitability of hippocampus tissue, consistent with reported behavioral changes.	Tattersall, 2001
0.0021 W/Kg	Heat shock protein HSP 70 is activated by very low intensity microwave exposure in human epithelial amnion cells	Kwee, 2001
0.0024 - 0.024 W/Kg	Digital cell phone RFR at very low intensities causes DNA damage in human cells; both DNA damage and impairment of DNA is reported	Phillips, 1998
0.0027 W/Kg	Changes in active avoidance conditioned behavioral effect is seen after one-half hour of pulsed radiofrequency radiation	Navakatikian, 1994
0.0035 W/Kg	900 MHz cell phone signal induces DNA breaks and early activation of p53 gene; short exposure of 2-12 hours leads cells to acquire greater survival chance - linked to tumor aggressiveness.	Marinelli, 2004
0.0095 W/Kg	MW modulated at 7 Hz produces more errors in short-term memory function on complex tasks (can affect cognitive processes such as attention and memory)	Lass, 2002
0.001 W/Kg	750 MHz continuous wave (CW) RFR exposure caused increase in heat shock protein (stress proteins). Equivalent to what would be induced by 3 degree C. heating of tissue (but no heating occurred)	De Pomerai, 2000
0.001 W/Kg	Statistically significant change in intracellular calcium concentration in heart muscle cells exposed to RFR (900 MHz/50 Hz modulation)	Wolke, 1996

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0.0021 W/Kg	A significant change in cell proliferation not attributable to thermal heating. RFR induces non-thermal stress proteins (960 MHz GSM)	Velizarov, 1999
0.004 - 0.008 W/Kg	915 MHz cell phone RFR caused pathological leakage of blood-brain barrier. Worst at lower SAR levels and worse with CW compared to Frequency of pathological changes was 35% in rats exposed to pulsed radiation at 50% to continuous wave RFR. Effects observed at a specific absorption (SA) of > 1.5 joules/Kg in human tissues	Persson, 1997
0.0059 W/Kg	Cell phone RFR induces glioma (brain cancer) cells to significantly increase thymidine uptake, which may be indication of more cell division	Stagg, 1997
0.014 W/Kg	Sperm damage from oxidative stress and lowered melatonin levels resulted from 2-hr per day/45 days exposure to 10 GHz.	Kumar, 2012
0.015 W/Kg	Immune system effects - elevation of PFC count (antibody-producing cells)	Veyret, 1991
0.02 W/Kg	A single, 2-hr exposure to GSM cell phone radiation results in serious neuron damage (brain cell damage) and death in cortex, hippocampus, and basal ganglia of brain- even 50+ days later blood-brain barrier is still leaking albumin (P<.002) following only one cell phone exposure	Salford, 2003
0.026 W/Kg	Activity of c-jun (oncogene or cancer gene) was altered in cells after 20 minutes exposure to cell phone digital TDMA signal	Ivaschuk, 1997
0.0317 W/Kg	Decrease in eating and drinking behavior	Ray, 1990
0.037 W/Kg	Hyperactivity caused by nitric oxide synthase inhibitor is countered by exposure to ultra-wide band pulses (600/sec) for 30 min	Seaman, 1999
0.037 - 0.040 W/Kg	A 1-hr cell phone exposure causes chromatin condensation; impaired DNA repair mechanisms; last 3 days (longer than stress response) the effect reaches saturation in only one hour of exposure; electro- sensitive (ES) people have different response in formation of DNA repair foci, compared to healthy individuals; effects depend on carrier frequency (915 MHz = 0.037 W/Kg but 1947 MHz = 0.040 W/Kg)	Belyaev, 2008
0.05 W/Kg	Significant increase in firing rate of neurons (350%) with pulsed 900 MHz cell phone radiation exposure (but not with CW) in avian brain cells	Beason, 2002

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0.09 W/Kg	900 MHz study of mice for 7 days, 12-hr per day (whole-body) resulted in significant effect on mitochondria and genome stability	Aitken, 2005
0.091 W/Kg	Wireless internet 2400 MHz, 24-hrs per day/20 weeks increased DNA damage and reduced DNA repair; levels below 802.11 g Authors say "findings raise questions about safety of radiofrequency exposure from Wi-Fi internet access devices for growing organisms of reproductive age, with a potential effect on fertility and integrity of germ cells" (male germ cells are the reproductive cells=sperm)	Atasoy, 2012
0.11 W/Kg	Increased cell death (apoptosis) and DNA fragmentation at 2.45 GHz for 35 days exposure (chronic exposure study)	Kesari, 2010
0.121 W/Kg	Cardiovascular system shows significant decrease in arterial blood pressure (hypotension) after exposure to ultra-wide band pulses	Lu, 1999
0.13 - 1.4 W/Kg	Lymphoma cancer rate doubled with two 1/2-hr exposures per day of cell phone radiation for 18 months (pulsed 900 MHz cell signal)	Repacholi, 1997
0.14 W/Kg	Elevation of immune response to RFR exposure	Elekes, 1996
0.141 W/Kg	Structural changes in testes - smaller diameter of seminiferous	Dasdag, 1999
0.15 - 0.4 W/Kg	Statistically significant increase in malignant tumors in rats chronically exposed to RFR	Chou, 1992
0.26 W/Kg	Harmful effects to the eye/certain drugs sensitize the eye to RFR	Kues, 1992
0.28 - 1.33 W/Kg	Significant increase in reported headaches with increasing use of hand-held cell phone use (maximum tested was 60 min per day)	Chia, 2000
0.3 - 0.44 W/Kg	Cell phone use results in changes in cognitive thinking/mental tasks related to memory retrieval	Krause, 2000
0.3 - 0.44 W/Kg	Attention function of brain and brain responses are speeded up	Preece, 1999
0.3 - 0.46 W/Kg	Cell phone RFR doubles pathological leakage of blood-brain barrier permeability at two days (P=.002) and triples permeability at four days (P=.001) at 1800 MHz GSM cell phone radiation	Schirmacher, 2000
0.43 W/Kg	Significant decrease in sperm mobility; drop in sperm concentration; and decrease in seminiferous tubules at 800 MHz, 8-hr/day, 12 weeks, with mobile phone radiation level on STANDBY ONLY (in rabbits)	Salama, 2008

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SAR (Watts/Kilogram)		Reference
0.5 W/Kg	900 MHz pulsed RF affects firing rate of neurons (Lymnea stagnalis) but continuous wave had no effect	Bolshakov, 1992
0.58 - 0.75 W/Kg	Decrease in brain tumors after chronic exposure to RFR at 836 MHz	Adey, 1999
0.6 - 0.9 W/Kg	Mouse embryos develop fragile cranial bones from in utero 900 MHz The authors say "(O)ur results clearly show that even modest exposure (e.g., 6 min daily for 21 days" is sufficient to interfere with the normal mouse developmental process"	Fragopoulou, 2009
0.6 and 1.2 W/Kg	Increase in DNA single and double-strand DNA breaks in rat brain cells with exposure to 2450 MHz RFR	Lai & Singh, 1996
0.795 W/Kg	GSM 900 MHz, 217 Hz significantly decreases ovarian development and size of ovaries, due to DNA damage and premature cell death of nurse cells and follicles in ovaries (that nourish egg cells)	Panagopoulous, 2012
0.87 W/Kg	Altered human mental performance after exposure to GSM cell phone radiation (900 MHz TDMA digital cell phone signal)	Hamblin, 2004
0.87 W/Kg	Change in human brainwaves; decrease in EEG potential and statistically significant change in alpha (8-13 Hz) and beta (13-22 Hz) brainwave activity in humans at 900 MHz; exposures 6/min per day for 21 days (chronic exposure)	D'Costa, 2003
0.9 W/Kg	Decreased sperm count and more sperm cell death (apoptosis) after 35 days exposure, 2-hr per day	Kesari, 2012
< 1.0 W/Kg	Rats exposed to mobile phone radiation on STANDBY ONLY for 11-hr 45-min plus 15-min TRANSMIT mode; 2 times per day for 21 days showed decreased number of ovarian follicles in pups born to these pregnant rats. The authors conclude "the decreased number of follicles in pups exposed to mobile phone microwaves suggest that intrauterine exposure has toxic effects on ovaries."	Gul, 2009
0.4 - 1.0 W/Kg	One 6-hr exposure to 1800 MHz cell phone radiation in human sperm cells caused a significant dose response and reduced sperm motility and viability; reactive oxygen species levels were significantly increased after exposure to 1.0 W/Kg; study confirms detrimental effects of RF/MW to human sperm. The authors conclude "(T)hese findings have clear implications for the safety of extensive mobile phone use by males of reproductive age, potentially affecting both their fertility and the health and wellbeing of their offspring."	De Iuliis, 2009
1.0 W/Kg	Human semen degraded by exposure to cell phone frequency RF increased free-radical damage.	De Iuliis, 2009

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1.0 W/Kg	Motility, sperm count, sperm morphology, and viability reduced in active cell phone users (human males) in dose-dependent manner.	Agarwal, 2008
1.0 W/Kg	GSM cell phone use modulates brain wave oscillations and sleep EEG	Huber, 2002
1.0 W/Kg	Cell phone RFR during waking hours affects brain wave activity. (EEG patterns) during subsequent sleep	Achermann, 2000
1.0 W/Kg	Cell phone use causes nitric oxide (NO) nasal vasodilation (swelling inside nasal passage) on side of head phone use	Paredi, 2001
1.0 W/Kg	Increase in headache, fatigue and heating behind ear in cell phone users	Sandstrom, 2001
1.0 W/Kg	Significant increase in concentration difficulties using 1800 MHz cell phone compared to 900 MHz cell phone	Santini, 2001
1.0 W/Kg	Sleep patterns and brain wave activity are changed with 900 MHz cell phone radiation exposure during sleep	Borbely, 1999
1.4 W/Kg	GSM cell phone exposure induced heat shock protein HSP 70 by 360% (stress response) and phosphorylation of ELK-1 by 390%	Weisbrot, 2003
1.46 W/Kg	850 MHz cell phone radiation decreases sperm motility, viability is significantly decreased; increased oxidative damage (free-radicals) significantly decreased; increased oxidative damage (free-radicals)	Agarwal, 2009
1.48 W/Kg	A significant decrease in protein kinase C activity at 112 MHz with 2-hr per day for 35 days; hippocampus is site, consistent with reports that RFR negatively affects learning and memory functions	Paulraj, 2004
1.0 - 2.0 W/Kg	Significant elevation in micronuclei in peripheral blood cells at 2450 MHz (8 treatments of 2-hr each)	Trosic, 2002
1.5 W/Kg	GSM cell phone exposure affected gene expression levels in tumor suppressor p53-deficient embryonic stem cells; and significantly increased HSP 70 heat shock protein production	Czyz, 2004
1.8 W/Kg	Whole-body exposure to RF cell phone radiation of 900-1800 MHz 1 cm from head of rats caused high incidence of sperm cell death; deformation of sperm cells; prominent clumping together of sperm cells into "grass bundle shapes" that are unable to separate/swim. Sperm cells unable to swim and fertilize in normal manner.	Yan, 2007

Stress proteins, HSP, disrupted immune function	Brain tumors and blood-brain barrier
Reproduction/fertility effects	Sleep, neuron firing rate, EEG, memory, learning, behavior
Oxidative damage/ROS/DNA damage/DNA repair failure	Cancer (other than brain), cell proliferation
Disrupted calcium metabolism	Cardiac, heart muscle, blood-pressure, vascular effects

Reported Biological Effects from Radiofrequency Radiation at Low-Intensity Exposure
(Cell Tower, Wi-Fi, Wireless Laptop and 'Smart' Meter RF Intensities)

SAR (Watts/Kilogram)		Reference
2.0 W/Kg	GSM cell phone exposure of 1-hr activated heat shock protein HSP 27 (stress response) and P38 MAPK (mutagen-activated protein kinase) that authors say facilitates brain cancer and increased blood-brain barrier permeability, allowing toxins to cross BBB into brain	Leszczynski, 2002
2 W/Kg	900 MHz cell phone exposure caused brain cell oxidative damage by increasing levels of NO, MDA, XO and ADA in brain cells; caused statistically significant increase in 'dark neurons' or damaged brain cells in cortex, hippocampus and basal ganglia with a 1-hr exposure for 7 consecutive days	Ilhan, 2004
2.6 W/Kg	900 MHz cell phone exposure for 1-hr significantly altered protein expression levels in 38 proteins following irradiation; activates P38 MAP kinase stress signalling pathway and leads to changes in cell size and shape (shrinking and rounding up) and to activation of HSP 27, a stress protein (heat shock protein)	Leszczynski, 2004
2.0 - 3.0 W/Kg	RFR accelerated development of both skin and breast tumors	Szmigielski, 1982
2 W/Kg	Pulse-modulated RFR and MF affect brain physiology (sleep study)	Schmidt, 2012

STANDARDS		
0.08 W/Kg	IEEE Standard uncontrolled public environment (whole body)	IEEE
0.4 W/Kg	IEEE Standard controlled occupational environment (whole body)	IEEE
1.6 W/Kg	FCC (IEEE) SAR limit for 1 gram of tissue in a partial body exposure	FCC, 1996
2 W/Kg	ICNIRP SAR limit for 10 grams of tissue	ICNIRP, 1996

Stress proteins, HSP, disrupted immune function	Brain tumors and blood-brain barrier
Reproduction/fertility effects	Sleep, neuron firing rate, EEG, memory, learning, behavior
Oxidative damage/ROS/DNA damage/DNA repair failure	Cancer (other than brain); cell proliferation
Disrupted calcium metabolism	Cardiac, heart muscle, blood-pressure, vascular effects



IARC CLASSIFIES RADIOFREQUENCY ELECTROMAGNETIC FIELDS AS POSSIBLY CARCINOGENIC TO HUMANS

Lyon, France, May 31, 2011 -- The WHO/International Agency for Research on Cancer (IARC) has classified radiofrequency electromagnetic fields as [possibly carcinogenic to humans \(Group 2B\)](#), based on an increased risk for [glioma](#), a malignant type of brain cancer¹, associated with wireless phone use.

Background

Over the last few years, there has been mounting concern about the possibility of adverse health effects resulting from exposure to radiofrequency electromagnetic fields, such as those emitted by wireless communication devices. The number of mobile phone subscriptions is estimated at [5 billion globally](#).

From [May 24–31 2011, a Working Group of 31 scientists from 14 countries has been meeting at IARC in Lyon, France, to assess the potential carcinogenic hazards from exposure to radiofrequency electromagnetic fields](#). These assessments will be published as Volume 102 of the IARC *Monographs*, which will be the fifth volume in this series to focus on physical agents, after [Volume 55](#) (Solar Radiation), [Volume 75](#) and [Volume 78](#) on ionizing radiation (X-rays, gamma-rays, neutrons, radio-nuclides), and [Volume 80 on non-ionizing radiation \(extremely low-frequency electromagnetic fields\)](#).

The IARC Monograph Working Group discussed the possibility that these exposures might induce long-term health effects, in particular an increased risk for cancer. This has relevance for public health, particularly for users of mobile phones, as the number of users is large and growing, particularly among young adults and children.

The IARC Monograph Working Group discussed and evaluated the available literature on the following exposure categories involving radiofrequency electromagnetic fields:

- occupational exposures to radar and to microwaves;
- environmental exposures associated with transmission of signals for radio, television and wireless telecommunication; and
- personal exposures associated with the use of wireless telephones.

International experts shared the complex task of tackling the [exposure data](#), the [studies of cancer in humans](#), the [studies of cancer in experimental animals](#), and the [mechanistic and other relevant data](#).

¹ [237 913 new cases of brain cancers](#) (all types combined) occurred around the world in 2008 (gliomas represent 2/3 of these). Source: [Globocan 2008](#)

IARC CLASSIFIES RADIOFREQUENCY ELECTROMAGNETIC FIELDS AS POSSIBLY CARCINOGENIC TO HUMANS

Results

The evidence was reviewed critically, and overall evaluated as being *limited*² among users of wireless telephones for glioma and acoustic neuroma, and *inadequate*³ to draw conclusions for other types of cancers. The evidence from the occupational and environmental exposures mentioned above was similarly judged inadequate. The Working Group did not quantitate the risk; however, one study of past cell phone use (up to the year 2004), showed a 40% increased risk for gliomas in the highest category of heavy users (reported average: 30 minutes per day over a 10-year period).

Conclusions

Dr Jonathan Samet (University of Southern California, USA), overall Chairman of the Working Group, indicated that "the evidence, while still accumulating, is strong enough to support a conclusion and the [2B classification](#). The conclusion means that there could be some risk, and therefore we need to keep a close watch for a link between cell phones and cancer risk."

"Given the potential consequences for public health of this classification and findings," said IARC Director Christopher Wild, "it is important that additional research be conducted into the long-term, heavy use of mobile phones. Pending the availability of such information, it is important to take pragmatic measures to reduce exposure such as hands-free devices or texting. "

The Working Group considered hundreds of scientific articles; the complete list will be published in the Monograph. It is noteworthy to mention that several recent in-press scientific articles⁴ resulting from the [Interphone study](#) were made available to the working group shortly before it was due to convene, reflecting their acceptance for publication at that time, and were included in the evaluation.

A concise report summarizing the main conclusions of the IARC Working Group and the evaluations of the carcinogenic hazard from radiofrequency electromagnetic fields (including the use of mobile telephones) will be published in [The Lancet Oncology in its July 1 issue, and in a few days online](#).

² '**Limited evidence of carcinogenicity**': A positive association has been observed between exposure to the agent and cancer for which a causal interpretation is considered by the Working Group to be credible, but chance, bias or confounding could not be ruled out with reasonable confidence.

³ '**Inadequate evidence of carcinogenicity**': The available studies are of insufficient quality, consistency or statistical power to permit a conclusion regarding the presence or absence of a causal association between exposure and cancer, or no data on cancer in humans are available.

⁴ a. 'Acoustic neuroma risk in relation to mobile telephone use: results of the INTERPHONE international case-control study' (the Interphone Study Group, in *Cancer Epidemiology*, *in press*)
 b. 'Estimation of RF energy absorbed in the brain from mobile phones in the Interphone study' (Cardis et al., *Occupational and Environmental Medicine*, *in press*)
 c. 'Risk of brain tumours in relation to estimated RF dose from mobile phones – results from five Interphone countries' (Cardis et al., *Occupational and Environmental Medicine*, *in press*)
 d. '[Location of Gliomas in Relation to Mobile Telephone Use: A Case-Case and Case-Specular Analysis](#)' (American Journal of Epidemiology, May 24, 2011. [Epub ahead of print].

What You Need To Know About 5G Wireless and Microcells (“Small” Cells)

“We recommend a moratorium on the roll-out of the fifth generation, 5G, for telecommunication until potential hazards for human health and the environment have been fully investigated by scientists independent from industry...RF-EMF has been proven to be harmful for humans and the environment.”

— 2017 5G Scientific Appeal (signed by more than 180 scientists and doctors from 35 countries)

Around the world, communities are being told by wireless companies that it is necessary to build microcell (or “small cell”) wireless facilities in neighborhoods on streetlight and utility poles in order to offer 5G, a new technology that will connect the Internet of Things (IoT). At every level of government, new legislation and new zoning aim to streamline the installation of these 5G microcell antennas in public rights-of-way.

The radiation from small cells is not small: Wireless antennas emit microwaves — non-ionizing radiofrequency radiation — and essentially function as cell towers. Radiation emitted from small cells is expected to typically travel from 10 feet up to several hundred feet.

Millions of small cells to be built in front yards: It is estimated that millions of these wireless transmitters will be built in our rights-of-way, directly in front of our homes.

5G will add to — not replace — our current wireless technology: 5G will add in another layer of wireless radiation to our environment. 5G will not only utilize wireless frequencies already in use but also add in higher frequencies — submillimeter and millimeter waves — in order to transmit data at superfast speeds.

Community authority is overruled: Communities are being stripped of their right to make decisions about this new technology. “Streamlining” means almost automatic approval. Public notice and public hearings are being eliminated. Even if every homeowner on the street opposes the antennas on their street, the opposition will be disregarded.

Scientists worldwide are calling for a halt to the 5G Roll-out: In 2017, over 180 scientists and doctors issued a declaration calling for a moratorium on the increase of 5G cell antennas citing human health effects and impacts to wildlife.

[Read the 2017 Scientific Appeal on 5G To the European Commission](#)

[Read the 2015 EMF Scientist Appeal to the United Nations](#)

[Read Letters From Dozens of Scientists on Health Risks of 5G](#)

Cumulative daily radiation exposure poses serious public health risks: Peer reviewed, published science indicates that exposures to wireless radiation can increase cancer risk and alter brain development and damage sperm. Most people are unaware that wireless technology was never tested for long-term safety, that children are more vulnerable and that the accumulated scientific evidence shows harm.

Decreased property values: Studies show property values drop up to 20% on homes near cell towers. Would you buy a home with a mini cell tower in the yard?

[Read Research on Cellular Base Stations Near Homes](#)

Microwave antennas in front yards present several worker and public safety issues: U.S. unions have already filed comments that workers were injured, unaware they were working near transmitting antennas. How will electrical workers, window washers, and tree cutters be protected? The heavy large equipment cabinets mounted on poles along our sidewalks also present new hazards. Cars run into utility poles, often, what then?

There is a safer alternative: Worldwide, many regions invest in safer and smarter fiber optic cabling all the way to each home, rather than antennas in front yards. Wired fiberoptic connections are safer, faster, more reliable, provide greater capacity, and are more cyber-secure.

KEY RESEARCH AND REPORTS

Study Finds 5G Frequencies Have A Biological Effect

A newly published study from distinguished Israeli physicists Yuri Feldman, Paul Ben-Ishai and colleagues found that the higher millimeter frequencies intended for use in 5G are preferentially absorbed in the sweat duct, a significant biological effect. [Read the study "The Modeling of the Absorbance of the Sub-THz Radiation by Human Skin."](#) [Watch a lecture](#) by Paul Ben-Ishai, PhD at [2017 IAS Conference](#).

US National Toxicology Program (NTP) Study Found Wireless Caused Cancer and DNA Damage in Rodents

The National Institute of Environmental Health Sciences NTP [long-term radiofrequency radiation](#) (RFR) studies found male rats developed gliomas (brain cancer) and schwann cell tumors, the same types of tumors increased in long-term human cell phone users. In addition, [DNA damage was found](#) leading the scientists to conclude that, "exposure to RFR has the potential to induce measurable DNA damage under certain exposure conditions."

Cell Tower Radiation is Linked To Damage in Human Blood

A newly published study compared people living close and far from cell antennas and found a significant impact on people living closer to cellular antennas. Damage was found in their blood that predicts cancer development. [Read the study "Impact of radiofrequency radiation on DNA damage and antioxidants in peripheral blood lymphocytes of humans residing in the vicinity of mobile phone base station"](#) (Zothansiamia et al, 2017; published in *Electromagnetic Biology and Medicine*).

Millimeter Waves Impact Bacteria Growth

New research finds that millimeter waves alter bacteria growth, and the combined action of these frequencies with antibiotics had even stronger effects. [Read the study "Millimeter waves or extremely high frequency electromagnetic fields in the environment: what are their effects on bacteria?"](#) (published in *Applied Microbiology and Biotechnology*).

RESOURCES

[A 5G Wireless Future: Will it give us a smart nation or contribute to an unhealthy one?](#) Santa Clara Medical Association Bulletin, Cindy Russell MD, 2017

[Letters by Scientists in Opposition To 5G Research on Cell Tower Radiation](#), 2017 Research on Cell Tower Radiation

[Biological Effects from Exposure to Electromagnetic Radiation Emitted by Cell Tower Base Stations and Other Antenna Arrays](#), Levitt and Lai, 2010

[Radiofrequency radiation injures trees around mobile phone base stations](#), Waldmann-Selsam et al., 2016

[Department of Interior Letter on the Impact of Cell Towers on Migratory Birds](#), Willie R. Taylor Director, Office of Environmental Policy and Compliance, 2014

[Anthropogenic radiofrequency electromagnetic fields as an emerging threat to wildlife orientation](#), Balmori, 2015

[Briefing Memorandum On The Impacts from Thermal and Non-thermal Non-ionizing Radiation to Birds and Other Wildlife](#), Manville, 2016

[International Policy To Reduce Public Exposure to Wireless Radiation](#)

[BioInitiative 2012: A Scientific Report By 29 International EMF Experts](#)

TAKE ACTION

Contact your elected officials in person now.

Share this information with your friends, family and community.

Ask for government policy that reduces RFR exposure to the public.

Citizens in all nations must organize and take action to halt the deployment of 5G which is moving forward right now.

LEARN MORE

[Read more about 5G and the Internet of Things](#)

5G Small Cell Antennas To Be Placed On:

- Street lights
- Trashcans
- Utility poles
- Bus stops
- Sides of buildings

5 Reasons Why Small Cells Are Not Small

- Increased radiation near homes
- Refrigerator-sized equipment cabinet
- Drop in property values
- Taller poles
- Fixtures weigh hundreds of pounds

Crown Castle's 2016 10-K Annual Report says:

"If radio frequency emissions from wireless handsets or equipment on our wireless infrastructure are demonstrated to cause negative health effects, potential future claims could adversely affect our operations, costs or revenues... We currently do not maintain any significant insurance with respect to these matters."

[Read warnings](#) from Crown Castle, Verizon and other wireless companies.

The American Academy of Pediatrics says:

"An Egyptian study confirmed concerns that living nearby mobile phone base stations increased the risk for developing:

- Headaches
- Memory problems
- Dizziness
- Depression
- Sleep problems"

[AAP on Cell Towers & Reducing Cell Phone Radiation](#)

Letter from oncologist Lennart Hardell MD & Colleagues:

"There is a substantial body of evidence that this technology is harmful to humans and the environment. The 5G millimeter wave is known to heat the eyes, skin and testes... Of particular concern are the most vulnerable among us — the unborn, children, the infirm, the elderly and the disabled. It is also expected that populations of bees and birds will drastically decline."

[2017 Scientific Letter](#)

Peer Reviewed Research Studies on Radiofrequency Radiation Have Found:

- Headaches
- Sperm damage
- Altered brain development
- Depression
- Neurological symptoms
- Hormone changes
- Memory problems
- Sleep problems
- Cancer

See also:

[Dr. Moskowitz, University of California at Berkeley](#)
[Dr. Lennart Hardell Örebro University Sweden](#)
[The Baby Safe Project](#)
[Physicians for Safe Technology](#)

www.ehtrust.org

 ENVIRONMENTAL
HEALTH TRUST

Information about EMFs & Safety Levels¹

By MICHAEL R. NEUERT, MA, BSME

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(© 2014 Michael R Neuert)

www.emfcenter.com www.emfinfo.org

What Are the Health Concerns?

Published studies from around the world have linked electromagnetic fields (EMFs) to increased risks for several types of cancer, as well as increased stress, suppression of the immune system, cellular and hormone changes, and even depression and suicide. In fact, several thousand studies have reported biological effects related to EMFs.

Some of the specific illnesses include leukemia, lymphoma, brain tumors, melanoma, breast cancer, asthma, Alzheimer's disease, Lou Gehrig's disease, miscarriage and birth defects. Anecdotally, EMFs are often associated with sleep problems, headache, fatigue, anxiety, mental confusion, irritability, memory loss, dizziness, itchy or burning skin, tinnitus, and other symptoms.

There are three main kinds of EMFs. All three types have been linked to important biological effects. And each type of EMF is measured with a different kind of test instrument...

- A. **ELF Magnetic Fields** ^{Note 2} are the particular EMF component most often linked to serious health effects – such as childhood leukemia and other cancers – in the research studies. Common sources include electric power lines, electrical wiring, lighting fixtures, electric appliances and most electrical devices. Wiring problems and stray electrical current in metal pipes can also create surprisingly high levels. Magnetic fields are measured with an ELF gaussmeter, in units of “milligauss” (mG).
- B. **ELF Electric Fields** ^{Note 2} are also linked to important biological effects, but have been studied less. Anecdotally, they are often involved when people feel “sensitive” to electromagnetic fields. Common sources include hidden electrical wiring, power cords for lamps and devices, and power lines. Electric fields create unnatural electric voltages on the skin, which can be measured with a Body Voltage Meter, in units of “Volts AC” (V).
- C. **RF Fields** (*radio frequency fields, includes microwaves*) have been linked to various types of cancer, tumors and health effects similar to the ELF fields. RF fields are commonly emitted from modern wireless and electronic equipment – cell towers, cell phones, cordless telephones, wireless computers, Wi-Fi routers, baby monitors, Smart Meters, TV and radio broadcast towers, microwave ovens, radar, etc. They are measured with an RF meter, usually in units of “microwatts per centimeter squared” ($\mu\text{W}/\text{cm}^2$). ^{Note 3}

Special Note: There is still great controversy about the potential health effects from EMFs. Please refer to the proper medical authorities and scientific research literature to make your own decisions regarding health effects and safety levels.¹ The attached “*What EMF Level Is Safe?*” page shows some of the more common EMF exposure guidelines that you may wish to consider.⁴

Note 1 I am engineer and not a medical doctor. I cannot diagnose or treat any EMF-related health concerns. Please consult with your own doctor or other health professional regarding EMF exposure guidelines.

Note 2 Extremely-Low-Frequency or “ELF” is the EMF frequency range which includes the common 60 hertz (60 cycles-per-second) electric utility power used in the US/Canada and the 50 Hz power in Europe.

Note 3 When RF frequencies are also added to the ELF magnetic and electric fields due to the use of electronic dimmers, fluorescent lights, computers, Smart Meters, etc., this is called “Dirty Electricity”.

Note 4 Some of this information is anecdotal, based on my 22 years of professional experience with clients.

What EMF Level is Safe? ⁹

EMF Safety Levels ©2014 by Michael R Neuert (www.emfcenter.com or 707-578-1645)

"Possible Safety Levels To Consider" 3 Types of EMF → (See attached page for more information)	<i>ELF</i> Magnetic Fields	<i>ELF</i> Electric Fields	Radio Frequency (RF) & Microwaves
Unit of Measurement in USA (Abbreviation)	Milligauss (mG)	AC Volts on skin (VAC)	Microwatts/cm ² (μW/cm ²)
Lowest Level Linked to Cancer ^{See Notes 5 & 6}	1.0 (2.0) ⁵	unknown	0.2 ⁶
Average Level in Homes ^{See Note 7}	0.5 to 1.0	0.5 to 2.0	0.0001 to 0.5
Building Biology Severe Concern ^{See Note 8}	1.0	0.1 (sleep)	0.001
BioInitiative 2012 Report ^{See Note 9}	1.0	n/a	0.0003
General Public Precautionary Level ^{See Note 10}	0.5	1.0 (sleep 0.5)	0.01
EMF Hypersensitivity Advice ^{See Note 11}	0.1	0.1	0.0001 or less
Official FCC Safety Limit ^{See Note 12}	n/a	n/a	1000 ^{Note 13}
ICNIRP Guidelines for General Public ^{See Note 12}	833	n/a	1000 ^{Note 13}

⁵ The Lowest Level Linked to Cancer for Magnetic Fields: The strongest evidence comes from the Swedish epidemiological study which reported increased leukemia for children at levels of 2.0 mG or more (Feychting & Ahlbom, 1993). And a German study has linked exposures as low as 1.0 mG to reduced survival rates for children trying to recover from leukemia (Svendsen, Weikopf, Kaatsch & Schuz, 2007).

⁶ The Lowest Level Linked to Cancer for RF is from two Australian studies of radio/TV broadcast towers that found increased childhood leukemia at levels as low as 0.2 microwatts/cm². The first (Hocking, 1996) found that leukemia death rates were more than double for the exposed children. The second (Hocking, 2000) found that children trying to recover from leukemia were twice as likely to survive in a lower exposure home.

⁷ The Average Level in Homes for *magnetic fields* is derived from nationwide research studies and confirmed in my own testing experience. The average levels for *electric fields* and *RF fields* are estimates from my own 22 years of professional testing in the San Francisco Bay area.

⁸ The Building Biology Severe Concern level is from the "Standard of Building Biology Testing Methods" published by the Institute for Baubiologie. (Go to www.hbelc.org/pdf/standards/sbm2008.pdf.)

⁹ The BioInitiative Report Recommendations are from the 2012 "BioInitiative Report: A Rationale for a Biologically-Based Public Exposure Standard for Electromagnetic Fields". (Go to www.bioinitiative.org. For a detailed list of the RF studies reporting adverse health effects and the related RF exposure levels, go to www.bioinitiative.org/report/wp-content/uploads/pdfs/BioInitiativeReport-RF-Color-Charts.pdf.)

¹⁰ The General Public Precautionary Level is my own offering to healthy concerned clients based on my own understanding of the EMF research, and leaning towards caution. For example for *magnetic fields*, to offer some margin of safety below the 1.0 mG linked to cancer, I might suggest a safety level of 0.5 mG.

¹¹ The EMF Hypersensitivity Advisory is based upon anecdotal experience by EMF professionals like myself who often find it necessary to reduce exposures to these levels for sensitive individuals to report relief of symptoms. However, there is no guarantee that these levels will be low enough for any particular person.

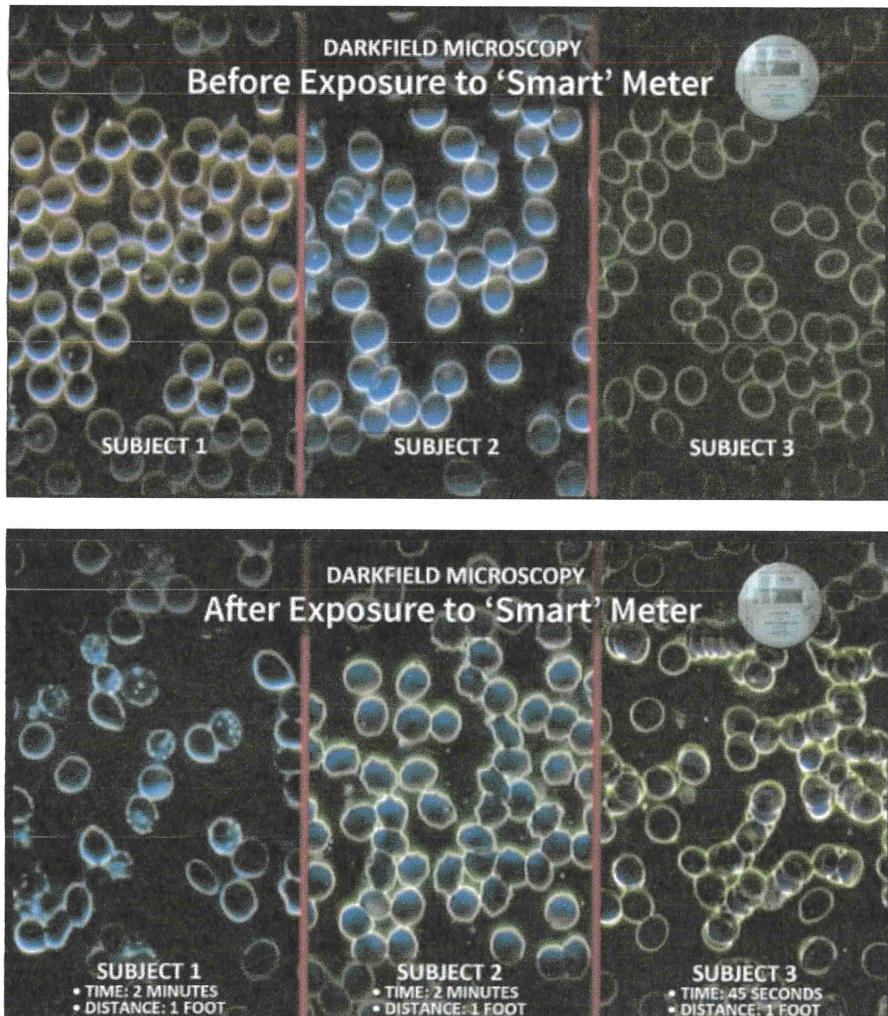
¹² The FCC Safety Limit is the US "Maximum Permissible Exposure for the General Public" in FCC/OET Bulletin #56 (www.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet56/oet56e4.pdf). The ICNIRP Guidelines are from the commonly cited 1998 publication by the International Commission on Non-Ionizing Radiation Protection (www.icnirp.de/documents/emfgdl.pdf).

¹³ The official safety level depends on frequency. Value shown is for frequencies of 1500 MHz and higher.

Live Blood Analysis – Observable Effects of Radiofrequency Radiation from Smart Meters

From StopSmartMeters.org.uk

This [clip](#) from the film Take Back Your Power shows observable effects of the RF/MW radiation from a Smart Meter on human blood cells using dark-field microscopy.



More than 5,000 studies now show RF/MW radiation to be harmful to human biology, animals and plants. Acute and chronic exposure to RF (radio-frequency) and MW (microwave) radiation can, even at [very low power-densities](#), lead to not only the negative health effects shown in this picture, but calcium ion damage in cells, endothelial cell dysfunction, nitric oxide depletion, oxidative stress, melatonin disruption, blood-brain-barrier leakage, DNA damage, sperm damage and more.

Glucose metabolism changes within the brain are observable after just [minutes of cell phone use](#).

The mechanisms for damage from non-thermal, non-ionizing radiation exposure are now becoming clear.

Unfortunately, so-called “safety” thresholds maintained in the UK are woefully out of date and obsolete, permitting a deluge of highly-profitable, RF-emitting technologies to be introduced into our lives. Whilst

attempts by campaigners in every country are being made to stem and reverse the tide of these environmental toxins, you can take positive action to protect yourself and your family by limiting your own exposure to RF and MW-emitting devices, such as Smart Meters, cell phones, WiFi routers and devices, wireless baby monitors, wireless alarm systems, wireless games consoles, etc.



Two Month Deferred Maintenance Report

May and June 2018

City Park Properties	May-June 2017	May-June 2018	Deferred Maintenance Tasks
	Snapshot of Actual Hours		
Arneson Gardens	43	47.5	landscape maintenance, path restoration
Baker Prairie Cemetery	11	13	landscape maintenance
Community Park	153.5	148.5	wetlands trail maintenance
Disc Golf	5	0	No maintenance required
Eco Park	13.5	30.5	trail maintenance
Faist 5 - Undeveloped	3	5	landscape maintenance
Legacy Park	141	143	increase in service level and maintenance
S. Locust Park	81	71	increase in service level
Forest Road Path	7.5	143	land clearing and cleanup
Fish Eddy	11.5	14.5	increase in service level
Maple Park	97.5	148	increase in service level and landscaping
19 th Loop	8	11	increase in service level, vector maintenance
Northwood Park	47.5	52.5	increase in service level
Simnitt - Undeveloped	0	0	no required maintenance, service as needed
Skate Park	36	24	Increase in service level & frequency
Territorial CLC	0	0	Maintained by volunteers, service as needed
Timber Park	2.5	61	starting out with increased service level
Triangle Park	15	41.5	tree clearing and increased maintenance
Wait Park	120	201	increase in services level and landscaping, pressure washed assets, repaired/prepped and painted the gazebo and the restroom exterior

Within the body of the May-June snapshot, the difference between the 2017 and 2018 cycles, there has been an increase of 358.5 hours dedicated towards all park maintenance.

Please note: The five new hires have been brought on board throughout the course of this May-June 2018 reporting cycle. I am anticipating that we will be beyond our new hire learning curve and expecting an increase in the deferred maintenance projects from this point moving forward.

Our priority for the *next reporting cycle* will be to start prioritizing deferred maintenance tasks in the following order: (1) Legacy Park number, (2) Maple St. Park and (3) S. Locust St. Park.

Respectfully Submitted, Jeff G. Snyder / Park Maintenance Lead Worker