

# Breast Cancer and Wireless Radiation

What do we know and what do we do now?

*Devra Davis, PhD MPH FACE*

***In Honor of H. Leon Bradlow, a pioneer in endocrinology and my esteemed mentor and Tiffany Frantz, a brave breast cancer advocate***

Founder and President of Environmental Health Trust

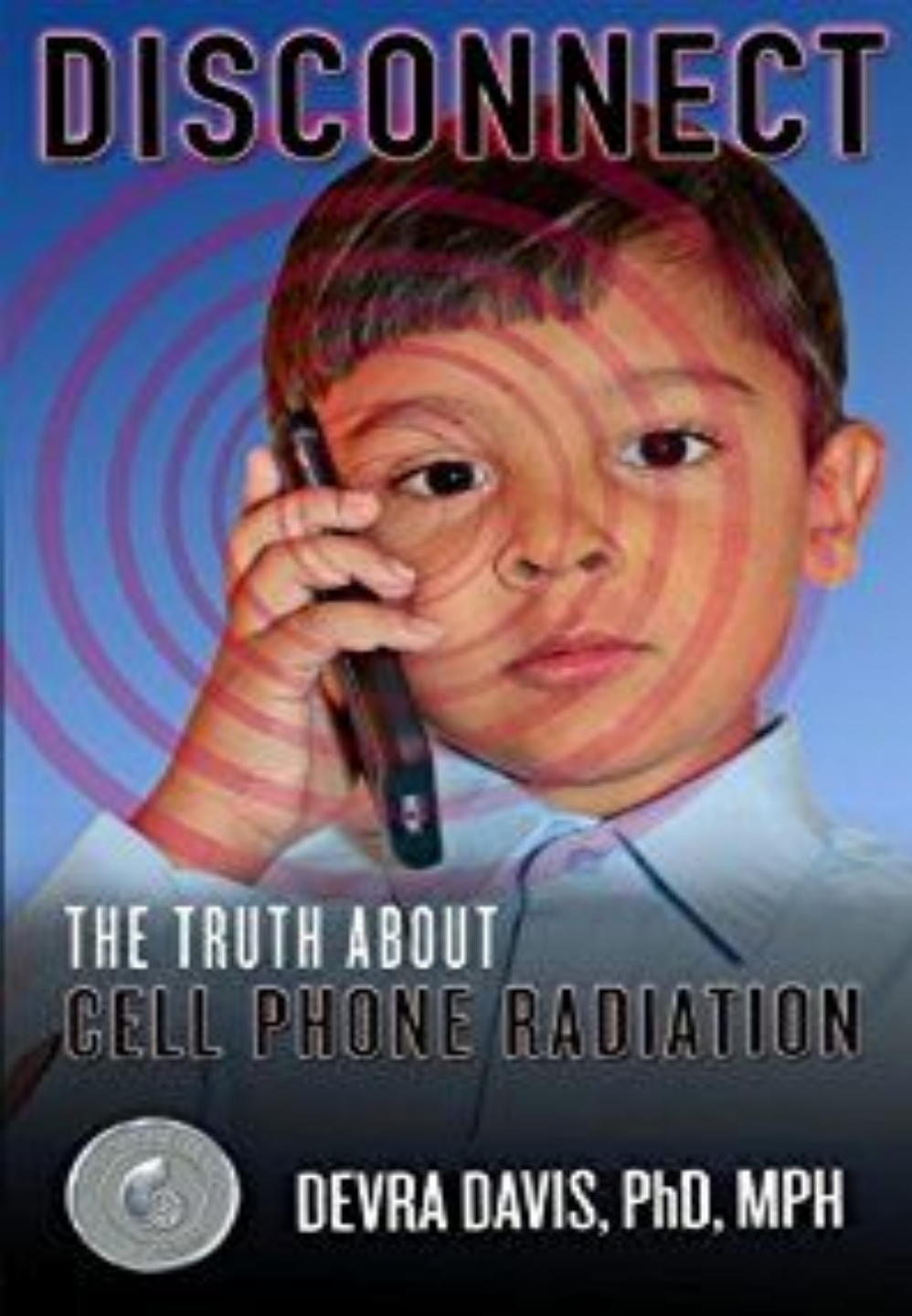
Massachusetts Breast Cancer Coalition  
September 13, 2022



# Devra Davis, PhD, MPH

- *President and Founder of the Environmental Health Trust*
- Visiting Professor of Medicine at the Hebrew University Hadassah Medical Center and the Ondokuz Mayıs University Medical School
- Founding Director of Center for Environmental Oncology, University of Pittsburgh Cancer Institute
- Member of Team Awarded Nobel Peace Prize with Al Gore 2007 for working on Climate and Health
- Founder of National Academy of Sciences Board on Environmental Studies and Toxicology
- Author of 220 scientific publications, 3 popular books

# DISCONNECT



THE TRUTH ABOUT  
CELL PHONE RADIATION

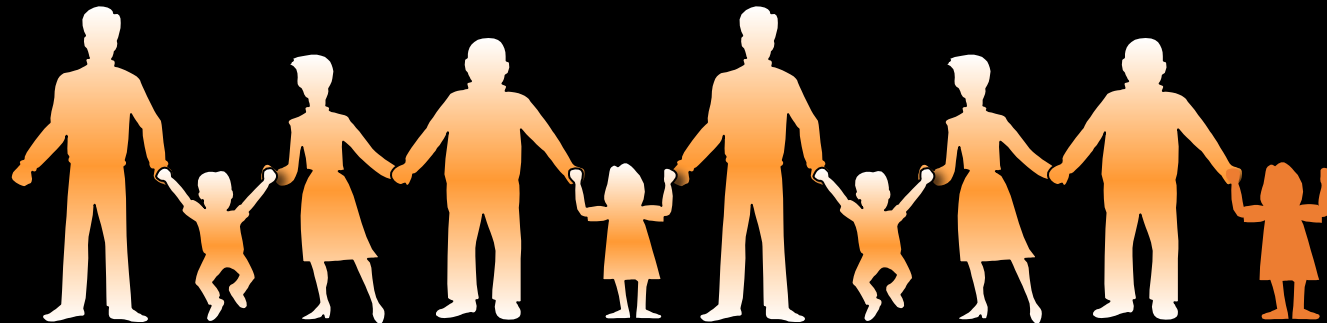
DEVRA DAVIS, PhD, MPH

- **Decades of research documented serious biological effects, 2010**
- **Government limits are quarter of a century old and not protective, 2021**  
*EHTrust et al v. FCC*

# Reasons why “environment” is a cause of cancer

Fewer than 1 in 10 cases of breast cancer arises in women born with genetic defects

National Cancer  
Institute

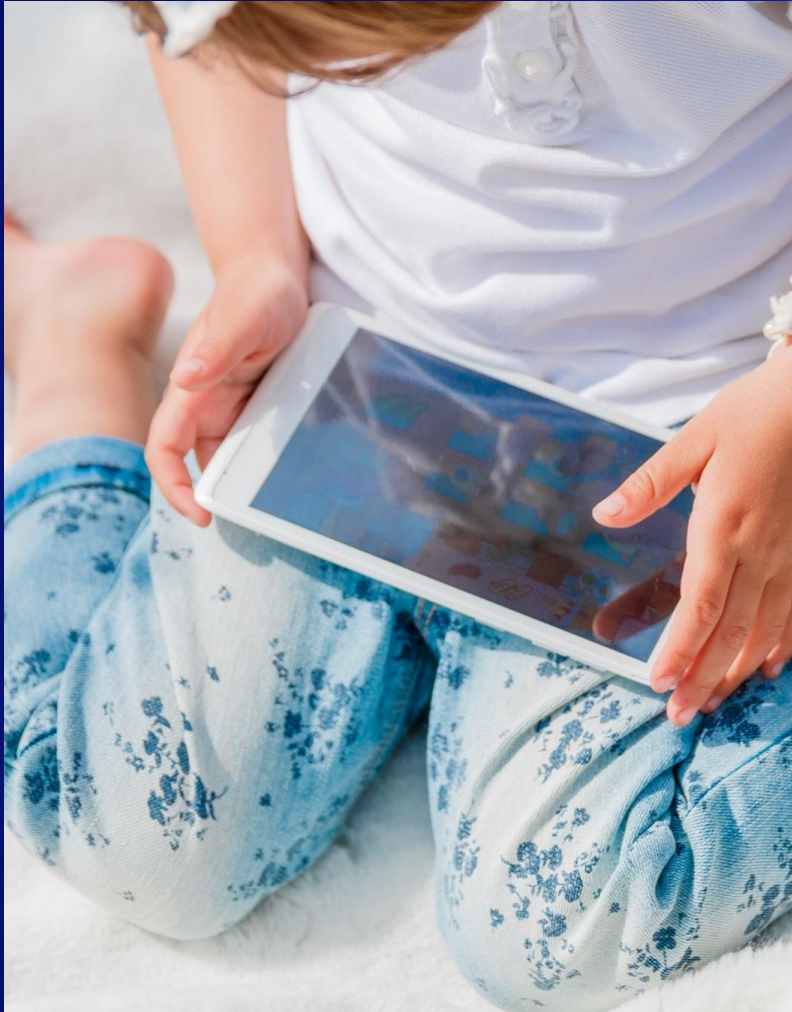




# Reasons why “environment” is a cause of cancer

- Cancer risk of adopted children mirrors that of their adopted (NOT their biologic) parents
- Fewer than half of identical twins get the same cancer
- Migrants develop risks of their new countries
- Workers have higher rates
- Patterns remain unexplained

# Wireless Radiation



- Microwaves at non heating levels
- Artificial not natural
- Information carrying waves
- Radiofrequency radiation
- Non Ionizing radiation
- Digital Pulsed waves

# Animal Carcinogens Cause Cancer in humans

- Every compound known to cause cancer in humans
- Also causes it in animals, when adequately studied.
- Therefore any animal carcinogen should be treated as a human carcinogen\*
- \*IBM Think Magazine, 1983
- NTP reports cellphone radiation clear cause of cancer and DNA damage in animals, 2018



## Cell Phone Radio Frequency Radiation Studies



### What did the studies find?

The NTP studies found that high exposure to RFR (900 MHz) used by cell phones was associated with:

- **Clear evidence of tumors in the hearts of male rats.** The tumors were malignant schwannomas.
- **Some evidence of tumors in the brains of male rats.** The tumors were malignant gliomas.
- **Some evidence of tumors in the adrenal glands of male rats.** The tumors were
- benign, malignant, or complex combined pheochromocytoma.

**NTP scientists found that RFR exposure was associated with an increase in DNA damage.** Specifically, they found RFR exposure was linked with significant increases in DNA damage in:

- the frontal cortex of the brain in male mice,
- the blood cells of female mice, and
- the hippocampus of male rats.

# Toxicologic Evidence on Causes of Cancer





# Electromagnetic Fields Affect Breast Cancer Risk

Experimental studies show that EMF interfere with melatonin production and the therapeutic impacts of Tamoxifen:

1. Growth inhibition of melatonin on MCF-7 human breast cancer cells in vitro (Harland & Liburdy 1997 & 1999)
2. Antiproliferative action of tamoxifen on MCF-7 cells disrupted

Epidemiological cross-sectional studies Clues to importance of melatonin

1. Blind women have half the risk of sighted women (Flynn-Evans et al, 2009)
2. Women who work at night(lower melatonin) have increased risk

-

# Induction of tamoxifen resistance in breast cancer cells by ELF electromagnetic fields

Article in Biochemical and Biophysical Research Communications · December 2005

DOI: 10.1016/j.bbrc.2005.08.243 · Source: PubMed

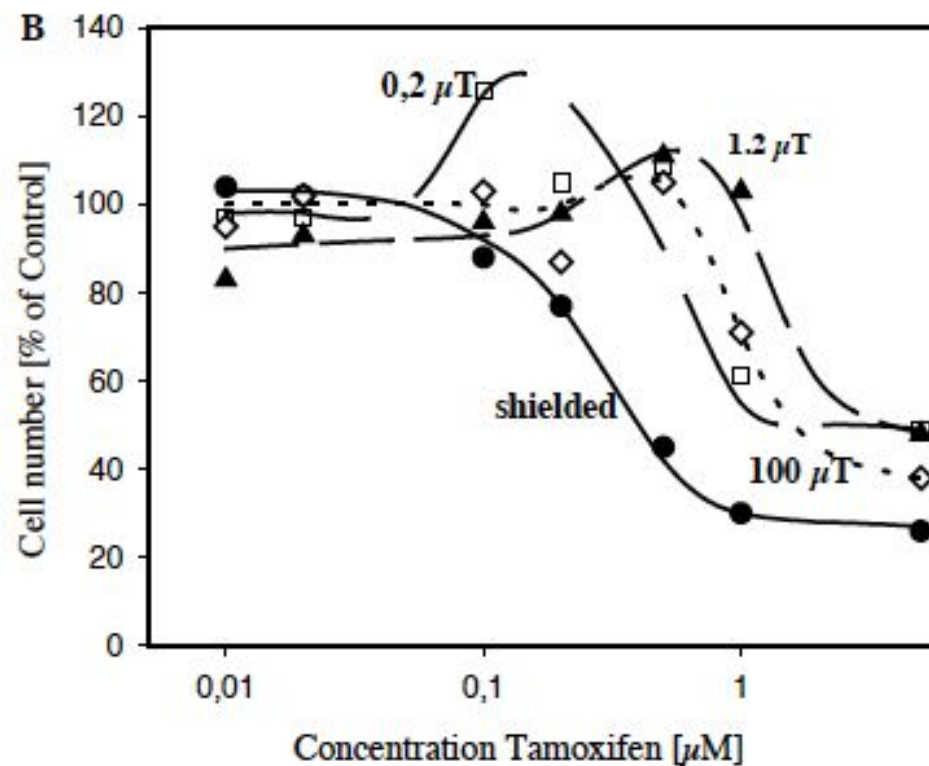
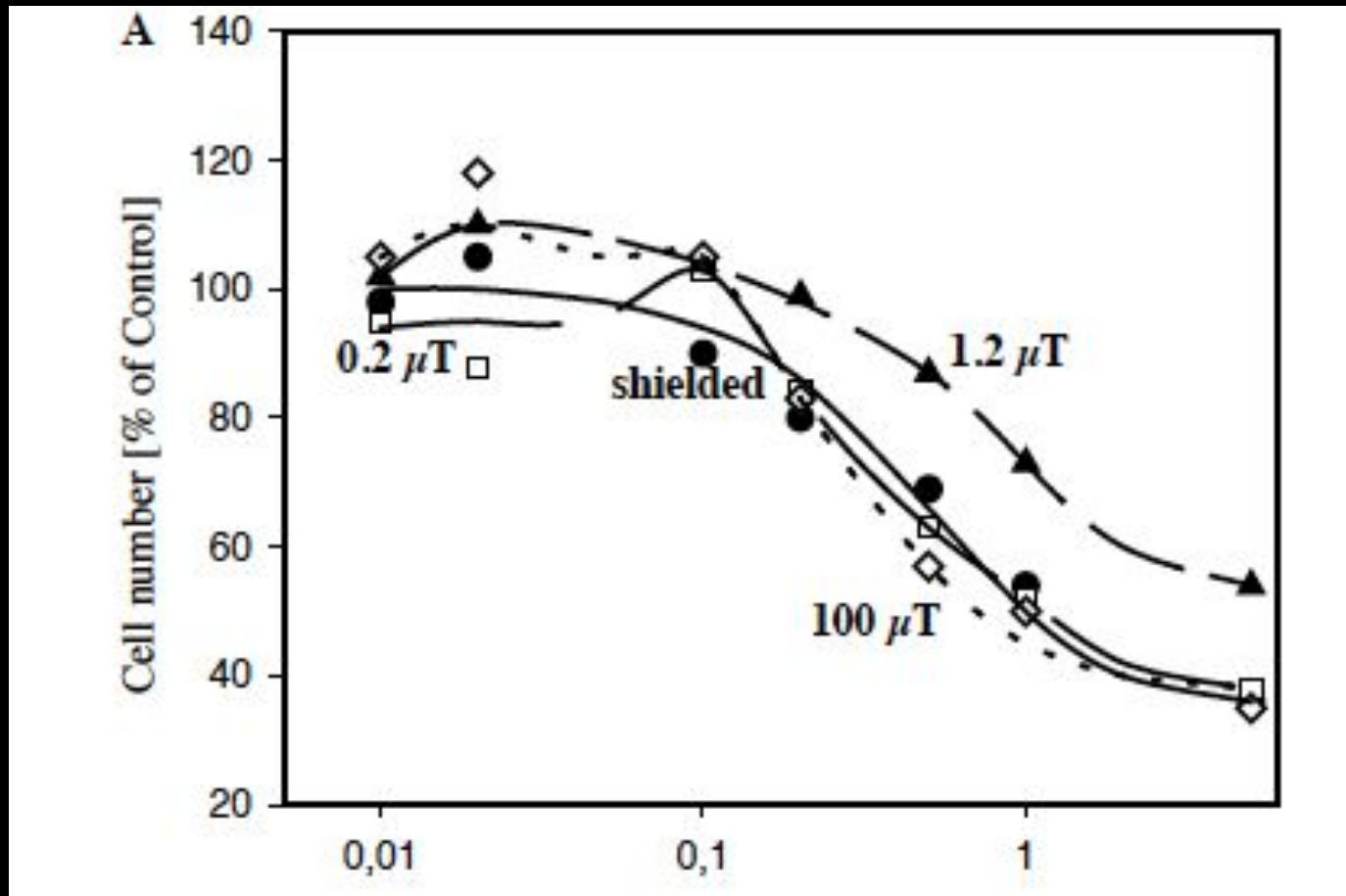


Fig. 1. Dose-response curves of tamoxifen at various intensities of 50 Hz electromagnetic fields. (A) Clone MCF-7 p40. (B) Clone MCF-7 p181.



# EMF reduces efficacy of Tamoxifen against breast cancer



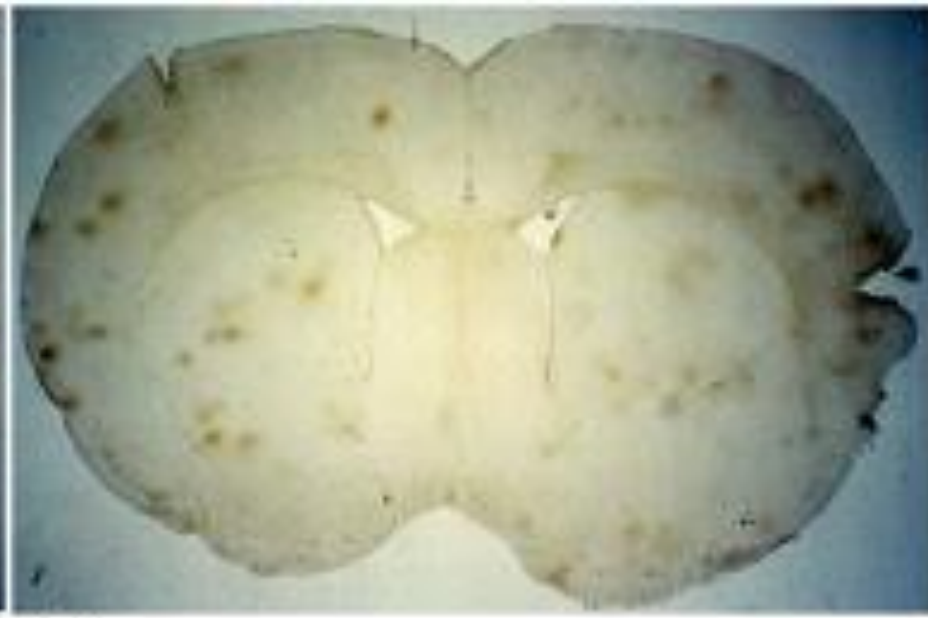
Rainer Gergert and Carsten Grundker, 2005)

# Microwaves Can Damage Blood Brain Barrier Permeability

Control



RF Exposed



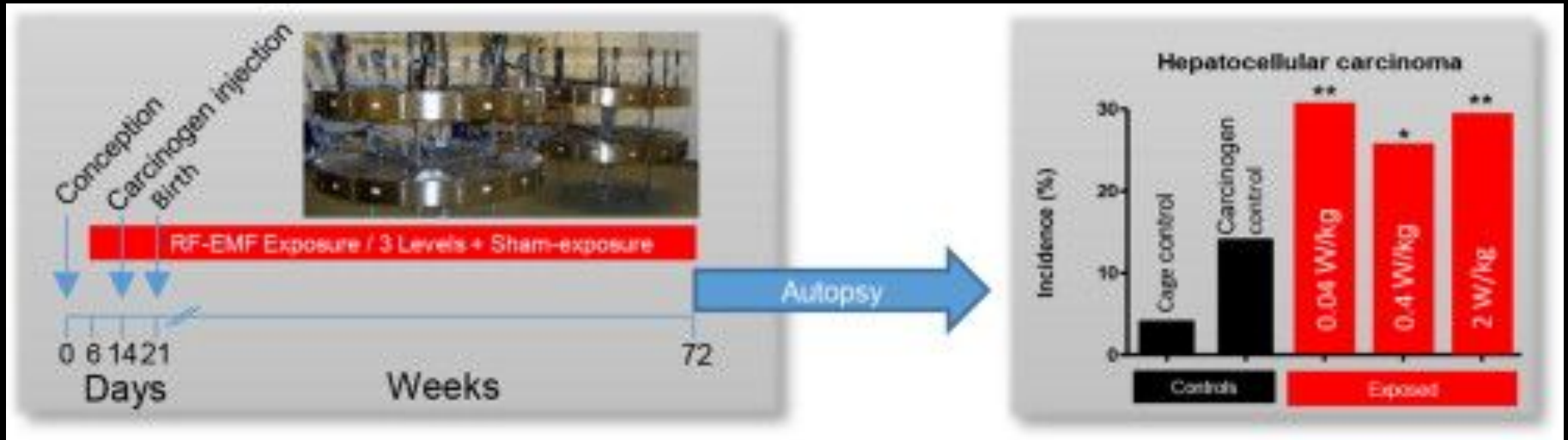
Dr. Leif Salford , 2009

Several Research Studies

Tang 2015, Nittby 2009, Nittby 2008, Belyaev 2006, Salford 1994,  
1975 Allan Frey-Annals of the New York Academy of Sciences

# RF Below Safety Limits Promotes Tumors

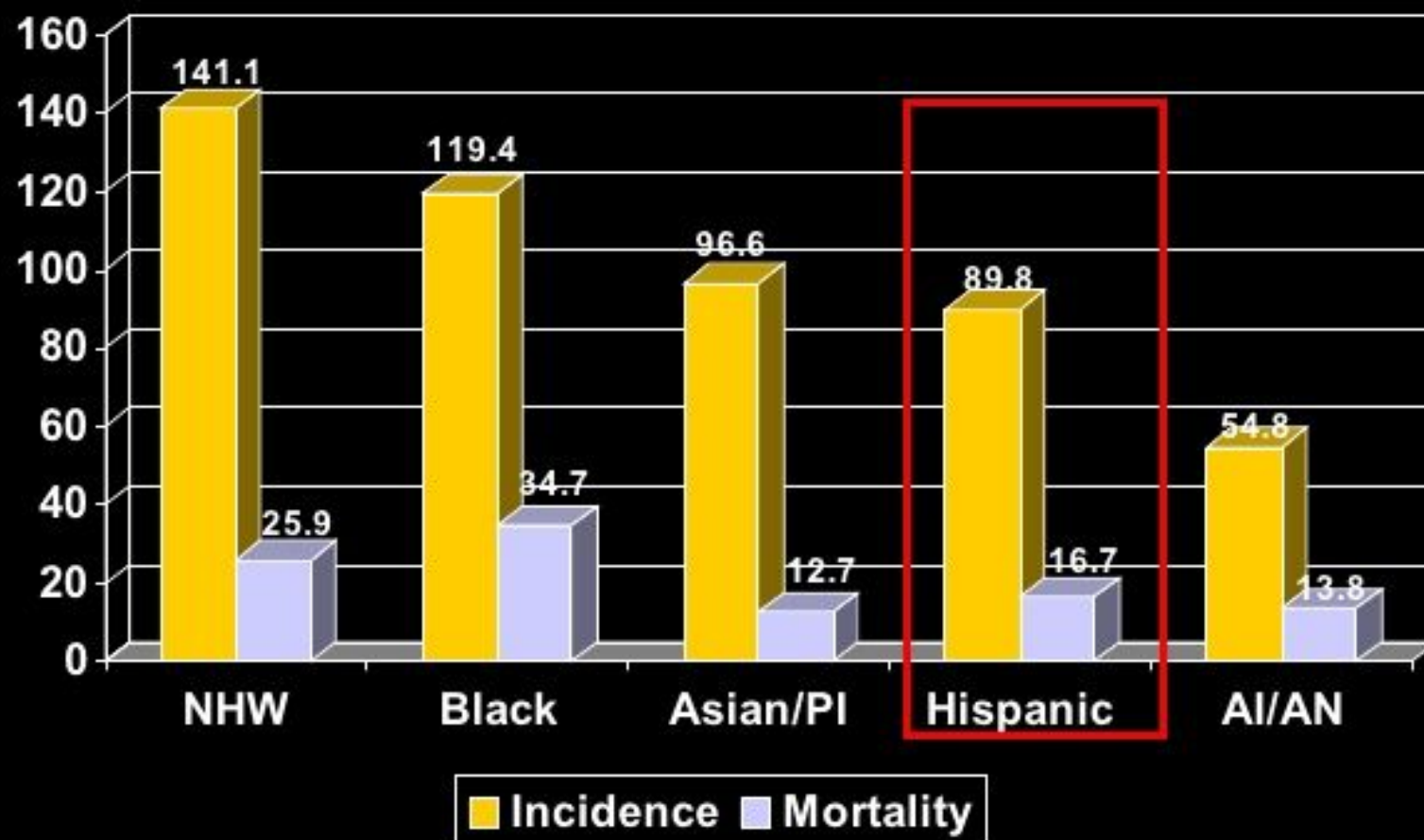
24/7 RF Exposure, in utero ENU (a replication study)



- Higher liver and lung tumors
- 2.5 fold increases in Lymphoma
- Nonlinear effect “may be due to metabolic changes”

*“Our findings may help to understand the repeatedly reported increased incidences of brain tumors in heavy users of mobile phones”*

# Female Breast Cancer Incidence and Death Rates\* by Race/Ethnicity, US 1998-2000



Age-adjusted rates per 100,000

Source: American Cancer Society, Surveillance Research, 2005

# Personal Risk Factors for Breast Cancer

Use of HRT or LATE  
MENOPAUSE

Early life  
RADIATION

ALCOHOL

Family  
HISTORY

LACK OF  
EXERCISE/obesity

LATE OR NO  
PREGNANCY

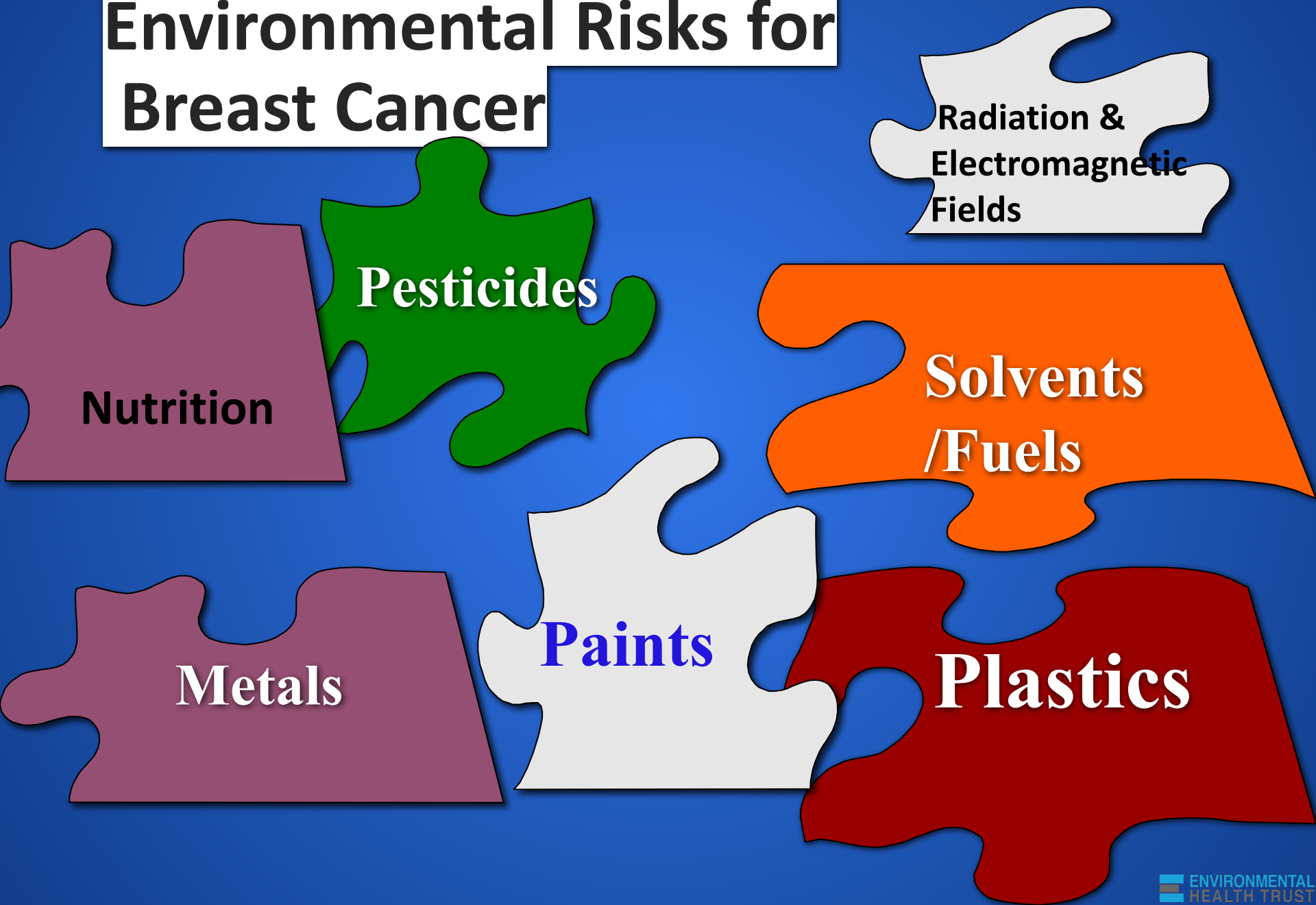
EARLY  
MENSES

*Higher Total Lifetime Exposure to  
Unbound Steroid Hormones Binding  
Globulin (SHBG)*



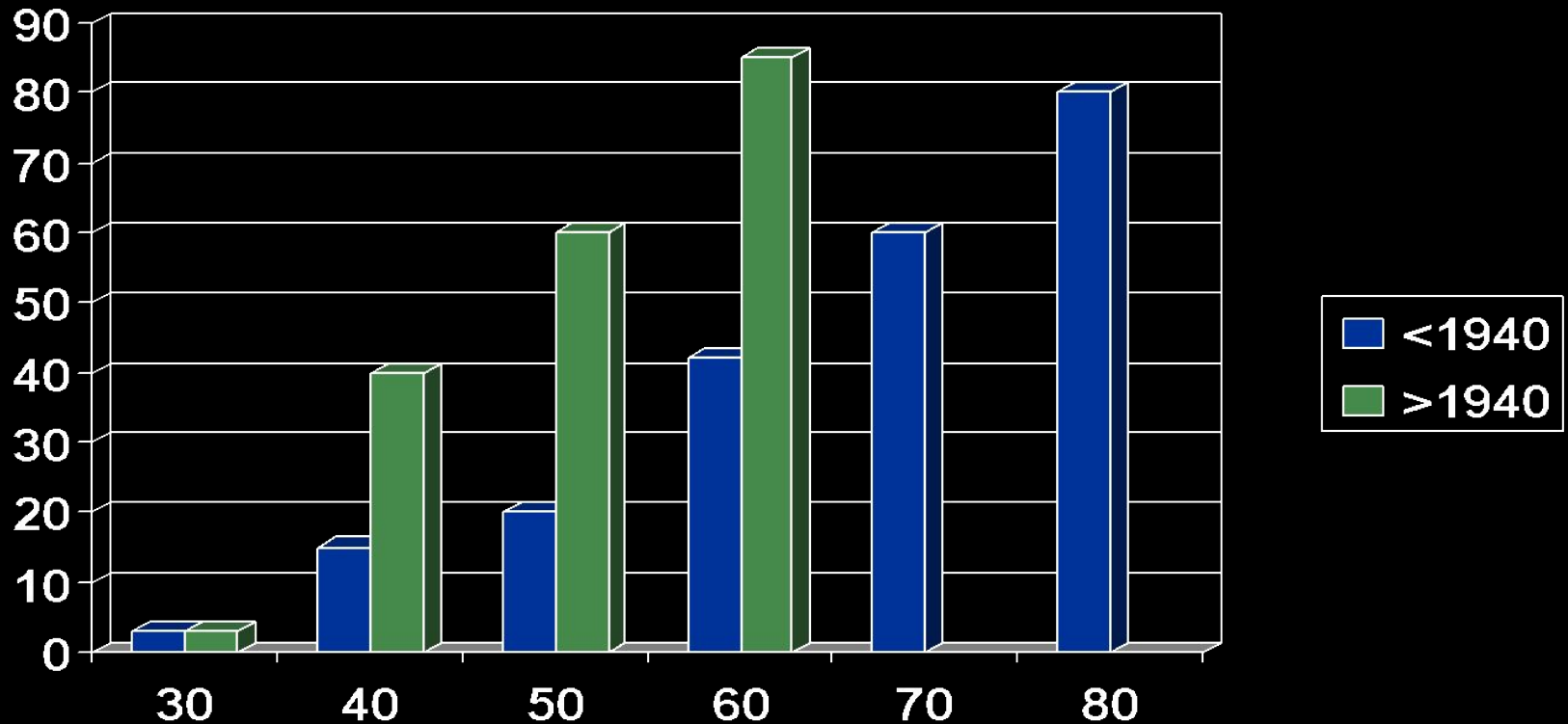
*Is the Common Link Between Most  
Known Risk Factors*

# Environmental Risks for Breast Cancer





# Cumulative Risk of Breast Cancer in BRCA1 carriers born before or after 1940 (M. King, 2003)



Cancer risk by age

# Jobs with increased risk of breast cancer

- Solvent workers
- Chemists
- Nurses/Dentists and Physicians
- Painters
- Hair Dressers



# Strengths and Limits of Human Studies

- Time trends allow comparisons between ethnic and racial groups
- Biomarker and/or genetic analyses suggest causal factors
- Cross-sectional/observational studies suggest hypothesis
- Case-control retrospective provide further refinement on causation

# Studying Humans Is Difficult

- People seldom know what they have been exposed to
- Breast cancer arises from prenatal, early-life and later-life exposures that cannot be easily measured at time of diagnosis
- Studying current levels or recent residues in cancer patients can be misleading — disease development affects storage of toxic compounds

# American Cancer Society Funded Study: Thyroid Cancer Increased Significantly with Regular Cell Phone Use in Certain SNPs, 2020

- **Luo and colleagues (2020) at Yale University case-control study found doubled risk of thyroid cancer in those using phones for 1+ hour a day who carried common Single Nucleotide Excisions (SNP) affecting DNA repair**

- [Luo 2020 "Genetic susceptibility may modify the association between cell phone use and thyroid cancer: a population based case-control study in Connecticut"](#)



A young woman with dark, curly hair is looking down at a white smartphone she is holding in her right hand. She is wearing a dark-colored shirt. The background is a soft, out-of-focus light brown color.

# Cell Phone Radiation Links to Cancer in Humans

Brain cancer  
Acoustic neuroma  
Thyroid cancer  
Breast cancer  
Rectal cancer?  
Leukemia?

For more information see:  
[Ehtrust.org](http://Ehtrust.org)



Cancer is the tip of the iceberg.

- DNA damage
- Memory/Brain damage
- Sperm/Reproduction damage
- Synergistic effects
- Headaches
- Oxidative Stress
- Bees and insects
- Trees



# Smartphone use linked to breast cancer risk (Shih et al, 2020)

Variable	Healthy Controls (N=894)	Patients with Breast Cancer (N=211)	AOR (95% CI)
People without smartphone addiction and smartphone use of $\leq 4.5$ min before night sleep	377 (42.2%)	56 (26.5%)	1.00
People with smartphone addiction and smartphone use of $\leq 4.5$ min before night sleep	437 (48.8%)	67 (31.8%)	1.04 (0.69~1.58)
People without smartphone addiction and smartphone use of $> 4.5$ min before night sleep	31 (3.5%)	22 (10.4%)	3.24 (1.62~6.44)
People with smartphone addiction and smartphone use of $> 4.5$ min before night sleep	49 (5.5%)	66 (31.3%)	6.88 (4.07~11.61)

**Note:** The AOR was adjusted for age, family history of breast cancer, educational level, placement of smartphone, and quality of sleep.

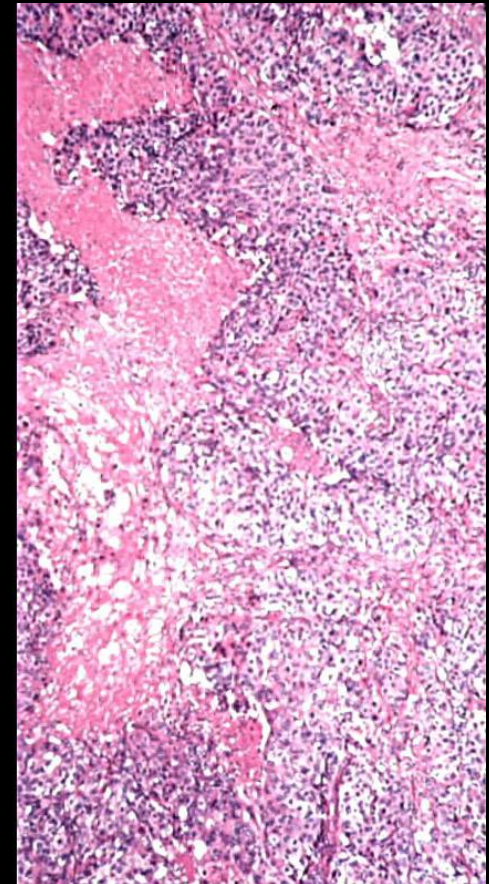
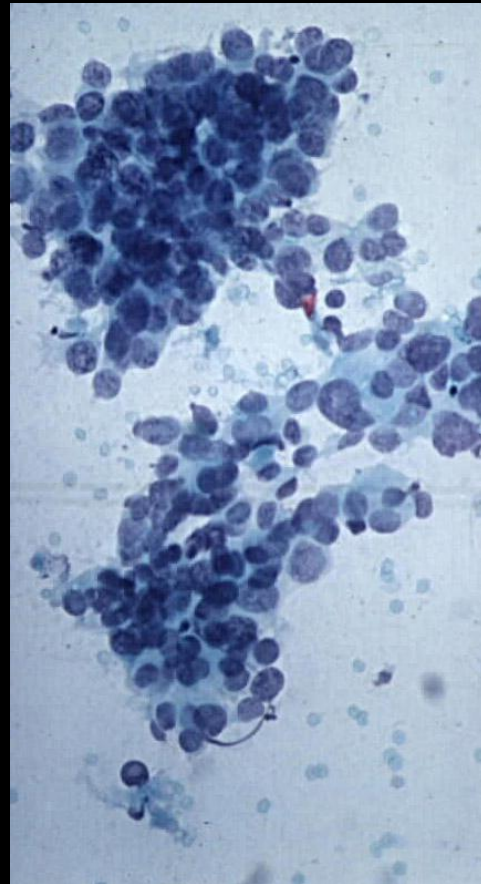
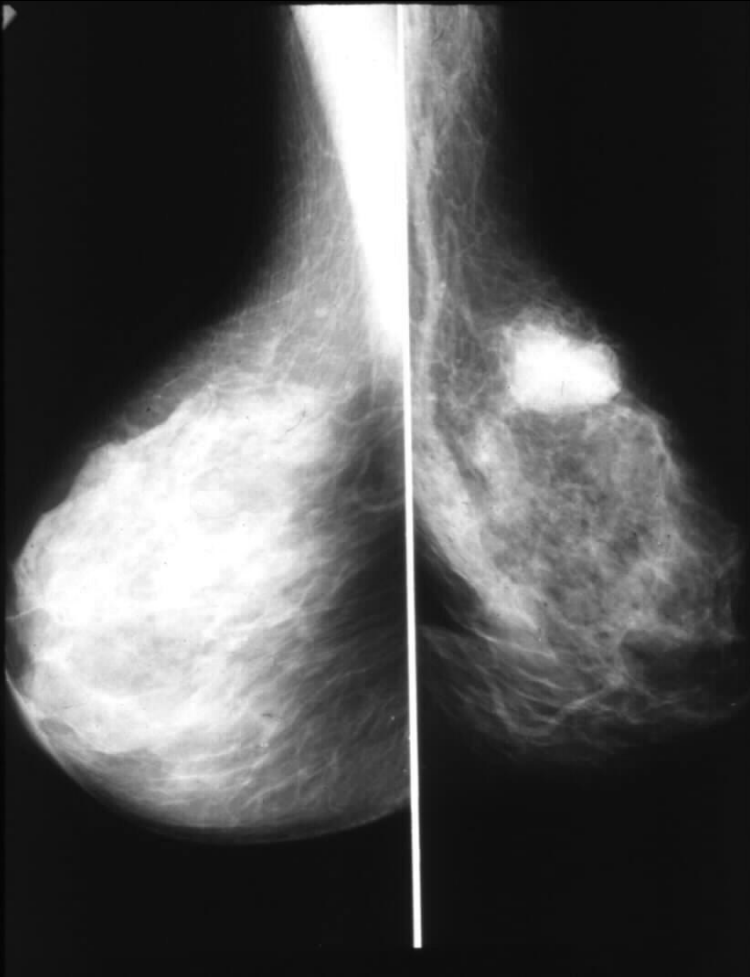
**Abbreviation:** min, minutes.

# Institute of Medicine Recommends Avoiding Unnecessary CT Scans

- The use of CT has increased five-fold over the last two decades and radiologists estimate that 30% or more of advanced imaging tests may be unnecessary
- “Because the radiation doses delivered by computed tomography (CT) imaging are high, women should reduce any unnecessary exposure to CT.”
  - Rebecca Smith-Bindman. “Findings from the Institute of Medicine report.” (2012)

# 56 yo female presents with firm mass

Chemist working with benzene for many years  
without a hood



# Risk of Breast Cancer Tied With Cell Phone Radiation



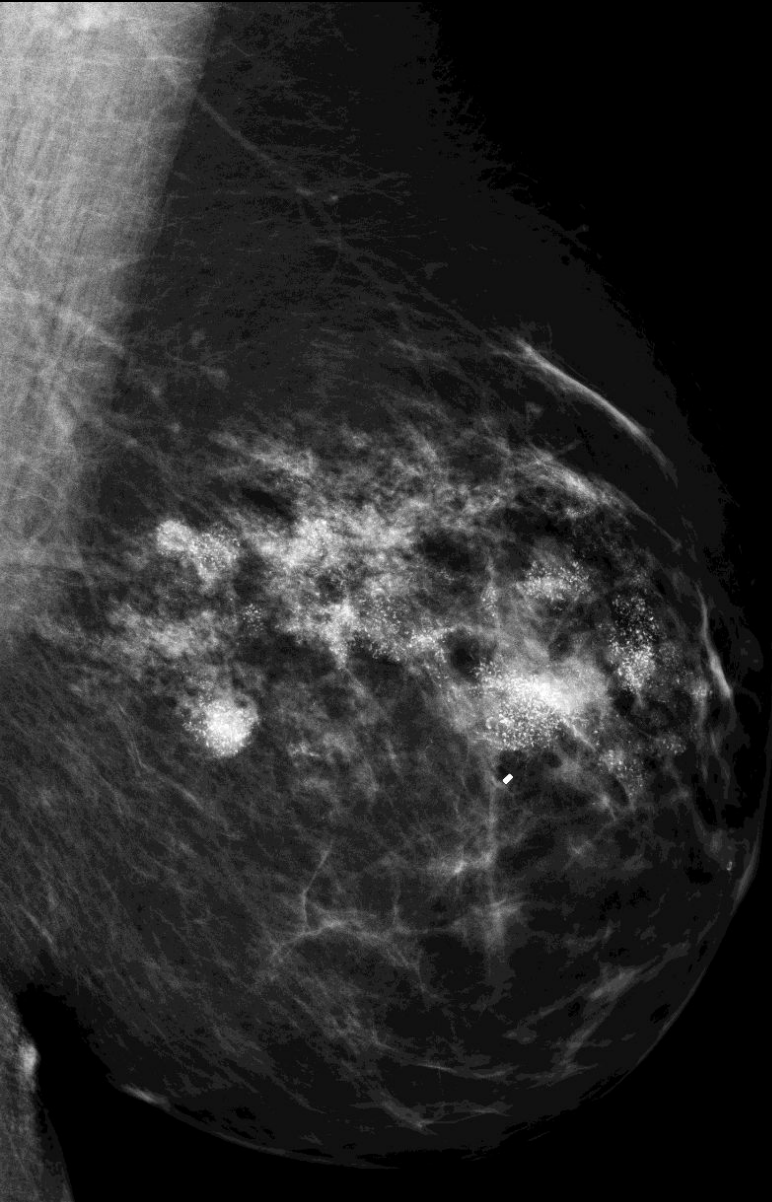
- The younger the breast the greater fluid and fat which equals greater microwave absorption.
- Published case reports of unusual breast cancers in young women with no family history.



# Latinas put phones in bras

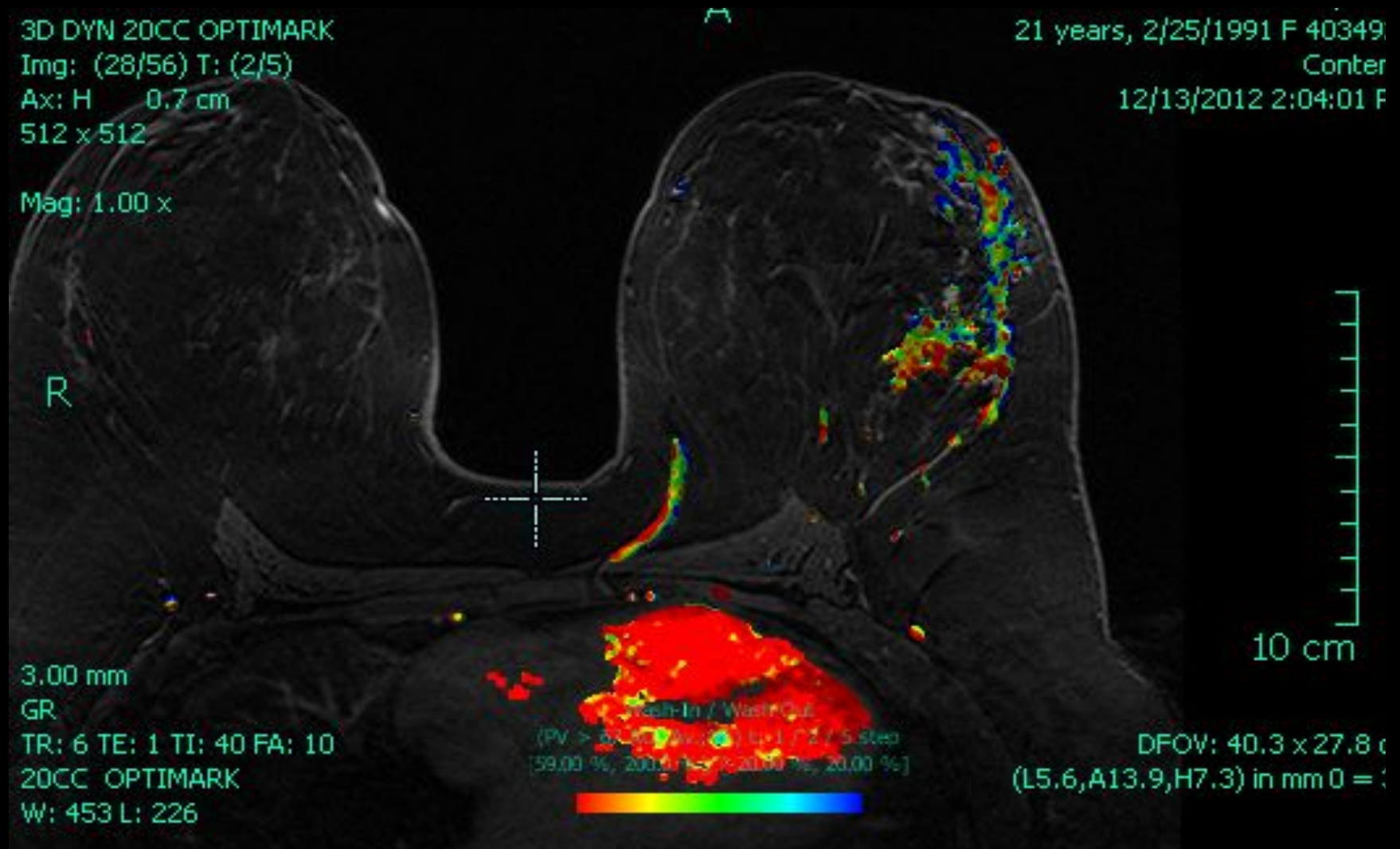


# First Case Report 2009



Invasive multiple  
primary tumors in 34  
year old, avid runner  
Chinese-American  
woman who used cell  
phone 4 hours a day in  
her bra for 10 years  
—reported by Robert  
Nagourney, MD, PhD

# Case Reports - 21 yr old multi-focal tumors tied with cellphones kept in bra





# 2017 CBC Report: Exposure Levels Exceed Limits When Tested Against the Body

LINK TO WATCH YOUTUBE on CBC [https://www.youtube.com/watch?v=Wm69ik\\_Qdb8](https://www.youtube.com/watch?v=Wm69ik_Qdb8)



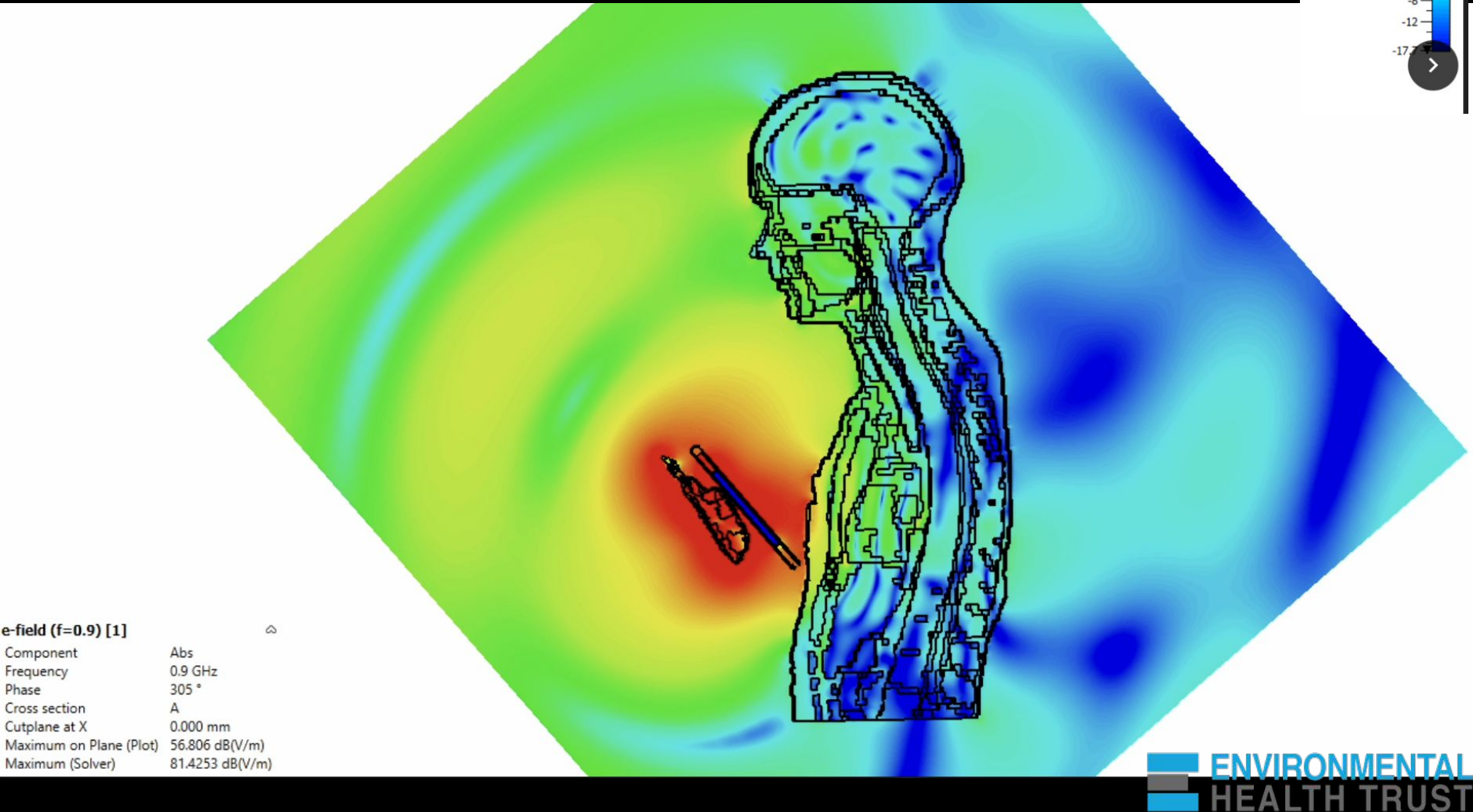
# RF Exposure Modeling From a Cell Phone In Front of the Body

Image: Claudio Fernandez 2022

## Environmental Health Trust

[Link to Youtube Playlist of Scientific Imaging of RF Exposures](#)

<https://www.youtube.com/watch?v=FRPnXsEVGUY&list=PLT6DbkXhTGoDBB44rZNJGihs-rPonU-Re>



# Impacts to Adolescents' Memory Performance Associated With Brain Dose of Microwave Radiation from Wireless Communication

*Foerster et al. 2018 in Environmental Health Perspectives*



- 895 adolescents 12 and 17 years
- Modeled RF-EMF doses into brain
- Testing before/after one year of cell phone use.
- Decreased figural memory scores in association with increase in estimated cumulative RF-EMF brain dose
- Replicated findings of earlier 2015 study.



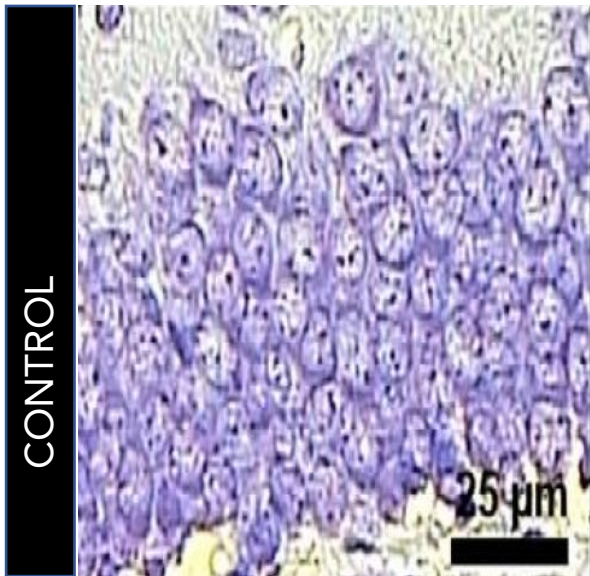
# Effects of electromagnetic fields on neuronal ion channels: a systematic review.

[Bertagna et al 2021 in Annals of the New York Academy of Sciences](#)



- A significant correlation between EMFs and multiple changes in the electrophysiological properties of diverse neuronal tissues.
- Neuronal ion channels are particularly affected and differentially modulated by EMFs at multiple levels dependent on different parameters (type of field, cell or tissue.)

# RF Radiation and the Developing Brain

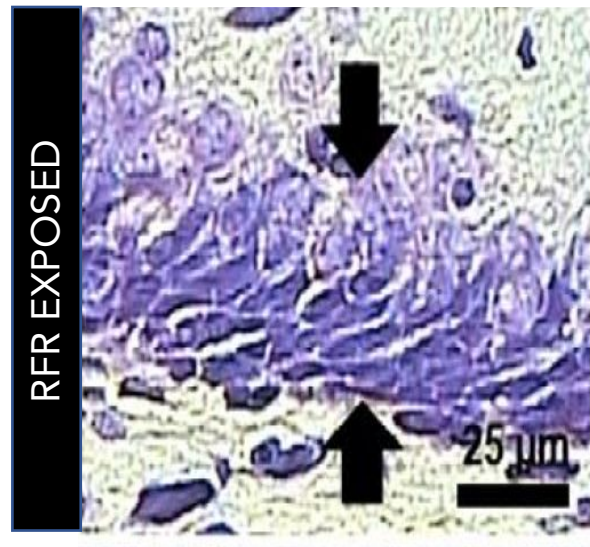


## STUDIES IN ADULTS

**Fewer hippocampal granular cells in the dentate gyrus (DG) of newborn rats following prenatal 900 MHz EMF exposure.**

(Image) [Odaci, Bas & Kaplan et al, 2008](#)

**Studies finding decreased and damaged brain cells in animals exposed as adults and prenatally** ([Suleyman et al, 2016](#), [Sonmez et al 2010](#), [Bas et al.2009](#), [2009](#))



## STUDIES IN HUMANS

**Behavioral problems after pre/post natal cell phone use.**

**University of California School of Public Health** ([Divan et al., 2008](#), [2012](#)).

**Hyperactivity/inattention problems in child after higher prenatal exposure** ([Birks et al., 2017](#))



# 2022 South Carolina RF Measurement Study

Found RF hotspots and elevated RF exposures to people

*When antennas were mounted close to ground on utility poles exceeded standards (Koppel and Hardell)*

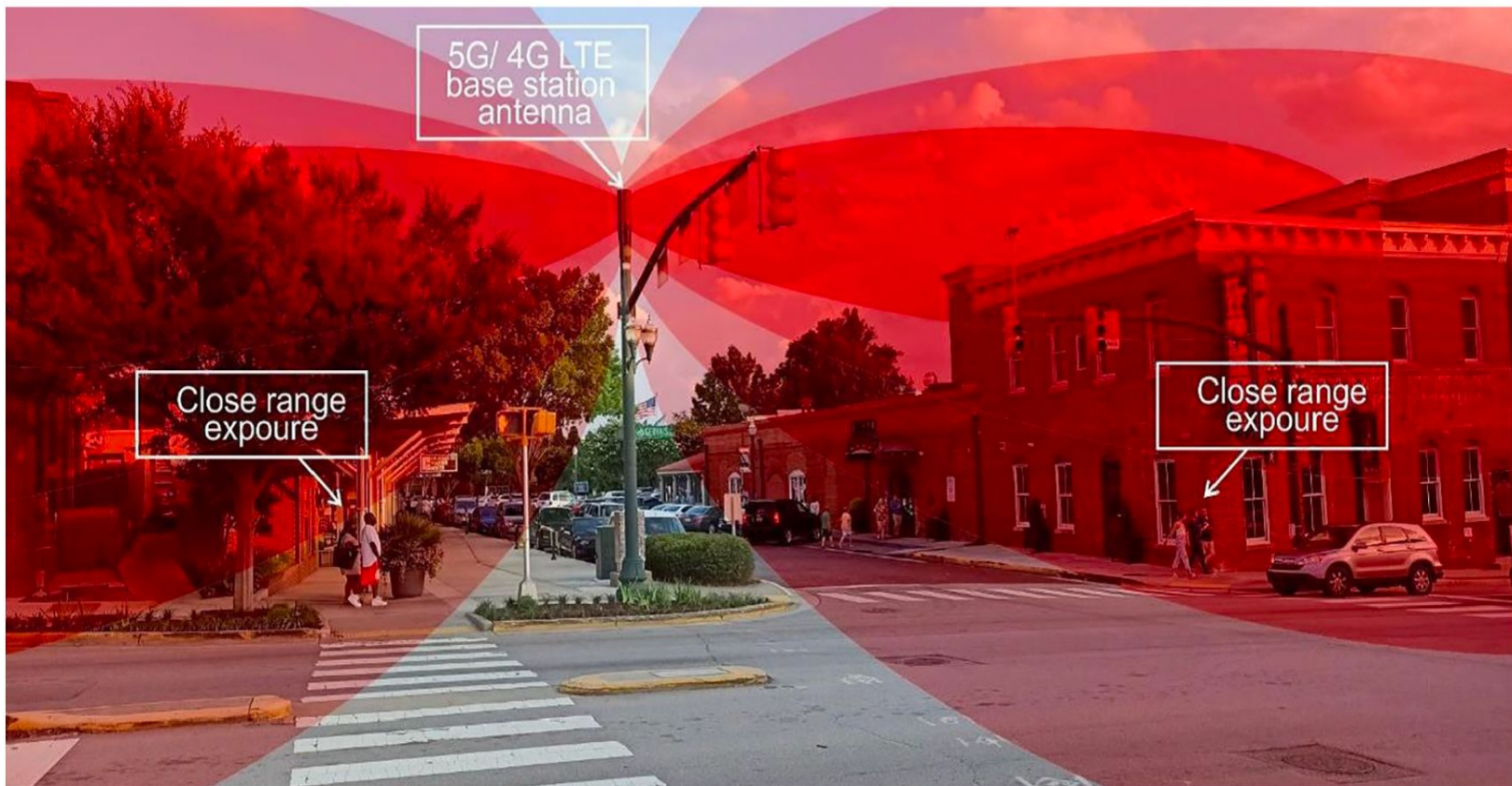


Figure 7. Gervais Street: Cell phone base station antenna placed close to street level and causing high exposure to pedestrians and nearby café visitors (exposure scenario illustration). The antenna appears camouflaged and seemingly part of a utility pole. The measurer only discovered the antenna due to the high radiofrequency levels in the vicinity.

*Measurements of radiofrequency electromagnetic fields, including 5G, in the city of Columbia, South Carolina, USA*

TARMO KOPPEL<sup>1,3</sup> and LENNART HARDEL WORLD ACADEMY OF SCIENCES JOURNAL 4: 23, 2022



NEWS ITEM: ESTROGEN-IMITATING  
CHEMICALS IN THE  
ENVIRONMENT SUSPECTED  
OF WIDE-RANGING  
BIOLOGICAL ANOMALIES

(INCLUDING  
HERMAPHRODISM  
IN ANIMALS  
AND LOWER  
SPERM  
COUNTS IN  
HUMAN  
BEINGS)

We in the business  
community prefer  
a cautious  
'wait-and-see'  
approach over  
needless media  
scare-mongering...



# Better Safe than Sorry . . . .

**Eat low on the food chain**

**Reduce your fat**

**Exercise daily**

**Stop using toxic cleaning products**

**Don't drink heavily**

**Avoid unnecessary x-rays**

**Limit pesticide use**

**Limit use of cordless cell phones**

**Don't keep cell phone in bra or on body**

**Do NOT microwave or heat food in plastic**

**Nick Naylor doesn't  
hide the truth...  
he filters it.**



**THANK YOU  
FOR SMOKING**

Based on the best-selling novel

[illegible]

© 2006 Twentieth Century Fox Film Corporation. All Rights Reserved.

**ENVIRONMENTAL  
HEALTH TRUST**



# Truth is Stranger Than Fiction

- “Gentlemen, practice these words in front of the mirror: Although we are constantly exploring the subject, currently there is no direct evidence that links cell phone usage to brain cancer.”



"Give your throat a vacation..."

# Smoke a **FRESH** cigarette"

**I**f the cigarette you have been smoking stings or burns your throat, switch to Camels and see the difference.

It's the peppery dust left in tobacco by inefficient cleaning methods that makes you cough.

It's the unkindly hot smoke of harsh, dried-out tobacco that burns and irritates your throat.

There is no peppery dust in Camels—that's whisked away by a special vacuum-cleaning process.

There are no stale, crumbly, parched tobaccos—the fine Turkish and mild Domestic tobaccos of which Camels are blended come to you in prime, factory-fresh condition, thanks to the Humidor Pack.

This scientific germ-safe wrapping—not plain ordinary Cellophane, but moisture-

proof Cellophane which costs nearly twice as much—seals in all the natural aroma and freshness, seals it so tightly that wet weather cannot make Camels damp, nor drought weather make them dry.

Camels are milder and more throat-friendly because they are dust-free and fresh.

Give your throat a vacation, switch to Camels for just one day. Then leave them—if you can.

There is a CAMEL GUARANTEE HERE! Guarantee: No Harm, No Injury and Every Way—Camel's Moisture-Proofing Process. No Harm, No Injury. Camels are fresh.



# CAMELS

SMOKE ... NO CIGARETTE AFTER-TASTE



**D**on't remove the moisture-proof wrapping from your package of Camels after you open it. The Humidor Pack is protection against dust and germs. In offices and homes, even in the dry atmosphere of artificial heat, the Humidor Pack delivers fresh Camels and keeps them right until the last one has been smoked.



# Fine Print Warnings

10

## READING THE FINE PRINT

We can't always trust our co-ways know good advice when it in a well-informed way, I t least a bit in that direction.

For more than three centuries work as actuaries have predicted catastrophes will take place insurance companies make money go broke. On some level insurers pay a premium hoping that they ever you are insuring against actu

likely. Take frequent breaks and if you have discomfort during or after each use, stop use and see a physician.

**Potentially Explosive Atmospheres** Turn off iPhone (press and hold the Sleep/Wake button, and then slide the power slider when in any area with a potentially explosive atmosphere. Do not charge iPhone, and obey all signs and instructions. Sparks in such areas could cause an explosion or fire, resulting in serious injury or even death.

iPhone with a potentially explosive atmosphere on offer, but not always. Rapidly moving thermal areas may include heating areas (such as gas stoves), below deck on boats, hot or chemical transfer or storage, or other areas where there are volatile chemicals or particles (such as grain, dust, or metal powders) and any other area where you would normally be prohibited from using your vehicle engine.

**Using Connectors and Ports** Never force a connector into a port. Check the connectors on the ports. If the connector and port don't fit, stop use. If the connector and port don't fit, stop use. If the connector and port don't fit, stop use. If the connector and port don't fit, stop use.

**Frequency Within Acceptable Temperatures** iPhone is designed to be used in temperatures between 32° and 95° F (0° and 35° C). Use in temperatures outside this range may affect performance. Use in temperatures outside this range may affect performance. Use in temperatures outside this range may affect performance.

When people using iPhone or charging the battery, it is normal for iPhone to get warm. The amount of iPhone becomes a slapping surface that reflects heat from inside the unit to the outside of the unit.

series of Japan, the European Union, and other countries. The exposure standard employs a unit of measurement known as the specific absorption rate, or SAR. The SAR limit applicable to iPhone set by the FCC is 1.6 watts per kilogram (W/kg). 1.6 W/kg by industry Canada, and 2.0 W/kg by the Council of the European Union. Tests for SAR are conducted using standard operating positions (i.e., at the ear and worn on the head) specified by these agencies, with iPhone transmitting at its highest certified power level in all tested frequency bands. Although SAR is determined at the highest certified power level in each frequency band, the actual SAR level of iPhone while in operation can be well below the maximum value because iPhone adjusts its cellular transmitting power based in part on proximity to the wireless network. In general, the closer you are to a cellular base station, the lower the cellular transmitting power level.

Frequency Band	Body	Head	FCC & IC SAR Limit (W/kg)
USA 800	1.1	1.6	1.6
USA 1900	0.43	1.2	1.6
USA 1900	0.43	1.2	1.6
USA 1900	0.43	1.2	1.6
USA 1900	0.43	1.2	1.6
USA 1900	0.43	1.2	1.6
USA 1900	0.43	1.2	1.6
USA 1900	0.43	1.2	1.6
USA 1900	0.43	1.2	1.6
USA 1900	0.43	1.2	1.6

Frequency Band	Body	Head	EU SAR Limit (W/kg)
EU 800	0.74	0.66	2.0
EU 1900	0.28	0.59	2.0
EU 1900	0.28	0.59	2.0
EU 1900	0.28	0.59	2.0
EU 1900	0.28	0.59	2.0
EU 1900	0.28	0.59	2.0
EU 1900	0.28	0.59	2.0
EU 1900	0.28	0.59	2.0
EU 1900	0.28	0.59	2.0
EU 1900	0.28	0.59	2.0

John Graunt created the tools that eventually allowed people to understand just how to predict the occurrence of natural or human-made disasters, whether from smoke and fires or floods. I wrote about him ten years ago and his relevance still hits me about once a week. Graunt was a master of assembling and making sense of ordinary information. He laid the foundation for the ways of categorizing, counting, and rendering facts and figures that would later change the way people thought about the connections between health and the surrounding world. In 1662, Graunt published a short book, *Natural and Political Observations Made Upon the Bills of Mortality*, that summed up his years of sorting and analyzing who died, where, when, and how.

to provide the government and church with policy, whether that required counting men or new surviving babies. organized people by sex, state, age, religion, and how and where they died and what caused their deaths by "cancer, dog bites, drownings, fever, head-mould, rupture, scurvy, dropping of the stomach, stangury, teeth, box [the British term for syphilis], smallpox" were recorded weekly. He reported on the deaths of males and females. He profited from his tabulations is not clear. Though at least five editions. It showed that it was on the basis of a few facts about a person's life that they would live and the likelihood that

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# Fine Print Warnings (iPhone 4)

For optimal mobile device performance and to be sure that human exposure to RF energy does not exceed the FCC, IC, and European Union guidelines, always follow these instructions and precautions: When on a call using the built-in audio receiver in iPhone, hold iPhone with the dock connector pointed down toward your shoulder to increase separation from the antenna. When using iPhone near your body for voice calls or for wireless data transmission over a cellular network, keep iPhone at least 15 mm (5/8 inch) away from the body, and only use carrying cases, belt clips, or holders that do not have metal parts and that maintain at least 15 mm (5/8 inch) separation between iPhone and the body.

iPhone's SAR measurement may exceed the FCC exposure guidelines for body-worn operation if positioned less than 15 mm (5/8 inch) from the body (e.g., when carrying iPhone in your pocket).

# Berkeley California

## Cell Phone Right To Know Ordinance

“If you carry or use your phone in a pants or shirt pocket or tucked into a bra when the phone is ON and connected to a wireless network, you may exceed the federal guidelines for exposure to RF radiation. ~~This potential risk is greater for children.~~”



# Samsung Galaxy Z Fold3 5G



“Body-worn SAR testing has been carried out at a

**separation  
distance of 1.5 cm.**

To meet RF exposure guidelines during body-worn operation, the device should be positioned at least this distance away from the body. “

-Samsung Galaxy Z Fold 3 5G SAR Info **SM-F711U** on SamSung Site

# Apple iPhone 13



“iPhone is evaluated in positions that stimulate uses against the head, with no separation, and when worn or carried against the torso of the body, with

**5 mm** separation...To reduce exposure to RF energy, use a hands-free option, such as the built-in speakerphone, headphones or other similar accessories.”

-Apple iPhone 13 RF Exposure



# Nanit Baby Monitor



“This device must be installed to provide a separation distance of **at least 20 cm from all persons** and must not be co-located or operating in conjunction with any other antenna or transmitter”

[Nanit Baby Monitor Manual](#)

# Lollipop Smart Baby Camera



"FCC Radiation Exposure  
Statement

This equipment should be  
installed and operated with

minimum distance **20**

**centimeters**

between the radiator and  
your body."

Lollipop Smart Baby Camera  
User Manual

FCC Masterwork Aoitek Tech Lollipop Pro Baby  
Camera CABC-LOL03 FCC ID 2AE92CABC-LOL03

<https://www.lollipop.camera/>





# STUDENT GUIDE: CELL PHONES, WIRELESS, AND YOUR HEALTH

**Massachusetts Breast Cancer Coalition Education**  
 “Lets Talk Prevention” educational modules have been developed on cell phone radiation for high school, middle school, and elementary. [Go to MBCC Let's Talk Prevention Classroom Modules](https://mbcc.org/lets-talk-prevention-actions-you-can-take-student-modules/) and download for Module 3 on Cell Phones  
<https://mbcc.org/lets-talk-prevention-actions-you-can-take-student-modules/>



## >>> What policies are in place by governments?

Over a dozen countries such as India, Russia, France, Belgium, Cyprus and Israel have issued clear recommendations to reduce RF exposure from cell phones. India, France and Korea label phones with their cell phone radiation levels. Many countries have policies in place to reduce exposures to children in schools. However US agencies only give the public two tips to reduce exposure “if you are worried.”

In the United States, the City of San Francisco passed a 2010 law to inform people how to reduce cell phone radiation. The law would make stores share information whenever someone went to buy a phone at a store. The wireless industry sued the City and halted implementation of the law but the City still has a website with information on how to reduce cell phone exposure. The City of Berkeley passed a similar law in 2015 and again, the Wireless Industry sued and took it to the Supreme Court. Some towns like Pembroke Pines Florida and Jackson Hole Wyoming passed cell phone proclamations to raise awareness about the issue.

## >>> How can we decrease exposure to radiofrequency radiation?

The American Academy of Pediatrics, California Department of Health, Maryland Council on Children's Environmental Health, Connecticut Department of Health, and several international medical organizations such as the Vienna Medical Association, Athens Medical Association and the International Society of Doctors for the Environment all recommend reducing exposure to radiofrequency radiation.

## >>> Recommendations to Reduce Exposure to Cell Phone Radiation

- Use cell phones in speaker mode or with the use of airtube headset.
- Keep phone at a distance from your head and body as general rule of thumb.
- Avoid carrying your phone against the body like in a pocket, sock, or bra. Cell phone manufacturers can't guarantee that the amount of radiation you're absorbing will be at a safe level.
- If you plan to watch a movie on your device, have movies pre-downloaded rather than streaming. Prefer wired computers to watch movies and do social media.
- Keep an eye on your signal strength (i.e. how many bars you have). The weaker your cell signal, the harder your phone has to work and the more radiation it gives off.
- Avoid making calls in cars, elevators, trains, and buses. The cell phone works harder to get a signal through metal, so the power level increases.
- Children should be given toys, not cell phones to play with.
- Make only short or essential calls on cell phones.
- Stop sleeping with your phone or wireless device.
- Turn the phone on airplane mode if you need to use your phone as an alarm clock.
- Use a hardwired cabled (not wireless) mouse, speaker, printer and keyboard with your computer.
- Turn Wi-Fi off and unplug wireless devices at night or when not in use.
- Hard-wire devices in your home that connect to the internet whenever possible.
- Use corded phones (with a curly cord from headset to base) instead of cell phones/ home cordless phones whenever possible, especially for your long voice calls.
- Remove screens and electronics from the bedroom for a healthier sleep.
- Educate your elected officials for policy changes that inform and protect the community.

# Environmental Health in Nursing

## 2<sup>nd</sup> Edition



## Alliance of Nurses for Healthy Environments Textbook of Environmental Health in Nursing 2nd Edition

Chapter on Cell  
Phone, Cell Tower and  
Wi-Fi Radiation and  
Electromagnetic  
Fields.

<https://envirn.org/e-textbook/>

### Editors:

Ruth McDermott-Levy, PhD, MPH, RN, FAAN  
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Adelita G. Cantu, PhD, RN, FAAN



# All Wireless Devices Emit Radio Frequency Radiation

## Microwave Radiation



Wireless  
Phones



Tablets



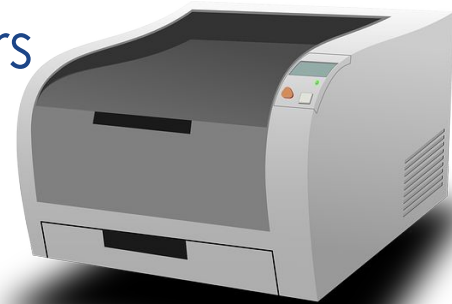
Laptops

Video Game  
Consoles



Computers

Wi-Fi  
Printers



Wi-Fi Router  
Access Points



# International Agency for Research on Cancer

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World Health  
Organization

PRESS RELEASE  
N° 208

31 May 2011

## 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 cancer<sup>1</sup>, associated with wireless phone use.

This classification applies to all RF-emitting devices, including WiFi.

- Robert A. Baan, PhD, IARC



Contents lists available at ScienceDirect

## Environmental Research

journal homepage: [www.elsevier.com/locate/envres](http://www.elsevier.com/locate/envres)



# Cancer epidemiology update, following the 2011 IARC evaluation of radiofrequency electromagnetic fields (Monograph 102)<sup>☆</sup>

Anthony B. Miller<sup>a,\*</sup>, L. Lloyd Morgan<sup>b</sup>, Iris Udasin<sup>c</sup>, Devra Lee Davis<sup>d,e</sup>

<sup>a</sup> Dalla Lana School of Public Health, University of Toronto, Canada

<sup>b</sup> Environmental Health Trust, Berkeley, CA, United States

<sup>c</sup> Rutgers University School of Public Health, United States

<sup>d</sup> Environmental Health Trust, Teton Village, WY, United States

<sup>e</sup> Hebrew University of Jerusalem, Israel

## ARTICLE INFO

### Keywords:

Brain cancer  
Vestibular schwannoma  
Salivary gland tumor  
Electric hypersensitivity  
Glioma  
Meningioma  
Radio frequency fields  
Cell phones  
Mobile phones

## ABSTRACT

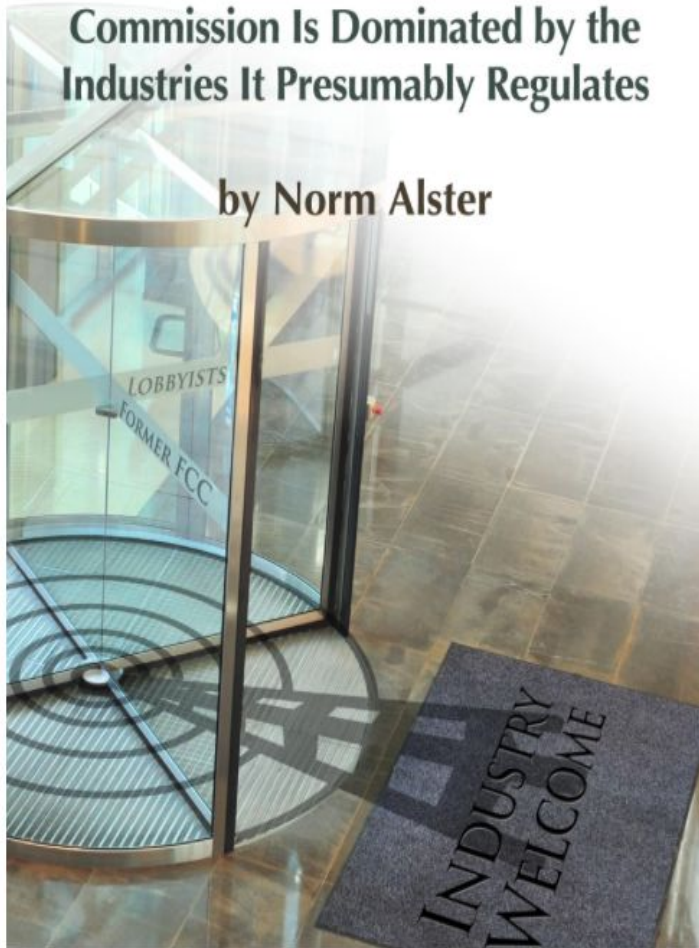
Epidemiology studies (case-control, cohort, time trend and case studies) published since the International Agency for Research on Cancer (IARC) 2011 categorization of radiofrequency radiation (RFR) from mobile phones and other wireless devices as a possible human carcinogen (Group 2B) are reviewed and summarized. Glioma is an important human cancer found to be associated with RFR in 9 case-control studies conducted in Sweden and France, as well as in some other countries. Increasing glioma incidence trends have been reported in the UK and other countries. Non-malignant endpoints linked include acoustic neuroma (vestibular Schwannoma) and meningioma. Because they allow more detailed consideration of exposure, case-control studies can be superior to cohort studies or other methods in evaluating potential risks for brain cancer. When considered with recent animal experimental evidence, the recent epidemiological studies strengthen and support the conclusion that RFR should be categorized as carcinogenic to humans (IARC Group 1). Opportunistic epidemiological studies are proposed that can be carried out through cross-sectional analyses of high, medium, and low mobile phone users with respect to hearing, vision, memory, reaction time, and other indicators that can easily be assessed through standardized computer-based tests. As exposure data are not uniformly available, billing records should be used whenever available to corroborate reported exposures.



# Captured Agency:

How the Federal Communications  
Commission Is Dominated by the  
Industries It Presumably Regulates

by Norm Alster



[www.ethics.harvard.edu](http://www.ethics.harvard.edu)



HARVARD UNIVERSITY  
**Edmond J. Safra**  
Center for Ethics

## Harvard Report “Captured Agency”

“...consumer safety, health, and privacy, along with consumer wallets, have all been overlooked, sacrificed, or raided due to unchecked industry influence.”

“It is these hardball tactics that recall 20th century Big Tobacco tactics.”  
-Investigative reporter Norm Alster,  
Harvard Center for Ethics



---

## Health impact of 5G

---

### **2021 Conclusions on Commonly Used RF Frequencies (450 to 6000 MHz)**

#### **1) Cancer**

**EMF are probably carcinogenic for humans, in particular related to gliomas and acoustic neuromas;**

#### **2) Reproductive Developmental Effects**

**These frequencies clearly affect male fertility and possibly female fertility too. They may have possible adverse effects on the development of embryos, foetuses and newborns**





### CELL PHONES AND BREAST CANCER

Women are developing breast cancer in the exact same place they kept cell phones in their bras, according to an increasing number of medical reports.

Cell phones emit microwave radiation linked to brain cancer and damaged DNA.

Cell phone manuals contain fine print directing users to put some distance between the phone and the body.

**Learn how to reduce your exposure. Do not carry your cell phone in your bra.**

**MORE AT EHTrust.org  
#PracticeSafeTech  
@saferphones**



### DOCTORS' RECOMMENDATIONS

#### 1. PROTECT YOUR BODY

Do not carry cell phones in your pockets or bra. No laptops or tablets on your lap.

#### 2. PROTECT YOUR BRAIN

Prefer a corded landline phone. Hold cell phones away from the head and body by using speakerphone.

#### 3. PROTECT YOUR FERTILITY & YOUR PREGNANCY

No wireless devices near reproductive organs or near a pregnant woman's abdomen.

#### 4. REDUCE WIRELESS

Turn off Wi-Fi and use cords to connect routers, phones, computers and other devices. Airplane Mode ON with Wi-Fi OFF turns off wireless.

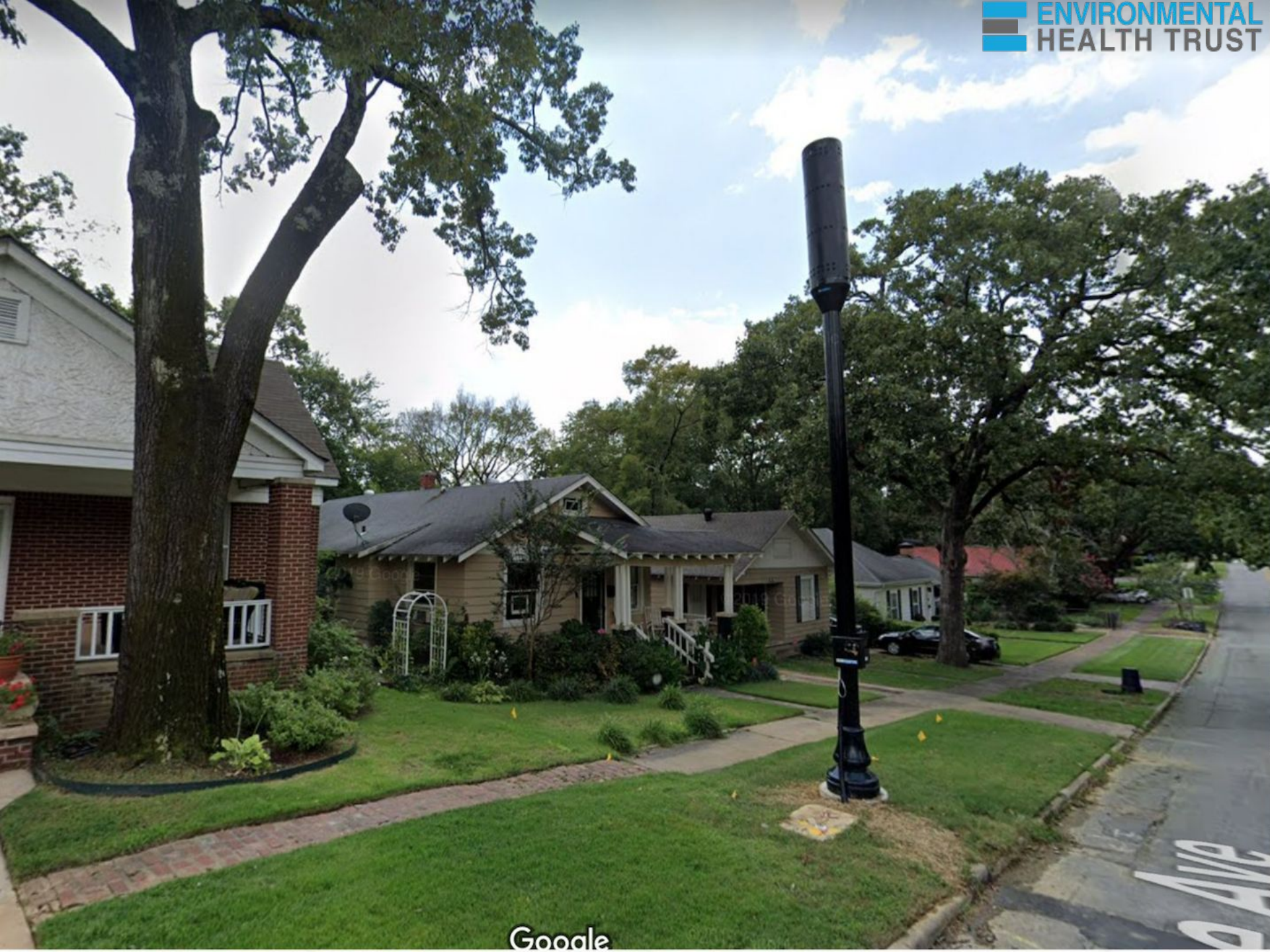




# 5G = Millions of New Cell Antennas Near Homes and Schools









Mobile phone base station antennas  
close to pedestrian's head



2022 cell tower radiation study concluded that  
mobile phone base station antennas located close  
to people results in highly elevated exposure levels.

Environmental Research 208 (2022) 112627



Contents lists available at ScienceDirect

Environmental Research

journal homepage: [www.elsevier.com/locate/envres](http://www.elsevier.com/locate/envres)



Very high radiofrequency radiation at Skeppsbron in Stockholm, Sweden  
from mobile phone base station antennas positioned close to  
pedestrians' heads

Tarmo Koppel<sup>a</sup>, Mikko Ahonen<sup>b</sup>, Michael Carlberg<sup>c</sup>, Lennart Hardell<sup>c,\*</sup>







## **Published research on bees has found:**

- Reduced motor activity of worker bees.
- Biochemical changes indicating stress.
- Inducing the worker piping signal. In natural conditions, worker piping either announces the swarming process of the bee colony or is a signal of a disturbed bee colony.
- Decline in colony strength  
Queen egg laying rate

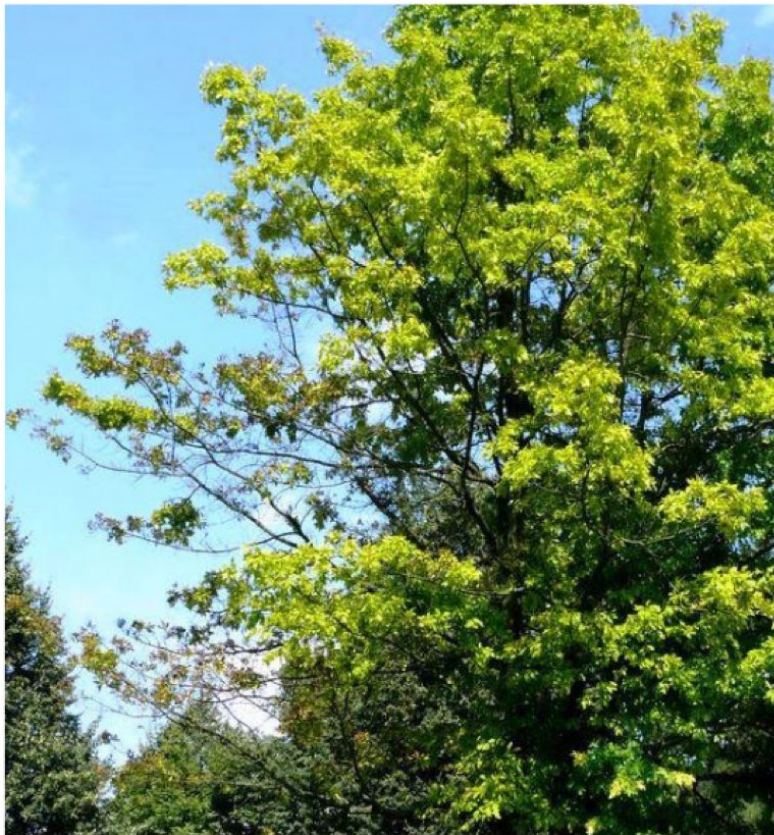




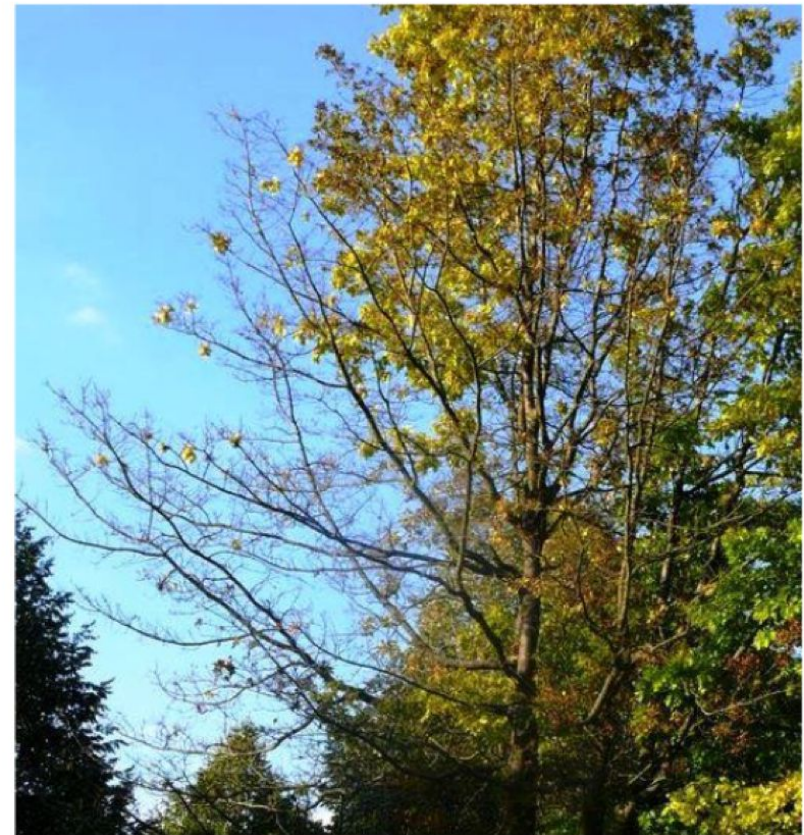
## Radiofrequency radiation injures trees around mobile phone base stations



Cornelia Waldmann-Selsam <sup>a</sup>, Alfonso Balmori-de la Puente <sup>b</sup>, Helmut Breunig <sup>c</sup>, Alfonso Balmori <sup>d,\*</sup>



*Section of red oak tree, August 2013*



*Section of red oak tree, August 2015*





**60% increase**

per year in production  
of wireless peripherals  
(Wi-Fi/Bluetooth  
speakers, appliances,  
wearables)

**700%**

increase in mobile  
data traffic globally  
projected between  
2017 and 2022



# The 5G appeal

Scientists and doctors call for a moratorium on the roll-out of 5G. 5G will substantially increase exposure to radiofrequency electromagnetic fields RF-EMF, that has been proven to be harmful for humans and the environment.

[Read more](#)

**Over 400 Scientists are calling for a moratorium on 5G**  
**[www.5gappeal.eu](http://www.5gappeal.eu)**





# The Need for Healthy & Sustainable Technology

- Increased energy consumption
- Damage to trees.
- Harm to wildlife.
- Human rights abuses - conflict minerals
- Manufacturing pollution
- Inadequate recycling-e-waste



**You work best  
when your tech  
works too.**

**Total Mobile Protection  
for Business**



Applicable for Business customers outside of New York. New York customers, please see the Total Mobile Protection for Business brochure for New York.

**verizon** | **asurion**

## **Verizon Total Mobile Protection Insurance Defines Non-ionizing Microwave Radiation as “Pollution”**

**LIBERTY INSURANCE UNDERWRITERS INC., or one of its insurance company affiliates.**  
WIRELESS COMMUNICATIONS EQUIPMENT COVERAGE INSURANCE POLICY

### **B. EXCLUSIONS**

This insurance does not apply to loss or damage identified in any of the following or directly or indirectly caused by or resulting from any of the following:

#### **16. Pollution**

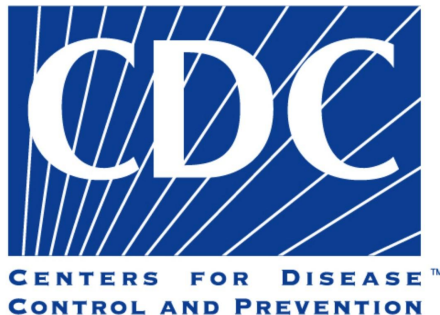
The discharge, dispersal, seepage, migration or escape of pollutants. Pollutants means any solid, liquid, gaseous, or thermal irritant or contaminant including smoke, vapor, soot, fumes, acid, alkalis, chemicals, artificially produced electric fields, magnetic field, electromagnetic field, sound waves, microwaves, and all artificially produced ionizing or non-ionizing radiation and/or waste. Waste includes materials to be recycled, reconditioned or reclaimed.

**ENVIRONMENTAL  
HEALTH TRUST**





United States  
Environmental Protection  
Agency



# Statement of Fact

- No systematic review of the totality of evidence.
- No risk or hazard assessment for health effects.
- No science based evaluation/review of FCC limits.
- By any U.S. regulatory agency with health, environment or safety expertise.



**Make the Bra a No Cell Phone Zone.**





### CELL PHONES AND BREAST CANCER

Women are developing breast cancer in the exact same place they kept cell phones in their bras, according to an increasing number of medical reports.

Cell phones emit microwave radiation linked to brain cancer and damaged DNA.

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MORE AT [EHTrust.org](http://EHTrust.org)  
#PracticeSafeTech  
@saferphones

ENVIRONMENTAL HEALTH TRUST

### DOCTORS' RECOMMENDATIONS

#### 1. PROTECT YOUR BODY

Do not carry cell phones in your pockets or bra. No laptops or tablets on your lap.

#### 2. PROTECT YOUR BRAIN

Prefer a corded landline phone. Hold cell phones away from the head and body by using speakerphone.

#### 3. PROTECT YOUR FERTILITY & YOUR PREGNANCY

No wireless devices near reproductive organs or near a pregnant woman's abdomen.

#### 4. REDUCE WIRELESS

Turn off Wi-Fi and use cords to connect routers, phones, computers and other devices. Airplane Mode ON with Wi-Fi OFF turns off wireless.

A close-up photograph of a baby with light brown hair, wearing a white patterned onesie, sleeping peacefully on a white surface. The baby is holding a black smartphone in their hands, which are positioned near their face. The background is a soft, out-of-focus white.

**“Do not sleep with  
your phone  
in your bed  
or near your head.”**







“Disable WiFi, Bluetooth & Data options from your cell phone and other mobile devices when not needed.”

-Athens Medical Association

"Fewer apps means less radiation – Minimize the number of apps and disable the most unnecessary background services on your smartphone."

-Vienna Medical Association





# Minimize Wireless Phone Use

"Make shorter phone calls. Less time with a phone next to your ear means less exposure."

"Scientists also agree that it is wise to reduce exposure to RF energy from cell phones whenever possible."

-Connecticut Department of Health, 2015





# Keep the Cell Phone Out of The Pants



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HEALTH TRUST

# Elvie Wireless Breast Pump



**“This equipment generates, uses and can radiate radio frequency energy...”**

▪ [FCC Elvie Manual](#)

[ehtrust.org/fine-print-warnings](https://ehtrust.org/fine-print-warnings)

**Apple iPhone 13**



**Apple iPhone 12 and 12 Pro**



**Apple iPhone 11**



**Apple iPhone XS Max**



**Nokia 8110 4G Phone**



**Samsung Galaxy S5**



**LG G2**



**LG G3**





# Could the Increases in Colo-rectal Cancer in Young Adults be Tied to Cell Phone Radiation?



- 4-fold increase in rectal cancer in last decade in American young adults
- Colo-rectal cancer cells are exquisitely sensitive to RF
- Phones are 'on' and radiating into the abdomen unless turned to airplane mode or off
- Research has found that the effect of exposure to mobile phone radiation and 3Gy gamma radiation have similar impacts on treated colon tissues of rats compared to the controls

Davis et al., 2020 Increased Generational Risk of Colon and Rectal Cancer in Recent Birth Cohorts under Age 40 - the Hypothetical Role of Radiofrequency Radiation from Cell Phones published in Annals of Gastroenterology and Digestive Disorders

# 2021 Review: Effects of Radiofrequency Electromagnetic Radiation on Neurotransmitters in the Brain

Hu C, Zuo H, Li Y. *Frontiers in Public Health* (2021)

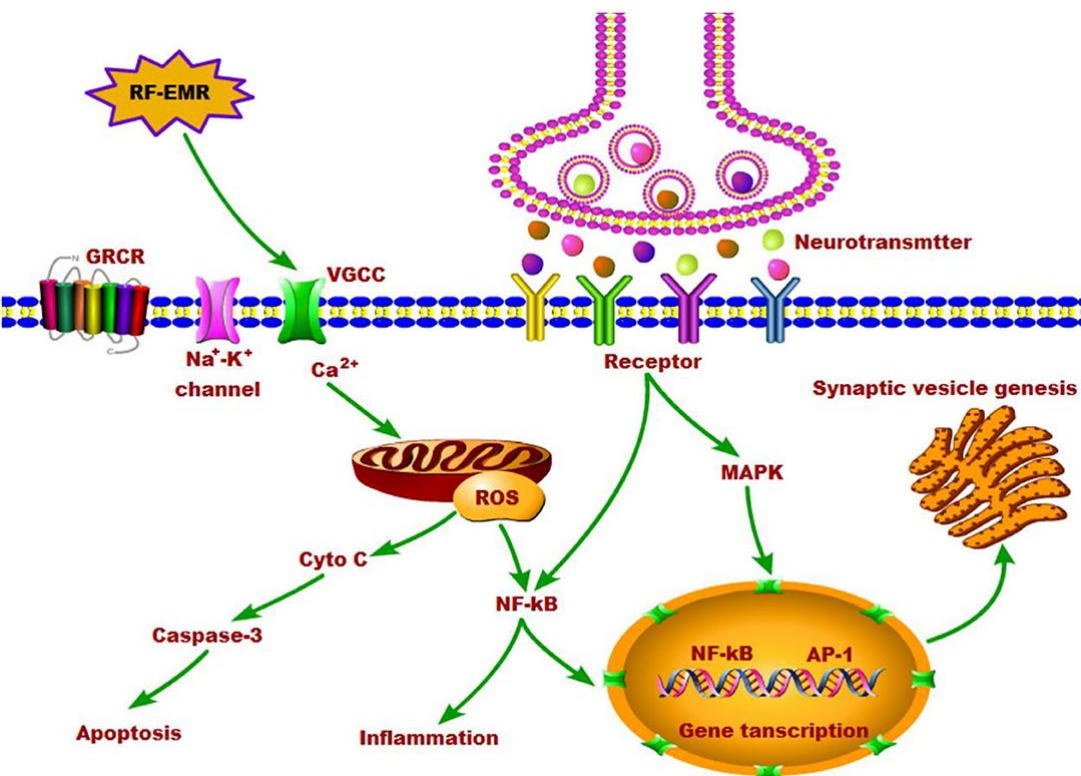


FIGURE 1. The effects of RF-EMR exposure on neurotransmitters in the brain and the possible underlying mechanisms.

Reviewed studies related to neurotransmitters 21 on short-term exposures and 19 on long-term EMR exposure.

- Research is complicated by the numerous parameters in experimental studies.
- However, studies do document a variety of impacts to neurotransmitters: dopamine, norepinephrine and epinephrine and acetylcholine.
- EMR increases the intracellular calcium and the formation of ROS, which would alter the cellular function eventually and lead to numerous biological effects including neurotransmitter imbalance.



# Children's Vulnerability Ignored by FCC's Outdated Safety Limits

- Unchanged for 25+ years.
- Based on body of large adult-man with big head.
- Do not consider the sensitivity of the developing brain.





## Environmental Health Trust et al. v FCC 2021 U.S. Court of Appeals DC Circuit

“Provide a reasoned explanation for its decision that FCC limits do not need to be updated.

FCC must address:

- the impacts of RF radiation on **children**,
- **the health implications of long-term exposure to RF radiation**,
- **the ubiquity of wireless devices**, and other technological developments that have occurred since the Commission last updated its guidelines”

**The FCC must address the impacts of RF radiation on the environment**



# No Agency is Ensuring Cell Tower Radiation is Safe

- No premarket safety testing.
- No post market surveillance for health effects.
- No reports/ reviews on long term exposure.
- No monitoring of radiation levels in country- since the 80s.

No budget. No government staff tasked to ensure cell towers are safe.





**5G Deployment and 4G  
Densification**  
**Over 800,000 new sites in USA.**

**70.2 million**

"small cell" tower  
bases to be installed  
by 2025

**500 billion**

devices are expected  
to be connected to  
the Internet by 2030

**8.9 billion**

mobile phone  
subscriptions  
worldwide by 2024



# No Safety Limits Nor Systematic Evaluation of Harm by ANY US Agency For Birds, Bees and Trees

## 3 Part Part Review in *Reviews of Environmental Health*

“exponential increases” of EMF in nearly all environments. ”

“Broad wildlife effects have been seen on orientation and migration, food finding, reproduction, mating, nest and den building, territorial maintenance and defense, and longevity and survivorship...It is time to recognize ambient EMF as a novel form of pollution and develop rules at regulatory agencies that designate air as 'habitat' so EMF can be regulated like other pollutants.”

**“Effects of non-ionizing electromagnetic fields on flora and fauna, part 1. Rising ambient EMF levels in the environment”**

Blake Levitt. Henry Lai. Albert Manville



# Pre- Download Large Files & Switch Antennas OFF



“If you plan to watch a movie on your device, download it first, then switch to airplane mode while you watch in order to avoid unnecessary radiation exposure.”

-American Academy of Pediatrics



## **France Government Order November 15, 2019 Consumer Information**

- **Use radio equipment in good reception conditions to reduce radiation.**
- **Use a hands-free kit or a loudspeaker**
- **Children and adolescents should limit calls**
- **Keep radio equipment away from the stomachs of pregnant women & adolescents.**



# Laptop Connected by a Wire to Internet



# Connection by a Wire not Wi-Fi to the Internet







# How To Reduce RF Exposure During Pregnancy

- Do not rest a cellphone or a wireless laptop/tablet on your abdomen.
- Use electronics on a table, not your lap.
- Distance cell phone and wireless devices away from brain and abdomen.
- Power off cell phone before carrying near your body.
- Minimize overall wireless use by using corded phones and hardwired internet.
- Reduce time in high RF environments.



# INFOGRAPHICS

Download and share our infographics on all your social media sites. We hope you will also share links to our website so friends can learn more.

## Cell Phone Radiation

**50%**

of radiation from your cell phone can be absorbed into the head and body.



"Carry iPhone at least 10 mm away from your body."  
— Apple iPhone 5



### Cell Phones are tested at a distance from the body.

When phones come on the market SAR tests use a distance between the phone and body. Phones are not tested in body contact positions. All phones instruct us to keep a distance.

### Specific Absorption Rate (SAR)

## WHY FRY FOR WI-FI?

Simple steps to reduce your cell phone radiation



### 1 LOOK OUT FOR SIGNAL STRENGTH

Signal strength, or how many bars you have on your cell phone, plays a big role in its radiation. When your cell signal is weaker, your phone has to work harder. Research finds low signal can equal up to **10,000 times** more radiation!



### 2 NO POCKET CARRYING

As tempting as it may be to instinctively shove your phone into the nearest pocket, please avoid carrying your phone against the body in a pocket, sock, or bra. The amount of radiation you're absorbing can exceed government limits.



### 3 TAKE SHORTER CALLS

On cell phones, take shorter or essential calls, preferably on speaker mode. Avoid making calls in cars, elevators, trains, and buses, as the cell phone works harder to get a signal through metal.



## WIRELESS STINGS!

How Wireless Technology Makes it Hard to Be(e) a Bee

### INTO THE BEEHIVE OF SCIENCE...



### ALL ABOUT BEES



Whether your knowledge on bees stems from 5th grade science class or *The Bee Movie*, there's one thing we can all agree on: Bees are vital to a healthy environment, their pollination allows the wildflowers we admire and our farms and fruits to flourish; Pretty unBEElievable if you ask me.



### ENTER WIRELESS



Bees do so much for our planet that it stings to think that our wireless technology could be harming those MVPs. And yet, the radiation emitted by our cell phones, cell towers, and wireless tech have been found to negatively alter bee behavior, induce biochemical changes, and impact bee reproduction. Don't BEElieve it? Check out the science below.





**¡Salven  
a las Mujeres**

#Practice

**Protege  
a los que  
amas.**



**Protect Yourself.**

**CELL PHONES EXPOSE  
YOUR BODY TO RADIATION**

Research links this  
microwave radiation to:

- Damaged sperm
- Reduced sperm count
- Erectile dysfunction
- Memory problems
- Cancer

5G and 4G cell antennas will  
increase your daily dose of  
radiation. Not to mention, it will  
also impact the birds, bees and  
trees. Educate yourself on 5G.

All cell phones and wireless devices  
have fine print warnings hidden  
deep in manuals advising the device  
not be in contact with the body.

More at [ehtrust.org](https://ehtrust.org)

ENVIRONMENTAL  
HEALTH TRUST

**DOCTORS' RECOMMENDATIONS**

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routers, phones, computers and other  
devices. Airplane Mode ON with Wi-Fi OFF  
turns off wireless.

**5. DO NOT SLEEP WITH YOUR  
CELL PHONE**  
Cell phones and Wi-Fi devices are radiating  
even when not in use. Power off all devices  
at night, and keep them out of the bedroom.

**¡Salvemos  
a los Jóvenes!**

#PracticeSafeTech

**Protect  
the ones  
you love.**



# STEP BY STEP TO SAFE TECHNOLOGY

## How To Minimize Wireless Exposure



## How to Reduce Electromagnetic Fields



## Deep Dive: A Low EMF Computer Station

## How To Minimize Wireless Exposure

## Worldwide Policy on 5G and Cell Towers

## Health Home Checklist for Low EMF



## Ways to Reduce Cell Phone Radiation

## Steps to Safer Technology

## Tips for Safer Technology at Home

## Tips for Reducing Magnetic Fields

<https://ehtrust.org/resources-to-share/printable-resources/>



# Human Health and the Environment

Learn More About Our Work

CLICK HERE FOR SIMPLE WAYS TO REDUCE CELL PHONE RADIATION

# Learn more at EHTrust.org

# EHTRUST.ORG

ENVIRONMENTAL  
HEALTH TRUST



Join our email list SIGN UP

Sign up for our newsletter at our website.



Contact us at  
[info@ehtrust.org](mailto:info@ehtrust.org) for  
an expert presentation.