

# EMF Dangers and EMF Effects on Health

EMFs (electromagnetic fields) can penetrate buildings and the human body. Today, everyone is exposed to man-made, artificial, EMFs from electrical power lines, radio and TV broadcast towers, cell phones and cell towers, tablets, baby monitors, surveillance devices, Wi-Fi routers, utility meters, and even satellites. These sources bombard us with both low frequency and high frequency radio waves.



Photo by [JeepersMedia](#) 

We are increasingly concerned about the myriad of EMFs we are exposed to every day. Radio frequency radiation produces biological effects at very low intensity levels. Damage does not require ionizing radiation to break molecular bonds. Significant biological effects occur at exposure levels much lower than current public safety levels.

Epigenetic changes that alter gene activation and expression are of increasing concern. Of particular interest is the effects EMFs have on young people, including the fetus, infant and young child.

Children exposed to electromagnetic radiation exhibit functional changes similar to autism and attention deficit hyperactivity disorder. Adolescents experience problems with memory, learning, attention, concentration, behavior problems and sleep quality.

## **What is Electromagnetic Radiation?**

Electromagnetic fields (EMFs) are caused by the movement of electrons. Even within atoms, electrons moving in a circular fashion create static, non-changing, magnetic fields. This is why certain substances can be magnetized.

But, most man-made EMFs are generated by alternating currents moving in wires or antennas. This creates changing electric and magnetic fields that radiate out at the speed of light. Electromagnetic radiation covers a broad range of frequencies from around 10 Hz (10 oscillations per second) to 300 GHz (300 billion oscillations per second).

Absorption of electromagnetic radiation depends on several factors. These factors include the strength of the radiation, the distance one is from the

source or radiation, as well as one's orientation to the radiation. The water and mineral content of your body also plays a role.

Children are more susceptible to damage from radiation than adults. The tissue composition and anatomy of a child differs from that of an adult. A child's head, bone marrow and eyes absorb more energy than those of an adult. And, children's bodies are still developing and are, thus, more sensitive to long term effects.

## **Typical Man-made Causes of Electromagnetic Fields (EMF)**

Man-made electromagnetic fields result from the movement of electrons, electrical currents, in wires and antennas. It is almost impossible to avoid exposure to these fields.

- Electrical wiring and transmission lines
- Radio or television broadcast antennas
- Radar installations
- Satellites
- Medical devices such as magnetic resonance imaging (MRI)
- Household appliances such as microwave ovens
- Cordless telephones
- Cell phones and cell towers
- Television and computer screens
- Wireless local area networks and WiFi
- Smart electric and gas meters

## **EMF Dangers in Animals**

Clinical studies of EMFs are typically done on animals. After all, deliberately exposing humans to EMFs is not exactly ethical.

One study exposed pregnant rats to 2.4 GHz Wi-Fi EMFs showed that the Wi-Fi exposed offspring impaired spatial learning and motor function. The study also found that exercise could help reduce the deficiencies of both cognitive and motor function.

Other mice or rat studies have shown the following effects of cell tower EMF radiation:

- Change in immunological functions
- Decrease in reproductive function (After five generations of exposure the mice were not able to produce offspring.)
- Increases in neurodegenerative diseases
- Increase in serum testosterone levels
- Increase in the permeability of the blood-brain barrier
- Increased DNA damage in cells
- Increase in DNA strand breaks in brain cells
- Decreased DNA repair
- Animals become more sensitive to radiation after long-term exposure

A study of cell tower electromagnetic radiation in India looked at the effects cell tower electromagnetic radiation had on birds. The researchers found that under the influence of cell tower radiation they became *disoriented* and flew in all directions. Also animals living near the towers had *more still births*, *spontaneous abortions*, *birth deformities*, and experience more *behavioral problems* with a general *decline in overall health*. The authors of the study indicate that because the cell phone industry do not admit any dangers, it is "becoming another cigarette industry."

## Symptoms of Electromagnetic Field Dangers to Humans

While we do not experiment on humans in a clinical setting, the environment is causing some humans to be exposed to higher levels of electromagnetic radiation. A number of studies have been done to compare the health of people living near cell phone towers with the health of those living far from cell phone towers. Some scientific findings about people living close to cell towers include:

- Significant increases for all cancers and malignant melanoma in both men and women
- Adult leukemia and lymphoma clusters
- Elevated rates of mental illness
- Higher rates of brain tumors
- Sleep disorders
- Decreased concentration
- Anxiety
- Elevated blood pressure
- Headaches
- Memory impairment
- Increased white cell counts
- Decreased lung function in children
- Motor, memory, and learning impairment in children

In addition to studying the effects of cell phone towers, a number of studies were conducted when digital TV was introduced. Three German physicians wrote to the President of the United States warning about the results of digital broadcasting in Germany. They indicated once digital broadcasts were begun there was a noticeable increase of headaches, sleep problems, fuzzy thinking, chest tightness, shortness of breath, irritability, nervousness, depression, anxiety, burning skin, and weight gain.

When people moved away from the area into nearby valleys where the radiation did not penetrate they symptoms quickly went away.

Another study showed that children born to mothers who used cell phones have more behavioral problems than children born to mothers who did not use cell phones during pregnancy. Children of cell phone using mothers had 25% more **emotional problems**, 49% more **conduct problems** and 35% more **hyperactivity**.

Eight out of ten epidemiological studies indicate that living within 500 meters (nearly a third of a mile) of a cell tower increased risks of neurobehavioral symptoms or cancer.

## Wireless wake-up call | Jeromy Johnson | TEDxBerkeley

A Silicon-valley engineer turned technology health advocate, Jeromy Johnson discusses our attachment to technology and the health hazards such an addiction may hold.

## Legal Remedies Regarding Utility Transmission Lines

A number of lawsuits have been brought to halt construction of transmission lines (as well as cell towers) or to seek monetary damages for loss of property value when utility transmission lines and their effect are placed close to an owner's property.

Transmission lines are high voltage lines (often from 230kV to 12kV) from the generating plants to local neighborhoods where the voltage is stepped down and delivered to homes.

The basic legal theories used in most lawsuits regarding transmission line include:

- **Trespass:** The idea is that electromagnetic fields constitute an "intrusion that invades the possessor's protected interest."
- **Nuisance:** The claim is that there is unreasonable and substantial interference caused by the EMFs that could cause more than trivial harm. This could be either a public or private nuisance.
- **Strict Liability:** This requires that electricity transmission lines be considered a defective product that causes harm or presents a high degree of risk.
- **Personal Injury:** Here a legal causation must be established.
- **Damages:** The claim here is that transmission lines cause emotional distress from fear of cancer or other injuries, on an increased risk of harm.

While some people have won cases against utility companies, most people struggle in legal battles. The utilities have nearly unlimited resources to defend themselves and the scientific evidence for harm is not readily demonstrable.

It will take time for the scientific community to isolate high voltage EMFs as the source of injury on humans.

## Conclusions You Can Use

The evidence is accumulating that exposure to electromagnetic radiation does cause harm to human beings. This exposure is, unfortunately, increasing as more wireless devices proliferate in our society.

While most people cannot eliminate such exposure from their lives, many people can take steps to limit such exposure. Some steps you can take to reduce exposure include:

- Turn off wireless devices (cell phones, routers, ect.) during sleeping hours
- If you have a “landline” phone, forward your cell phone to your landline while you are home and turn off your cell phone.
- Children and pregnant women should avoid using cell phones
- Use “old-fashioned” flip-phones that emit less electromagnetic radiation than smart phones
- Carry cell phones in a purse or backpack as far from your body as possible
- Use tablets in “airplane mode” whenever possible and shut them off when not in use
- Use cell and mobile phones in “speaker” mode to avoid close contact with the phone’s radiation
- Connect your computer to your modem with an Ethernet cable and turn off Wi-Fi
- When looking for a new home, try to be at least a third of a mile from the nearest cell tower, broadcast antenna or high tension transmission lines
- Check at school to try to reduce wireless devices in and around the classroom

In short, try to limit your exposure to artificial, man-made electromagnetic radiation.

## References

- [Microwave frequency electromagnetic fields \(EMFs\) produce widespread neuropsychiatric effects including depression](#) as published in the *Journal of Chemical Neuroanatomy*
- [Physical activity as an option to reduce adverse effect of EMF exposure during pregnancy](#) as published in *International Journal of Developmental Neuroscience*
- [Causes of Action for EMF Harm](#) as published in *Fordham Environmental Law Review*
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- [EFFECT OF MOBILE TOWER RADIATION ON BIRDS IN BIJAPUR DISTRICT, CHHATTISGARH](#) as published in *WORLD JOURNAL OF PHARMACY AND PHARMACEUTICAL SCIENCES*
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