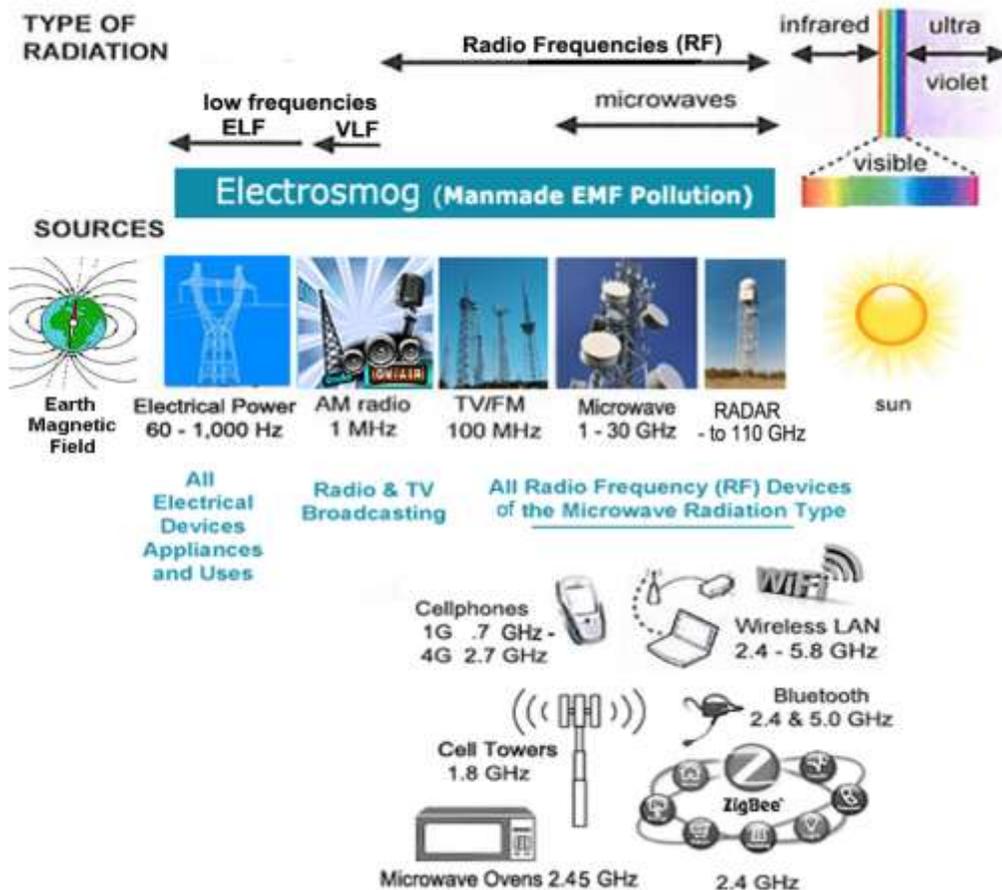


# The EMF Spectrum: Electromog

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This illustration gives us a snapshot of the EMF Spectrum and the frequencies on the spectrum where an overabundance of **manmade EMF fields has proliferated** to the point that it has come to be known as Electromog.

Notice the wide range of Electromog occurring on the EMF spectrum- on the low end of Electromog are emissions from electric appliances, motors, utility power lines, and at a higher frequency we get emissions from cellphones, WiFi, radio and remember, all emissions can be happening at the same time, bombarding us with multiple sources of EMF. So, with EMF protection in mind, it is easiest if we break it down into its main three EMF components to get a handle on how to deal with each one separately, though they act on us together.

# The Big Three: EMF Sources

There are three main sources of EMF you will need to understand:



**Magnetic Fields,**



**Electrical Fields**



**Radio Frequency Fields**

Although there are other sources of EMF on the wider spectrum that includes such things as radon and radioactivity, these big three account for 99% of the greatest general level of EMF Pollution facing us today. This concentration is rapidly becoming more dense, largely because of the explosion in cellphone and wireless technology use, and the ever growing reliance on electrical conveniences.

## Guidelines for Identifying EMF

### Magnetic Fields

While static magnetic therapy has been established as a well-known treatment for inflammation and healing, chronic exposure nightly to varying magnetic fields, the kind that occur with electricity, can cause problems. The problem that is getting the most scientific concern lately is that magnetic fields - a component of electromagnetic field (or EMF) - have a disruptive effect on our intercellular communication, and since we have multiple cell communication interactions going on all the time the problem is compounded.

Magnetic fields are caused whenever there is a flow of electrical current, such as in the electrical wiring in your walls. Since magnetic and electric field components of electromagnetic fields occur simultaneously and act together (orthogonally) but differently and not proportionately, we have found that magnetic and electrical fields occurring together produce the most biologically impactful EMF emissions. Power lines are an example of this, where the electromagnetic power flows together continually, and elevated risk for Alzheimer's and childhood Leukemia is well associated with the ELF (extremely low frequencies), and VLF (very low frequencies)

from power lines. Utility companies have also lost many lawsuits due to demonstrated commercial financial damage caused by power line effects on cow's health, their milk production, and chicken's egg production.

Magnetic fields only stop when electric current stops, however since we never completely turn off all electric power (electricity) in our homes there are things that are on all the time creating magnetic fields – things like door bells, smoke detectors, controls for heating and cooling systems, hot water heaters, live wires to the circuit breaker box etc. The strength of the magnetic field is directly proportional to the amount of electrical current flowing, so high electrical current, such as in electric baseboard heaters or anything that uses a lot of electricity, or if it produces heat, causes higher magnetic field strength.

In addition to the current strength, your proximity to the electromagnetic field is of significant importance with regards to how much you are exposed to. That is why high magnetic field strength can also be experienced with low levels of electrical current if you are very close to the source, such as being covered with an electric blanket, an electric heating pad, or sitting with your laptop on your legs.

In electrical engineering terms it is explained this way - the intensity of the field is inversely proportional to the square of the distance to the source; in plain English this means that the magnetic field strength drops off dramatically the farther you get from it.

Magnetic fields are not easily shielded without large, thick ferromagnetic metal barriers, but without any shielding barrier magnetic fields impact us by freely penetrate through walls, floors and ceilings of our homes.

## **Electrical fields**

Electric fields are present whenever there is something (a wire, antenna, electric fence, etc.) that is energized, "live" or "hot". This can be measured in terms of voltage, and volts are units that describe the strength of an electrical field.

When the electrical wiring in your wall is not energized, in other words it is turned off at the switch, there is no current moving in the wire and thus no EMF emitted by that section of wire, however the wire is still live from the electrical service box (circuit breaker box) up to the switch in your room. If you turn off the electrical service box, in other words you turn off the circuit to your bedroom so no power flows to the room and thus no EMF will be generated, the wire is nevertheless still live from that electrical service box to the Electric Utility source outside somewhere on the property, or the service entry point on the building, usually where the electrical meter is located. Take into consideration where your live wires run.

To complete our understanding of typical (Standard Electric Code compliant) wiring, all wires within walls that are not connected to on/off wall switches are live, or hot, all the time. You'll recognize these unswitched outlet plug-ins as the ones that you would normally use to plug in a clock or a computer (in other words, something you don't want to turn off accidentally with a wall switch). These unswitched wires in your walls are constantly surrounded with electrical fields (constantly emitting EMF), even when wall outlet plug-ins on those wires are not in use, and even when nothing is plugged in.

**Unswitched wall wiring always emits electric fields, whether any device is plugged into it or not.** In other words if you had nothing plugged into any wall outlet, the wires in the walls would still be live and emit electric fields that impact you.

However, whenever a device is plugged into an outlet on that wire and turned on, for instance turning on a table lamp, it causes the current to flow in the wire and this same wire (like all wiring) then emits *both* electric and magnetic fields, and they impact you, each separately as well as both together. When the lamp is turned off again the current stops so the magnetic field stops, but the electric field continues.

#### **A Word about The National Electrical Code and the National Electrical Safety Code**

You may at this point be wondering why all the necessity for distancing and shielding to protect from EMF when we have both electrical installation codes and electrical safety codes to protect us. The answer is that this aspect of electromagnetic energy – namely its biological effects on health or wellbeing - is not addressed in any code.

The electrical installation code was written by the NFPA – the National Fire Protection Association – who were interested in preventing fires from the failure of electrical systems. The electrical safety code was written to prevent injury, primarily electrical shock, to electrical workers and end users of electricity.

Further, another portion of the code is written to ensure that communication data is not corrupted by electric fields, in other words so your landline phone transmission, your Cable TV, your internet connection, and your sound system will not have an annoying hum on it caused by electrical interference. Or so much “noise” on the line that the equipment cannot work, caused by cross talk of the magnetic component of the electro-magnetic fields imposing itself on a communication system.

Put this way, we can begin to feel that the code is more concerned about electromagnetic interference with communication transmission, than it is about its interference with our biological cell communication transmissions. And we would be right.

Today's cellphone and digital wireless technology phenomenon is eerily reminiscent of the invention and explosive proliferation of electricity, and its subsequent widespread implementation into everyday use without a thorough understanding of its impact on human biology or environment, not to mention the health safety of both.

Next we look at the part Radio Frequencies play in Electrosmog.

## Radio Frequency Fields

This category includes everything that is used for **wireless communications**, from radios, to TV's, to cell phones, to wireless internets. Human bodies are not designed to live within a world with elevated radio frequency signals; yet that is exactly the environment we have created. Long-term exposure to low levels of RF can cause sympathetic lock of cell membranes and the consequential cascade of cellular dysfunction. Male fertility has been closely linked with RF from cellphones habitually carried in a man's front pants pockets; male sperm counts are half what they were a generation ago and continuing to decline.

**A note to clarify terms** - RF (radio and microwave frequencies that occur in the range from 30 kHz to 300 GHz), while only a part of the larger EMF spectrum, in today's world these frequencies have taken on their own significance and are simply called "RF" and have become a separately distinct category of electronic pollution, due to burgeoning cellphone, cell tower and WiFi proliferation.

### A Word about RF Safety Codes

EMF radio frequency transmissions, or RF, are not regulated by a safety code. The Federal Communication Commission (FCC) in the USA establishes what frequencies can be used and for what purposes, and they establish the limits for power output to avoid interference with other communication transmissions. The government regulation has not been driven by concerns for consumer biological safety in the use of RF devices like cellphones, WiFi, Bluetooth etc. Cell towers fall under their purview, and they adopt rules for cellphone manufacture (largely concerned with maximum transmittable power), and other wireless technology, by proxy based on recommendations by other independent (non-government) agencies such as the National Council for Radiation Protection (NCRP), and American National Standards Institute (ANSI), which sets standards for most industries.

### An Important RF Safety Alert to Protect Children

**Keep your children far away from RF sources**, such as cellphones, (WiFi routers, etc.) – as far away as you can, for as long as possible. **Children's bodies and brains are many times more susceptible to RF damage than adults** due to the fact that their tissues and bones are much more permeable. While this is also true for electrical and magnetic emissions, the links between children's health issues and RF is even more seriously

urgent. Shockingly in North America, more cell towers are being erected in public school yards, parks and playgrounds because it is easier acquire use of public spaces and it (seductively) brings in much desired steady “rental space” income for school boards or cities trying to balance a tight budget. In many other countries around the world, such as the 27 countries of the European Union, celltowers near children’s areas are illegal.

At the same time that cell towers are going up on the roofs of elementary schools and high school high mast football field lighting WiFi and wireless networks are being added indoors, literally bathing our kids in constant RF fields all day long, for their entire school life.

In many countries worldwide, it is not legal to put WiFi or cell towers in or near schools, daycares, playgrounds, nursing home, and hospitals, since these are frequented by the segments of our population most vulnerable to RF pollution. North America legislators have put no such guidelines, or precautions, in place.

## **Static Magnetic Fields Anomalies**

While varying or static magnetic fields are often referred to simply as magnetic fields, they are each quite different in their biological effects. Some types of static magnetism are useful for medical therapies like bone fracture healing and bone regeneration, and personal therapeutic devices like magnetic jewelry or magnetic sole inserts in your footwear have been shown to increase blood circulation and heat, thus speeding healing to an area. Varying magnetic fields that are found with electrical fields are entirely different, biologically speaking, and these are the type of magnetic fields that are not beneficial to us.

However there is another type of varying magnetic field that can affect you in your bedroom, and this is one oddly enough caused by metal bedsprings in a typical mattress. These types of varying magnetic fields are called anomalous or novel fields (i.e. something we are not typically exposed to).

This happens because metal bedsprings often have residual magnetism of their own, either from when the metal was manufactured or due to repetitive compression over time caused simply by typical sleep-time body movements on the mattress. It has been shown that constant exposure to magnetic field anomalies can reduce the production of red blood cells and disturb the REM sleep, and as with electric fields, these magnetic field anomalies can also reduce melatonin, which you’ll recall we mentioned earlier has been linked to several degenerative diseases including cancer.

# Dirty Electricity Anomalies

Dirty Electricity is a phrase that has become commonly used to describe a type of corrupted electromagnetic field that has particularly close causal links with serious health issues such as diabetes, multiple sclerosis, breast cancer and more. However, dirty or clean, recent scientific research is making it abundantly apparent that electricity, even what is now differentiated as clean electricity, is not as biologically safe for users as we once assumed, due to the electromagnetic fields it generates in our environments that interfere with our own bioelectrical impulses. The concern is that the proliferation of dirty electricity is on rising sharply at the same time scientists are discovering that dirty electricity is far more harmful biologically.

## **What is dirty electricity and why is it on the rise?**

The concept of “Dirty Electricity” stems from the notion that there is a “Clean” electricity that has been corrupted in some way. So let’s first determine what clean electricity is.

As originally conceived the power system was designed to deliver electricity at a single frequency of AC, alternating current (commonly 60 Hz in North America or 50 Hz in Europe and other countries) to be used for incandescent lighting and powering motors. As technology advanced, enterprising companies began to use AC power to operate new devices that were never envisioned in the original power delivery system. They did this by finding ways to change or add frequencies as needed or to reduce power usage with the use of AC modifiers, adapters, transformers etc. that chopped up or somehow changed the clean AC current in order to use it differently than originally intended. These actions, though well-meaning and economically advantageous, created multiples of the base frequency (harmonics) as well as abrupt, short changes in electrical system characteristics (transients), adding non-fundamental or extra frequencies that are now called ‘dirt’, and contributing to the ever growing amount of dirty electricity that piggy-backs on the “clean” power system.

With the propagation of more types of electronics, and the preponderance of AC adapters and chargers that they require to operate, added to the new energy saving devices and efficiency minded switched power supplies that are designed to enable consumers to use less power, the dirtier and dirtier the electricity flowing in the entire power grid system becomes, making it progressively less safe biologically.

“Dirty” power has been shown to have its own very serious biologically harmful effects, independent of the harmful effects of “Clean” power, so removing the “dirt” is advisable, and fortunately possible. Remember though removing the dirty electricity makes good sense and produces a safer and more efficient use of electrical power but does not change the harmful effects of clean electricity.