

How To Get the Most Out of This eBook

If you want to understand the EMF protection issue and really get the most out of this book, start at the beginning and read to the end.

- In the preface I talk about me, my story and what motivated me to write this book.
- The first two chapters give you background information on EMFs. I explain what EMFs are exactly, why EMF protection is important and what's 'safe'.
- Chapters 3, 4 and 5 are the hands on stuff.
- In chapter 6 I explain earthing, how to earth and how to measure the effectiveness of earthing.
- In chapter 7 I talk about EMF exposures emanating from the earth and how to deal with them.

If you're short on time and want to dive straight into the nitty-gritty, chapters 3, 4 and 5 are the place to go.

- In chapter 3 I speak about the different types of EMFs present in our environment and explain the different meters you need to measure these EMFs.
- In chapters 4 and 5 I outline, step-by-step, how to measure the EMFs in your home and work environment. I also give guidance on when and how to shield.

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Preface

This eBook is a step-by-step guide to EMF protection. I share with you the information I've learned and used for over a decade to deal with my EMF sensitivity.

This isn't an eBook about beating EMF sensitivity. That's a different, much broader issue.

This eBook is devoted to EMF protection and only EMF protection. So we're on the same page right from the outset, if you're looking for a "quick fix" for EMFs you won't find it here. THERE IS NO MAGIC BULLET. There is no magic pill, no diode, or chip or neutralizer you can buy which will suddenly make EMFs safe. None.

If someone tells you there is you can seriously question their motives. I don't work for any EMF company. I don't have any sponsors. My advice is based on what I've tried and what works.

Its true there's a growing market in these devices. Things you stick on your cell phone, put next to your WiFi router, stand in the corner of your living room which are supposed to make EMFs 'safe'. But just because more and more companies are selling these devices doesn't mean they work.

Chips, diodes, pendants, neutralizers and harmonizers should NOT form the basis of your approach to dealing with EMFs.

Because unless you can actually feel EMFs (what's commonly called electrical sensitivity) these devices will lull you into a false sense of security. And even if you are electrically sensitive, your body might fool you into thinking the device is protecting you in some way.

Relying on chips, diodes, pendants, and the like can be dangerous. Why?

You buy the device. Then, gradually, you become less and less careful about how and when you use your cell phone, your tablet, your WiFi.... in short you increase your EMF exposure, thinking (mistakenly) that you're safe.

If you're lucky you start to feel symptoms. Perhaps prickly skin, perhaps a hot head when you spend too much time on your cell phone and you realize that the device is not offering you the protection you thought it was.

If you're not so lucky, you experience a gradual decline in health. Perhaps difficulty sleeping, weight gain, lack of energy, headaches, difficulty concentrating....which you don't particularly notice or attribute to anything. Except old age.

The risk being that one day this transforms into something worse.

The link between EMF exposures and a long list of very serious diseases, including Parkinson's, Alzheimers, cardiovascular disease, diabetes, suicide, autism, brain tumors and even cancer, to name just a few, are becoming abundantly clear.

EMF pendants, chips, diodes and the like are NOT where your focus should be.

I don't use any chips, diodes, neutralizers or similar gizmos. I make no outrageous claims. I speak about what I've tried and what works.

The objective of this book is to show you how to get long-term EMF protection

But before I talk about this, first here's a bit more about me and how EMFs have impacted my life....

My First Encounter With A Cell Phone

In 1986, my wife and I were living in a studio apartment in North London. Our landlord was a retired Army major in his 50s with a full handlebar mustache. He

drove a big 4 x 4, and he also had a big pouch on his belt. One day, he was paying us a visit, this pouch started to ring. This was my first encounter with a mobile phone, or cell phone.

In 1992 we moved into our own apartment. At the end of the road where we lived was a little shop that was selling cell phones.

A lot of city types seemed to have one of these devices. I was tempted to buy one because they were very 'in' and I love gadgets. At that time, cell phones were big and expensive. I'd no real use for one so I resisted the temptation a while longer.

In 1994, one day my wife, who is French, decided she wanted to move back to France. I was 27 years old. I couldn't speak any French, but I was tempted by the idea of moving out of the city.

So we moved away from the hustle and bustle of city life to a small town on the west coast of France. I remember the day I left London; it was a cold, foggy, overcast, and wintry. When I woke up the next morning in France it was sunny and warm. It felt good.

Our new life began, with all of its difficulties. For me my main challenges were the language barrier and the problem of finding suitable work. On the plus side were: the feeling of a new start, a healthy lifestyle, and a much more pleasant climate. We'd moved away from the pollution of the city to a beautiful, semi-rural setting.

France is known for its quality of life, I assure you this is no myth. I quickly took to French cuisine. We ate meat from the town's butcher's shop, fruits and vegetables (some of which I'd never seen before) from local markets, and fresh fish because we lived near a fishing port. In my off time I windsurfed, cycled, and jogged on the beach.

My shortcomings with the language meant my career took a while to take off, nevertheless it was an idyllic lifestyle. Six months later I spoke conversational French, within two years I was fully fluent. Three years after arriving I was married, we had our first child and I'd set up my own business.

Life was good. I'd always dreamt of running my own business, now I was finally living the dream.

In 1998, because my business was growing I bought my first cell phone. I transferred the incoming calls on my office line to my cell phone so I could field calls from customers without being tied to my office.

I was seduced. The cell phone gave me freedom. I could achieve so much more in a day.

From February to May, during the run up to the summer season, I used my cell phone about two hours a day. Over the summer months, because I was in the office I used it very little. The rest of the year, I was an occasional user.

My cell phone use would be categorized as moderate to light by today's standards

That day in February 2002 when my cell phone rang and I felt a physical reaction - it was a bolt from the blue.

The cell phone rang and I raced to retrieve it from my jacket pocket to answer the call in time. I pressed the talk button, within seconds I began to feel light-headed and dizzy. By the end of the short conversation I felt confused and dazed.

The next time my cell phone rang the symptoms were worse. The unpleasant feeling was now a searing pain on the side of my head I was holding my phone. The longer I spoke the worse it got until the pain was so intense it was excruciating.

I'd never experienced a pain like this before and yet intuitively I knew it was the cell phone that was causing it. Little did I realize my life was about to change forever.

Although I'd experienced nothing like this



before, I thought it'd pass. I've never been one to let aches and pains get in my way so I carried on and continued to use my cell phone. I tried to anyway...

Here were my symptoms when using or near a cell phone:

Immediate Symptoms:

- A "hot head"
- Dizziness
- Searing pain in the ear using the cell phone.
- Feeling as though my head were being held in a vice

Prolonged Symptoms

- Overwhelming and constant fatigue that could not be alleviated by an amount of rest
- Sensitive eyes/light sensitivity
- Constant headaches
- A burning sensation all over my body
- Prickly, tingling hot skin
- Stomach pain, gas, loose stool
- High blood pressure
- A stiff neck
- Joint pain, initially in the shoulders and spreading to the elbows
- Tightness/stiffness in muscles
- Metallic taste in the mouth
- Dark circles under the eyes
- Deterioration of eyesight
- Regular cramps in feet and legs
- Anxiety and irritability
- Feelings of hopelessness and depression
- Pain in the back of the ear
- Unexplained muscular aches and pains

My symptoms progressively meant that I was unable to:

- use a cell phone or to be around people using a cell phone; consequently, out of the loop communication-wise.
- spend time in an environment with Wi-Fi activated; socializing in other people's homes became difficult.
- spend time in an environment with cordless phones.
- be around a television screen when it was switched on; spending time with my family became difficult.
- play with my children on wireless game consoles
- stay in hotels or friends' homes with Wi-Fi and cordless phones; traveling became difficult.
- use the computer for any length of time; my business was affected.
- use a corded landline at my most sensitive time, making it very difficult to work at all.
- go into supermarkets and similar shops and spend time around supermarket checkouts, making it difficult to shop and spend time in town.
- go into electrical shops selling computers, TVs, and appliances.



In terms of cars and transport I was progressively unable to:

- be in a car with a cell phone switched on, making it difficult to travel with other people.
- use the car radio because of the speakers, often irritating or inconveniencing other passengers.
- travel in a car with Bluetooth activated, making modern car travel no longer an option.
- travel in a car with GPS; caused difficulty navigating and following directions to a destination.
- travel on planes due to electronic scanners and electronic equipment.

My developing symptoms meant that I found myself increasingly being confined to my home. The increasing prevalence of EMFs in my outside environment coupled with my growing sensitivity made any form of social interaction difficult. These symptoms dramatically affected not only my quality of life, but the lives of the people around me.

As my symptoms deteriorated I became hungry for answers. In 2002 information was scarce about this “disease” that was plaguing my life. For a full two years I lived in a perpetual state of doubt, fear and denial. I thought the symptoms were “all in my head”.

I thought I was going crazy

Then one day I happened to read an article in my newspaper about a UK chief executive who could not use cell phones or a computer because of the pain it caused him.¹ He could not use modern cars, electrified trains or take long distance flights. At night, he had to switch off the electricity just so that he could sleep.

The sense of relief I felt from learning this was huge. I wasn't the only person in the world suffering from this condition and I wasn't going crazy.

What I was experiencing finally had a name. The name given to the collection of symptoms I was experiencing in the newspaper article was “electromagnetic hypersensitivity” or “electrosensitivity” or “electrical sensitivity”.

"Anywhere between 3 and 5% of the population has severe electrical sensitivity, that's my estimate, other people will tell you it's much higher, but that's a conservative estimate... There is about 35% of the population who has the symptoms of electrical sensitivity, they may or not realize that they are electrically sensitive."

**Dr Magda Havas –
Toxicologist Trent University**

This book is the fruit of my experience in dealing with EMFs

Before outlining what you need to do to get EMF protection I want to get clear on just how important the question of EMF protection really is....

Chapter 1:

Is EMF Protection Really Important?

Are EMFs dangerous? It's easy to think they are not. We live in an age when it's very socially acceptable to use cell phones, Bluetooth, WiFi, laptops, computer tablets etc. At one time it was the same with smoking. Over the last 10 or 20 years the dangers of smoking has become public knowledge. Although there are people who still smoke, there are less of them and they do it in full knowledge of the facts.

EMFs are not quite the same. There is also a functional aspect to it. Many people consider their cell phones much more than a useful accessory, they wouldn't think of leaving home without it. There are now some jobs that it would be very difficult, if not impossible to do without having access to a cell phone. I understand this.

This book is not about stopping using technology

But this book is not about stopping using these technologies. It's about using them intelligently. And it's about using them in full possession of the facts.

What are the facts?

The facts are our governments have taken a back seat on the protection front, particularly since the advent of wireless. When cell phones were first introduced

into the US market in the early 1980s, strangely, they were exempted from premarket safety testing.

Why was that? Somehow the telecommunications industry managed to convince the government regulatory authorities that the mechanisms of harm at work weren't detrimental to the human body.

Your smart phone, wifi, laptop etc., use non-ionizing radiation. The tactic of the telecom industry has been to argue that the levels of energy involved are so low, that it's perfectly safe. They say that because there is no thermal (heating) effect, there is no effect. But there are effects.

There are adverse biological reactions to low-level non-ionizing radiation

Study after study has shown that there are adverse biological reactions to long-term exposures to low-level non-ionizing radiation. These studies have existed for decades. Over the last 30 years, there have been literally thousands of studies that show that these low-level EMFs are dangerous.

The BioInitiative Report

The first complete review of these studies was the BioInitiative Report 2007.

The Report found significant evidence of cancer, leukemia, childhood cancers, brain tumors and breast cancer

It found evidence of changes in the nervous system and brain function and effects on genes (DNA). It also found effects on stress proteins and the immune system.

In 2007 the BioInitiative Working Group concluded, "The clear consensus of the BioInitiative Working Group members is that the existing public safety limits are inadequate for [EMFs]".

In 2012 this Report¹ was updated. The BioInitiative Working Group 2012, who published the report, was comprised of 29 independent scientists and health experts from 10 countries.

EMFs linked to Autism, Fetal Exposure, Fertility, Alzheimer's Disease and other neurological and autoimmune disease effects

Through over twenty-one chapters, the 2012 report assesses the 1,800 new research papers in the intervening 2007-2012 period regarding risks from wireless technologies and electromagnetic fields. It shines the spotlight on the link between exposure to EMFs and Autism, Fetal Exposure, Fertility, Alzheimer's Disease and other neurological and autoimmune disease effects.

Public safety limits around the world remain grossly inadequate

Despite the overwhelming evidence public safety limits around the world remain grossly inadequate. People continue to put their health at risk because of these inadequacies.

Here is some more food for thought:

- According to the 2012 BioInitiative Report, young children (including those still in the womb), pregnant mothers, the elderly, and the sick are most in danger.
- Cell phones use virtually the same frequency of EMFs as microwave ovens. Conventional Wi-Fi uses exactly the same frequency, 2.45Ghz—a frequency that is known to be particularly biologically active.
- A study by Dr. Michael Klieseisen from the Neuro Diagnostic Research Institute in Marbella, Spain found that a single call lasting just two minutes can alter the natural electrical activity of a child's brain for up to an hour afterwards

- the American Academy of Environmental Medicine reports that epidemiological studies demonstrate that significant harmful biological effects occur from non-thermal RF exposure

These findings lead to some other very important questions. Do you or your children ever complain of headaches? Cell phone use has been linked to a variety of neurological concerns, including migraines and vertigo—not to mention acoustic neuromas and brain tumors.

Brain tumors twice as likely to be found on the same side of the head as phone use

In 2016 the U.S National Toxicology Program (NTP) published findings of what is considered by many as the world's largest, most well-designed study of its type. They found that cell phone radiation can cause 2 types of tumors Malignant Gliomas (Brain Cancer) in the brain and Schwannomas (also known as Neuromas) in the heart of male rats exposed to RF Radiation.

There are many other studies that have been published by other independent scientists which lead to similar conclusions. It's also true that there are studies which say EMFs are "safe". But there is also a problem of research and funding bias which you should be aware of

Research and Funding Bias

A study published in 2009 by Moskowitz et al in the Journal of Clinical Oncology investigated the research bias in blinded and un-blinded studies. In blinded studies, the study is done in such a way that the patients or subjects do not know what treatment they are receiving to ensure that the results are not affected by a placebo effect. In blinded studies, the meta-analysis found there was on average a 1.35 times increase in cancer risk for subjects who had more than 10 years of cell phone use. For un-blinded studies, the meta-analysis found a lower increased cancer risk.

A meta-analysis published in 2005 investigated the “funding bias” between industrial and independently funded research. The study found that most, if not all, independently funded research found an increase risk of gliomas. Conversely most industry funded research reported decreased risk to gliomas.

Many people think that because they can't feel anything EMFs are safe. This is clearly not true, but they are mis-lead because of the long latency period before diagnosis.

Studies show it takes on average 40 to 50 years from when you start smoking before you're diagnosed with lung cancer. It takes 30-40 years from exposure to asbestos before you are diagnosed with mesothelioma. And it takes 20 to 30 years from exposure to occupational dyes before you're diagnosed with bladder tumors. Infants who were exposed to radioactive radiation from the Chernobyl accident took on average 10 years before they were diagnosed with thyroid carcinoma.

We don't know the latency period yet for EMF exposures. Its thought to be several decades, which means if you wait to be diagnosed before taking action it will probably be too late.

EMF exposures are highly detrimental to human health

The evidence is clear EMF exposures are highly detrimental to human health.

In the next chapter I'm going to explain what constitutes a safe level of EMF exposure. But first, by way of introduction, I am going to get clear on what EMFs are exactly so you can better understand the practical steps you need to take to protect yourself.

Chapter 2: What are EMFs & What's Safe?

Whatever your current circumstances, you have symptoms around EMFs or you currently have no symptoms around EMFs, reducing your EMF exposure to safe levels needs to be at the very top of your list of priorities.

But what are safe levels? Before I answer this question let me first explain what I mean when I say “EMFs”.

Understanding Electromagnetic Fields

An electromagnetic field, also called an EMF, is a region of space where electric and magnetic forces interact. This could be an area found near magnets, broadcasting antennas, electrical currents, and the like. It could be an area near a cell tower, smart phone, WiFi router etc. An EMF transmits unseen energy in the environment.

An EMF contains both electric and magnetic forces of energy

Natural magnetic fields are a familiar concept to most people. The most common natural magnetic field that I can reference is the gravitational pull on earth that keeps us securely on the ground. The magnetic field of the earth will also cause

the needle on a compass to move in any given direction: north, south, east, or west.

The best example of an electric field in nature is lightning. On a smaller scale, you may have been “shocked” before by static electricity in the carpet or when touching the metal handle of a car door.



Throughout the last century, man has learned how to harness this electrical energy to conduct it via wires into homes to power heating and cooling systems, lighting, appliances, and modern electronics.

Electric and magnetic fields can be described as follows:

- **Electric Field:** This field is made by variations in voltage. The field becomes even stronger at higher voltages. An electric field will still exist if there is no electric current flowing through it.
- **Magnetic Field:** This field is created through the natural flow of electrical current. As the current becomes stronger, the magnetic field grows stronger as a result.

Electric Field

Made by differences in voltage.

Higher voltage equals a stronger field.

Magnetic Field

Made by natural/man-made electrical current flow.

Greater current equals a stronger field.

Field strength decreases with distance.

Field strength decreases with distance.

Field strength is reduced/weakened by building materials.

Field strength is not reduced by building materials.

Field strength is of constant strength (irrelevant of power consumption).

Field strength varies based on power consumption.

Field exists even without electric current flowing.

No current flow = no magnetic field

EMFs are generally expressed in terms of their frequency and wavelength.

Imagine EMFs as a series of very regular waves that travel at the speed of light. “Frequency” describes the number of complete waves that go by per second, or oscillations per second.

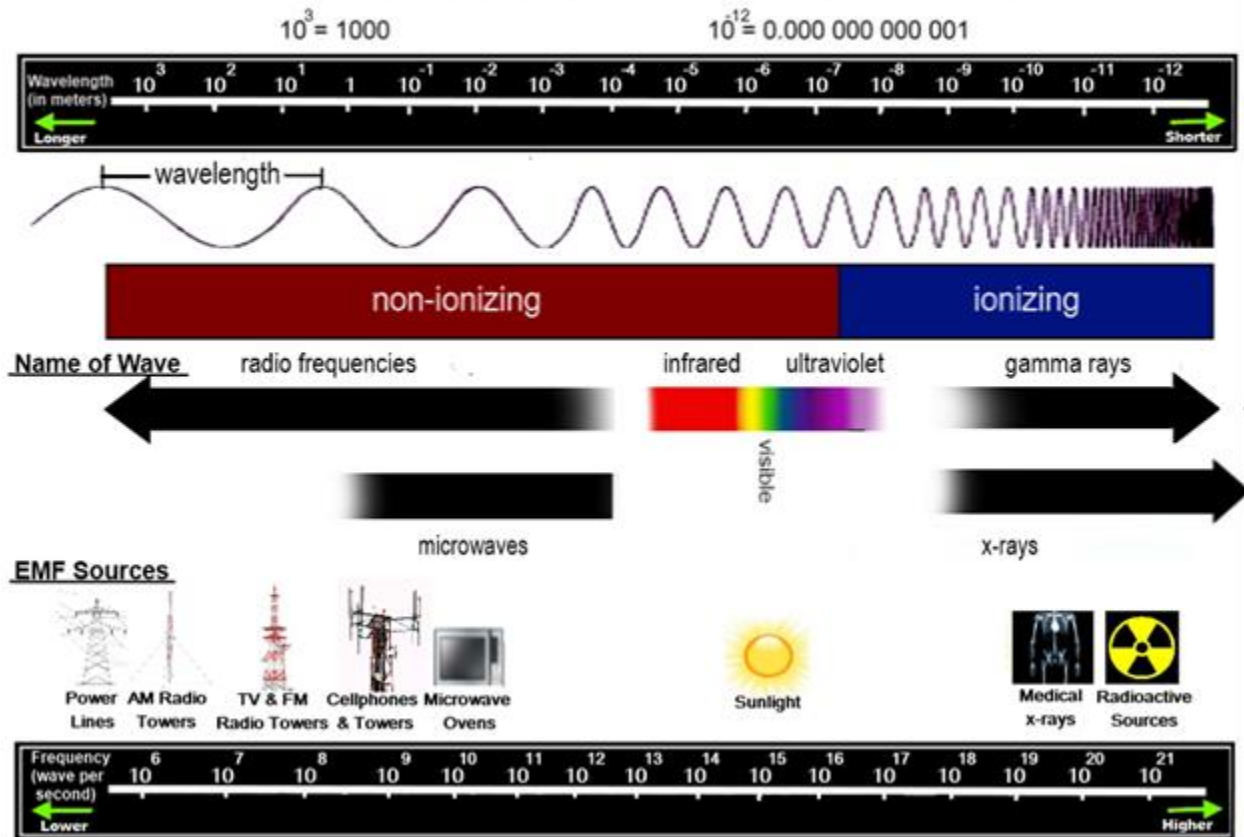
“Wavelength” describes the distance between one wave and the next.

Wavelength and frequency are inseparably intertwined

The higher the frequency (number of oscillations per second), the shorter the wavelength (the distance between the waves) and vice versa.

We use something called the EMF spectrum to show the relationship between these different types of EMFs.

THE ELECTROMAGNETIC SPECTRUM



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Understanding the EMF spectrum:

- **Hertz:** 1 cycle per second.
- **MegaHertz (MHz):** 1 million cycles per second (1,000,000 Hz or 10^6)
- **Gigahertz (GHz):** 1 billion cycles per second (1,000,000,000 Hz or 10^9)

So an EMF with a frequency of 1 GHz (the bottom scale on the diagram above) has a wavelength of 300 millimeters (the corresponding point on the top scale), that's to say a little less than a foot.

We can differentiate two main categories of man-made EMFs. This differentiation is made according to frequency as follows:

- **Low frequency EMFs:** also called ELFs (extremely low frequencies) in the range 1-300 Hz. This category of EMFs is transferred through wires. They relate to electrical power systems.
- **Radio Frequency EMFs:** also called RF radiation. As the name implies these are high frequency EMFs in the range 10 MHz-300 GHz. This category of EMFs is transferred through the air; the term “wireless” is often used. They relate essentially to telecommunication devices like cell phones, WiFi etc.

The current in an electromagnetic field will either be an AC or DC current. A DC current is a direct current that flows in one direction to create a static field without any variation. The perfect example of this is the magnetic field of the earth.

An AC, or alternating current, electromagnetic field is the power that is most often used in our homes. It is transmitted over wires, through the air, and into the ground. AC currents reverse direction regularly, causing drastic changes in their electromagnetic fields.



Electromagnetic fields, whether man-made or natural, constantly surround us at all times

Our exposure to man-made electromagnetic fields has steadily increased as modern technology has advanced. The biggest increase in electromagnetic fields has occurred within the past two decades due to innovations in the telecommunications industry, especially with the introduction of cell phones and other forms of wireless technology.

Cell phones and similar devices operate by emitting and receiving radio frequency (RF) radiation. There are two types of RF radiation, analogue and digital. Pretty much all cell phones, TV broadcasts, Wi-Fi, Bluetooth, cell towers / masts, and other wireless technologies work using digital technology.

Apart from frequency, what also differentiates RF radiation from other forms of electric and magnetic radiation is that they are pulsed.

In the US the FCC (Federal Communications Commission) defines “microwaves” as a subcategory of RF radiation operating at frequencies ranging from about 1 GHz upward.

Ionizing vs. Non-Ionizing Radiation

Particles called *quanta* are transmitted through electromagnetic waves. Some electromagnetic waves have so much quantum energy that they can break down the bonds that hold molecules together, this creates molecules with unpaired molecules termed “free radicals”. Free radicals in themselves are not dangerous, but if there are too many of them they are believed to be responsible for cancer, aging, and a variety of diseases. These EMFs are called ionizing radiation. Examples include cosmic rays, radioactive materials, and x-rays that emit gamma rays.

Quanta at lower energy levels that cannot break molecular bonds create non-ionizing radiation. Examples of electromagnetic fields with a long wavelength and low frequency include microwaves, electricity, and radiofrequency fields.

Low-level non-ionizing radiation is not safe

For years, we have been told that non-ionizing radiation is safe. But, it is not safe. Studies¹ show that, even at very low levels this non-ionizing radiation has adverse health effects.

What Are Safe Levels of Radiation?

"What is clear is that the existing public safety standards limiting these radiation levels in nearly every country of the world look to be thousands of times too lenient."

The BioInitiative Report¹

There are many different guidelines on what are considered to be safe EMF levels. These recommendations differ dramatically, depending on what organization has published the guidelines.

The main international guidance on the health effects of EMFs comes from the World Health Organization (WHO) which relies largely on the work of the International Commission on Non-Ionizing Radiation Protection (ICNIRP). Other organizations which publish authoritative statements are the:

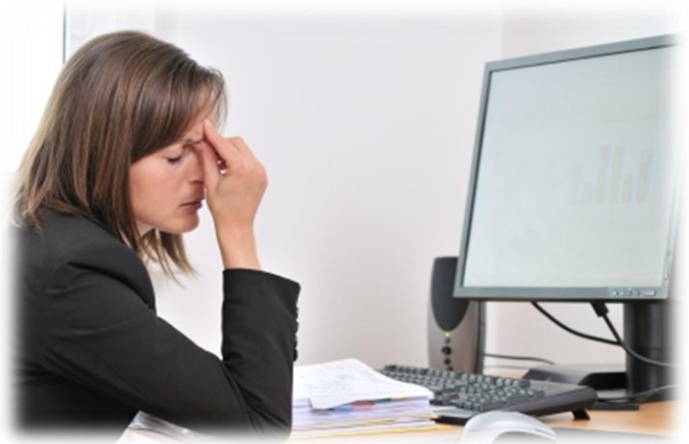
- International Committee on Electromagnetic Safety - ICEMS
- European Union
- United Working Group
- International EMF Collaborative

Unfortunately, **most of the current guidelines for EMF exposure around the world are based on evidence demonstrating whether there is a thermal effect.** That's to say if the radiation is not sufficient to heat up body tissue it is considered safe.

The most reliable information we currently have on the effects of EMFs on health is that provided by the BioInitiative Working Group.

The authors of the BioInitiative Report² concluded that the current guidelines for EMF exposures were much too lenient for the public.

In some cases the guidelines were found to be 1000s of times too lenient.



In the case of electrically sensitive people, people who have symptoms around EMFs, the BioInitiative Report found the existing safety standards to be hundreds of thousands of times too lenient.

Institute of Building Biology

Another independent body, the Institute of Building Biology, also publishes some useful guidelines. According to the Building Biology Evaluation Guidelines² for sleeping areas, there are four basic categories of concern:

- **No Anomaly** - Highest degree of precaution.
- **Slight Anomaly** - Precautionary, especially for sensitive or ill people.
- **Severe Anomaly** - Unacceptable; a number of scientific studies confirm potential health problems.
- **Extreme Anomaly** – Immediate and rigorous action must be taken.

As an example, for magnetic fields similar to those emitted by your electrical wiring, here are the levels of anomaly for sleeping areas according to Building Biology Evaluation Guidelines³:

- **No Anomaly:** <0.2mG (20 nT)
- **Slight Anomaly:** 0.2-1mG (20-100 nT)
- **Severe Anomaly:** 1-5 mG (100-500 nT)

- **Extreme Anomaly:** >5 mG (500 nT)

Michael Bevington⁴ published a helpful table in his book *Electromagnetic Sensitivity* of the exposure levels in nature:

- **Magnetic Field:** 0.000002mG (or 0.0002 nT)
- **Electric Field:** 0.0001 V/M
- **Radiofrequency Radiation:**<0.00002 V/M

When we compare even the lowest, strictest, levels of Building Biology magnetic field Guidelines (<0.2mG) to those found in nature (0.000002mG) there is a difference of many orders of magnitude. Indeed the levels in nature are so low, they are effectively zero; you would need very sophisticated equipment to measure these levels.

Ideally you should aim to reduce your exposure levels to AC fields and RF radiation to those found in nature, effectively zero. In practical terms it's probably impossible to achieve such low levels, but the more you are able to significantly reduce your EMF exposure levels the better.

The Radiofrequency Menace

The particularity of radiofrequency radiation is that unless you have an EMF meter, it can be very difficult to tell if you are in an environment with high levels of RF radiation. Sitting in the middle of the desert away from any signs of man-made infrastructure, your exposure can be significant.

This RF radiation used by cell phones and similar technologies consist of a carrier wave, typically operating at 1800 or 1900 MHz also known as the carrier signal, and a second frequency, known as modulation, which is embedded in the carrier signal. This second signal is used to send data; sounds, words and images. These modulations work at extra low frequencies and are known to cause a wide variety of biological effects.

The second problem is the fact that most forms of RF signals are now digital, which is another way of saying pulsed.

"Pulses carried by microwaves are particularly dangerous. This is because their very short wavelength allows the transmission of pulses with extremely rapid rise and fall times, and it is the rate of change of the fields (rather than their total energy) that does most of the biological damage;

Andrew Goldsworthy⁵

Pulsed RF radiation is not found in nature and neither is alternating current (AC).

Rather than say what's safe, which nobody truly knows, always aim to get your EMF exposures ALAR, as low as reasonably possible.

In the next chapter I'm going to explain the practical steps you need to take to analyze the EMFs in your life

Chapter 3:

How to Analyze the EMFs in Your Life

Having gained a better understanding of EMFs and the “guidelines” for safe levels of radiation exposure, analyzing the EMF levels in your environment is the next step.

There are four different kinds of EMFs that we can easily measure in our environment:

1. Electric Fields
2. Magnetic Fields
3. Radiofrequency Radiation
4. Intermediate frequencies or “dirty electricity”

When measuring EMFs using a meter, typically

- a magnetic field will be measured in milligauss (mG),
- an electric field in volts/meter (V/m),
- and radio frequency radiation in volts/meter (V/m) or microwatts/m² ($\mu\text{W}/\text{m}^2$).

EMF Meters I Recommend

Over the years I've tried lots of different EMF meters. The thing they all have in common is that they may all be considered "consumer meters". So they will supply you with invaluable information for dealing with the EMFs in your environment. But they're not designed to be nearly as accurate and precise as professional instruments, which usually require some technical knowledge to operate.

Here are the EMF meters I recommend:

Trifield TF2 Meter: The Trifield meter measures three of the categories of EMFs listed above: AC magnetic fields, AC electric fields, and radiofrequency radiation. The thing I like most about this meter is it's very easy to use.

Begin by turning the dial to the first magnetic setting and then slowly moving the device around your home or office. Magnetic fields can be detected anywhere, like TV screens, clock radios, refrigerators, electric ovens, and electrical wiring.

To measure electric fields, turn the dial to the electric setting and again slowly move through your home or office. This setting may detect fluorescent lights, TVs, computer equipment, and even electric blankets.

You have the choice between obtaining 'standard' or 'weighted' readings for electric and magnetic fields. Standard gives equal sensitivity across all frequencies where as weighted shows a number proportional to the effects induced inside the human body from the fields. I find weighted most meaningful.

To measure radiofrequency radiation turn the device to the RF setting. It can measure radiation from cell phones and other wireless devices including WiFi.



My biggest gripe is its RF capability. It only measures up to 6GHz and has a resolution of 0.001mW/m² compared to the Cornet ED88Tplus and the Acoustimeter which have superior sensitivity and frequency range (8GHz).

If measuring magnetic fields is your priority this meter is a very good choice. The TF2 also has an audio function, which I particularly like, and a backlight. See my video review here <https://www.youtube.com/watch?v=3mP5M8xb74g>

ME3030B Meter: The ME 3030B is an easy to use electric and magnetic field meter. It can measure AC fields ranging from 16 Hz to 2000 Hz and magnetic fields from 0.001 to 1.999 microtesla. This meter is a single-axis, which means you have to turn it round to get the highest reading, with sensitivity to AC electric fields at 1 V/M.



The ME 3030B can be used in environments that have magnetic fields, and electric fields.

This is a meter for measuring ELFs (extremely low frequencies) – there is no RF function. For measuring electric fields I prefer this meter to the Trifield because it's ground cord (supplied) gives you greater accuracy. For measuring magnetic fields, the Trifield has the upper hand.

The downsides are that it's mono-directional, so you need to turn it to get readings. And it has a limited frequency range; it only detects AC fields in the low frequency band 16 Hz to 2 KHz, so there could be intermediary or high frequency fields in an environment that this meter will not show.

The Trifield measures in the range 40 Hz to 100 KHz but its lack of accuracy and precision can be misleading. If you only need to measure magnetic and electric fields the ME 3030B is a good choice.

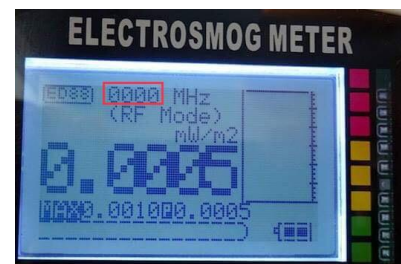
See my video review here <https://www.youtube.com/watch?v=98ggC--kFgo>

Cornet ED88TPlus Meter: Like the Trifield meter this meter measures three of the categories of EMFs: AC magnetic fields, AC electric fields, and radiofrequency radiation. It also has a sound function so you can hear what it's measuring and offers data logging functionality via USB to your PC – though I don't know anyone that uses data logging.



It can measure RF radiation from 100 MHz up to 8 GHz, which is better than the Trifield, which only measures to 6 GHz. It has three modes for RF radiation, decibel-milliwatts (dBm), microwatts per sq. meter ($\mu\text{W}/\text{m}^2$) and volts per meter (V/m), which is overkill really. The volts per meter setting is all you need for personal use.

It also has a frequency display function for RF (the four digits in the first line of the display shown in red here), so it also tells you the actual frequency of the exposures in the range 100 Mhz to 2.7 Ghz, which can be very useful.



It can also measure magnetic fields from sources like power lines, transformers and home appliances. It measures magnetic fields in the frequency range 50 Hz to 1 KHz, which covers most things, and it measures from 0.1 mG right up to 600 mG! And it measures electric fields in the range 50Hz – 50KHz.

What I like about this meter is that like the Trifield TF2 its multi-function. But what really set's this meter apart compared to the Trifield TF2 is its RF mode functionality – its more sensitive, has a broader frequency range and has a frequency display function.

Video review of the Cornet ED88T (the ED88T has the same basic functionality as the ED88Tplus) <https://www.youtube.com/watch?v=FEpJlr6arxg>

- **Acoustimeter:** The Acoustimeter measures RF radiation, giving readings with LED lights an LCD display and a loud speaker. It display's peak and average readings for radiofrequency radiation.

It can measure signals from 200 MHz to 8 GHz, so pretty much on a par with the Cornet on that score.

What I like about this meter is it's very simple to use, simpler than the Cornet or Trifield meters. But it does only measure RF radiation which means you will need another meter to measure electric fields and magnetic fields.

The Acoustimeter display has 2 lines where 3 different readings are shown simultaneously. On the top line the reading in brackets, (5.29), corresponds to the "peak hold" reading in V/m, that's to say the highest reading recorded since the unit has been switched on. The number next to this, 2.45, is the current peak signal strength in V/m. The number on the bottom line, 140, is the average reading in microwatts per square meter ($\mu\text{W}/\text{m}^2$).



The advantage of this meter is its sensitivity in measuring peak readings (the LHS column of LEDs) - it's the peak readings, which are the most important.

Strictly speaking this is not a directional meter but I have been able to use it to determine the direction of RF sources. It is more expensive than the Cornet meter; you get what you pay for.

- **GS Meter:** There is a lot of ignorance about the dangers of intermediary frequencies, or dirty electricity. Even I was ignorant on this issue for about 6 years after becoming EHS.

When you live or work in an environment where there is electricity, this electricity doesn't stay in the wiring it is radiated out into the room. It seeks the path of least resistance to return to ground. Your body, is electrically conductive, and as such this electricity is attracted to you. If you spend time in an environment where there is dirty electricity then the potential for harm is increased.

Dirty electricity can be defined as high-frequency voltage pollution, called harmonics and transients, on electrical wiring. In layman's terms, it means things like cell phone chargers, TVs, computers, dimmer switches, compact florescent bulbs, surge protectors etc cause an interruption of electrical current flow which introduces harmful intermediate frequencies into your electrical system. Ground currents may also be a source of dirty electricity.



Dr Samuel Milham¹ talks of it being a universal issue, affecting schools, offices, and homes worldwide.

It is believed to be a causal factor in many common diseases such as diabetes, cancer, heart disease, and neurodegenerative disease.

You can measure the dirty power or dirty electricity in your home or office by plugging a GS (Graham Stetzer) meter into any electrical socket.

"In the Southern California middle school that I studied, there was a 21% increase per year [in dirty electricity] if you worked in the school.

If you worked in a room that had a reading that was too high for the Graham/Stetzer meter to measure; that was above 2000 units, a teacher's risk to cancer was increased by 26% per year, in a decade it is 26% times 10 higher, that's a 260% increase. If you compare the teachers in this school to the California population they had 10 times the risk of melanoma and 11 times the risk of uterus cancer."

- Dr. Samuel Milham¹

The GS meter measures these harmonics and transients present within the 4 KHz to 100 KHz frequency range.

GS filters filter out intermediary frequencies in your electricity supply in the range 4 to 150 KHz (that which Russian research has shown to be the most dangerous).

The manufacturers of the GS filter recommend adding filters if your GS levels are above 50. I use GS filters in my home and office to keep the GS levels around 30, which gives me a good safety margin.

First, you measure the level of dirty electricity in your home or office with a GS meter with EVERYTHING switched off and unplugged in the house. Then compare the reading to that when everything is switched on. This will tell you whether the dirty electricity is coming into the house from the outside.

If the GS levels are high with everything switched off and unplugged then the source of the problem is external. You could try plugging in some GS filters as close as possible to your electricity box. But ideally you would want to have installed a sophisticated filter unit between the meter and

your electricity box. Contact a qualified electrician to have this installed correctly.

If the GS levels are low when everything is unplugged but high when plugged in, it indicates that the problem is internal. In which case you need to look at eliminating all those devices which are causing the problem: dimmer switches, fluorescent lighting, CFLs, TVs, DVDs, computer equipment, induction cooktops, mains adapters and chargers.

You can identify these devices by plugging them in one by one, while keeping an eye on the reading given by your GS meter. When you see your readings spike, you can either eliminate the device in question or insert a filter/s. An RF filter strip (not the same as a surge protection strip) can be used where you plug in your computer or TV to keep this noise out of your wiring.

If you live in an urban area with multiple electrical appliances and/or are in close proximity to a cell phone tower, then it's very likely that you are living in a high GS environment.

A word of warning, GS filters increase the currents in your house wiring. If your house contains any wiring errors installing filters can generate magnetic fields, which is counter-productive. Better to eliminate the device/s causing the problem and if in doubt about your house wiring get it checked by a qualified electrician.

As ever, listen to what your body is telling you. If you install filters and find that your symptoms deteriorate, you know that installing filters are not the solution. An even more prudent approach is to have your electrical system evaluated by a professional before installing GS filters.

- **ME3951A Meter:** Classified as a “professional meter”, like the ME3030B this meter measures electric and magnetic fields. But it's more accurate and has a significantly greater range. It can measure AC fields ranging from 5 Hz to 400

KHz and magnetic fields from 0.1 to 1999 nanotesla. This meter is a single-axis, or monodimensional meter, with sensitivity to AC electric fields at 0.1 V/M.

The big advantage with this meter is that it can measure dirty electricity on electrical wiring generated by things like CFLs and dimmer switches. Because it measures electric fields up to 400 KHz, the ME3951A is a superior tool for measuring dirty electricity than the GS meter, which only measures up to 100 KHz. To test for dirty electricity with this meter proceed in the same systematic manner as described above for the GS meter room. The advantage of this meter is that you can measure dirty electricity at any given location in a room.



This is an extremely sensitive meter with a good range, the downside to this meter is its cost.

I am not saying these are the best meters to test for EMFs but **I have tried all of the meters above and can attest to their benefits.** The crux of effective EMF protection is to use EMF meters that can give you reliable readings.

It is imperative to use your EMF meters regularly to stay aware of your surroundings

You can easily speculate, and other people may tell you about levels of EMFs found in their environment, but it's not until you take a meter into your home or office and see the reading for yourself that you truly appreciate your EMF exposure. It's surprising and sometimes even shocking to detect EMFs, even if you have been using a meter for years, like me.

3 Things to Keep in Mind When Choosing Your Meter

1. **There is no one meter that can measure everything.** The Trifield can be misleading and make you think that it can do everything. It can't.
2. **There is always a trade-off between cost and accuracy.** The more you pay, the more you get when it comes to EMF measurement (certainly in so far as the meters mentioned on these pages are concerned).
3. **These meters are not considered professional measuring equipment.** The meters reviewed on these pages do not have the same accuracy as an EMF meter that could cost you in the thousands or tens of thousands of dollars.

I strongly recommend buying a meter instead of a detector. With a meter, you will get actual readings even if they are not 100% accurate. It's better to have readings that you can compare when you do EMF remediation to track the before and after. A detector will not allow you to do that since it will provide only audio or visual information and not an actual reading.

If you want more detailed information than an EMF meter can give you, you need to buy a spectrum analyzer. It's designed to measure and display power spectral density. So it displays signal strength as it varies in relation to signal frequency in graph form. These devices are expensive, typically you would pay several thousand dollars for a fairly basic model and they are not very portable (they are designed for laboratory use).

Having the Acoustimeter, the 3030B and a GS meter is a good choice. With these three meters, you can be assured of obtaining reasonably accurate readings without breaking the bank.

Equipping yourself with the proper tools will enable you to educate yourself about your surroundings. Once you have a basic understanding of EMFs and the means to test your level of exposure on a day-to-day basis in your home and office, you can begin to implement the steps to reduce the EMF load in your life. I will discuss these in detail in the next chapter.

Chapter 4: Reducing EMF Exposure in Your Life

In this chapter I am going to explain in detail how you can reduce the EMF load in your life.

Let me first start by giving you the criteria that will enable you to evaluate your exposure to EMFs.

The Four EMF Exposure Criteria

Your exposure to EMFs mainly depends on 4 criteria:

- the strength of the field at the source (or power density for RFs),
- the distance from the source,
- the frequency (oscillations per second),
- the duration of exposure

These are the 4 main factors to be taken into account when evaluating your EMF exposure (With RF radiation the information content is also considered an important factor).

In a practical sense, given that your meter reading condenses the first



three criteria into a single reading, you only need to factor in the duration of your exposure.

For instance, a strong magnetic field in your utility room will generally be less of a problem than a weaker electric field in your living room because you only pass through your utility room, rather than spend time there.

Given that EMFs are now present virtually everywhere a good starting point for EMF mitigation is the place where you spend the majority of your time.

For some people, this could be your place of work, for the majority of people this will be your home environment.

The two principal sources of EMFs in the home are:

1. Your electrical wiring.
2. Your electrical appliances.

Here is how to do your testing:

1. **Use your meter/meters to identify the sources of EMFs in your wiring or appliances.**
2. **Take remedial action. This will usually involve:**
 - a) Eliminating the source, for instance replacing a cordless phone with a corded version.
 - b) Changing the way you interact with the source, like turning off the cordless phone when it is not in use.
 - c) Protecting yourself from the source. For instance applying shielding materials if the cordless phone is in your neighbor's apartment.

Electrical Wiring

Current building regulations regarding electricity are primarily concerned with protecting homeowners against electrical shocks. Little or no consideration is given to the aspect of EMF exposure. Poor wiring is a common problem. In an older property there might be some tell-tale signs like blackened wires, blown fuses or lights that dim when an appliance is switched on. But newer properties can also have their fair share of problems, for instance poor grounding or a high water table creating EMF issues.

There are practical steps that you can take to deal with the issue of EMFs in your household wiring:

- 1. With your EMF meter, go through your house room by room.** Start with your bedroom since this is the most important room, and test for electromagnetic fields.

Be systematic, test everything, plug in *all* the appliances you use or could use in your day, take readings of the EMFs being emitted by the appliances and note the readings down. Run your meter along the walls and floors to measure the EMFs from the wiring. Compare your readings with the Building Biology Evaluation Guidelines and the safe levels in nature (see appendix 1).

- 2. Take remedial action.** This may be as simple as moving your bed twelve inches away from the wall so that you are a safe distance from the EMFs in your wiring while you sleep. If you do have high levels of EMFs in your electrical wiring (compare with the levels in appendix 1), then you will probably



be looking at more elaborate and costly solutions.

Your main priority is to use your meter to determine if there are EMF issues in your wiring. When and if you establish that there are issues, do not try and carry out work on your electrical wiring yourself (not unless you are a qualified electrician).

This will be your next task, to find an electrician who is competent enough to carry out the work that needs to be done. He also needs to be open-minded. Much of the work will go beyond normal electrician safety protocols and practices so you will need someone who is willing to take your needs into consideration.

The biggest problem with EMFs in household wiring is usually magnetic fields.

To some extent this depends on where you live. In the UK for instance, wiring and appliances all have three electric wires: the phase, the neutral, and the earth. The phase and the neutral are the outward and return paths for the current.

In continental Europe and the US there are still some older buildings wired on a two prong system, there is no earth wire. Though the three pronged system is now fairly universal, the signification of the color of the wires differs from country to country.

The earth wire does not carry any power, unless there is a fault. It acts as a safety net; in the case of a fault, the earth wire will safely send the charge back down to earth.

Because the electricity system works on the principal of balance, one of the most common causes of high levels of magnetic fields, is when the phase and neutral wires are not put together. When wired properly the positive cancels out the negative. If the phase and neutral wires are separated its extremely likely that high levels of EMFs occur.

This problem is fairly simple to resolve, but other issues with EMFs in wiring may be more difficult to resolve in an existing home. **Effective EMF mitigation may involve:**

- Covering tables, walls, and ceilings with earth metal screening tape.
- Putting all wiring in metal conduits.
- Inserting plastic sections in piping, such as in gas and water pipes.
- Repositioning the meter and consumer unit away from rooms where you spend any time.
- Removing dimmer light switches and replacing them with conventional switches.

Test with your meters and consult with your electrician to decide on the best course of action.

Porcelain knob insulators and rotating disk meters, found in older properties, can also cause issues with EMFs in home wiring. Rotating disk meters can also be harmful since they give off high levels of magnetic fields, maintaining a distance of six to eight feet will usually minimize any exposure to these magnetic fields. EMFs from smart meters are harder to deal with (see below).

Again, reducing EMFs from building wiring is not something that you want to undertake yourself. You can often make the problem worse if the work is not done properly. *You must use a qualified electrician.*

For more information on this subject read *Tracing EMFs in Building Wiring and Grounding* by Karl Riley¹. His DVD, *Tracing Magnetic Fields in Building Wiring* is also a great resource.

Electrical Devices

Most of the talk in the media focuses on the dangers of cell phones. We tend to forget that all electrical appliances produce EMFs to some extent, even when the appliances are not turned on.

Any appliance with an electric motor or heater will give off electromagnetic fields. These EMF sources affect everyone to varying degrees .

- **Microwave Ovens:** Microwave ovens use electromagnetic radiation to cook or heat your food but they can cause serious issues when used over the long-term.

*There are two issues with microwave ovens. **The first issue is what they do to your food.*** A microwave oven leaves food virtually devoid of any kind of nutritional value.



Japanese and Russian studies have already revealed that food loses up to 60% to 90% of its nutritional value when it is cooked in a microwave oven. This also includes the loss of vital antioxidants when food is microwaved (more on this in chapter 8).

The second problem is the EMFs. Microwave ovens typically give off very high magnetic fields and they leak pulsed RF radiation (2.45 GHz) through the door seals - even brand-new models (I have tested this). The solution is to do like me, remove your microwave oven from your home or to stay out of the kitchen when cooking with a microwave.

Better still, instead of cooking with a microwave, buy a steamer. This is a healthy and nutritious way to cook food, and it won't expose you to the risk of RF radiation.

- **Wireless Devices:** It's not just wireless routers and cordless phones that give off RF radiation. Even appliances like washing machines, cookers and refrigerators are now being fitted with components that emit RF radiation to link up to the Smart meter network being installed in many communities.

Use your RF meter to eliminate the wireless devices in your home environment as much as possible and be sure to test any new items, preferably prior to purchase, for RF emissions.

- **Smart Meters:** These are digital meters that are being introduced in most parts of the world to measure gas, electricity, and water supplies. Some smart meters send information back to the utility company via the powerline, which creates dirty electricity. But the most common problem with smart meters is the RF radiation they emit. Smart meters typically send information to the utility company using a wireless signal via the smart grid, so that a utility meter reader doesn't have to physically come to a property for a manual reading. Which means you have a device in or next to your home emitting radio frequency microwave radiation that penetrates the walls of your home and into your home 24/7, 365 days/year.

There are basically two ways of dealing with smart meter RF radiation, have the smart meter removed from your home, or install shielding (see below).

Both electric and magnetic fields are present in power lines and appliances. Anything electric gives off an electric field, lamps, wiring, extension cords etc. But as I said in the previous chapter, magnetic fields represent a particular hazard because virtually nothing can stop them.

The only real solution is to maintain a safe distance between yourself and the source.

A major source of magnetic fields is next to the power meter in your home, you definitely want to avoid spending any time next to your power meter.

The United States Environmental Protection Agency Office of Radiation and Indoor Air² provides the following table for the magnetic fields from a host of appliances that may be found in your house. The first number in the table is the lowest measurement (called “low”), the second number is the median (called “medium”), and the third number is the highest measurement taken (called “highest”).



The table below shows the distance from the source, as well as its magnetic field strength measured in mG.

Distance from Source	6"	1'	2'	4'
Hair Dryers				
Lowest	1			
Medium	300	1		
Highest	700	70	10	1
Blenders				
Lowest	30	5		
Medium	70	10	2	
Highest	100	20	3	

Coffee Makers

Lowest	4			
Medium	7			
Highest	10	1		

Dishwashers

Lowest	10	6	2	
Medium	20	10	4	
Highest	100	30	7	1

Microwaves

Lowest	100	1	1	
Medium	200	40	10	2
Highest		300	200	30 20

Refrigerators

Lowest				
Medium	2	2	1	
Highest	40	20	10	10

Television

Lowest				
Medium		7	2	
Highest		20	8	4

This table is only indicative. Use your EMF meters, go from room to room around your home then mitigate or eliminate as appropriate.

Field strength and proximity to the EMF source are important, but when everything else is equal the more prolonged your exposure to EMFs the more important it is to bring effective solutions to bear. And the longer you spend in a room where there are any EMFs the greater your potential for exposure.

In the next chapter I'm going to explain the rooms you need to give special consideration to and address the issue of shielding.

Chapter 5: Reducing EMF Exposure in Your Home & at Work

In terms of EMF exposures your bedroom is the most important room in your home – in your life.

The bedroom is the primary location for cell rejuvenation and melatonin production. This makes it the most important place to start getting tough on EMFs.

Melatonin is a hormone produced by the pineal gland. Studies¹ show melatonin has an important role to play in cancer prevention, protection from heart disease, maintaining the brain's function, and immunity. They also show that EMF exposures lower melatonin levels. Your body produces melatonin essentially at night.²

There are two important points to understand about melatonin:

1. Optimum melatonin production can only be achieved by sleeping in total darkness.
2. You need to avoid exposure to high EMFs, especially magnetic fields, at least two hours before you go to bed. Exposure to magnetic fields, especially around that time, will severely inhibit melatonin production.



Studies show that Melatonin deficiency is a common factor in electrically sensitive people.³

Low EMF Bedroom Setup

But sleep time is not only important for melatonin production it is also a busy time for your cells. They are involved in processes of rejuvenation, regeneration, detoxification, and melatonin production. Sleeping in an EMF polluted environment inhibits these processes, greatly.

If your cells and organs are not able to detoxify and repair themselves each night, your body will be under constant stress.

Because this stress is cumulative the risk is that over time your healthy cells will become damaged. Unhealthy cells are more vulnerable to infection, mutation, and neural disorders. EMFs can disrupt sleep cycles and contribute to a number of physical issues, like allergies, fatigue after sleeping, heart palpitations, daytime irritability, muscle weakness, and a weakened immune system. Not surprisingly, these are symptoms which many electrically sensitive people become victim to.

Your EMF meters, RF, electric, magnetic and GS meter (as described previously) are your best allies to eliminating harmful EM pollution from your bedroom environment.

The objective of your bedroom setup is to promote and maintain quality sleep. To achieve this you need to create an EMF bedroom environment which resembles as closely as possible the EMF levels found in nature, the Schumann resonance. This will enable your body's repair processes to function correctly.

Here are 10 tips to help make your bedroom a low EMF environment:

1. **Don't use cellular phones in your bedroom.** I have said it before, but I will say it again.
2. **Don't use cordless phones in your bedroom.** Having a cordless phone base in your bedroom is like sharing your sleeping quarters with a mini cell phone tower. The same goes for wireless speakers and wireless baby monitors. Use a wired landline if you need a phone close by as you sleep.
3. **Unplug all electrical devices in your bedroom.** Remember AC electrical devices emit strong electrical fields, even if they are turned off. You do need to unplug them, or better still remove them.

Use a battery-powered alarm clock instead of one working on the mains supply, and do not sleep with an electric blanket. Devices that meet this criterion include stereos, air conditioning units, TVs, and refrigerators within 6 feet horizontally and vertically from the bedroom. Check also that your fuse box isn't within this radius.

4. **Eliminate compact fluorescent lighting from your bedroom.** These light bulbs emit electromagnetic radiation due to the energy-saving mechanism they are equipped with to reduce voltage. Similarly the transformers used in low voltage halogen lights emit strong magnetic fields. Remember the human body thrives on exposure to a light spectrum ranging from ultra-violet to infra-red. Traditional incandescents are to be preferred because like daylight they cover a good part of this spectrum.

5. **Eliminate dirty electricity.** Even if you have followed and applied all of the tips



above, you may still be exposed to EMF pollution through your household wiring. Use your GS meter to test for dirty electricity and filter as necessary.

6. **Remove any Wi-Fi in your home.** Double check your router since many routers have the Wi-Fi setting on auto reset. Meaning, if you unplug your router at night and turn it back on in the morning, it will automatically turn the Wi-Fi on again.

If you live in close proximity to a cell phone tower, you may need to take measures to protect and shield your home. See below for information on how to shield your home.

7. **Talk to your neighbors.** Even if you have taken the precaution to protect yourself from EMFs in your home, your neighbor's flat screen TV, or dimmer switches etc. could be creating dirty electricity. If your neighbors have Wi-Fi switched on 24/7 in a nearby apartment, this could seriously affect you. Go and talk to your neighbors and see if they are willing to work with you to come to a solution.

8. **Use blackout curtains in your bedroom.** Sleeping in total blackout conditions is a prerequisite to optimum melatonin production. You could take sleeping pills to rest deeply, but I would not recommend it. Sleeping pills often contain chemical toxins that could aggravate your symptoms of electrosensitivity. Blackout curtains are the way to go.

9. **Use EMF netting.** You may also want to consider an EMF Faraday canopy net to hang above your bed. It works similar to a mosquito net but instead of keeping out mosquitoes, by virtue of creating a sealed enclosure it will keep out up to 99% of RF radiation at given frequencies (it may need to be grounded – see below for information on grounding). I only recommend this for extreme cases where despite applying the EMF remediation measures listed above you still have high levels of RF radiation in your

sleeping area - long term, sleeping in a Faraday canopy is not advisable because it isolates you from the earth's natural beneficial energies.

10. Replace your mattress. There are two issues here; the residual magnetism found in metal bed springs, and the fact that spring mattresses can

"In the U.S. bed frames and box springs are made of metal, and the length of a bed is exactly half the wavelength of FM and TV transmissions that have been broadcasting since the late 1940s. Radiation envelops our bodies so that the maximum strength of the field develops 75 centimeters above the mattress in the middle of our bodies. When sleeping on the right side, the body's left side will thereby be exposed to field strength about twice as strong as what the right side absorbs."

Scientific American⁴

transform into a giant antenna!⁴ My recommendation is to buy a chemical-free, organic mattress that does not contain metal springs and use a wood frame and headboard for the bed.

The most effective way to solution bedroom EMFs might be to turn off the electricity in your bedroom. You can pull out the fuse on the fuse box for the bedroom area so that there are no EMFs in the electrical wiring where you are sleeping. If you are going through a particularly sensitive period, this is a very effective and easy way to get through it and improve your condition.

As a longer term solution, you can have an electrician install a demand switch on the circuits which relate to your bedroom which automatically switches off the AC supply when it detects the devices on the circuit are switched off.

Even something as simple as moving your bed 12 inches away from the wall will reduce your EMF exposure

Establish A Natural Sleep Pattern

Establishing a natural sleep pattern is not just about EMF mitigation and melatonin. It's more to do with what is called your "circadian rhythm". Your body's clock is regulated by your circadian rhythm, that's to say your body's chemical and hormonal production and metabolism over a 24 hour period.

Melatonin works together with another hormone called cortisol. In an ideal setup your melatonin levels rise in the evening to facilitate recovery while you sleep, as morning arrives the melatonin levels drop off and cortisol kicks in to wake you up. Your cortisol levels rise in the morning to enable you to deal with your day. When they begin to fall off your body prepares for sleep. To enable these hormones to do their job you need to establish a lifestyle which facilitates this mechanism of ebb and flow. A natural sleep pattern can be facilitated by implementing the following:

1. **Keep a regular sleep schedule.** Go to bed and get up at approximately the same time each day. If you want to change these times, help your body adjust by making the change in small daily increments, such as 15 minutes earlier or later each day.
2. **Nap to make up for lost sleep.** If you need to make up for a few lost hours rather than sleeping late take a daytime nap. This allows you to recover without disturbing your natural sleep/wake rhythm, which can backfire in insomnia and throw you off for days.
3. **Establish regular mealtimes.** Fatty, spicy or acidic foods in the evening can cause stomach trouble and heartburn. Avoid heavy, rich foods within two hours of bed (see chapters 8 and 9 on nutrition).
4. **Engage in a physical activity during the day.** You sleep better if you exercise regularly. You don't have to be athletic to reap the benefits (see chapter 11).

5. **Create a relaxing bedtime routine.** In the hour before bed time engage in activities which require minimal concentration, and minimal exposure to noise and light. Keep exposure to artificial light to a minimum use blue light blocking glasses.
6. **Avoid drinking too many liquids in the evening.** Avoid caffeinated drinks, tea, coffee and soda in the hours before bed time. Particularly, strong coffee can take more than six hours to work through your system.
7. **Eliminate nighttime sources of noise.** Ensure that your bedroom is as quiet as possible, eliminate sources of noise like noisy fans, dripping taps, clocks etc.

Again in the two to three hours before you sleep, try to minimize your exposure to all forms of EMFs, this includes artificial light. Light, late at night, can significantly reduce your melatonin synthesis; even the extremely conservative IARC (International Agency for Research on Cancer) has classified light at night as a class 2A carcinogen, placing it on the same level of severity as the effects of tobacco smoke on lung cancer. Light at night and circadian disruptions have been suggested to play a role in other cancers including ovarian, prostate, colorectal, and non-Hodgkins lymphoma.

Your office is another room that requires special consideration. If you don't have an office or don't have a computer you can skip this section.

Office Setup

Offices are generally full of equipment that can create electromagnetic fields, like computers, printers, air conditioners, lighting, dehumidifiers and more.

The truth is that most of us can't get by without using a computer today.

Look for the “TCO certified” label when purchasing office equipment. This ensures minimum standards have been adhered to in terms of toxicity, energy savings, ergonomics and even EMFs. The standards for EMFs, although not very rigorous (Mandate A.4.2 requires $\leq 2\text{mG}$ at 12-20 inches), do offer some protection.

This section contains important tips to reduce your EMF exposure in your office or home office.

Desktop versus Laptop: Pros and Cons

Since more and more people use laptops today, laptop radiation is becoming a bigger issue than ever before. The best way to cut down on your exposure to EMFs from your PC, be it a laptop, desktop or tablet, is to maintain a safe distance between you and your computer.

Never use your laptop on your lap

The other inconvenience of the laptop or tablet is that you are exposed to more EMFs than with a standard keyboard because when you type both hands are held over the electronic workings of the device.

When organizing your office environment, keep the following tips in mind:

1. **Maintain a good distance between your PC all its peripherals and where you sit.** Desktops usually involve lots of wires which can be a more significant source of EMFs than the PC itself. Sit at least three feet away from these EMF sources or better still replace existing wires and cables with shielded extension and power cords.
2. **Ground your computer equipment.** Run a wire from a screw or some other part of the metal casing of your PC to the ground terminal on your electrical socket. Do the same for all the other electrical appliances (including lamps) in your office.

3. **Choose carefully your computer monitor.** Current LCD monitors are equipped with either fluorescent or LED backlights. Go for an LCD with LED backlights.
4. **A degaussed LCD computer screen is an excellent investment if you are electrically hyper sensitive and a regular computer user.** There are companies that specialize in doing this, you can use a radiation filter over the screen (needs grounding). Reducing the brightness of the screen will also help to lessen radiation exposure. Sit at least three feet away from the screen.
5. **Use shielded wiring.** If you sit in close proximity to electric cables and wires to and from your computer consider replacing the wiring with shielded wiring. Shielded Ethernet cables are also preferable.

6. **Use a wired mouse.** Avoid a wireless mouse and shield your mouse if you are experiencing pain when you use your computer in the side of your body that uses the mouse.



7. **Make sure that your PC has Bluetooth and Wi-Fi disabled.** Check the settings regularly, system updates can cause the settings to be re-initialized.
8. **Use an external, shielded and wired keyboard.**
9. **Use only full spectrum lighting.** Traditional incandescent bulbs, in terms of EMFs, remain the healthiest choice.

10. Introduce plants into your office. It is thought that the symptoms of electrosensitivity are exacerbated by the presence of toxic substances and a reduction in negative ions in the air. Certain species of plants are believed to purify the air and thereby minimizing these symptoms, in particular, cacti. This was discovered by NASA during their space research. I have several cereus cacti in my office environment.



11. Use a natural crystal salt lamp in your office. Crystal salt lamps are said to cancel out electromagnetic radiation, they also help to maintain a normal ionic balance in the air. Although the effect of a crystal salt lamp on EMFs has yet to be proven, I can assure you it will help to bring your office more in harmony with nature.

12. Prefer anti-static furnishings and floor coverings. Synthetic curtains and carpeting can contribute to static electricity build up and steel desks and furnishings can distort natural magnetic fields. Prefer natural furnishings and floor coverings which also avoid potential problems with outgassing toxins.

A less obvious, but often significant, source of EMF pollution can be the power strips which are used increasingly to add more electrical sockets in an office environment or offer protection against power surges and power failures. These devices and the wiring around them can be a significant source of magnetic fields and dirty electricity. Keep these strips a safe distance (ideally at least 5 or 6 feet) from where you sit and if necessary add a GS filter on one of the sockets to reduce dirty electricity exposure.

Lastly, rearrange the furniture in your office (and home for that matter) so that you do not sit for any length of time in proximity to electrical appliances, wiring and any other sources of EMFs.

Router

You should only use a wired router or a router which enables you to easily disable the Wi-Fi function. A wired Internet connection is the safest way to go. If your home is not fitted with Ethernet cables in the walls this may be unsightly but it is by far the safest option.



Phones

With most cordless phones both the handset and the base emit radio frequency radiation. In most offices they are totally unnecessary.

Replace your cordless phone with a corded phone which plugs into the telephone socket (no electrical connection).

Even corded phones can have significant magnetic fields in the handset, base and speakerphone. Corded phones with low EMF headsets in the form of a clear plastic tube provide the best protection.

Using VoIP services like Skype with a loudspeaker or wired headset on a hard wired computer is safer than using a cordless phone or cell phone.

How to Shield Your Home

It's more than likely that RF radiation is the main EMF pollutant in your home. This RF radiation may be coming from a source which is internal or external to your home.

There are many possible external sources of RF radiation: cell towers, digital broadcasting, a neighbors WiFi, and military radar.

Sometimes people get totally hung up about an external radiation source when the most pressing problem is the EMFs being generated by appliances inside the home.

Remember RF radiation diminishes with distance; at a rate of one over the square root over the distance between you and the source. So even a weak EMF source at close proximity in your home, will usually be more of a threat than a powerful external EMF source (refer to the four EMF exposure criteria above).

As a rule of thumb, before you start to worry about the potential dangers of the external EMF sources near your home, you must first use all of the practical steps that I have outlined within this chapter to deal with the issue of EMFs generated inside your home.

Focus on reducing radiation sources in your home

Once the internal EMF issues have been effectively resolved you can address the issue of shielding EMFs from your outside environment.

If you do have high levels of RF radiation external to your home **there are essentially two solutions available to you:**

1. Shield your home
2. Move out of your home

For most people moving out of their home is not an option they want to consider, the more realistic option is shielding.

For some people a local radar facility or digital broadcasting station may be their main source of RF pollution. But **for most people the main source of RF radiation outside of their home is from cell phone towers.**



An EMF bed canopy made of ultra-fine metal wire mesh is by far the easiest way to shield initially, and can limit exposures by up to 99%. The only issue with this canopy is that you will not be protected when you are not underneath it.

Another possible solution is shielded clothing. Shielded hoodies are a popular choice amongst some electrosensitives, they are easy to wear and inexpensive.

There is now a growing range of shielded clothing. For this type of clothing to be effective it would have to be a full body suit, which is not really practical for everyday life.

I've tried shielded clothing and found it to have limited effectiveness. At best this will be a temporary solution, or one which you will apply when visiting areas of high exposure.

If you do decide to buy shielded clothing buy from a reputable company because all shielded clothing is not created equal (look at the shielding performance and see if it has been tested by an independent laboratory).

But shielding in this way does not reduce the level of RF radiation in your home environment; at best it will reduce your exposure. If you want freedom to roam about your bedroom with protection, then shielding the windows, walls, ceiling and maybe even floor may be necessary.

Here are 7 tips to protect your home from external RF radiation:

- **Decide if you need to take action.** First, determine how close the nearest major source of external RF radiation is to your home.

Cell towers are usually the biggest concern. If you are concerned about cell towers and you are in the US, you can check at www.antennasearch.com to find the nearest cell phone tower in your area. If you are in the UK, you can check mastdata.com.

There is much confusion as to the dangers of cell phone tower radiation. One particular study pointed to negative health effects caused by cell phone towers within 400 m of a home. Apart from distance, much depends upon the radiation output of the cell phone tower. As a rule of thumb, if you can see the cell phone tower antennas from your home, then you should consider taking action.

- **Get reliable EMF readings.** Taking action means investigating further through obtaining reliable readings with your RF meter.
- **Shielding your home.** Once you have some concrete readings, if those readings show that you do have RF radiation in your home environment from an outside source (obviously internal sources need to be eliminated first), shielding your home is your best option. First, focus on the rooms where you spend the majority of your time, start with your bedroom. If you spend a lot of time in your kitchen, then shield the kitchen and your bedroom.
- **Shield your bedroom.** I know I am repeating myself, but I can't stress enough how important it is that this room be as free from EMF pollution as you can make it.
- **Shield your windows.** It depends where the radiation is coming from, but often the first place to begin in a room is by shielding the windows. Typically your windows provide the least protection against EMFs and as such constitute a weak spot. This is quite easy to remedy with some shielding window film. Sticking ScotchTint directly to your window is not only an effective way to shield from RF radiation it can also help you to save money on your heating bill.

- **Shield your walls.** If you want to stop RF radiation from penetrating your walls, you need to use a shielding paint like Yshield. I have used this paint and found it easy to apply. It is a water-based paint that is completely free of toxic chemicals.

You can use it on walls, ceilings, and doors. It also adheres well to cement, plaster, polystyrene, and many other building materials. Yshield can be used indoors and outdoors, although it will last longer if you use it on interior walls.

- **Shielding with aluminum foil.** For interior walls, you can use the inexpensive solution of aluminum foil to shield. You can stick the foil directly to the walls with wallpaper paste (use one that is free from antifungals) and then place your wallpaper over the top.

When using any of the shielding methods above, *it may be necessary to properly ground.* From a health and safety view point this is a good idea (electric shocks).



If possible ground your shielding using your electrical socket (same method as described above for computer radiation) or better still connect to a dedicated grounding rod. Ground rods (as shown in the photo below) can be bought in most big “general store” type shops, they are usually about 3 feet long.

Ideally you want to try and plant (knock it in with a hammer) your ground rod in soil where there is some degree of humidity to ensure good conductivity.

Measuring before and after grounding with your EMF meter will tell you whether grounding reduces your EMF exposures and whether or not it is necessary.

For your shielding to be effective, you need to be thorough in the application of your shielding materials

If you do not paint thoroughly radiation, can and will seep through. Start out by taking RF readings with your meter, determine where the RF radiation is coming from, shield that area, measure, ground it, and measure again to check your results.

Typically RF radiation will be the only external source of EMF radiation in your home, but if you are living in close proximity to electric power lines, an electric power substation or similar installation, electric and magnetic fields could be an issue.

Electric fields are usually easy to shield. You just need a conductive fabric, aluminum for instance, which is connected to earth. The conductive fabric attracts the electric field and sends it to earth.

Magnetic fields are more complicated.

Shielding From Magnetic Fields

The complication is that no material can block magnetic fields. Shielding will allow you to re-route magnetic field lines by using a material with a higher magnetic permeability than the surrounding materials. The problem is the cost. Often it's simpler to just move away from the source.

Here are some tips if you decide to undertake magnetic shielding:

- 1.** Move your EMF meter gradually along the surface of the wall to locate where the magnetic fields are the highest.
- 2.** From this point move your meter vertically and horizontally to identify how far you must shield.

3. With a pencil note this information on the wall itself (assuming you are going to apply shielding) or on a notepad if you're not sure.
4. Nearby EMF sources such as wiring, lighting or a circuit box can mean that these magnetic fields vary significantly. So follow the procedure as outlined above at different times of the day and night.
5. The effect of shielding will be to displace the magnetic field. After shielding it will be concentrated at the edges of the shield. Aim to position these edges away from where you spend time.
6. If you install a large shield there may be some interaction with the Earth's magnetic field. It'll be difficult to say at the outset how much surface you should shield and how many layers of shielding material you'll need.

For magnetic fields the BioInitiative Report 2012 recommends a limit of 1 mG, this is the level you should aim for with your shielding.

Up until recently MuMetal has been the preferred material for magnetic shielding. But Giron is growing in popularity not just for reasons of price but because it can be bent or shaped without losing its shielding properties.

Nevertheless magnetic field shielding is complicated and the materials used costly. It might be more cost effective to get in an experienced EMF consultant to do the shielding for you.

EMFs in Your Outside Environment

For some people EMFs in their outside environment will be the predominant issue. The same exposure criteria apply as outlined at the beginning of this chapter:

- intensity and frequency of the EMFs,
- proximity to the source and
- length of exposure

Dealing with EMFs isn't always easy to do outside of the home since you may not have your EMF meters on hand at all times.

Here are some common external sources of EMFs in your outside environment:

- Trains
- Electric buses and other public transport
- Hospital scans and x-rays
- Wimax (WiFi broadcast to a geographical area)
- Hanging transformers in residential areas
- Identification devices in shops



Lastly, a few words about cell phones.

Your Cell Phone

For me, cell phone radiation was the straw that broke the camel's back. It's what triggered my electrical sensitivity. My solution was to stop using a cell phone. This was the most effective way to reduce my EMF exposure.

If you've decided to continue using your cell phone, here are 7 tips to reduce your exposure to cell phone radiation:

- 1. Only use your cell phone for calls that are absolutely necessary.** Keep the length of your cell phone calls to a minimum.
- 2. Use an airtube headset.** Speakerphone is another alternative but because battery power is ramped up, airtubes are safer.
- 3. Don't carry your cell phone on your body.** If you do need to carry your cell phone with you, make sure it is switched off.
- 4. Use your phone only when you have the best reception.** I recommend using your cell phone only when it has full signal with all signal bars showing.
- 5. Avoid using your cell phone in a moving vehicle.** In a moving vehicle your cell phone antenna is constantly scanning to maintain contact which means it is working at maximum signal strength, even using your cell phone in a parked car is inadvisable. A car is an enclosed metal container, similar to a Faraday Cage, which in effect magnifies your exposures.
- 6. Don't take your cell phone into your bedroom at night.** There's always a risk that you could leave it switched on.
- 7. Communicate via text message as opposed to phone calls as much as possible.** Texting exposes you to radiation bursts but it enables you to use your phone without holding it to your head and it should reduce exposure times.



To close this chapter I want to say a few words about 'EMF quick fixes'.

EMF Protection 'Quick Fixes'

There are a multitude of products on the market that claim to provide relief from EMFs. My own personal experience is that many companies, in spite of the elevated price tags, are making unsubstantiated claims. I prefer not to name

names here to avoid giving them any further publicity, but you should be able to see which companies I am talking about without too much difficulty.

I have tried a number of these devices:

- **Neutralizers** – You plug these devices in (they need electricity to run), they are supposed to clear a building of distorted energies from electromagnetic stress and protect from EMF influences. These products also claim to raise personal energy levels and enhance the overall sense of harmony and wellbeing.
- **Pendants** – The company I purchased from has a huge range of pendants which claim to provide full spectrum EMF protection, including technology to protect your health against Wi-Fi emissions. They advertise the use of Resonance Technology to ground your nervous system using the earth's electromagnetic field.
- **Link pendant** – This was the first of a long line of products I bought. The product claims to reduce the effects of EMF radiation and strengthen your resilience to the effects of stress. The product is also advertised to increase energy and stamina, reduce symptoms of fatigue and jetlag, and improve mental performance and alertness.
- **Computer Software** - The software claims to put an end to computer burnout by adding superconductive technology to the inner workings of your PC. The software is advertised to use quantum physics to improve both the function of the computer and the user's experience.

All of the above listed devices I have personally tried. At worst I found them to be ineffective and at best they only provided initial relief without any long term benefits.

Instead, follow the steps outlined in this chapter. Assess the EMF levels in the environment/s, starting with your bedroom, your most sensitive window of opportunity for recovery and regeneration. And apply EMF exposure reduction in the way I have described. When you have done all this then you can consider using harmonizers, chips, pendants and the like.

Another important way of bolstering your EMF protection is through earthing.

Chapter 6: Earthing

At its most basic level, earthing, or grounding, is about getting back into contact with Mother Earth. This sits well with the concept that the development of many modern diseases proliferate because we do not have the daily contact with nature that our ancestors once enjoyed.

Simultaneously, billions of pollutants have been introduced to our environment over the past 10 to 20 years.

Most of us have lost contact with the earth because of the homes we live in, the offices where we work, and the transportation that we use each day. We are constantly insulated from contacting the earth directly - which is vital to our health, wellbeing, and survival.

- Our beds keep us suspended off the floor.
- Our offices cause us to spend each day several storeys off the ground.
- Our cars carry us from point A to point B on insulated rubber tires.
- When we take a walk in the park, we wear man-made shoes that keep our feet from directly contacting the earth beneath.

Walking around barefoot as often as possible is an effective way to earth

Earthing is believed to work by virtue of the following two processes:

1. Direct contact with the earth replenishes the body with natural direct current electrons, which in turn promotes the normalization of your bodies systems and rhythms.

2. It facilitates evacuation or discharge of accumulated harmful man-made EMFs.

The book *Earthing: The Most Important Health Discovery Ever?*³ has extensive research and a wealth of testimonials to support the health benefits of earthing.

I installed an earthing sheet on my bed initially to try the idea. It's a special sheet that you sleep on which you can ground by plugging it into the electrical socket in your bedroom. You do need a ground on your socket to do it this way. If in doubt about the earth on your socket you can earth directly by using a long wire which you connect to an earthing rod which you then stick in the ground outside.

The earthing sheet can be an effective way of gaining the benefits of being earthed while you sleep without upsetting your nighttime rituals. But care does need to be taken when earthing indoors so as not to increase your exposure to electric fields – see below.

A good way to understand the mechanism of earthing is by measuring your body voltage.

Measuring Body Voltage

Measuring your body voltage is a means of quantifying the electric tension in your body against the ground. As Dr. Dietrich Klinghardt explains:

"The body acts like an antenna for ambient electric fields in the home and builds up electric tension against the ground which interferes with numerous biological and physiological functions.... Since our neurons operate at voltages between 80 and 120 milli Volt (mV), the threshold at which artificially induced body voltage interferes with our normal physiology is at a level at or above 80 millivolts. The higher the body voltage, the worse[it is]".

Dietrich Klinghardt MD,PhD¹



Measuring your body voltage can be done easily and inexpensively with a digital multimeter costing under a 100 dollars. Most multimeters measure AC voltage, DC voltage, DC current, AC current, resistance, continuity, diode check and more. You will need a basic meter which can give you AC voltage, DC voltage and millivolt readings because sometimes your readings will be close to zero on the volts setting so you will need to change the range to millivolts to get a meaningful reading.

There are companies selling multimeters costing several hundred dollars, which in my view is a waste of money. Your objective is to obtain approximate body voltage readings so that you can

ascertain if you are earthing properly; it is not necessary to obtain readings that are 100% accurate.

As with the EMF meters, the whole value of this exercise is “seeing is believing”. If you can actually see a significant change in body voltage you will be much more inclined to adopt and integrate earthing into your everyday life.

The two aspects to earthing, as outlined above, can be expressed in terms of body voltage objectives:

- Reduce your AC body voltage, i.e. that which is man-made and unnatural
- Increase your DC body voltage, thereby increasing your exposure to the earths beneficial natural electrons

You need to take an AC body voltage reading *earthed* and compare it with an *unearthed* reading.

To obtain an unearthed body voltage reading:

- Put your multimeter on the AC volts setting

- Hold the red probe between your thumb and finger,
- Put the black probe to earth,
- Make a note of the reading

When you do this test the “earth” needs to be always the same. It can be your earthing sheet or the earth connection on your electrical sockets or some other earth like an earth pad, but you need to use the same earth for both the earthed body reading and the unearthed body reading. If you do use your earthing sheet as the earth, press the black probe so it touches the silver thread in the sheet or even better the black strip.

To get an earthed AC body voltage reading:

- As above, but put your body in connection with the earth also.

If you are using an earth pad for your earthing, put both feet on the earth pad while the black probe is on the earth pad and the red probe is between your fingers.

It's not unusual to obtain readings of 10 volts or more unearthed and one or two millivolts (1 volt = 1000 millivolts) when earthed. Much depends on the quality of your environment as to the readings you obtain. When I first did this test my environment was already low EMF, I obtained an unearthed reading of 0.7 volts and an earthed reading of 2 millivolts.

You may find that your readings change at different times of the day. Your readings will sometimes be higher in the evening because there are more electrics switched on and therefore more man-made EMFs.

The second part of this process is to obtain a DC body voltage reading *earthed* and compare it with an *unearthed* reading.

The procedure is identical to taking an unearthed AC body voltage reading except you set the meter to the DC setting:

- Switch your multimeter on the DC volts setting

- Using your multimeter with the setting on Volts, hold the red probe between your thumb and finger and,
- Put the black probe to earth,
- Make a note of the reading

To take an earthed DC body voltage reading:

- As above, but put your body in connection with the earth also.

With the DC voltage body test the effect of earthing should be just the opposite. That's to say that the DC voltage reading should be higher when you are grounded than when you aren't grounded, indicating that you have a better contact with the natural electrons from the earth. When I first did this test I obtained an ungrounded reading of 0.003V and a grounded reading of 0.21V.

Obtaining body voltage levels enables you to better understand your interaction with your environment. Using a multimeter is an easy way to get this feedback, and gain a better understanding about your body.

A possible downside to the practice of earthing is exposure to ground currents, or stray voltage. I say this, though I have no knowledge of anyone who has engaged in the practice of earthing that has suffered ill health due to exposure to ground currents because of it. The grounding equipment I use is equipped with resistors for this purpose. If ground currents are an issue in your environment, you will be able to determine their existence in your body by using a multimeter in the way I have described above.

A Word of Warning

Body voltage readings do not tell the whole story as far as EMF exposures are concerned. Research conducted by Baubiologie⁸ shows that reducing AC body voltage does not necessarily equate to a reduction in AC field strength.

"Whether an electrically conductive and grounded sheet or pad does have a shielding effect or not - or whether, in some cases, the electric field strength may even actually go up - depends on the relative location of the field source (high potential terminal), person, and low potential terminal (grounded sheet/pad) to each other."

Dr. Martin Virnich²

This research suggests that where the source of EMFs is above the bed, sleeping on an earthing sheet could actually increase the field strength. And yet the body voltage measurement will not show this increase in electric field because the potential to earth is unaffected.

Obtaining reliable readings of these electric fields is complicated. Dr Virnich has devised a method for obtaining such readings using potential-free, 3-D E-field probes called "cube sensors".

Unfortunately for the moment these technologies remain cost prohibitive and therefore impractical.

In the absence of precise measurements, you do need to be vigilant as to how you apply earthing solutions.

In practical terms the best way of reducing AC body voltage and AC electrical field exposure in the bedroom is:

1. Switch off the mains circuits in the bedroom and on any wires that run in the walls, floors and ceiling of the bedroom
2. Install your earthing sheet and test with your multimeter to ensure that the earthing is effective

Or:

1. Have a qualified EMF consultant test to ensure that any electric fields are below the bed

2. Install your earthing sheet and test with your multimeter to ensure that the earthing is effective

When there is a lot of unshielded or ungrounded electricity around you, as may be the case in an office, it is not a good idea to earth. Your body may offer the shortest pathway to the ground. In a bedroom environment where you are able to switch off the electricity, earthing can be very beneficial.

Above all, watch how your body reacts to your earthing. I found initially that I did not sleep very well for the first few nights, then after a few days of earthing in this manner I felt more rested in my bed and more refreshed in the morning.

So far my focus has been on man-made EMF exposures. In the next chapter I talk about another form of EMF exposure potentially more powerful and harmful....

Chapter 7: Other EMF Exposures

There are times when you may witness the electromagnetic energies of the earth, like viewing a thunderstorm, for example. Cosmic radiation is another form of energy that exists in the cosmos. It's blocked by the magnetosphere, a protective layer over the planet. And this cosmic energy is much more substantial the higher that you go in altitude. For example, at 25,000 feet, the energy has an even stronger force.

"The earth itself is a gigantic complex dipole magnet - not unlike a common bar magnet, with its North and South Poles - with its spinning core, molten iron, and nickel thousands of miles beneath its surface. Micropulsations in the 10 Hz range emanate constantly from the planet's core."

- Blake Levitt¹

Our entire planet is infused with geological faults and folds. Landslides and earthquakes are the most visible examples of the presence of the earth's electromagnetic energy.

I believe all living things on the earth interact with this natural electromagnetic field. It influences everything that happens on the planet: the changing of the tides, the seasons, the bird patterns, right down to the cell divisions in our bodies.

Everyone is profoundly affected by this electromagnetic field

At all times, you're exposed to this electromagnetic field in the earth unknowingly. It's unavoidable as you go about your day-to-day life.

No matter where you go, on earth or into the atmosphere, you are living in the middle of a very powerful electromagnetic system. These natural electromagnetic energies can affect us for the better and for the worse.



Perhaps you have already experienced firsthand the impact that manmade EMFs can have on your health, make no mistake these natural EMFs can also cause very severe health reactions. **The negative influence of these natural EMFs is commonly called geopathic stress.**

Geopathic Stress

When you spend time in an environment that is geopathically stressed, it can result in health problems over the long term. Electromagnetic energies emanating from the center of the earth form a grid-like system, referred to as **telluric lines**.

Dr. Ernest Hartmann formulated that the electromagnetic energy lines of the earth flow in a wave pattern and form telluric lines in a grid. This grid-like system has come to be known as the Hartmann Grid.

The lines of the grid run north to south and east to west in a checkerboard pattern. The total size of the grid is a 12 foot square with lines that are roughly 4 inches wide. If there is a full moon, the lines may be wider.

Depending upon the area where you live, especially dependent on the rock beneath the earth where you live, there will be some variance in the grid. Some lines of the grid may be found underneath your home in areas where they are

"[A person with geopathic stress may] feel better when away from home. For instance, a condition may clear up or improve when away on holiday only to come back again when they get back home."

**- Dr. Robert Jacobs, MRCS,
LRCP.**

closer together. As an example, farther north of the equator, lines on the grid are only 12 feet apart. Yet closer to the equator, they increase to 17 feet apart with much less intensity. The point where two of these lines intersect should not be situated near sleeping areas.

The Curry Net, named after Dr. Manfred Curry, derives its energy from the cosmos. It runs at a diagonal to the Hartmann Grid from northwest to southeast and southwest to northeast. So, one grid will lie on top of the other. The lines on the Curry Net are anywhere from 25 to 50 feet apart, so you will not find this net underneath every home. Curry lines, also referred to as *cancer lines* are not considered to be detrimental except where they cross or if they cross a subterranean water flow.

Regardless of the existence of Curry or Hartmann Lines an underground water line can generate a weak electrical field. This in itself can cause significant health issues, particularly if your sleeping area is in proximity.

These energies can be particularly harmful when they all interact

As the name implies, the Curry Net has a structure like a thrown out net with irregular spacing. Consequently the Curry lines are less consistent than the Hartmann lines, and so more difficult to understand. For this reason kinesiological testing (see chapter 18) may be a more appropriate way of dealing with this phenomena than dowsing.

Studies have found geopathic stress to play a part in many illnesses².

Additionally, treatments on people living in areas that are subject to geopathic stress are less effective.

Dr. Richard Gerber, in his book *Vibrational Medicine*³, says that a geopathic field likely acts in concert with a variety of other factors, including diet, genetics, environmental carcinogens, viruses, and abnormal electromagnetic exposure, as well as subtle energy factors that affect vitality and immunity.

Solutions

The best solution to deal with this issue is to contact a **dowser**, someone who is trained to use a dowsing rod to detect the occurrence of these natural energies in the earth. Make sure you go through a professional body to find a credible professional trained in divination to locate these currents of natural energy.

For more information, you can contact the American Society of Dowsers at www.dowsers.org, The British Society of Dowsers at www.britishdowsers.org, or the International Society of Dowsers at www.dowsingworks.com



A dowser can determine if you are living in an area where there is geopathic stress. If your house is in an area of geopathic stress, or if you sleep in an area of geopathic stress, a dowser will help you to decide whether you need to move your bed to sleep or move away from an intersection of energy lines or, in extreme circumstances, if you need to move homes.

Another possible solution might be to drive metal rods or copper wires in the ground around the house. These have been compared to acupuncture and work by diverting the noxious energies around and over the house.

The electromagnetic energies of the earth are continually changing, depending on where you live and what your own sensitivities are it may be advisable to have your sleeping area verified every two to three years by a dowser.

Geomantic Zones

Ron Garner in his book *Conscious Health*⁴ states “Earth areas where energies are harmful are called geopathic zones.... areas that are health enhancing are called geomantic zones.”

Most of the research in this area focuses on the notion of geopathic stress, there is really very little research about geomantic zones. You can determine a geomantic zone by calling in a qualified dowser, but there are very possibly places where intuitively you will feel a sense of wellbeing.

Be aware of the earth’s energies. Use the information in this chapter to take the necessary steps to protect yourself from potentially harmful natural EMF exposures.

Chapter 8: Bringing it All Together

I started out by asking the fundamental question is 'EMF protection really important'. I guess if you bought this book you already knew the answer to that question. But I also guess you didn't realize just how important it is.

Nobel prize nominee Robert O. Becker, M. D who is widely viewed as one of the pioneers on EMFs and health says "The greatest polluting element in the earth's environment is the proliferation of electromagnetic fields."

EMF protection is of fundamental importance to everyone

EMFs permeate everything. The studies tell us this. They tell us that EMFs affect everybody. Just because you can't feel a reaction doesn't mean there isn't one. Make no mistake there is.

EMF protection is of fundamental importance to everyone. Understanding this is not a matter of belief. It's a matter of fact.

Naturally the question that arises is 'what's safe?'. Unfortunately 'Safe levels' of EMF exposure is a concept very difficult to define. What's clear is that current safety guidelines offer virtually no protection from the biological effects of EMFs. And the more time goes by, the more we know and understand about EMFs, the more it becomes clear that what's considered 'safe' today will probably be much higher than what will be considered 'safe' tomorrow.

Nevertheless this book gives you the necessary tools to achieve long term EMF protection. Because once you have the meters you need and know how to use them and shield and protect you are in a position to adapt to any circumstances.

Remember, conditions change. You need to keep using your EMF meters regularly. Every week or at least every month make a note in your dairy to take your meters out and do some basic testing in rooms where you spend any

significant amounts of time. This will only take a few moments but it will enable you to apply EMF protection as and when necessary.

An ounce of prevention is worth a pound of cure

You now have the knowledge at your disposal to offer long term EMF protection for you and your family. Count yourself fortunate because few people have any notion of the dangers.

Use this knowledge wisely.

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Appendix 1

A Comparison of Some International Guidance Levels on EMFs

The information in the table below is taken from Supplement to the Standard of Building Biology Testing Methods SBM-2015

Building Biology Evaluation Guidelines for Sleeping Areas
SBM-2015, Page 1

No Anomaly	Slight Anomaly	Severe Anomaly	Extreme Anomaly
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A FIELDS, WAVES, RADIATION

1 AC ELECTRIC FIELDS (Low Frequency, ELF/VLF)

Field strength with ground potential in volt per meter	V/m	< 1	1 - 5	5 - 50	> 50
Body voltage with ground potential in millivolt	mV	< 10	10 - 100	100 - 1000	> 1000
Field strength potential-free in volt per meter.	V/m	< 0.3	0.3 - 1.5	1.5 - 10	> 10

Values apply up to and around 50 (60) Hz, higher frequencies and predominant harmonics should be assessed more critically.
ACGIH occupational TLV: 25000 V/m; DIN/VDE: occupational 20000 V/m, public 7000 V/m; ICNIRP: 5000 V/m; TCO: 10 V/m; US Congress / EPA: 10 V/m; BUND: 0.5 V/m; studies on oxidative stress, free radicals, melatonin and childhood leukemia: 10-20 V/m; nature: < 0.0001 V/m

2 AC MAGNETIC FIELDS (Low Frequency, ELF/VLF)

Flux density in nanotesla	nT	< 20	20 - 100	100 - 500	> 500
Flux density in milliGauss	mG	< 0.2	0.2 - 1	1 - 5	> 5

Values apply to frequencies up to and around 50 (60) Hz, higher frequencies and predominant harmonics should be assessed more critically. Line current (50-60 Hz) and traction current (16.7 Hz) are recorded separately.
In the case of intense and frequent temporal magnetic field fluctuations, the 95th percentile of the data logging records, especially those from nighttime logging, shall be used for the assessment.
DIN/VDE: occupational 5000000 nT, public 400000 nT; ACGIH occupational TLV: 200000 nT; ICNIRP: 100000 nT; Switzerland 1000 nT; WHO: 300-400 nT "possibly carcinogenic"; TCO: 200 nT; US Congress / EPA: 200 nT; Bio Initiative: 100 nT; BUND: 10 nT; nature: < 0.0002 nT

3 RADIO-FREQUENCY RADIATION (High Frequency, Electromagnetic Waves)

Power density in microwatt per square meter	$\mu\text{W}/\text{m}^2$	< 0.1	0,1 - 10	10 - 1000	> 1000
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Values apply to single RF sources, e.g. GSM, UMTS, TETRA, LTE, WiMAX, Radio, TV, WLAN, DECT, Bluetooth..., and refer to peak measurements. They do not apply to rotating-antenna radar.
More critical RF sources like pulsed or periodic signals (GSM, TETRA, DECT, WLAN, digital broadcasting...) and broadband technologies with pulsed signals/patterns (UMTS, LTE...) should be assessed more seriously, especially at higher levels, and less critical RF sources like non-pulsed and non-periodic signals (FM, short, medium, long wave, analog broadcasting...) should be assessed more generously, especially at lower levels.
Former Building Biology Evaluation Guidelines for RF radiation / HF electromagnetic waves (SBM-2003): pulsed fields < 0.1 no, 0.1-5 slight, 5-100 strong, > 100 $\mu\text{W}/\text{m}^2$ extreme anomaly; non-pulsed fields < 1 no, 1-50 slight, 50-1000 strong, > 1000 $\mu\text{W}/\text{m}^2$ extreme anomaly
DIN/VDE: occupational up to 100 000 000 $\mu\text{W}/\text{m}^2$, public up to 10 000 000 $\mu\text{W}/\text{m}^2$; ICNIRP: up to 10 000 000 $\mu\text{W}/\text{m}^2$; Salzburg Resolution / Vienna Medical Association: 1000 $\mu\text{W}/\text{m}^2$; Bio Initiative 2007: 1000 $\mu\text{W}/\text{m}^2$ outdoor; EU-Parliament STOA: 100 $\mu\text{W}/\text{m}^2$; Salzburg: 10 $\mu\text{W}/\text{m}^2$ outdoor, 1 $\mu\text{W}/\text{m}^2$ indoor; EEG / immune effects: 1000 $\mu\text{W}/\text{m}^2$; sensitivity threshold of mobile phones: < 0.001 $\mu\text{W}/\text{m}^2$; nature < 0.000 001 $\mu\text{W}/\text{m}^2$

4 STATIC ELECTRIC FIELDS (Electrostatics)

Surface potential in volt	V	< 100	100 - 500	500 - 2000	> 2000
Discharge time in seconds	s	< 10	10 - 30	30 - 60	> 60

Values apply to conspicuous materials and appliances close to the body and/or to dominating surfaces at ca. 50 % r.h.
TCO: 500 V; damage of electronic parts: from 100 V; painful shocks and actual sparks: from 2000-3000 V; synthetic materials, plastic finishes: up to 10 000 V; synthetic flooring, laminate: up to 20 000 V; CRT TV screens: up to 30 000 V; nature: < 100 V

5 STATIC MAGNETIC FIELDS (Magnetostatics)

Deviation of flux density (metal/steel) in microtesla	μT	< 1	1 - 5	5 - 20	> 20
Fluctuation of flux density (current) in microtesla	μT	< 1	1 - 2	2 - 10	> 10
Deviation of compass needle in degree	°	< 2	2 - 10	10 - 100	> 100

Values for the deviation of the flux density in μT apply to metal/steel and for the fluctuation of the flux density to direct current.

DIN/VDE: occupational 67900 μT , public 21200 μT ; USA/Austria: 5000-200000 μT ; MRI: 2-4 T; earth's magnetic field: Europe, USA, Australia 40-50 μT , equator 25 μT , north/south pole 65 μT ; eye: 0.0001 nT, brain: 0.001 nT, heart: 0.05 nT; animal navigation: 1 nT; 1 μT = 10 mG

Source: http://www.baubiologie.de/downloads/english/richtwerte_2015_englisch.pdf

In the above table:

No Anomaly reflects the optimal natural condition or the common and inevitable background of our modern living environment.

Weak Anomaly makes you aware of an imbalance, which following the precautionary principle calls for a remediation in the long term, especially out of consideration for sensitive and ill people.

Strong Anomaly is not acceptable for the Building Biology Guidelines, but requires remediation in the short term.

Extreme Anomaly calls for immediate and rigorous action. In this case potential international guidelines of occupational exposures limits may be reached or even exceeded.

EMF exposure levels in nature,

- Magnetic Field: 0.000002mG (or 0.0002 nT)
- Electric Field: 0.0001 V/M
- Radiofrequency Radiation:<0.00002 V/M

Source: Bevington, Michael. Electromagnetic - sensitivity and electromagnetic - hypersensitivity: a summary. Capability Books, 2010. Print.

General Public Levels	Frequency MHz	E field V/m	Power W/m ²	Power μW/m ²
ICNIRP, 1998 (recognised by WHO, EU & UK) CENELEC, 1995	400 900 1800 2100	28 41 58 61	2 4.5 9 10	2 000 000 4 500 000 9 000 000 10 000 000
Russia 2003 (general public), PRChina	300 - 300000	6	0.1	100 000
Italy, Decree 381 (1999)	30 - 30000	6	0.1	100 000
Swiss Ordinance ORNI (<i>for base stations</i>) From 1st. Feb. 2000 (rms values)	900 1800	4 6	not specified	not specified
EU & UK EMC Regulations suscept test level (domestic & comm.)	30 - 2000	3 any signal	not specified	not specified
Belgium - Wallonia	900, 1800, 2100	3	0.024	24 000
Typical max in public areas near base station masts (can be higher)	900 & 1800	2	0.01	10 000
USA City Dweller max (FCC 1999)	Aprx. 30 - 300000	< 2	< 0.01	< 10 000
Wien (Vienna)	Sum of GSM	1.9	0.01	10 000
Italy (2003) each base station (aim); Lichtenstein law from 2013	900, 1800, 2100	0.6	0.001	1000
Salzburg - 1998 & 2000	Sum of GSM	0.6	0.001	1000
BioInitiative, 2007	30 - 300000	0.6	0.001	1000
EU-Parliament, GD Wissenschaft, STOA GSM (2001)	900, 1800, 2100	0.2	0.0001	100
Typical US (EPA 1980, mainly FM & TV)	Aprx. 30 - 300000	< 0.13	< 0.00005	< 50
Salzburg - 2002, outside houses aim	GSM UMTS 3G	0.06	0.000 01	10
Salzburg - 2002, inside houses	GSM UMTS 3G	0.02	0.000 001	1
Bürgerforum - BRD 1999	GSM UMTS 3G	0.02	0.000 001	1
Mobile phone handsets will work at these levels	900, 1800, 2100	0.00001	< 0.000 000 000 1	< 0.000 03
Broadband 'natural' background	300 - 3000	< 0.00003	< 1 e-13	< 0.0000001

Source: Acoustimeter User Manual version 4.0 2011-06-29

Appendix 2

EMF Education & Information Websites

American Academy of Environmental Medicine

The mission of the AAEM is “to promote optimal health through prevention, and safe and effective treatment of the causes of illness by supporting physicians and other professionals in serving the public through education about the interaction between humans and their environment”.

www.aaemonline.org

BioInitiative Working Group

The BioInitiative Working Group is an international working group of scientists, researchers and public health policy professionals. In 2007 and again in 2012 they released a report on electromagnetic fields (EMF) and health which documents serious scientific concerns about current limits regulating how much EMF is allowable from power lines, cell phones, and many other sources of EMF exposure in daily life. The reports concluded that existing standards for public safety are inadequate to protect public health.

www.bioinitiative.org

Dirty Electricity

This site compiles a comprehensive list of resources and information about Dirty Electricity.

www.dirtyelectricity.org

The Earthing Institute

The mission of the institute is to “disseminate knowledge about Earthing and its benefits, coordinate Earthing research, facilitate the development of effective Earthing products, and to train experts in the practical applications of Earthing for home and workplace use”.

www.earthinginstitute.net

Electrical Pollution Solutions

This site provides basic information about electrical pollution, its health effects, and solutions.

<http://www.electricalpollution.com/>

Electromagnetic Health

Electromagnetichealth.org is a non-profit making organization created by Camilla Rees, which provides EMF education and information from experts.

www.electromagnetichealth.org

International EMF Alliance

The aim of the International EMF Alliance is to disseminate coherent, health-oriented information and advice on the growing body of knowledge on biological disruptions caused by exposure to low environmental levels of non-ionizing electromagnetic fields.

www.international-emf-alliance.org/

Institute of BuildingBiology

Founded in 1983 the Institute of Building Biology + Ecology Neubeuern (IBN) has a holistic approach to building biology and is widely recognized as having some of the most prudent guidelines on EMF exposure levels.

<http://www.baubiologie.de/site/english.php>

EM Radiation Research Trust

The purpose of the RRT is to uncover and communicate the facts concerning electromagnetic radiation and health.

www.radiationresearch.org

Environmental Health Trust

The Environmental Health Trust is a registered charity, set up by Devra Lee Davis, Ph.D., M.P.H., a visiting professor at Georgetown University and one of the leading advocates on the dangers of EMFs.

www.environmentalhealthtrust.org

Lisa Nagy

Lisa Nagy, M.D., who is chemically sensitive and electrically sensitive, offers this informative website that contains suggestions for dealing with your own environmental health history.

www.lisanagy.com

Magda Havas

Her academic website provides a collection of Dr. Havas's publications, technical reports, open letters, testimony as an expert witness at hearings, and invited presentations on chemical and electromagnetic contaminants. She has a second website which provides more mainstream information on EMFs.

www.magdahavas.org/

www.magdahavas.com

Microwave News

Probably the most authoritative website on EMFs, operated by Louis Slesin, Ph.D., a former scientist for the Natural Resources Defense Council.

www.microwavenews.com

Powerwatch

Powerwatch is one of the most authoritative websites on EMFs. It is a nonprofit independent organization based in the United Kingdom that has been researching the effects of EMFs on health for more than twenty years.

www.powerwatch.org.uk

Rainbow Consulting

The website of Katharina Gustavs, Building Biology Environmental Consultant (IBN) contains a number of EMF guides which are free to download.

<http://www.buildingbiology.ca/index.php>

The World Health Organization

This site contains fact sheets and reports on the WHO findings.

As part of its Charter to protect public health and in response to public concern, the World Health Organization (WHO) established the International EMF Project in 1996 to assess the scientific evidence of possible health effects of EMFs.

www.who.int/peh-emf/en/