PLAYING with the INVISIBLE:

How cell phones are making our children sick

The secret of how to make our children grow up healthy, without giving up technology

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I dedicate this book to you, Mom (and Dad), who, like me, care about the future of our children. Who is willing to, above all, face reality and make the necessary changes for their well-being and mental, spiritual and physical development.
I also dedicate it to my beloved children Matheus and Lilian. And to my husband, Rafael, who accompanied me on the journey of electrosensitivity, supporting me in difficult times, in my studies, in my research and listening to me speak. As my daughter says, “Again, electroradiation.”

Acknowledgments

To Rafael, my love and companion, who always supported me and encouraged me to write this book.

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To dear Lila, who made me see beyond the surface.

To the NGO Slowphone, of which I am a proud member. Especially to Aline, Fabiano and Carla, for their dedication, with determination and love, to the cause of raising awareness on the health effects of cell phone radiation.

To all the courageous researchers, promoters and electrosensitive people, who did not remain silent in the face of the power of the telecommunications industry.

Contents

Chapter 1 – Why are cell phones making our children sick?

Chapter 2 – The industry's Big Lie: There is not enough evidence that cell phones are harmful to our children

Chapter 3 – The 5 secrets on how to protect our children from cell phone radiation

Chapter 4 – How to Protect our children, from the womb to the age of two

Chapter 5 – How to protect our children from 3 to 6 years old

Chapter 6 – How to protect our children aged 7 to 11

Chapter 7 – How to protect our children in adolescence

Chapter 8 – The Danger for our children, which comes from outside the home

Features

References

Foreword by Dr. Magda Havas, B.Sc., Ph.D.

I just finished reading a very important book written by Silvia Calbo Aroca, who is a co-founder member of the NGO Slowphone (Brazil for Safe Technology), and a contributor to the Global EMF network that consists of citizen scientists documenting electromagnetic radiation around the world. As a mother of two, she is deeply concerned about protecting children from environmental pollutants. Her book, entitle: "Playing with the Invisible: How cell phones are making our children sick," is intended for parents and those who care about the health of children and future generations. It is easy to read and comprehend with numerous practical suggestions on how to minimize exposure of children and family members to electromagnetic radiation generated by wireless devices like cell phones.

This book consists of eight chapters and in these chapters, Ms. Calbo Aroca provides a brief historical overview of the issues and controversies that surround this topic from a scientific perspective. Several chapters are devoted to providing useful, easy to implement ways to protect children from the womb through adolescence.

While the focus of this book is on cell phones, other forms of wireless radiation are also mentioned including, but not limited to WiFi, baby monitors, wearables like smart watches, blue light from screens, as well as cell phone base stations and even powerlines that emit lower frequencies. In the Resource section you will learn which websites provide reliable educational information; how to connect your cell phone, laptop or tablet to the internet with wires; which meters to buy to measure your exposure to radio frequency radiation and dirty electricity; how to minimize your exposure to dirty electricity; where to purchase radio frequency blocking technology; and institutions in Brazil that can perform radio frequency measurements in your home. This book has figures throughout and provides more than 200 references.

Do you or family members suffer from any of the following symptoms: difficulty sleeping; chronic fatigue; chronic pain; mood fluctuations; cognitive difficulties like a foggy brain, difficulty concentrating or poor short-term memory; skin problems; heart palpitations? If you do, you may have Electrohypersensitivity (EHS) also known as Electromagnetic Radiation Syndrome (EMR-S). Instead of taking medication to reduce symptoms, reduce your exposure to radio frequency radiation as outlined in this book to see if any of your symptoms diminish in intensity, frequency and duration. One way to do this is to convert your bedroom and your child's bedroom into a sleep sanctuary.

Much of the information in this book can be life changing especially for those who already suffer from EMR-S. And even if you don't have any of the above symptoms, reducing your exposure to electromagnetic radiation may reduce your risk of developing cancer. Although this topic has been studied for more than 50 years, much of the information will be new to most parents and to many in the health care profession.

If you care about the health of your children and family members and if this topic is new to you, I would strongly encourage you to read *Playing with the Invisible*, which is available in English and Portuguese.

Chapter 1 – Why are cell phones making our children sick?

Mom, did you know that radiation transmitted by cell phones can affect the functioning of our cells?

Cells communicate using very weak electromagnetic signals (electrical impulses). Cell phones also communicate using electromagnetic signals, as will be explained later.

In children and babies there is a prevalence of stem cells (cells that have not yet specialized to form tissues). And it is precisely stem cells that are most affected by the radiation emitted by cell phones and other wireless electronic devices[1,2,3].

But wait, there's a lot more to wireless radiation. I want to share with you both my concerns and my indignation regarding the topic. To do this, I invite you, who is a mother like me.

Mom, I invite you to sit with me and have tea or coffee, whichever you prefer. Because I have an urgent and important matter to deal with, mother to mother. If you don't like tea or coffee, grab a glass of water, or anything that makes you sit down and feel comfortable.

I want to present to you what I found about the effects of cell phones on the health of children and adolescents, which turned my life from head to toe, and still shocks me today.

Let's talk about the impacts of cell phone use on the health of babies, children and adolescents and what are the scientific evidence that they exist.

But don't worry: in the final chapters I share with you several secrets to protect our children from cell phone radiation.

In this first chapter, we will focus on the scientific evidence that cell phone radiation is harmful to our children's health. Are you ready?

As you may already know, there is no scientific consensus that radiation transmitted by cell phones and wireless devices, such as Wi-Fi routers, are safe for your health. Many people prefer not to believe that there could be any effect from this radiation, as they believe that a good diet, exercise and healthy lifestyle are more than enough to offset the supposed effects of electromagnetic exposure.

Wow! How nice it would be if that were true. But, unfortunately, it is not. This thinking comes from telecommunications industry propaganda. Don't feel bad if you fall into it, we all have, at some point in our lives. What we can't do is let our children fall too!

Shall we learn how not to let them fall for false advertising? To do this, first we will explore, more closely, the effects of cell phones on health.

The scientific community is talking, but is anyone listening?

To begin with, the WHO (World Health Organization) classified the radiation emitted by cell phones and Wi-Fi (also known as radiofrequency), in 2011, as being possibly carcinogenic[4].

Since then, it has been classified in the same category as other pollutants such as DDT, gasoline, diesel, and aspartame. According to the WHO's International Agency for Research on Cancer (IARC), radiofrequency is classified as Group 2B (Possibly Carcinogenic), due to the risk of a significant increase in glioma (malignant brain tumor) associated with cell phone use (Table 1). Nowadays, there are many other studies that show an association between different types of cancer and cell phone use.

Group	Meaning	Examples
1 - Carcinogenic to humans	There is sufficient evidence that the agent causes cancer in animals and humans.	Processed meats, alcoholic beverages, benzene
2A - Probably carcinogenic to humans	There is sufficient evidence that the agent causes cancer in animals, but there is limited evidence that it causes cancer in humans.	Hot frying fat, soluble cobalt
2B - Possibly carcinogenic to humans	Limited evidence in humans, and even less evidence in animals.	Radiofrequency, aspartame, DDT, gasoline, diesel
3 - Not classified as carcinogenic to humans	Limited evidence for humans and animals.	Ceramic implants, coffee

Table 1 - Carcinogenicity classification according to the WHO, IARC. Source: adapted from https://monographs.iarc.who.int/list-of-classifications/.

Currently, several researchers into the biological effects of radiofrequency (RF) on health, including some present at the 2011 commission at the WHO, point out that there is a need for a reclassification by the WHO, where RF would move from Group 2B - Possibly

carcinogenic to Group 1 - Potentially carcinogenic. Because, according to them, there is currently enough scientific evidence for this[5].

Several researchers on the European Parliament's “Impacts of 5G on health” panel in 2021 presented work showing scientific evidence that the WHO should review its classification to at least Group 2A, that is, Probably Carcinogenic[6]. This increases the likelihood that the classification of RF radiation will be reviewed, in the coming years, by the IARC, at the WHO. Let's put pressure on the WHO! After all, it's more than time for this to be reviewed!

Cancer is a disease that usually takes years to develop. One of the reasons is that a cancer cell needs to multiply thousands of times before it is detected by cutting-edge technologies such as computed tomography and magnetic resonance imaging.

Because they can take decades to detect, we should not wait for human evidence before taking precautions to reduce RF exposure. We need to trust laboratory studies with animals, which have shown that the same components that cause cancer in them, especially in rats, in the laboratory also cause cancer in humans.

This is how researchers know whether a component is carcinogenic or not. They do not test on humans as that would be unethical. Therefore, the conclusions about the biological effects of RF in animals also apply to humans[7].

I find the testimony of Dr. Lennart Hardell, a Swedish oncologist and researcher, who participated in the IARC/WHO commission in 2011, important:

We conclude that there is clear evidence that radiofrequency is a human carcinogen, causing glioma and vestibular schwannoma (acoustic neuroma). There is some evidence of an increased risk of developing thyroid cancer, and clear evidence that radiofrequency is a carcinogen for other areas of the body[8].

This researcher, in 2011, already evaluated radiofrequency as belonging to Group 2A. These results were based mainly on studies with laboratory rats subjected to controlled RF exposure.

There are currently some articles by Dr. Hardell on the impact of 5G on health, which further reinforce the likelihood of RF being classified as potentially causing cancer, that is, Group 1.

But what, after all, is radio frequency?

The name itself reminds us of the radio waves that we generally hear when we are driving. Yes, AM and FM radio waves are radio frequencies, ranging from about 535 KHz (535 000 Hz) to approximately 108 MHz (108 000 000 Hz).

The waves emitted by cell phones, including Wi-Fi, 2G, 3G, 4G and 5G (lower band frequencies) technologies range from around 700 MHz (700 000 000 Hz) to 3.5 GHz (3 500 000 000 Hz). They correspond to the microwave range of the electromagnetic spectrum.

If you look at Figure 1 below, you will see that microwaves are a band within radio frequency. FM, AM waves and those emitted by cell phones (microwaves and Wi-Fi) are found in the same region, in the electromagnetic spectrum, as radio or radio frequency waves. This is the way that physicists created to classify electromagnetic waves, according to the frequency with which they are emitted (Figure 1).

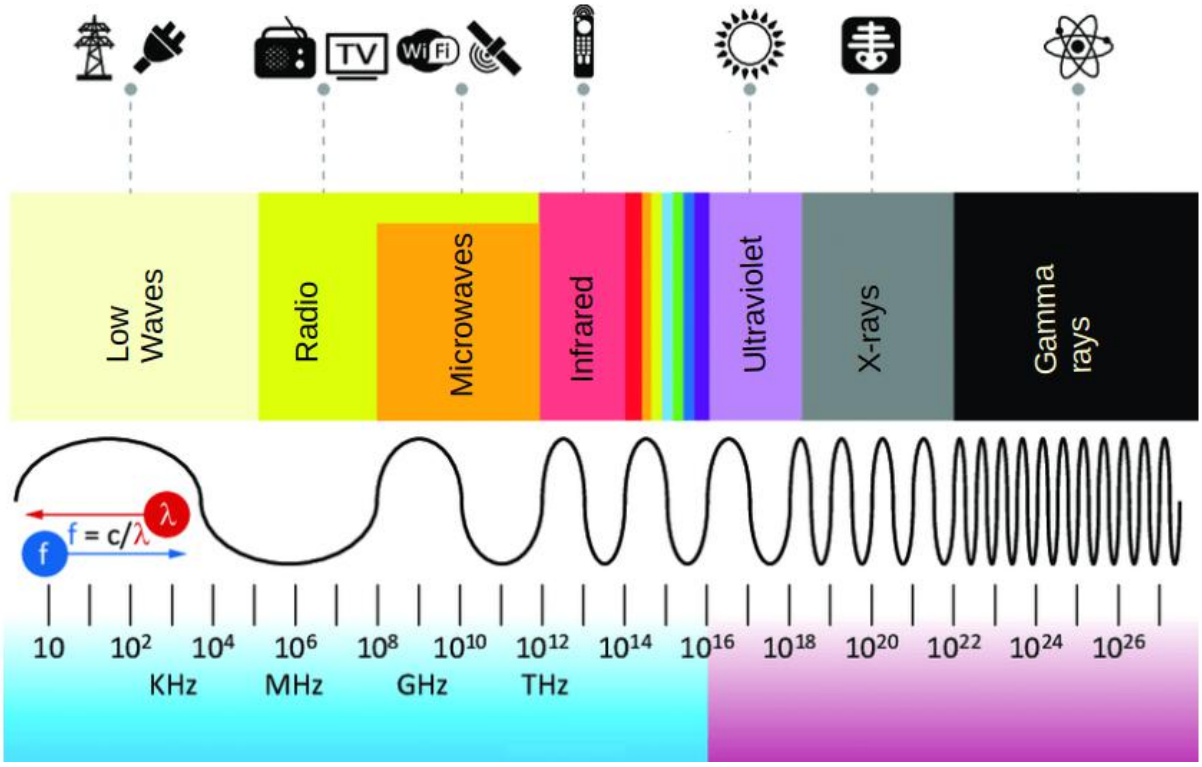


Figure 1 - Electromagnetic spectrum, showing that the microwave range is contained within the radio frequency range. Source adapted from: https://cdn.britannica.com/s:700x500/75/95275-050-6ABFB771/Radio-waves-rays-light-gamma-ultraviolet-electromagnetic.jpg

The frequency of a wave is defined as the number of oscillations (rises and falls of the wave, also called cycles) per second, measured in Hz. What do you mean?

One Hertz (Hz) corresponds to the rise and fall of the wave (one cycle) in 1 second.

Radio frequencies are electromagnetic waves, just like visible ligh, ultraviolet and infrared light, which means they travel at the speed of light, $3x10^8$ m/s. Ultraviolet, microwaves and infrared emit radiation at frequencies invisible to the human eye, as can be seen in Figure 1.

The waves emitted by cell phones operate at around fractions of 1 Watt of power, that is, with powers well below that of a light bulb that we usually use at home, which work at around 12W.

Microwaves, which are transmitted by cell phones, are very fast, pulsed waves. Every second, they pulse approximately two billion times! It is important to highlight that microwaves are used in both older cell phones and current smartphones. Dr. Devra Davis, researcher into the effects of cell phone radiation on health, comments in her book *Disconnect*[7] that the correct name for the radiation emitted by cell phones should be microwaves, not radiofrequency.

Because microwaves attract people's attention much more than radiofrequency, since radio refers to the idea of radio waves and microwaves, to heating.

According to her, it was the telecommunications industry that adopted this terminology, so as not to cause alarm among the population, which, in turn, would imply two things: more caution when purchasing and using their products and, consequently, less profit for companies involved.

Mom, did you know that your cell phone, even when you're not making a call, is constantly emitting and receiving radiation from the cell tower, several times a second?

In other words, even when we are not making a call, or we are not touching the device, it is receiving and emitting microwaves.

So what happens to our children when they are exposed, for hundreds of hours, or a few years, to a cell phone, which operates with less than 1W of power but emits radiation at the same frequency as a microwave oven?

“What do you mean, as a microwave oven?”

“Is this serious?”

To answer this question, shall we delve a little into the research on the subject?

There is no scientific consensus that cell phones are safe for health. One growing number of scientific publications have pointed to the harm caused by exposure to radiation emitted by cell phones, microwaves[10,11].

From now on I will use the terms microwaves and radiofrequency to refer to the radiation emitted by cell phones interchangeably, remembering that they are not exactly the same frequency range.

Now, if you're thinking about the microwave oven, you're thinking right!

Because the radiation from cell phones, Bluetooth and Wi-Fi are also microwaves, like that emitted by the microwave oven when it is turned on to heat food.

The cell phone works like an open microwave, but at lower power! The microwave oven operates at higher powers than the cell phone and only heats food when there is water inside it. As you know, our body is mainly made up of water. So, cell phone radiation, when it is close to the body, heats our tissues.

The fact that microwaves heat our tissues is, in itself, quite worrying, but this is not the only sinister side of the story.

Is there more? Yes. Unfortunately, a substantial amount of research has indicated that, even at low power (without tissue heating), microwave radiation is harmful to our health[12,13,14]. This last information has been little publicized in Brazil, but is already better known in Canada, Russia, Sweden and the USA, thanks mainly to researchers such as doctors, epidemiologists and former employees of cell phone companies.

The cell phone works like a low-power microwave, which receives and sends radiation. When we hold the cell phone close to our head to make a call, the radiation penetrates the brain. The closer to us, the more intense the radiation received from the device.

And pay attention, mom! Babies and children are the most vulnerable! Because they have a smaller head, with a less robust skull than that of an adult, which facilitates the penetration of radiation.

Another factor that makes radiofrequency (RF) more serious for children is that they have more immature cells, stem cells, which are more sensitive to low doses of RF. Stem cells are critical for children's development and, at the same time, they are the cells most impacted by RF!

The researchers, Dr. Álvaro Salles[15], of the University of Rio Grande do Sul, and professor Claudio Fernandez[16], of the Federal Institute of Rio Grande do Sul, both Brazilian citizens, have carried out computer simulations that show cell phone radiation penetrating the brains of children and adults during telephone calls. They warn about its health dangers (Figure 2). There are also simulations that these researchers carried out with children using cell phones, tablets and with an adult using a laptop. The source of this study is in the legend of Figure 2.

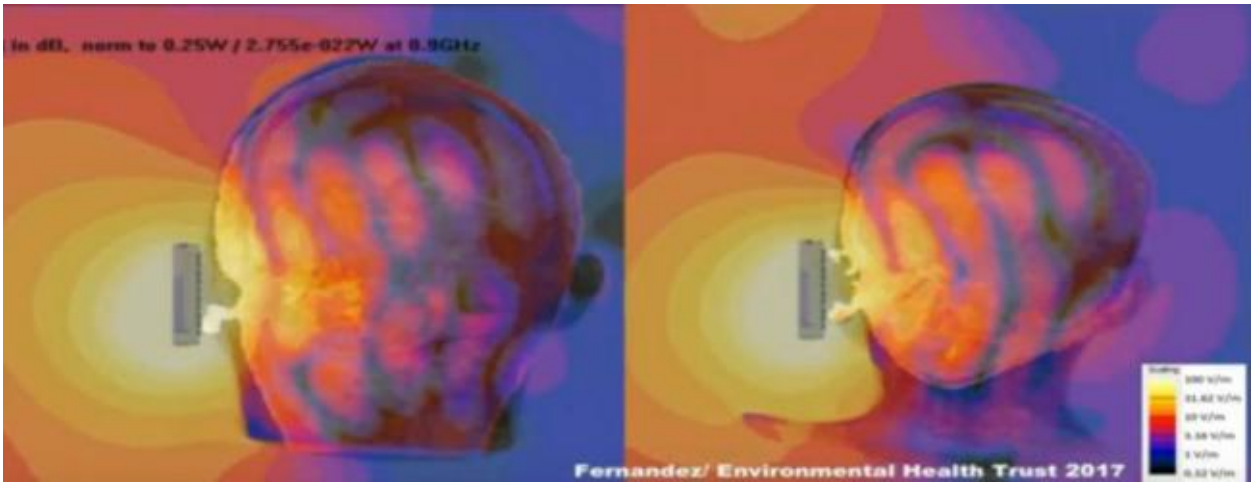


Figure 2 - Simulation of how much cell phone radiation penetrates the head of a 6-year-old child (on the right) compared to a 34-year-old adult (on the left). The yellow color indicates a larger range of radiation. Source: https://ehtrust.org/2018-scientific-research-modeling-childrens-microwave-radiation-exposure-wi-fi-tablets-laptops/.

Dr. Joel Moskowitz, a research professor at Berkeley University in the USA, carried out a study analyzing various research studies to investigate the relationship between the development of brain cancer and cell phone use.

He found that using a cell phone for about 17 minutes a day over 10 years is associated with a statistically significant increase in brain cancer of 60%[17].

Attention, moms of teenagers!

A 2018 study, which evaluated the dose of radiation in the brains of teenagers, found that those who used their cell phones close to their heads experienced memory

loss after just 1 year of using the device[18]![i] As we will see later in the book, this article is not an isolated case, there are several studies that indicate that memory is lost when using cell phones and wireless devices.

What happens to our children's blood under the effects of cell phone radiation?

Are there visible effects on the blood from exposure to RF? Yes!

Dr. Magda Havas, a researcher professor at Trent University in Canada, made a small hole in her index finger and placed the blood on a microscope plate.

She observed the shape of her own red blood cells[19] (Figure 3a). Some were separated and others were more united. This first image was taken before she worked on a computer or used her cell phone. Secondly, the researcher worked for around 70 minutes on her computer and obtained the second image. In Figure 3b we can see that the red blood cells are joined together, as if they were stacked coins, in what doctors call the Rouleaux Formation.

Later on the same day, she used a cordless phone for 10 min and observed the blood under the microscope (Figure 3c). She noticed that the blood had an unhealthy appearance, with virtually no loose cells, mostly in the Rouleaux Formation.

This formation is common in cancer patients. The Rouleaux Formation interferes with the transport of oxygen from the blood and the removal of waste products such as carbon dioxide.
Did you know, Mom, that this can cause migraines, fatigue, difficulty concentrating and heart and blood pressure problems?

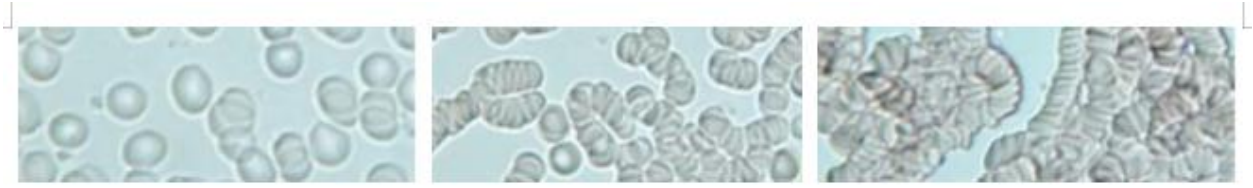


Figure 3 - Red blood cells observed through a microscope by Dr Havas. From left to right: 3a) before using the computer and cordless telephone; 3b) After working on the computer for 70 minutes; 3c) On the same day, later, after a 10 minute wireless telephone call.
Source: https://magdahavas.com/electrosmog-exposure/mobile-phones-electrosmog-exposure/live-blood-cells-and-electrosmog/

There is a barrier that prevents toxins and bacteria that are harmful to health, present in the blood, from reaching the brain. It is called the blood-brain barrier. Children, teenagers and adults have this barrier.

However, research carried out in the 1960s at Cornell University (USA) and in subsequent years showed that radiofrequency can penetrate the blood-brain barrier[20]! This is very serious! How did they show this?

In 1975, Dr. Allan Frey carried out an experiment with rats using a fluorescent dye on the circulatory system of these animals. Soon after, each mouse was exposed to radio frequency[21].

In a matter of minutes the contrast reached the farthest reaches of the rats' brains! Over time, this was confirmed by dozens of other laboratories, in different countries! This, according to some researchers, such as Dr. Leif Salford, from Sweden, has very serious health implications, such as the appearance of Alzheimer's and dementia in increasingly younger people[22,23].

When I was a child, I only knew of cases of Alzheimer's and dementia in senile adults. But last year, my daughter studied with a child with Alzheimer's. This is very worrying!

Nowadays, one of the most common ways doctors treat brain tumors is to irradiate the cancer cells with RF. It's called radiotherapy.

In other words, RF is not always evil. There are many situations in which, knowing how to use it, RF can be beneficial to your health. We can make a comparison with solar radiation which, like RF, is also electromagnetic. We need to sunbathe to stay healthy. However, too much sunlight can be harmful.

A very interesting study, carried out by researcher Dr. Herietta Nittby, in the USA, a student of Dr. Salford, exposed rats to cell phone signals for just two hours a day, for a single week. She noticed that the mice began to have microscopic fluids leaking from their brains into their blood[24]. She also discovered damage to genes that mice and humans use for everyday repairs.

Other studies she conducted, this time exposing mice to a year of cell phone radiation, showed that the animals presented evidence of senility and memory loss[25].

Here I share a very common concern among parents and teachers.

Children are finding it increasingly difficult to remember simple things. For example, where they put the school book, or even whether or not they took the book that day, which questions were on the test the same day they were asked.

These forgetfulness, until a few years ago, happened more frequently among adults. Furthermore, children and adolescents are finding it difficult to focus on study material and even on what the teacher is saying, showing that their attention span, or focus, is increasingly reduced.

This is also reflected in the difficulty in reading a text with more than three paragraphs, without diverting attention to something else.

According to many scholars, this is due to the excessive use of screens. I agree, but there is also a very important factor that is ignored by most people, including many scientists: the effects of radiofrequency, which can cause agitation (hyperactivity), memory deficits, attention deficits, learning difficulties, depression and dizziness , as many researchers report in their studies, including those from the American Association of Pediatrics[26].

Is there research showing that RF can impact the health of fetuses in pregnant women? Yes!

Research carried out by doctors at Yale University in 2012, in the USA, placed pregnant rats in environments with cell phone radiation and then studied the offspring[27].

The mice exposed during prenatal care had impaired memory, modified brains and showed hyperactivity. This Yale research and other studies, showing the impact of RF on children's brains, gave rise tot *The Babysafe Projec*t[28].

This project educates pregnant women about the dangers of RF and what they can do to mitigate its impact on their babies' health before, during and after prenatal care.

It is worth remembering here: research into environmental impacts, which can cause cancer in people, is carried out with rats and not humans. In other words, protocols and treatments adopted in cancer diagnoses involve experiments with animals. What affects mice affects our children!

Our children's DNA feels what our eyes don't see

Radiofrequency is classified as non-ionizing radiation. This is why it is different, for example, from X-rays, which are ionizing.

It is known that ionizing radiation can cause damage to biological tissue. Hence the need to wear a protective cover when taking an X-ray, to reduce our exposure.

But, did you know mom that having X-rays during prenatal care, in the 1950s to 1970s, was routine in Europe? Well, the risks the mom and baby were facing when irradiated were unknown at that time.

It was an English researcher, Dr. Stewart, who, instead of just listening to prenatal doctors, interviewed mothers during and after pregnancy. And she discovered that X-rays were very harmful to mothers and children.

At the time, the researcher was ridiculed as an alarmist and pseudoscientist, since X-rays were considered by the scientific community to be safe for health[29].

Look how things have changed. I even lost count of how many times I went with my children to take X-rays of one of their arms, hands or legs, and the nurse asked me if I was pregnant, before telling me to put on the protective coat.

Today, a pregnant woman is never allowed to enter a room where X-rays are being taken. This shows that scientific knowledge is not absolute, it is subject to experiments, inquiries, refutations and theories at all times.

Although cell phone radiation is not ionizing, a wide range of research over many years has shown that radiofrequency is linked to brain cancer, an increase in free radicals (affects the production of antioxidants in the body, which keep our cells healthy), memory deficit, impacts on fertility, breast cancer, behavioral changes, headaches and damage to the DNA [30,31,32]. This is just to name a few! They can all potentially affect our children!

Is there any mega-study, carried out over the long term, specifically designed to show whether or not there are effects of cell phones on biological tissue?

Yes!

In 2018, the US National Toxicology Program (NTP) presented the results of research, which cost 30 million dollars, to show that low-intensity exposures (those that do not cause heating in human tissues) would not produce biological effects[33]. In other words, cell phone radiation would be safe for everyone. The research was carried out, over 10 years, on rats that were exposed to 900 MHz for about 9 hours a day, for 2 years.

What did the NTP studies find?
That exposure to high levels of radiation, at 2G and 3G frequencies, emitted by cell phones, is associated with:

- Clear evidence (substance capable of causing cancer) of heart tumors in male rats. Malignant Schwannoma-type tumors.
- Some evidence (the substance shows evidence of causing cancer, but less intensely than in the first case) of tumors in the brains of male rats. Malignant glioma-type tumors.
- Some evidence of tumors in the glands of male rats. Pheochromocytoma-type tumors.
- Newborn mice were born with below average weight.
- A relationship was found between the time of exposure to RF and the increase in damage caused to the DNA of the rats studied[33].

But, mom, the scientific evidence doesn't stop here!

There is another large study that also found an association between biological damage to animals and evidence of cancer.

The study, carried out by the Ramazzini Institute in Italy[34,35], investigated the effects of radiofrequency on rats exposed to cell tower antennas, within the radiation levels accepted by the Brazilian government and ICNIRP[36].

The ICNIRP (*International Comitee on Non Ionizing Radiation Protection*) is considered the world authority on electromagnetic protection. It is a group of around 14 people, located in Germany, in Munich. Many of its members, including founding member, Eric Van Rongan, worked for the telecommunications industry for many years and is now a member emeritus of the commission.

This commission is constituted by appointment of its own members, that is, they are not elected by external entities[37]. The group favors the interests of the industry, to the detriment of scientific research and the health of our children. Truly absurd!

Well, the experiments were carried out within radiation levels considered safe for the population in many countries, such as Brazil and the USA.

Returning to the experiment, the mice were exposed, for their entire lives, for 19 hours a day, to 1.8 GHz, simulating the power densities emitted by cell phone towers of 5V/m, 25V/m and 50V/m. The study found, in rats, the same tumors as those recorded by NTP. And also, the mice that were exposed to radiation during prenatal care were born underweight.

Are there more Brazilian studies on the effects of cell phone radiation?

Yes, there is, including a doctoral thesis, defended in 2010 at the Federal University of Minas Gerais in Brazil, by researcher, Dr. Adilza Dode[38]. It shows a correlation between cases of death from cancer and the location of cell towers in Belo Horizonte.

Up to 500 meters away from cell towers, she found 81% of deaths due to neoplasia (cancer). She emphasizes that she cannot say that the cause of the deaths was the antennas, but emphasizes that there is no new environmental factor, in the period analyzed, that could cause so many deaths. In the same interview, she says that doctors recommend that people undergoing chemotherapy should not be exposed to electromagnetic fields[39,40].

Diabetes: what does it have to do with exposure to cell phone radiation?

Mom who has a child with diabetes, did you know that electromagnetic pollution (mainly due to RF) can worsen the disease?

Dr. Magda Havas, professor researcher at Trent University in Canada, studied diabetic people who were exposed to RF. She noticed that, after just 20 minutes of exposure, their blood sugar levels rose significantly. The same did not happen when these people were in an environment free of electromagnetic pollution[41]!

Dr. Stella Michaelidou, a researcher from Cyprus, together with health authorities, campaigned in her country to reduce the level of radiation in maternity wards, hospitals, daycare centers and schools.

The campaign presented a drawing, on municipal buses, showing a child with a father holding an umbrella, with the purpose of protecting the daughter from wireless equipment (Figure 4)[42]. Above the figure was written “Do not irradiate me”. As part of the campaign, they also made videos where children explain to adults the reasons why they don't want and shouldn't be irradiated[43].

In maternity wards and intensive care units, Wi-Fi was replaced by wired internet. In schools, children from preschool to elementary school cannot receive tablets, cell phones and other wireless equipment, unless they are in airplane mode or disconnected from the internet. In France, preschools can only have wired internet.



Figure 4 - Cyprus campaign to protect children and adolescents from radiation from wireless devices. Source: https://ehtrust.org/cyprus-emf-reduction-in-makareio-hospital-and-new-wireless-public-health-awareness-campaign

Do we also need to worry about the effects on the fertility of our sons and daughters ? Yes!

Mommy, do you want to be a grandmother one day? So, pay attention!

Did you know that the number of sperm counts has fallen drastically in recent decades? This is the finding of fertility laboratories around the world[44]!

We know that there may be several factors behind this reduction. But one of them is certainly RF! A 2021 European Parliament report confirmed, after analyzing thousands of articles on the effects of RF on fertility, that between 400 and 6500 MHz there is clear evidence that RF affects male and probably female fertility[45].

These frequencies correspond to those we use in telecommunications in Brazil!

But don't panic, because in the next chapters I present the secrets on how we can reduce exposure to radiation, which our children receive daily. But I'll give you an essential tip: immediately, start by not letting your son or daughter put their cell phone close to their reproductive organs!

Several fertility clinics around the world have advised couples who want to have children and are having difficulties that men do not sleep with their cell phones turned on next to their body.

But what are these effects on male fertility? Unfortunately, there are many! According to experimental, epidemiological research and carried out *in vitro* (living cells in the laboratory) and with animals, there is a decrease in the number and mobility of sperm, damage to DNA and changes in the cellular structure of sperm, in addition to a decrease in testosterone production and an increase in erectile dysfunction[46,47,48].

So, now you know why you need to inform your child of these effects and warn him or her not to place the device near reproductive organs! And this also applies to tablets, computers, video game controllers and other electronic equipment, especially wireless ones.

What about girls' fertility? Unfortunately, it is even more serious than in the case of boys. Because they carry all their eggs until menopause, which means they have longer exposure to RF than sperm, which are constantly produced and have a much shorter life span.

A comprehensive study in 2023, which analyzed the role of RF in female fertility based on various published research, pointed out that there are harmful effects of RF on ocytocytes, ovarian follicles, endocrine reproductive hormone, the embryo, the forming fetus and the newborns[49]. So, be very careful! Don't let your daughter put her cell phone near her reproductive organs, talk to her!

But, mom, the worries we have with our girls go even further!

There is plenty of evidence that RF can aggravate, or even cause, breast cancer. Several doctors have reported that, in recent years, the location where tumors develop in the breasts has changed. Previously they were located in the external area of the breasts. Today they are mainly between the breasts, that is, where many women put their cell phones, inside their bra! Young women, without any case of cancer in the family, are developing tumors.

There is a case of an American woman, Tiffany Frantz, who died at just 21 from breast cancer, after spending 5 years placing her cell phone between her breasts[50]!

The tumor developed right where she left her cell phone. The girl's mother points out that the industry is aware of the dangers of RF on health, as it recommends that there is no cell phone contact with the body. However, this is written in small print, within menus lost in the cell phone. She exclaimed: "*I wish there was a warning on the cell phone case for everyone to read, so my daughter wouldn't have had to fight for her life*[51]!"

So, mom, educate your daughter so she doesn't do the same!

https://gigahertz-solutions.com/

c) Institutions in Brazil that can perform radiofrequency measurements in your home:

MRE Engenharia, by Dr. Adilza Dode, in Belo Horizonte: https://mreengenharia.com.br/

HBC - Casa Saudável, in Rio de Janeiro: https://hbcertificate.com/

Slowphone in Brazil – https://www.slowphone.org/

d) Websites on blocking RF radiation

https://eu.geovital.shop/shop/emf

https://lessemf.com/

https://www.yshield.com/

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