

Dr Ron Ehrlich: Hello and welcome to Unstress, I'm Dr. Ron Ehrlich. Today's episode affects everyone, and I mean everyone. From fetuses in vitro to infants, children, teenagers and adults alike. We are all connected, so we are all affected. The topic is radiation, specifically, radio frequency radiation or electromagnetic radiation of which microwave radiation as in wifi radiation is part. Now, from the beginning of time, we have been exposed to radiation. The Sun is literally the big one, and we all know it's life-giving. Without the Sun, not many lives, not very long anyway and of course, we know too much of it can cause cell dysfunction, which many of us know as cancer.

Well, the last 30 or 40 years has seen some huge additions to our electromagnetic exposure and total load as you will hear. My guest today is a medical practitioner and mother of two Dr Pri Bandara. Pri beautifully introduces today's episode, tells a compelling personal story and goes on to share some rather disturbing information we all need to take notice of. I hope you enjoy this conversation I had with Dr Pri Bandara. Welcome to the show Pri.

Dr Pri Bandara: Thank you, Ron. It's a great pleasure to be taking part.

Dr Ron Ehrlich: Thank you. Well, I've been looking forward to this conversation since we first talked about this. Our subject today is something that everyone, whether they like it or not, is part of so this is important for every single person but I wondered if you might share with our listener a little bit about your own background. What brought you to this point professionally?

Dr Pri Bandara: Okay. Our topic today is going to be about the health impact of wireless technologies, and particularly the agent radio frequency radiation, particularly microwave radiation emanating from all things wireless that we use very commonly these days. How I ended up with research in this area, it's actually a fascinating story that I think is important sharing with your audience. I was an academic clinical and basic researcher. I worked for the faculty of medicine at UNSW first, and then at Sydney Uni where I've been based at Westmead and [inaudible 00:02:48] hospitals, I took a break from my career with my first bub and subsequently join the Westmead Children's Hospital.

Dr Pri Bandara: Though I had never planned to give up my academic career. I was compelled to in 2008. Because my second bub was unwell. I would like to take a few minutes to go into little details about his story.

Dr Ron Ehrlich: Sure.

Dr Pri Bandara: He was very unsettled from infancy, colicky, unable to sleep, crying and vomiting too much all the time. He was put on anti-reflux medications at six months of age and they went till until he was about three years. Gastroscopy at I think it was about two years showed that his upper GI tract was fine and there was no apparent reason for the cause for his chronic reflux disease. His insomnia was terrible. Even by three years, he was unable to sleep, everyday past, he would wake up around midnight, and would cry till dawn. Then he would crash out of exhaustion and this happened on a daily basis and caused an enormous amount of mental and physical stress to my husband and me.



Dr Ron Ehrlich: Just to mention, this is setting the scene for a real problem. Please go on.

Dr Pri Bandara: Yeah. We were simply helpless, two professionals who had a good life basically we were in a desperate position and we talked to me, we tried to comfort the distressed child night after night. My husband would often take him for a drive around 2:00 a.m or 3:00 a.m to lull the little one to sleep. I couldn't go because we had another child at home and I was worried rotten. I wanted my bub to fall asleep, but I did not want my husband to fall asleep at the wheel. Then he had to go to work and use his brain professionally. At least I could stay home and recover a little bit during the day. My little one also had a deranged immune system. He had three immune-mediated diseases by the age of three years. He also had clear ADHD like behaviour, but I didn't seek a formal diagnosis of this saying that it's just nothing but due to his chronic sleep deprivation.

Dr Pri Bandara: He also had some [inaudible 00:05:40] neurological symptoms because he used to say, "I have hands in my legs," so frequently from about three years of age and his itchy legs was giving trouble a lot. It was a multitude of issues and we consulted the best pediatricians specializing in various disciplines of medicine, but there was little relief. Other members of the family also had developed immune-mediated conditions, skin diseases but there was no family history of them and I was very focused on nutritional health. I really believed in good food. My children were breastfed for more than two years and despite our struggles, we were still growing lots of organic fruits and veggies at home and we really well on a healthy diet.

Dr Pri Bandara: Then in March 2012, a friend just casually happened to share an informative video made by, Dr Magda Havas, an environmental scientist at University of Trent, Trent University in Canada in which she cautioned on adverse health effects caused by exposure to radiofrequency electromagnetic radiation, mostly microwave radiation from wireless devices. This got my attention.

Dr Ron Ehrlich: At best.

Dr Pri Bandara: Yeah. After what, I had a chat with my husband, I organized someone to come in, measure the levels of electromagnetic radiation at home, and we were told that we had a hot house with too much microwave radiation particularly in our sleeping area. Now, I have to say that we were early adopters of wireless things. My husband and I were both tech-savvy. Hubby was from the first batch of robotics engineers that had established, so no wonder he had a love for fancy tech things. However, at this point, we decided to replace everything wireless with wired alternatives, and we did that in early April 2012.

Dr Pri Bandara: Just so you know, the magnitude of this simple exercise, we reduced the levels of microwave radiation in our sleeping area by 2,070 folds.

Dr Ron Ehrlich: Wow.

Dr Pri Bandara: Not two folds, it wasn't a two-fold drop.



Dr Ron Ehrlich: 2,070 fold. Okay, a significant reduction.

Dr Pri Bandara: Massive. This by just getting rid of two devices in that area, baby monitor and a cordless phone.

Dr Ron Ehrlich: Wow, oh, my God. Our whole audience is, okay.

Dr Pri Bandara: That was very interesting to me and this is we had such a big reduction because our phone was still, we had perfect mobile phone reception that we had a relatively low-level exposure from external sources like mobile phones, tablets. Anyway, what happened after that was life changing although we simply could not believe at that time. Within a couple of weeks, our little one started sleeping well and he started showing settled behaviour and his most notable was the [inaudible 00:09:47] his very itchy atopic dermatitis. That cleared up and we could actually discontinue our long term dependence on topical steroid creams.

Dr Pri Bandara: After a month, he was clearly very different and I was gobsmacked. By this time, I was anywhere reading a lot of scientific papers on RF-EMR health defects. I bought instruments at this point and got myself trained on taking measurements and interpreting them. The changes in our son were profound and that year we had held him back from starting school because of his health issues. By the middle of the year we basically even pulled him out of preschool to keep him in a stringently controlled home environment to monitor this newfound relief. We completely changed our lifestyle. The child continued to thrive in every way. I remember very clearly once calling my husband at work and saying, "Can you believe the little ones sat and did some colouring for 14 minutes?" Before that he could not sit down, stay still for five minutes.

Dr Ron Ehrlich: We're talking, at this stage, he's four or five years old.

Dr Pri Bandara: He was five by this time and he was actually due for a brain MRI with his pediatric neurologist. I said to the neurologist, "I think I have just found the cause of his immune disturbance and all these neurological problems. I don't know, it's new." I told him what it was and the pediatrician, the neurologist said that he didn't know anything about it. I said, "Could we postpone his MRI by six months or one year?" He agreed with me. Thankfully he was someone who had worked with me at the Westmead kids, so he knew me and that I wasn't just an actor. Guess what, we never had to do that MRI.

Dr Ron Ehrlich: Fantastic.

Dr Pri Bandara: Because I know my child was better and there was no need to follow up. After one year, the neurologist said we don't need to follow up on unless he gets a problem again and we haven't followed for years.

Dr Ron Ehrlich: You have really been in the trenches before.

Dr Pri Bandara: Absolutely.



Dr Ron Ehrlich: This, of course, must have catapulted you on a new trajectory.

Dr Pri Bandara: Absolutely. It was clear to me at that point environmental health is critically important in this wireless age when there's a barrage of new technologies coming at us on a daily basis. I knew that especially knowing that I wouldn't have known anything about this if Dr Havas didn't take some time to create awareness with that video that came my way. I knew that I had to focus in on this issue to really investigate the science behind it and to protect particularly the younger generations, including my own children. In 2015, I joined a few like-minded Aussie scientist who had just formed a professional nonprofit organization called Oceania Radiofrequency Scientific Advisory Association or ORSAA. Retired radiation physicist, Victor Leach, who was a founding member of the Australasian Radiation Protection Society, took the initiative to build a database of peer-reviewed studies on radiofrequency EMR, biological and health effects. Today this database is the world's largest categorized database on RF health studies.

Dr Pri Bandara: We wanted to actually from a very unbiased position investigate the science, the mainstream science in this area. I have been collaborating with a large group of scientists and clinicians from all over the world in the last seven years publishing peer-reviewed the literature and presenting at conferences. Before we go to the next question, can I quote a pioneering researcher and in this area, Dr Robert Beck MD

Dr Ron Ehrlich: Yes. I know him well, body electric.

Dr Pri Bandara: Oh, there you go. Well, I'm very pleased to hear that Ron.

Dr Ron Ehrlich: Good too.

Dr Pri Bandara: He was twice nominated for the Nobel prize. He said this around the turn of the century, "I have no doubt in my mind that at the present time, the greatest polluting element in the Earth's environment is the proliferation of electromagnetic fields." After seven years of intense study in this area, I firmly believe in these prophetic words of doctor Beck and I actually think it is perhaps the biggest challenge to public health in the 21st century.

Dr Ron Ehrlich: When did he say that?

Dr Pri Bandara: I think it was in an interview around the year 2000.

Dr Ron Ehrlich: Right. For 4G, 3G, 2G hadn't quite arrived at that point, but it was on the cusp. I mean, it was happening. Wow. This is, you're no slouch, I say that with all due respect, of course. You are an academic researcher, your husband into robotics, you're embracing Wifi radiation in your very home. You were experiencing something which you had no idea, but I mean really there, that's a compelling story. Well, let's go because as I said, this is something whether people like it or not, we are all part of this experience. Now, can you perhaps describe for us some of the common sources of radio frequency electromagnetic radiation, some of those common sources that we should be aware of?

Dr Pri Bandara: Okay. Well, mobile phones, cordless phones, they obviously communicate via this media, electromagnetic radio frequency, electromagnetic radiation and they all at, they are in the microwave frequency range. I think for Wifi and in fact, the frequency we use for Wifi 2.45 gigahertz radio frequency radiation, it is identical to the wave that we use in a microwave oven. The difference is the intensity. In a microwave oven, we use a very high dose to create a lot of thermal heat but for wireless communication, we use a much lower level so the regulation of microwave radiation exposure is entirely dependent on heating effects. That's based on an old notion that only heating can be problematic to the health and if there's no tissue heating, then there's no problem. We now know despite, we still hold those exposure standards based on entirely thermal effects. We know that's an old obsolete notion and there are a lot of biological effects that happen without tissue heating in the absence of heating. Anyway, every little wireless device, particularly the baby monitor was the biggest player in my family's case.

Dr Ron Ehrlich: I'm guessing Bluetooth is another one.

Dr Pri Bandara: Yes. One of our, we had radio frequency remote controllers for toys and our kids spent a lot of times playing with them and games consoles. These things are very, very common these days. A couple of decades ago, oh, not a couple of, a few decades ago, radio frequency exposure was almost exclusively occupational. Now it is everyone, we have multiple inches of microwave radiation and the exposure happens pretty much from the fetal stage.

Dr Ron Ehrlich: Yeah. Well, you quote, you just said by removing the baby monitor and the cordless phone which I think a lot of our listeners would think pretty innocuous, really 2070 fold reduction in radiation exposure. That's massive. What about, and how do these things like 3G, 4G, 5G, what does that mean? I was going to ask, should we be getting excited or worried? And I think the answer is obviously worried. What are these differences in 3G, 4G, 5G? What does that mean?

Dr Pri Bandara: Okay. Mobile telephony, the technology has to change rapidly over the years and the frequencies used. First, we had an analog phone and now we've digital, so there's a lot of technical changes, an advancement that facilitated faster, better data transfer. Second generation, third generation, fourth generation, that's what those Gs stand for and so we've got currently fourth generation, 4G that use the previously used frequencies for analog broadcasting like TV, radio, not radio, I think it's just TV, but anyway, so it just refers to, there are different frequencies being used, but they're all within the radio frequency spectrum of the electromagnetic spectrum, and they are all different types. They're all microwave radiation of different frequencies and some there's research evidence showing that different frequencies inducing some differences in biological responses.

Dr Pri Bandara: We know that because, say, for example, UV radiation, UV is different UVB depending on the frequency. It's quite, it's like that. There are some technical differences, but it is still very much the same agent. The difference is now with 5G upcoming, there's a need to put mobile phone base station and antennas base very close to each other. There's a lot of concern about 5G because that's going to increase the number of



base stations by millions and there will be pretty much. See at the moment, we had, we are used to seeing one or two base stations per suburb or-

Dr Ron Ehrlich: These are typically big antennas on top of office or residential blocks.

Dr Pri Bandara: ... Yes.

Dr Ron Ehrlich: They're usually nicely encased so we don't see them too much or.

Dr Pri Bandara: We don't see them much now because they are getting smaller. You may have noticed the new 4G ones that are smaller boxes on like now they are coming to even residential streets on-

Dr Ron Ehrlich: Telegraph poles.

Dr Pri Bandara: ... telegraph poles. This is the industry is gearing up for 5G as well, which will require a base station pretty much on every street. The coming years, this is what we will see and there is already a scientist appeal in Europe against 5G asking to halt 5G because there are a lot of health concerns already about existing exposure levels to radiofrequency radiation and 5G coming on top of existing 3G and 4G, is going to add another layer, so it's a massive layer of radiofrequency exposure.

Dr Ron Ehrlich: Yeah. Now, one of the things that have often fascinated me is that Einstein, of course, made the point that every atom in the universe is both mass and energy, and that means every atom in our human body. He made the point that over, well, how have these levels increased over the last 20, 30 years? We've been around for millions of years in one form or another, but things have taken a dramatic change in recent years. To associate energy affecting every atom in the body which includes our own, how have our energy exposures changed in the last 20 or 30 years? Your room went up 22,000 times, relatively innocuously I can only imagine how much, go and tell us.

Dr Pri Bandara: Yes. Actually I published a paper with Professor David Carpenter from University of Albany, New York in the last, in the December issue of the Lancet Planetary Health, which has a diagram, a graph showing how the, I must give credit to a brilliant electrical engineer, Alistair Phillips from the UK who thankfully modified an old graph that he had created and put for this publication. That if anyone can look up, it's free to download. If one goes to the Lancet Planetary Health and type in electromagnetic pollution, you might, you will find it.

Dr Ron Ehrlich: We will try and have links to that in our show notes.

Dr Pri Bandara: That's wonderful. Thank you. That shows how this manmade environmental pollutant has increased in our environment rapidly in the last few decades. The natural levels that we get from the sun are extremely small and manmade, so our exposure is entirely from manmade radio frequency radiation and the levels have gone up on average by

about 10 to the 18 times. That's a billion times, con trillion times and for some frequencies, this is actually exceeding even 10 to the 20. Yes, so it's a massive increase in exposure.

Dr Ron Ehrlich: Massive increase.

Dr Pri Bandara: Sadly, mostly in the last two decades.

Dr Ron Ehrlich: Yeah. Given that observation of every atom being energy and matter, it would be naive to think that this wasn't having some effect. You've already listed your son's more than just some of it. What are some of the risks?

Dr Pri Bandara: Well, I would first see, approach the scientific evidence. As I said, the ORSAA database that the Australian scientists have created collecting all the peer-reviewed scientific papers from all over the world. Last year, in a snapshot of this database, we found that out of the experimental studies there were 1,283, that is 67% of 1,900 per teen experimental studies showed a significant biological effect. That's overwhelmingly showing the vast majority of studies showing that there is a biological impact and the effects are wide ranged. If you look at from a health point of view, there are neurological effects, immune effects, metabolic effects, endocrine effects. You can explain these effects if you look at the biological effects that happen at a very fundamental level in cells at a cellular level. What we have seen is consistent evidence of oxidative stress. I'm sure your listeners are well aware, everybody seems to know about oxidative stress.

Dr Ron Ehrlich: Well, go on, just give us a one on one oxidative stress because we know we take antioxidants.

Dr Pri Bandara: That's right. We take-

Dr Ron Ehrlich: To combat oxidative stress, but tell us a little bit about oxidative stress.

Dr Pri Bandara: ... Our kales, salads or [inaudible 00:29:44], juice, drinks, all of these things, fruit and veggies really provide antioxidants to combat what's called reactive oxygen species and reactive nitrogen species, which are as the name implies, highly reactive chemical species that are generated in ourselves as part of normal biological functions, maintaining life. If the balance between reactive oxygen species and the antioxidant levels in our cells that counter the harmful effects of reactive oxygen species, if that balance is disrupted in favour of reactive oxygen species, then we create oxidative stress. It's the phenomenon very well known to be implicated in the pathology of pretty much every chronic disease. We don't fully understand, exactly what goes on and in most of the disease pathologies but we know that oxidative stress is implicated. Reactive oxygen species if they are built up too much, they can damage important cellular constituents that are from other genetic material, DNA to proteins, lipids, carbohydrates, everything that makes up our building blocks. If our building blocks, our tissue sustain constant oxidative damage, they obviously malfunction.

Dr Ron Ehrlich: Yeah, resulting in stuff like cancer.



Dr Pri Bandara: Absolutely.

Dr Ron Ehrlich: Which I think most people would acknowledge is a significant problem in our community. I mean, I think the statistics, I don't think anybody listening to this wouldn't know somebody within one degree of separation who has not had cancer. That's as a result of imbalance at a cellular level. Yes.

Dr Pri Bandara: That's right. I think for Australians, we need to be particularly serious about cancer prevention because as per latest data from the International Agency for Research on Cancer, IARC, we are the nation with the highest cancer rate out of 185 countries in the world.

Dr Ron Ehrlich: Wow.

Dr Pri Bandara: Yes we are. We've got the gold medal for that. That's something that we cannot be happy about.

Dr Ron Ehrlich: Wow. That's just, that is very interesting. Australia has the highest rate.

Dr Pri Bandara: Rate of cancer in the whole world. Now, the thing is I have different light and as you said, here in Australia, everybody knows someone who's suffered cancer and the thing is I spent my first 20 years, the first two decades of my life in Sri Lanka, a very different place. You know what, there was only one family friend who developed cancer and died in that two decades and there was no one that we knew. Even today when I look, so I always compare, as we said, I look at the different factors that may have caused this difference.

Dr Pri Bandara: Now, out of that 185 countries, Sri Lanka is in the 176th place, so very low cancer. Okay. What I observed as a youngster, everybody dreaded the word cancer like because it was unheard of back in those days but unfortunately cancer rates have peaked up rapidly in Sri Lanka in the last couple of decades. Anyway, in Australia, we need to be of course diagnoses and treatment aspect that's important but we really need to find the causes, the root causes and try to effectively control them to really prevent cancer.

Dr Pri Bandara: Now speaking of oxidative stress, can I tell you something? Now, I presented focusing on oxidative stress-related studies. These were peer-reviewed studies done in different countries. There was only one study unfortunately from Australia from the University of Newcastle, which was a positive study that found that mobile phone radiation could cause oxidative stress and DNA damage in sperm. That was a 2009 study I think, but that was the single contribution from Australia to the 242 peer-reviewed studies on oxidative stress caused by the studies investigated, radio frequency radiation exposure. 216 out of them, that is a whopping 89% found that this is empirical evidence, that either the exposure increased oxidative damage to cellular components like DNA or produced antioxidant levels, which also indicates that there is oxidative stress or both. In some studies, treatment, pretreatment with an antioxidant prevented or reduced the subsequent damage caused by exposure to wireless radiation or radio frequency radiation.



Dr Ron Ehrlich: Oh, okay.

Dr Pri Bandara: Yes. Some of, few studies are human studies, but most studies are rodent studies, not actual human study.

Dr Ron Ehrlich: Those antioxidants would be things like Vitamin C.

Dr Pri Bandara: Yes, you're right, and-

Dr Ron Ehrlich: Vitamin E.

Dr Pri Bandara: ... I'm not sure if there was one with this, with vitamin E supplementation, but clearly, melatonin was one that was used. There were significant effects.

Dr Pri Bandara: Now, the interesting thing is how I presented this overview of at least 242 studies at the annual conference of the Australasian Radiation Protection Society. This paper was subsequently published in their official journal, Radiation Protection in Australasia. Now, these challenges the current view, current position of other radiation safety agency, [inaudible 00:37:41] that had done a review and in the conclusion about, I must say, unfortunately only one person, one reviewer was responsible for during the entire experimental study review. I quote, this was the conclusion. "Many recent in vitro experiments reporting RF effects have pointed to the production of reactive oxygen species as a possible link between RF exposure and adverse bioeffects. However, the putatively link between RF energy and [inaudible 00:38:22] production remains tenuous." What we found and we showed with empirical data is completely different, that radio frequency at currently permitted level overwhelmingly induced oxidative stress, so it's a bit of a-

Dr Ron Ehrlich: Now, this is so interesting isn't it? Because the logic tells us that we'd be naive to think it doesn't have an effect. The studies overwhelmingly show it does have an effect, and yet from a regulatory perspective, and here we are in Australia, top of the list. How are we comparing as a country when we compare ourselves to say the US, UK or Europe, how do we compare in terms of reducing that established exposure?

Dr Pri Bandara: Okay. Very good question there Ron. Now, Australia, UK, USA, and Canada and New Zealand, we follow the guidelines of a professional body called ICNIRP, International Commission for Non-Ionizing Radiation Protection. It's a small NGO based in Europe and their guidelines which only prevent tissue heating is still our exposure standard after up to 20 years. Now-

Dr Ron Ehrlich: Basically they're saying, if you don't heat up the tissue, these other radiations don't matter.

Dr Pri Bandara: That's right. Absolutely.

Dr Ron Ehrlich: That's our regulatory body that we're basing our regulation.

Dr Pri Bandara: In fact, however, many countries, particularly, actually it was the Russians who pioneered the [BaWER 00:40:22] effects research and there are standards followed also by China and many European countries, so for Russia and China, their exposure standard is hundred times less or more stringent than Australia. There are other countries like Italy and many continental European countries have at least 10 times more stringent exposure standards than what we have. In fact, India a few years ago reduced, they are previously adhering to what we use here, ICNIRP standards and they reduced it by 10 folds saying, trying to, but there is more than the standards. Despite the differences in standards, if you look at what comes out of the devices that we use, they are very similar and they are way below the standards. Even if you reduce the standards by 1000 times, still there's a problem.

Dr Ron Ehrlich: Particularly when you consider that historically, I think you mentioned 10 to the 18 times higher, that's a billion times higher manmade radiation tinkering around the edges of a hundred times, or a thousand times is just tinkering around the edge of a pretty major problem. I know that I think I'd heard that the World Health Organization has now classified Wifi radiation as a class 2B carcinogen, which means it possibly could cause cancer. Is that right?

Dr Pri Bandara: Yes. Now, there are two arms of the World Health Organization that has looked at radio frequency, the health effects, the IARC, the International Agency for Cancer Research is the one that appointed a panel of experts in 2011 and they concluded, well, there's credible evidence, but they couldn't be absolutely sure because there were possible biases in some of the studies, for example, the studies that investigated mobile phone use and brain cancer. The use was estimated by questioning these people and often people can forget how much they use the phone. Because of that uncertainty, it was given possible like a 2B, possible carcinogen category.

Dr Pri Bandara: However, what's really important to mention is that since 2011, the newly emerged research has very strongly supported that evidence. Now, there are published reports where experts have shown how this agent can now meet the, what's called Bradford Hill criteria for causalities. That's something we look at in cancer. It meets the requirements to be classified as a known carcinogen. I know when I say this, there will be a lot of people who would say, "No, I doubt it, still the evidence is not clear," but especially last year there was very strong evidence that came from the national toxicology program of the National Institutes of Health USA.

Dr Pri Bandara: They conducted a study that took a bit over 10 years and it was at a cost of \$30 million dollars. That's a large study exposing rats and mice to radio frequency radiation. It was only last year that they released the data after very stringent peer review and they showed that there was clear evidence, that there's the highest category of evidence, clear evidence of them, there's a type of tumours Schwannoma, they are [inaudible 00:45:19] arising out of the Schwann cells that encapsulate other nerves and that's very important because, and there was also evidence of Glioma. Gliomas make most of the brain tumours, the brain cancers in humans.



Dr Pri Bandara: Now these two tumour types that were increased in the irradiated rodents, in rats are the same two types of cancers that have been found to be occurring at a higher rate with increased risk in association with mobile phone use in humans. That really strengthens the existing evidence.

Dr Ron Ehrlich: It's moving it into not just category 2B possible carcinogen, but actually the next step up is category 2A, which is probable and the highest is category one, which is known carcinogen. Look, what a story this is that we've covered here today, your own personal one, your background in science, your search for knowledge, and some of these statistics are just mind boggling, to say the least. I'm not sure whether we could feel reassured by our regulatory bodies. If we had to now give our listener a few tips, what are some three, four tips for minimizing their own exposure because ultimately I think we, most of my listeners would now realize that taking control of your own health is the best alternative? If you're waiting for regulatory bodies you may be waiting too long. What are a couple of things that people can do to minimize their exposure to this electromagnetic radiation?

Dr Pri Bandara: Okay. There are very practical measures we can take to substantially reduce our exposure. Now, I don't want to create a panic here. We don't have to throw away our mobile devices and I use a mobile phone too, but I use it very carefully now. The recommendations given by many medical and scientific organizations, for example, the European Academy for Environmental Medicine and American counterpart and even government agencies like for example, Israeli Ministry of Health, these organizations have given very clear instructions to reduce exposure by preferentially choosing wired connections. For example, instead of relying on a mobile phone, on a cordless phone for regular phone calls, use a corded like wireless of the wired phone and you can drastically cut down your exposure and let's keep the mobile phones for short term communications when we are out and about.

Dr Pri Bandara: In the same way, at homes in schools we can use safer wired internet for computers through an ethernet connection instead of using Wifi. In fact, a lot of people don't know that many European, continental European countries have given recommendations for schools to use wired computers, wired internet instead of Wifi. In fact, France, couple of, in 2016 banned all wireless devices including Wifi in small children's facilities and they restricted the use of older students use of wireless Wifi for up to three hours per week. In contrast, Australia on a world scale, there was a study conducted by the OECD in 2015 and that showed Australian students use the internet more than any other country that took part in this international survey for school work and most of this actually is through Wifi. It is quite likely that we have very high levels of exposure here in Australia and it's prudent at this stage with the existing evidence to wire where possible and reduce and turn off.

Dr Ron Ehrlich: That would include because it's very common now to have speakers put in ceilings or walls that are Wifi and everybody thinks isn't it terrific, we haven't got any wires.

Dr Pri Bandara: Absolutely.



Dr Ron Ehrlich: I can imagine that is another factor and of course you mentioned child monitoring, baby monitors, I mean, God, where were we before we had baby monitors? How did babies ever survive? How did we survive Pri?

Dr Pri Bandara: Yes.

Dr Ron Ehrlich: What about the distance from this idea of putting the phone to one's ear or resting the laptop in one's lap?

Dr Pri Bandara: That's right.

Dr Ron Ehrlich: What about distance?

Dr Pri Bandara: You mentioned the most important point that I actually forgot to mention. Distance is really your friend because your exposure mostly comes from your personal devices. That is unless you live close to a mobile phone tower or a radio transmitter or something like that like in one of those big broadcast towers. Now, keeping the phone away from your head, using speaker function, or headset, we'll reduce your exposure. When it comes to headsets, instead of a wire connected to the mobile phone, there are newer, what's called air tube headsets and those earphones transmit the least amount of radiation to the head. Speakerphone or headsets that don't put the mobile phones against your head.

Dr Pri Bandara: In fact, if you look at the manufacturer's manuals, mobile phones and in that, even iPads now, iPads emit very similar levels to mobile phones, they all have minimum distances that the industry has specified but these instructions are buried deep, it's very hard to find and nobody seems to be aware of them. These distances, the minimum distance is hardly met by real-time usage. People just press, keep these devices against their body which shouldn't be done. Those instructions are there not just to protect the manufacturers from legal implications in future, but also to protect consumers. These should be, people should be made aware of it, but unfortunately, there's no such public awareness campaign happening in Australia too.

Dr Ron Ehrlich: Does texting generate less radiation than-

Dr Pri Bandara: Yes.

Dr Ron Ehrlich: ... yes.

Dr Pri Bandara: Yeah, it's a really good way to actually, I mean that's how I communicate mostly without going to have to use-

Dr Ron Ehrlich: We were going to do this interview via texting Pri, but I just didn't think we would have the same appeal to our listener. We will have transcripts then.

Dr Pri Bandara: I actually, I use a landline phone, I used to use an old fashioned corded for now, but I've used a cordless phone for 12 years but I'm very serious about reducing my family's-



Dr Ron Ehrlich: I know you came up to my surgery and you looked around out the window and you mentioned there was also some shielding that can go on windows.

Dr Pri Bandara: Yes. Especially in high-density areas where there are a lot of external powerful transmitters like mobile phone base stations, people who are concerned, who are aware often use a special field to block out this microwave radiation coming through the windows. There are various, again that is an effective way to reduce the levels inside a home or in an office. There are also, I should mention there are a lot of gadgets that are simply making a lot of money for their commercial providers, but not really giving you protection. I've seen people sticking various crystal, whatever things on their mobile phones and there's very little research on those and a lot could be just gimmicks.

Dr Ron Ehrlich: Yeah, now listen, as I say, we've covered some great territory here and I think you may have answered this already, but look, if you were taking a step back from your role as a researcher and we're all on this health journey together through life, what do you think the biggest challenge is for people on that health journey in our modern world? I think too, the answer is obvious here, but-

Dr Pri Bandara: Yes, if you look at where we are now in the 21st century, as electrochemical beings we've evolved with nature, sunlight is our natural source of electromagnetic radiation, but we've created very different electromagnetic radiation since that bright idea of Edison some hundred years ago about the light bulb and we've drastically changed that natural environment around us. These days, our lifestyle, we've become a lot of us night owls, we keep up too late surrounded by our digital screens and what not and artificial light and these collectively electromagnetic radiations in the form of, today our focus was radio frequency radiation that we use for wireless communication but also there's more talk about blue light coming from these screens. We collectively disrupt the production of Melatonin, a very important hormone that regulates our asleep and also provides excellent antioxidant protection to us.

Dr Pri Bandara: If with our modern lifestyle we are disrupting our day-night cycle by chemical changing the biology of Melatonin etc., unfortunately, that is a challenge to our long-term health, particularly the younger generations keep up until very late and they wake up late and they in fact often miss the beneficial electromagnetic radiation in the form of sunlight, morning sunlight to make vitamin D. There are things that with the knowledge we have we can incorporate very practical changes to our lifestyle to maximize, have natural exposures, the beneficial exposures and to minimize these harmful and natural exposures while being on a healthy diet, being active and doing all the other things that we should be doing.

Dr Pri Bandara: Another challenge in the modern age is that we are living in a time of information overload. I know the internet is fantastic. It is a fantastic source of information, but at the same time there's a lot of misinformation on the internet and people don't know what to believe and it's not helped by various commercial conflicts of interest, people and organizations pushing various things, products and programs with claimed health benefits. It is a challenge for people to figure out what's really good and what they should be doing particularly to prevent disease. I think considering that, that's why we actually need

organizations like the ACNEM, the Australasian College of Nutritional and Environmental Medicine of which now you are the latest president.

Dr Ron Ehrlich: Now, there we go. There is the official announcement on my podcast. Well, listen, it's one of the reasons-

Dr Pri Bandara: Congratulations.

Dr Ron Ehrlich: Thank you very much. It's one of the reasons why we do this podcast to help people wade through that and it's one of the reasons why I actually do feel rather passionate and passionate enough to become president of the Australasian College of Nutritional and Environmental Medicine. Pri, thank you so much for joining us today and thank you for sharing your story and your knowledge and expertise. Thank you so much.

Dr Pri Bandara: Thank you very much for the opportunity to share this information with your audience, Ron. Cheers.

Dr Ron Ehrlich: The issue of environmental stress is a big and important one. Whether we are talking about chemical load as we have in many episodes, Professor Marc Cohen, Nicole Bylsma, Alex Stewart and Kate Harris, all those early episodes I did with Lynn McLean, you could be excused for thinking if it's out there being sold, the government must have checked it's safe, but it's sobering to learn that that's not always the case and even more sobering to learn that a lot of the research that informs those government decisions and regulations are conducted by the very industries that stand to benefit financially from the sales.

Dr Ron Ehrlich: Now, it's worth mentioning the precautionary principle. If something has the potential to cause harm, it's best avoided until independent studies verify it's safety. Europe is very big on the precautionary principle and it's why Wifi radiation has been removed from many schools because like so many things, young people are the most vulnerable.

Dr Ron Ehrlich: Another way to go, which is the way things work in the U.S. and to a similar extent in Australia and the UK have put things out there. If they cause a health problem, you can take the manufacturer to court and let the courts decide the validity and extent of your case. Well, I know which way I'd like to go. It's important to know that making informed decisions can reduce your toxic load by 80 to 90%. That is true of chemicals you are exposed to and also the degree to which you expose yourself and your family to the effects of electromagnetic radiation. Now, I do carry my phone in my pocket close to my body and I'm as a result of today I'm just going to need to pull out that man bag I haven't been using often enough, but I will most certainly be putting my phone on aeroplane mode and switching off the Wifi, Bluetooth until I get it out of my pocket or away from my body. My God, I'm going to be disconnected for a half an hour, or an hour. How scary is that?

Dr Ron Ehrlich: I'm going to install a master switch at home as well to easily turn off my internet while I sleep, and of course keeping all electrical appliances away from my head at night is another one I haven't been doing. Look, we can make choices that do make a big



difference. Now, and also don't forget to download the Unstressed App from the App Store or from Google Play. Just search Unstress and then download. It's some great resources and of course, you will know immediately when the latest episode is posted.

Dr Ron Ehrlich:           Also, while you are there, why not leave a review on the iTunes about the podcast? Look, I've got a very simple goal for this podcast. Not only to empower you to better health but to make the planet healthier too. The two as you know, are inseparable, so share the message and the love. Until next time, this is Dr Ron Ehrlich, be well.

*This podcast provides general information and discussion about medicine and health and related subjects. The content is not intended and should not be construed as medical advice or as a substitute for care by a qualified medical practitioner. If you or any other person has a medical concern, he or she should consult with an appropriately qualified medical practitioner. Guests who speak in this podcast express their own opinions, experiences, and conclusions.*