

# A Special Interview with Dr. Devra Davis

By Dr. Joseph Mercola

**DM: Dr. Joseph Mercola**

**DD: Dr. Devra Davis**

Introduction:

**DM:** Welcome, everyone. This is Dr. Mercola. Today we're honored to have Dr. Devra Davis, who is really one of the most well-respected and credentialed researchers in the area of the dangers of cellphones among a number of other things. It took us a while to get her on, but we have her now. And we're really excited, because we're likely going to be working with her in the future. Let me tell you a little bit about her credentials. For those of you who aren't familiar with her, you might learn a little bit more.

She served as the founding director for the Center for Environmental Oncology. Her work, as I've mentioned, really focuses quite a bit on cellphones and the scientific association with brain cancer and the environmental leagues. She's written a number of books.

Her newest book is called *Disconnect: The Truth About Cellphone Radiation, What Industry Has Done to Hide It, and How to Protect Your Family*. It has been translated into six languages and is prompting major re-assessment of governmental policies on this issue around the world. She also wrote *The Secret History of the War on Cancer*. She's been able to merge these two issues together with her unique perspective.

It's just, as I mentioned, a really great privilege to have you join us today and share your wisdom and insights, so that we can be better informed on this very important issue. So, thank you.

**DD:** The honor is mine. I really appreciate all of your doing to bring awareness to the world that there are ways people can stay healthy.

**DM:** Yes. It's a bit of a challenge. I think that they'll appreciate that seeking health is also one of your passions, and you're actively engaged in lifestyle changes to optimize that. You have an interesting perspective. Because many scientist and researchers can look at this from an academic perspective, but not apply the information personally. This gives your information another level of validation.

**DD:** Well, thank you. Like you, I like to walk the talk.

**DM:** Yes. It's important. I've read a little bit about what you're doing. Why don't you provide us, with your words, a bit of your background on your fields of expertise and research, and how you came about to actually write this book?

**DD:** Well, thank you. I started out in cancer epidemiology and a focus on the history of science, and I've come back to that in a way. I trained at Johns Hopkins and got my post-doctoral M.P.H. there. I got an interdisciplinary doctoral degree from the University of Chicago prior to that and was a Senior National Cancer Institute post-doctoral fellow at Johns Hopkins, working with a brilliant fellow. Then I went to work actually from the beginning of the EPA when there was something called the Office of Toxic Substances being set up and worked for the administrator of EPA in 1976. So, that goes back quite a bit.

I then went on to do a variety of things in the academic world and went to work in the Clinton administration, where I held the presidential appointment during parts of that administration. I left that to do further academic research and founded the Center for Environmental Oncology at the University of Pittsburg in 2004.

As part of the academic work that I did before going to the Clinton administration, I was also the founding director at the U.S. National Academy of Sciences, of the Board on Environmental Studies and Toxicology, which is the board that reviewed studies and data on such things as, "Is passive smoke harmful for you? Is asbestos in the environment a bad thing?"

So, I've had a lot of experience of working on environmental health hazards. Most recently, I left the University of Pittsburg Cancer Institute and founded the Environmental Health Trust, which is a non-profit research and public educational group that's conducting research and supporting efforts to communicate what that research means, so that we can help people become healthier – one community, one nation, one world at a time.

**DM:** Terrific. You've got both books that you've had, but I think it probably is more appropriate to talk about your more recent books. Can you give us some insights as to how and why the book was written and some challenges you might have encountered with the industry [*Laughs*], which is a very powerful industry.

**DD:** Yes.

**DM:** I think far more powerful than most people watching this realize. This is not something we talk about a lot, because our primary focus being a physician is on the medical component and all the challenges with Big Pharma and their massive political lobbying, but it appears that the....

**DD:** Telecom...

**DM:** Telecom, sorry. Yeah, the telecom industry is actually far larger and more powerful than the pharmaceutical industry.

**DD:** That's a very good question, but before doing that I should mention one other thing. My first book was *When Smoke Ran like Water*, and it was a National Book Award finalist. It told the story of growing up in Donora, Pennsylvania, where in one five-day period, 20 people dropped dead from air pollution. I grew up in that town, and no one ever talked about it.

When I was growing up, there were two things people never discussed. One was pollution, and the other was the holocaust. The two are not comparable in many ways. But they were not discussed, because they were just too difficult for people to acknowledge at that time in the 1950s when I was growing up there.

I learned that the town I grew up in has had this massive catastrophe that later on led to the recognition that the environment affected our health. Yet no one wanted to talk about it then. I learned about it and wrote this book and told the stories about what happened to my grandmother, my uncle, and others, as we all learned what the consequences could be of living in a world where the sun didn't shine for days at a time.

Now this book, *Disconnect: The Truth about Cellphone Radiation*, really started at the birth of my first grandchild who, of course, is a brilliant boy. At the age of nine months, he could manipulate a cellphone. I mean manipulate. Not just look at it once it's turned on. I got to be really interested. "Wow!" I thought. "That's a very fascinating brain this boy has." Well, I started to do research. Now remember, I've been at the U.S. National Academy of Sciences, so I figured...

**DM:** Wait. Let's just stop there, because many people watching this... You and I understand what that is, but maybe you could expound on what that really means, because it's quite a prestigious association.

**DD:** Right.

**DM:** So for those who don't know what that means, maybe you could expound on that.

**DD:** Sure. The U.S. National Academy of Sciences was founded by Abraham Lincoln. It sits in a beautiful marble building right off the mall in Washington D.C., as well as a lovely and newer facility in the moon setting of D.C., and has for years been the body that advises the president, the Congress, our major issues having to do science and policy, whether it's the investigation of a challenger disaster of the shuttle or an evaluation of whether or not we know enough to tell people that they shouldn't smoke around children. Those are the kinds of things the National Academy has done over the years.

The academy works by appointing people who are the best in their fields to come together and offer advice. I was the founding director of what was at that time the largest board at the academy, which was designed to evaluate environmental and toxicological evidence on things in the environment that might be affecting our health. In that capacity, I had overseen groups that

asked the question, “Is passive smoke bad for us if we’re not smokers, and for our children?” I’d also overseen a study on whether or not there were any dangers to bystanders from asbestos. Both of those reports weighed very heavily on me, because as a cancer epidemiologist and a toxicologist, we are now facing the burdens of our failure to address tobacco and asbestos in the past.

Tobacco, I think there’s no one who debates its effects. But in 1983, when I started at the National Academy of Sciences, serious scientists at Harvard, Yale, Princeton, and Oxford were doing research for the tobacco industry. In 1978, the American Medical Association received 11 million dollars from the tobacco industry to do research on tobacco. *[Laughs]* In 1970 and into the early 1980s, the U.S. National Cancer Institute was doing research on designing a safer cigarette. And in 1964, the director of the U.S. National Cancer Institute was a four-pack-a-day smoker.

**DM:** *[Laughs]*

**DD:** Right? So when the surgeon general’s report came out, saying that tobacco was a cause of cancer, most people in the government and many people in high-ranking positions smoked cigarettes. You may remember when a lot of surgeons smoked, and surgical conventions were full of smoke.

**DM:** Eighty percent of nurses were smokers, too.

[----- 10:00 -----]

**DD:** Right, and because it’s a high-stressed job. Nursing is a very high-stressed job. Nicotine does reduce stress. It also kills you eventually. But it does reduce stress, and it’s highly addictive.

When I worked at the academy, we brought together groups to evaluate whether or not we had enough evidence to say X, Y, or Z. Having been in that position where I would convene expert scientists around the world, I thought I knew. If there was a problem, I would know about it. And I figured that cellphones had to be safe. At that time, I owned three of them.

**DM:** What year was this again?

**DD:** This would have been 2004.

**DM:** Okay.

**DD:** All right? 2004. I kind of prided myself on being able to, you know, wear them like a fashion statement (it became sort of a sign of how powerful I was) on my hips. I wanted all my senior staff to have them, so I could reach them at any time. Because, after all, we’re all so important, we have to be able to interrupt you whatever else you’re doing. I thought I was a big shot because I could keep up with my grad students in using all the new apps, as they were just coming out at the time. I was one of the earliest users of these devices.

At the academy, we were one of the beta testers for what became the e-mail system, because we had people working in different buildings, and it's a great way to connect people. That became, as you know, the foundation for telecommunicating. It's something you and I are doing now wherever we are. So there are a lot of advantages to this system.

But the cellphone itself has always been assumed to be safe. I assumed it was safe. And I assumed that if there was a problem, I'd know about it, because after all, I worked with the best scientists in the world, and we were all using these devices. Well, I was really shocked when I started to look into it. I looked into it because I understood the history of tobacco and asbestos, and I had been part of that history.

If I may take a moment, and tell you one story: The academy was asked in the 1980s to evaluate whether or not we knew that passive tobacco smoke could be a health threat. So, we took that on as a committee, appointed eminent scientists to lead that committee. At the same time, another committee was asked about airplane cabin air quality. These two committees were meeting. The head of the airplane cabin air quality study was a wonderful guy named Tom Chalmers, who became the dean at Mt. Sinai Medical Center.

At his first meeting he announced, "We will never recommend getting smoke off of airplanes, because I used to smoke four packs a day, and I still would like to smoke now (because that's how addictive it was) but I know it's bad for my health, so I've stopped. I would never want someone flying a plane who used to be a smoker, because he might make mistakes." That was his opening statement. To his credit, he changed his opinion. Okay?

That evolution is discussed in my book *The Secret History of the War on Cancer* – how we came to look at the evidence and decided that there was no question that being around tobacco smoke increases your risk of cancer and other diseases and, in particular for children, increases the risk of serious ear infections, bronchitis, and pneumonia. They were hospitalized four times more frequently if their parents were smokers.

As you know and as I write about it on *The Secret History of the War on Cancer*, the war on cancer got started in the early 70s and ignores tobacco, even though the surgeon general has said tobacco is a cause of cancer in 1964. In my book I showed that the surgeon general could have issued a report on tobacco dangers in 1950s, if they had been able to use secret research done by the Nazis and done by the Argentinians in the 1930s. In the 1930s, the danger of tobacco was officially well known that in Argentina there was a national institute to study tobacco dangers. In Germany, there was an institute to study tobacco as well.

The first case-control study on tobacco and lung cancer was done in 1939 in Germany. Two people who were aware of that work, Ernst Wynder (in the United States) and Richard Doll, each were privy to information about that work, which they did not discuss when they discovered the link between tobacco and lung cancer.

Until this history had been on Earth, which I've unearthed in my book, and others such as Robert Proctor, a distinguished historian of science at Stanford University, have done an excellent job of discussing this as well. But until historians started to unearth this evidence, it was widely believed that we had no idea tobacco was bad for you, until the mid-1950s.

I was aware of this history of tobacco. I was also aware of a similar and worse history even with asbestos, where in the 19<sup>th</sup> century, women working for the ladies factory inspectorate reported on the crippling effects of asbestos for those who started to work in the mills as teenagers who would be dying by the time they were in their 30s. If they started to work at, say, age 10 or 12, which people did in Victorian England, by the time they were in their 30s, they would be dying of lung disease. These women at the time of the 19<sup>th</sup> century wrote very graphic descriptions of why these young people would die in asbestos.

Yet despite that, during the run-up and during the World War II, the U.S. government and industry put asbestos into our ships and used it because it's a terrific insulation, and suppressed information about its dangers. Only when deaths from asbestos became irrefutable and undeniable and lawsuits were filed and won was action taken to control asbestos.

Right now – this one of the things I'd like your help on – there are 30 million homes in the United States of America with asbestos insulation in them that are not labeled "asbestos." They say, "zonalite," which contains tremolite. If you dig deeply to the EPA website and look at our new website which will be going up in about a week, you will find information where EPA says, "Don't touch this. If you think it's asbestos, you must have a qualified inspector come and look at it and decide whether to leave it alone (which is often the best thing to do, by the way) or whether it needs to be mitigated, in which case you have to get it done professionally, because exposure to asbestos can cause crippling lung disease 40 or 50 years later."

In *The Secret History of the War on Cancer*, I discussed a family in Canada, a native Canadian family. Raven ThunderSky, her mother, father, and all of her siblings are either dead or sickened with asbestos, because it was in their attics. This attic insulation can be deadly. EPA has tried for years to issue more of a public notice about this, and they've been turned back in the Bush W's administration (Christie Whitman wrote and tried to do this) and more recently, because OMB says, "They can't afford to create this awareness." I think this is absolutely yet another scandal.

Knowing those things, though, when I started to look at cellphones, I thought, "Hmmm... You know what happened with tobacco and with asbestos," so I wanted to dig a little more. When I started to dig, I found out that a fellow named William Stewart, who had been Margaret Thatcher's chief science advisor, had issued a warning for the Royal College of Physicians, advising that teenagers not use cellphones. He did this in the year 2000. I've never heard of it. Frankly, my first thought was, "Well you know... The Brits are kind of eccentric, and maybe it's just an unusual thing."

But I knew Sir William Stewart by reputation, because he ran Britain's chemical and biological warfare program. One of the programs that I was supervising was the Committee on Toxicology for the Department of Defense. And chemical and biological warfare was and is a very serious issue for the world. Controlling those weapons and decontaminating them is a very important thing to be addressed.

Having seen what happened with asbestos and tobacco, where we only took action years after the hazard was first confirmed in experimental studies, we insisted on proof of human harm. We made human sickness and death the basis for taking regulatory action. We said we're not sure about asbestos or passive smoke, and we need to have proof in the form of sick or dead people. I came to understand that we can't do that now with cellphones, because everybody is using a cellphone, and growing numbers of children are using cellphones.

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If we wait for proof of harm – and that proof is brain cancer... What we know about brain cancer is this: it can take 40 years to develop. We know that from when the bombs fell toward the end of World War II – there was no increase in brain cancer at all until 40 years after. And we know that there is an increase in brain cancer from ionizing radiation associated with that bomb. If brain cancers have 40-year latency in a population, and we wait for evidence as we did with tobacco and asbestos and population increases of cancer, we will be in huge trouble.

More importantly, we have evidence that cellphone radiation interferes with sperm production, sperm quality, and sperm vitality. We know that there are millions – in fact, billions – of young people growing up, keeping phones in their front pockets. The fine print warning that come with cellphones (which I hope your team will edit in here, showing what they say) for the Android says, "Keep it 2.54 centimeters from the pregnant abdomen or the abdomen of a teenager." That's what it says with the Android. Nobody reads it. The iPhone 4S has fine print warnings also to not to put it in your pocket.

**DM:** Isn't it true that last year the World Health Organization classified exposure to cellphones as a Class B carcinogen?

**DD:** Last year, the World Health Organization almost unanimously concluded that cellphone radiation is a possible human carcinogen in the same category as diesel engine exhaust, some pesticides, and some heavy metals. We would never let a child play with some pesticides, heavy metals, or diesel engine exhaust. Yet people are giving their children cellphones. It makes no sense.

**DM:** It's ludicrous. I have a question about the exposure to the ionizing radiation and the latency of 40 years. My understanding is that the primary danger from cellphones is not ionizing radiation.

**DD:** Okay.

**DM:** That's actually the justification that much of the industry uses to defend it. But it is non-ionizing radiation that interferes the brain function. Is it still the similar 30- or 40-year lag period – latency – period before you see the brain cancers?

**DD:** That's an excellent question. I think actually, it's not the same latency. It may be shorter. We know that because case-control studies have been done, where you compare a group of people who have brain cancer with those who do not. We find out about their history of cellphone use. Every study that has been able to follow people who have used cellphones for 10 years or more and include them in the study has found a double or greater risk of brain cancer in those who've used cellphones for 10 years or more.

Leonard Hardell has shown that people who started to use cellphones as teenagers have four to five times more brain cancer by the time they reached the end of their 20s, suggesting strongly that for young people there's a shorter latency – just as your question implies.

Now, I think it would be useful for your listeners to see the radio frequency spectrum, which as your question implied, goes from the invisible radiation that is cosmic in X-rays (which we know damages DNA and causes cancer and can kill you) to the visible spectrum of light (which allows us to see) to the invisible spectrum of microwave radiation.

In fact, a cellphone is a two-way microwave radio. Industry has fought successfully to use the phrase “radiofrequency energy” instead of microwave radiation. Because they know radiofrequency energy sounds fine. We listen to music with radios. Everybody needs more energy. What could be better than that?

But radiofrequency energy is another word for microwave radiation. If people understood that they were holding a two-way microwave-radiating device next to their brain or next to their reproductive organs, they might think differently about it. That's what Environmental Health Trust is working on, and we're delighted to work with you to promote a better understanding of this.

The city of San Francisco passed a law almost two years ago, but industry is fighting. It gives people the right to know that phones emit radiation. In fact, they sued the city. The industry has sued the city. First, objecting to the use of the term “microwave radiation,” and then objected (although I think they will be rejected in this)... The industry is objecting to the fact that they're being forced to tell people before they buy the phone what the fine print warnings that you get after you buy the phone say. Those fine print warnings for the Apple iPhone 4S say, “If you keep it in your pocket, you can exceed the FCC exposure guideline.”

When phones are tested... and I can share with your team a video of the test...

**DM:** Which guidelines are those? Are those the SAR ratings, which we know aren't really valid? I mean, this is not the most dangerous.

**DD:** Right.

**DM:** I think one of the frauds that's being imposed upon the public is that if you have good SAR rating (S-A-R rating) for your phone, you're okay. But there are other frequencies that are more important biologically. So, is this the one that they're warning us about?

**DD:** The SAR stands for specific absorption rate, and it is based solely on how much heating would be caused in the brain. The SAR test (we can share a video with you of a recent testing that we saw, if we get permission from the people that we filmed) uses basically a huge bowling ball, kind of a big plastic head of a guy with about an 11 pound head.

He was about six feet two and dips into the fluid that's poured into that head – that homogenous fluid – a computer-controlled instrument to measure the temperature change that would happen with cellphone exposure. The assumption has been that the only effect of microwave radiation on the brain is to cause a change in temperature.

Now as you know, the brain actually can't perceive heat at all. That's why you can do awake brain surgery. The brain does not perceive pain or heat. So, you can operate on people when they are awake, once you drill onto their skull by anesthetizing the skull, that can feel the pain. The brain itself doesn't feel pain or heat. You can have a device on the outside and... By the time you feel heat in your ear, your brain is much hotter. The cellphones have only been tested for heat. They have never been tested for the biological impact of microwave radiation aside from heat.

Studies that I talk about in my book *Disconnect* and that we show on our website clearly indicate that pulse digital signals from cellphone radiation can alter membranes, weaken membranes, increase reactive oxygen species, which produce free radicals (which, as you know, are very damaging and go around wherever they find us, lose electron, knock it off, and can cause havoc within cells). Cellphone radiation, it does those things. We don't understand the long-term biological effects, but I'm really concerned that the major damage from cellphone radiation is to our reproductive organs.

People keeping phones in their pockets – the fine print warnings say don't do that. People aren't aware of that. That's why I'm delighted to talk to you about this, because I think we need a much more public campaign to inform people about how to practice safe phone. It's not that hard.

**DM:** This reproductive damage is due to the biological effects, not necessarily the heating impact that the microwave radiation would do?

**DD:** As a matter of fact, yes. That's a very important point. Thank you. In fact, studies have shown that you could damage the ability of sperm to swim. You can damage their shape. You can damage what's called their vitality.

Now I'll share a little joke with you. Do you know why you need half a billion sperm to make one healthy baby?

**DM:** *[Laughs]* No.

**DD:** Because sperm don't know how to ask for directions.

**DM:** *[Laughs]*

**DD:** *[Laughs]*

**DM:** I think this becomes particularly important when we have a panoply or a large number of different environmental exposures that can work synergistically. Because not only do we have this massive and pervasive exposure to cellphone radiation, but we also have another battle, which is genetically modified foods, which are also pervasive in our food supply. Also, preliminary animal studies strongly suggest to have a profound impact on fertility not in the current generations, but in subsequent generations. It seems to me that there's potential for massive synergistic destruction of our fertility. *[Laughs]*

**DD:** You're right. I'm not familiar with the work on GMO, but I am familiar with one other effect of cellphones I want to share with you, which I think relates to a lot of the toxicology here. Cellphone radiation weakens membranes everywhere. It weakens the blood-brain barrier. I discussed in my book *Disconnect* the pioneering research of Allan Frey.

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Allan Frey from the Office of Naval Research in the 1960s did research with pulse digital signals from microwaves. What he was able to do was show that that signal allowed blue dye (that was yellow) that he injected into the animals to get into the brains. Animals that were not exposed to this pulse digital signal, their brain stayed naturally pink (the normal color of the brain). The animals that were exposed to cellphone-like radiation, their brains were dyed fluorescent yellow. Then he concluded that this radiation was clearly weakening the blood-brain barrier.

Now, the interesting thing is that when he did this study, there were no cellphones. He was just studying weak pulse digital signals. Because at that point the issue was what is the effect of radar and what might be the effects of microwaves later on. This is an issue of some controversy.

**DM:** Does the frequency make a big difference here – of the pulsing?

**DD:** The frequency can make a huge difference, but here's the deal. The frequency of microwave oven and the frequency of the cellphone are in the same order of magnitude for sure, right? Maybe 900 megahertz, 1800 megahertz, 2400 megahertz, also 2.4 gigahertz, or 1.9 gigahertz. Cellphones are in the same ballpark. Okay?

The microwave oven works at a thousand watts a power and can boil a cup of water in about a minute. A cellphone works at less than one watt of power on average. It was assumed that because the power was weak, it had no biological effect at all. It doesn't have the power to disrupt photon, because it is non-ionizing. It is not ionizing like X-rays. It's non-ionizing.

In fact, non-ionizing radiation can have biological effects, and frequency is important. Unfortunately, with cellphones we seem to pick the frequency that resonates most with the human body. That's not a good thing. We really ought to try to come up with different frequencies that are going to be less biologically effective. This frequency that we're using now looks to be especially biologically effective. That may be part of the problem. That may be why we're seeing these effects.

To go back to your story about synergies. This means you're holding a cellphone next to your brain, you're weakening the blood-brain barrier, and any toxic material that's in your blood (because you live in the modern world) is going to be more deeply absorbed into your brain and into the cells of your body, just because you have cellphone radiation next to you. That is why we want people to practice safe phone.

Practice safe phone is very simple. It means distance is your friend. Keep the phone off your body. Use an air tube headset if you can find one, or any headset will do, so long as it's not dripping down the front of your body and conducting it right back into you. Never keep a phone on in your pocket or on your body.

If you go to the fine print warnings, it says, "If you have a pacemaker, keep the phone six inches away from your body," or eight inches away depending on the brand. A pacemaker, as you know, is an electronic device that regulates the heart. But what is the heart? The heart is your pacemaker. Why would you want to expose your heart, as so many men do, by keeping their phone right here?

**DM:** Just getting back to the frequency issue again... I'm sure you're familiar with Dr. George Carlo. He proposed a mechanism which alluded to the fact that it wasn't this microwave transmission that was the big issue. It was the modulating carrier wave, I believe, that resonates at a biological frequency somewhere between 60 and 150 cycles per second or hertz. From your understanding of the physiology and the sciences, would you agree with this? And this affected microtubule transmissions.

**DD:** It's an interesting hypothesis. I think this gets back to a larger issue. We don't have any serious research underway on that question now.

**DM:** *[Laughs]*

**DD:** It's a fascinating idea, and there are other ideas. We don't know what makes cellphone radiation as damaging as it appears to be in experimental studies and some epidemiology studies. We need to find out.

I just came back from Finland. Researchers there are taking this issue very seriously, as they are in Italy. We need to do a better job. That is why I'm hoping you'll be able to support the idea that Environmental Health Trust floated to the Senate in 2009, which is to put a dollar of phone fee on every phone for five years to create independent funding for research that's need to be done; monitoring, surveillance, and training in medicine for electrical engineering; and training for electrical engineering for medicine. Because as you know very well, doctors know nothing about electrical engineering. There's no reason that they have to, unless they become specialists in radiology or in sciences that use it.

**DM:** That proposal seems like... at least superficially seems to be a wise one, but pragmatically one needs to be aware that there are very powerful lobbying groups that manipulate governmental influences and doing it in a very highly leveraged way. I mean they can make these donations of, you know, six figures, sometimes seven figures, or even eight to certain politicians, and they can sway the way that these governmental policies are initiated. Ultimately, it seems like anytime it involves the government, there's enormous potential for fraud, deceit, and manipulation. *[Laughs]*

**DD:** I won't dispute that.

**DM:** Especially with this industry – the telecom industry, which we didn't really discuss. I mean I mentioned it, but you talked about something else. There's a suggestion that it's even stronger than the pharmaceutical industry.

**DD:** I won't dispute that. In fact, it's a global multi-trillion dollar industry. I'll tell you something else. We talked about the WHO report? I have heard from insiders that the industry has setup a quarter of a billion dollar fund to counter and attack the World Health Organization for its assessment that cellphone radiation as a possible human carcinogen. Now that's a pretty good validation of the issue, isn't it? If they're willing to spend that kind of money...But it's also an indication of how powerful they are.

Having said that, there are good people in that industry, and I am talking to some of them. They do recognize they got to produce safer phones. There are ways to do that. There are protective cases that do deflect radiation. I don't know if you want to use this or not, but...

**DM:** Oh no. I definitely...

**DD:** The Pong case actually does deflect radiation.

**DM:** How do you spell that?

**DD:** P-O-N-G.

**DM:** P-O-N-G.

**DD:** Yeah.

**DM:** I've never heard of it.

**DD:** Look up "Pong research" and you'll see that it really does. I went to the laboratory there. I've tested it. I've talked to people who have tested it independently. It deflects radiation. But that doesn't mean it's okay for you to still keep it near eight hours a day, as unfortunately, some people have done.

The Israelis are especially concerned, because they are seeing a huge uptake in parotid gland tumors. This is a story that you might be able to give attention to. Adam Yauch formerly "MCA" of the Beastie Boys died of a malignant parotid gland tumor of his left cheek. I believe he was left-handed. We need to find that out. But if he was, then the cellphones and wireless devices that he used all the time in his music business could explain this. Because the average case of a parotid gland tumor is diagnosed in their late 50s; he died at 43.

In Israel, one in five cases now is under the age of 20. This is a very rare tumor, but it is occurring in young people. That is why the Israeli government has issued warnings about children using cellphones. The Israeli Dental Association has issued a warning as well, because of the dramatic increase in a very rare and malignant tumor of the cheek.

**DM:** Okay. Yeah, it's important to know that. I mean, there's a whole variety of a different toxic side effects from chronic exposure this is, but I think what we're all interested... It seems like it's practically almost close to impossible. Nothing is impossible, but this close to it – to avoid exposure to technology. Because even if you decide to opt out yourself and not own a cellphone, everyone around you does. I mean literally, the vast majority of the planet is using these.

We need really a comprehensive approach. It would seem that the most effective strategy would be to really utilize committed researchers with integrity who understand the issue to influence the industry in a way that it doesn't cause harm or damage.

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It's easy to do. I mean unlike cigarettes (it's probably close to impossible to make a truly safe cigarette), you can pretty well design a cellphone to be relatively inert.

**DD:** Right. In fact, that's why I recently returned from meeting with people in Finland and a few other countries to discuss exactly that. I think where we are on this issue with cellphones is where we were with cars, seatbelts, and airbags. I think we need the equivalent of the seatbelt or the airbag for the phone.

**DM:** Yes. That makes sense.

**DD:** My engineering friends tell me that all environmental problems are just flaws of engineering design.

**DM:** *[Laughs]*

**DD:** In some sense that's true. We need to design upstream. We need to design more efficient devices. But there are also some things that we need to rethink. One of them (I hope your listeners already know this) is that children and wireless is just not a good combination. I was appalled at the number of people who download apps to their phones for babies. We're talking about young, young children. Even six months, you can get a baby iPhone plastic rattle case (if you want, I'll go show you one. I have one here) to give your infant in the crib an iPhone.

Now, if you think that this is a good idea and you're out of any other way to distract your child, then please disconnect it from the wireless and disconnect it from the Internet. Do not ever give a child a phone that's connected to hold it next to their body.

**DM:** Just to translate that to easier layman's speak, I think that's simple as just putting it in airplane mode, isn't it?

**DD:** Yeah. The airplane mode will do it. Yes.

**DM:** Yes, because it disconnects the Bluetooth and wireless and everything.

**DD:** Right. There's a center at Harvard, the Center for the Environment and Media, which like the American Academy of Pediatrics, recommends that no children should be given these devices before age two and that they should only be used very, very little, in a limited way. I've seen people with young children who are just... They are just completely hooked into it, and they're not making eye contact.

Our children, we have them for such a short period of time. My daughter got married last year and I can still remember when she was three. Now she's not three anymore. She's in her 30s, and she's doing well with her wonderful husband. But I realized, you know... Childhood is such a short time. And these busy parents, their busy nannies, and their busy babysitters, you see them all hooked in looking down like this and not making eye contact. That's how children learn who they are. That's how they learn to have empathy and think about somebody else as important, not by relating to these devices.

There's a growing concern about neurodevelopment specialists about what the heavy use of these devices could mean for our children. They're great learning tools in limited ways. In fact, there's a new problem emerging, particularly in young boys. They can't write. They can't write, because they know how to type, but they don't know how to write. There are a lot of kids ages

eight, nine, 10 years old who can't write, but they can type. Writing and fine motor coordination is important for all kinds of brain development as you know.

**DM:** Good points. I'd like to go back to one of the other points you mentioned about asbestos. Since you're really an expert in this form of environmental toxicology, one of the pieces of information we recently encountered was the danger not only of asbestos, but perhaps something equivalent and even more pervasive, which would be fiberglass.

**DD:** Right.

**DM:** It's typically assumed to be inert and safe, but can you comment on the dangers of fiberglass versus asbestos?

**DD:** Yeah. This is the story that didn't make it into *The Secret History of the War on Cancer*. When I worked for the Clinton administration and worked for the Secretary of Health and Human Services, Donna Shalala, early in that administration a group of people came in to lobby against listing fiberglass as a possible human carcinogen in the National Toxicology Program review.

The evidence then – and that was in 1993 – was strong enough, because we know this: fiberglass fibers – not the fiberglass in your boat that's embedded, but fiberglass fibers in insulation, that pink puffy stuff – can be asbestiform. It's the shape of asbestos that's critical.

Asbestos is long, thin, or else curly. There are certain types of asbestos fiber. There's crocidolite, anthophyllite – it doesn't matter. But the bottomline is the aspect ratio of the asbestos, the ratio of its diameter to its length, is what determines how deeply it can be inhaled into the lungs and where it stays in the lungs. And if it's tiny enough, it's like a nanoparticle and it can get into the ovaries, into the bloodstream, and end up in the ovary, where it can cause ovarian cancer or end up in the lung, where it can cause lung cancer.

Asbestiform fibers can be found in fiberglass. Because of that, although it's not as big a cancer risk as asbestos, it still is a cancer risk. Workers who work with it have an increased risk of lung cancer and of other lung diseases.

That listing of fiberglass as a possible human carcinogen was effectively delayed for three or four years, maybe longer, because of the political lobbying that went on in the Clinton administration and had been going on for years earlier in the Republican administrations. The lobbying efforts on behalf of these huge multibillion-dollar chemicals and materials are phenomenal. It's really amazing.

The relevant thing here, which I want to use in the movie we're working on, is the last scene of "Thank You for Smoking." The last scene of Thank You for Smoking features a number of guys who look a little awkward, sitting at the table. The movie is about a guy whose job it is to promote tobacco smoking. For social support, he meets once a week with his friends from the

gun and alcohol industry. They call themselves the M.O.D. squad, the Merchants of Death. At the end of the movie, there's a new recruit to the M.O.D. squad.

It's gun to guys in suits and our camera boy says, "Well, is it true? Does cellphones cause cancer?" They all start to speak at once. They say, "Well, there's a study in Idaho. We don't know. We're not really sure." The guy says, "Gentlemen, I want you to practice saying these words in front of the mirror: While we're concerned about the issue, at this point there's no direct evidence linking cellphones and brain cancer."

That has been the industry's response in 1993, 1997, 2002, 2007, and I'm afraid it will be the response when the GAO finishes the investigation that they just started but is supposed to have been completed now. There's no direct evidence. That means we don't have enough sick or dead people. That's what happened with tobacco, that's what happened with asbestos, and that's why I'm talking.

**DM:** Okay. We we're talking about the connection between asbestos and fiberglass, and their similarities. Sort of an extension to that question, so that people can have some practical information on how to implement this information or details, is that fiberglass comes in different forms. It comes in bats that you can roll, layout, and attach to the ceiling.

**DD:** Yeah.

**DM:** It also comes as blown-in insulation. I'm wondering if the blown-in insulation might be more dangerous, and if you have that it might be more urgent to remove that from your attic, and replace it with something safer such as a foam insulation, which is sprayed on and less toxic.

**DD:** Right. You're absolutely right. Fiberglass comes in many different forms. The safest form is the form that makes boats and other things, because it's solid and basically doesn't break down. The most dangerous is in the form that comes in the floppy pink stuff that you can put behind your dry wall, the sort of rock wall. The things that can break off... If it's friable, meaning it can break, that's the most problematic.

It's really important that having any contact with fiberglass, people wear a mask, gloves, and protective clothing. The mask can't just be like routine surgical mask. There are masks that are actually graded and rated for handling fiberglass. Because there have been studies that found the damage to wrap lungs at exposure to these things. Again, studies are showing that if you intake the fiberglass and instill it into the lungs (called intraperitoneal injection) you can actually cause cancerous growths.

[----- 50:00 -----]

You want to be aware that this is a serious threat to human health and take precautionary steps particularly for that insulation that is this [inaudible 50:12] stuff.

**DM:** The primary risk is inhaled or pulmonary? It's not contact.

**DD:** Actually... It's very interesting that you asked. Your skin, as you know, is the largest organ.

**DM:** Uh huh.

**DD:** The tiny, tiny fibers from asbestos can actually get through it – through the skin, into the body as well. But inhalation is the major root concern, absolutely.

**DM:** Okay. Well, thank you for answering that. I guess if we can go back to the cellphone, which is one of your main areas of expertise and current passions. We were starting to discuss how it's just essentially pervasive and unavoidable exposures at the current stage of technology in 21<sup>st</sup> century and probably increase. It appears the big bulk of efforts need to be at making safer cellphones, but that's going to take a while. That's not going to happen this year or next year, maybe not even in the next 10 years. Maybe it is. I mean with efforts like yours.

**DD:** Yeah. I think it is.

**DM:** I don't want to be pessimistic, but there's going to be this window, however long it is, where we're essentially vulnerable. I'm wondering what your recommendations are, aside from the ones that we currently recommend such as staying away from the handset and using a safe headset and minimizing your exposures. Are there any protective devices like the Pong mentioned earlier, or any other efforts to this? And sort of a corollary to that, what type of technology or engineering solution are they going to put into the phones that will solve the problem?

**DD:** First of all, I'm not an electrical engineer, although I'm studying with some of the best in the world like Om Gandhi in Utah and Alvaro DeSalles in Porto Alegre. Phones are being made to be more safe now. But there is a fight going on within companies about how to market their increased safety, because of lawyers' concerns about liability issues for past manufacturer of more dangerous phones. That's what's going on.

I don't think it's going to take 10 years. I think it's happening now, and the issue is a marketing issue. If you admit that you can make safer phones now, you're conceding that you could have done it earlier.

Patents do exist on designing antennas and on designing phone cases to make them safer. The Pong case has been engineered, so that it contains a copper circuit that deflects the radiations from the phone. It doesn't absorb it. It's not one of these little plastic chips, which as far as I know do nothing at all, as I've not seen any independent data on their efficacy. It simply deflects the radiation.

That would mean, though, if you had a Pong case on an iPhone, you would not want to have it here and have a toddler right there, because you're deflecting it out. Even though you're

deflecting it out and it will be weaker, you still want to use basic common sense with respect to children and the young.

**DM:** How would the Pong case work? I assume that the case is in the back of the phone, because the front of the phone, you're going to have to see.

**DD:** Yeah, and the edge you know... It covers...

**DM:** On the edges?

**DD:** Yeah. Of course, the iPhone has the antenna around the edges.

**DM:** Wouldn't the radiation come through the front of the phone – the glass?

**DD:** Some does. But it's all of a question. If you had no radiation, you'd have no signal, and you wouldn't be able to talk, right? So, you have to have some, otherwise you wouldn't be able to communicate. But when I looked at their facilities and what they were doing, I thought that it clearly did reduce the radiation between 60 to 80 percent.

You can find information about this on CNET.com, which did a review of it. Also, because it uses less radiation, the batteries will last longer. It is expensive. I don't think... And it's not a solution that anyone can afford. But it does absorb this and redirect it, so that you're getting less exposure when you use it.

CNET.com, which is the geeks' source of information, tested Pong and reported on it. In their report on it in September – I think – last year, they said that although they were very skeptical in the beginning, they found that it does. If you use a headset and use this case, you really have substantially redirected your exposure. They went to the labs and there are images – as you can see – of the difference in the immediate exposure with and without the Pong case. It's a fairly substantial and impressive thing.

The case does not cut down on the amount of RF energy that comes from a phone, because that would mean it would be working more and draining itself. It interacts with the phone's antenna to deflect the microwave radiation away from your head and out the back of the phone. The test that we saw... We know that the phone is not going to be absolutely safe, but it is reducing the amount that can get directly into you.

**DM:** Perfect.

**DD:** We know from research done by Dr. Nora Volkow, the director of the National Institute of Mental Health, that even 50 minutes of holding a phone next to the brain significantly alters glucose metabolism. Dr. Volkow herself advises that you have to be careful how you use a cellphone because of that, because nobody knows what the long-term consequences will be.

And we do know that another way to describe Alzheimer's is diabetes of the brain, because there's too much glucose on the brain when you have Alzheimer's. Nobody knows what this will be.

Interestingly, in the tech community when the Pong case first came out, it was called snake oil by *Wired* magazine. Okay?

**DM:** *Wired* is notorious for....

**DD:** No. No, but then they issued a reverse course after *Wired* had it tested. They said, "Well, I guess, we were wrong."

**DM:** They're frequently wrong on these types of natural medicine issues.

**DD:** Oh, that's interesting.

**DM:** Yeah, and I have subscribed to *Wired*.

**DD:** Yeah.

**DM:** I enjoy their insights on technical issues, but with respect to natural medicine, they're way behind the curve.

**DD:** Interesting.

**DM:** So, a technical question I have for you is, we know that one of the most important principles is to keep the phone as far away from your body as possible and to use a speakerphone. And ideally, you're not touching the phone, which is my strategy frequently. But occasionally, when I'm moving, or in the car and you can't hear, you can still use a speakerphone. But I'm wondering if you can compare the damage to the body to holding it a few feet away from your head, but still in contact with your hand. Can you put a perspective on the danger that you're doing, or is it the same?

**DD:** No. It's not at all the same, because your hand is mostly bone and doesn't have a lot of soft tissue. The potential for harm requires a lot of soft tissue. Where do you have soft tissue? The breast and the abdomen. Therefore, keeping a phone in the pocket of your chest or your pants is particularly bad.

The brain is actually protected in part by the skull, because bone is more dense than brain, which contains fluid. The brain of a child, the head of a child is particularly vulnerable because their skulls are thinner and their brains contain more fluid. It's the fluid in fat which can absorb more microwave radiation. Your hand does not have a lot of fluid and fat in it. It is not the same exposing your hand.

Stephen Sinatra and I have had a little discussion going about how important is it. Yes, ideally you don't even hold the phone in your hand. But frankly, I do hold the phone in my hand and talk on it trying to use a speakerphone or a headset. And I'd try to make more use – as we are today – of Skype.

**DM:** Yes. Skype is a very useful tool. They actually have different versions of Skype now, where you can conference multiple people in.

**DD:** Yeah. When it works, it's great.

**DM:** Yeah. I mean it's improved quite dramatically in the last three years.

**DD:** Yes.

**DM:** It's pretty consistently easy now to get it to work. So, are there any other strategies or comments you would like to make on this really important topic? Because it is really crucial for all of us to understand and even more so for the children in our life, whether they're our relatives or people we're responsible for.

**DD:** With your help, what we'd like to do now is reach out to more schools. I want to tell you about a program we have in Jackson Hole, Wyoming. The mayor, the town council, the school superintendent...

**DM:** Is that where you're based out of?

**DD:** That is where I'm based out of, and Washington D.C.

**DM:** Okay.

**DD:** Jackson Hole Community Foundation has been very supportive of what we're doing. And I probably should get them a shoutout at some point, because they really have made a huge difference.

[----- 1:00:00 -----]

The community of Jackson Hole, which is pretty conservative, understands the need to practice safe phone. And as a matter of community policy, the town council issued a proclamation on cellphone safety. The local pediatricians have issued a report, and they are handing out cards to people telling them (if you come to their office) how to practice safe phone.

The dermatologists and orthopedics are also handing out these cards of information. We're making that information available through doctors' offices. We'd like to work with you to make it more broadly available, so people can download it, print it out, and hand it out to give to people.

**DM:** It's the two-page brochure you sent?

**DD:** Yes.

**DM:** Okay. We'll definitely have a link to that in this article.

**DD:** We want to revise one on the breast cancer story. That story is really important, because we're seeing very young women with breast tumors in the center of their chest, where as you know, the breast tumor usually occurs one tumor in the upper outer quadrant. And we're seeing it in the inner quadrant right outlining where people have kept phones. It's quite unusual.

We're presenting this at the [inaudible 01:01] case series report to breast cancer conferences now, because we think it's a concern. I'm working with some surgeons who are going to start asking questions of their young patients to see if they have these tumors occurring in their population.

I think we are all a work in progress when it comes to this issue. You and I love technology. We use it a lot. It's allowed you to grow to this phenomenally important site that people go to for lots of information. And it's allowed us to reach people within what we otherwise couldn't reach. The technology is not going to go away, but we do have to make it safer. That's why our motto is practice safe phone.

We need to start to ask questions. Nobody should be sleeping with their phone. If you have to use it as an alarm clock, put it on airplane mode, so that it's not sending or receiving microwave radiation. Put it on the floor. Don't have it next to your head. Never put a phone under a baby's head. These apps that you...

**DM:** Let me just extend that, too, because it's not just the phones. I mean that is also your tablet computers or your iPads. The same caution exists. Put it absolutely.... It's okay to use it. I use mine frequently before I go to bed. But you have to turn it into airplane mode before you go to sleep.

**DD:** Yeah. By the way, the iPad is engineered with a proximity sensor. They don't brag about it, though. It has a proximity sensor so that when it's on the body, it shuts down the amount of radiation that it can send or receive, which, of course, means it's going to drain the battery. It's really interesting. They did that because if they do not do that, the iPad would never have passed even the FCC test for heating effects.

**DM:** Interesting.

**DD:** I want to thank you and your listeners, because it's very important for people to understand that they have the right to know how to keep themselves healthy and how to stay healthy. And often the answer is no further away than your refrigerator, looking under your kitchen sink, looking in your medicine cabinet, and getting rid of things that you thought might be good for you but turn out not to be. I want to thank you personally for the efforts that you've made to help all of us figure out how to stay safer and healthier.

And practice safe phone.

*[END]*