

PREVIEW

ZAPPED

Why Your Cell Phone *Shouldn't* be Your
Alarm Clock *and* 1,268 Ways to *Outsmart*
the Hazards of Electronic Pollution

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ANN LOUISE
GITTLEMAN

SPECIAL REPORT:
Zap-Proof Your Kids

The following is an excerpt from *Zapped* (HarperOne, 2010) by Ann Louise Gittleman, PhD, CNS.

ZAP-PROOF YOUR KIDS

As you might expect, protecting children from electropollution begins even before a child is born. And so, in this chapter you will be introduced to many tips and tools you need to safely raise a healthy family today. Just keep in mind that infants and children are not just little versions of you and me. Instead, their bodies are significantly different than adult bodies and also far more susceptible to potential damage. The bottom line: yes, children are definitely at risk and you may never have suspected the extent to which they are being exposed to electropollution.

So you may be startled at what you will read in this chapter. But you have the power to make positive changes in the lives of your children, and you can take charge and make a lasting impact in their long-term well-being. The gift of your children's future health is in your hands today. Four-year-olds with working cell phones? It's happening. Parents who wouldn't dream of letting their kids use a microwave oven are buying their kids phones that will expose them to a similar form of EMF—this one that can penetrate across the depth and breadth of a child's brain.

Miami-based Firefly Mobile markets a phone that's tiny enough to fit easily into a preschooler's hands, though the company says it makes the phone for kids of all ages. Even Disney produces a phone for tweens and teens (kids eleven through fifteen) that has plenty of flashy bells and whistles—camcorder, camera, games, and customizable ring tones—to keep kids on the phone so long they'd have to be classified as heavy users even if they never make or receive a call.

Parents love cell phones because it allows them to reach their kids—and to be reached—in case of an emergency. And that's a good thing. But they may be inadvertently putting their children at another risk.

WHY CHILDREN ARE MORE VULNERABLE

Children are always the most vulnerable victims of environmental pollution. For instance, because of their size, they absorb 50 percent more air pollution than adults.¹ When it comes to EMFs, studies have shown that their thinner skulls and bones allow them to absorb twice the amount of radiation as a grown-up. EMFs can more deeply penetrate their brain tissue, which is more conductive than an adult's because it contains a higher concentration of fluid and ions.² One study found that a cell phone call lasting only two minutes causes brain hyperactivity that persists for an hour in children.³

Because they're growing 24/7, children's cells are dividing at breakneck speed. The more cells that divide, the greater the risk for damage at critical junctures. EMFs can cause breaks in the blood-brain barrier, which is more permeable in children.⁴ That breach can allow toxins to travel to the brain through the bloodstream and can result in oxidative stress, damage to nerve tissue, and adverse effects to brain hormones such as dopamine and serotonin.

Worse, children may be exposed, even before they're born, to the pollution a mother absorbs—through her cell phone use, even her exposure to high EMFs at home or on the job. At a 2004 World Health Organization meeting on EMFs and children, experts pointed out that RF emissions can cause whole body heating.⁵ Ultrasound scans, now done routinely on women during pregnancy, produce strong frequencies and penetrate the body deeply, creating heat in the tissues of both the mother and baby. Heat—when it raises the mother's core temperature to 102 degrees—can result in congenital abnormalities, and the effects are cumulative. Certain tissues in the body absorb frequencies more readily; it all depends on their fluid content—the more fluid they contain, the more EMFs are absorbed. Since a fetus spends forty weeks essentially floating in a sack of water, it is likely that it's particularly vulnerable.⁶

Many studies have linked maternal and child exposure to EMFs, even at levels regulatory agencies consider safe, to childhood cancers (particularly leukemia) as well as asthma, autism, Add, and behavioral problems in children, rates of which have been rising at an alarming rate. For example, alternative physician Dietrich Klinghardt, M.D., in a small but significant study, found that a pregnant woman's body voltage, measured in her bedroom, as well as the body voltage of children in their bedrooms, was a predictor of autism and other serious neurological disorders.⁷

As a parent, you want what's best for your child. Before your baby is born, you scan the house for potential dangers and baby-proof it with locks and outlet covers. Think of this chapter as an instruction booklet for EMF child-proofing your kids' lives, from the womb until they leave the nest.

FROM THE WOMB TO ADULTHOOD: PHONE SAFETY FOR YOUR KIDS

Today, an estimated thirty-one million kids—10.5 million of them preteens—are on their cell phones on average 3.75 hours a day. That's a lot of close exposure to RF waves. Here's how to help them cut way back, starting in the womb!

First and foremost, restrict cell and cordless phone use during pregnancy. Here's why: A 2008 survey of more than thirteen thousand children found that women who use a cell phone two or three times a day while pregnant are more likely to have children with behavior problems such as hyperactivity, difficulty controlling their emotions, and developing good relationships with others. In the same way that you protect your baby from other toxic exposure during pregnancy, it is vital that you protect your baby from electropollution, as it can impact the baby's nervous system development—long before birth.⁸ Perhaps more important, heavy-duty cell phone use during pregnancy has been linked to risk of miscarriage and birth defects.⁹

ARE TEENS ADDICTED TO CELL PHONES?

Many teens think they are addicted to cell phones, and they certainly act like it. In one study, teens aged fifteen to nineteen describe themselves as addicted to their phones, and in another, 30 percent say they're depressed when they can't use it.¹⁰

Two Latin American researchers—a psychologist who works with drug addicts and an EMF expert—in a paper published in March 2007 suggest a plausible explanation for why teens go into withdrawal when they can't use their phones: cell phone use, like drugs and alcohol, may act on the reward centers of the brain which contain opiate receptors. When the brain gets its perceived reward—whether it's heroin, chocolate, or the fun of texting two thousand times a month on average—it wants a do-over, again and again. Suddenly, a behavior is born.¹¹

In fact, they note, Henry Lai, Ph.D., of the University of Washington has found that microwaves increase the activity of the feel-good hormones known as endorphins and the brain's own happy chemicals—neurotransmitters such as dopamine. Lai further ties EMFs to addiction: using a drug that quashes heroin cravings, he blocked these effects in rats exposed to RF waves.¹²

Psychologists who have studied cell phone use, particularly texting, by teens, report that it's leading to anxiety, behavioral problems, distractions in school, repetitive stress injury, and sleep deprivation.

If your teen is addicted, he's not going to stop on his own. You may need to enforce the age-old rule that the one who pays the bill (at fifteen cents apiece for texts, likely no small figure) gets to decide how and how often a phone is used.

Don't throw away your cell phone! But use it only for emergencies, not casual chatting or lengthy conversations. Text when you can so you avoid holding the phone near your head. If you must use a cell phone, buy a hands-free kit with a wireless air tube near the earpiece. Carry your phone in a purse rather than in a pocket or clipped to a belt—unless it's turned off, a cell phone is always emitting dangerous microwave radiation which can affect you and your unborn child. Follow the other tips on safe cell phone use in chapter 8.

Minimize total prenatal AC magnetic field exposure. Before you get pregnant, do a home inspection with a Gauss meter that picks up AC magnetic field readings. Ideally, you want your home's AC magnetic field level to be no more than 1 mG if there are children or if you're planning to start a family. If you find higher readings, find the spot where they begin to fade and position furniture that safe distance away from the EMF source.

Reduce dirty electricity. Measure dirty electricity with the Stetzerizer Microsurge meter at various outlets throughout your home. If readings are very high, you will want to consider installing the special filters, called Graham-Stetzer filters, that are discussed in chapter 7. These, as you may remember, neutralize the medium frequency voltage spikes (2,000 to 100,000 Hz), a peculiar and dangerous hybrid of low and high frequency waves known as dirty electricity. Follow the instructions in chapters 5, 6 and 7 for inspecting your home and taking measures to eliminate any dangerous EMF emissions from the environment.

Sweep the nursery and kids' bedrooms. Avoid baby monitors if you can, but if you need one for your peace of mind, look for a used older monitor that is a wired baby monitor. Newer monitors with the stubby half-inch antenna operate the same as a Wi-Fi or cordless phone and should not *ever* be used in the house, let alone in a bedroom. Keep them as well as night-lights or bedside lights six feet away from your child as he sleeps. Determine where wiring is in the wall, and check beside and below the child's bedroom for water pipes, appliances, computers, garage door openers, black box transformers, and fluorescent lights—all sources of low and medium frequency AC magnetic fields—and position your baby's crib or child's bed as far away from them as possible. Use a Trifield or Gauss meter to measure precisely: you want to keep children as far away as possible from AC magnetic fields measuring more than 1 mG. Measure RFs with an electrosmog meter.

Microwave food without baby. Baby's cranky time usually coincides with dinner preparation, but resist the urge to carry your crying child on your hip while cooking—especially at the microwave. The kitchen is filled with EMF-producing appliances, the most powerful of which is your microwave.

Curb kids' cell phone use. In Russia, scientists and government officials have advised that anyone under the age of eighteen should not use a cell phone. In France, there's a ban against marketing mobile phones to young children. In the United Kingdom, Sir William Stewart, chairman of the National Radiological Protection Board, was quoted as saying, "I don't think we can put our hands on our hearts and say mobile phones are safe."¹³ In the United States? Not much...yet.

In an ideal world, you would never buy your child a cell phone. But if you did that, you might never hear the end of it because all their friends now own them. Besides, in our two-career families, those cell phones equate to peace of mind. But since you're the parent, you can set the rules for cell phone use. First, do not buy preschoolers cell phones. It is far too dangerous a device to put into their hands—and especially for them to put up to their ears.

There are studies suggesting that, in addition to brain tumors, children's cell phone use could result in hearing loss (if they use it an hour a day or more) and the death of auditory nerve cells. One Indian study found that cell phone users who were on the phone for sixty minutes a day over four years experienced damage to the DNA in roughly 40 percent of their cells.¹⁴

If you absolutely must equip your little one, look for phones without dial pads. Those will have buttons that you can program to speed dial emergency numbers only. And insist they be carried in shielded cases.

Cell phones are just as dangerous for your tweens and teens as they are for your preschoolers. But now, peer pressure really kicks in. As long as parents are paying for cell use, however, you have the power of the purse. Parents of both preteens and adolescents will need to establish clear guidelines as to their cell phone use, while understanding your kids' needs for independence. Your children will be even safer if they obey these rules:

- Text rather than call.
- Use a safe headset.
- No phoning or texting while driving. The U.S. Department of Transportation reports that teen drivers on cell phones have slower reaction times than teens not on the phone while behind the wheel.¹⁵ British scientist Andrew Goldsworthy has suggested that it's not just inattention that triggers accidents involving cell phone use, but the false signals our nerve cells send out when they leak, as they do when exposed to EMFs. The brain hyperactivity that results may also be at the root of attention deficit hyperactivity disorder (ADHD) in children, he speculates.¹⁶
- No phones in the bedroom. Many teens already have sleep problems, and a constantly beeping or buzzing phone—and friends just a text message away—won't help. (While you're at it, move all the electronics from sleeping areas to avoid EMF exposures when kids are most vulnerable.)
- Teach kids to keep phones away from the body while they're turned on. Those incoming calls and texts cause a burst of RF emissions that can penetrate the body, so have them stash the phone in a purse or backpack.

As a parent, the more you can do to set a good example with your own cell phone use—making calls on a landline at home, for example—the more likely your kids are to follow suit. Don't be afraid to ground any child's cell phone use—by taking it away for a day or two if she ignores reasonable rules!

Fight Wi-Fi in schools, communities—and at home. It's easy enough to stick with or go back to wired technologies at home. It's a little harder to protect your family when your school district or city wants everyone wireless. While schools and even cities now consider Wi-Fi de rigueur, many parents, thankfully, do not. In one suburb of Chicago, concerned parents filed suit against the Oak Park School District, claiming that constant exposure to 802.11 Hz signals could cause their children neurological harm. (They cited one Swedish study that showed that exposure caused brain damage in teenaged rats.¹⁷ In England, consumer, parent, and teacher groups have all called for a suspension of Wi-Fi in schools.¹⁸ In Santa Fe, New Mexico, a college librarian quit her job because she didn't think that "allowing oneself to be irradiated" by Wi-Fi should be a condition of employment.¹⁹ If your school or community is considering going wireless, organize with other concerned people and use the information in this book to campaign against it.

Campaign against cell towers and antennas. For all you know, that church steeple or grain silo near your child's school hides a cell phone tower or antenna. Or there might be one on the roof of the school itself. Go to www.antennasearch.com to find any cell towers or antennas near your child's school. Studies have found an increase in cancer in people who live within about one-quarter of a mile of towers and antennas, so if they are this close to your child's school, work with other parents to convince your school or school district to request that local authorities have the towers and antennas moved.

You may run into opposition, but maybe not. In September 2009, school officials made the unprecedented move to close the Fredon Township Elementary School in New Jersey, because AC magnetic field readings from the eighty-foot electrical towers carrying 230 kV lines across school property were six times the recommended safe levels set by the World Health Organization (which is still higher than most EMF experts recommend).²⁰

The community became concerned when the local utility proposed an upgrade to the electrical system, a project that would string 500 kV transmission lines from eastern Pennsylvania to New Jersey. For the first time, readings were taken on the existing lines and the results were shocking: AC magnetic field levels averaged 19.34 mG. The WHO recommends a 3 mG threshold, while other experts recommend 1 to 2 mG.²¹

Fix your electrical system. To its credit, the power industry has not dismissed the possible connection between electromagnetic fields and childhood leukemia, a link first made in 1979 when researchers Nancy Wertheimer and Ed Leeper found that children who lived closest to utility power lines that could be expected to produce elevated magnetic fields in the home transformers had a two- to three-fold increase in cancer, particularly leukemia and brain tumors. Since 1999, the Electric Power Research Institute (EPRI) has been pursuing a plausible explanation for the leukemia findings confirmed by international studies.²²

Since 1999, EPRI is following a promising lead: contact current. That's the current that flows within you when you're in contact with two electrically conductive surfaces with different voltages, like when you place your thumb and forefinger on either end (positive and negative) of a battery. You may not feel it, but a current flows through you. It's likely to be fairly small unless your fingers are wet, which would give you an electrical shock since water is a much better electrical conductor than skin. Don't try this.

Where does EPRI think children are becoming the conduit for an electrical current in the home? In the bathroom.²³

As I've pointed out, since 1918, the National Electrical Code has required that your electrical system be grounded to one metal water pipe, which gives the pipe what's usually a less than 1 mV charge as the electric current travels along the pipe back to the nearest power substation. In chapter 6, I showed you that the journey isn't quite as straightforward as it sounds: current can stray far and wide and pick up unwelcome high frequency hitchhikers as it heads home. It can also travel throughout your house along metal pipes (only metal pipes are conductive), even creating a current in older ceramic-coated metal bathtubs or sinks (or your stainless steel refrigerator with ice maker).

If a child touches a faucet, for example, that current will travel into her arm and throughout her body—even into her bone marrow! A child, especially one who is wet, can expect to get the biggest dose in the thinnest extremities, such as a hand or arm. A study done at the University of Victoria in British Columbia, Canada, confirmed that contact current so mild it was imperceptible could produce a magnetic field in the bone marrow of the forearm as much as thousands of times higher than the normal environmental field.²⁴

EPRI researchers knew that children were very likely to touch and play with faucets while in the tub or at the sink. They worked with scientists at the University of California at Berkeley who, using interviews and diaries, found that 80 percent of the children from infants to five-year-olds whose parents reported on their tub activities frequently touched the faucet and played in the water stream.

The research is ongoing. EPRI has teamed with the long-running Northern California Childhood Leukemia Study to determine if contact current in homes is associated with an increased risk of this childhood cancer. But you don't have to wait for an answer. See chapters 5 and 6 for ways you can test for and reduce contact current in the home.

THIS IS YOUR CHILD'S BRAIN ON EMFS

Rates of autism, ADHD, and learning disabilities have soared in the last forty years. In 1970, for example, about one in ten thousand children was diagnosed with autism. Today, the incidence is estimated at one in one hundred and ten.²⁵ No one is sure why. Genes, greater awareness, and better diagnostic techniques may all play a role. But is it really a coincidence that these statistics have gone up at the same time as burgeoning technologies are surrounding us with EMFs?

We know that EMFs cause a disruption in cellular communication, in part by causing membrane rupture and leakage of calcium ions, which play a major role in transmitting messages throughout the body. Andrew Goldsworthy, who has written extensively on the subject, believes that when sensory cells leak their calcium, they can “send false signals to the brain,” which can result in sensations like pins and needles or burning. When neurons—nerve cells—leak, they also start transmitting impulses, which Goldsworthy believes can cause hyperactivity in the brain and may be at the bottom of at least some cases of ADHD.²⁶ Early animal studies did find that exposure to an everyday 60 Hz field interferes with the ability of rats and monkeys to perform simple tasks, including pressing a lever for food.²⁷

Other researchers found that the kinds of lesions identified in the brains of some children with autism are the same as those that were created in animals exposed to 50 Hz fields (the same as the electrical system in Europe) and to microwaves. In a study published in 2006 in the journal *Medical Hypotheses*, researcher I. M. Thornton of the University of Wales postulated that environmental exposure to EMF could affect mirror neurons, the nerve cells that fire when we observe an action in another or act ourselves. (Those neurons allow us to take behavior we've seen and turn it into behavior we do.) At least one theory of autism is that the mirror neuron system is faulty, throwing a child's perception off and making him unable to mimic the actions of others or to act normally himself.²⁸

Thornton speculates that EMFs could interfere at a critical point in the maturation of a child's brain when the neurons of this system are grouping to work together. In adults, this see-and-do system is already formed.²⁹ Tamara J. Mariea, CCN, who has treated more than five hundred children with autism spectrum disorder at her Tennessee Clinic since 2000, published a study in 2007 in the *Journal of the Australasian College of Nutritional and Environmental Medicine* reporting her success in improving her patients' symptoms without changing any of their previous treatment. The only thing she did differently was lower the EMFs in her clinic.³⁰

Remember, you can't rely on federal or industry safety standards when it comes to kids' exposure to EMF. Not only are those rules governing communications radiation only concerned with thermal effects—whether you can be burned by the radiation—they are based on the height and weight of a six-foot man, not a teen, child or baby.

Now that you are off to a running start with the kids, let's take a moment and revisit—but in more detail—the specific zapped challenges in the workplace and what you can do to eliminate them. This next chapter is a must for anyone who works, especially for managers, owners and corporate executives.

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