THE POTENTIAL HEALTH DANGERS
OF CELL PHONE USAGE

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SIMPLE TRUTHS
WHITE PAPER RESEARCH SUPPLEMENT

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Think Twice Before You Place That Call
Cell Phone Health Effects | Busy Signals
by William Thomas
http://willthomas.net/Investigations/Articles/cell phones.htm

Though intended for renovations, Chris Anderson would like all visitors to deposit their cellular phones in the cement mixer by his front door. This sounds excessive - until you step into Anderson’s orchard, where the pegged needle of a shrieking electromagnetic radiation (EMR) meter placed beside a connected cell phone still shows significant exposure 100 feet away.

Much to the chagrin of this certified EMR-mitigation specialist, every day some 300 million cell phone users are “reaching out and touching someone you love. Yourself, and anyone else within range of the microwaves emitted by your cell phone.”

Mesmerized by magical gadgets, we have yet to count the costs of miniature radio transmitters that are transforming Marconi’s invention into new possibilities for portable personal pollution. As entire nations reach for pocket communicators, the explosively emergent $40 billion a year cell phone industry is poised to deliver a “Wireless Revolution” that over the next five years is expected to double the one-billion people connected by telephone lines over the past century.

Silicon sensors are already calling to each other. Soon, countless communicating microchips embedded in everything from bumpers to brooms will be sending streams of encoded electrical energy through glass, steel, concrete, bone and flesh.

Exquisitely sensitive to subtle electromagnetic harmonies, human brains and bodies as intricate as galaxies depend on tiny electrical impulses to conduct complex life-processes - including the ability to read, recall and respond to these words. Acting as antennas, our anatomies just as easily tune into spurious signals from radio and microwave transmissions. Blake Levitt, author of Electromagnetic Fields, says that when it comes to cell phones, “a worse frequency could not have been chosen for the human anatomy.”
As cell phones conquer consumer minds and markets, researcher Carolanne Patton notes that “the brain reaches peak absorption in the UHF bands, right where cellular telecommunications operate.” British military scientists have discovered that cell phone transmissions disrupt the brain sites for memory and learning, causing forgetfulness and sudden confusion.

Other studies show that electromagnetic signals from cellular phones reduce the ability to concentrate, calculate and coordinate complicated activities such as driving a car. Startled by $4 billion a year in extra claims among cell phone-wielding drivers, North American insurers did a double-take that found simply juggling ‘cell phones is not causing a 600% increase in accidents over other drivers busy shaving, applying makeup, tuning radios, taming pets, making out, pouring coffee, retrieving dropped cigarettes, talking and gesturing to passengers, or actually steering the vehicle.

Instead of just another dangerous distraction, tests conducted by the U.S. Department of Energy found that using a cell phone severely impairs memory and reaction times. “Hands-free” mobile speaker-phones cause even more crashes because they typically emit 10-times more brainwave interference than handheld units.

For all drivers dialing out on their cell phones, University of Toronto investigators report that the heightened probability of cracking up your car persists for up to 15-minutes after completing a call.

That’s comparable to the risk of crashing while driving dead drunk exclaims Dr. Chris Runball, chairman of the B.C. Medical Association’s emergency medical services committee. Reeling from “dial-a-collision” costs, the government of British Columbia may join England, Spain, Israel, Switzerland and Brazil in restricting or banning the use of cell phones by drivers.

In New Zealand, cell phone towers are prohibited on school property because of possible health effects. But Health Canada regulations ignore the hidden hazards of cell-wrenching cell phones, which send pulsed signals through the skull in a process one expert likens to “jackhammers on the brain.”

“Safety Code 6” looks only at microwaves burning skin. “Basically, Health Canada claims if it can’t cook you, it can’t hurt you,” says Walter McGinnis. “It’s like saying cigarettes aren’t dangerous unless they burn you.”

One of a handful of licensed electricians who understand electromagnetic fields well enough to eliminate them from household wiring, McGinnis has been testing EMFs and collaborating with fellow testers and researchers for nearly a decade. In Victoria, where he has helped residents’ defeat six cell phone towers, there was dancing in
the streets after Microcell Connexions withdrew its application to erect a microwave transmission tower against the Wishart Elementary School fence in the spring of 1998.

Microcell spokesman Colin McCrae points out that emissions from the company’s towers carry about the same energy as a 50-watt light bulb - well within federal guidelines.

This is hardly reassuring, retorts the former president of the Wisehart parents advisory council. Tania Berenuik observes that Health Canada “also told us thalidomide, asbestos and the blood supply were safe.”

Carrying similar risks of long-term lethality, and strangely just as legal, cell phone addiction mirrors the prestigious early allure of smoking - as well as an immensely profitable industry’s steadfast denial of risk and responsibility. As poisonous as cigarette smoke and even harder to corral, the cell phone’s “second-hand” microwave and radio-frequency (RF) pollution pose invisible but significant risks to bystanders - particularly children riding in cars that transmit amplified cell phone signals through their steel structure. Reporting the conclusions of a 12-person British study team, scientist Sir William Stewart told London’s Financial Times that “children may be more vulnerable because of their developing nervous system, the greater absorption of energy in the tissues of the head and a longer lifetime of exposure.”

Roger Coghill became a long-standing advocate for health warnings to be affixed to cell phones after this biologist found that cell phone transmissions damage the ability of white blood cells to ward off infectious disease by disrupting the immune system’s electromagnetic communications.

Dr. Neil Cherry has measured accelerated aging, increased cell death and cancers caused by radio frequency microwaves from cell phones and their relay towers. With the brain’s electro-chemical communications repeatedly zapped by lightning-like cell phone pulses, this Ph.D. biophysicist warns that headaches, fatigue, lethargy, nausea, dizziness, depression, arteriosclerosis and even Alzheimer’s can result from frequent or prolonged calls on cell phones.

“There is also a higher incidence of cardiac problems,” Cherry comments, “in terms of the timing function in hearts. You get more heart attacks and more heart disease - it has now been shown in many studies.”

The biophysicist from Lincoln University in Christ Church, New Zealand has also found that cell phones can murderously modify moods. In brains and bodies seriously derailed by tiny imbalances in trace minerals and hormones, depression, suicide, anger, rage and violence can result when calcium and serotonin levels are disrupted by cell phone transmissions.
In 1995, Cell phone sales in North America exceeded the birth rate. Hired by the Cellular Telecommunications Industry Association to condone cell phones, public health scientist George Carlo found that rare tumors on the outside of the brain are more than doubled among cell phone callers - particularly on the right side of the head where ‘phones are usually held. Carlo told ABC’s “20/20” that cell phone causes genetic damage that leads to cancer.

Warning of “the potential for a global health disaster,” ABC recommended “prudent avoidance” of cell phones after finding that every cell phone they lab-tested exceeded the Federal Communication Commission’s standards for EMF absorption rates. EMF researcher Dave Ashton cautioned 20/20 viewers that because cell phones constantly search for the nearest repeating tower, “long-term damage comes from cell phones in the stand-by mode.” Cell phone “shields” and headsets “cannot adequately address these problems,” Ashton added.

Dr. Carlo later told London’s Express newspaper that cell phones cause genetic damage following a dose-response curve. That is, the more a person uses a cell phone, the more cellular destruction and health risks they incur. Cell phone-confused cells can go crazy, Carlo cautioned. Experiments on captive animals show that this cumulative DNA damage is passed on to succeeding generations.

Addicted as we are to a culture of convenience, we forget how inconvenient it is to contract cancer. An Adelaide Hospital study confirmed Carlo’s conclusions after finding B-cell lymphomas doubled in mice within 18 months of one-hour daily exposure to power densities experienced by a cell phone user. B-cell lymphomas are implicated in 85% of all cancers.

As magazine-size “cellular” relay antennas hidden in church steeples and rooflines keep popping up just about everywhere, more and more communities are declaring their airspace a “No Fry Zone”. But in Canada, where cell phone towers come under federal jurisdiction, municipalities are only “advisers’ to a process in which no permits are required to erect transmitter towers deemed necessary for “national security.” Cell phones do save a lot of lives. FCC Chairman William Kennard reports that every day more than 98,000 people make 911 calls from wireless cell phones.

Many more lives are involuntarily imperiled by non-emergency calls. Pat Irwin was working in a Colwood health food store when she noticed a truck unloading metal framework. The next morning, a new cell phone tower was ready to add its emissions to another BC Tel tower already operating down the street. There had been no announcement, no public hearings - just a quiet notification to the municipality that a tower was going up, literally overnight.
The intruder radiated for a month when Irwin felt her immunity dropping. She wondered if other changes in her energy and menstrual cycle were “not from the moon or something that I ate.”

Irwin also seemed more irritable after her central nervous switchboard began receiving round-the-clock cell phone calls. With cellular relay towers in Kansas and Oklahoma being shut down because they interfered with passing aircraft, Irwin sensed how the same transmissions plucked her own electrical circuitry, inflicting a “chronic edginess” that “twangs human nerves.” Sleep disorders, she learned, are common among people exposed to high levels of electromagnetic pollution.

After several other women in the same business centre reported similar symptoms, Irwin quit her job. “I saw it as something that was there to stay and I’d be daily exposed to it over a long period of time,” she told Alive. “All this stuff is what we’re playing with on a daily basis, and we don’t know the long-term health effects.”

Implying recognized hazard, cell phone companies such as B.C.’s FIDO insist that the new digital phones operating at 1/50 the power of older analog models are safer. But there is nothing “safe” about the new 1.9 gigahertz broadcasting frequency. Much like a boxer taking repeated blows to the head, rapidly pulsing cell phones signal permanent brain damage. A study by Dr. Peter Franch found unequivocally that “cells are permanently damaged by cellular phone frequencies.” This cellular damage, Franch noted, is maximized at low dosage - and “inherited unchanged, from generation to generation.”

Attempting to explain a 25% increase in asthma and a 5% increase in asthma-related death rates throughout rapidly “mobilizing” metropolitan Sydney, Franch found that the production of histamine, which triggers bronchial spasms, is nearly doubled after exposure to mobile phone transmissions. Cell phones also reduce the effectiveness of anti-asthmatic drugs, and retard recovery from illness.

Katharina Gustavss, a certified Building Biology consultant with 25 years experience, explains that CDMA’s 217 Hz spikes are very close to the frequencies of human cell membranes. Gustavss accompanied a Microcell technician to the Colwood microwave relay tower Irwin and others had complained about. When he waved a spectrum analyzer, Gustavss checked the display and saw “pretty scary” energy spikes.

“What’s that?” she asked the tech.

“I’ve never seen that before,” he told her. It turned out that this cell phone tower tester only set his meter to an averaging mode. Switching to “real time” froze the readings at “scary” maximum output levels.
How dangerous are cell phones? “The risk is extremely high,” declares Dr. Cherry. “There are 66 epidemiological studies showing that electromagnetic radiation across the spectrum increase brain tumors in human populations. Two of those studies are for particular brain tumors from cell phones.”

Cherry says that because cancer takes decades to develop, it will be another 10 or 20 years before “mobiles” manifest a big bonanza in brain tumors. But he adds, we’re already seeing “acute effects that are noticed within minutes of using a cell phone.”

After two minutes’ conversation, a cell phone’s digitized impulses disable the safety barrier that isolates the brain from destructive proteins and poisons in the blood. Professor Leif Salford, the neurologist who carried out the research for this finding, informed the Daily Mail: “It seems that molecules such as proteins and toxins can pass out of the blood, while the phone is switched on, and enter the brain. We need to bear in mind diseases such as MS and Alzheimer’s which are linked to proteins being found in the brain.”

If you must pack a cell phone, treat it like a loaded pistol. Keep it turned off. Don’t carry it near ovaries, testicles, or the heart. For partial protection, buy an antenna shield. Limit calls to one-minute, six to 10 minutes a month. Never fire off a cell phone with children anywhere in sight.

A better bet is to facilitate the growth of organic telephone networks with lots of fiber. Instead of more microwave towers, “We should be wiring up our cities with fiber-optic cables to provide Internet, fax, telephone, radio and television at very high quality,” Cherry urges, “rather than saturating our cities with the microwave, radiowave and low frequency signals all the time.”

When it comes to cells, consciousness and cell phones, every call is collect. How can convenience count more than cancer? What is gained by being in constant contact with disembodied voices, while being “out of touch” with the friends and neighbors around us? Are we comfortable having our location traced by monitoring authorities?

Unless we start voting with our wallets, consumer complacency could prove as species-limiting as corporate cynicism. “Microwave frequencies are the same as those used in radar and your microwave oven,” says Florida cell phone tower opponent Joe Chwick. “You wouldn’t think of sticking your head in the oven, but there is no hesitation to putting the cell phone to your ear.”

Having somehow survived three-million years of evolution without them, many contemporary hominids claim they cannot live without them. But can exquisitely sensitive electromagnetic beings live with cell phones - and the cell
phone towers their signals ride in on? Like polyethylene food and water containers, plastic cookers and coffee-
makers, microwave ovens and petroleum-powered vehicles, cell phones could be one of those brilliantly
beguiling inventions we have to let go. Would hanging up on such an intrusive and hazardous addiction be so
terrible?

On Jan. 1, 2001 I cancelled my cell phone service...

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The Latest Teen Obsession: Is Your Child a Cell Phone Junkie?
Drug Rehab Treatment

Does your teen panic if she realizes she forgot her cell phone at home? Is she moody and frustrated if she can't
check her messages during dinner or a family outing? She may have a cell phone addiction.

With more than 225 million people carrying cell phones in the U.S. in 2007, up from 34 million in 2005, and nearly
two-thirds (63%) of teens owning their own cell phone, many parents have noticed obsessive behaviors in their
teens, often so extreme they resemble addiction. Most teens spend an average of one hour a day on their cell
phones. Add in the extra time they spend e-mailing, IMing, talking in person, or communicating through MySpace
or Facebook, and it's not surprising so many children are getting hooked on their high-tech gadgets.

Concern Spreads Worldwide
In a recent Pew Internet & American Life Project report, Americans picked cell phones as the technology they
can least go without. Recent reports also suggest cell phones, Blackberries, and other communication devices
are interfering with personal relationships, classroom lectures, productivity at work, and traffic safety all over the
world.

Although reliable studies on cell phone addiction are sparse, a study from China found that nearly one-third of
high school students showed signs of addiction, including paranoia, when they were without their phones, and
two-thirds were "constantly worried" that they would miss a text message when their phones were off. In Britain,
researchers concluded that people are so dependent on their cell phones that they see them as "an essential
item, an extension of self."
In Spain, two children ages 12 and 13 were recently admitted to a mental hospital for mobile phone addiction. Their treatment will resemble that of drug addicts and those with obsessive-compulsive disorder. Maite Utgés, director of the hospital, indicated that the children were failing in school and couldn't complete normal tasks because they spent five or six hours a day on their phones. And it only took one year of cell phone usage for them to get hooked.

**Know the Warning Signs**

Despite a number of maladaptive behaviors associated with teen cell phone use, most experts agree that this obsession doesn't qualify as a genuine addiction or mental disorder - at least not yet. Others argue that anything can become an addiction if a person becomes dependent to the detriment of other areas of their lives. Based on the sheer number of people affected, many believe cell phone addiction is well on its way to being classified as a disease similar to drug addiction, alcoholism, or gambling.

The symptoms of cell phone addiction are similar to the symptoms of other types of addictions, and may include the following:

- Feeling restless or uncomfortable when not using a cell phone;
- Having irrational reactions to being without a phone if it is lost or forgotten;
- Substantial increases in the amount of time spent talking on a cell phone;
- Mounting cell phone bills that cause financial distress;
- Problems at school and work from constant cell phone use;
- Interpersonal problems from constant cell phone use; or
- Taking unnecessary risks such as using a cell phone during inappropriate times (driving, etc.).

**Counteracting Cell Phone Abuse**

Experts predict more and more American teens will struggle with cell phone addiction in the next decade as we become more reliant on technology in our daily lives. More than just a phone, cellular devices are also used as alarm clocks, watches, music players, cameras, and calendars. And the cell phones of the future will be so "smart," they may even replace laptops, personal organizers, and gaming devices.

While most people can enjoy the ever-improving technology and convenience of cell phones without any problems, that small percentage that can't function without their handheld devices may require professional help. Here are a few steps parents and teens can take to set boundaries around their cell phone use:
• Set specific times during the day when you can use your cell phone, use a journal to track your cell phone use, or buy a prepaid calling card to limit the number of minutes you can use.

• Make time for activities and hobbies that aren't conducive to being on the phone, such as sports, watching a movie in a theater, or spending time with friends.

• Focus on living in the moment and spend less time multi-tasking. When you're out with a friend or spending time with your loved ones, practice active listening and be respectful of other people's time.

• Foster healthy relationships that are strong enough to last a few hours or days without constant contact.

• Turn cell phones off at a certain time each evening so you can unwind without distractions.

• Work on developing a healthy relationship with technology. Cell phones are supposed to make our lives better, keeping us safe in emergencies and connected to our friends and family. When cell phones begin to control our lives, we lose sight of their true purpose.

• If you can't reduce cell phone use on your own, seek professional help from a treatment facility or therapist to explore the reasons underlying the addiction.

Cell phones serve many useful purposes, such as safety and keeping teens in touch with their parents, so quitting cold turkey may not be an option. By their nature, cell phones are harder to monitor than Internet use or time spent on the computer. But by reviewing the cell phone bill each month, purchasing plans with limited minutes and texts, and talking with teens about cell phone use, parents can take affirmative steps to prevent cell phone addiction.

While some experts recommend waiting to buy children cell phones until 16 years of age, others advise parents to simply stay alert to teens using cell phones to avoid personal issues, schoolwork, or spending time with the family. If cell phones are having a negative impact on any area of a child's life, it's up to parents to set and enforce limits and seek help when necessary.

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**Can cell phones cause health problems?**

Answers.com


**Answer**

Numerous studies have been done, including those by the federal government. The general conclusions are that no types of cancers or cell changed have been detected under cellphone usage against one's head.

Of course, time well tell in reference to your question, as scientific studies are just that; science.
Even if a low percentage of people did get cancer from cellphones, I would presume it wouldn't happen until late in life, when you'd most likely die of something else anyway. So keep utilizing those night and weekend minutes without any fears!

And as far as health problems; there are people who claim they are "EMF Sensitive", so presumably most of these people will claim it affects their health. However, these people would be better off seeing a psychiatrist to ward of the nausea and sickness they (irrelevantly & factitiously) encounter from exposure to less than 1 watt of transmit power.

**Answer**

No, but if your ringtone is too loud, you could lose your hearing. SO BE CAREFUL!!!!

**Another answer...**

The affects on human health have been under constant debate for many years, specifically if the radiation emitted is enough to be damaging to the brain. It has been proven that depending on how close the cell phone antenna is to your head, between 20% and 60% of the radiation emitted by your cell phone is transferred into your head. The radiation actually penetrates the area around your head and is absorbed, with some radiation reaching an inch, to an inch and a half, into your brain.

Dr. George Carlo, PhD, JD, is an epidemiologist and medical scientist who, from 1993 to 1999, headed the first telecommunications industry-backed studies into the dangers of cell phone use. He ran afoul of the very industry that hired him when his work revealed preventable health hazards associated with cell phone use. His studies concluded that cell phone radiation caused DNA damage, impaired DNA repair, and interfered with cardiac pacemakers.

European research later confirmed Dr. Carlo's findings. European studies suggest that cell phone radiation contributes to brain dysfunction, tumors, and potentially to conditions such as autism, attention deficit disorder, neurodegenerative disease, and behavioral and psychological problems.

Until further research into cellphone radiation is done or accepted, it is generally recommended that you use a headset at all times in order to maximize the distance between your head and the cellphone.
Do Cell Phones Cause Cancer?

By Joshua Levine

http://www.askmen.com/sports/health_60/72_mens_health.html

In the year 2000, it was estimated that 92 million people used cellular phone in the U.S.; a number that keeps growing by one million every month. By 2003, it is believed that the number of users worldwide will reach upwards of 700 million. In recent years, the widespread use of cell phones has led to increased concerns about possible health hazards, particularly brain cancer.

The issue first came to public attention in 1993, when a Florida man appeared on a popular TV talk show and claimed that his wife's brain tumor was caused by RF (radiofrequency) radiation from her cell phone.

The lawsuit was dismissed in 1995 due to a lack of scientific and medical evidence, but the issue had already taken on a great deal of importance. Since then, there have been many allegations in the media that cell phones cause cancer.

The question remains: Are cell phones really dangerous? The following summary of recent research results and answers to frequently asked questions may shed some light on this burning topic.

WHAT IS THE CONCERN?

Cellular phones operate with RF (Radio Frequencies); a form of electromagnetic energy located on the electromagnetic spectrum between FM radio waves and the waves used in microwave ovens, radars and satellites.

The amount of RF a person is exposed to with the use of a cell phone depends on a number of factors:

- The distance from the base station;
- The duration and frequency of cell phone use;
- The age of the phone (older analog models involve higher exposure than newer, digital ones).

A number of organizations, such as the FCC (Federal Communications Commission), have set limits for human
exposure to RF fields. Nevertheless, many individuals claim that repeated RF exposure from cell phones, even at low levels, may cause brain tumors.

RESEARCH RESULTS
Because cell phones have only been in widespread use for about a decade, there hasn't been much opportunity to carry out long-term studies of their effects on our health. However, four recently published studies that compared cell phone use in brain cancer patients and individuals with no brain cancer found the same results. Here they are...

The first study (conducted by Hardell et al.) compared 233 brain cancer patients, diagnosed between 1994 and 1996, to 466 controls in Sweden. The second (conducted by Muscat et al.) compared 469 brain cancer patients, diagnosed between 1994 and 1998, in New York, Providence and Boston, with 422 controls. The third and largest study (conducted by Inskip et al.) was conducted in Phoenix, Boston and Pittsburgh. It compared 782 brain cancer patients, diagnosed between 1994 and 1998, with 799 controls.

Finally, a Danish study (conducted by Johansen et al.) linked data on all of the 420,095 cell phone users in Denmark between 1982 and 1995, to the Danish Cancer Registry and found the same results as the three case-control studies. The results are the following:

The brain cancer patients didn't report more cell phone use than the subjects who were free of brain cancer. In fact, for reasons that remain unclear, most of the studies showed a tendency toward lower risk of brain cancer among cellular phone users.

When different types of brain cancer were considered, none were consistently associated with cell phone use.

When specific locations of tumors within the brain were considered, no associations with cell phone use were found.

None of the studies showed a clear link between the side of the head on which the brain cancer occurred and the side on which the cellular phone was used.

Many animal experiments have also been conducted and have yielded conflicting results. A few of these studies have suggested that low levels of RF could accelerate the development of cancer in laboratory rats.

However, many of the studies that showed increased tumor development used rats that had been genetically
engineered to be predisposed to develop cancer in the absence of RF exposure. Other studies exposed the animals to RF for up to 22 hours per day.

Since these conditions are not similar to the conditions under which people use wireless phones, we do not know with certainty what the results of such studies mean for human health.

In summary, there is now considerable evidence that shows no consistent association between cell phone use and brain cancer, although more research is needed before any definite conclusions can be drawn.

MORE RESEARCH IS NEEDED
According to the FDA (Food and Drug Administration), a combination of laboratory studies and studies of people actually using cell phones would provide some of the necessary data.

Lifetime animal exposure studies could be completed in a few years, but very large numbers of animals would be needed to provide reliable proof of a cancer-promoting effect, if one exists.

Do hands-free kits make a difference?
Studies on humans can provide information that is directly applicable to the human population. But since it can take many years after exposure to a cancer-causing agent for tumors to develop, 10 or more years of follow-up could be necessary in order to achieve reliable results.

In addition, measuring actual RF exposure in day-to-day cell phone use is quite complicated because it varies according to the angle at which the phone is held, the model of the phone, as well as many other factors.

DO HANDS-FREE KITS REDUCE RISK?
Given that there are no known risks, there is no reason to believe that hands-free kits are safer, although they do reduce the absorption of RF energy in the head since the phone is not placed against it.

On the other hand, if the phone is mounted on another part of the body (such as the waist) during use, that body part will absorb more RF energy. In any case, wireless phones marketed in the U.S. are required to meet safety standards regardless of whether they are used against the head or against the body.

Additionally, there is no reason to believe that accessories that claim to shield the head from RF radiation actually work. Accessories that state this claim vary from special phone cases and a metallic clip attached to the phone to, more recently, a baseball-style cap.
Studies have shown that these products generally do not work as advertised, except perhaps the newly invented cap, which includes a light metal tissue that channels almost 100% of radio waves away from the head while allowing sound to pass through.

In fact, these devices may interfere with proper operation of the phone, which may need to boost its power to compensate, resulting in higher RF absorption. In February 2002, the FTC (Federal Trade Commission) charged two companies that sold such devices with making false and unsubstantiated claims.

REDUCING EXPOSURE
Although there is no proof that there are risks, if you are concerned about it, then the best precaution you can take to reduce your exposure to RF energy would be to reduce the amount of time spent on your phone. If you must have extended conversations on your cell phone every day, place more distance between your body and your phone. For example, you could use a headset and carry the phone away from your body.

IN THE LONG RUN...
Since cell phones are a relatively new technology, we do not yet have long-term follow-up information of their possible effects on our health.

However, according to the American Cancer Society, the low energy level emitted from cell phones and absorbed by human tissues make it unlikely that they cause cancer. The bottom line is that only time and more long-term research will tell for sure.

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Mobile phone radiation and health
From Wikipedia, the free encyclopedia
http://en.wikipedia.org/wiki/Mobile_phone_radiation_and_health

Mobile phone radiation and health effects have been studied, especially following the enormous increase in the use of wireless mobile telephony throughout the world (as of June 2009, there were more than 4.3 billion users worldwide[1]). Mobile phones use electromagnetic radiation in the microwave range, and researchers[2] believe this may be either harmful or beneficial to human health. A large body of research exists, both epidemiological and experimental, in non-human animals and in humans. Other digital wireless systems, such as data communication networks produce similar radiation.
The World Health Organization, based upon the consensus view of the scientific and medical communities, has stated in the past that cancer is unlikely to be caused by cellular phones or their base stations and that reviews have found no convincing evidence for other health effects. The WHO expects to make recommendations about mobile phones in 2010. National radiation advisory authorities have recommended measures to minimize exposure to their citizens.

Effects
Many scientific studies have investigated possible health effects of mobile phone radiations. These studies are occasionally reviewed by some scientific committees to assess overall risks. A recent assessment was published in 2007 by the European Commission Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR). It concludes from the available research that no significant health effect has been demonstrated from mobile phone radiation at normal exposure levels.

In the studies reviewed, normal exposure to mobile phone radiation did not cause headaches or dizziness, nor did it cause brain cancers, neurological effects or reproductive effects.

A few inconclusive studies suggest that it may cause a benign tumour of the auditory nerve. However, more studies concerning potential health effects on children are needed.

Radiation absorption
Calculated specific absorbed radiation (SAR) distribution in an anatomical model of head next to a 125 mW dipole antenna. Peak SAR is 9.5 W/kg averaged over a 1 mg cube. (USAF/AFRL).

Part of the radio waves emitted by a mobile telephone handset are absorbed by the human head. The radio waves emitted by a GSM handset, can have a peak power of 2 watts, and a US analogue phone had a maximum transmit power of 3.6 watts. Other digital mobile technologies, such as CDMA2000 and D-AMPS, use lower output power, typically below 1 watt, UVA. The maximum power output from a mobile phone is regulated by the mobile phone standard it is following and by the regulatory agencies in each country. In most systems the cell phone and the base station check reception quality and signal strength and the power level is increased or decreased automatically, within a certain span, to accommodate for different situations such as inside or outside of buildings and vehicles. The rate at which radiation is absorbed by the human body is measured by the Specific Absorption Rate (SAR), and its maximum levels for modern handsets have been set by governmental regulating agencies in many countries. In the USA, the FCC has set a SAR limit of 1.6 W/kg, averaged over a volume of 1 gram of tissue, for the head. In Europe, the limit is 2 W/kg, averaged over a volume of 10 grams of tissue. SAR values are heavily dependent on the size of the averaging volume. Without information about the averaging
volume used comparisons between different measurements cannot be made. Thus, the European 10-gram ratings should be compared among themselves, and the American 1-gram ratings should only be compared among themselves. SAR data for specific mobile phones, along with other useful information, can be found directly on manufacturers’ websites, as well as on third party websites.

Thermal effects
One well-understood effect of microwave radiation is dielectric heating, in which any dielectric material (such as living tissue) is heated by rotations of polar molecules induced by the electromagnetic field. In the case of a person using a cell phone, most of the heating effect will occur at the surface of the head, causing its temperature to increase by a fraction of a degree. In this case, the level of temperature increase is an order of magnitude less than that obtained during the exposure of the head to direct sunlight. The brain's blood circulation is capable of disposing of excess heat by increasing local blood flow. However, the cornea of the eye does not have this temperature regulation mechanism and exposure of 2-3 hours' duration has been reported to produce cataracts in rabbits' eyes at SAR values from 100-140W/kg, which produced lenticular temperatures of 41°C. [verification needed][9] Premature cataracts have not been linked with cell phone use, possibly because of the lower power output of mobile phones.

Non-thermal effects
The communications protocols used by mobile phones often result in low-frequency pulsing of the carrier signal. Whether these modulations have biological significance has been subject to debate. [10]

Some researchers have argued that so-called "non-thermal effects" could be reinterpreted as a normal cellular response to an increase in temperature. The German biophysicist Roland Glaser, for example,[11], has argued that there are several thermoreceptor molecules in cells, and that they activate a cascade of second and third messenger systems, gene expression mechanisms and production of heat shock proteins in order to defend the cell against metabolic cell stress caused by heat. The increases in temperature that cause these changes are too small to be detected by studies such as REFLEX, which base their whole argument on the apparent stability of thermal equilibrium in their cell cultures.

Blood-brain barrier effects
Swedish researchers from Lund University (Salford, Brun, Perrson, Eberhardt, and Malmgren) have studied the effects of microwave radiation on the rat brain. They found a leakage of albumin into the brain via a permeated blood-brain barrier.[12][13] Other groups have not confirmed these findings in cell.[14] or animal studies.[15]
Cancer
In 2006 a large Danish study about the connection between mobile phone use and cancer incidence was published. It followed over 420,000 Danish citizens for 20 years and showed no increased risk of cancer. The German Federal Office for Radiation Protection (BfS) considers this report as inconclusive.

In order to investigate the risk of cancer for the mobile phone user, a cooperative project between 13 countries has been launched called INTERPHONE. The idea is that cancers need time to develop so only studies over 10 years are of interest.

The following studies of long time exposure have been published:

A Danish study (2004) that took place over 10 years found no evidence to support a link. However, this study has been criticized for collecting data from subscriptions and not necessarily from actual users. It is known that some subscribers do not use the phones themselves but provide them for family members to use. That this happens is supported by the observation that only 61% of a small sample of the subscribers reported use of mobile phones when responding to a questionnaire.

A Swedish study (2005) that draws the conclusion that "the data do not support the hypothesis that mobile phone use is related to an increased risk of glioma or meningioma."

A British study (2005) that draws the conclusion that "The study suggests that there is no substantial risk of acoustic neuroma in the first decade after starting mobile phone use. However, an increase in risk after longer term use or after a longer lag period could not be ruled out."

A German study (2006) that states "In conclusion, no overall increased risk of glioma or meningioma was observed among these cellular phone users; however, for long-term cellular phone users, results need to be confirmed before firm conclusions can be drawn."

A joint study conducted in northern Europe that draws the conclusion that "Although our results overall do not indicate an increased risk of glioma in relation to mobile phone use, the possible risk in the most heavily exposed part of the brain with long-term use needs to be explored further before firm conclusions can be drawn."

Other studies on cancer and mobile phones are:

A Swedish scientific team at the Karolinska Institute conducted an epidemiological study (2004) that suggested that regular use of a mobile phone over a decade or more was associated with an increased risk of acoustic...
neuroma, a type of benign brain tumor. The increase was not noted in those who had used phones for fewer than 10 years. [24]

The INTERPHONE study group from Japan published the results of a study of brain tumor risk and mobile phone use. They used a new approach: determining the SAR inside a tumor by calculating the radiofrequency field absorption in the exact tumor location. Cases examined included glioma, meningioma, and pituitary adenoma. They reported that the overall odds ratio (OR) was not increased and that there was no significant trend towards an increasing OR in relation to exposure, as measured by SAR. [25]

In 2007, Dr. Lennart Hardell, from Örebro University in Sweden, reviewed published epidemiological papers (2 cohort studies and 16 case-control studies) and found that[26]:

- Cell phone users had an increased risk of malignant gliomas.
- Link between cell phone use and a higher rate of acoustic neuromas.
- Tumors are more likely to occur on the side of the head that the cell handset is used.
- One hour of cell phone use per day significantly increases tumor risk after ten years or more.

In a February 2008 update on the status of the INTERPHONE study IARC stated that the long term findings ‘…could either be causal or artifactual, related to differential recall between cases and controls.’ [27]

A self-published and non-peer reviewed meta-study by Dr. Vini Khurana, an Australian neurosurgeon, presented an "increasing body of evidence … for a link between mobile phone usage and certain brain tumors" and that it "is anticipated that this danger has far broader public health ramifications than asbestos and smoking". [28] This was criticized as ‘…an unbalanced analysis of the literature, which is also selective in support of the author’s claims.’ [29]

A publication titled "Public health implications of wireless technologies" cites that Lennart Hardell found age is a significant factor. The report repeated the finding that the use of cell phones before age 20 increased the risk of brain tumors by 5.2, compared to 1.4 for all ages. [30] A review by Hardell et al. concluded that current mobile phones are not safe for long-term exposure. [31]

In a time trends study in Europe, conducted by the Institute of Cancer Epidemiology in Copenhagen, no significant increase in brain tumors among cell phone users was found between the years of 1998 and 2003. "The lack of a trend change in incidence from 1998 to 2003 suggests that the induction period relating mobile phone use to brain tumors exceeds 5–10 years, the increased risk in this population is too small to be observed,
the increased risk is restricted to subgroups of brain tumors or mobile phone users, or there is no increased risk.”

Cognitive effects
A 2009 study examined the effects of exposure to radiation emitted by standard GSM cell phones on the cognitive functions of humans. The study confirmed the existence of an effect of exposure on response times to a spatial working memory task, as well as the fact that exposure duration may play a role in producing detectable effects on performance.

Electromagnetic hypersensitivity
Main article: Electromagnetic hypersensitivity
Some users of mobile handsets have reported feeling several unspecific symptoms during and after its use; ranging from burning and tingling sensations in the skin of the head and extremities, fatigue, sleep disturbances, dizziness, loss of mental attention, reaction times and memory retentiveness, headaches, malaise, tachycardia (heart palpitations), to disturbances of the digestive system. Reports have noted that all of these symptoms can also be attributed to stress and that current research cannot separate the symptoms from nocebo effects.

Genotoxic effects
A large recent meta-study of 101 scientific publications on genotoxicity of RF electromagnetic fields shows that 49 report a genotoxic effect and 42 do not. Research published in 2004 by a team at the University of Athens had a reduction in reproductive capacity in fruit flies exposed to 6 minutes of 900 MHz pulsed radiation for five days. Subsequent research, again conducted on fruit flies, was published in 2007, with the same exposure pattern but conducted at both 900 MHz and 1800 MHz, and had similar changes in reproductive capacity with no significant difference between the two frequencies. Following additional tests published in a third article, the authors stated they thought their research suggested the changes were “…due to degeneration of large numbers of egg chambers after DNA fragmentation of their constituent cells …”

In 1995, in the journal Bioelectromagnetics, Wengong Lai and Mohinder Singh reported damaged DNA after two hours of microwave radiation at levels deemed safe according to government standards. Later, in December 2004, a pan-European study named REFLEX (Risk Evaluation of Potential Environmental Hazards from Low Energy Electromagnetic Field (EMF) Exposure Using Sensitive in vitro Methods), involving 12 collaborating laboratories in several countries showed some compelling evidence of DNA damage of cells in in-vitro cultures, when exposed between 0.3 to 2 watts/kg, whole-sample average. There were indications, but not rigorous evidence of other cell changes, including damage to chromosomes, alterations in the activity of certain genes and
a boosted rate of cell division. Reviews of in vitro genotoxicity studies have generally concluded that RF is not genotoxic and that studies reporting positive effects had experimental deficiencies.

Sleep and EEG effects

Sleep, EEG and waking rCBF have been studied in relation to RF exposure for a decade now, and the majority of papers published to date have found some form of effect. While a Finnish study failed to find any effect on sleep or other cognitive function from pulsed RF exposure, most other papers have found significant effects on sleep. Two of these papers found the effect was only present when the exposure was pulsed (amplitude modulated), and one early paper actually found that sleep quality (measured by the amount of participants' broken sleep) actually improved.

While some papers were inconclusive or inconsistent, a number of studies have now demonstrated reversible EEG and rCBF alterations from exposure to pulsed RF exposure. German research from 2006 found that statistically significant EEG changes could be consistently found, but only in a relatively low proportion of study participants (12 - 30%).

Health hazards of base stations

Another area of concern is the radiation emitted by the fixed infrastructure used in mobile telephony, such as base stations and their antennas, which provide the link to and from mobile phones. This is because, in contrast to mobile handsets, it is emitted continuously and is more powerful at close quarters. On the other hand, field intensities drop rapidly with distance away from the base of the antenna because of the attenuation of power with the square of distance. Base station emissions must comply with safety guidelines (see Safety standards and licensing below). Some countries however (such as South Africa) do not have any health regulations at all governing the placement of base stations.

Several surveys have found increases of symptoms depending upon proximity to electromagnetic sources such as mobile phone base stations.

A 2002 survey study by Santini et al. in France found a variety of self-reported symptoms for people who reported that they were living within 300 metres (984 ft) of GSM cell towers in rural areas, or within 100 m (328 ft) of base stations in urban areas. Fatigue, headache, sleep disruption and loss of memory were among the symptoms reported. Similar results have been obtained with GSM cell towers in Spain, Egypt, Poland and Austria. No major studies have been reported in which health effects did not occur on actual populations living near mobile base stations. However, there are significant challenges in conducting studies of populations near base stations, especially in assessment of individual exposure.
A study conducted at the University of Essex and another in Switzerland\[^62\] concluded that mobile phone masts were unlikely to be causing these short term effects in a group of volunteers who complained of such symptoms.\[^63\] The Essex study has been criticized as being skewed due to drop-outs of test subjects, \[^64\] although these criticisms were answered by the authors.

As technology progresses and data demands have increased on the mobile network, towns and cities have seen the number of towers increase sharply, including 3G towers which work with larger bandwidths.\[^{citation \text{needed}}\] Many measurements and experiments have shown that transmitter power levels are relatively low - in modern 2G antennas, in the range of 20 to 100 W, with the 3G towers causing less radiation than the already present 2G network. An average radiation power output of 3 W is used. The use of 'micro-cell geometries' (large numbers of transmitters in an area but with each individual transmitter running very low power) inside cities has decreased the amount of radiated power even further.\[^{citation \text{needed}}\] The radiation exposure from these antennas, while generally low level, is continuous\[^{citation \text{needed}}\].

Experts consulted by France consider it is mandatory that main antenna axis not to be directly in front of a living place at a distance shorter than 100 meters.\[^65\] This recommendation was modified in 2003\[^69\] to say that antennas located within a 100-metre radius of primary schools or childcare facilities should be better integrated into the cityscape and was not included in a 2005 expert report.\[^67\]

Occupational health hazards
Telecommunication workers who spend time at a short distance from the active equipment, for the purposes of testing, maintenance, installation, etcetera, may be at risk of much greater exposure than the general population. Many times base stations are not turned off during maintenance, but the power being sent through to the antennas is cut off, so that the workers do not have to work near live antennas.

A variety of studies over the past 50 years have been done on workers exposed to high RF radiation levels; studies including radar laboratory workers, military radar workers, electrical workers, and amateur radio operators. Most of these studies found no increase in cancer rates over the general population or a control group. Many positive results could have been attributed to other work environment conditions, and many negative results of reduced cancer rates also occurred.\[^68\]

Safety standards and licensing
In order to protect the population living around base stations and users of mobile handsets, governments and regulatory bodies adopt safety standards, which translate to limits on exposure levels below a certain value. There are many proposed national and international standards, but that of the International Commission for Non-
Ionizing Radiation Protection (ICNIRP) is the most respected one, and has been adopted so far by more than 80 countries. For radio stations, ICNIRP proposes two safety levels: one for occupational exposure, another one for the general population. Currently there are efforts underway to harmonize the different standards in existence. Radio base licensing procedures have been established in the majority of urban spaces regulated either at municipal/county, provincial/state or national level. Mobile telephone service providers are, in many regions, required to obtain construction licenses, provide certification of antenna emission levels and assure compliance to ICNIRP standards and/or to other environmental legislation.

Many governmental bodies also require that competing telecommunication companies try to achieve sharing of towers so as to decrease environmental and cosmetic impact. This issue is an influential factor of rejection of installation of new antennas and towers in communities.

The safety standards in the U.S. are set by the Federal Communications Commission (FCC). The FCC has based its standards primarily on those standards established by the Institute of Electrical and Electronics Engineers (IEEE), specifically Subcommittee 4 of the "International Committee on Electromagnetic Safety".

Evolution of safety standards
The following is a brief summary of the wireless safety standards, which have become stricter over time.

1966: The ANSI C95.1 standard adopted the standard of 10 mW/cm² (10,000 µW/cm²) based on thermal effects.

1982: The IEEE recommended further lowering this limit to 1 mW/cm² (1,000 µW/cm²) for certain frequencies in 1982, which became a standard ten years later in 1992 (see below).

1986: The National Council on Radiation Protection and Measurements (NCRP) recommended the exposure limit of 580 µW/cm².

1992: The ANSI/IEEE C95.1-1992 standard based on thermal effects used the 1 mW/cm² (1,000 µW/cm²) safety limit. The United States Environmental Protection Agency called this revised standard "seriously flawed", partly for failing to consider non-thermal effects, and called for the FCC to adopt the 1986 NCRP standard which was five times stricter.

1996: The FCC updated to the standard of 580 µW/cm² over any 30-minute period for the 869 MHz, while still using 1 mW/cm² (1,000 µW/cm²) for PCS frequencies (1850-1990 MHz).

1998: The ICNIRP standard uses the limit of 450 µW/cm² at 900 MHz, and 950 µW/cm² at 1900 MHz. The limit is frequency dependent.
More stringent standards
A few nations have set safety limits orders of magnitude lower than the ICNIRP limits. A resolution adopted at a conference in Salzburg in 2000 called a limit of 0.1 μW/cm² (10,000 times lower than ICNIRP) for "...pulse modulated high-frequency facilities such as GSM base stations."[71]

In September 2008, the European Parliament adopted a resolution on the mid-term review of the European Environment and Health Action Plan 2004-2010. The resolution covered several topic areas, such as Mental Health and Global Warming, and included under the topic "Dangers of new technologies" the statement "...that the limits on exposure to electromagnetic fields which have been set for the general public are obsolete."[72]

In the Courts
In the USA, a small number of personal injury lawsuits have been filed by individuals against cell phone manufacturers, such as Motorola[74], NEC, Siemens and Nokia, on the basis of allegations of causation of brain cancer and death. In US federal court, expert testimony relating to science must be first evaluated by a judge, in a Daubert hearing, to be relevant and valid before it is admissible as evidence. In one case against Motorola, the plaintiffs alleged that the use of wireless handheld telephones could cause brain cancer, and that the use of Motorola phones caused one plaintiff's cancer. The judge ruled that no sufficiently reliable and relevant scientific evidence in support of either general or specific causation was proffered by the plaintiffs; accepted a motion to exclude the testimony of the plaintiffs' experts; and denied a motion to exclude the testimony of the defendants' experts.[75]

French High Court ruling against Telecom Company
In February 2009 the telecom company Bouygues Telecom was ordered to take down a mobile phone mast due to uncertainty about its effect on health. Residents in the commune Charbonnières in the Rhône department had sued the company claiming adverse health effects from the radiation emitted by the 19 meter tall antenna.[76] The milestone ruling by the Versailles Court of Appeal reversed the burden of proof which is usual in such cases by emphasizing the extreme divergence between different countries in assessing safe limits for such radiation. The court stated that, "Considering that, while the reality of the risk remains hypothetical, it becomes clear from reading the contributions and scientific publications produced in debate and the divergent legislative positions taken in various countries, that uncertainty over the harmlessness of exposure to the waves emitted by relay antennas persists and can be considered serious and reasonable".[77]

Precautionary principle
In 2000, the World Health Organization (WHO) recommended that the precautionary principle could be voluntarily adopted in this case.[78] It follows the recommendations of the European Community for environmental risks.
According to the WHO, the "precautionary principle" is "a risk management policy applied in circumstances with a high degree of scientific uncertainty, reflecting the need to take action for a potentially serious risk without awaiting the results of scientific research." Other less stringent recommended approaches are prudent avoidance principle and ALARA (As Low as Reasonably Achievable). Although all of these are problematic in application, due to the widespread use and economic importance of wireless telecommunication systems in modern civilization, there is an increased popularity of such measures in the general public, though also evidence that such approaches may increase concern\(^7\). They involve recommendations such as the minimization of cell phone usage, the limitation of use by at-risk population (such as children), the adoption of cell phones and microcells with ALARA levels of radiation, the wider use of hands-free and earphone technologies such as Bluetooth headsets, the adoption of maximal standards of exposure, RF field intensity and distance of base stations antennas from human habitations, and so forth.

Precautionary Measures and health advisories
Some national radiation advisory authorities, including those of Austria,\(^6\) France,\(^8\) Germany,\(^8\) and Sweden\(^8\) have recommended measures to minimize exposure to their citizens. Examples of the recommendations are:

- Use hands-free to decrease the radiation to the head.
- Keep the mobile phone away from the body.
- Do not use telephone in a car without an external antenna.

The use of "hands-free" was not recommended by the British Consumers' Association in a statement in November 2000 as they believed that exposure was increased\(^8\). However, measurements for the (then) UK Department of Trade and Industry\(^8\) and others for the French l'Agence française de sécurité sanitaire environnementale\(^8\) showed substantial reductions. In 2005 Professor Lawrie Challis and others said clipping a ferrite bead onto hands-free kits stops the radio waves traveling up the wire and into the head.\(^8\) Several nations have advised moderate use of mobile phones for children.\(^8\)

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Potential Dangers Of Regular Cell Phone Use
Posted By Dr. Ben Kim on Feb 28, 2005

Health Warnings
http://www.drbenkim.com/articles-cellphonedangers.html
Here are some points* that all cell phone users need to be aware of:

The risk of death from brain cancer is higher for cell phone users who hold their cell phones against their heads compared to those who keep their cell phones away from their heads.

Using a cell phone for six years or more is associated with a fifty percent increase in risk of developing an acoustic neuroma, a benign tumor of a nerve that lies close to the ear and is within close range of the radiation that comes from a cell phone's antenna.

Regular use of a cell phone doubles your risk of developing neuro epithelial tumours on the outside of your brain. Radio waves from cell phones are known to cause damage to DNA and cells, effects that are passed on to the next generation of cells.

The harmful health effects of using a cell phone are probably insignificant if you use one for emergency purposes only. If you must use a cell phone on a daily basis, it is essential to use a headset or similar device that allows you to talk without pressing your cell phone up against your head.

Children are at higher risk of negative health effects from using cell phones because their rapidly dividing cells are more susceptible to damage by radio waves from mobile devices than adult cells are. With the marketing that's done these days to convince children and teenagers that cell phones are a must if they want to be cool and have fun, it is critical that parents and teachers educate them on the real dangers of using cell phones for more than emergency purposes.

If you have friends or relatives in countries where the per capita use of cell phones is much higher than in North America, England, and Australia, please share this information with them. Many Asian and Eastern European countries have extraordinarily high rates of cell phone usage because their lack of telecommunications infrastructure makes using mobile devices more economical than traditional land lines. A good example is Korea, where as of February 8, 2005, more than 80 percent of their 45 million people had camera cell phones. That's right, camera cell phones.

To learn more about the potential dangers of cell phones, I recommend that you read Cell Phones: Invisible Hazards in the Wireless Age: An Insider's Alarming Discoveries About Cancer and Genetic Damage, by George Carlo and Martin Schram

*Statistics are from the work of George Carlo.
There are many reports about the dangers of cell phone radiation based upon studies that are much debated about. This article will cover some of the potential dangers of radiation linked to mobile cell phone usage, what to be aware of and how to protect oneself from potential harm or damage.

Cell Phone Safety

Cell phones do in fact transmit a certain amount of electromagnetic radiation. The primary concerns are how much transmitted radiation from the cell phone to the person’s head is considered unsafe and if there are any long-term negative effects of this type of radiation exposure.

Radiation

The two types of electromagnetic radiation are Ionizing radiation and non-ionizing radiation. Ionizing radiation can take the atoms and molecules from human tissue and change the chemical reactions inside the body. X-rays and Gamma rays are two examples of ionizing radiation. It is known that they both cause damage--for example, lead vests are used by patients during X-ray examinations for protection. Non-ionizing radiation is usually considered safe and does not seem to cause any long-term damage to human tissue. Microwaves, lights, radio-frequency energy, televisions, computers and photocopy machines are some sources of non-ionizing radiation ("How Cell-Phone Radiation Works," electronics.howstuffworks.com/cell-phone-radiation2.htm).

Evidence

Despite the fact that the FDA states there is no scientific evidence showing any negative health effects connected to the use of mobile phones, this does not rule out the possibility that there exists the potential of harm from cell phone usage (Lauran Neergaard, “Cell Phone Safety,” sarshield.com/news/cellphonesafety.html). Exposure to high levels of radiation can damage human tissue much in the same way a microwave cooks food internally. The human body is not able to sustain and disperse such large amounts of heat.
Disease and Cell Phones

Though it is claimed that cell phones may not cause immediate damage to human tissue, scientists are still debating what long-term effects, if any, of prolonged exposure to the non-ionizing radiation transmitted from cell phones are (Marguerite Reardon, "Are cell phones safe? Researchers still uncertain," news.cnet.com/8301-30686_3-10351577-266.html). Some potential consequences to mobile phone radiation are Parkinson's disease, Alzheimer's disease, headaches, fatigue, brain tumors, leukemia and cancer (William Thomas, "Cell Phone Faqs," willthomasonline.net/willthomasonline/Cell_Phones_FAQ.html, "How Cell-Phone Radiation Works," electronics.howstuffworks.com/cell-phone-radiation2.htm).

Safety Tips

If there is even a small chance of harming your health from cell phones, then take steps to ensure your health. To play it safe you can do the following:

- Use the cell phone outdoors where radiation can be dispersed more easily
- Reduce your usage indoors where radiation is more concentrated
- Limit the amount of cell phone time children have
- Use a Bluetooth or earpiece to limit the contact your cell phone has with your head

Conclusion

Because different studies yield different results, it is difficult to rest on one conclusive answer when dealing with the topic of cell phones and health. To date, there is no concrete evidence of the dangers of radiation in connection with mobile phones. Because of this, studies are ongoing.

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Senate Committee Talks of Potential Cell Phone Danger

Study by Environmental Group Says Cell Phones Emit Different Levels of Radiation

By YUNJI DE NIES

Sept. 14, 2009


A Senate committee will take up in a hearing today the potential health risks cell phones pose, following a new, controversial report by the Environmental Working Group that warns of varying levels of radiation the different cell phones emit.
Using a cell phone for 10 years or more can significantly increase a person's risk for certain kinds of brain cancer, according to the report.

"These studies are showing 50 to 90 percent increased risk for those rare tumors," Jane Houlihan of the Environmental Working Group told "Good Morning America."

But the link between cell phone use and cancer has not been proved, ABC News senior health and medical editor Dr. Richard Besser said.

VIDEO ON SITE

GENERAL HEALTH

Injuries Evolve Along With New Gadgets

Erin Allday, Chronicle Staff Writer

Tuesday, February 2, 2010

http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2010/02/02/MNNR1BR271.DTL

Smart phones and laptops, handheld video games and MP3 players, and now, perhaps, Apple's new iPad - the latest technology is great, but it is also a literal pain in the neck, doctors say.

And not just the neck, either. All these newfangled gadgets also are hurting our backs, shoulders, arms and hands. The kids are suffering from "text thumb" and their parents are getting "BlackBerry neck."

"I have a lot of patients who come in and say my mom is 80 years old, I'm 50, and I've got more pain than her," said Dr. Srinivas Ganesh, a sports medicine specialist with Kaiser Permanente in Redwood City. "But we have a much more sedentary lifestyle, and much more computer interfacing with laptops and PDAs and cell phones. We see a lot of poor posturing, a lot of stress on the wrists."

Strains and pains caused by modern technology are hardly new - workplace ergonomics is a multimillion-dollar industry, and pretty much anyone who's ever typed on a computer keyboard knows all about carpal tunnel syndrome.

New gadgets, new pains

But orthopedists and others who specialize in muscle and joint injuries say there's no question that the surge of handheld technology is leading to a new wave of aches and pains. Doctors say they struggle now to keep up with
the latest equipment and what it might mean for their patients. Apple's new iPad, for example, has caught the attention of doctors who wonder what new complaints they'll hear.

"The engineers spend a lot of time thinking about how people use new devices. But when you release them to a large population, you run into issues that were never perceived beforehand," said Dr. Matthew Smuck, an assistant professor of orthopedic surgery at the Stanford Spine Center. "That's what happened with desktop computers, and there's a whole science behind ergonomics now."

The neck and upper back seem to be taking the brunt of the pain. Laptops are a big culprit, because as the name implies, many people sit with them in their laps. That might be convenient, but it usually means the screen is too low to be comfortable, and people have to hold their heads at an awkward angle, which strains muscles in the back and neck.

Smart phones and other handheld devices like MP3 players can be even worse for the back and neck, since people hold them even lower than laptops and the screens are so small.

Hard on the thumbs
For people who send upward of 100 text messages a day, the pain is usually focused on their thumbs and wrists. The thumb muscles, which spread across the back of the hand and into the wrist, aren't used to all that up-and-down motion.

The tiny keyboards that are becoming increasingly standard on cell phones might make texting easier and faster, but it's not helping with thumb injuries. The keys are so small that it just means the thumb muscles have to work harder, Ganesh said.

"And the thumbs don't get any rest because they're constantly text messaging," he said. "Our fingers are pretty good with the flexion, but every time we lift them up we use tendons that go over the top and side, and that motion can cause a tendonitis to occur right at the wrist."

Take a break
The cure for thumb injuries is usually to cut back on text messaging - hardly a palatable treatment to anyone who is addicted to texting. Fortunately, doctors say, treating most other technology-related injuries is less challenging. The most important preventive tool is simple awareness, say doctors and others who treat back and neck pains. People who regularly use handheld technology - or even a desktop computer or laptop - should take frequent breaks.
They should get up and walk around at least once an hour. To prevent eyestrain, they should frequently look away from the screen and focus on an object in the distance. Every 10 minutes or so, they should stop for a few seconds to make sure nothing hurts.

“There needs to be a lot more self-awareness. We get so wrapped up in the work we do that we sometimes don’t bother to check in with our bodies,” said Gary Witt, director of San Francisco School of Massage. “These devices are supposed to be making everything simpler for us, but there are more physical ailments coming from them.”

Tech Age health tips

**Limit texting:** Don't send too many text messages. If your thumbs or wrists hurt from texting, cut back.

**Rest:** Every five or 10 minutes, take a brief break to listen to your body and move around if you’re uncomfortable.

**Move:** When sitting at a laptop or desktop computer, take a break at least once an hour and stand up and walk around.

**Look away:** When looking at a small screen - watching a movie on an iPod, for example, or reading e-mails on a PDA - look up frequently and focus your eyes on something far away to help prevent eyestrain.

**Support elbows:** Rest your elbows on an armrest or tuck them into your sides to support your arms and shoulders when using a handheld device. This also raises the screen closer to eye level, which alleviates neck stress.

**Call a doctor:** If you feel sharp pain, pain shooting down your arms, or tingling in your hands and fingers, see a doctor.

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**7 SURPRISING WAYS CELL PHONES AFFECT YOUR HEALTH**

Mobile Devices Can Pose Health Risks -- and Not in the Way You Might Think

By DAN CHILDS

ABC News Medical Unit

March 9, 2009


In recent years, public fears over the radiation emitted from cell phones have led to several theories about the health conditions this radiation might engender.
Almost invariably, the assertions that the use of cell phones may lead to a higher risk of brain cancer, that their use by pregnant women may result in badly behaved children -- even a video that suggested that the waves from two cell phones could be used to cook an egg -- have been discredited by scientific investigation.

"Current scientific evidence doesn't indicate any adverse health outcomes associated with exposure to radio frequency energy from cell phones," U.S. Food and Drug Administration spokeswoman Peper Long told ABCNews.com last May.

"Although there have been reports of negative health effects from low levels of radio frequency energy, these reports have not been replicated or confirmed."

So those who suspect their phones are frying their brains can likely rest easy. However, research and anecdotes have suggested a number of other means by which cell phones may adversely affect health -- and possibly not in the way you might think.

1. Paging Dr. Pestilence: Doctors' Dirty Cell Phones

New research released Thursday suggests that one cell phone-related health threat that many people face may not be from their own phones at all -- but from their doctors' mobile devices.

In a study published in the journal Annals of Clinical Microbiology, researchers at Ondokuz Mayis University in Samsun, Turkey screened the mobile phones of 200 health care workers in hospitals for germs that are known to be dangerous to human health.

What the researchers found was that 94.5 percent of the phones tested -- nearly 19 out of 20 -- were contaminated with some kind of bacteria. Worse, some of the bacteria that the researchers found were known "superbugs" -- bacteria that are resistant to one or more commonly used antibiotics.

Despite this, the researchers found that only about 10 percent of the health care workers studied cleaned their cell phones on a routine basis.

"Mobile phones are frequently-used devices with clean or dirty hands in daily practice, including in hospitals," Dr. Ahmet Dilek of the Ondokuz Mayis University team told ABCNews.com. "[W]e found that most of the medical professionals do not clean their own cell phones, and most of the [unclean] phones carried important hospital pathogens."
Dr. Charles Gerba, a microbiologist and germ expert at the University of Arizona in Tucson, has performed similar studies on cell phones. He said that his past research, too, has found that cell phones are a haven for a variety of microbes -- some of which are pretty nasty.

"We have found [the superbug] MRSA on several cell phones," he said. "So we certainly find a lot of stuff on them -- particularly the flip kind, since they have surfaces that do not dry out."

The solution to this problem may be decidedly low tech -- disinfectant spray and a paper towel.
"I think that they should wipe [their cell phones] down with a disinfectant wipe, or spray a towel with disinfectant and wipe the phones off," Gerba said. "They should be doing that at least once a day, if not maybe twice a day."

2. When Cell Phone Hazards Hit the Road

While the radiation that emanates from cell phones may not be enough to affect our brains, the conversations themselves might.

Specifically, researchers at Carnegie Mellon University studied the brain waves of drivers using cell phones -- and they found that even just listening to a conversation reduced the amount of brain activity devoted to driving by 37 percent. The quality of driving showed a "significant deterioration," according to the 2008 study.
"The science tells [us] when [we're] on the phone while driving, it is a high-risk activity -- very, very risky," Janet Froetscher, president and CEO of the National Safety Council, told ABC News correspondent Lisa Stark in a "World News" report in January. "But most people don't understand that."

Still, 80 percent of drivers admit to having had a cell phone conversation while driving, according to a May 2008 Nationwide Insurance poll -- even though more than 40 percent of those surveyed said they'd been hit or almost hit by another driver who was talking on a cell phone.

Even hands-free phones appear to contribute to unsafe driving. A 2005 study by the Insurance Institute for Highway Safety found that drivers using cell phones -- even hands-free -- were four times as likely to have an accident involving an injury, according to Ann McCartt, senior vice president for research at the insurance institute.

"I think there is still a big misconception among drivers and policymakers, intuitively, that a hands-free phone would be safer," she said. "And there may be a margin of safety there, but it is still unsafe."
3. Talking While Walking: Another Traffic Hazard?

Those behind the wheel may not be the only ones at risk of a cell phone-related auto accident. So suggests a study published in January in the journal Pediatrics that shows that children are more distracted while crossing the street if they happen to be talking on a cell phone.

Using a virtual reality setting, researchers studied 77 children ages 10 and 11 to see what effect cell phone conversations had on their ability to make it across the street safely.

What they found was that when children were on the cell phones, their attention to traffic -- the number of times a participant looked right or left -- went down 20 percent. The risk of getting hit by a car, or the number of close calls, went up 43 percent.

"The influence of cell phones on child pedestrian safety is particularly concerning because cell phones, an oddity a decade ago, are quickly becoming ubiquitous among American schoolchildren," said the study's authors. Some preliminary studies show that even adult pedestrians get distracted while carrying on cell phone conversations while walking. Still, adults are much more likely to avoid injury, as they are generally more adept at navigating the crosswalk than children are.

4. 'Phantom' Vibrations

While they may pale in comparison to the seriousness of a car accident, the "phantom" vibrations experienced by some habitual mobile device users can be an annoying side effect of the wireless era.

Indeed, many cell phone and BlackBerry users report feeling vibrations when their phones are, in fact, silent. "If you use your cell phone a lot, it becomes part of you," Dr. William Barr, the chief of neuropsychology at the New York University School of Medicine, told ABCNews.com. "It's like wearing a tight sock all day. When you take it off, you still feel it there on your foot. If your cell phone is not there, you still feel like it is."

Our reliance on our cell phones may actually be "training" some of us to believe it is vibrating when it is not. In the case of cell phones, people are rewarded when they pick up their calls and read their incoming text messages, which causes them to pick up their cell phones more and more frequently.

"People are rewarded when they are able to detect low amplitude vibrations so they get better and better at responding," said Jon Kaas, a professor of psychiatry at Vanderbilt University. "It is very rewarding to get the message, so people are able to train their system to detect that signal."
As people repeat this behavior over and over again, connections between nerves in their brain become stronger and new ones are formed, which helps to make the behavior automatic.

And sometimes, as is the case with vibrating cell phones, the behavior becomes too automatic. "People have gotten so good at detecting vibrations that they start responding to false positives -- they think something is there when it is not," Kaas said.

5. Texting Takes a Toll on Thumbs
When it comes to the possible downsides of mobile device use, the side effects are not all in our heads. Our thumbs, it turns out, may also bear the brunt of our reliance on these devices.

The sores and blisters that some experience from too much texting and typing have earned monikers such as "BlackBerry thumb." And while the sore thumbs may seem like a new phenomenon, medical experts say there is a rational explanation for this modern-day nuisance.

"They are really repetitive stress injuries -- pain, numbness, discomfort in the base of the thumbs from overuse," Margot Miller, a physical therapist and president of the Occupational Health Section of the Orthopedic Section of the American Physical Therapy Association, told ABCNews.com.

These sorts of injuries, known as repetitive strain injuries or a repetitive motion disorders, are sometimes minor. But they can also lead to serious medical problems.

"I've seen a significant increase in the number of people with pain in their tendon regions in their thumbs and their fingers," Dr. Richard Brown, an orthopedic hand surgeon at the Scripps Memorial Hospital in La Jolla, Calif., said. "I have to send them to the therapist or start them on medicine or put them in splints or, sometimes even operate."

6. Allergic to Your Phone?
Those with allergies to certain metals, such as nickel, may experience yet another side effect of exposure to their cell phones in the form of contact dermatitis.

In recent years, dermatologists have begun to see an increasing number of contact dermatitis patients who are allergic to these metal components in their cell phones.
"Some people are extremely nickel-sensitive," Dr. Lionel Bercovitch, a professor of dermatology at Brown Medical School, told Kirk Fernandes of ABC News OnCall.

Nickel is a metal that's used in a wide variety of products, including jewelry, belt buckles and watch bands. It's the most common cause of contact dermatitis in the developed world.

The symptoms of a nickel reaction range from mere redness to an obvious rash, or even blisters. "My guess is that [the reactions are] probably more common than we think, but it's just not widely recognized," he said.

In a study published in the Canadian Medical Association Journal in January 2008, Bercovitch tested 22 models of cell phones for the presence of nickel. He found that 10 devices contained the metal -- often around the menu buttons, near decorative logos, around the edge of the screen or on a part of the handset where paint was chipped.

"As more cases get reported, more people will begin to think about it," Bercovitch said.

7. The Perils of Loud Music

Ok, so mobile phones are not the only devices that must share blame for exposing our ears to potentially loud noises. But as the convergence of technology brings more and more of our gadgets together, a growing number of people are using their mobile phones to store and play their favorite music.

The only problem? They may be playing this music far too loudly for their own good.

According to statistics from the U.S. Centers for Disease Control and Prevention (http://www.cdc.gov/healthyyouth/noise/index.htm), about 12.5 percent of children and adolescents 6 and 19 years old and 17 percent of adults between 20 and 69 years of age have suffered permanent damage to their hearing from excessive exposure to noise. In total, this accounts for more than 30 million people.

Sounds louder than 85 decibels can damage hearing. Normal conversation is about 60 decibels, and stereo headphones out of our MP3-enabled devices often reach 100 decibels.

Fortunately, this noise-related side effect is easily remedied. Simply turning down the volume can limit chronic exposure to loud noises -- quite possibly ensuring that our future conversations on our cell phones continue to come in loud and clear.
CELL PHONES AND ACOUSTIC NEUROMA

Defining Acoustic Neuroma
Goggle Health
https://health.google.com/health/ref/Acoustic+neuroma

Overview
An acoustic neuroma is a non-cancerous (benign), often slow-growing tumor of the nerve that connects the ear to the brain. It is located behind the ear right under the brain.

Symptoms
The symptoms vary based on the size and location of the tumor. Because the tumor grows so slowly, symptoms usually start after the age of 30.
Common symptoms include:
  - Abnormal sensation of movement (vertigo)
  - Hearing loss in the affected ear that makes it hard to hear conversations
  - Ringing (tinnitus) in the affected ear
Less common symptoms include:
  - Difficulty understanding speech
  - Dizziness
  - Headache
    - Upon waking up in the morning
    - Wakes you from sleep
    - Worse when lying down
    - Worse when standing up
    - Worse when coughing, sneezing, straining, or lifting (Valsalva maneuver)
    - With nausea or vomiting
  - Loss of balance
  - Numbness in the face or one ear
  - Pain in the face or one ear
• Sleepiness
• Vision problems
• Weakness of the face

Treatment

• Surgery
  o Goals of surgery are to remove the tumor and prevent paralysis of the face. Preserving hearing is more difficult. If a tumor is removed when it is very small, hearing may be preserved. You cannot get back any hearing that is lost before surgery. Large tumors usually result in total loss of hearing on the affected side.
  o Large tumors may also press down on nerves important for movement and feeling in the face. These tumors can typically be safely removed, but the surgery often leads to paralysis of some muscles of the face.
  o Extremely large tumors may also press on the brainstem, threatening other nerves and preventing the normal flow of cerebrospinal fluid. This can lead to a build-up of fluid (hydrocephalus), which can increase pressure in the head and can be life-threatening. Goals of surgery in these cases are to treat the hydrocephalus and relieve pressure on the brainstem.

• Stereotactic radiosurgery, a form of radiation therapy
  o The goal is to slow or stop the tumor growth, not to cure or remove the tumor.
  o Radiosurgery is often performed in elderly or sick patients who are unable to tolerate brain surgery.
  o Sometimes during brain surgery to treat acoustic neuromas, not all of the tumor can be safely removed, and some of the tumor must be left behind. Radiosurgery is often used after surgery in these cases to treat the tumor that remains.
  o Radiosurgery is only appropriate for small tumors, so that radiation damage to surrounding tissues can be minimized.
  o Like brain surgery, radiosurgery can sometimes result in paralysis of the face or loss of hearing.

• Observation
  o Since these tumors usually grow very slowly, small tumors that have few or no symptoms can be safely watched with regular MRI scans and left untreated unless they grow dangerously.
  o Very often elderly patients will die of other natural causes before small, slow growing tumors show symptoms.
Causes
An acoustic neuroma is believed to occur when there is a defect in a gene that normally prevents tumors from forming. The cause of the genetic defect is not known. However, acoustic neuroma is often linked with the genetic disorder neurofibromatosis type 2 (NF2).

Acoustic neuromas are relatively uncommon.

Tests & diagnosis
The health care provider may diagnose an acoustic neuroma based on your medical history, an examination of your nervous system, or tests.

Often, the physical exam is normal at the time the tumor is diagnosed. Occasionally, the following signs may be present:
- Drooling
- Facial drooping on one side
- Unsteady walk
- Dilated pupil on one side only (See: eyes, pupils different size)

The most useful test to identify an acoustic neuroma is an MRI of the head. Other useful tests used to diagnose the tumor and to tell it apart from other causes of dizziness or vertigo include:
- Head CT
- Hearing test (audiology)
- Test of equilibrium and balance (electronystagmography)
- Test of hearing and brainstem function (brainstem auditory evoked response)
- Test for vertigo (caloric stimulation)

Prognosis
An acoustic neuroma is not cancer. The tumor does not spread (metastasize) to other parts of the body, but it may continue to grow and press on important structures in the skull.

Complications
- Brain surgery can completely remove the tumor in most cases.
- Most people with small tumors will have no permanent paralysis of the face after surgery. However, about two-thirds of patients with large tumors will have some permanent facial weakness after surgery.
• Approximately one-half of patients with small tumors will get back useful hearing in the affected ear after surgery.
• There may be delayed radiation effects after radiosurgery, including nerve damage, loss of hearing, and paralysis of the face.

When to contact a doctor
Call your health care provider if you experience new or worsening hearing loss or vertigo (dizziness).

▼

Do Cell Phones Cause Acoustic Neuroma?
by Barry Keate
http://www.tinnitusformula.com/infocenter/articles/conditions/cell_phone.aspx

There has been a good deal of discussion in scientific circles recently over the concern that radio-frequency (RF) radiation, from cell phone usage, may cause damage to the human brain in the form of an acoustic neuroma.

The incidence of acoustic neuroma among tinnitus patients is approximately one in one thousand individuals as opposed to one in one hundred thousand in the general population. This is the reason many ENT physicians require an MRI of their tinnitus patients; to rule out the possibility of acoustic neuroma.

One of the primary symptoms is hearing loss and tinnitus, usually occurring in only one ear. Acoustic neuromas are rare, non-malignant growths that occur on the auditory nerve leading from the cochlea to the brain. They are slow growing, developing over many years, and are not cancerous. They do not spread but continue growing from the point where they begin.

They can be very dangerous, however, if left undiagnosed. As they grow they may begin to press against the brain, causing pressure on the brainstem and endangering vital functions necessary to life.

In 2003, a study was published that showed microwave radiation emitted from GSM (digital) mobile phones caused damage to the brains of laboratory rats. Leif Salford and colleagues at Lund University Hospital in Lund, Sweden attached cell phones to the cages of rats and varied the intensity of radiation to reflect the range of exposures a human cell phone user might experience over the same time period. They exposed the rats to this radiation for two hours.
Fifty days after the one-time, two-hour exposure, the rats’ brains showed significant blood vessel leakage as well as areas of shrunken, damaged neurons. The higher the radiation exposure, the more damage was apparent.

The safety of cell phone usage was first brought to the public’s attention in a 2003 lawsuit filed in the death of a Florida woman by her husband. He claimed that the cell phone he bought for her when she was pregnant caused or accelerated the growth of the brain tumor that killed her. The case was later dismissed for lack of scientific evidence but the media had hold of it by then and started raising questions.

Hand-held phones appear to be the most damaging. Phones mounted in cars, with the antenna outside, appear safe. Using a headphone that allows the individual to hold the main power source away from their head is also preferable.

Network news programs ran their own tests of mobile phones and found that some exceed the maximum level of emitted radio-frequency energy allowed by the US Federal Communications Commission (FCC).

In 2004 a landmark study was completed at the prestigious Karolinska Institute in Stockholm, Sweden on the use of cell phones and acoustic neuroma. The study, published in *Epidemiology*, provided conclusive proof that use of cell phones over a 10 year period significantly increased the user’s chance of developing acoustic neuroma. It showed there was no increased incidence of the tumor within 10 years but that after that time the risk increased two-fold. When tumors appearing on the same side of the head as used for cell phones were compared, the risk increased four-fold.

Researchers said they found no association between the tumors and the amount of use measured in hours or cumulative number of calls but rather on the length of time those in the study had been regular users of cell phones.

“It is a natural place to look for a problem because this is the area of the head that is exposed” said Anders Ahlbom, director of the Institute of Environmental Medicine at the Karolinska Institute.

Dr. Henry Lai, research professor of bioengineering at the University of Washington in Seattle, WA said the Karolinska study is not the first to show a link between cell phones and acoustic neuroma. “Another Swedish researcher, Dr. Lennart Hardell found similar results in 2002, so this is, in effect, a replication. I think the data is quite solid and is cause for concern on long-term cell phone use.”
Dr. Sam Milham, epidemiologist and pioneer in studying the effects of electromagnetic radiation on humans, said it usually takes 20 years or more for solid tumors to develop. “I’m actually astonished that they found anything like this early,” Milham stated in an article published in Florida's Sun-Sentinel. “If that energy can do that to normal nerve tissue cells, what can it do to adjacent brain cells? I think it’s the tip of a big iceberg and the peak could be 25 years past exposure. What’s really alarming is that in the last five years an enormous number of people started using cell phones, including kids, so I think this is just the beginning of it. I hope I’m wrong.”

At least three federal agencies, the Food and Drug Administration (FDA), the Federal Communications Commission (FCC) and the Environmental Protection Agency (EPA), have roles in regulating radio-frequency radiation. Only recently has the federal government committed funds to study the cell phone issue. Those studies are not expected to be completed for five to seven years.

In October, 1999, the FDA responded to increased media focus by issuing a Consumer Update on Mobile Phones in which it stated, “The available science does not allow us to conclude that mobile phones are absolutely safe or that they are unsafe. However, the available scientific evidence does not demonstrate any adverse health effects associated with the use of mobile phones.”

To be sure, there are clinical studies that show cell phones do not cause acoustic neuroma or other brain tumors. However, the majority of these studies were conducted on users of less than ten years. A study published in the British Journal of Cancer in 2005 is representative of these and states, “The study suggests that there is no substantial risk of acoustic neuroma in the first decade after starting mobile phone use. However, an increase in risk after longer term use or after a longer lag period could not be ruled out.”

Those at highest risk of suffering long-term consequences are children, who are now beginning to use cell phones at 8 to 10 years old. Some experts say research conducted in the past decade indicates the world’s 1.6 billion cell phone users are the equivalent of lab rats in a grand living laboratory and that children, with many years of cell phone use ahead of them, might be particularly vulnerable.

In the United Kingdom, Education Secretary David Blunkett has written to all schools in England and Wales. He stated that pupils under 16 years old should not use cell phones except in emergencies. His order to schools follows an investigation by Government chief scientist Sir William Stewart that children could be susceptible to damage from radiation because their immune system is not fully developed. He also pointed out that the younger the child, the more years they could be exposed to radiation.
In 2006, Walt Disney Internet Group, teaming with Sprint, began Disney Mobile to provide cell phones for “the family mobile market.” Disney withdrew cell phone faceplates featuring Mickey Mouse and other cartoon characters when health concerns were raised by cell phone research. Nonetheless, Disney Mobile is today offering cell phones and calling plans to children as young as 8 years old.

How do we protect ourselves and our children from the consequences of long-term exposure? Awareness and moderation are the best courses to follow. Being aware that a potential danger exists can help change our own behaviors and modify overall usage. Until further research resolves this issue, here are some ideas to reduce exposure to cell phone radiation.

- Reduce the amount of time spent using cellular phones. Whenever possible, use a land-line.
- Use a hands-free kit which dramatically reduces the absorption of RF energy in the head.
- Use the cell phone in speaker-phone mode and hold it in front of you. This is not practical in noisy, public settings but works fine in the home or office.
- Restrict cell phone use in children and adolescents except in emergency situations.

SEXTING

'Sexting' Teens Can Go Too Far
Sending Provocative Images Over Cell Phones Is All the Rage, but It Can Go All Wrong
By GIGI STONE
March 13, 2009
http://abcnews.go.com/Technology/WorldNews/story?id=6456834&page=1

What happened to the time when if you liked a boy at school you'd pass him a note?

These days the disturbing new trend in teenage flirting is sending nude or semi-nude photos from cell phone to cell phone: instead of "texting," they call it called "sexting."

While the X-rated offerings are usually intended just for a boyfriend or girlfriend, the photos often wind up being shared.

While 17-year-old Matthew Younger of Maryland says he has never done anything like this himself, he has seen it happen among his peers.
"If a boy meets a girl or has a girlfriend on summer break he comes back and shows all his boys the [naked] pictures he's been sent. No one gives it that much thought really," says Younger.

The dangerous combination of teenagers behaving provocatively and impulsively is not new, but the accessibility to the technology is. With cell phone cameras, they have been handed a tool so easy to use for some it's impossible to pass up.

And in the transparent culture built around social networking sites, it all spreads like wildfire. "Somebody might send it to somebody else's phone and that person has Facebook on their phone and they automatically upload it to their Facebook or MySpace page," explains Somalia Yaborow, 16, of Alexandria, Va. What teens don't realize is just how serious the consequences can be.

News reports are increasingly documenting legal repercussions after indecent photo appear online. And attorneys say there are many unanswered questions about whether young people who send their own photos could face prosecution for obscenity or child pornography.

This year in Wisconsin, a 17-year-old was charged with possessing child pornography after he posted naked pictures of his 16-year-old ex-girlfriend online.

In Alabama, authorities arrested four middle-school students for exchanging nude photos of themselves. In Rochester, N.Y., a 16-year-old boy is now facing up to seven years in prison for forwarding a nude photo of a 15-year-old girlfriend to his friends.

"I don't think that's what was contemplated when the laws were written, says the Rochester teen's attorney, Tom Splain, who has worked on several similar cases this year."I think it was more for the older pedophile collecting pictures of young children; we're now running into high school students getting swept up in these charges."

The nonprofit National Campaign to Prevent Teen and Unplanned Pregnancy has been researching the issue.

Director Marisa Nightingale says it's crucial parents talk to their children about potential consequences, because while criminal charges are rare, compromising photos could easily come back to haunt the teens when they go to apply for college or their first job.
"Even if it doesn't result in something official, they can get really humiliated and find something they thought was a joke can become something that haunts them for years," says Nightingale.

**DRIVING SAFETY**

Mobile phones and driving safety


Mobile phone use while driving is common but controversial. Using a cell phone while operating a motor vehicle has been shown to increase the risk of accident. Because of this, some jurisdictions have made the use of a cell phone while driving illegal. Others have enacted laws to ban handheld mobile phone use, but allow use of a hands free device. In some cases restrictions are only directed to minors or those who are immediate license holders.

Recent statistics show that new drivers are particularly more inclined to get into accidents when cell phones are involved.

Increased risk

A more traditional study method was used by the Société de l'assurance automobile du Québec (SAAQ) for their 2003 study. Questionnaires were sent to 175,000 drivers and analysis was done on the 36,078 who responded. The questionnaire asked about driving habits, risk exposure, collisions over the past 24 months, socio-demographic information, and cell phone use. Questionnaires were supported with data from cell phone companies and police crash records. The study found that the overall relative risk (RR) of having an accident for cell phone users when compared to non-cell phone users averaged 1.38 across all groups. When adjusted for kilometers driven per year and other crash risk exposures, RR was 1.11 for men and 1.21 for women. They also found that increased cell phone use correlated with an increase in RR. When the same data were reanalyzed using a Bayesian approach, the calculated RR of 0.78 for those making less than 1 call/day and 2.27 for those with more than 7 calls/day was similar to cohort analysis. When the data were reanalyzed using case-crossover analysis, RR was calculated at a much higher 5.13. The authors expressed concern that misclassification of phone calls due to reporting errors of the exact time of the collisions was a major source of bias with all case-crossover analysis of this issue.
Simulation studies versus alcohol

Simulations are particularly useful for comparing cell phone use while driving with the known-dangerous drunk driving. A 2003 study by University of Utah Psychology department measured response time, following distance, and driving speed of a control group, subjects at the legal BAC limit of 0.08%, and subjects involved in cell phone conversations. Data from the report are listed to the right.

From the report:
Drivers in the cell-phone condition exhibited a sluggish behavior (i.e., slower reactions) which they attempted to compensate for by increasing their following distance. Drivers in the alcohol condition exhibited a more aggressive driving style, in which they followed closer, necessitating braking with greater force. After controlling for driving difficulty and time on task, the study concluded that cell phone drivers exhibited greater impairment than intoxicated drivers.

Meta-analysis

A 2005 review by the Hawaiian legislature entitled "Cell Phone Use and Motor Vehicle Collisions: A Review of the Studies" contains an analysis of the current state of knowledge on cell phone/motor vehicle accident causality. Meta-analysis by The Canadian Automobile Association and The University of Illinois found that response time while using both hands-free and hand-held phones was approximately 0.5 standard deviations higher than...
normal driving (i.e., an average driver, while talking on a cell phone, has response times of a driver in roughly the 40th percentile).

As a percentage of distraction-related accidents
Driver inattention is estimated to be a factor in between 20 to 50 percent of all police-reported crashes. Driver distraction, a sub-category of inattention, has been estimated to be a contributing factor in 8 to 13 percent of all crashes. Of distraction-related accidents, cell phone use may range from 1.5 to 5 percent of contributing factors. However, large percentages of unknowns in each of those categories may cause inaccuracies in these estimations. A 2001 study sponsored by The American Automobile Association recorded "Unknown Driver Attention Status" for 41.5 percent of crashes, and "Unknown Distraction" in 8.6 percent of all distraction related accidents. According to NHTSA, "There is clearly inadequate reporting of crashes that may be related to cellular telephone use while driving".

Currently, "Outside person, object, event" (commonly known as rubbernecking) is the most reported cause of distraction-related accidents, followed by "Adjusting radio/cassette/CD". "Using/dialing cell phone" is eighth.

Hands-free car kit
Driving while using a handsfree device is not safer than using a hand held cell phone, as concluded by case-crossover studies, epidemiological, simulation, and meta-analysis. The increased "cognitive workload" involved in holding a conversation, not the use of hands, causes the increased risk. One notable exception to that conclusion is a study by headset manufacturer Plantronics, which found 71 percent of the test subjects steered more accurately, 100 percent had faster brake reaction times, and 92 percent maintained a more consistent speed when using a headset versus handheld. The consistency of increased crash risk between hands-free and hand held cell phone use is at odds with legislation in many locations that prohibits hand held cell phone use but allows hands-free. Dialing a cell phone is more distracting than talking on a cell phone, and hands-free devices that offer voice-dialing may reduce or eliminate that increased risk.

As compared to conversation with a passenger
The scientific literature is mixed on the dangers of talking on a cell phone versus those of talking with a passenger. The common conception is that passengers are able to better regulate conversation based on the perceived level of danger, therefore the risk is negligible. A study by a University of South Carolina psychology researcher featured in the journal, Experimental Psychology, found that planning to speak and speaking put far more demands on the brain’s resources than listening. Measurement of attention levels showed that subjects were four times more distracted while preparing to speak or speaking than when they were listening. The Accident Research Unit at the University of Nottingham found that the number of utterances was usually higher.
for mobile calls when compared to blindfolded and non-blindfolded passengers across various driving conditions. The number of questions asked averaged slightly higher for mobile phone conversations, although results were not constant across road types and largely influenced by a large number of questions on the urban roads. A 2004 University of Utah simulation study that compared passenger and cell-phone conversations concluded that the driver performs better when conversing with a passenger because the traffic and driving task become part of the conversation. Drivers holding conversations on cell phones were four times more likely to miss the highway exit than those with passengers, and drivers conversing with passengers showed no statistically significant difference from lone drivers in the simulator. A study led by Andrew Parkes at the Transport Research Laboratory, also with a driving simulator, concluded that hands-free phone conversations impair driving performance more than other common in-vehicle distractions such as passenger conversations.

In contrast, the University of Illinois meta-analysis concluded that passenger conversations were just as costly to driving performance as cell phone ones. AAA ranks passengers as the third most reported cause of distraction-related accidents at 11 percent, compared to 1.5 percent for cellular telephones. A simulation study funded by the American Transportation Research Board concluded that driving events that require urgent responses may be influenced by in-vehicle conversations and that there is little practical evidence that passengers adjusted their conversations to changes in the traffic. It concluded that drivers' training should address the hazards of both mobile phone and passenger conversations.

Texting
Main article: Texting while driving

The scientific literature on the dangers of driving while sending a text message from a mobile phone, or driving while texting, is limited. A simulation study at the Monash University Accident Research Centre provided strong evidence that retrieving and, in particular, sending text messages has a detrimental effect on a number of safety critical driving measures. Specifically, negative effects were seen in detecting and responding correctly to road signs, detecting hazards, time spent with eyes off the road, and (only for sending text messages) lateral position. Surprisingly, mean speed, speed variability, lateral position when receiving text messages, and following distance showed no difference. A separate, yet unreleased simulation study at the University of Utah found a sixfold increase in distraction-related accidents when texting.

The low number of scientific studies may be indicative of a general assumption that if talking on a mobile phone increases risk, then texting also increases risk, and probably more so. 89% of U.S. adults think that text messaging while driving is "distracting, dangerous and should be outlawed." The AAA Foundation for Traffic Safety has released polling data that show that 87% of people consider texting and e-mailing while driving a "very serious" safety threat, almost equivalent to the 90% of those polled who consider drunk driving a threat. Despite
the acknowledgement of the dangers of texting behind the wheel, about half of drivers 16 to 24 say they have
texted while driving, compared with 22 percent of drivers 35 to 44.[26]

Texting while driving received greater attention in the late 2000s, corresponding to a rise in the number of text
messages being sent.[26] The 2008 Will Smith movie Seven Pounds deals with Smith’s character
committing suicide in order to donate his organs to help save the lives of seven people to make up for the seven
people he killed in a car accident because he was receiving a text message while he was driving. Texting while
driving attracted interest in the media after several highly publicized car crashes were caused by texting drivers,
including a May 2009 incident involving a Boston trolley car driver who crashed while texting his
girlfriend.[27] Texting was blamed in the 2008 Chatsworth train collision which killed 25 passengers. Investigations
revealed that the engineer of that train had sent 45 text messages while operating.

On July 27, 2009, the Virginia Tech Transportation Institute released preliminary findings of their study of driver
distraction in commercial vehicles. Two studies, comprising about 200 long-haul trucks driving 3 million combined
miles, used video cameras to observe the drivers and road; researchers observed 4,452 safety-critical events,
which includes crashes, near crashes, safety-critical events, and lane deviations. 81% of the safety critical events
had some type of driver distraction. Text messaging had the greatest relative risk, with drivers being 23 times
more likely to experience a safety-critical event when texting. The study also found that drivers typically take their
eyes off the forward roadway for an average of four out of six seconds when texting, and an average of 4.6 out of
the six seconds surrounding safety-critical events.[26]

Legislation

A sign along Bellaire Boulevard in Southside Place, Texas states that using mobile phones while driving is
prohibited from 7:30 AM to 9:30 AM and from 2:00 PM to 4:15 PM

Accidents involving a driver being distracted by talking on a mobile phone have begun to be prosecuted as
negligence similar to driving while intoxicated. In the United Kingdom, from 27 February 2007, motorists who are
captured using a hand-held mobile phone while driving will have three penalty points added to their license in
addition to the fine of £60.[28] This increase was introduced to try to stem the increase in drivers ignoring the
law.[29] Israel, Japan, Portugal and Singapore prohibit all mobile phone use while driving, including use of hands-
free devices. New Zealand bans hand held cell phone use from 1 November 2009. Many states in the United
States have banned texting on cell phones while driving because studies have shown this to be just as, if not
more, dangerous as drunk-driving. Illinois became the 17th American state to enforce this law.[30]
Effectiveness of legislation

Current laws banning cell phone use in New York and Connecticut have proven to be ineffective, due to a lack of visible enforcement. The percentage of offenders decreased from 2.3% to 1.1% immediately after the ban was implemented, but after being in effect for a year the percentage increased to 2.1%, which is not significantly different from the pre-ban figure. The authors of the study conclude that "vigorous enforcement campaigns accompanied by publicity appear necessary to achieve longer term compliance." Many States currently have legislation pending regarding the use of cell phones. Most States also cover using cell phones in the case of accidents or other law-breaking activities while driving a vehicle in their respective traffic legislation.

A study by the Highway Loss Data Institute has found that while laws aimed against texting or making calls while driving are effective in reducing such behavior, they are not effective in reducing crashes.

Cell Phone Use as Dangerous as Drunken Driving

Drivers who talk on either handheld or hands-free cellular phones are as impaired as drunken drivers, according to experimental research conducted by Drs. Frank Drews, David Strayer, and Dennis L. Crouch of the University of Utah.

The study reinforced earlier research showing that hands-free cell phones are just as distracting as handheld cell phones.

“If legislators really want to address driver distraction, then they should consider outlawing cell phone use while driving,” says Dr. Drews.

Both handheld and hands-free cell phones impaired driving, with no significant difference in the degree of impairment. That “calls into question driving regulations that prohibited handheld cell phones and permit hands-free cell phones,” the researchers write.
Details of the Experiment

This controlled laboratory study included 25 men and 15 women ages 22 to 34 who were social drinkers (three to five drinks per week) recruited via newspaper advertisements. Two-thirds used a cell phone while driving. Each participant was paid $100 for 10 hours in the study.

The driving simulator has a steering wheel, dashboard instruments and brake and gas pedals from a Ford Crown Victoria sedan. The driver is surrounded by three screens showing freeway scenes. Each simulated daylight freeway drive lasted 15 minutes. The pace car intermittently braked to mimic stop-and-go traffic. Drivers who fail to hit their brakes eventually rear-end the pace car. Other simulated vehicles occasionally passed in the left lane, giving the impression of steady traffic flow.

Each study participant drove the simulator during three sessions – undistracted, drunk or talking to a research assistant on a cell phone – each on a different day.

The simulator recorded driving speed, following distance, braking time and how long it would take to collide with the pace car if brakes were not used.

The Utah Highway Patrol loaned the researchers a device to measure blood-alcohol levels.

The study found that compared with undistracted drivers:

Motorists who talked on either handheld or hands-free cell phones drove slightly slower, were 9 percent slower to hit the brakes, displayed 24 percent more variation in following distance as their attention switched between driving and conversing, were 19 percent slower to resume normal speed after braking and were more likely to crash. Three study participants rear-ended the pace car. All were talking on cell phones. None were drunk.

Drivers drunk at the 0.08 percent blood-alcohol level drove a bit more slowly than both undistracted drivers and drivers using cell phones, yet more aggressively. They followed the pace car more closely, were twice as likely to brake only four seconds before a collision would have occurred, and hit their brakes with 23 percent more force. “Neither accident rates, nor reaction times to vehicles braking in front of the participant, nor recovery of lost speed following braking differed significantly” from undistracted drivers, the researchers write.

The lack of accidents among the study’s intoxicated drivers may have been because it was conducted in morning hours when participants were well rested. However, most drunken driving accidents occur late at night when
drivers are fatigued and their average blood alcohol content (BAC) levels are also twice the legal .08 level used in the research.

"Fortunately, the percentage of drunk drivers at any time is much lower," said Dr. Drews, "So it means the risk of talking on a cell phone and driving is probably much higher than driving intoxicated because more people are talking on cell phones than driving while drunk."

Cell phone users have been found to be 5.36 times more likely to get in an accident than undistracted drivers. Other studies have shown the risk is about the same as for drivers with a 0.08 blood-alcohol level.

Dr. Strayer says he expects criticism “suggesting that we are trivializing drunken-driving impairment, but it is anything but the case. We don't think people should drive while drunk, nor should they talk on their cell phone while driving.”

Drews says he and Dr. Strayer compared the impairment of motorists using cell phones to drivers with a 0.08 percent blood-alcohol level because they wanted to determine if the risk of driving while phoning was comparable to the drunken driving risk considered unacceptable.

“This study does not mean people should start driving drunk," says Drews. “It means that driving while talking on a cell phone is as bad as or maybe worse than driving drunk, which is completely unacceptable and cannot be tolerated by society.”

The study, was supported by a grant from the Federal Aviation Administration, which is interested in impaired attention among pilots, and was in the summer 2006 issue of Human Factors: The Journal of the Human Factors and Ergonomics Society, 2006 (Summer), 381-391.

▼

Cell Phones and Traffic Fatalities
by David J. Hanson, Ph.D.
Those who die in traffic accidents are just as dead whether killed by drug use, fatigue, falling asleep at the wheel, alcohol intoxication, or inattention caused by cell phone use while driving.

A study in The New England Journal of Medicine found that drivers who used mobile phones while driving were
four times more likely to crash than those not, a rate equal to that for drunken driving at the .01 level, which is 20% higher than the current .08 in all U.S. states.

At least 25 countries restrict or prohibit cell and other wireless technology: Israel, Japan, Portugal and Singapore all prohibit mobile phone use while driving. Australia, Brazil, Chile, Denmark, Germany, Greece, Hungary, Italy, Poland, the Philippines, Romania, Slovenia, South Africa, Spain, Switzerland, Turkey, the United Kingdom, and the United Arab Emirates prohibit the use of hand-held cell phones while driving. Drivers in the Czech Republic, France, the Netherlands, and the United Kingdom may use cell phones but can be fined if they are involved in crashes while using such a phone.

Similar life-saving legislation has been proposed in 40 states in the US, but only New York has passed such legislation. A major obstacle has been the cellular phone industry, which strongly opposes any restrictions on cell phone use.

So long as the cellular phone industry strongly opposes the needed legislation and Mothers Against Drunk Driving (MADD) remains indifferent or opposed, the prospects for reducing this important cause of needless injuries and deaths are not bright.

UNBORN BABIES

Do Cell Phones Harm Unborn Babies?
Researcher Says Media Misinterpreted Study on Cell Phones, Behavior Problems
By DAN CHILDS
ABC News Medical Unit
May 20, 2008
http://abcnews.go.com/Health/ReproductiveHealth/story?id=4890097&page=1

Medical experts say media reports of a study that suggests a pregnant woman's cell phone use could cause later behavioral problems in her baby raise unnecessary alarm.

In the study, slated for publication in the July issue of the journal Epidemiology, researchers at the Universities of California, Los Angeles, and Aarhus, Denmark, issued a survey to mothers of 13,159 children in Denmark. The survey asked the mothers questions about their use of cell phones during their pregnancy as well as their child's behavior and their current cell phone use.
The researchers found that the mothers who said they used cell phones during their pregnancy also reported a higher level of behavioral problems in their children.

But while the results suggested an increased risk of hyperactivity, impulsivity and difficulty concentrating in children whose mothers used cell phones during pregnancy, epidemiological experts -- including one of the paper's authors -- said it would be a mistake to assume that the findings were conclusive.

In fact, Dr. Jorn Olsen, professor and chair of epidemiology at UCLA and a co-author of the paper, said media coverage of the research thus far has been off target.

Olsen specifically referred to a report in the British press with the headline "Warning: Using a Mobile Phone While Pregnant Can Seriously Damage Your Baby."

"That's clearly not what we wanted to suggest, and we think that there is no reason that pregnant women should be very alarmed at the findings we have," Olsen said.

He added that he and his colleagues had not expected the paper to be released until next month.

"I think that a number of journalists broke the story on this and that they did not take all of the assumptions into consideration [when reporting it]," he said.

Confounding Factors
Charles Poole, associate professor of epidemiology at the University of North Carolina at Chapel Hill, said that a number of factors could have been at play in this preliminary study that would have thrown the results off one way or the other.

He said one problem was that the information was obtained through interviews with the mothers, who may not have given accurate accounts of their cell phone use when pregnant. Alternatively, he noted, perhaps mothers who were heavy users of cell phones were more likely to report behavior problems in their children.

Additionally, the authors "only briefly mentioned the possibility that maternal cell phone use, especially postnatal use, could have adverse effects on child behavior in ways having nothing at all to do with radio frequency fields," he said. One possibility: Mothers who were constantly on their cell phones may have paid less attention to their children, who subsequently acted out.
Olsen added that the study was never intended to suggest a biological mechanism by which cell phone exposure could lead to behavioral problems in children.

"I don't think anyone has suggested that there is a causal mechanism," he said.

And in the study, the authors point out other confounding variables that could explain behavioral changes in these children, including diet, exposure to lead paint and exposure to pollution.

"We think it is interesting, but many associations seen in studies of this type occur due to chance," Olsen said, adding that parents can comfort themselves with the fact that the vast majority of children who have been exposed to cell phones, both in and out of the womb, do not exhibit behavioral problems.

The study is far from the first to attempt to explore some of the possible adverse health effects of cellular phones. And, as with past studies, the conclusion of this most recent study is that more research is needed in order to determine whether there is anything to be worried about.

"Current scientific evidence doesn't indicate any adverse health outcomes associated with exposure to radio frequency energy from cell phones," said U.S. Food and Drug Administration spokeswoman Peper Long, who agreed that the public should be cautious in interpreting the most recent study.

"Although there have been reports of negative health effects from low levels of radio frequency energy, these reports have not been replicated or confirmed," she said.

Solid Answers? Please Hold

Olsen noted that there are many reasons to explore all conceivable health impacts of cell phone use, as it is a technology that is becoming ever more pervasive in our highly connected society. The results of the study, Olson said, could provide avenues to other researchers studying the potential effects of cell phone radiation. Still, epidemiological experts said, the findings may not be ready for public consumption.

"I think this is a competently and well-done study, but I think there are enough red flags that this should probably not be something the U.S. public needs to be alarmed about," said Dr. Tim Byers, professor of epidemiology and community health at the University of Colorado in Aurora. "I am particularly concerned about mothers and fathers who may constantly be worried about whether something they did caused their child's behavioral problems."
"This study is well worth publishing [in a medical journal]," Poole said. "But, given its highly preliminary and unexpected nature, and its liability to any number of methodologic problems, it is not the kind of study that should be making news in the general public.

"No one connected with the study should be doing anything to encourage media attention on it -- that includes the journal, the funding source, the institutions with which the authors are affiliated and the authors themselves," Poole added. "In my opinion, that would constitute sensationalism."

**ADDICTIONS, ABUSES & BEHAVIORAL RISKS**

**COULD EXCESSIVE CELL PHONE USE LEAD TO COGNITIVE IMPAIRMENT AMONG YOUTH?**

MENTAL HEALTH BLOG


Dr. Gaby Badre, of Sahlgren’s Academy in Gothenberg, Sweden presented to the Associated Professional Sleep Societies (APSS) that there is a relationship between excessive cell phone use and sleeping problems, such as disrupted sleep, restlessness, stress and fatigue, among youth 14 to 20 years of age.

The study consisted of two groups; those who made less than 5 calls and/or text messages per day (control group) and those who made more than 15 calls and/or text messages per day (experimental group).

The results showed that youth in the experimental group had "increased restlessness with more careless lifestyles, more consumption of stimulating beverages, difficulty in falling asleep and disrupted sleep, more susceptibility to stress and fatigue". Furthermore, there seems to be a connection between excessive cell phone use and a tendency toward unhealthy habits such as smoking and drinking among youth.

The study suggests that youth are delaying their biological clocks in order to remain in constant connection with the world. The impact on mental health and cognition could be detrimental if youth continue to disrupt their sleep patterns at a period in life where sleep is so critical. It makes me wonder if this trend will hinder the potential of today's youth.
Cell Phone Addiction?
By RICK NAUERT PHD Senior News Editor
PsychCentral
Reviewed by John M. Grohol, Psy.D. on June 8, 2007

Many view cell phones as an essential item, an integral tool necessary for family, work, safety and social networking. A new Australian study finds the average Australian spends one hour on his or her mobile phone every day with one in five obsessed with their cell and potentially addicted to the device.

An online survey assessed more than 2500 phone owner’s survey on the psychological, financial and social impact of the use of mobile phones. Consumer behavior expert, Diana James found 22 percent of these people considered themselves to be heavy or very heavy users and 8 percent had experienced monthly bills that were over $500.

Ms James’ preliminary findings also show that texting now dominates Australians’ use of mobile phones.
“People who did the survey used SMS almost three times as much as voice communication,” she said.
“The average respondent made 3.5 voice calls each day but sent nine text messages. They spent one hour on the phone every day on average, which included 35 minutes of texting.”

And Ms James said mobiles had become a social tool, rather than a business tool.

“The people surveyed said most of their phone time was spent contacting close friends (28 percent) and partners (28 percent), or family (26 percent), with just 11 percent of phone time relating to business,” she said.
Ms James said Australia had one of the highest mobile phone penetration rates in the world and it was important to find ways to measure mobile phone addiction.

“The survey results show that the majority of people are responsible with their phone, just like the majority who drive cars are responsible,” she said.

“But there’s a significant element who have severe problems with their phones and that’s expressed in their psychological relationship with their phone and their financial relationship.”
Ms James said 2500 people aged 16 to 84 had logged on to do the survey from every state and territory in Australia, with 64 percent being women and 50 percent aged 25 and under.

“My research is focusing on whether or not people are consuming mobile technology in a healthy manner,” she said.

“It’s not just a phone anymore, it’s more like a mobile computer and entertainment unit.

“The paradox of the phone is that it gives independence but it also creates dependence.”

Ms James said addiction danger signs included running up huge bills and having irrational reactions to being without a phone if you forgot or lost your mobile.

“As ownership rates have increased, they’ve become a huge part of people’s social lives … without their phone, people feel like they are out of the loop,” she said.

Ms James’ survey showed the average monthly phone bill was $65. About 8 percent of respondents said they had been billed more than $500 for a month, with the biggest bill reported as $5200.

“Given that half the people surveyed were 25 or younger and on fairly low incomes, the amount they are spending is quite significant,” she said.

Need help with cell phone addiction? Learn more in our article, Coping with Cell Phone Addiction.

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Coping with Cell Phone Addiction
PsychCentral
By JOHN M. GROHOL, PSY.D.


As cellphones have become prevalent in modern society, some people have a significant issue with not being able to disengage from their cell phone. So-called “smart phones,” which combine functionality of an organizer, browsing the Internet, playing tunes, and taking pictures, only worsen the reliance on one’s cell phone. While
using such devices for everyday tasks, work, and socializing with friends and family is perfectly normal, not being able to put them down while engaged in a conversation with your significant other or a friend who’s sitting in front of you may denote an increasing problem.

According to research on cell phone addiction, addiction danger signs included running up huge bills and having irrational reactions to being without a phone if you forgot or lost your mobile.

According to that same research, 22 percent of these people considered themselves to be heavy or very heavy users and 8 percent had experienced monthly bills that were over $500.

What to Do to Better Cope with Cell Phone Addiction

If you feel like you can’t part from your cell phone or have run up huge bills unexpectedly, don’t worry, there are some steps you can take to bring your relationship with your cell phone back down to earth.

1. **Track your cellphone use.** Yes, it’s a pain to do, but the more you keep track of the time you spend messaging or talking on your cellphone, the better you’ll be able to control it. Jot down in a notepad when you’re talking, messaging, or conducting other activities on the phone. Keep the journal for a week’s time, then review the amounts of time you’re spending on each activity.

2. **Start the weaning.** Now that you know you’re spending 10 hours a week on messaging, it’s time to start cutting back. Take it slow and start with the least important activity you use your phone for. Commit to reducing the time spent on that phone activity just 10% the first week. So if you’re spending 10 hours a week on messaging, aim for 9 hours the next week. That means being more conscious each time you’re using the phone for that activity, and trying to cut things short sooner rather than later.

3. **Commit to being in the moment.** One of the reasons people use their cell phones as much as they do is to be with another person in another place. That’s fine when we’re waiting in line at the post office, but less acceptable when your significant other or a friend is trying to have a conversation with you. Commit to turning the cell phone off, or at least putting it away out of sight, when engaged in a face-to-face conversation with another person. It’s not only helpful to your addiction, it’s far less rude and you may be surprised to learn you’ll regain these people’s respect.

4. **You don’t need that kind of connection.** So many people spend so much time on their cellphones because they believe it is a necessary part of their connections with others, or with their ability to be reached and respond instantly to any and all kinds of communications. For what purpose? If you need such hyperactive connectivity,
that suggests something isn’t entirely healthy with some of those relationships to begin with. Quality social, work and romantic relationships aren’t built on 180 character sarcastic notes constantly exchanged with one another. While it’s fun for a time, it’s not going to lead to a higher-quality relationship or a better, more enjoyable life (especially if it’s creating anxiety and problems in your existing life).

5. **You’re not as important as you think you are.** Some people check email via their cell phone incessantly (e.g., “crackberry”) because they believe something so important might come up it requires their immediate attention. Sure, I can understand in some positions, some jobs, that’s true. But for 99.9% of people and jobs, it is not. Even if you’re the CEO of a company, there’s virtually nothing that could come up that can’t wait until you get back to the office. Remember, if it’s that important, someone will call you.

6. **Turn it off.** Yes, that’s right. Turn it off. There’s nothing you need to do in the middle of the night that the cell phone will alert you to that won’t be there in the morning (unless you happen to be the President, then you might want to keep your cell phone handy). By turning it off and putting it away, you’re taking back conscious control of your life and this little piece of technology. Instead of it calling to you, you’re telling it, “Hey, I’ve had enough for one day. Seeya in the morning.” Set a deadline every evening for a time to retire the technology, and then don’t check or use it again until the next morning.

7. **Technology works for us, not the other way around.** If technology is taking control of your life — creating stress, anxiety, arguments with other people in your life, or financial hardships — then you have a backwards relationship with technology. Technology works for us. If it’s not working for you, you’re chosen to be on the losing side of the relationship, and it’s time to put a stake in the ground and take responsibility and control for your use of the technology. Set aside specific times of the day or evening you will use your cell phone, for instance, rather than checking it every moment you get.

Cell phone addiction doesn’t have to ruin your life, your work, or your relationships with others. If these tips still don’t help, it might be a sign that cell phone addiction is more of an issue in your life than you realized. A psychotherapist who has experience in treating addictions can often help in such a case, and it is a treatment you should explore if you can’t reduce cell phone use on your own.

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**Cell Talk Makes Walk Dangerous**
By RICK NAUERT PHD Senior News Editor
Reviewed by John M. Grohol, Psy.D.
Note: Story about going to Safeway after hearing this and talked and used my cellphone ... yep, I bumped into no less that 6 people in less than 15 minutes ... all of them were nice except one woman who looked at me with disdain.

We all know the joke about the individual who could not walk and chew gum at the same time. Now, the joke becomes reality as new studies warn of dangers associated with talking over a cell phone while walking.

Two new studies of pedestrian safety found that using a cell phone while strolling can place one in peril. And for older pedestrians (over 60 years old), talking on cell phones is especially a problem when crossing a busy street. The studies, in which participants crossed a virtual street while talking on the phone or listening to music, found that the music-listeners were able to navigate traffic as well as the average unencumbered pedestrian.

Users of hands-free cell phones, however, took longer to cross the same street under the same conditions and were more likely to get run over. Older cell phone users, especially those unsteady on their feet to begin with, were even more likely to become traffic casualties.

“Many people assume that walking is so automatic that really nothing will get in the way,” said University of Illinois psychology professor Art Kramer, who led the research with psychology professor Jason McCarley and postdoctoral researcher Mark Neider.

“And walking is pretty automatic, but actually walking in environments that have lots of obstacles is perhaps not as automatic as one might think.”

The first study, in the journal Accident Analysis and Prevention, found that college-age adults who were talking on a cell phone took 25 percent longer to cross the street than their peers who were not on the phone.

They were also more likely to fail to cross the street in the 30 seconds allotted for the task, even though their peers were able to do so.

Each participant walked on a manual treadmill in a virtual environment, meaning that each encountered the exact same conditions – the same number and speed of cars, for example – as their peers.
The second (and not yet published) study gave adults age 60 and above the same tasks, and included some participants who had a history of falling. The differences between those on and off the phone were even more striking in the older group, Kramer said.

“Older adults on the phone got run over about 15 percent more often” than those not on the phone, he said, and those with a history of falling fared even worse.

“So walking and talking on the phone while old, especially, appears to be dangerous,” he said.
Source: University of Illinois

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Cell Phones Are the Latest 'Addiction'
Tuesday, July 18, 2006
By Michael Y. Park
http://www.foxnews.com/story/0,2933,204046,00.html

The United States is in the midst of an epidemic of (Excuse me, I have to take this call.)
Sorry about that. Let's get back to the story.

Americans from all walks of life are jonesing for the latest (Hold on just one sec. I've been trying to get this guy on the line all day. I'll be right back.)

There we go. OK, let's try this again.

America's love affair with cellular phones — 212 million carried them as of April 2006 — may have blossomed into a full-fledged addiction, with the devices interfering with personal relationships, classroom lectures, businesses and, yes, journalists' deadlines.

Some have even called cell phones "the new cigarettes," seeing as how people fiddle with them in elevators, whip them out as soon as they leave the office, take "cell phone breaks" on the job and chat away while walking, driving, etc.

And when your phone isn't ringing, your brain sometimes tricks you into thinking that it is — a phenomenon that has been dubbed "phantom ringing."
"I'm never without my cell phone," Courtney Tompkins, spokeswoman for the medical school at Des Moines University and owner of a small business, wrote in an e-mail.

“When we go to bed, we have one cell phone on each side of the bed. I use it as an alarm throughout the day; I text- and picture-message constantly. I can send a text message while driving or talking on another phone. I hear phantom ringing often. I've been teased at the gym for keeping my phone in hand while walking and next to me while I work out. Yes, I'm a cell phone junkie!"

Karen Gail Lewis, a therapist in Cincinnati, says she has even seen clients break out their phones in the middle of a counseling session.

“I have even had couples in my office for couple’s therapy where one takes the call," she said.

In 2003, information-science professor Sergio Chaparro wanted to test out just how deeply cell phones had insinuated themselves into the lives of his students at Rutgers University in New Jersey.

He gave them a seemingly simple homework assignment: to turn off their cell phones for 72 hours. Of 220 students with cell phones, only three could bring themselves to complete the assignment.

“They were afraid. They were truly afraid," said Chaparro, now a professor at the Simmons Graduate School for Library and Information Science, in Boston.

“What I found was basically a high level of dependence on cell phones. Most students were particularly, I would say, scared of the experience.”

As part of the experiment, the students were required to keep logs of their thoughts and feelings while going without their mobile phones. The responses were telling, he said.

“They had high levels of anxiety, high levels of stress, high levels of insecurity," he said. “Some of them also told me personal stories. One student told me that the year before she went on a spring-break trip for a week, and the minute she got on the plane, she realized she had forgotten her cell phone. So her mom had to FedEx her the cell phone because she couldn't be without her cell phone for a few days. She was afraid of even driving without her cell phone.”
But as bad as it seems, the obsession with cell phones for the most part doesn't qualify as a genuine addiction, many experts say. And you'd hard-pressed to find someone to take you in as a patient suffering from a pure case of “the talkies.”

“I firmly believe that cell-phone use, as with anything that’s a behavior in life, can turn into an addiction, and the way I would define addiction in a clinical sense is any behavior in which a person becomes dependent to the detriment of an important part of their lives,” said Christopher Knippers, who holds a doctorate in clinical psychology and is an assessment specialist at the Betty Ford Center in Rancho Mirage, Calif.

“Quite frankly, the average person doesn't have to really worry about becoming addicted. A glass of wine can be a wonderful accompaniment to a meal, but most people aren't going to become alcoholics. If you already have a certain set of personality traits or biological traits in yourself, you're going to become addicted to something anyway.”

Andrea Macari, an instructor of psychology at Suffolk County Community College with a doctorate in clinical and school psychology, said it could be a long time before a cell-phone addiction might be recognized as a genuine mental disorder, if ever. Nevertheless, it can definitely qualify as maladaptive behavior.

“The symptoms are similar to the symptoms we see with other types of addictions,” she wrote in an e-mail. “The following are some common symptoms: The person feels uncomfortable when not using a cell phone; their cell-phone use has increased significantly; their need to talk on the phone is insatiable; their cell-phone bill is causing financial distress; they are having problems at school and work because they are constantly using their cell phone; they are having interpersonal problems because they are constantly using their cell phone; they are endangering their health because they use their cell phone during inappropriate times (driving, etc.).”

And it's not just a matter of etiquette. Knippers offered one example that he himself witnessed of cell phones hurting personal relationships.

“The other night, I went out to a relatively casual-dining restaurant, and we were watching this man with his young children at another table,” he said. “And from the time before he ordered until the time that he was walking out the restaurant, he had a cell phone to his ear. And his little kids were sitting there in silence, just munching away on their food. He was ignoring his little kids, which doesn't sound like a crime, but is a case where the cell phone was interfering with an important aspect of his life.”
And though Knippers still said that most people who casually toss off jokes about being addicted to their mobile telephones probably aren't, more and more Americans will be making that claim for real.

“It's real rare at this point, but I think we'll see more and more of it,” he said.

Whether or not cell phones can cause real addictions, Macari said that it's a good idea to look to cognitive behavioral therapy if you want to wean yourself off the gadgets.

“Create cell phone times that specifically define the times that you are able to use the phone. For instance, I will only use the phone from 6 to 8 p.m. I would also recommend buying a cell phone that works with a prepaid calling card so that when the minutes are up, that is it,” she said.

Macari also said cellular "addicts" should explore the reasons why they need to talk on the phone. "Do they feel insecure in life, but important when on the phone? Are they uncomfortable when by themselves? Are they running from loneliness?” she said.

But in this 21st-century world of instant results, it's nearly impossible to go cold turkey when many businesses almost demand that their workers carry cells.

“You can't outright ban your own cell-phone use, but when you start to catch yourself using a cell phone instead of dealing with a problem at work or in a relationship, you need to limit yourself as to when and where you use a cell phone,” Knippers said — by cell phone at the beach.

Of course, for every person who kicks cell-phone dependence, there always seem to be four more that are just starting to get the taste.

Take 39-year-old Chaparro, for instance. When he first conducted his casual study at Rutgers, he was one of only four people in the room who didn't own a cell phone.

“I refused to have a cell phone,” he said, laughing. “I got one a year later. And now I find myself replicating my students' behavior.”
The Wireless World

Cellphone Addiction

Wendy Tanaka and Sarah Terry-Cobo 06.16.08, 6:00 PM ET

Forbes.com


Call us the never-off society.

We tote our iPhones, LGs and BlackBerrys with us so we can contact anyone, anywhere, any time--and so we can be reached instantly. According to a recent Pew Internet & American Life Project survey, 51% of those polled said it would be very hard to give up their cellphones, up from 38% in 2002. The cellphone, in fact, was the most coveted technology in the survey, ahead of Internet access and television.

Video: Confessions of an Uber-Connected Gal

But have mobile devices become too much of a good thing? While they provide constant access to people and information, they also make us more anxious and demanding. There's no excuse anymore for missing a call, e-mail or text message. "If you don't pick up a girl's phone call and you're dating her--my god, expect to buy flowers for her," says Shaun Mehtani, a restaurateur in Morristown, N.J.

And a network glitch can wreck your entire day. "When you're having a text conversation and the service drops, it's like your whole world has ended," says Megan Young, a graduate student at Baylor University in Waco, Texas. These aren't the frustrations of an isolated few, but of the mobile majority. Our phones have become such a big part of how we're able to function that it begs the question: Are we addicted to our cells?

Experts say constant use of mobile devices hasn't been diagnosed as an addiction--yet. But some contend that it's fast on its way to being classified as a disease similar to drug addiction, alcoholism or gambling.

David Greenfield, a psychologist who is an expert on Internet-related behaviors, says he predicted a decade ago that people would become ultra-dependent on mobile devices, even more than they are on PCs and laptops. Since phones don't weigh much and fit easily into a pocket or a purse, "the threshold is even easier to cross, and there's no end to it," Greenfield says. "You're pretty much hooked in wherever you are, if you want to be."
Greenfield says constant and continual use of untethered devices produces chemical responses in the body similar to gambling. When compulsive gamblers win a hand, they are motivated to keep playing till they win again--no matter how much they lose in between.

It's the same with mobile texting and e-mailing, he says. "Every once in a while you'll get a good [text message or e-mail] between Viagra ads and Uganda money schemes," Greenfield says. "That's a hit, and it's a powerful reinforcer."

Others, however, aren't convinced that high-usage of mobile devices is an addiction or even detrimental to most people's quality of life, if kept in check. "I believe [dependency] happens, but the extent to which it plays a harmful role in your life, that is another matter," says Scott W. Campbell, an assistant professor at the University of Michigan, Ann Arbor, who studies cellphone behaviors. "I don't think it's as harmful as substances or [that it] needs treatment," he says.

Campbell, however, notes that mobile devices were first seen as a convenience for accessing people and data without having to be indoors and only when absolutely necessary. Now, they've morphed into on-call pagers and mini laptops full of digital content. "The technology has come to own many of us," he admits.

To avoid feeling stressed, set limits on usage, experts say. John Horrigan, associate director of Pew's Internet project, says limits vary greatly by temperament and age. Younger people who grew up with wireless technologies tend to have a higher threshold for dealing with all the calls, e-mails and texts clogging their phones, while older people tend to feel annoyed and distracted by them.

And if you think you have cellphone overload now, you ain't seen nothin' yet. Experts say usage will only increase as smart phones become more sophisticated and powerful, likely replacing laptops in the future.

The growth in cellphone service subscribers and revenues support the trend. In just two years, the number of subscribers in the U.S. increased eight-fold to 225 million, or 84% of the population, in 2007 from 34 million, or 13%, in 2005, according to wireless industry association CTIA. Meanwhile, industry revenues soared to $139 billion from $19 billion. Worldwide, 3 billion people have mobile service.

Despite the inexorable mobile tide, Greenfield says there's little clinical evidence that the devices improve quality of life. Mehtani agrees that his iPhone hasn't made him happier--but it has improved his business, he asserts. "I wouldn't say it's made my life better. It's made my life efficient," he says. "When my employees are communicating with each other, I'm cc'd so I don't have to be briefed."
DIGITAL NATION
Life on the Virtual Frontier
FRONTLINE PBS

Within a single generation, digital media and the World Wide Web have transformed virtually every aspect of modern culture, from the way we learn and work to the ways in which we socialize and even conduct war. But is the technology moving faster than we can adapt to it? And is our 24/7 wired world causing us to lose as much as we've gained?

In *Digital Nation: Life on the Virtual Frontier*, FRONTLINE presents an in-depth exploration of what it means to be human in a 21st-century digital world. Continuing a line of investigation she began with the 2008 FRONTLINE report *Growing Up Online*, award-winning producer Rachel Dretzin embarks on a journey to understand the implications of living in a world consumed by technology and the impact that this constant connectivity may have on future generations. "I'm amazed at the things my kids are able to do online, but I'm also a little bit panicked when I realize that no one seems to know where all this technology is taking us, or its long-term effects," says Dretzin.

Joining Dretzin on this journey is commentator Douglas Rushkoff, a leading thinker and writer on the digital revolution -- and one-time evangelist for technology's positive impact. "In the early days of the Internet, it was easy for me to reassure people about what it would mean to bring digital technology into their lives," says Rushkoff, who has authored 10 books on media, technology and culture. "Now I want to know whether or not we are tinkering with something more essential than we realize."

Dretzin and Rushkoff begin on the campus of the Massachusetts Institute of Technology, home to some of the most technologically savvy students in the world. Many of these "digital natives," who have hardly known a world in which they weren't connected 24/7, confess to having increasingly limited attention spans that make it difficult for them to read books or learn in conventional ways. "Honestly, I can't sit somewhere for two hours straight and..."
focus on anything," says a student named Alex. "Maybe it's some technology dependence I've developed over the course of the years, but at this point I don't think I can go back to just focusing on one thing."

"I teach the most brilliant students in the world," says MIT professor and clinical psychologist Sherry Turkle, who describes the challenges of teaching students who are surfing the Internet and texting during class. "But they have done themselves a disservice by drinking the Kool-Aid and believing that a multitasking learning environment will serve their best purposes. There are just some things that are not amenable to being thought about in conjunction with 15 other things."

A multitasker herself, Dretzin travels to California to the Communication Between Humans and Interactive Media (CHI Me) Lab, where Stanford professor Clifford Nass has been studying the effectiveness of self-proclaimed multitaskers. After taking one of Nass' tests, Dretzin is shocked by her poor results. "It turns out multitaskers are terrible at every aspect of multitasking. They get distracted constantly. Their memory is very disorganized. Recent work we've done suggests they're worse at analytic reasoning," Nass tells Dretzin. "We worry that it may be creating people who are unable to think well and clearly."

INSERT MORE ABOUT CLIFFORD NASS

► http://www.pbs.org/wgbh/pages/frontline/digitalnation/interviews/nass.html

He is a professor at Stanford University and the founder and director of the Communication between Humans and Interactive Media (CHI Me) Lab. The lab's experiments with students at the university have led to some troubling discoveries about the brains of chronic multitaskers. This is the edited transcript of an interview conducted on Dec. 1, 2009.

What is multitasking?

Multitasking as we're studying it here involves looking at multiple media at the same time. So we're not talking about people watching the kids and cooking and stuff like that. We're talking about using information, multiple sources. And that is the part of everyone's life that's growing so rapidly, "We have not yet found something that [multitaskers] are definitely better at than people who don't multitask."

So is it that most people think it is possible to do two things at the same time? What do we know about that?
We know that there are a few things humans can do at the same [time], two things at the same time our brains can do, but not any of the things we think about as multitasking. So your brain can use two words at the same time. So if someone's speaking to you, and someone else is speaking to you, we can listen to both at the same time; if you’re reading and someone’s talking to you. In the case of music, it’s a little different. We have a special part of our brain for music, so we can listen to music while we do other things. But in general, no, our brain can't do two things at once.

... Can't some tasks, [like breathing], be put on autopilot and others just be focused on?

The idea of autopilot is not really precise. But there are certain tasks like physical tasks, like breathing and such, that we do without much thinking. The problem is when it comes to media, when it comes to information content, we don't have that luxury, whereas reading or listening to speech, the brain is very good at. But there's no such thing as autopilot. So for any of the tasks that we think about as part of the media landscape, no, there's no autopilot. ...

So what's the big point here [behind your research]? ...

The big point here is, you walk around the world, and you see people multitasking, working on tasks while watching TV, while talking with people. If they're at the computer, they're playing games and they're reading e-mail and they're on Facebook, etc. Yet classic psychology says that's impossible; no one can do that. So we're confronted with a mystery. Here are all these people doing things that psychology says is impossible. And we want to ask the question, how do they do it? Do they have some secret ingredient, some special ability that psychologists had no idea about, or what's going on?

What are you putting them through here [in your lab]?

What we're doing here is, we're giving them different tasks that ask about the most basic ways the brain works. We're not literally throwing them in with 10 different things at once, but to ask the question, do their brains work differently? Do high multitaskers think about information differently than low multitaskers?

Explain to me what a high multitasker and a low multitasker is.

We call those high multitaskers ... who are constantly using many things at one time when it comes to media. So let's say they're doing e-mail while they're chatting, while they're on Facebook, while they're reading Web sites, while they're doing all these other things. And low multitaskers are people who really are more one-at-a-time.
people. When they're texting, they're texting. When they're reading a Web site, they're reading a Web site. So those are the low multitaskers.

Psychologists say all of us should be low multitaskers. But obviously the world's changing, and more and more people, especially young people, but even older people, are becoming multitaskers. ...

**What are the experiments that you're doing today?**

Today we have people doing two experiments. The first one asks the question, can high and low multitaskers focus on something and not be distracted? Because one would think to multitask, you'd have to be good at ignoring distractions and going, "Oh, that's important; that's unimportant." ...

The idea we're looking at today is can high multitaskers ignore irrelevancy, which would seem to be very important. So what we do is we're going to show them red rectangles and blue rectangles, tell them all we want to know is did the red rectangles move. Ignore the blue. They're totally irrelevant. And what we want to see is if the high multitaskers can ignore them, the blue, very well, or are they suckers for looking at the blue rectangles.

**What about the other experiment?**

The other experiment has to do with the idea of shifting from one task to another. In fact, that's where the term "multitasking" comes from. So what we're doing here is we're telling people, we're going to either show you the word "letter" or "number" and then show you a letter and number. And if you see the word "letter," press this letter if it's a vowel and this one if it's a consonant. If you see the word "number," press this one if it's even and this one if it's odd. And the idea is to see when people have to switch from looking at the number to looking at the letter, how fast are they? Are high multitaskers fast multitaskers? Or are they in some sense slower, crippled by having to switch from task to task?

**What did you expect when you started these experiments?**

Each of the three researchers on this project thought that ... high multitaskers [would be] great at something, although each of us bet on a different thing.

I bet on filtering. I thought, those guys are going to be experts at getting rid of irrelevancy. My second colleague, Eyal Ophir, thought it was going to be the ability to switch from one task to another. And the third of us looked at a third task that we're not running today, which has to do with keeping memory neatly organized. So we each had our own bets, but we all bet high multitaskers were going to be stars at something.
And what did you find out?

We were absolutely shocked. We all lost our bets. It turns out multitaskers are terrible at every aspect of multitasking. They’re terrible at ignoring irrelevant information; they’re terrible at keeping information in their head nicely and neatly organized; and they’re terrible at switching from one task to another.

So what do you make of that?

... We’re troubled, because if you think about it, if on the one hand multitasking is growing not only across time, but in younger and younger kids we’re observing high levels of multitasking, if that is causing them to be worse at these fundamental abilities -- I mean, think about it: Ignoring irrelevancy -- that seems pretty darn important. Keeping your memory in your head nicely and neatly organized -- that’s got to be good. And being able to go from one thing to another? Boy, if you’re bad at all of those, life looks pretty difficult.

And in fact, we’re starting to see some higher-level effects [of multitasking]. For example, recent work we’ve done suggests we’re worse at analytic reasoning, which of course is extremely valuable for school, for life, etc. So we’re very troubled about, on the one hand, the growth, and on the other hand, the essential incompetence or failure. ...

One would think that if people were bad at multitasking, they would stop. However, when we talk with the multitaskers, they seem to think they’re great at it and seem totally unfazed and totally able to do more and more and more. We worry about it, because as people become more and more multitaskers, as more and more people -- not just young kids, which we’re seeing a great deal of, but even in the workplace, people being forced to multitask, we worry that it may be creating people who are unable to think well and clearly.

... Are there certain kinds of thought that suffer more than others?

It’s a great question. The answer is yes. So we know, for example, that people’s ability to ignore irrelevancy -- multitaskers love irrelevancy. They get distracted constantly. Multitaskers are very disorganized in keeping their memory going so that we think of them as filing cabinets in the brain where papers are flying everywhere and disorganized, much like my office.

And then we have them being worse at switching from one task to another. ... It’s very troubling. And we have not yet found something that they’re definitely better at than people who don’t multitask.
How solid is your data? How confident are you about it?

We're pretty carefully doing our statistical analysis, so we're very confident in the results. We're of course doing much larger studies. Historically, psychology studies start small. We've done a variety of different tests, which gives us more confidence, versus doing just one experiment, then saying, "Aha!" ... We'll be putting people in fMRIs [functional Magnetic Resonance Imaging] ... to look at what parts of the brain multitaskers and non-multitaskers are using. So we're very confident now, and we'll certainly be gathering more data.

Explain to me the fMRI that you're going to be doing.

This is probably better explained by Anthony Wagner, [researcher at the Stanford Memory Laboratory and associate professor in the Department of Psychology and Neuroscience Program]. But basically the ideas are, our brain is divided into pieces, with different pieces doing different things. So the question is, when I confront you with something, what parts of your brain does your brain decide to use?

So, for example, if I present you with a lot of potentially irrelevant information, some people go for it, just say, "Oh, more, more, more, more, more!" Others say: "No, I'd like to work with what I've got. That's what I want to focus on." That would be indicated by different parts of the brain lighting up or not, and that's what we're trying to see.

So what are the potential outcomes of what you're doing later today?

The potential outcome of the fMRI is to start to ask the question, is it nurture or nature? Are people born multitaskers, or are they made multitaskers?

Now, if they're born multitaskers, we can say to them, "You know, you shouldn't multitask because you're going to be bad at it." But if they're made multitaskers, and we're in a world where multitasking is being pushed on more and more people, we could be essentially undermining the thinking ability of our society. ...

And frankly, we're seeing this across the world, from the least developed countries to the most developed countries. Multitasking is one of the most dominant trends in the use of media, so we could be essentially dumbing down the world.

That's a terrifying thought.
It's very scary. And it's one of the reasons we're so excited about this research and why so many other people are getting excited.

People never bothered to look at what we call chronic multitaskers. What they would do is they'd make people do five things at once and say: "Ha ha! They're not as good as if they do one thing at a time." Not a big shock, I think. What we decided to do is ask the question, what's happening if you're doing this all the time, even when you're not multitasking? So if we take a multitasker and say, "Now just focus on this," can they? As a professor and as a teacher, we think a lot about how do you teach kids who can't pay attention or are distracted by irrelevancy or don't keep their memory neatly organized? It's a scary, scary thought.

And, in fact, you already hear professors and others talking about changes in the way kids write, so that instead of writing an essay, they write in paragraphs, because what happens is, they write a paragraph, and they say, "Oh, now I'll look at Facebook for a while." Or they write a paragraph and say, "Oh, chance to play poker," or whatever other activity they want, or to do all of these at once.

So what we're seeing is less of a notion of a big idea carried through and much more little bursts and snippets. And we see that across media, across film, across, in Web sites, this idea of just do a little bit and then you can run away.

**We were at MIT, and we were interviewing students and professors. And the professors, by and large, were complaining that their students were losing focus because they were on their laptops during class, and the kids just all insisted that they were really able to manage all that media and still pay attention to what was important in class -- pick and choose, as they put it. Does that sound familiar to you?**

It's extremely familiar. ... And the truth is, virtually all multitaskers think they are brilliant at multitasking. And one of the big new items here, and one of the big discoveries is, you know what? You're really lousy at it. And even though I'm at the university and tell my students this, they say: "Oh, yeah, yeah. But not me! I can handle it. I can manage all these," which is, of course, a normal human impulse. So it's actually very scary. ...

**So who are these kids that you picked [for your study] to come in here today?**

We picked the kids at Stanford who are multitasking a whole lot. So on a college campus, most kids are doing two things at once, maybe three things at once. These are kids who are doing five, six or more things at once, all the time.
So they're the kids who are texting while talking with people, while working on their papers, while chatting on multiple sessions. They're the kids who are playing multiple games on their screen while they're doing Facebook, while they're talking, while they're doing all these other things. So these are the extreme kids, the kids who are at the very, very high end of that. ...

And do these kids think they're pretty good at it?

Yeah. They all seem to think they're really good at it. In fact, what's ironic is when we talk with people who multitask all the time, those who don't -- even though our research suggests the ones who don't would actually be better at it -- they're the ones who are sure they're really bad at it. And the ones who do it all the time and are sure they are great at it are really bad at it. So it's a real question: What's going on?

I know with myself that I've started multitasking much, much more. And it's not that I necessarily think that I'm good at it, but ... my sense is that I can function in a world in which I have to multitask. But I recently had myself analyzed by an interruption scientist. ... She watched me for a whole day, and she said that at the end of the day, I hadn't spent more than three minutes on a single task, and that really chilled me.

It should be chilling. Our brains aren't really built for that. We evolved in a world in which there [were] very few things to look at at one time, or, more precisely, very few things that weren't related. So if you were out hunting an animal, yeah, you might look at a lot of things, but they were all about hunting that animal. Now what we see is people trying to use information in a totally unrelated way. And that's not how your brain, or anyone's brain, is built.

So what gets lost?

Some things that we know get lost are, first of all, anytime you switch from one task to another, there's something called the "task switch cost," which basically, imagine, is I've got to turn off this part of the brain and turn on this part of the brain. And it's not free; it takes time. So one thing that you lose is time.

A second thing you lose is when you're looking at unrelated things, our brains are built to relate things, so we have to work very, very hard when we go from one thing to another, going: "No, not the same! Not the same! Stop it! Stop it!" It's why people who aren't multitaskers, like me, often experience when we're typing and someone walks up and starts talking with you -- you've probably had this -- you start typing their words and go, "Ah, what happened?" And that's because your brain loves to mix. So we're spending a lot of time trying to beat down this combining brain we have. ...
At the end of the day, it seems like it's affecting things like ability to remember long term, ability to handle analytic reasoning, ability to switch properly, etc., if this stuff is, again, ... trained rather than inborn. If it's inborn, what we're losing is the ability to do a lot of things that we're doing. We're doing things much, much poorer and less efficiently in time. So it's actually costing us time.

One of the biggest delusions we hear from students is, "I do five things at once because I don't have time to do them one at a time." And that turns out to be false. That is to say, they would actually be quicker if they did one thing, then the next thing, then the next. It may not be as fun, but they'd be more efficient.

**You're confident of that?**

Yes. There's lots and lots of evidence. And that's just not our work. The demonstration that when you ask people to do two things at once they're less efficient has been demonstrated over and over and over. No one talks about it -- I don't know why -- but in fact there's no contradictory evidence to this for about the last 15, 20 years.

Everything [as] simple as the little feed at the bottom of a news show, the little text, studies have shown that that distracts people. They remember both less. Studies on asking people to read something and at the same time listen to something show those effects. So there's really, in some sense, no surprise there. There's denial, but there's no surprise.

The surprise here is that what happens when you chronically multitask, you're multitasking all the time, and then you don't multitask, what we're finding is people are not turning off the multitasking switch in their [brain] -- we think there's a switch in the brain; we don't know for sure -- that says: "Stop using the things I do with multitasking. Focus. Be organized. Don't switch. Don't waste energy switching." And that doesn't seem to be turned off in people who multitask all the time.

**So are you suggesting that by multitasking all the time, we are actually changing our brains and making our brains worse at focusing on one thing?**

There's a good chance. We don't know for sure, because it also could be that people are born to multitask. That is, they're born with the desire to do all these things, and that's making them worse. But there is reason to worry at least, and believe that.
One of the other worries is, we're seeing multitasking younger and younger and younger. So in a lovely study, someone showed that when infants were breastfeeding and the television was on, infants were doing a lot of television watching. Now, if we think about it, the way that we think that breastfeeding evolved the way it did is the distance from the mother's face to the infant is the perfect focal distance. The voice is one that's very attractive.

Well, if you think about it, what is television filled with? Faces and voices. What do babies love? Faces and voices. So now, at a time when we believe that children learn intense concentration, they're being drawn away. Then as they get older, as they get to 3 or 4, we started feeling guilty that we put kids in front of the TV as a baby-sitter. So what did we do? We didn't turn off the TV. We started giving them toys, books, etc., while they're watching TV. So what are we telling them? We're telling them, "Don't pay attention; do many things at once." Well, it may not then be surprising that years later, that's how they view the media world. ...

**So is there any movement to stop all this multitasking?**

Oddly enough, we see the opposite. We see a number of societal forces encouraging multitasking. So in a lot of workplaces we see people being told, "You must answer e-mail within 15 minutes." Well, that means you're stopping what you're doing. Or, "You must keep your chat windows open."

Among software, how many new apps are there every single day on the iPhone, on the Android? How many new YouTube videos are there? How often does Facebook change? So, if anything, cultural forces and the expectation that people will respond instantly and chat and talk and do all these things all at once means, frankly, all the pressure is going that way.

We are seeing some rebellion. So, for example, [there are] companies, you know, calling me and saying, "How can we stop this? Our workforce is being driven crazy" or teachers trying desperately -- mostly failing -- to control the level of multitasking in the classroom. But it seems like mostly a losing battle.

**It's disturbing.**

It is scary. And it changes. We don't know how to teach to multitaskers. We don't know how to design software for multitaskers. We don't know how to have conversations effectively with multitaskers. So we're utterly unprepared for a world we're being thrust into. ...
How much research is there on [multitasking]? How much do we know about it? Why are you the only guy that we found who’s really doing this kind of work? ...

No one expected multitasking to take off as fast as it did, and I think most academics, myself included, kept on seeing it as an aberration, because it was impossible. So you'd see someone multitasking and go, "Ha ha ha, those wacky college kids," you know, that we all sort of laugh at for one reason or another. OK, they'll grow out of it. And then you start looking around and go, "Wait a minute; they're growing into it, not out of it." Little kids are growing up with it. Older people are being stuck with it. And all of a sudden you go, "Oh, my gosh." So it's become a frantic thing.

The one other domain, of course, is cars. So all of a sudden we have drivers with the idea they can multitask: more and more screens in the car; more voices in the car; more functions in the car; texting obviously a huge issue, and talking in the car. And once again, what do you hear people say? "Oh, I can talk in the car. I can talk while I drive, no problem at all. Speak on the cell phone, doesn't affect me a bit." Yet the results are unambiguous and clear.

And even weirder is texting. So once someone came to me and said, "Why haven't people researched texting and driving?" So I said, "OK, imagine I go to the National Science Foundation and say: 'Hmm, people have to do this thing called driving, which requires your hands and your eyes, and there's this other thing they do called texting, that requires their hands and their eyes. I wonder if it affects them.'" I said, "I'd be thrown out of the room!" It would be ludicrous!

So part of it is it's so obvious in these cases that no one would ever think you could do it. But again, the culture has changed, and this faith in our ability to manage information just because it's there is really startling from a cultural point of view.

Absolutely. What about gender and age differences?

Well, gender ... was a surprise. ... There's a lot of research on what we call physical multitasking, the ability to manage multiple physical things at the [same] time, so the classic example would be watching the kids while cooking, while cleaning, etc. And in those domains, lots and lots of research over a number of years has shown women are better. And there are evolutionary explanations for that, etc. So we expected, surely we'd see the same thing for multitasking. We actually see no gender difference whatsoever, which was very surprising. ...
So what we think is that the human brain of men and women is built different for the physical world but the same for the information world. And that's not surprising, because the physical world, evolution happened a long time ago. We didn't evolve to 20th- and 21st-century media, right? So the idea of lots of media at once -- I even tell my students, you know: "I would have loved to multitask as a kid. We had nothing to use!" You know, I could read two books at once, I guess, but basically, we didn't have any of this stuff, so I think that's a large part of it, too.

What about the notion that kids, because they've learned how to multitask for longer, are better at it than people like you and I?

We expected that, and we hope that. There are some colleagues who are looking at kids and children and development. One of the things we're seeing important for kids is -- already mentioned it -- very young age groups, infants watching TV ... and doing a bunch of other tasks.

But what we're also seeing is, in younger and younger ages, social relationships occurring online rather than face to face, and all the classical theories of developmental psychology worked on the assumption that kids would interact with other kids, and you learned everything from that -- everything from moral development to your identity to whatever. We're seeing incredible growth in social multitasking among younger and younger kids. We're talking third grade, fourth grade. As soon as they can write, one of the first things they're writing is social communication, not reading books. So now all of a sudden, we're changing that, too.

Of course the advantage is, it's hard for me to navigate talking with two people at once. But on the Web, I can easily talk with -- well, not easily [for me] -- I can talk with four people at once. I can have four different conversations at the same time. So we don't know at all -- and again, it's scary just because we don't know -- how are their brains changing. How is the whole nature of social life [changing] because of multitasking?

One of the biggest points here I think is, when I grew up, the greatest gift you could give someone was attention, and the best way to insult someone was to ignore them. ... The greatest gift was attention. Well, if we're in a society where the notion of attention as important is breaking apart, what now is the relationship glue between us? Because it's always been attention.

What is it [now]? Do you have any theories?

No. None at all, and it's scary, because this seems to be an inexorable trend.

• • •
But supporters of teaching with technology say it is vital for educators to keep students engaged by using the tools students have so thoroughly mastered in their everyday lives. "We have to be interactive, because [students] are accustomed to sitting in front of a screen, and they've got five windows up, and they're talking to three people at the same time," says Michael LaSusa, co-principal of New Jersey's Chatham High School. "We have to capture the attention of students. We almost have to be entertainers." In the South Bronx, Digital Nation finds administrators at a local public middle school who credit increased use of technology with helping boost both student attendance and standardized test scores.

Beyond school, Digital Nation explores the phenomenon of multiplayer online games like World of Warcraft and 3-D virtual worlds like Second Life -- online destinations with millions of participants. Last summer, Rushkoff and Dretzin traveled to BlizzCon, a giant party Blizzard Entertainment throws every year for its fans. Many of the people they spoke to there had never met, but considered each other close friends. "We've all spent hundreds of hours together," one gamer tells FRONTLINE. "My traditional-style friends who I have outside the game, none of them do I spend 16 hours a week with, week in and week out. I mean, I've known some of these folks for years."
"Technology over the last 50 years has mostly separated us," Second Life founder Philip Rosedale tells Rushkoff. "We've gone from watching movies together to watching them in living rooms to watching them on iPods. And I think that technology is starting to bring us back together again."

As more people become deeply immersed in these popular sites and are having profound experiences via online personas, or avatars, researchers are studying real-world effects of virtual immersion. Rushkoff visits Jeremy Bailenson, director of the Virtual Human Interaction Lab at Stanford University. "Digital stuff is such a new phenomenon that if it looks real and feels real, the brain tells us it is real," says Dr. Bailenson. "We've done studies with children where they see themselves swimming around with whales in virtual reality. ... About 50 percent of them will believe that in physical space, they actually went to SeaWorld and swam with whales."

FRONTLINE also examines how digital technology has transformed many aspects of warfare, from a controversial Army recruitment center that offers teens as young as 13 free access to commercial combat video games to Air Force pilots who sit at a base in Nevada but fly drones over the war zones in Iraq and Afghanistan to treating returning veterans' post-traumatic stress disorder with virtual reality therapy. "This disconnect of being at war and being at home is very tough for the human mind to wrap itself around," P.W. Singer, a senior fellow at the Brookings Institute, tells FRONTLINE. "And we're finding that some of these drone pilots actually have combat stress and PTSD even, just like the units physically deployed into Iraq and Afghanistan."
The *Digital Nation* Web site launched more than 10 months before the broadcast as part of FRONTLINE’s first multiplatform project, publishing short online video reports in addition to a producers' blog and a mosaic of user-generated content called [Your Stories](http://news.stanford.edu/news/2009/august24/multitask-research-study-082409.html) designed to let visitors participate in the documentary process. The site also features embeddable video, and an archive of online events with expert guests. Self-guided online workshops for teachers and parents can be found [here](http://news.stanford.edu/news/2009/august24/multitask-research-study-082409.html).

Media Multitaskers Pay Mental Price

Think you can talk on the phone, send an instant message and read your e-mail all at once? Stanford researchers say even trying may impair your cognitive control.

Multitasking works? Not really, Stanford study shows you might think a lot gets done when you multitask, but a study conducted by Stanford researchers Eyal Ophir, Clifford Nass and Anthony Wagner says it isn't so.

Attention, multitaskers (if you can pay attention, that is): Your brain may be in trouble.

People who are regularly bombarded with several streams of electronic information do not pay attention, control their memory or switch from one job to another as well as those who prefer to complete one task at a time, a group of Stanford researchers has found.

High-tech jugglers are everywhere -- keeping up several e-mail and instant message conversations at once, text messaging while watching television and jumping from one website to another while plowing through homework assignments.

But after putting about 100 students through a series of three tests, the researchers realized those heavy media multitaskers are paying a big mental price.

"They're suckers for irrelevancy," said communication Professor Clifford Nass, one of the researchers whose findings are published in the Aug. 24 edition of the *Proceedings of the National Academy of Sciences.*

"Everything distracts them."
Social scientists have long assumed that it's impossible to process more than one string of information at a time. The brain just can't do it. But many researchers have guessed that people who appear to multitask must have superb control over what they think about and what they pay attention to.

Is there a gift?
So Nass and his colleagues, Eyal Ophir and Anthony Wagner, set out to learn what gives multitaskers their edge. What is their gift?

"We kept looking for what they're better at, and we didn't find it," said Ophir, the study's lead author and a researcher in Stanford's Communication Between Humans and Interactive Media Lab.

In each of their tests, the researchers split their subjects into two groups: those who regularly do a lot of media multitasking and those who don't.

In one experiment, the groups were shown sets of two red rectangles alone or surrounded by two, four or six blue rectangles. Each configuration was flashed twice, and the participants had to determine whether the two red rectangles in the second frame were in a different position than in the first frame.

They were told to ignore the blue rectangles, and the low multitaskers had no problem doing that. But the high multitaskers were constantly distracted by the irrelevant blue images. Their performance was horrible.

Because the high multitaskers showed they couldn't ignore things, the researchers figured they were better at storing and organizing information. Maybe they had better memories.

The second test proved that theory wrong. After being shown sequences of alphabetical letters, the high multitaskers did a lousy job at remembering when a letter was making a repeat appearance.

"The low multitaskers did great," Ophir said. "The high multitaskers were doing worse and worse the further they went along because they kept seeing more letters and had difficulty keeping them sorted in their brains."

Still puzzled
Puzzled but not yet stumped on why the heavy multitaskers weren't performing well, the researchers conducted a third test. If the heavy multitaskers couldn't filter out irrelevant information or organize their memories, perhaps they excelled at switching from one thing to another faster and better than anyone else.
Wrong again, the study found.
The test subjects were shown images of letters and numbers at the same time and instructed what to focus on. When they were told to pay attention to numbers, they had to determine if the digits were even or odd. When told to concentrate on letters, they had to say whether they were vowels or consonants.

Again, the heavy multitaskers underperformed the light multitaskers.

"They couldn't help thinking about the task they weren't doing," Ophir said. "The high multitaskers are always drawing from all the information in front of them. They can't keep things separate in their minds."

The researchers are still studying whether chronic media multitaskers are born with an inability to concentrate or are damaging their cognitive control by willingly taking in so much at once. But they're convinced the minds of multitaskers are not working as well as they could.

"When they're in situations where there are multiple sources of information coming from the external world or emerging out of memory, they're not able to filter out what's not relevant to their current goal," said Wagner, an associate professor of psychology. "That failure to filter means they're slowed down by that irrelevant information."

So maybe it's time to stop e-mailing if you're following the game on TV, and rethink singing along with the radio if you're reading the latest news online. By doing less, you might accomplish more.

▼

**Multitasking Muddles Brains, Even When the Computer Is Off**
By Brandon Keim


Wired Science
Wired Magazine

Some people suspect that a multitasking lifestyle has changed how they think, leaving them easily distracted and unable to concentrate even when separated from computers and phones. Their uneasiness may be justified.
In several benchmark tests of focus, college students who routinely juggle many flows of information, bouncing from e-mail to web text to video to chat to phone calls, fared significantly worse than their low-multitasking peers.

Other studies have focused on multitasking’s immediate effects — children doing worse on homework while watching television, office workers being more productive when not checking email every five minutes.

“We wanted to ask a different question,” said Clifford Nass, a Stanford University cognitive scientist. “What happens to people who multitasking all the time?”

In a study published Monday in the Proceedings of the National Academy of Sciences, Nass and Stanford psychologists Anthony Wagner and Eyal Ophir surveyed 262 students on their media consumption habits. The 19 students who multitasked the most and 22 who multitasked least then took two computer-based tests, each completed while concentrating only on the task at hand.

First, they had to remember the briefly glimpsed orientations of red rectangles surrounded by different numbers of blue rectangles. In the second task, they were asked to categorize a random string of words, and then to do it again without categorizing words that were preceded by a beep.

In a third test, a different group of 30 high- and low-multitaskers were asked to identify target letters on a screen. As the test was repeated, they had to remember whether letters had also been targeted in earlier trials.

In every test, students who spent less time simultaneously reading e-mail, surfing the web, talking on the phone and watching TV performed best.

“These are all very standard tasks in psychology,” said Nass. “In the first, there’s lots of evidence that if people do poorly, they have trouble ignoring irrelevant information. For the second task, there are many demonstrations that this is a good reflection of people’s ability to organize things in their working memory. The third task shows how fast and readily people switch from doing one thing to another.”

As for what caused the differences — whether people with a predisposition to multitask happen to be mentally disorganized, or if multitasking feeds the condition — “that’s the million dollar question, and we don’t have a million dollar answer,” said Nass.

Wagner next plans to use brain imaging to study the neurology of multitasking, while Ness wants to look at the development of multitasking habits in children.
“The causality question is enormous here,” he said. “There’s a lot of social pressure to multitask. You’re getting tweets, e-mails, IMs from multiple people at once, and the web offers unbelievable opportunities for text and video. It may be thrust upon you.”


Read More http://www.wired.com/wiredscience/2009/08/multitasking/#ixzz0ema4zPav

Digital Overload Is Frying Our Brains

By Brandon Keim
Wired Science – Wired Magazine
http://www.wired.com/wiredscience/2009/02/attentionlost/

Paying attention isn’t a simple act of self-discipline, but a cognitive ability with deep neurobiological roots — and this complex faculty, says Maggie Jackson, is being woefully undermined by how we’re living.

In Distracted: The Erosion of Attention and the Coming Dark Age, Jackson explores the effects of "our high-speed, overloaded, split-focus and even cybercentric society" on attention. It’s not a pretty picture: a never-ending stream of phone calls, e-mails, instant messages, text messages and tweets is part of an institutionalized culture of interruption, and makes it hard to concentrate and think creatively.

Of course, every modern age is troubled by its new technologies. "The telegraph might have done just as much to the psyche [of] Victorians as the Blackberry does to us," said Jackson. "But at the same time, that doesn’t mean that nothing has changed. The question is, how do we confront our own challenges?"

Wired.com talked to Jackson about attention and its loss.

Wired.com: Is there an actual scientific basis of attention?

Maggie Jackson: In the last 30 or 40 years, scientists have made inroads into understanding its underlying mechanisms and physiology. Attention is now considered an organ system. It has its own circuitry in the brain,
and there are specialized networks carrying out its different forms. Each is very specific and can be traced through neuroimaging and even some genetic research.

While there is still debate among attention scientists, most now conclude that there are three types of attention. The first is orienting — the flashlight of your mind. In the case of visual attention, it involves parts of the brain including the parietal lobe, a brain area related to sensory processing. To orient to new stimuli, two parts of the parietal lobe work with brain sections related to frontal eye fields. This is what develops in an infants’ brain, allowing them to focus on something new in their environment.

The second type of attention spans the spectrum of response states, from sleepiness to complete alertness. The third type is executive attention: planning, judgment, resolving conflicting information. The heart of this is the anterior cingulate — an ancient, tiny part of the brain that is now at the heart of our higher-order skills. It’s executive attention that lets us move us beyond our impulsive selves, to plan for the future and understand abstraction.

We are programmed to be interrupted. We get an adrenalin jolt when orienting to new stimuli: Our body actually rewards us for paying attention to the new. So in this very fast-paced world, it’s easy and tempting to always react to the new thing. But when we live in a reactive way, we minimize our capacity to pursue goals.

Wired.com: What does it mean to be distracted?

Jackson: Literally, it means to be pulled away to something secondary. There’s also an interesting, archaic definition that fell out of favor in the 18th century: being pulled to pieces, being scattered. I think that’s a lovely term.

Our society right now is filled with lovely distractions — we have so much portable escapism and mediated fantasy — but that’s just one issue. The other is interruption — multitasking, the fragmentation of thought and time. We’re living in highly interrupted ways. Studies show that information workers now switch tasks an average of every three minutes throughout the day. Of course that’s what we have to do to live in this complicated world.

Wired.com: How do these interruptions affect us?

Jackson: This degree of interruption is correlated with stress and frustration and lowered creativity. That makes sense.
When you're scattered and diffuse, you're less creative. When your times of reflection are always punctured, it's hard to go deeply into problem-solving, into relating, into thinking.

These are the problems of attention in our new world. Gadgets and technologies give us extraordinary opportunities, the potential to connect and to learn. At the same time, we've created a culture, and are making choices, that undermine our powers of attention.

Wired.com: Has a direct link been measured between interruptions and neurophysiology?

Jackson: Interruptions are correlated with stress, and a cascade of stress hormones accompany that state of being. Stress, frustration and lowered creativity are pretty toxic. And there are studies showing how the environment shapes brain development in kids.

But I can’t say if attention fragmentation really rewire our brains.

When you sit at a desk for six hours multitasking like a maniac, are you actually rewiring parts of your attention networks? That’s difficult to say right now.

Wired.com: Is establishing that link the next scientific step?

Jackson: It’s one priority for future research. Right now, the field of attention science is especially concerned with attention development in children. The networks develop at different paces. Orienting is largely in place by kindergarten. The executive network is largely in place by age 8, but it develops until the mid-20s.

Understanding the sweet spots for helping kids develop attention is where the science is at.

Wired.com: So adults are out of luck?

Jackson: We do know that people’s attention networks can be trained, though we’re not sure how long-lasting the gains are. There are exercises and computer games designed to strengthen attention, sometimes by boosting short-term memory.
The only sort training going on now in the office world is meditation-based, and that's being used more for stress rather than to boost attention, although it does do that. In terms of mainstream research, there's nothing I'm aware of that's being done to help the average adult, though there's tremendous interest in what's possible.

But there are ways to cut back on the multitasking and interruptions, shaping your own environment and work style so that you better use your attentional networks. If you have a difficult problem or a conundrum to solve, you need to think about where you work best. Right now, people hope they'll be able to think or create or problem-solve in the midst of a noisy, cluttered environment. Quiet is a starting point.

The other important thing is to discuss interruption as an environmental question and collective social issue. In our country, stillness and reflection are not especially valued in the workplace.

The image of success is the frenetic multitasker who doesn’t have time and is constantly interrupted. By striving towards this model of inattention, we're doing ourselves a tremendous injustice.

Wired.com: The subtitle of your book predicts a "coming dark age." Do you really believe this?

Jackson: Dark ages are times of forgetting, when the advancements of the past are underutilized. If we forget how to use our powers of deep focus, we’ll depend more on black-and-white thinking, on surface ideas, on surface relationships. That breeds a tremendous potential for tyranny and misunderstanding. The possibility of an attention-deficient future society is very sobering.

Read More http://www.wired.com/wiredscience/2009/02/attentionlost/#ixzz0emadVyUP

Cell phones and ADHD

CNN
By Dr. Sanjay Gupta
CNN Chief Medical Correspondent
http://pagingdrgupta.blogs.cnn.com/2008/05/20/cell-phones-and-adhd/

I am one of those people who is on his cell phone all the time. Between the hospital and my job as a reporter, I get a lot of calls, especially when I am on the road. So, like many people, I pay attention when I read new studies about cell phones and possible health effects. The good news is that most of the studies out there have shown
no reason to worry. In fact one study out of Denmark of 52,000 cell phone users who'd used cells for 10 plus years found the incidence of tumors was even less than the general population. The cell phone industry is quick to point out that "the overwhelming majority of studies show wireless phones do not pose a health risk."

So, what to make of the fact that Dr. Vini Khurana out of Australia and Dr. Keith Black out of Los Angeles, who are both neurosurgeons, have voiced concerns about cell phones and brain cancer? And, just today, there is a new study of cell phones and pregnant women. That study found women who used cell phone two to three times a day while pregnant had children that were 54 percent more likely to develop ADHD and other behavioral problems. And, if those children used cell phones before age 7, they were 18 percent more likely to develop ADHD. (Watch Dr. Gupta’s report here)

Now, as we dug into this story, we found even the study authors acknowledge that there is no causal link. That means there is no cause-and-effect relationship. It could be that young children who are on their cell phones a lot are also more prone to developing ADHD. Or, on the other hand it could mean that cell phones cause problems we haven’t even imagined. We don't know. What we do know: Most cell phones emit between 850 and 1900 MHz of non-ionizing radiofrequency (RF) energy. It is different from the ionizing radiation from a medical X-ray. It can also make your speakers hum when you walk by them.

So, what do you think? Black, who is also the chair of neurosurgery at Cedars Sinai Hospital, believes that the science simply hasn’t caught up and that we would all be well served by taking precautions. He always uses an earpiece. What about you? Are you concerned about cell phones and health effects or is this not a big deal?

Editor’s Note: Medical news is a popular but sensitive subject rooted in science. We receive many comments on this blog each day; not all are posted. Our hope is that much will be learned from the sharing of useful information and personal experiences based on the medical and health topics of the blog. We encourage you to focus your comments on those medical and health topics and we appreciate your input. Thank you for your participation.

▼

ADHD and the Myth of Multitasking: How to Regain Your Focus
Health.com
Lead writer: Gretchen Roberts
http://www.health.com/health/condition-article/0,,20255244,00.html
Whether you have adult attention deficit hyperactivity disorder (ADHD) or are just a busy person on the go, you've probably developed your own strategies for multitasking: paying bills while checking email, preparing for a meeting while cooking dinner, or spending time with your kids while scribbling down to-do lists. And you probably think you're pretty efficient when you multitask, right?

Think again.

A growing body of research shows that people who try to manage more than one unrelated task at the same time typically don't perform as well; drivers chatting on cell phones, for instance, take longer to reach their destinations, a 2008 University of Utah study found.

“That’s the myth of multitasking,” says Edward Hallowell, MD, ADHD specialist and author of CrazyBusy: Overstretched, Overbooked, and About to Snap! Strategies for Handling Your Fast-Paced Life. “It’s like playing tennis with two balls: Your game’s not as good as it would be with one ball.”

How to stop?
Strive to give each task your full attention. Dr. Hallowell tells of a lawyer who negotiated an amazing deal. Later, the adversaries couldn’t believe they’d agreed to such terms. The savvy lawyer’s secret? He focused on the deal only, while the other team checked their PDAs.

You can achieve this type of focus if you go linear—do one thing at a time, moving from one task to the next. Try it: Instead of talking on the phone while answering emails and helping your child do homework, go linear; it won't take longer and you’ll be sharper.

This content was first published in Health magazine, August 2008. Read the full article, Making Time for Me.

▼

Multitasking makes us stupid?
http://headrush.typepad.com/creating_passionate_users/2006/03/multitasking_ma.html

I'm typing this while talking on my cell phone to one person and IMing another. Am I fooling myself that I can actually do these three things without a loss of quality? No... because I know I can't. I understand that what most of us call multitasking comes with a steep price tag.
But where I once believed that the myth of multitasking was about time (that doing four things simultaneously takes much longer than to do those same four things in sequence), scientists now know it's also about quality. And it gets worse... it's not just that the quality of those four things in parallel will suffer, it's that your ability to think and learn may suffer. Some researchers believe that all this constant, warpspeed, always-on multitasking is causing young people, especially, to become less able to follow any topic deeply. (more on that in another post) Perhaps the biggest problem of all, though, is that the majority of people doing the most media multitasking have a big-ass blind spot on just how much they suck at it.

We believe we can e-mail and talk on the phone at the same time, with little or no degradation of either communication.

We believe we can do homework while watching a movie.

We believe we can surf the web while talking to our kids/spouse/lover/co-worker.

But we can't! (Not without a hit on every level—time, quality, and the ability to think deeply)

From the current cover story in Time magazine:

"Decades of research (not to mention common sense) indicate that the quality of one's output and depth of thought deteriorate as one attends to ever more tasks."

And according to Jordan Grafman, chief of the cognitive neuroscience section at the National Institute of Neurological Disorders and Stroke:

"Kids that are instant messaging while doing homework, playing games online and watching TV, I predict, aren't going to do well in the long run."

And from this study on young people and media use:

"Nearly one-third (30%) of young people say they either talk on the phone, instant message, watch TV, listen to music, or surf the Web for fun "most of the time" they're doing homework."

The news is not all bad, of course -- from the Time article:
"The breadth of their knowledge and their ability to find answers has just burgeoned...but my impression is that their ability to write clear, focused and extended narratives has eroded somewhat."

And yes, we are all able to do some form of multitasking--some can even win an Olympic gold medal listening to an iPod. But the brain science helps explain this--we can do two things at once as long as one of them is something we've practiced so much that it doesn't require any sort of cognitive planning (there's a lot about this in the Time article).

The main problem today is that cognitive overload--provoked by so much media to attend to--is happening at a pace our poor little hunter/gatherer brains never evolved to deal with, and there's only so much that neural rewiring can do. And of course this is all very recent. When I was in high school, there were no iPods. There were no cell phones. No web, email, or IMing. No blackberrys. No PSP. (How did we ever survive? asks my daughter.) Multitasking for me in high school meant a ripping game of 1-bit Pong while simultaneously flirting with the geek from my history class.

Whenever I talk about the big myth of multitasking, people always come up to tell me how they themselves just "have the kind of brain that can do this." Riiiight. They don't. I don't. You don't. And maybe you'd realize it if you turn off your cell phone, disable IM, mute the little "ding" alarm that says you've got email, and just sit there for a few moments.

The big problem for most young people, it seems, is that they don't know how to "just sit there." They get the shakes after just a few minutes without media stimulation. But that is also a whole separate topic I'll get to very soon...

One of the most interesting things discussed in the Time article is that neuroscientists have established the specific area of the brain responsible for context switching. And unfortunately for some of us, it appears that this part of the brain performs less well as our brain ages. In a nutshell, the older we get, the less quickly and effectively we can multitask. But... most parents of teenagers already know that we have no frickin' idea how our kids manage to do what they do simultaneously. The key issue, though, is that while we now know they're better at it than we (the parents) are, they aren't half as good at it as they think they are.

And chances are, you aren't as good at it as you think you are. ; )
In Nurture Your Inner Slacker, I suggested a connection between multitasking and the lack of available time for thinking. To summarize: Many people respond to information overload and task overload by multitasking. As a result, due to to (a) taking o... [Read More]

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» Multitasking vs. multigoaling from Muses et essais
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» Links for Charles from ntschutta.com
The other day I gave a presentation with a set of links in it and when I mentioned that to my friend Charles (no, not that one) he said post them to the blog. So, let it never be said I dont listen to my constituents! First and foremost is an in... [Read More]

INJURIES AND CELL PHONES

Injuries evolve along with new gadgets
Erin Allday, Chronicle Staff Writer
Tuesday, February 2, 2010
http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2010/02/02/MNNR1BR271.DTL

Smart phones and laptops, handheld video games and MP3 players, and now, perhaps, Apple's new iPad - the latest technology is great, but it is also a literal pain in the neck, doctors say.

And not just the neck, either. All these newfangled gadgets also are hurting our backs, shoulders, arms and hands. The kids are suffering from "text thumb" and their parents are getting "BlackBerry neck."
"I have a lot of patients who come in and say my mom is 80 years old, I'm 50, and I've got more pain than her," said Dr. Srinivas Ganesh, a sports medicine specialist with Kaiser Permanente in Redwood City. "But we have a much more sedentary lifestyle, and much more computer interfacing with laptops and PDAs and cell phones. We see a lot of poor posturing, a lot of stress on the wrists."

Strains and pains caused by modern technology are hardly new - workplace ergonomics is a multimillion-dollar industry, and pretty much anyone who's ever typed on a computer keyboard knows all about carpal tunnel syndrome.

**New gadgets, new pains**

But orthopedists and others who specialize in muscle and joint injuries say there's no question that the surge of handheld technology is leading to a new wave of aches and pains. Doctors say they struggle now to keep up with the latest equipment and what it might mean for their patients. Apple's new iPad, for example, has caught the attention of doctors who wonder what new complaints they'll hear.

"The engineers spend a lot of time thinking about how people use new devices. But when you release them to a large population, you run into issues that were never perceived beforehand," said Dr. Matthew Smuck, an assistant professor of orthopedic surgery at the Stanford Spine Center. "That's what happened with desktop computers, and there's a whole science behind ergonomics now."

The neck and upper back seem to be taking the brunt of the pain. Laptops are a big culprit, because as the name implies, many people sit with them in their laps. That might be convenient, but it usually means the screen is too low to be comfortable, and people have to hold their heads at an awkward angle, which strains muscles in the back and neck.

Smart phones and other handheld devices like MP3 players can be even worse for the back and neck, since people hold them even lower than laptops and the screens are so small.

**Hard on the thumbs**

For people who send upward of 100 text messages a day, the pain is usually focused on their thumbs and wrists. The thumb muscles, which spread across the back of the hand and into the wrist, aren't used to all that up-and-down motion.
The tiny keyboards that are becoming increasingly standard on cell phones might make texting easier and faster, but it's not helping with thumb injuries. The keys are so small that it just means the thumb muscles have to work harder, Ganesh said.

"And the thumbs don't get any rest because they're constantly text messaging," he said. "Our fingers are pretty good with the flexion, but every time we lift them up we use tendons that go over the top and side, and that motion can cause a tendonitis to occur right at the wrist."

**Take a break**

The cure for thumb injuries is usually to cut back on text messaging - hardly a palatable treatment to anyone who is addicted to texting. Fortunately, doctors say, treating most other technology-related injuries is less challenging.

The most important preventive tool is simple awareness, say doctors and others who treat back and neck pains. People who regularly use handheld technology - or even a desktop computer or laptop - should take frequent breaks.

They should get up and walk around at least once an hour. To prevent eyestrain, they should frequently look away from the screen and focus on an object in the distance. Every 10 minutes or so, they should stop for a few seconds to make sure nothing hurts.

"There needs to be a lot more self-awareness. We get so wrapped up in the work we do that we sometimes don't bother to check in with our bodies," said Gary Witt, director of San Francisco School of Massage. "These devices are supposed to be making everything simpler for us, but there are more physical ailments coming from them."

**Tech Age health tips**

**Limit texting:** Don't send too many text messages. If your thumbs or wrists hurt from texting, cut back.

**Rest:** Every five or 10 minutes, take a brief break to listen to your body and move around if you're uncomfortable.

**Move:** When sitting at a laptop or desktop computer, take a break at least once an hour and stand up and walk around.

**Look away:** When looking at a small screen - watching a movie on an iPod, for example, or reading e-mails on a PDA - look up frequently and focus your eyes on something far away to help prevent eyestrain.
Support elbows: Rest your elbows on an armrest or tuck them into your sides to support your arms and shoulders when using a handheld device. This also raises the screen closer to eye level, which alleviates neck stress.

Call a doctor: If you feel sharp pain, pain shooting down your arms, or tingling in your hands and fingers, see a doctor.

Read more: http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2010/02/02/MNNR1BR271.DTL#ixzz0eP4g8J6s

BLOGGER’S COMMENT

After teaching at the HS level for 15 years I have quit teaching in the classroom and have decided to lecture/educate our students, parents and faculty as well as businesses about this form of media that is not going to go away. In addition to sexting, texting inappropriate messages students are receiving texts all day long. In the middle of an essay, 'bzzz bzzz', how in the world will they be able to remain focused when that text is so appealing? Writing that essay at home, 'ring' google chat opens up. My sons "admirer" has a very provocative Facebook photo. You all know the one, lips pursed, chest pushed in. We have rules and checkpoints with all our electronic devised. "If the pics on your phone don't match the bill..." There will be ramifications. My former school district did not allow cell phones to be carried by the students. Everyone had one anyway. Many had two, three. I'm sure you all know about that. The one the parents gave them. The boyfriend's cell and the misc cell. Pay as You Go should be called, "Text so your parents wont know phone" Should we talk about grammer? No! My youngest texts, you never writes otherwise. At least he's using the written language. He'll learn how to spell know with all four letters. BTW, my wife and I text all the time. Last night she told me I didn't respond to her closing,"I love you." as many times as I should have. I 'll work on that. Did Prohibition work? Did AA? Much more successful... TTYL;)}