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EMF Exposures May Explain Decades-Long Decline in Sperm Quality

July 3... Exposures to ambient magnetic fields may affect the quality of human sperm and may well explain its well-documented decline over the last few decades. De-Kun Li, an epidemiologist at Kaiser Permanente in Oakland, CA, has found that daily exposures of only 1.6 mG or higher for at least two-and-a-half hours were associated with significantly poorer semen quality. Men who were exposed to over 1.6 mG for over six hours a day were four times more likely to have substandard sperm.

"The longer you are exposed, the higher the risk," Li told *Microwave News*. He presented these findings last week at the annual meeting of the **Society for Epidemiologic Research**, held in Chicago. He has submitted them for publication.

"If it holds up, this would be very important because magnetic field exposures are ubiquitous," Li said. "We know that sperm quality has been going down for a long time with the largest declines in urban areas. That would be consistent with EMF exposures which are highest in cities."

The quality of the semen was assessed according to WHO criteria for motility and morphology—that is, the ability of sperm to "swim" (to the egg) and their shape. "Sperm quality could turn out to be a sensitive endpoint to study the biological effects of EMFs," Li said.

Li is one of the few to explore new ways of defining what is a biologically significant dose of EMFs. An important implication of his new study is that while he might classify a man as being in a "high" exposure group, that same man could still have a time-weighted, 24-hour average exposure of less than 1 mG, which would put him in the "unexposed" group in most past studies. Such a misclassification would reduce the chances of seeing this effect.

In a **study** published in 2002, Li showed that women exposed above a certain threshold (16 mG) had higher rates of miscarriages (see **MWN, J/F02**, p.1). At the time, many considered that this new concept of EMF dose was worth pursuing. But, in fact, no one did—at least no one has yet published a follow-up study. "In that earlier study we saw higher miscarriage risks among women who had an exposure of more than 16 mG at least once a day," Li said, "in our new study, men had poorer sperm quality if they were exposed to a much lower field but it had to be for at least 10% of the day."

The power-frequency fields implicated in this new study are extremely weak. They are approximately 1,000 times lower than the current **ICNIRP** guidelines and some three times lower than what many see as the threshold for increasing the risk of childhood leukemia (3-4 mG). According to a large-scale survey carried out a decade ago, close to 15% of the U.S. population is exposed to an average of more than 2 mG over a 24-hour period (see **MWN, M/J98**, p.4).

(continued on p.2)

SARs Are Twice as High For Children Under Eight

July 22... The brains of young children absorb twice as much as RF energy from a cell phone as those of adults, according to a new set of calculations carried out by Joe Wiart's research group at France Telecom in the suburbs of Paris.

"[Our] analysis confirms that peripheral brain tissues of children seem to be higher exposed than the peripheral brain tissue of adults," Wiart concludes in a **paper** that appears in the July 7 issue of *Physics in Medicine and Biology*. "Children are not simply small adults," Wiart explained in an interview with *Microwave News*. "Their skin and their skulls are thinner than those of adults, and their ears are smaller too," he said. "Given these differences, the higher **SAR** for children is not surprising,"

These new findings apply to children who are eight years old or younger. Above the age of eight, the SARs in children are much like those of adults, according to Wiart.

"I agree with Joe," said Niels Kuster, the director of the **IT'IS Foundation** in Zurich. A team led by Kuster and Andreas Christ recently completed a **project** for the German Federal Office of Radiation Protection (**BfS**), which like Wiart, found that regions of the brains of young children can have exposures that are twice those of adults—or even higher.

Even more striking, Kuster and Christ concluded that the "exposure of the bone marrow of children can exceed that of adults by about a factor of ten." They also report that children's eyes are more highly exposed than those of adults.

Whether or not children are at a greater health risk than adults has been debated since at least the year 2000, when a U.K. **panel** chaired by Sir William Stewart advised that parents limit their children's use of mobile phones. Since then, other government groups, especially those in France and Germany, have issued similar precautionary recommendations.

The mobile phone industry has long disputed the possibility that children are at any greater risk. For instance, earlier this year after the French Ministry of Health **reiterated** concerns

over children's use of cell phones, the **MMF**, an industry lobby group, issued an **advisory** stating that cell phones do not present health risks to any users "regardless of age."

The MMF has relied heavily on **statements** issued by the WHO's **EMF Project** in Geneva, and the **Health Council of the Netherlands**. For instance, in a **paper** published in 2004, the Health Council concluded that: "There is no convincing scientific data to assume a difference in the absorption of electro magnetic energy in heads of children and adults."

U.S. Cancer Institute Director Favors Precaution

July 23... One of the hallmarks of the cell phone health controversy has been the silence of the U.S. public health communities. No medical, consumer, environmental or labor group has called for precaution, or even for more research. The **American Cancer Society**, for instance, has adopted a what-me-worry approach. Indeed, **CTIA**, the industry lobby group, routinely refers press inquiries about possible health impacts to the ACS. As for the **Consumers Union**, it has decided not to get involved, preferring instead to advise its members on how to pick the best phones and find the best service contracts.

Ronald Herberman, the director of the **University of Pittsburgh Cancer Institute**, has taken a new course. In a **memo** to the institute's faculty and staff released today—and featured on the front page of the *Pittsburgh Post-Gazette*—Herberman offers "practical advice" to limit exposures from cell phone radiation (see also the accompanying "**The Case for Precaution in the Use of Cell Phones**"). These recommendations include: "Do not allow children to use a cell phone, except for emergencies." The Pittsburgh initiative follows from the Appeal for Caution launched in France last month by **David Servan-Schreiber** (see **June 19** post). Among the Americans who have signed the appeal are **David Carpenter**, **Devra Davis** and **Dan Wartenberg**.

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Memo to AP: Call Rewrite Tumor Study Facts Wrong

July 25... At this writing, Google News has a list of some 900 articles on the cell phone health **alert** issued by the University of Pittsburgh a couple of days ago. The *Post-Gazette*, the hometown paper, broke the story on the same day (it got an advance copy), and though some newspapers like the *Baltimore Sun* ran their own write-ups, the vast majority relied on the **Associated Press** for their coverage.

Unfortunately, the AP reporters made a hash of it. Their story suffers from a number of serious errors as well as misplaced emphases, which made it seem as if the actions of **Ronald Herberman**, the director of the University's Cancer Institute, were misguided and inconsistent with the published literature.

Here are some corrections and clarifications:

- The AP reporters cite a 2008 University of Utah **meta-analysis** of nine published studies as finding no brain tumor risks among cell phone users. In fact, it did point to a 25% increase among long-term users, that is, those who had used a mobile phone for ten or more years. This increase reached (just) statistical significance.

- The AP states that Herberman is relying on the as-yet unpublished **Interphone** study, a 13-country effort to investigate possible tumor risks from cell phone use. It's true that the overall Interphone results have not yet been public—it's now close to three years behind schedule—but a number of the participating countries, either individually or in groups, have reported elevated incidences of three different types of tumors: glioma (brain tumors), acoustic neuroma, and parotid gland tumors among long-term users. These findings have been published in leading peer-reviewed journals.

- The AP states that the Interphone study suffers from selection bias and casts doubt on the reliability of its risk estimates. This remains an open and highly contested issue among members of the project team and is a major reason for the delay in the release of the final results. While the NRC's recent **report** cites selection bias as a possible confounder, it also details other reasons as to why the Interphone study may underestimate the risks. It is far too early to toss out the project's final results as unreliable. Shouldn't we at least wait for it to be published before trashing ten years of work?

- While the French Interphone **study** does not show significant elevated risks, it does point to increases. These were sufficiently strong to prompt the French Ministry of Health to issue an **advisory** reiterating the recommendation that children be discouraged from using mobile phones.

- It's true that most studies have not indicated a tumor risk, but most of these have only looked at short-term users. For in-

stance, the **Muscat study** included only 17 cases which had used a phone for four or more years. The **NCI study** also had very few long-term users: 22 who had used a cell phone for five years or more. Neither discloses how many had used a phone for at least ten years—maybe none.

- It's also true that the **Danish study** showed no increased risks. But as a cohort study it could not provide any information on the side of the head the phone was used, which, not surprisingly, turns out to be a key variable. The study also excluded corporate accounts, which tended to have the heaviest users.

To be sure, the jury is still out on cell phone health risks. That said, it will be a long time before we know what the true risks may be. It seems that the **American Cancer Society** is waiting for conclusive data showing elevated tumor rates before it is willing to advise caution. And some like physicist **Robert Park** will never acknowledge there might be a risk regardless of what studies might show.

What we have now are highly suggestive results from a number of different Interphone groups, as well as those from a separate team led by Sweden's **Lennart Hardell**, that point to long-term health risks. Surely it is time to have an open discussion on what these data mean and how we should protect the most vulnerable in our society. After all, there are now 260 million regular users in the U.S. and more than two billion worldwide, and the wireless phone industry, still looking to grow, is marketing its phones to younger and younger children. This is exactly what Herberman has achieved with his alert.

They say journalism is the first draft of history, but in this case the AP story was a rough draft at best. We should also understand that writing a story on a complicated subject under a tight deadline is far from easy. Reporters must rely on their sources to point them to the facts. In this case, they were misled by those who want to play down the risks so that our love affair with cell phones can continue unchallenged.

Larry King On Cell Phones Second Time Around

July 29... The University of Pittsburgh Cancer Institute's alert continues to attract media interest. CNN's *Larry King Live* ran a second show on the subject of cell phone health risks tonight. (The last one was on **May 27**.) The guest list included: **Keith Black**, a neurosurgeon at the Cedars-Sinai Medical Center in Los Angeles, **Otis Brawley**, the chief medical officer of the American Cancer Society, **Devra Davis** of the University of Pittsburgh Cancer Institute, **Sanjay Gupta**, CNN's chief medical correspondent, **Paul Song**, a radiation oncologist in Los Angeles and **Ted Schwartz**, a brain surgeon at the Columbia-Presbyterian Medical Center in New York City. Black, Gupta and

Schwartz were also on the May 27 show.

Brawley called for the release of the **Interphone** study on the possible cell phone-tumor link:

“I think we’re going to have to look at the Interphone Study very carefully. For those listeners who don’t know, the Interphone Study is run by the World Health Organization of the United Nations. It’s actually been completed for about two and a half years and the people who actually ran the

study have yet to publish it. There’s a lot of discussions going on amongst those scientists as to exactly what the data show. And it would be really nice if it were published, I must tell you.”

A **transcript** of the broadcast is now available, and NEXT-UP, the European activist organization, has posted a **video** of the 23-minute segment on its Web site. See also CNN’s “**5 Tips To Limit Your Cell Phone Risk**” out today.

Interphone Study May Be Released in Late Fall

August 1... The results of the **Interphone** study may finally surface by the end of the year. In an interview with *Le Monde*, published today, Elisabeth Cardis said the paper with the combined data from the 13 participating countries should be submitted for publication in September. If the peer-review process proceeds smoothly, it should then be available in the late fall. Cardis, the leader of the Interphone project who is now at **CREAL** in Barcelona, confirmed the schedule to *Microwave News*.

A couple of weeks ago, **Martine Hours**, the head of the French Interphone team, explained the reason for the delay to

L’Express, a news weekly. While the Interphone data do point to an elevated tumor risk among long-term cell phone users, Hours said, one-third of the Interphone researchers believes the observed excess is an artifact due to bias in the study. Another third thinks that the observed effect is in fact real, while the others are agnostic, arguing that it is impossible to reach a conclusion. Cardis agrees with Hours’s breakdown. “There are indeed three groups of roughly similar size,” she told us.

“It’s high time to publish the results and air our disagreements,” Hours said in her interview with *L’Express*. “The longer we wait, the more the rumor mill will keep on growing.”
