Biomedicine

Cellular telephones and pacemakers

People who rely on a pacemaker to regulate their heartbeat should heed a new report. It suggests that some cellular telephones can interfere with the device, which emits an electric signal to keep the heartbeat on track.

David L. Hayes of the Mayo Clinic in Rochester, Minn., and his colleagues studied 980 people with pacemakers. The team had these people use a variety of cellular phone models in more than 5,500 tests. Results of the study appear in the May 22 New England Journal of Medicine (NEJM).

The findings apply only to cellular phones, not cordless household phones.

The researchers found that in 20 percent of the tests, the cellular phone altered the pacemaker's function, resulting in abnormalities in heart rhythm. Only rarely did people experience noticeable effects such as dizziness or lightheadedness, the researchers said. These effects nearly always occurred when a volunteer held the phone directly over the pacemaker. When patients held the phone to their ear, they did not experience any such effects, Hayes says.

Patients who use cellular phones should keep them out of their breast pockets, where the phones may be close to or directly over a pacemaker, comments Donald M. Witters Jr. of the Food and Drug Administration in Rockville, Md. To receive calls, a cellular phone must periodically transmit a signal to its home base. That signal can interfere with a pacemaker's regulation of the heartbeat, he says.

Hayes contends that "there's no significant public health risk" to pacemaker patients who use cellular phones properly. Nonetheless, FDA has asked manufacturers to begin designing pacemakers that reject any interference from cellular phones or other wireless technology.

The NEJM study was supported by grant money from Wireless Technology Research, a Washington, D.C., group funded primarily by the cellular phone industry. —*K.F.*

Moles heighten skin cancer risk

In 1976, Wallace H. Clark Jr. saw a patient who had a history of malignant melanoma, a deadly form of skin cancer. The patient had a "startlingly high number of moles" that looked unusual to Clark. The patient's mother was also present, and Clark decided to examine the mother's skin for evidence of abnormal moles. His hunch paid off: He found an undiagnosed malignant melanoma on the mother's arm.

That experience sparked Clark's interest in studying the relationship between moles and melanoma. Clark, now at Harvard Medical School in Boston, and his colleagues have just published a report that has practical implications for people worried about skin cancer.

The team studied 738 melanoma patients and more than 1,000 controls—people who had gone to a hospital clinic for reasons other than skin cancer. The researchers' findings suggest that people with 50 or more small, yet normal-looking moles have twice the melanoma risk of people with 25 or fewer such moles.

Abnormal-looking moles heightened the danger of melanoma, the researchers report in the May 14 Journal of the American Medical Association. People with one abnormal mole had twice the melanoma risk of people with no abnormal moles; people with 10 or more normal moles increased their risk of this cancer 12-fold, the team reports.

If malignant melanomas are caught early enough, patients have an almost 100 percent cure rate. "There is a compelling reason to identify people at high risk," Clark told Science News.

People should ask their doctor about conducting a whole-body examination of the skin, Clark says. Those with many moles or unusual moles may need regular skin examinations, he adds. —*K.F.*

Earth Science

From a meeting in Baltimore of the American Geophysical Union

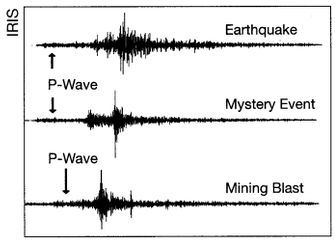
Australia's enigmatic tremor

When a small tremor shook the remote Australian Outback on May 28, 1993, the seismic event went unnoticed except by the few local residents. Since then, the modest, magnitude 3.6 shock has succeeded in capturing the ever-growing attention of geoscientists, who are struggling to get to the bottom of this strange case.

The hunt for clues began in 1995, when the U.S. Senate's permanent subcommittee on investigations asked a consortium of seismologists whether the 1993 event could have been a nuclear blast. Senate staff raised the question because the tremor had originated near a ranch in western Australia frequented by members of the Japanese doomsday cult Aum Shinrikyo. After the cult was linked to a 1995 poison gas attack in the Tokyo subway, U.S. authorities learned that the same group had been conducting secret nuclear experiments on the Australian ranch, aimed possibly at building a bomb.

Seismologists with the Incorporated Research Institution for Seismology (IRIS) in Washington, D.C., examined data from the closest digital seismic station, located 650 kilometers from the mystery event. They compared readings from past earthquakes and mining blasts in the vicinity of the 1993 tremor.

Blasts begin abruptly with large primary (P) waves, whereas this event started with relatively weak P-waves—a sequence typical of earthquakes, says Christel B. Hennet of IRIS. The difference is quite easy to spot with large seismic signals, but it becomes harder to distinguish as they approach the size of the Australian event. Despite the ambiguities, says Hennet, "we're able to tell that it wasn't an explosion by the characteristics of the seismic signal."



Comparison of seismograms from the 1993 mystery tremor (middle), a nearby quake (top), and a local blast (bottom).

The case didn't end there, however. Eyewitnesses to the event mentioned seeing a bright flash of light and hearing a loud explosion near the time of the shock. Although such accounts are often inaccurate, Hennet and her colleagues began to wonder whether a meteorite impact caused the quake.

It is difficult to test this idea, she explains, because scientists do not know what kinds of vibrations would come from such a crash. "No meteorite strike has ever been recorded seismically. This would be the first one," says Hennet.

The seismologists had to resort to producing artificial seismograms from hypothetical meteorite impacts. Using these, they calculated that a 2-meter-wide iron meteorite could have generated the observed seismic waves.

If such a sizable chunk hit Earth, it should have produced a crater the size of a football field, says IRIS' Gregory E. van der Vink. Researchers at Sandia National Laboratory in Albuquerque, N.M., are now searching for hints of a crater on satellite images of the region. It is not clear where they should look, though. The weakness of the vibrations makes it difficult to pinpoint their exact origin.

"This is definitely the weirdest thing I've ever been involved with," says van der Vink. He notes, though, that the exercise of analyzing the event is quite similar to what international monitoring teams must do to verify compliance with the recent worldwide ban on nuclear weapons testing (SN: 5/11/96, p. 298). When a suspicious event occurs in the future, teams will need to determine whether it originated from a blast, an earthquake, or a meteorite. They must also locate the seismic source precisely so that inspectors can reach the site quickly. —*R.M.*