Physical by Smartphone Becoming Real Possibility

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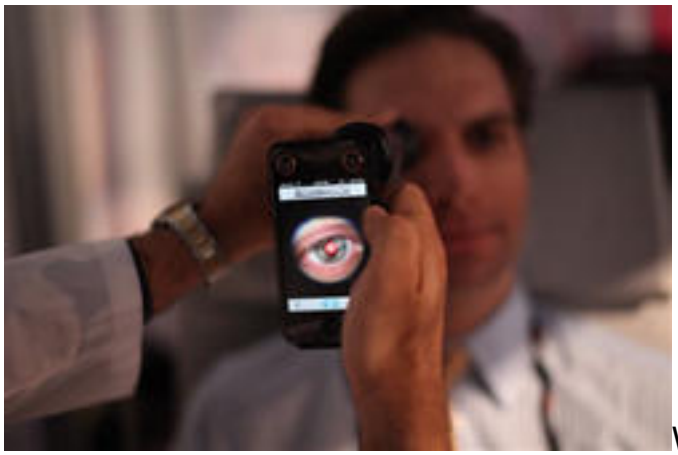

WASHINGTON (AP) — It's not a "Star Trek" tricorder, but by hooking a variety of gadgets onto a smartphone you could almost get a complete physical — without the paper gown or even a visit to the doctor's office.

Blood pressure? Just plug the arm cuff into the phone for a quick reading.

Heart OK? Put your fingers in the right spot, and the squiggly rhythm of an EKG appears on the phone's screen.

Plug in a few more devices and you could have photos of your eardrum (Look, no infection!) and the back of your eye, listen to your heartbeat, chart your lung function, even get a sonogram.

If this sounds like a little too much DIY medical care, well, the idea isn't to self-diagnose with Dr. iPhone. But companies are rapidly developing miniature medical devices that tap the power of the ubiquitous smartphone in hopes of changing how people monitor their own health.

"We wanted to make sure they have all the right tools available in their pocket" is how Joseph Flaherty of AgaMatrix describes his company's tiny glucose monitor. Diabetics can plug the iBGStar into the bottom of an iPhone and check blood sugar on the go without carrying an extra device.

This mobile medicine also might help doctors care for patients in new ways. In March, prominent San Diego cardiologist Eric Topol tweeted "no emergency landing req'd" when he used his smartphone EKG to diagnose a distressing but not immediately dangerous irregular heartbeat in a fellow airplane passenger at 30,000 feet.

And the University of California, San Francisco, hopes to enroll a staggering 1

million people in its Health eHeart Study to see whether using mobile technology, including smartphone tracking of people's heart rate and blood pressure, could help treat and prevent cardiovascular disease.

The question: Do smartphone devices really work well enough for the average patient and primary care doctor to dive in, or are early adopters just going for the cool factor? Many of the tools cost $100 to $200, there's little public sales information yet, and it's not clear how insurers will handle the fledgling trend.

"Technology sometimes evolves faster than we're ready for it," cautioned Dr. Glen Stream of the American Academy of Family Physicians. "We're recognizing more and more that not all care needs to be delivered face to face," but only if people measure the right things and have a relationship with a doctor to help make good use of the findings, he stressed.

Addressing a recent TEDMED conference in Washington, Dr. Susan Desmond-Hellmann, UCSF's chancellor, put the challenge this way: "How does mobile monitoring become something more than a toy, or something interesting? How does it connect to how I'm cared for by my caregiver?"

About 300 doctors, health policy wonks and others attending that high-tech meeting received what was dubbed a "smartphone physical" from medical students using 10 of the latest devices. The Food and Drug Administration has approved a number of the gadgets for sale; others are experimental prototypes gathered for the demonstration by Nurture by Steelcase and the doctor website Medgadget.

"It's going to be our generation that adopts most of these," noted Shiv Gaglani, a Johns Hopkins medical student who helped organize the project.

The FDA cites industry estimates that 500 million smartphone users worldwide will use some type of health app by 2015. Today's apps mostly are educational tools, digital health diaries or reminders and fitness sensors. The new trend is toward more sophisticated medical apps, some that work with plug-in devices, that provide information a doctor might find useful.

Some of the devices sell by prescription or on drugstore shelves, while others like the diabetes monitor and blood pressure cuff have entered a new venue for medicine — the Apple store.

Simplicity is part of the idea. Take the AliveCor Heart Monitor. Snap it on like a smartphone case, place fingers on the sensors — no sticky wires on the chest — and you've got an EKG recording in 30 seconds. The FDA approved sale of the $199 device in December for doctors to use in exams or to prescribe for patients to use on themselves.

It doesn't measure as much as a full-scale EKG, and patients must email the recording to a doctor for analysis. But heart patients frequently experience palpitations that have ended by the time they reach a cardiologist — and emailing an on-the-spot EKG reading might help the doctor figure out what happened, said

AliveCor co-founder Dr. Dave Albert.

"This is a brand-new technology. We're trying to understand how people will use it," said Albert, whose company also is seeking FDA permission to sell the device over the counter.

Welch Allyn's iExaminer taps the smartphone's camera to photograph deep inside the eye — the orange view of the retina filling the phone's screen.

Similarly, CellScope Inc. is developing an otoscope — that magnifier doctors use to peer into the ear — that can snap a photo of the eardrum. It's not for sale yet, but might parents one day email that kind of picture to the pediatrician before deciding whether Johnny needs an office visit?

And University of Washington researchers are testing a way to measure lung function in people with asthma or emphysema as they blow onto the phone and it captures the sound. Today, those measurements require blowing into special machines.

Insurers are studying what smartphone technology to pay for. For example, health care giant Kaiser Permanente is about to begin a project in Georgia to sell the iBGStar alongside other diabetes monitors in its on-site pharmacies. The project will determine whether patients like the smartphone monitor, if it improves care — and if so, whether the readings should beam

into patients' electronic health records, in Georgia and in other Kaiser regions.

But ultimately these devices may have a bigger role in developing countries, where full-size medical equipment is in short supply but smartphones are becoming common. Even in rural parts of the U.S. it can take hours to drive to a specialist, while a primary care physician might quickly email that specialist a photo of, say, a diseased retina first to see whether the trip's really necessary.

"These tools make diagnosis at a distance much easier," said Dr. Nicholas Genes, an emergency medicine professor at New York's Mount Sinai School of Medicine, who helped with TEDMED's smartphone physical.

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