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Cancer detection faster, more precise with new app

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Might doctors soon be able to detect cancer faster and more accurately with their smartphones? Thanks to researchers based at Massachusetts General Hospital, it appears to be a distinct possibility.

According to a research article published in February's *Science Translational Medicine* journal, scientists have developed a quantitative micro-nuclear magnetic resonance system (NMR) that can find tumors by scanning a person's cells. The system works like a mini MRI, reports British-based magazine *NewScientist*, "using magnetic nanoparticles to measure protein levels, looking for specific markers that indicate the presence of cancer." Doctors then are able to look at the results of their scan on their smartphone through an app created for the device.

"We were driven to develop this device by two factors: 1) the exquisite sensitivity of magnetic resonance techniques like MRI and 2) the desire to detect cancer in very small cell samples," Jered B. Haun, PhD, one of the researchers, told *FierceMobileHealthcare* in an email. "Achieving these goals necessitated miniaturization of the device to the levels presented in our paper."

Although trials of 50 and 20 patients netted positive results--researchers were able to detect cancer correctly 96 percent of the time in the first trial, and 100 percent of the time in the second--issues do persist, according to *NewScientist*. Four protein markers are read to determine the existence of cancer in each patient, but because cancer cells don't always contain those markers, the readings might not always be accurate.

While we've already reported on a similar device [1] used to diagnose skin cancer--the Handyscope--the potential micro-NMR holds for the future of cancer diagnoses is remarkable, both in terms of accuracy and speed. Traditional cancer detection processes generally are around 84 percent accurate (compared to the aforementioned 96 percent accuracy) and take three days to garner results, according to researchers; results with the new device are available in roughly an hour's time.

Haun said that his team is definitely planning for more trials, ones that will use specific cancer types (only breast, lung, etc.), as well as multicenter testing to address issues of robustness and detection accuracy.

"Our...goal [is] for this device to join cytopathology/histology as the standard-of-care for diagnosing cancer," Haun told *FierceMobileHealthcare*. "The information that the device can provide about protein biomarker expression could also enable doctors to better formulate therapies for specific patient's scenarios as well as monitor efficacy."

The device already has been used to detect tuberculosis in patients, according to an article published in January 2010 [2] on website for the National Institute of Biomedical Imaging and Bioengineering. According to Haun, no timeline has been set for when this device could be deployed, as it still has to go through "multicenter testing and the commercialization process."

To learn more:
- here's the *Science Translational Medicine* abstract [3]
- read the *NewScientist* article [4]
- check out this *Mobiledia* piece [5]

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