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# Device linked to smartphone helps diagnose cancer

By Carolyn Y. Johnson

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The future of cancer detection may be in your pocket.

Researchers at Massachusetts General Hospital have built a \$200 portable device that can hook up to a smartphone and analyze a tiny amount of tissue to determine in an hour whether a patient's cancer is malignant and likely to spread.

The device can display its findings using the monitors on mobile phones.

In a paper published yesterday in the journal *Science Translational Medicine*, a team described the device they built and an early clinical test of 50 people who had their abnormal stomach tissue biopsied.

By looking at a combination of four biomarkers in the samples, the researchers correctly predicted whether 48 of the patients had benign or malignant cancers.

The technology is still at a very early stage and has yet to go through rigorous clinical testing. But it has shown promising early results and can produce a result in an hour, instead of in the days it might take with traditional methods.

It also avoids the subjectivity that may result from the varying skill levels of pathologists analyzing a sample.

"At the end of the day there are a lot of good technologies out there that are very promising on the bench side — the key is how to translate it into the clinic," said Dr. Cesar Castro, an oncologist at Mass. General and one of the authors of the paper.

Next, he said, the team will look at whether it can customize the test for different types of cancer, starting with ovarian cancer.

If the technology is proven to work in more extensive clinical trials, it could offer a powerful and portable way of quickly assessing a cancer.

The researchers found they could obtain 96 percent accurate predictions of whether a cancer was malignant in the first group of 50 people — better than the 84 percent accuracy of current methods. To validate the work, they used the test in a second group of 20 people, and found it was 100 percent accurate.

Further work will need to be done to verify the accuracy of the testing and whether it can guide more successful interventions.

Castro said that, ultimately, such technology might help cancer research and treatment in real time. It's possible that a physician could use it to assess whether a drug was likely to work, choose a more effective clinical trial for a patient, or monitor progress and response to therapy over time.

Because the device is inexpensive and smartphones are readily available, the work could affect cancer care in the developing world. Still, Castro emphasized, the technology needs further testing and would probably supplement, not supplant, existing methods for analyzing cancer.

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