

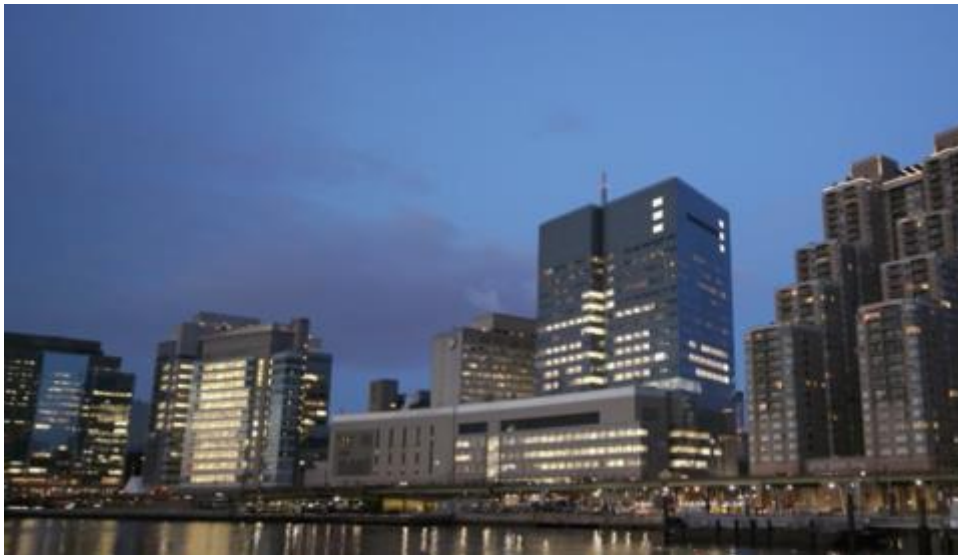
Ultrasound-analyzing AI improves breast cancer diagnoses by 37%, NYU study finds

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NYU Langone Health researchers developed an artificial intelligence tool that spots irregularities in standard ultrasound images to improve breast cancer diagnoses and reduce the number of invasive biopsies often needed to confirm a diagnosis. (NYU Langone)

Ultrasound imaging is a less expensive, radiation-free alternative to mammography for breast cancer diagnosis. Radiologists' analyses of the scans, however, have delivered huge numbers of false diagnoses, leading to unnecessary follow-up procedures and patient anxiety.

The solution? Add some decidedly nonhuman analysis to the mix.

Researchers from NYU Langone Health have developed an artificial intelligence tool that they say massively boosts physicians' ability to spot signs of breast cancer in ultrasounds alone, simultaneously minimizing not only the number of misdiagnoses typically linked to the imaging method but also the number of unneeded biopsies, which are often expensive and sometimes painful.

The research team trained their machine learning AI to identify cancerous lesions using a repository of more than 288,000 ultrasound exams performed on more than 143,000 NYU Langone patients between 2012 and 2018.

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When tested on another group of nearly 44,800 ultrasounds in a retrospective **study** of its diagnostic accuracy, the tool easily outperformed a group of 10 board-certified breast radiologists.

On their own, the physicians achieved an average accuracy of 92% while reviewing a set of more than 600 breast exams—a number that jumped to 96% when aided by the AI model.

Combining the artificial and human intelligence decreased the radiologists' false-positive rate by 37.3%, which in turn reduced the number of unnecessary follow-up biopsies to confirm the presence of cancerous cells by almost 28%.

The study of the AI tool is believed to be the largest of its kind, which the researchers hope will lend credibility to the new ultrasound analysis method.

"If our efforts to use machine learning as a triaging tool for ultrasound studies prove successful, ultrasound could become a more effective tool in breast cancer screening, especially as an alternative to mammography, and for those with dense breast tissue," **said** Linda Moy, M.D., co-investigator of the study and a radiologist at NYU Langone.

"Its future impact on improving women's breast health could be profound," Moy added.

To unlock that potential, the researchers will continue to refine and validate the AI. That will include upgrading the model to take into account certain data from patients' medical histories, including their genetic risk of developing breast cancer, according to Krzysztof Geras, Ph.D., the study's senior investigator. They also plan to launch clinical trials to test the AI tool's ability to diagnose current patients in real-world settings, rather than the retrospective approach taken in the initial study.

RELATED: [Ibex wins European approval for breast cancer-spotting AI pathology tool](#)

Because breast cancer is one of the most common cancers in the U.S.—with an estimated 1 in 8 women diagnosed throughout their lifetimes—it has become a popular target for new cancer-spotting AI models.

Google's DeepMind AI, for example, has also been proven to vastly outperform humans in catching signs of breast cancer in mammography images. Meanwhile, cancer-spotting tools from Ibex, Zebra Medical, Paige and more have already received regulatory clearances around the world to begin being used in actual clinical settings.

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