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More breast cancers detected in first evaluation of breast screening AI

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An artificial intelligence (AI) breast screening solution called Mia helped doctors find an additional 12% more cancers than in routine practice, as announced today in collaboration with Kheiron Medical Technologies,

NHS Grampian, the University of Aberdeen and Microsoft.

If deployed across the entire NHS, a 12% uplift in the detection of breast cancer could lead to better outcomes for thousands of women across the UK. The augmented AI workflow also showed a decrease in women recalled unnecessarily for further assessment and modeled a workload reduction of up to 30%.

More than 2 million women are screened for breast cancer each year in the UK, but breast cancer is extremely hard to detect. About 20% of women with breast cancer have tumors that are missed by mammogram screening, which is why many countries mandate that two radiologists should read every mammogram.

NHS Grampian, which provides health and social care services to more than 500,000 people in the North East of Scotland, conducted the first formal prospective evaluation of Kheiron's Mia AI solution (CE Mark class IIa) in the UK as part of a study with 10,889 patients.

Through this evaluation, Mia helped medical staff detect more cancers. The earlier detection of primarily high-grade cancers has enabled earlier treatment, which has a greater likelihood of success. The evaluation also showed no increase in the number of women called back unnecessarily for further investigation because of false positives. A workload reduction of up to 30% was modeled as part of a simulated workflow with AI augmentation.

Barbara, from Aberdeen, was one of the first women in the UK to have her cancer detected by Mia. "My cancer was so small that the doctors said the human eye would not have picked it up," said Barbara. Because her cancer was picked up at an earlier stage before spreading, Barbara now has a much better prognosis than her mother, who needed much more invasive treatment for her own breast cancer. "It's a lifesaver, it's a

life changer," she said.

Dr. Gerald Lip, who led the prospective trial at NHS Grampian, said, "If you pick up cancer under 15mm, most women now will have a 95% survival rate. Not only did Mia help us find more cancers, most of which were invasive and high-grade, but we also modeled that it could reduce the time it takes to notify women from 14 days to just 3 days, reducing significant stress and anxiety for our patients."

Professor Lesley Anderson, Chair in Health Data Science at the University of Aberdeen, said, "While our earlier research, led by Dr. De Vries, suggested that Mia could spot more cancers, the GEMINI trial results left us amazed. If Mia were used in breast screening, it would mean that more cancers would be detected without putting more women through additional tests.

"However, our previous research pointed out a possible issue—changes to the mammography machines could affect how well Mia works.

"To smoothly integrate Mia into screening programs, we are working closely with Kheiron to develop ways to monitor and adjust the AI, ensuring it continues delivering the impressive results we saw in the recent evaluation."

Operating as a medical device in Microsoft's Azure Cloud, the Kheiron solution gives hospitals or breast screening centers that have internet connectivity the ability to use Mia to read mammograms and help radiologists make the critical decision in breast screening: to reassure a woman that her mammogram is normal or call her back for further investigation.

"Hearing directly from a woman whose cancers were picked up by Mia was momentous for everyone who has helped us pioneer the

development and evaluation of our AI technology," said Peter Kecskemethy, CEO of Kheiron.

"These outstanding results have exceeded our expectations, and we are so grateful to the teams from NHS Grampian, the University of Aberdeen, Microsoft, and the UK Government who have enabled us to conduct this groundbreaking work."

Identifiable patient data is removed before a mammogram is uploaded to the Azure Cloud. Once de-identified, the Mia software reads the mammogram and sends the recommendation back to the hospital or clinic. It is currently deployed at 4 sites in Europe and 16 NHS sites in the UK as part of ongoing trials.

This wide-scale deployment leveraging the Azure Cloud is part of the UK Government's ambition to be at the forefront of AI technology in health care. In 2020.

Jacob West, managing director of health care and life sciences at Microsoft UK, said, "AI has the ability to transform every industry, but there is perhaps no more powerful case than in health care, which impacts us all throughout our lives. We believe that AI, in partnership with clinicians, can play a vital role in improving patient outcomes, and the results of the prospective evaluation at NHS Grampian are clear evidence."

"Thanks to this pioneering work, more women have a greater chance of beating cancer."

Provided by University of Aberdeen

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