

Case Study

Simon Harris & Dierdre Dineen



^[1] Chesterfield Royal Hospital NHS Foundation Trust, Kettering General Hospital NHS Foundation Trust, Northampton General Hospital NHS Trust, Nottingham University Hospitals NHS Trust (host organisation), Sherwood Forest Hospitals NHS Foundation Trust, United Lincolnshire Hospitals NHS Trust, and University Hospitals of Derby and Burton NHS Foundation Trust.

EMRAD

The East Midlands Radiology Consortium (EMRAD) is a partnership of seven NHS trusts^[1] spread over 11 hospitals, covering more than five million patients. EMRAD launched in 2013 with the objective to create a new, common digital radiology system. Its work was supported with the award of 'Vanguard' status by NHS England's New Care Models programme which ran from 2016 to 2018.

This pioneering work saw the East Midlands become the first health community in the UK where NHS hospitals could quickly and easily share diagnostic images such as x-rays and scans. The cloud-based image-sharing system has set the national benchmark for a new model of clinical collaboration within radiology services in the NHS.

In 2018, EMRAD formed a partnership with two UK-based Artificial Intelligence (AI) companies, Faculty and Kheiron Medical Technologies, to help develop, test and - ultimately - deploy AI tools in the breast cancer screening programme in the East Midlands. The project is one of seven 'wave two' NHS Test Beds, and is administered by NHS England and the Office for Life Sciences. The Test Bed project is focused on Capacity, Care, and Confidence: it aims to improve and optimise clinical service capacity, to enhance patient care at significant scale and to increase NHS confidence in the utilisation of innovative machine learning tools. The project aims to develop and test both clinical and non-clinical (operational) AI tools. Kheiron's 'MiaTM' tool has the potential to support the clinical workforce issues in the service by acting as the second reader in the dual-read mammography workflow, while Faculty's 'Platform' software has the potential to help optimise operational processes such as clinic scheduling and staff resourcing.

Clinical applications of AI

At the June EMRAD AI Project Board, the Lincolnshire BSP lead described the pressures as “tremendous”, with “no end in sight”. Deep learning is increasingly being proposed as a solution to the breast cancer screening workforce crisis. As part of their role in the Test Bed, Kheiron are conducting a large-scale retrospective study on mammograms from two of the NHS sites within the EMRAD Consortium. The aim is to test the generalisability of Mia™, their novel deep learning mammography software. They hope to conclude that their generalisable model is suitable for consideration as an independent reader in double-read screening programmes (see Figure 1). This would have significant implications for the future of the breast screening workforce throughout the UK.

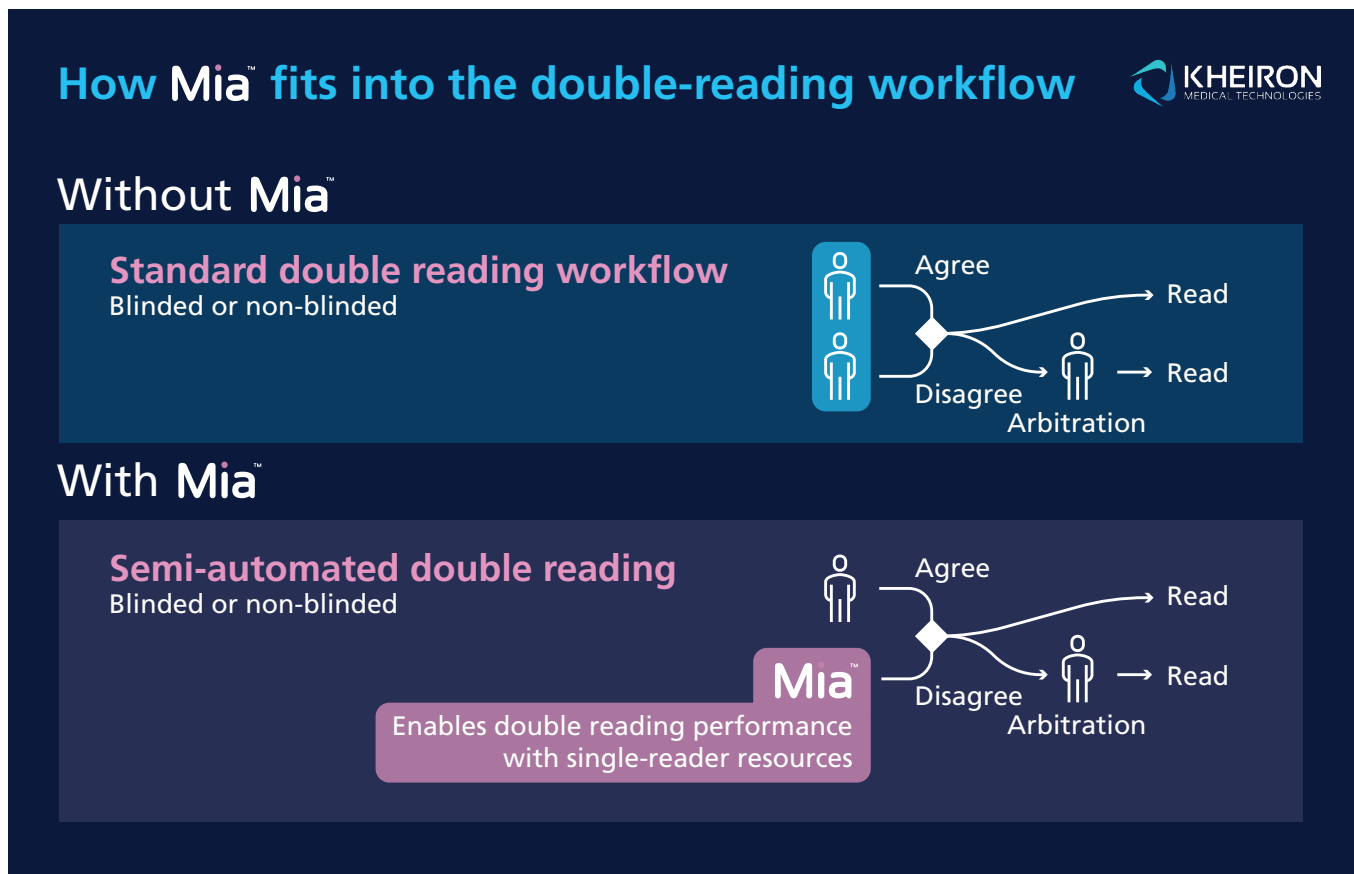


Figure 1: How Mia™ fits into the double-reading breast screening workflow