Deploying and Evaluating AI for Fracture Detection in the NHS:
A Multimodal Real-World Approach

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The Problem

Fractures are frequently missed on plain radiographs in the Emergency Department (ED).

Delayed or incorrect diagnoses can lead to harm and repeat attendances.

Consultant radiologist reports are often unavailable at the time of clinical decision-making.

There is a need for effective decision-support to improve fracture detection by non-specialists.

The Proposed Solution: Artificial Intelligence

Artificial Intelligence (AI) tools for fracture detection provide automated analysis of radiographs and highlight potential fracture sites.

These tools are designed to support non-radiologists in making timely and accurate diagnoses.

Fracture AI systems may reduce missed injuries, streamline ED workflow, and improve patient safety, especially in time-critical settings.

1. Deployment:
AI Deployment Platform (AIDP)

Project Lead for fracture AI deployment at Oxford University Hospitals.

Supported integration of the Radiobotics RBFracture™ tool into the hospital PACS via shadow-mode deployment.

Completed Data Protection Impact Assessment (DPIA) and presented to the Trust Technology Advisory Group (TAG).

Deployment includes; Lunit INSIGHT CXR and Lucida Prostate under the AIDP programme.

Overcame withdrawal of NHS England funding by facilitating local approvals and progression to clinical safety assessment.

2. Benchmarking:
Comparative Evaluation of Commercially Available Fracture AI Tools

Led a head-to-head benchmarking study involving six CE-marked AI tools.

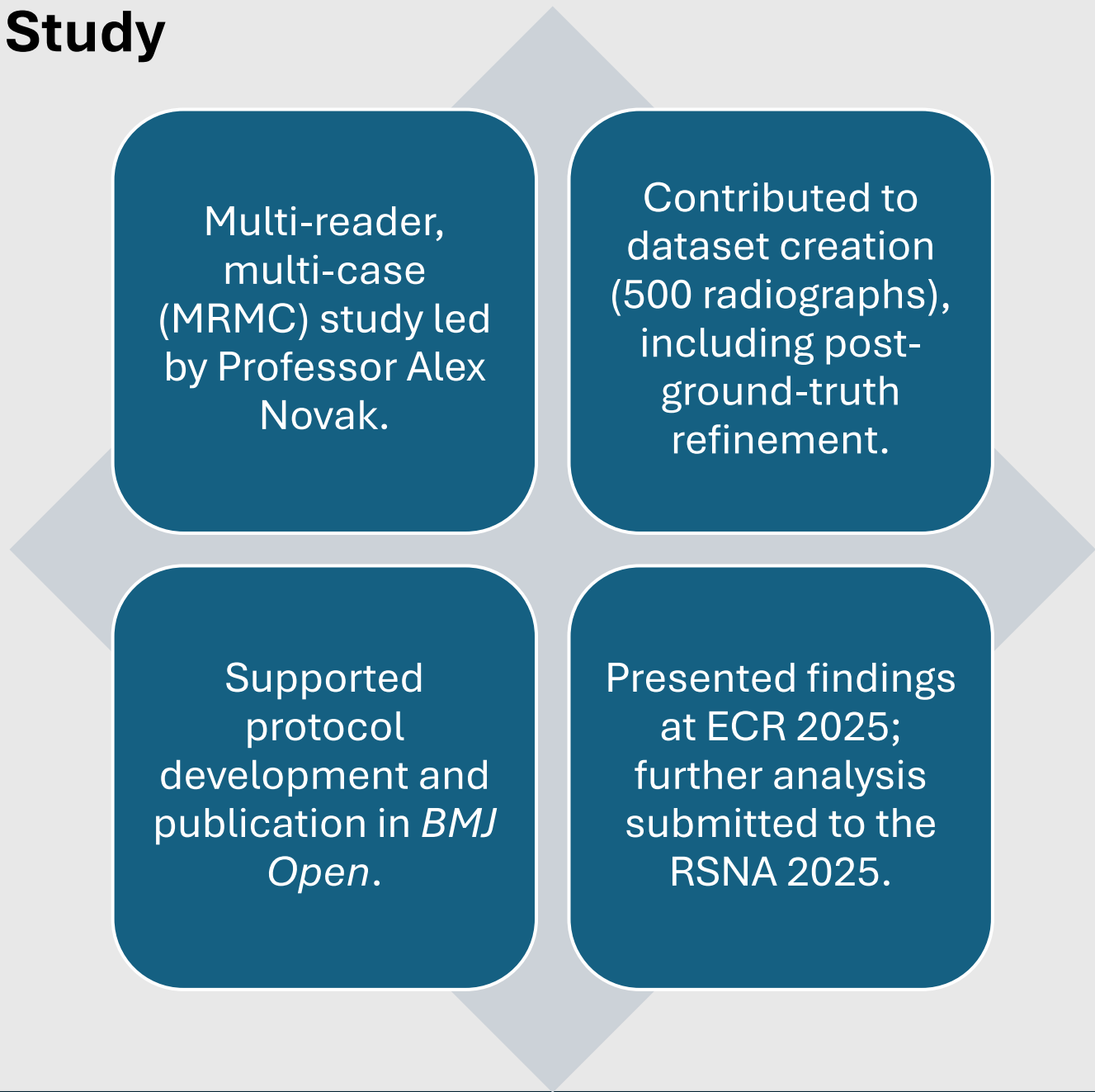Developed a standardised dataset of anonymised NHS radiographs for vendor inferencing.

Negotiated governance framework and technical infrastructure for time-limited external inference under consistent conditions.

Study will inform procurement decisions and regulatory evidence submissions.

3. Validation:
FRACT-AI Study

Multi-reader, multi-case (MRMC) study led by Professor Alex Novak.

Contributed to dataset creation (500 radiographs), including post-ground-truth refinement.

Supported protocol development and publication in *BMJ Open*.

Presented findings at ECR 2025; further analysis submitted to the RSNA 2025.

4. Prospective Evaluation:
SAMURAI-Fracture Study

Site Co-Lead for Oxford and co-author of study protocol and ethics application.

£491,712 Small Business Research Initiative (SBRI)-funded, multi-centre prospective evaluation of the Radiobotics RBFracture™ AI tool.

Primary outcome: reduction in unnecessary NHS contacts resulting from false positive and false negative radiographic interpretations.

Incorporates health economic analysis in partnership with the Health Innovation Network.

Key Outputs

AI tools deployed in shadow mode across clinical sites.

Comparative performance benchmarking underway.

Diagnostic accuracy results presented internationally and submitted for peer review.

NHS governance and regulatory frameworks engaged throughout.

Contributed to Trust-level AI strategy and policy development.

Future Work

Completion of SAMURAI-Fracture data collection and economic analysis.

Expansion of deployment to additional clinical sites under research approval.

Initiation of NIHR Fellowship (August 2025) focused on translational AI evaluation.

Contribution to national best practice guidance for AI deployment and monitoring in imaging.