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Testing whether a fast MRI scan can detect breast cancers which were not detected on mammograms, in women with average breast density

Submission date 30/09/2024	**Recruitment status** Recruiting	[X] Prospectively registered [_] Protocol
Registration date 04/10/2024	**Overall study status** Ongoing	[_] Statistical analysis plan [_] Results
Last Edited 25/10/2024	**Condition category** Cancer	[_] Individual participant data [X] Record updated in last year

Plain English summary of protocol

Background and study aims

Finding breast cancers early saves lives. The NHS Breast Screening Programme (NHSBSP) uses either mammograms (quick X-rays) or magnetic resonance imaging (MRI) scans to find breast cancers as early as possible. Mammograms are used most widely as they are quick but are less good at finding the most aggressive cancers early. MRIs are better at detecting small aggressive cancers but take longer and are expensive, so are only offered to people at the highest risk of getting breast cancer. A newer type of scan is the “FAST” MRI scan. This is quicker than standard MRI and may be better at detecting small cancers than mammograms. Until now, researchers worldwide have focussed on women with high breast density to test if FAST MRI can find breast cancers early. This means that, until now, women with average breast density have been unable to take part in research about FAST MRI. The DYAMOND study will test if a FAST MRI can detect cancers not seen on a first screening mammogram, for women with average-density breasts. If this study shows that cancers not found by a mammogram can be found by FAST MRI for women with average-density breasts, this group of women will be included in a larger study to see if FAST MRI is a good alternative to mammograms for breast screening.

Who can participate?

Women will be invited for a FAST MRI if they are aged 50-52 years old, their mammogram does not show cancer and their breast density is “average” (a computer measures this from mammogram images).

What does the study involve?

All DYAMOND participants will have a FAST MRI as well as their standard screening mammogram. Some participants will have a second FAST MRI 1 year later.

Trained health professionals will check the FAST MRI images. If any cancers are found, the women will be looked after by their local hospital, which will collect information about their care for the DYAMOND study team. Women will be asked their thoughts about having the FAST MRI scan to understand their experiences.

What are the possible benefits and risks of participating?
Benefits: The FAST MRI scan may find breast cancer earlier than it would have been found without the DYAMOND study. Treatments are more effective when a cancer is detected early and so this could prevent the participant from dying from their breast cancer.

Risks: To have a FAST MRI, participants will need to have an injection into a vein in their arm at the time of the scan. Hospitals worldwide use this type of injection every day for standard MRI scans of many different parts of the body. The MRI radiographers will follow all standard safety procedures for the injection and the scan during DYAMOND.

Where is the study run from?
North Bristol NHS Trust is running the study. Women can join the study from NHS Breast Screening Services, including Avon, Gloucestershire, Cornwall, Wiltshire, South West London and South East London.

When is the study starting and how long is it expected to run for?
May 2023 to October 2024

Who is funding the study?
The Medical Research Council (MRC) and the National Institute for Health and Care Research (NIHR) jointly fund the DYAMOND Study through the Efficacy and Mechanism Evaluation (EME) funding stream of the NIHR

Who is the main contact?
1. Dr Lyn Jones: FASTMRI@nbt.nhs.uk
2. Dr Rebecca Geach: FASTMRI@nbt.nhs.uk

Plain English summary under review with external organisation

Study website
https://www.nbt.nhs.uk/FASTMRI

Contact information

Type(s)
Public, Scientific, Principal Investigator

Contact name
Dr Lyn Jones

ORCID ID
http://orcid.org/0000-0001-7439-7037

Contact details
Research and Development, Level 3 Learning & Research Building, Southmead Hospital
Bristol
United Kingdom
BS10 5NB
+44 (0)1174149330
Lyn.Jones@nbt.nhs.uk

Additional identifiers

EudraCT/CTIS number
Nil known

IRAS number
330059

ClinicalTrials.gov number
Nil known

Secondary identifying numbers
CPMS 59828, NIHR150502

Study information

Scientific Title
Diagnostic yield study to determine whether an abbreviated form of breast magnetic resonance imaging (FAST MRI) can detect breast cancers missed by screening mammography: for women at population risk of breast cancer with average mammographic density following their initial screening mammogram

Acronym
FAST MRI: DYAMOND

Study objectives
This research aims to refine the study design and define the study population, for a future randomised controlled trial (RCT) of FAST MRI as a screening modality for women having their first mammographic screen with the NHS breast screening programme (BSP) (future application to NIHR). Specifically, the proposed work will determine if women with average mammographic density (BI-RADS category B) could benefit from screening with FAST MRI and fill the knowledge gap. The hypothesis this proposal will test is that FAST MRI can detect breast cancers missed by mammography for the 40% of the population of women having their first mammogram with NHSBSP (age 50-52) who have category B mammographic density. The findings of this study will be important, no matter whether the hypothesis is proved or disproved because they will justify either the inclusion or the exclusion of 40% of the screened population (not previously investigated) in a future study proposal to NIHR (HTA) for a randomised controlled trial (RCT) of FAST MRI.

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 09/01/2024, Yorkshire & the Humber – Sheffield (NHS Blood & Transplant Centre, Holland Drive, Newcastle-upon-Tyne, NE2 4NQ, United Kingdom; +44 (0)207 104 8388; sheffield.rec@hra.nhs.uk), ref: 23/YH/0268

Study design
Non-randomised controlled feasibility/pilot study

Primary study design
Interventional

Secondary study design
Non randomised study

Study setting(s)
Hospital, Internet/virtual, Medical and other records, Telephone

Study type(s)
Treatment

Participant information sheet
Not available in web format, please use the contact details below to request a patient information sheet

Health condition(s) or problem(s) studied
To measure the number of cancers detected by FAST MRI that were missed by screening mammography

Interventions
This study will invite women aged around 50-52 years old to take part.

They will receive study information at their first mammogram appointment (after they have had their mammogram). They will be invited to find out if they are eligible to have a FAST MRI - by being asked to consent to the research team looking at their breast screening records and sending their mammogram to the DYAMOND team at Royal Surrey Foundation Trust who will use a computer to measure the breast density. This is Stage 1 of DYAMOND participation.

Once the breast density measurement has been done, study teams will look at the results and breast screening records to check if the person is eligible. The study teams will then send Stage-2 participant information leaflets to potentially eligible women - those aged around 50-52, with average / B density breasts, and who have not been recalled by the screening programme. The study team will then contact the participant to discuss participation in Stage 2 - having the FAST MRI scan.

1,000 women will be scanned at NHS sites, chosen for the ethnic diversity of the screened population and the experience the site has in working with FAST MRI. This choice of NHS sites will ensure our sample is representative of the UK population.

NHS professionals who have completed FAST MRI reader training will interpret the FAST MRI scans. The total number of cancers detected by FAST MRI and be counted and the types, aggressiveness and size of cancer found will be recorded. The study will also count how many women need further tests but turn out not to have cancer.

The study will also look at the results of people who were not eligible for a FAST MRI because they had been recalled by the screening programme and will look at the number and types of cancers found.

Participants will be asked to share their experience of having a FAST MRI. The results will help to decide which women should be included in a future FAST MRI trial to measure if FAST MRI would be a good scan for the NHS to use for breast screening.

Intervention Type
Procedure/Surgery

Primary outcome measure
Cancers detected by FAST MRI after a negative mammogram, defined as the FAST MRI scans classified as MRI 3b 4 or 5 with confirmed breast cancer (invasive and non-invasive) on a subsequent biopsy investigation, measured using recorded study data at one timepoint

A sensitivity analysis will be undertaken to assess the need for additional investigations for the MRI 3 group and whether MRI 3b and/or MRI 3a should be considered as cancers or negative results

Secondary outcome measures
The following secondary outcome measures are assessed using recorded study data and the methods stated below at one timepoint:
1. The characteristics of the cancers detected by FAST MRI (including grade, size, stage, nodal involvement)
2. Acceptability of the intervention through a questionnaire and an additional qualitative interview of a subset of participants
3. Recruitment rate is defined as those that are recruited out of all those with density B that were contacted
4. Retention/compliance rate accounts for the number that withdraw from the study once recruited or do not attend the FAST MRI scan
5. Recall rate, defined as the proportion of women classified with an MRI 3b, 4 or 5 and invited for further investigation out of the total number of recruited women who had a FAST MRI
6. The biopsy rate is calculated as the number of biopsies undertaken out of all women recruited who had a FAST MRI
7. Early call rate, defined as the number of women who have a FAST MRI at y1 (includes all those classified as MRI 3a, and those classified as MRI 3b, 4 and 5 who did not have cancer confirmed at y0 biopsy) out of all women recruited who had a FAST MRI at y0
8. Adverse reactions to FAST MRI
9. The proportion of women in each density category (A, B, C, D) in the UK NHSBSP screened population at this age
10. Interval cancers detected during the study period
11. FAST MRI classifications of y1 scans (for all those with MRI 3a at y0 and those with MRI 3b, 4 and 5 and no cancer detected at y0)
12. FAST MRI reader data, the diagnostic accuracy of readers within the study (individually and by reader group and NHS site), numbers of scans requiring arbitration, standard arbitration outcomes and expert panel arbitration outcomes

Overall study start date
01/05/2023

Completion date
31/10/2026

Eligibility

Key inclusion criteria
1. Women with breast density category B
2. Aged [49 years + 8 months] < = [53 years – 1 day] at the time of mammogram
3. Having prevalent round mammogram screening (participant-reported)
4. Received standard NHSBSP “no findings” confirmation letter
5. Willing and able to give informed consent
6. No absolute contraindication to breast MRI

Participant type(s)
Patient

Age group
Adult

Lower age limit
49 Years

Upper age limit
53 Years

Sex
Male

Target number of participants
Planned Sample Size: 1000; UK Sample Size: 1000

Key exclusion criteria
1. Breast density category A, C or D
2. Known recall after mammogram
3. Has not received a breast mammogram
4. Aged [< 49 years + 8 months] or > = 53 years at time of mammogram
5. Pregnant or breastfeeding
6. Contraindication to MRI
7. Contraindication to gadolinium-containing contrast agents (GDCA)
8. Unwilling to have FAST MRI
9. Unwilling to allow follow-up of outcomes through data-linkage
10. Unwilling to have mammograms measured for density
11. eGFR equal to or below 30
12. BMI, weight and abdominal girth restrictions may apply to recruiting sites’ MRI scanner(s) that could exclude otherwise eligible participants from having the study intervention

Date of first enrolment
25/10/2024

Date of final enrolment
30/09/2025

Locations

Countries of recruitment
England

United Kingdom

Study participating centre
Cheltenham General Hospital
Sandford Road
Cheltenham
United Kingdom
GL53 7AN

Study participating centre
St Georges Hospital
Blackshaw Road
Tooting
London
United Kingdom
SW17 0QT

Study participating centre
Kings College Hospitals
Denmark Hill
London
United Kingdom
SE5 9RS

Study participating centre
Royal Cornwall Hospital (treliske)
Treliske
Truro
United Kingdom
TR1 3LJ

Study participating centre
Great Western Hospital
Marlborough Road
Swindon
United Kingdom
SN3 6BB

Sponsor information

Organisation
North Bristol NHS Trust

Sponsor details
Southmead Hospital, Southmead Road, Westbury-On-Trym
Bristol
England
United Kingdom
BS10 5NB
+44 (0)1174149330
researchsponsor@nbt.nhs.uk

Sponsor type
Hospital/treatment centre

Website
https://www.nbt.nhs.uk/

ROR
https://ror.org/036x6gt55

Funder(s)

Funder type
Government

Funder Name
National Institute for Health and Care Research

Alternative Name(s)
National Institute for Health Research, NIHR Research, NIHRresearch, NIHR - National Institute for Health Research, NIHR (The National Institute for Health and Care Research), NIHR

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Funder Name
Medical Research Council

Alternative Name(s)
Medical Research Council (United Kingdom), UK Medical Research Council, MRC

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Results and Publications

Publication and dissemination plan
The data is owned by the Sponsor, North Bristol NHS Trust.

Scientific audience
The protocol for the study will be published in a peer-reviewed journal and the results of the study presented at National and International meetings on behalf of North Bristol NHS Trus. These publications and presentations will acknowledge the sponsor and funder of the study. On completion of the trial, the data will be analysed, and tabulated, and final study reports will be sent to the relevant authorities (funder, HRA, NHSBSP Research Innovation and Dissemination Advisory Committee). The primary outcome paper will be submitted to an open-access peer-reviewed journal.

Public audience
A lay summary will be disseminated to:
1. All involved bodies (e.g., public and patient charities and support groups involved in the DYAMOND study, including BUST, Independent Cancer Patient's Voice, Breast Density Matters UK).
2. Formal PPIE group.
3. FAST MRI mailing list.
4. Uploaded to the FAST MRI website.
5. All FAST MRI readers within the study.
6. All participants
Social media will also promote these findings through the NBT Research and Development teams and the FAST MRI X (Twitter) account. Sites that have taken part in the study will also be allowed to disseminate the findings.

Intention to publish date
31/10/2027

Individual participant data (IPD) sharing plan

The datasets generated during and analysed during the current study will be available upon reasonable request at the end of the study from Dr Lyn Jones, FASTMRI@nbt.nhs.uk. Consent for the storage and use of anonymised data for health-related research purposes is obtained from all participants during DYAMOND study recruitment.

IPD sharing plan summary

Available on request