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Digital histopathology and MRI as predictors of prostate cancer outcome in the PROMIS study

Submission date 11/06/2024	**Recruitment status** Recruiting	[X] Prospectively registered [_] Protocol [_] Statistical analysis plan [_] Results [_] Individual participant data [X] Record updated in last year
Registration date 14/06/2024	**Overall study status** Ongoing	
Last Edited 05/03/2026	**Condition category** Cancer	

Plain English summary of protocol

Background and study aims
The overarching aim of this study is to obtain clinical outcomes for men who participated in the PROMIS study (https://www.isrctn.com/ISRCTN16082556) and digitise all PROMIS prostate biopsy H&E slides to examine whether digital pathology-based biomarkers predict outcome. PROMIS was led by UCL between 2012 and 2015. This unique, never-to-be-repeated study was the first to prove that MRI is a superior test for prostate cancer detection compared to standard transrectal biopsy. Participants with raised PSA underwent MRI in multiple UK institutions, followed by combined transrectal-transperineal template mapping (TPM) biopsies at 5 mm intervals, resulting in one of the most extensively characterised prostate cancer diagnosis cohorts in existence. All biopsies were reported by study pathologists, who looked at H&E slides and recorded standard information such as cancer grade (Gleason), maximum cancer core length and the presence or absence of inflammation. Although these metrics are currently essential for clinical decisions, modern image analysis offers unprecedented opportunities to use automated computational tools to examine prostate tissue morphology in previously unattainable detail. Furthermore, clinical outcomes for PROMIS patients are yet to be collected and linked to previously collected baseline data (e.g. MRI). To bridge these gaps, this study will have two basic objectives: 1. Create a PROMIS digital pathology repository by retrieving all standard H&E PROMIS biopsy slides and digitising them at the UCLH Biobank, and; 2. Collect linked hospital data (overall survival, death from prostate cancer) to test whether existing baseline clinical-histological-MRI information from PROMIS and newly generated digital pathology-based features predict cancer progression or death. If successful, this work will lead to the creation of one of the most comprehensive repositories for prostate cancer diagnosis in the world, incorporating MRI and pathology report data, clinical outcomes and digital H&E from a unique, never-to-be-repeated study. This will be an invaluable resource for prostate cancer researchers worldwide and could produce entirely new standards of prostate biopsy interpretation and cancer risk prediction.

Who can participate?
Adult participants involved in the PROMIS trial

What does the study involve?
Patients in this study will have their previously collected biopsy slides digitised and analysed

using advanced image analysis to identify potential biomarkers. Additionally, their clinical outcomes will be tracked to see if these digital biomarkers, along with MRI and other clinical data, can predict the progression or outcome of prostate cancer.

What are the possible benefits and risks of participating?
The main challenges in prostate cancer are overdiagnosis, overtreatment and the late recognition of highly aggressive disease. This study aims to address these challenges by improving our current risk stratification strategies at diagnosis. Although there will be no direct benefit to PROMIS participants, the digital histopathology and clinical outcome information collected will be added to the PROMIS dataset, resulting in one of the largest and most comprehensively characterised prostate cancer cohorts in existence. This will help researchers derive new metrics that better capture the heterogeneity of early prostate cancer and, as a result, help doctors recommend the right treatment to the right patient at the right time. As the study involves retrospective collection of already existing information, it will not pose significant risks to the participants, although specific measures will be taken to ensure that this information is anonymised and used in the best and safest way possible.

Where is the study run from?
University College London

When is the study starting and how long is it expected to run for?
May 2023 to September 2029

Who is funding the study?
Cancer Research UK

Who is the main contact?
Prof Mark Emberton, m.emberton@ucl.ac.uk

Contact information

Type(s)
Public, Scientific, Principal investigator

Contact name
Mr Vasilis Stavrinides

ORCID ID
https://orcid.org/0000-0003-0011-9792

Contact details
University College London
Cancer Institute
Paul O'Gorman Building
72 Huntley Street
London
United Kingdom
WC1E 6DD
+44 (0)20 7679 6500
v.stavrinides@ucl.ac.uk

Type(s)
Principal investigator

Contact name
Prof Mark Emberton

ORCID ID
https://orcid.org/0000-0003-4230-0338

Contact details
University College London, Suite 1A, Maple House, 149 Tottenham Court Road
London
United Kingdom
W1T 7NF
+44 (0)20 3447 9194
m.emberton@ucl.ac.uk

Additional identifiers

Integrated Research Application System (IRAS)
329659

Central Portfolio Management System (CPMS)
62482

Study information

Scientific Title
Digital histopathology metrics and baseline clinical-MRI information as predictors of prostate cancer outcome in the PROMIS study

Study objectives
The central hypothesis is that, in men with abnormal PSA values and suspected prostate cancer, baseline clinical, MRI and biopsy information collected at diagnosis (including digital pathology metrics) can predict clinical outcomes, including prostate cancer-specific death.

Ethics approval required
Ethics approval required

Ethics approval(s)
1. Approved 06/06/2024, Yorkshire & The Humber - Sheffield Research Ethics Committee (NHS Blood and Transplant Blood Donor Centre, Holland Drive, Newcastle upon Tyne, NE2 4NQ, United Kingdom; +44 (0)207 104 8139; sheffield.rec@hra.nhs.uk), ref: 24/YH/0106

2. Approved 05/02/2025, Health Research Authority, Confidentiality Advisory Group (2 Redman Place, Stratford, London, E20 1JQ, United Kingdom; +44 (0)207 104 8000; cag@hra.nhs.uk), ref: 24/CAG/0105

Primary study design
Observational

Study design
Observational cohort study

Study type(s)
Diagnostic, Screening, Treatment

Health condition(s) or problem(s) studied
Risk stratification of prostate cancer at diagnosis

Interventions
The overarching aim of the proposed work will be to obtain clinical outcomes for men who participated in the PROMIS study and digitise all PROMIS prostate biopsy H&E slides to examine whether digital pathology-based biomarkers predict outcomes. The purpose is to enrich the existing PROMIS data repository and examine whether digital pathology metrics at diagnosis can efficiently predict prostate cancer outcome, along with MRI, clinical and biomarker information.

PROMIS (https://www.isrctn.com/ISRCTN16082556; NCT01292291) was conducted at UCL between 2012 and 2015. This study was the first to prove that MRI is a superior test for prostate cancer detection compared to standard transrectal biopsy.

In total, 574 participants with raised PSA underwent MRI in multiple UK institutions, followed by combined transrectal-transperineal template mapping (TPM) biopsies at 5 mm intervals, resulting in the most extensively characterised prostate cancer diagnosis cohort in existence.

All biopsies were reported by study pathologists, who looked at H&E slides and recorded standard information such as cancer grade (Gleason), maximum cancer core length and presence or absence of inflammation.

Although these are essential for clinical decisions, modern image analysis offers unprecedented opportunities to use automated computational tools to examine prostate tissue morphology in previously unattainable detail. Furthermore, clinical outcomes for PROMIS patients are yet to be collected and linked to other information.

This project will have two basic objectives:
1. Create a PROMIS digital pathology repository by retrieving all standard H&E PROMIS biopsy slides and digitising them at the UCLH Biobank.
2. Collect linked hospital data (overall survival, death from prostate cancer) to test whether existing baseline clinical-histological-MRI information from PROMIS and newly generated digital pathology-based features predict cancer progression or death.

Intervention Type
Mixed

Primary outcome(s)
The following primary outcome variables will be measured using collected linked hospital data and generated digital prediction by the end of the study:
1. Prostate cancer-specific death
2. Death by any cause

Key secondary outcome(s)

The following secondary outcome variables will be measured using collected linked hospital data and generated digital prediction by the end of the study:
1. Time to metastasis
2. Time to disease progression
3. Prostate cancer treatment

Completion date
01/09/2029

Eligibility

Key inclusion criteria
Participants involved in the PROMIS trial (https://www.isrctn.com/ISRCTN16082556; NCT01292291)

Participant type(s)
Patient, Other

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
18 Years

Upper age limit
90 Years

Sex
Male

Total final enrolment
0

Key exclusion criteria
1. PROMIS exclusion criteria (alpha-reductase inhibitors at the time of registration or during the previous 6 months
1.1. Previous history of prostate biopsy, prostate surgery, or treatment for prostate cancer, with interventions for benign prostatic hyperplasia or bladder outflow obstruction deemed acceptable
1.2. Evidence of urinary tract infection or history of acute prostatitis within the last 3 months
1.3. Contraindications to MRI such as claustrophobia, pacemaker, estimated glomerular filtration rate ≤50
1.4. Any other medical condition precluding procedures described in the protocol
1.5. Previous history of hip replacement surgery, metallic hip replacement, or extensive pelvic orthopaedic metal work)

2. Lack of PROMIS consent for the use of MRI and clinical data by future researchers
3. H&E slides unavailable or damaged
4. NHS-linked data unavailable or participants opted out of clinical data collection and use

Date of first enrolment
01/09/2024

Date of final enrolment
01/09/2029

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
University College London Hospitals NHS Foundation Trust
250 Euston Road
London
England
NW1 2PG

Sponsor information

Organisation
University College London

ROR
https://ror.org/02jx3x895

Funder(s)

Funder type
Charity

Funder Name
Cancer Research UK

Alternative Name(s)
CR_UK, Cancer Research UK - London, Cancer Research UK (CRUK), CRUK

Funding Body Type
Private sector organisation

Funding Body Subtype
Other non-profit organizations

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan
The data collected will be pseudonymised and will be available in the public NCITA database (https://ncita.org.uk/) and data access will be granted through an open access request (https://ncita.org.uk/promis-data-set-open-access-request/) with a reasonable research proposal plan.

IPD sharing plan summary
Available on request, Stored in publicly available repository

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Study website	Study website	11/11/2025	11/11/2025	No	Yes