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Real-world evaluation of the GALEAS™ Bladder biomarker for bladder cancer detection

Submission date 02/06/2026	**Recruitment status** No longer recruiting	[_] Prospectively registered [_] Protocol [_] Statistical analysis plan [_] Results [_] Individual participant data [X] Record updated in last year
Registration date 24/06/2026	**Overall study status** Completed	
Last Edited 24/06/2026	**Condition category** Cancer	

Plain English summary of protocol

Background and study aims
Bladder cancer is one of the most common cancers in the UK, with around 10,000–18,000 new cases diagnosed each year. While it is not always immediately life-threatening, up to 44% of cases can progress to a more serious form of the disease, which has a 5-year survival rate of 27–50%. Outcomes for bladder cancer have not significantly improved for over 25 years, highlighting the need for better ways to diagnose and manage the disease.

A common warning sign of bladder cancer is blood in the urine (haematuria). However, most people referred to hospital with haematuria do not have bladder cancer. At present, these patients are usually investigated with a flexible cystoscopy, where a thin camera is used to look inside the bladder. This test is effective but can be uncomfortable and requires a hospital visit, placing pressure on NHS services.

New tests are being developed that can detect bladder cancer using urine samples. These tests look for biomarkers, such as small changes in genetic material (DNA), that are associated with cancer. The GALEAS™ Bladder test is one such test. This study aims to assess how well the GALEAS™ Bladder urine test detects bladder cancer in patients referred with haematuria. This is an important early step in understanding whether some patients could, in the future, be assessed using a simple urine test instead of, or before, undergoing cystoscopy.

Who can participate?
Adults aged 18 years and over who have been referred to an NHS Urology Department for urgent investigation of haematuria (blood in the urine), either visible to the naked eye or detected on urine testing and who are able to provide a urine sample and undergo standard haematuria investigations including flexible cystoscopy.

What does the study involve?
Participants are asked to provide a urine sample before their cystoscopy appointment, using a special urine collection device that can be used at home. The device contains a preservative to keep the urine sample stable during transport to the laboratory. Participants then attend their

normal haematuria clinic appointment and undergo their standard NHS investigations, including flexible cystoscopy, exactly as they would if they were not in the study. Where cystoscopy identifies an abnormality, standard biopsy and tissue analysis takes place as normal.

The urine sample is sent to the Nonacus Clinical Services laboratory in Birmingham, where it is tested using the GALEAS™ Bladder assay. This test analyses DNA in the urine to look for genetic changes associated with bladder cancer. The GALEAS™ Bladder result is then compared with the outcome of the cystoscopy and any tissue analysis to assess how accurately the urine test detects bladder cancer.

Participation does not change the standard care or investigations that patients receive. No additional hospital visits are required beyond those already planned as part of routine haematuria investigation.

What are the possible benefits and risks of participating?
Participants do not receive a direct clinical benefit from their GALEAS™ Bladder result as part of this study, as the test result is not used to guide their clinical care at this stage. However, participation contributes to research that may benefit future patients by helping to develop a faster and less invasive way of investigating haematuria and diagnosing bladder cancer earlier.

There are no direct risks to participants from taking part in this study. Providing a urine sample at home carries no medical risk. All standard clinical investigations proceed exactly as they would outside of the study, so participants are not exposed to any additional procedures or risks as a result of participation.

Where is the study run from?
The study is run across seven NHS Urology Departments in the United Kingdom:

University Hospitals of Leicester NHS Trust
Department of Urology, Royal Berkshire Hospital
Department of Urology, Manchester University NHS Foundation Trust
Kingston and Richmond NHS Foundation Trust
Dorset County Hospital NHS Foundation Trust
Department of Urology, Western General Hospital, Edinburgh, EH4 2XU
Institute of Genetics and Cancer, The University of Edinburgh, Edinburgh, EH4 2XU
Leeds Teaching Hospitals NHS Trust

Laboratory analysis of all urine samples is carried out at Nonacus Clinical Services, Birmingham, an ISO 15189 UKAS-accredited diagnostic laboratory.

When is the study starting and how long is it expected to run for?
The study started in October 2024 and recruitment was completed in August 2025. The total duration of the study from first patient enrolled to completion of data collection was approximately nine months.

Who is funding the study?
Nonacus Ltd, Birmingham, UK.

Who is the main contact?
Lee Silcock, Co-Founder Nonacus Ltd, lee.silcock@nonacus.com

Contact information

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Public, Scientific

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Additional identifiers

Study information

Scientific Title
Real-world multicentre evaluation of GALEAS™ Bladder for the detection of bladder cancer in UK NHS haematuria clinics

Study objectives
To assess the diagnostic performance and clinical utility of GALEAS™ Bladder as a molecular triage tool in real-world haematuria investigation pathways.

Ethics approval required
Ethics approval not required

Ethics approval(s)

Primary study design
Observational

Secondary study design
Cohort study

Study type(s)

Health condition(s) or problem(s) studied
Adults referred for bladder cancer investigation following the detection of either visible haematuria (VH) or non-visible haematuria (NVH).

Interventions
Design
This study is an observational real-world evaluation study conducted across seven UK NHS Urology Departments. All participants underwent standard diagnostic procedures for haematuria investigation, including flexible cystoscopy for direct bladder visualisation, imaging to assess the upper urinary tract, and histological confirmation where indicated.

Study Population
Eligibility criteria included adults aged ≥18 years referred for investigation following the detection of either visible haematuria (VH) or non-visible haematuria (NVH), with the ability to provide informed consent and a voided urine sample prior to cystoscopy. Exclusion criteria comprised a prior diagnosis of urothelial cancer, inability to provide an adequate urine sample, or unwillingness or inability to undergo standard haematuria investigations.

Sample processing with GALEAS™ Bladder
All referrals, sample receipt, processing, and reporting were conducted at Nonacus Clinical

Services (NCS), an ISO 15189 UKAS-accredited laboratory. Urine samples (≥25 ml) were collected primarily at home using the GALEAS™ Urine Collection Device (UCD); collection time was not recorded. The UCD contains 3.5ml preservative agent to inhibit bacterial growth and preserve DNA (final preservative:urine ratio 1:7-1:14). Samples were stored at room temperature for ≤28 days prior to processing. UCD content was centrifuged at 1500g for 10 minutes to isolate a pellet from which genomic DNA was extracted using the GALEAS™ Bead Xtract: Urine gDNA 96 kit. DNA quantification was performed using Qubit (Thermo, USA). DNA libraries were prepared using the GALEAS™ Bladder NGS kit (Nonacus Ltd, UK), targeting a panel of >450 single nucleotide variants across 23 genes. Sequencing was performed on an Illumina NextSeq 2000 (Illumina, USA) and FASTQ files processed using the proprietary GALEAS™ Bladder Software pipeline (Supplemental Methods).

Statistical Analysis
This study aimed to recruit 1,200 patients, based on an estimated BC prevalence of 10.5%. Accounting for an anticipated combined 10% participant dropout rate and patient non-compliance. This sample size was expected to yield approximately 113 BC positive and 967 BC-negative evaluable cases. Diagnostic performance metrics were calculated from 2×2 contingency tables. Likelihood ratios were computed as LR+ = sensitivity/(1-specificity) and LR-= (1-sensitivity) /specificity, with 95% confidence intervals via the Wilson score method. The diagnostic odds ratio (DOR) was calculated as (TP×TN)/(DP×FN), representing the odds of a positive test result in patients with cancer relative to those without.

Intervention Type
Genetic

Primary outcome(s)
1. Diagnostic sensitivity and specificity of GALEAS™ Bladder for detection of bladder cancer measured using a comparison of GALEAS™ Bladder assay results against flexible cystoscopy with histopathological confirmation, expressed as sensitivity, specificity, positive predictive value and negative predictive value with 95% confidence intervals calculated from 2×2 contingency tables (Wilson score method) at one timepoint, following the receipt of both GALEAS™ Bladder result and final diagnosis during the study period of October 2024 to June 2025

Key secondary outcome(s)
1. Diagnostic sensitivity and negative predictive value (NPV) of GALEAS™ Bladder for detection of highgrade bladder cancer measured using sensitivity and NPV with 95% confidence intervals calculated using the Wilson score method from a 2×2 contingency table against flexible cystoscopy with histopathological confirmation at one time point, following receipt of both GALEAS™ Bladder result and histopathological grade and stage confirmation during the study period of October 2024 to June 2025

2. Diagnostic performance of GALEAS™ Bladder for muscle-invasive bladder cancer (MIBC) measured using Diagnostic sensitivity and negative predictive value of GALEAS™ Bladder for detection of muscleinvasive bladder cancer measured using sensitivity and negative predictive value with 95% confidence intervals calculated using the Wilson score method from a 2×2 contingency table against flexible cystoscopy and histopathological confirmation at one time point, following receipt of both GALEAS™ Bladder result and histopathological grade and stage confirmation during the study period of October 2024 to June 2025

3. Diagnostic performance of GALEAS™ Bladder stratified by haematuria type (visible/non-visible) recorded at or prior to clinic attendance measured using sensitivity, specificity, positive

predictive value (PPV) and negative predictive value (NPV) with 95% confidence intervals calculated using the Wilson score method separately for visible and nonvisible haematuria subgroups from 2×2 contingency tables against cystoscopy and histopathological confirmation at one time point, following receipt of both GALEAS™ Bladder result and reference standard results during the study period of October 2024 to June 2025

4. Diagnostic performance of GALEAS™ Bladder stratified by tumour stage measured using sensitivity and negative predictive value with 95% confidence intervals calculated using the Wilson score method for each TNM stage subgroup (Ta, T1, T2+) from 2×2 contingency tables against cystoscopy and histopathological confirmation at one time point, following receipt of both GALEAS™ Bladder result and histopathological staging during the study period of October 2024 to June 2025

5. Clinical usefulness of GALEAS™ Bladder measured using positive and negative likelihood ratios and diagnostic odds ratio with 95% confidence intervals calculated from the final 2×2 contingency table at study data lock in June 2025 following availability of both GALEAS™ Bladder results and reference standard (cystoscopy with or without histopathology)

6. Molecular patterns in GALEAS™ Bladderpositive urine samples measured using comparison of frequency and variant allele frequency (VAF) of cancerassociated mutations across the 23gene panel between truepositive and discordantpositive samples by gene and mutation type at data lock in June 2025 following confirmation against cystoscopy and histopathology

Completion date
22/08/2025

Eligibility

Key inclusion criteria
1. Adult patients aged ≥18 years
2. Patients referred for investigation following the detection of either visible haematuria (VH) or non-visible haematuria (NVH)
3. Patients with the ability to provide informed consent
4. Patients with the ability to provide a voided urine sample prior to cystoscopy

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
18 Years

Upper age limit
100 Years

Sex
All

Total final enrolment

964

Key exclusion criteria
1. Patients with a prior diagnosis of urothelial cancer
2. Patients with an inability to provide an adequate urine sample
3. Patients with an unwillingness or inability to undergo standard haematuria investigations

Date of first enrolment
01/10/2024

Date of final enrolment
30/06/2025

Locations

Countries of recruitment
United Kingdom

England

Scotland

Study participating centre
Royal Berkshire NHS Foundation Trust
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Sponsor information

Organisation
Nonacus Limited

Funder(s)

Funder type

Funder Name
Nonacus Limited

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not expected to be made available