SONIC HEALTHCARE UK

Research & Innovation

2023 - 2025 BIENNIAL REPORT

Welcome

I am delighted to introduce the inaugural Research and Innovation Report for Sonic Healthcare UK.

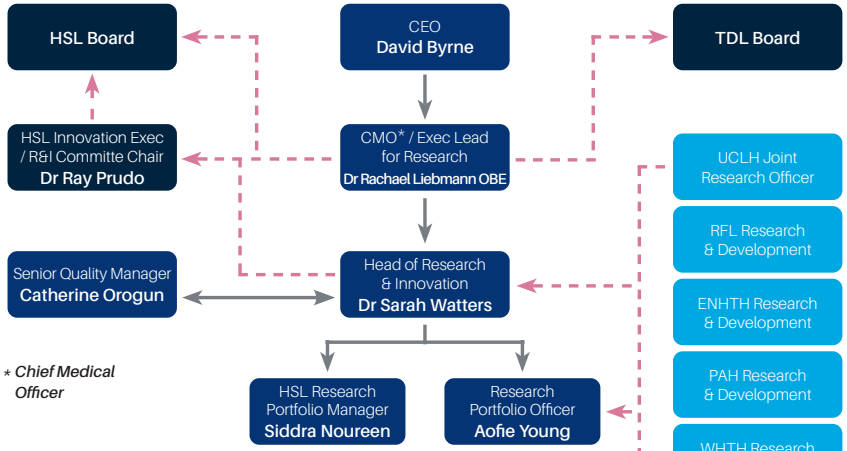
This publication marks an important milestone for our organisation, underscoring our commitment to continuous improvement and the pursuit of innovation. Covering the period 2023-2025, the report highlights the progress we have made in advancing diagnostic excellence, fostering collaboration and driving innovation across our laboratories.

Through strategic investment in research activity and professional development we continue to build a culture of continuous improvement. The insights and outcomes shared in this report are a testament to the dedication and expertise of our staff, whose contributions ensure that Sonic Healthcare UK remains at the forefront of diagnostic innovation.

I would like to express my thanks and appreciation to both members of my Research and Innovations team, and the wider R&I committees (whom are listed on page 3) who dedicate their energy towards a vital aspect of healthcare.

Finally, I invite you to explore this publication and gain a deeper understanding of the breadth of research and innovation taking place across our company.

Dr Sarah Watters
HSL Head of Research & Innovation



Front Cover Image: Taken from the CosMx Spatial Molecular Imager, courtesy of Sofia Carneiro and Dr Duong Vo

Sarah Watters, HSL Head of Research & Innovation

One of the core values at Sonic Healthcare UK is improving patient care by whatever means possible. To this end, we have made a commitment to Translational Research as an important route to meet this objective.

Together with our clinical and academic partners we are working towards transforming the way diseases are detected, diagnosed, and monitored, driven by major advances in digital technology, molecular science and artificial intelligence.

This journey of discovery at our organisation embraces a wide range of diseases and technologies, including detecting antimicrobial resistance - a global health threat, improving diagnostic practice with digital histopathology and monitoring disease outcome via novel biomarkers in cancer. Much of this work is underpinned by HSL's investment in diagnostic technology and its people, including molecular and genomic sciences which provide deep insights into the biology of disease.

This, together with our academic partners experience and skills in Big Data and analysis, enables us to take clinical diagnostics into a data-rich and technologically advanced direction. We look forward to navigating our way through a period of technical transformation to help ensure that these advances play a key role in our research and improving our services to patient care. These exciting developments reflect the growing importance of laboratory science in clinical medicine.

I hope the Research and Innovation Report will help showcase our progress and provide you with insights into our way of engaging with evolving technology.

Dr Ray Prudo
Chairman, The Doctors Laboratory &
Director, Health Services Laboratories

The Innovation Executive Membership

Dr Ray Prudo	TDL Chairman (Chair)
Dr Rachael Liebmann OBE	Chief Medical Officer / Exec Lead for Research & Innovation (Deputy Chair)
Mike Gandy	Group Scientific Officer
Dr Vanya Gant	HSL Board Member / UCLH Consultant Microbiologist
Dr Rajeev Gupta	HSL Consultant Specialty Lead for Haematology / UCLH Consultant Haematologist (Deputy Chair)
Dr Lisa Levett BEM	Director of Genetics and Molecular Pathology
Dr Sarah Watters	HSL Head of Research & Innovation

The Research & Innovation Committee Membership

Dr Ray Prudo	TDL Chairman (Chair)
Dr Rajeev Gupta	HSL Consultant Specialty Lead for Haematology / UCLH Consultant Haematologist (Deputy Chair)
Prof. Judith Breuer	Director of the UCL Pathogen Genomics Unit
Dr David Brealey	UCL Lead for Clinical Trials in Critical Care / UCLH Consultant in Critical Care
David Byrne	Sonic Healthcare UK CEO
Prof. Tariq Enver	Director of the UCL Cancer Institute/ UCLH
Mike Gandy	Group Scientific Officer
Dr Vanya Gant	HSL Board Member / UCLH Consultant Microbiologist
Dr Aiman Haider	UCLH Consultant Histopathologist
Prof. Derralynn Hughes	RFL Clinical Director of Research and Innovation
Dr Lisa Levett BEM	Director of Genetics and Molecular Pathology
Dr Rachael Liebmann OBE	HSL Chief Medical Officer and Exec Lead for Research & Innovation
Prof. Tim McHugh	Director of UCL Centre for Clinical Microbiology based at the RFL
Siddra Noureen	HSL Research Portfolio Manager
Prof. Karl Peggs	UCLH Director of Research and Director of the NIHR UCLH Biomedical Research Centre
Dr Robert Smillie	RFL Chief Medical Information Officer for Innovation
Aoife Young	HSL Research Portfolio Officer
Dr Sarah Watters	HSL Head of Research & Innovation

R & I in Numbers

The HSL Research and Innovation (R&I) department receives requests for HSL to provide pathology laboratory testing for research studies including clinical trials, academic clinical research studies and requests from commercial companies.

The R&I team are involved in checking capacity and feasibility of these requests with the laboratory leads. The R&I department undertake study setup, including bespoke sample pathways if required, are involved in contracts / agreements, costings and invoicing, they provide trouble shooting advice and check appropriate research governance is in place.

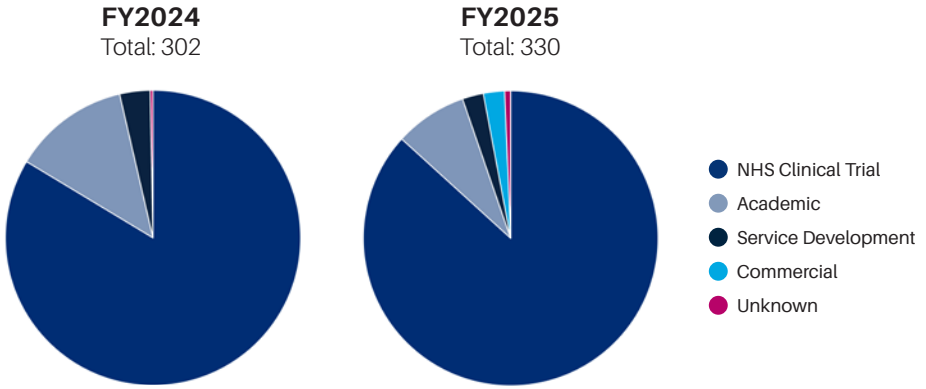
Research nurses at Watford General Hospital who have honorary contracts with HSL to access laboratory facilities, joined by Pamela McColgan, West Herts Operations Manager (far right)

From L-R: Kareena Raichada, Sehrish Zeeshan, Jincy Joseph, Rebekka Frick (back middle), Annia Wright (back middle), Elvira Hoxha (front middle), Mary James (front middle), Jules Kho

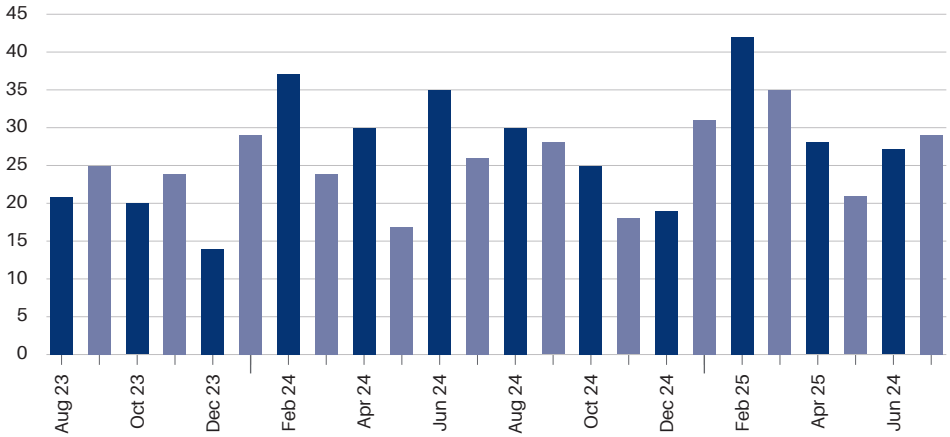
TDL Trials

TDL Trials offer routine and specialised testing for over **400 active studies** with sites in the EU, Middle East and North Africa. They provide a full service including kit supply, logistics, project management, site support and data management. With collaboration with Sonic Clinical Trials in Sydney Australia and Sonic Reference Laboratory in Austin Texas, TDL Trials offer a harmonised service globally.

Studies Reviewed by HSL (FY24 & FY25)



Total Number of Clinical Trials and Research Studies Logged (per month) Across all HSL Sites (FY24 & FY25)



36
peer reviewed staff publications

9 Working Days
average TAT for reviewing study feasibility

330
projects logged via the HSL portal in FY25

Publications & Presentations

For the period of 2023 to 2025, Sonic Healthcare UK staff have been involved in 63 publications in scientific journals. Below are just some of the featured articles.

Peak ADAMTS13 Activity to Assess ADAMTS13 Conformation and Risk of Relapse in Immune-mediated Thrombotic Thrombocytopenic Purpura. Prasannan et al. 2024 Blood

Deepak Singh (Haemostasis Laboratory Manager and ADAMTS13 Testing Service Lead at the UCLH RRL) was involved in a study that demonstrated the optimal time point to assess ADAMTS13 conformation in remission and show the risk of relapse within 2 years of achieving peak ADAMTS13 activity. It is still unclear why some patients remain at higher risk of relapse; however, if used clinically, the data will help differentiate patients who have a significantly lower risk of relapse within 2 years. ADAMTS13 is an inherited mutation that can lead to the potentially lethal syndrome Thrombotic Thrombocytopenic Purpura (TTP).

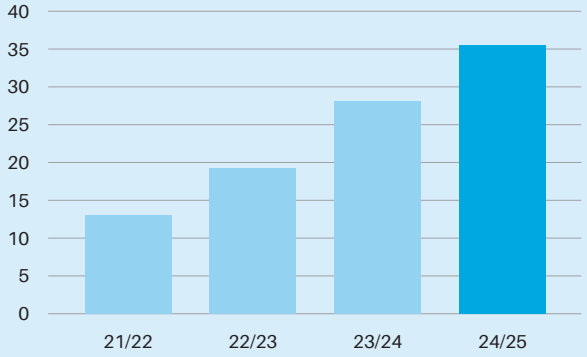
Sustained Clinical Benefit of AAV Gene Therapy in Severe Hemophilia B. New England Journal of Medicine Reiss et al. 2025 NEJM

Anne Riddell (Scientific Lead) and colleagues at the HSL Haemophilia Laboratory based at the Royal Free Hospital London were involved in a longitudinal follow-up study of patients who received adeno-associated virus mediated gene therapy as a treatment for haemophilia B. The results demonstrated the success of this novel therapy in treating the disease.

Incidence of Rodentolepis Nana Infection within People Seeking Asylum and Refugees Attending Health Screening at an Integrated Refugee Health Service. Killington et al. 2025 BMC Glob Public Health

Dr Laura Nabarro (Clinical Lead for Parasitology) and **Dr Katherine Bowers** (Senior BMS in Parasitology) were involved in a study that demonstrated a high prevalence of R.nana in children seeking asylum as part of the Respond cohort. R.nana is clinically significant as it can cause abdominal pain, diarrhoea and growth stunting. Recommendations included prompt treatment to prevent any transmission within families.

Publications Featuring Sonic Healthcare UK



Dr Katherine Bowers (l) and Dr Laura Nabarro (r)

Case Study: YouScreen

Sonic Healthcare UK played an active part in the YouScreen study[1]. YouScreen demonstrated that HPV self-sampling could encourage one million more women and people with a cervix each year to have HPV screening at home and consequently reduce the number of deaths from cervical cancer. The results have led to a national government backed national self-screening programme.

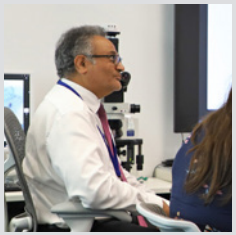
In February 2021 the YouScreen study launched across North London with the aim to increase the number of people with a cervix being screened for HPV. The study was primarily aimed at those who had not responded to invitations to be tested as part of the NHS Cervical Screening Programme.

Self-sampling kits were mailed directly, or offered via their GP, to 27,000 people with a cervix aged 25-60 who did not respond to invitations for routine screening from the NHS Screening Programme. Around 160 GP practices supported the trial. 13% returned self-sample kits when mailed directly to them, and 56% returned a kit when it was offered at their GP practice.

Sonic Healthcare UK's Chief Medical Officer, Dr Rachael Liebmann said about the project:

"We have successfully coordinated with NHS England and various charities to ensure that, thanks to these self-sampling kits, victims of sexual assault and FGM continue to have access to cervical screening services."

Sonic Healthcare UK hosts CSL, a single integrated service for molecular HPV testing and cytology led by Consultant, Martin Young. CSL is participating in the government backed self-screening programme which will continue to target under screened women and people with a cervix. Participants complete the kit at home and return it via their local postbox.



Hasit Patel, Consultant Biomedical Scientist

"We played an important role in the programme in terms of establishing the best type of sampling kits, and the testing methodology. The results are still being assessed by NHS England but it would be good to see the programme extended."

1. Opportunistic offering of self-sampling to non-attenders within the English cervical screening programme: a pragmatic, multicentre, implementation feasibility trial with randomly allocated cluster intervention start dates (YouScreen) - eClinicalMedicine

Case Study: Enhancing Infection Diagnosis Via Metagenomics Assay

Over 50% of patients with cancer and haematological malignancies die from infection, not the disease. University College London Hospitals NHS Foundation Trust (UCLH) has the largest Haemato-Oncology Unit in Western Europe. Sonic Healthcare UK benefits from having possibly the largest experience of the clinical application of molecular technologies in the UK, mostly based on Illumina sequencing platforms. In collaboration with UCLH and Royal Free London NHS Foundation Trust (RFH) Virology and Microbiology clinicians, Sonic Healthcare UK is verifying an Illumina-based clinical pathogen metagenomics assay to provide a service to UCLH and RFH using blood samples.

Metagenomics is an agnostic sequencing method that doesn't target a specific organism. It differs from other molecular assays in Infection Sciences where polymerase chain reaction (PCR) is first performed to amplify a specific gene of interest from a specific organism. The advantage of metagenomics is that any organism may be detected, not just the one being looked for.

Drs Paul Grant and Jude Heaney, Molecular Virology Scientific Lead and Assay Development Scientist respectively, have been working on this project to produce a diagnostic pipeline with excellent performance – less than 48-hour turnaround.

Current work suggests that metagenomics can provide an unexpected, clinically actionable diagnosis in 20–25% of patients i.e., an organism no one had considered, for which no other test had been done or was possible. This treatment can be in excess of £400,000. The cost of failure far outweighs the expense and potentially life-saving benefit of such an extra test. Alongside this, various samples have been tested with this method so that the service can be extended to multiple sample types.

In addition to our in-house metagenomics method, the organisation is part of an NHSE pilot study specifically studying respiratory sample types (endotracheal aspirate and bronchoalveolar lavage) involving activity in intensive care units (ICU) across six partners – UCLH, Guy's and St Thomas' NHS Foundation Trust, University Hospitals Birmingham NHS Foundation Trust, Oxford University Hospitals NHS Foundation Trust, University Hospital Southampton NHS Foundation Trust, and Manchester University NHS Foundation Trust. £1 million has been awarded to roll out Oxford Nanopore (ONT) sequencing to these six centres across England. As part of this project, we are testing respiratory samples from ICUs across UCLH with the aim to use the data for an epidemic preparedness / early warning system.

Running two methodologies gives Sonic Healthcare UK the ability to assess the best clinical approach. ONT allows a faster diagnosis, but Illumina technology appears to be more accurate. The aim is to roll out Illumina metagenomics sequencing at UCLH in late 2025.

Case Study: Collaborating with the UCL Cancer Institute

Collaborating with the UCL Cancer Institute to discover novel biomarkers in T-Cell Lymphomas using Spatial Transcriptomics and high-throughput exome sequencing.

In 2024 HSL and the UCL Cancer Institute (CI) launched a formal collaboration with the aim of identifying biomarkers for T-Cell Lymphomas using a spatial transcriptomics. The project is fully funded by HSL and led by Dr Rajeev Gupta, Consultant in Haematological Malignancies at UCLH Clinical Lead for Haematology at Sonic Healthcare UK, and Associate Professor at UCL.

The aim is to use the CosMx (Bruker) spatial transcriptomics platform to uncover novel biomarkers that predict response to auto-Haematopoietic Stem Cell Transplantation (HSCT) and/or novel targeted therapies in relapsed Non-Hodgkin Lymphoma (T-NHL). These are likely to be proteins detectable by immunohistochemistry.

This is an important new digital pathology initiative which has the potential to produce a rapid format diagnostic tool. Rajeev Gupta said, ***"The challenge is to identify and develop a predictive bespoke panel of optically barcoded antibodies which would enable histopathologists to be able to rapidly screen tissue sections on a disease specific basis."***

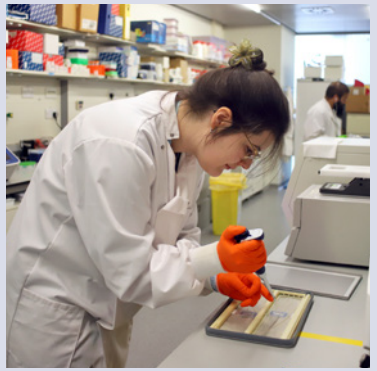
Sofia Carneiro, a Biomedical Scienstis at HSL-AD has been seconded for two years to work specifically on the project. Here Sofia reflects on what led her to apply for the role and how it differs to life as a BMS working in diagnostics.

"Since I was young, I have been fascinated with science, with a special inclination towards biological sciences. I studied Biomedical Sciences in Portugal and quickly got captivated by the Molecular Biology field, which led me to doing two postgraduate courses in Molecular Technologies. Due to my previous work experience in Molecular techniques in my previous job in Portugal, I was able to join HSL as a member of the FISH team. I have gained invaluable knowledge and skills, but the best part is how it kept my brain always curious about the little details in every case.

"I got to know about the R&D position through internal communications, and it was interesting how a few colleagues pointed out how 'it looks like something right up your alley'. I agreed and luckily got the job!

"This role was a 180-degree change in comparison to my normal BMS position. I do bench work at two facilities - the Halo Building and the CI. This requires me to manage my time and day autonomously, to ensure my tasks are completed to meet the monthly objectives discussed in project meetings.

"The project has an objective looking into two groups of haematological malignancies, applying the same approach on how to collect data. At the Halo, samples nucleic acids are extracted and sequenced by NGS. At the CI we take a more research-based approach, using a novel technology called CosMx Spatial Molecular Imager that is an in situ imaging platform that can show transcriptome at single cell level. It provides spatial multiomics with formalin-fixed paraffin embedded (FFPE) tissue samples at single cell and subcellular resolution."



MSc Students

MSc projects undertaken by staff present the perfect opportunity for Sonic Healthcare UK to create a win-win environment. By aligning projects with the needs of the laboratory, staff achieve academic excellence while contributing innovations that benefit patients and healthcare systems. In 2024, we funded 30 staff members to undertake master's degrees. The organisation currently has 58 active MSc students across its vast UK network of laboratories. Staff undertaking an MSc have been able to progress to senior scientist positions within the company.

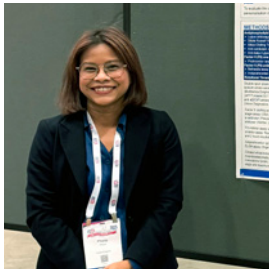
Phway Thwin | Senior Biomedical Scientist, Haemophilia, Royal Free Hospital NHS Foundation Trust

MSc in Biomedical Science (University of Greenwich)
MSc Project Title: Evaluation of Plasmin Generation in Severe Haemophilia A Patients Treated with Novel Therapies

Phway completed her MSc with distinction in 2024. She used a calibrated plasmin generation assay to investigate fibrinolytic responses in severe haemophilia A (SHA) patients, with the aim of assessing bleeding risks and haemostatic correction before and after treatment with an extended half-life recombinant factor VIII concentrate and factor VIII bispecific antibody. The plasmin generation assay is not currently commercially available; however, Phway formed a collaboration with researchers at the Synapse Research Institute in the Netherlands and used their assay.

Supported by the Royal Free Charity, Phway presented the data generated from her project at the 32nd Congress of the International Society on Thrombosis and Haemostasis (ISTH) in Bangkok (June 2024). A manuscript is being prepared for publication. As a fairly new assay, clinicians from other London NHS Trusts have approached Phway to learn how to perform the assay in their laboratories.

Phway attributes her success to excellent time management and organisational skills, a passion for research and innovation, and the support and guidance she received from her mentors Dr Paul Batty (UCL Associate Professor), Anne Riddell, (Head of Haemophilia and Scientific Lead for Haemostasis at Health Services Laboratories (HSL), and Prof Pratima Chowdhury (Director of the Katherine Dormandy Haemophilia Centre at the RFH and HSL Consultant Haemostasis Specialty Lead.



Shaila Chinchole | Senior Biomedical Scientist & Training Officer, Molecular Haematology, Halo Building

MSc in Biomedical Science (University of Greenwich)
MSc Project Title: Development of Lymphoma Genomics by DNA and RNA Sequencing Methods

Shaila's MSc project focused on developing a High-Grade Lymphoma NGS assay. The initial work and subsequent verification were performed on archived patient material. Once the data had been generated, collaborative discussions were held with the lead SIHMDS Lymphoma Consultant and Sonic Healthcare UK's Clinical Lead for Haematology, Rajeev Gupta, around further testing the assay's integrity and the benefits of bringing the assay into clinical service at the Haem-Oncology laboratory.

The High-Grade Lymphoma assay was brought into use in 2024 and offers in-house lymphoma genomics testing to patients which, compared to fluorescence in situ hybridisation (FISH) analysis, has reduced both turnaround time and cost.

Shaila said:

"I feel proud that my MSc project could contribute to the development of a new service. This has given me the confidence and knowledge to do more in the future, if the opportunity arises. I want to thank my whole team and my mentor and line manager for the support I received."

A Day to Empower, Engage and Excite

On the 14th November 2024 the Sonic Healthcare UK Research and Innovation Symposium was held at the Wellcome Collection in London after a four-year hiatus. It proved to be a resounding success, bringing together colleagues, exhibitors and thought leaders from across healthcare.

Attendees explored exhibitor stands from some of our organisation's suppliers, along with a World Quality Day area, before gathering in the Henry Wellcome auditorium. CEO, David Byrne, opened the event with a foreword on innovation emerging from the pandemic and future opportunities in healthcare.

Sonic Healthcare Group Chief Medical Officer, Dr Stephen Fairy, delivered the keynote address on the role of anatomical pathology in medicine and how AI is transforming diagnostic reporting. Digital pathology and AI continued as the theme of the morning, with contributions from Prof. Greg Shaw, Dr Adam Levine, Dr Sara Trompeter, and Dr Nicholas Gleadall, chaired by Dr Aiman Haider.

A second keynote was given by NHS GIRFT Leader, Dr Tom Lewis on aligning recommendations with ISO:15189 and patient value.

The afternoon highlighted the "Getting it Right First Time" programme and clinical diagnostic innovations led by Sonic Healthcare UK. Staff speakers included Molecular Haematology Operational Manager, Robert Baker, Molecular Virology Scientific Lead, Dr Paul Grant, and Haemostasis Manager, Deepak Singh, who participated in a panel led by Assay Development Scientist, Dr Jude Heaney. Later, Daniel Frayne presented on the organisation's GIRFT recognition scheme, joined by Deputy Head of the UCLH RRL Haemostasis Department, Sabina McCann, HSL-AD Services Manager, Josep Linares, and UCLH RRL Haematology Scientific Lead, Billy Janda.

During the breaks, colleagues presented research in a poster competition. Thirteen posters were showcased by staff, with winners – HSL-AD Quality Manager, Sahar Zargarzadeh and Sabina McCann – announced by Dr Rachael Liebmann and Dr Stephen Fairy.

The Symposium proved to be a valuable day of knowledge-sharing, collaboration, and forward-thinking discussion, leaving staff inspired about the future of healthcare and pathology.

1 | Sabina McCann presenting her poster 2 | David Byrne and Dr Rachael Liebmann OBE 3 | Dr Jude Heaney 4 | Dr Stephen Fairy with prize winner Sahar Zargarzadeh 5 | Prof Rajeev Gupta 6 | Engaged audience
7 | Elaine Holgado planning her day 8 | A packed auditorium for speaker Adam Levine 9 | Dr Rachael Liebmann OBE, Dr Stephen Fairy and Dr Ray Prudo 10 | Lisa Manze alongside Ishmael Carboo 11 | Speaker Tom Lewis

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