Medical Microbiology and Mycology

Laboratory Users Handbook

Version number 1.0

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1.0	New SOP	13/03/2026

Contents

1. General Information

Synnovis Group LLP is a joint venture between Guy's and St. Thomas' NHS Foundation Trust, Kings College Hospital NHS Foundation Trust and SYNLAB. Synnovis Group LLP is a provider of Pathology services. Synnovis Analytics and Synnovis Services sit within the Synnovis Group: The Department of Infection Sciences sits within Synnovis Analytics LLP. Please see for further information http://www.Synnovis.co.uk

This user manual outlines the Medical Microbiology and Mycology service provided by Synnovis Analytics LLP based at the Blackfriars Hub on Friars Bridge Court, 41-43 Blackfriars Road, London SE1 8NZ, with an Essential Services Laboratory [ESL] at each of the following sites: Kings College Hospital, Princess Royal University Hospital, Guy's Hospital, St Thomas' Hospital, Royal Brompton Hospital and Harefield Hospital.

The Infection Sciences department includes the Medical Microbiology and Mycology service and the Virology service. The information provided in this user manual includes specimen requirements, instructions for collection of specimens, and reference values or interpretative data where relevant for Microbiology. Please refer to the Virology User Manual for information relating to Virology. The Microbiology department provides an extensive consultant-led, customer focussed clinical microbiology service and specialist advice in microbiology, mycology and parasitology to hospitals and General Practitioners.

Commitment to Quality

The Synnovis management system supports the business vision to be the leading Pathology provider of high quality, cost effective pathology services. The Infection Sciences, Microbiology Department, is a UKAS accredited medical laboratory No XXXX. The Microbiology test repertoire No. is stated on the Schedule of Accreditation, please see https://www.ukas.com/find-an-organisation/ and enter in the Search accreditation organisation field to retrieve the department's schedule of accreditation

A statement of Purpose constitutes the Quality policy for Synnovis Group LLP and is applicable to both Synnovis Analytics and Synnovis Services. Synnovis is an independent pathology provider registered with the Care Quality Commission. The quality policy can be found at http://www.Synnovis.co.uk

Synnovis continually monitors activity (Microbiology receives approximately 1,000,000 samples annually). Services complete an Annual Management Review (AMR) to ensure quality objectives are monitored locally and changes or new systems are implemented effectively. Satisfaction of service users is seen as a key indicator of success in improvement of services.

Key performance and quality indicators are used to enhance operational performance and remove variation from laboratory processes. Internal quality control (IQC) and assurance with External Quality Assurance (EQA) is used as part of the overall assurance mechanism along with clinical and internal audit to monitor adequacy of operating procedures and effectiveness of the quality systems. We recognise the confidentiality of information we hold on patients, donors and clients and allow accreditation and regulatory bodies appropriate access to knowledge systems maintained to provide third party assurance to Synnovis and our stakeholders.

The laboratory complies with the requirements of the General Data Protection Regulation (GDPR) 2018, the Data Protection Act 1998, the Caldicott principles on safeguarding patient confidentiality and patient information, and with guidance from the Royal College of Pathologists. All patient identifiable information is regarded as confidential and is passed on only for official purposes e.g. to professionals with responsibility for patient care or public health. Confidential data is held only as long as necessary for operational purposes, and is stored securely.

1.1 Location

The Medical Microbiology laboratory covering bacteriology is located on the 3rd floor and mycology is located on the 5th floor at the Blackfriars Hub, the ESL sites can be found:

South London Specialist Virology Hub Virology 5th Floor Blackfriars Hub on Friars Bridge Court, 41-43 Blackfriars Road, London SE1 8NZ DX address: DX 432901	ESL in Denmark Hill address Blood Sciences Laboratory King's College Hospital NHS Foundation Trust Ground Floor, Bessemer Wing Denmark Hill, London SE5 9RS
ESL in St Thomas Hospital address Blood Sciences Laboratory St Thomas' Hospital Floor 5 North Wing London SE1 7EH	ESL in Guys Hospital address Blood Science Laboratory Pathology Laboratory 4th Floor Southwark Wing Guy's Hospital Great Maze Pond London SE1 9RT
ESL in Royal Brompton Hospital address Blood Sciences Laboratory Royal Brompton Hospitals Laboratory Medicine Sydney Street London SW3 6NP	ESL in Harefield Hospital address Blood Sciences Laboratory Harefield Hospital Pathology Block Hill End Road Harefield UB9 6JH
ESL in Princess Royal University Hospital Blood Sciences Laboratory Orpington Kent BR6 8ND	

1.11 Population served and services within King's College Hospital NHS Foundation Trust

King's College London was founded in 1829. Clinical teaching in the medical faculty was dependent on the Middlesex Hospital until 1839 when King's College London gained its own hospital in Portugal Street. The hospital was rebuilt in 1861 and moved to the Camberwell site in 1913. It became part of the NHS in 1948 as a teaching hospital. The 1960s saw the introduction of a new dental school, maternity block (now the Ruskin Wing) and King's liver unit. This was followed by the Normanby College of Nursing, Midwifery and Physiotherapy. In 1995 the UK's first specialist Motor Neurone Disease Care and Research Centre was established, and the Weston Education Centre was opened in 1997, accommodating the medical school, library and lecture theatres. A new Accident and Emergency Department was opened in the same year. King's College Hospital (KCH) received Foundation Trust status on 1 December 2006. Following the dissolution of the South London Healthcare Trust, King's helped oversee the management of the Princess Royal University Hospital (PRUH) in October 2013.

KCH NHS Foundation Trust is a large provider of acute and specialist services that serves a population of over 1,000,000 in the economically diverse Greater London boroughs of Southwark, Lambeth, Bromley, Bexley and the county of Kent. The trust operates from 5 sites: Denmark Hill (main) site, Princess Royal University Hospital (PRUH) in Bromley, Beckenham Hospital, Queen Mary's Hospital Sidcup and Orpington Hospital. The PRUH is in Farnborough, near Orpington, Kent. Beckenham Hospital is about 6 miles to the north of the PRUH and provides outpatient services. Orpington Hospital is 3 miles south of PRUH and provides outpatient services and has 40 intermediate care beds.

KCH NHS Foundation Trust has 1673 beds including 1050 acute, 125 maternity and 144 critical care beds. The Denmark Hill site has approximately 836 beds including a major critical care service (122 beds) and maternity services (103 beds). The PRUH has 455 acute beds, 22 critical care and 22 maternity beds (plus a midwifery led birthing centre) whilst Orpington provides 29 acute beds. Emergency Department services are provided at both KCH Denmark Hill and PRUH. The Trust employs in excess of 13,450 staff and receives over 250,000 emergency attendances, 115,000 inpatient spells and 960,000 outpatient attendances

All core services are provided from KCH Denmark Hill and PRUH while outpatient and surgical services are provided from Orpington Hospital. The Trust provides services to a population from the boroughs of Lambeth, Southwark and Bromley. Several specialist units of international repute offer regional or supra-regional services and are located within the Denmark Hill site. These include tertiary services for liver disease and transplantation, neurosciences, diabetes, cardiac services, haematology and foetal medicine. For the population of southeast London and Kent, KCH is the designated major trauma centre, as well as a heart attack centre and the regional hyper acute stroke centre. The helipad at Denmark Hill, opened in November 2016 and has reinforced King's position as a major trauma centre for the south of England.

King's provides services to local residents of the London Boroughs of Lambeth, Southwark, Bromley, Bexley and Lewisham from its sites at Denmark Hill, the Princess Royal University Hospital Farnborough Common, Queen Mary's Hospital Sidcup, and Orpington Hospital. These include accident and emergency services, maternity, care of the elderly, orthopaedics, diabetes, ophthalmology, oncology, dermatology, and many more. King's has a reputation as pioneers in medical research, with a record of innovation in a number of key fields. The hospital is home to a number of leading clinical units and research centres, such as the Clinical Age Research Unit, the HIV Research Centre, and the Harris Birthright Centre. King's College Hospital NHS Foundation Trust has an enviable track record in

research and development and service innovation. In partnership with King's College London the Trust was awarded a National Research Centre in Patient Safety and Service Quality. It is also a partner in two National Institute for Health Research biomedical research centres. The first is a Comprehensive centre with King's College London and Guy's and St Thomas's NHS Foundation Trust and the second is a Specialist centre with the South London and Maudsley NHS Foundation Trust and the Institute of Psychiatry. King's Health Partners brings together research, education and clinical practice across three NHS Foundation Trusts - Guy's and St Thomas', King's College Hospital and South London and Maudsley - and a world-leading university, King's College London.

The regional and supra-regional services include:

- Haemato-oncology (including the UK's largest bone marrow transplantation unit)
- Institute for Liver Studies (providing 30% of UK liver therapy, including transplantation and liver failure) for both adult and paediatric hepatology
- Variety Club Children's Hospital
- Regional Neurosciences and Neurosurgical services
- Renal unit (offering dialysis including HBV, HCV and HIV positive individuals)
- Harris Birthright Centre for Fetal Medicine
- Adult Intensive Care Units, neonatal and paediatric intensive care and high dependency units
- Solid tumour oncology / cancer services (including skin, hepatobiliary, head and neck)
- Cardiac surgery (regional)
- South East London Major Trauma Centre
- Paediatric and adult Accident and Emergency departments
- Obstetrics and gynaecology; assisted conception
- Genito-urinary medicine (Caldicot Centre)
- Reproductive and Sexual Health

1.12 Population served and services within Guy's & St Thomas's Hospitals Foundation Trust

GSTT NHS FT is one of the UK's leading providers of hospital and community-based healthcare, research and education. There are 5 main hospitals –Guy's Hospital, St Thomas' Hospital, Evelina London Children's Hospital, Royal Brompton Hospital and Harefield Hospital, and in the community in Lambeth and Southwark. They provide a full range of lifelong, general and specialist care. St Thomas' was founded in the 1100s, Guy's in the 1720s, Royal Brompton in the 1840s, Evelina Children's Hospital in 1869 and Harefield Hospital in 1915.

Guy's Hospital

Guy's Hospital, in Southwark, is a 400-bed major elective centre for south London and a specialist centre for cancer, kidney, urology, orthopaedics, dental and ear, nose and throat.

Our state-of-the-art cancer centre at Guy's provides treatment for a wide range of cancers, offering radiotherapy, chemotherapy and surgery. It's also the centre for ground-breaking research and clinical trials, helping us to improve cancer treatments and outcomes.

Guy's Tower is one of the tallest hospital buildings in the world. It is the site of many of our dedicated clinical research facilities.

Our medical school, GKT School of Medicine, is based at Guy's Hospital.

Guy's Hospital also houses our dental school, which is the largest dental school in Europe.

St Thomas' Hospital

St Thomas' Hospital, in Lambeth, has one of the busiest emergency departments (A&E) in London and is home to a wide range of specialties including: cardiovascular, respiratory (including Lane Fox), women's services (including maternity), acute medicine and ageing and health, critical care, gastro-intestinal medicine and surgery, general surgery, plastic surgery and eye (ophthalmology).

St Thomas' is our largest hospital with 840 beds. It's also home to one of London's busiest maternity services, where over 6,000 babies a year are born, with the support of our specialist obstetric, medical and midwifery care.

Evelina London Children's Hospital

Evelina London Children's Hospital is on the same site as St Thomas'. It is one of only 2 specialist children's hospitals in London and provides the most comprehensive health services for families from pre-birth, throughout childhood and into adult life. Evelina London was the first specialist children's hospital to be rated 'Outstanding' by the Care Quality Commission.

Each year we treat over 120,000 children in Lambeth and Southwark, and across London, Kent, Surrey and Sussex through clinical networks for specialties including: cardiology, kidney, neurology, neonatal care

Together with Royal Brompton Hospital, we're one of the UK's main centres for children's cardiology and respiratory care.

Our neonatal unit cares for around 1,000 babies a year and has some of the best survival rates in the UK.

Evelina London also runs the South Thames paediatric intensive care retrieval service, to bring children to our ICU in specially designed intensive care ambulances, helicopters or planes.

Royal Brompton Hospital

Royal Brompton Hospital, in Chelsea, West London, is our 350-bed specialist heart and lung hospital. Together with Harefield Hospital, St Thomas' and Evelina London, we form the largest specialist heart and lung centre in the UK and among the largest in Europe. Specialties include cardiology, thoracic medicine, asthma and allergy, sleep and ventilation, imaging and diagnostics.

We set up the UK's first adult cystic fibrosis centre. It is now one of Europe's biggest treatment centres for the condition. We're the only centre in the country with a total artificial heart programme and our cystic fibrosis experts are pioneering opportunities in remote digital care.

Harefield Hospital

Harefield Hospital, near Uxbridge, is one of the largest and most experienced centres in the world for heart and lung transplants and has jointly pioneered work in the development of 'artificial hearts' (also known as left ventricular assist devices or LVADs). The hospital has: 168 beds with 5 operating theatres and 4 catheter laboratories

Specialties include cardiology, transplantation (heart and lung) and cardiac surgery

At our dedicated heart attack centre, we deal with heart attack emergencies from outer north-west London, providing primary angioplasty in our specialist catheter laboratories. We're also pioneers in minimally invasive surgery, allowing some patients to undergo surgery through a small incision, minimising the impact of the procedure.

Much of the hospital's pioneering research is performed alongside the Heart Science Centre, which investigates the causes and treatments of heart disease and is based in the hospital grounds.

Harefield is also a major centre for cancer treatment, including lung cancer, chest cancer, oesophageal cancers

Community services

Much of our care is delivered closer to and at home, in the communities we serve. We provide community services for adults and children in Lambeth and Southwark, working closely with our local NHS, local authority and voluntary sector partners. We deliver services in a variety of locations, including in GP practices, health centres, schools, community buildings and in patients' homes. Our services range from health promotion through to delivery of high-quality care for complex patients in our community centres.

We also provide specialist service outreach clinics in partnership with local hospitals at over 50 locations. Services include children's, cardiovascular, cancer, thoracic and clinical genetics

1.0 Primary care

The hub laboratory serves more than 100 fund-holding general practitioners. The Integrated Care Boards with their Primary Care Groups general practitioners' expect direct access for prompt clinical advice, including virological advice in addition to timely results. Specialist virology services and clinical advice are offered by virology to the London Boroughs of Lambeth, Southwark, Lewisham, Bromley, Bexley and Greenwich. The local authorities serviced by the laboratory are the London Boroughs of Bromley, Southwark, Lambeth, Lewisham, Bexley and Greenwich.

1.1 Research

There are collaborations between clinical research groups and academic partners at Guy's, King's, and St Thomas's School of Medicine, the Institute of Psychiatry, The School of Nursing and Midwifery, King's College London and King's Division of Biomedical Sciences. King's College Hospital Foundation Trust, King's College London, Guy's and St Thomas' and South London and Maudsley Foundation Trusts are members of King's Health Partners, an Academic Health Science Centre.

There is a small team of clinical scientists working in collaboration with medical and biomedical scientist colleagues in a variety of projects including technology transfer to the routine diagnostic service as well as other academic research activities. Work carried out in the both microbiology and virology laboratories has been published in numerous peer-reviewed journals and presented at local, national and international meetings.

1.2 Key Personnel and Contact Details

KCH medical team

0203 229 9000 (switch) or extension		
Designation	Name	Telephone extension

Consultant Medical Microbiologist/ ID Physician, Strategic Clinical Lead Microbiology & Laboratory Director of Hub Microbiology.	Dr Anjaneya Bapat	31759
Consultant Medical Virologist, Strategic Clinical Lead Virology Synnovis and Laboratory Director for South London Specialist Virology Hub, Blackfriars, Synnovis	Dr M Sudhanva	36298 / 36971
Higher Specialty Trainees/Combined Infection Trainee/Clinical Fellows	On Rotation	36298
Consultant in Infectious Diseases and Microbiology Lead for Infectious Diseases	Dr Mauricio Arias	93766
Trust Clinical Lead for Infection Sciences and Consultant Medical Microbiologist/ ID Physician	Dr Aileen Boyd	34369
Trust Laboratory Lead and Consultant Medical Microbiologist/ ID Physician	Dr Jonathan Youngs	34361
Interim Clinical Director of KCH NHS FT Pathology and Consultant Medical Microbiologist/ ID Physician	Dr Caoimhe Nic Fhogartaigh	36260
KCH NHS FT Chief of Division A and Consultant Medical Microbiologist	Dr Carmel Curtis	32709
Consultant Medical Microbiologist/ID Physician	Dr Alberto San Francisco Ramos	
Consultant Medical Microbiologist/ID Physician	Dr Jasmin Islam	
Consultant Medical Microbiologist	Dr Martin Brown	
Consultant Medical Microbiologist	Dr Anita Verma	

PRUH microbiology medical team [KCH NHS FT]

01689 863 0000 (switch) or extension

Designation	Name	Telephone extension
Consultant Medical Microbiologist	Dr Mustafa Atta	64287 / 64280
Consultant Medical Microbiologist	Dr Sumati Srivastava	64287 64409
Consultant Medical Microbiologist / ID Physician	Dr Jose Abarca	64287 / 64325
Clinical Fellows	Dr May Mohamed Dr Osman Nayeem Dr. Ala Elhbishi	64287 / 66541 64287 / 64323
Trust Clinical Lead for Infection Sciences and Consultant Medical Microbiologist/ ID Physician	Dr Aileen Boyd	34369
Interim Clinical Director of KCH NHS FT Pathology and Consultant Medical Microbiologist/ ID Physician	Dr Caoimhe Nic Fhogartaigh	36260
KCH NHS FT Chief of Division A and Consultant Medical Microbiologist	Dr Carmel Curtis	32709

GSTT medical team

020 7188 7188 (switch) or extension +8		
Designation	Name	Telephone
Trust Clinical Lead for Infection Sciences and Consultant Medical Microbiologist/ ID Physician	James Whitehorn	

Consultant Medical Virologist and Infectious Disease Consultant	Dr Sam Douthwaite	Virology Consultant on duty could be contacted via switchboard
Consultant Medical Virologist and Infectious Disease Consultant	Dr Iain Milligan	
Consultant Medical Virologist and Infectious Disease Consultant	Dr Gaia Nebbia	
Specialty Doctor in Virology	Dr Alina Botgros	
Specialty Trainee	On Rotation	On smart page or on ext x83140 via switchboard
Consultant Medical Microbiologist	Dr Simon Goldenberg	8515
Consultant Medical Microbiologist	Dr John Klein	
Consultant Medical Microbiologist / ID Physician	Dr Carolyn Hemsley	
Consultant Medical Microbiologist / ID Physician	Dr Ho Kwong Li	
Consultant Medical Microbiologist	Dr Dakshika Jeyaratnam	
Consultant Medical Microbiologist / ID Physician	Dr Liana MacPherson	

Royal Brompton Hospital and Harefield Hospital medical team

Designation	Name	Telephone
Consultant Medical Microbiologist and Infectious Diseases Consultant	Dr Devan Vaghela	01895 823 737 extension 88448
Consultant Medical Microbiologist and Microbiology Consultant [Harefield Hospital]	Dr Luciana Sowole	01895 823 737 extension 85245
Infectious Diseases and Consultant Medical Microbiologist [Harefield Hospital]	Dr Saraswathy Murthy	01895 823 737 extension 85728
Infectious Diseases consultant [Royal Brompton hospital]	Dr Elda Righi	01895 823 737 extension 88440
Microbiology Registrars Royal Brompton Hospital		Mon-Fri 9-5 – 7811596428 Out of hours – switchboard 01895 823 737
Microbiology Registrars Harefield Hospital		Mon-Fri 9-5 - 07814553640 Out of hours – switchboard 01895 823 737

Hospital switchboard numbers for medical advice

During weekdays from 9 am to 5 pm medical advice on interpretation of microbiology and mycology results, antibiotic management and general infection-related clinical advice can be sought from the specialty trainees or consultants as detailed in section 2

Infection control advice can be obtained from the Infection Control Nurses as per local trust protocol.

Please DO NOT CALL medical teams to obtain RESULTS.

An on-call service for medical advice is provided by Trusts for Microbiology according to local trust policies.

Hospital switch boards are as follows

King's College Hospital NHS Foundation Trust sites	**King's College Hospital Denmark Hill site 020 399 9000**
	King's College Hospital PRUH & South sites 01689 863 0000
Guy's and St Thomas's Hospital NHS Foundation Trust sites	**Guy's and St Thomas's Hospital 020 7188 7188**
	Royal Brompton Hospital 020 7352 8121
	Harefield Hospital 01895 823737

Synnovis Contact list for laboratory at all sites

Site	Situation / Location	Telephone	Email if available
All sites	Hub Results, add-ons, logistics, consumables	Mon-Friday 08.00-18.00 020 4513 7300	synnovis.customerservices@nhs.net
Microbiology General enquires	Routine samples	08:00-17.30: 0204 614 7510	hubmicrobiology@synnovis.co.uk
Microbiology Urgent enquiries	Urgent samples and blood cultures only	24/7: 07354 820907	
Microbiology Hub **Floor 3**	Operations Manager Office	0204 614 7530, 0204 614 7531, 0204 614 7533	
KCH - Princess Royal University Hospital	Microbiology Laboratory	Mon-Friday 08.00-18.00 01689864343, 01689 864342	hubmicrobiology@synnovis.co.uk
	Clinical Advice	Mon-Friday 09.00-17.00 01689 864287, 01689 864323 Out of hours via PRUH switchboard 01689 863 000	
KCH – Denmark Hill	Microbiology Registrars Clinical Advice	Mon-Friday 09.00-17.00 0203 299 4360 Out of hours via DH switchboard 020 3299 9000 for on-call microbiology registrar	kch-tr.microregistrars@nhs.net
	Microbiology Consultant Clinical Advice	Mon-Friday 09.00-17.00 0203 299 4360 Out of hours via DH switchboard 020 3299 9000 for on-call microbiology consultant	kch-tr.microconsultants@nhs.net
	Microbiology Laboratory	Mon-Friday 09.00-17.00 0203 299 1481 Monday-Friday 09:00-17:00 Saturdays 08:00-13:00 Out of hours via DH switchboard 020 3299 9000 for On call BMS	HubMicrobiology@synnovis.co.uk

	Microbiology Laboratory	Mon-Friday 09.00-17.00, for urgent only 02071883111 Out of hours via GSTT switchboard 020 7188 7188 and then bleep 1802	HubMicrobiology@synnovis.co.uk
GSTT – Guy's Hospital and St Thomas' Hospital	Microbiology Clinical Advice	9-5 St Thomas' General Microbiology (including all GP enquires): 07354 249 435 St Thomas Clinical Infection and GP advice (if non-urgent please call 12-1pm or 2-4pm) 020 7188 3100 St Thomas' Bacteraemia / endocarditis: 07720 166 002 St Thomas' ICU: 07720 165 924 St Thomas' Ward Consults: 07761 046 269 St Thomas' Hillyers Ward Team: 07720 166 048 Guy's (HaemOnc / Orthopaedics / ENT / Head and Neck): 07928 513 650 Guy's (Renal / Urology / Thoracic / GCCU): 07511 440 507 Out of hours via via GSTT switchboard 020 7188 7188 for Infection resident medic on call	
GSTT – Royal Brompton Hospital and Harefield Hospital	Microbiology laboratory	Mon-Friday 09.00-17.00 020 7351 8451	HubMicrobiology@synnovis.co.uk
	Clinical Advice	Mon-Friday 09.00-17.00 Royal Brompton Hospital - Consultant Microbiologist: Day phone: 07811596428. Landline 020 7351 8440, 020 7351 8414, 020 7351 2972	

	Harefield Hospital - Consultant Microbiologist: Day phone 07814553640. Landline 01895 828 728 Out of hours Consultants Via Switchboard RBH: 0207 352 8121 07814553640HH: 01895 823 737	

Synnovis Microbiology key personnel and contact details

Microbiology laboratory personnel contact details for Primary Care clinical teams, Secondary Care clinical teams and External enquiries.

The purpose of contacting laboratory team members can be divided into the following categories

1. Contacting to obtain results add-ons, logistics, consumables
2. Obtaining medical advice regarding the diagnosis and treatment of infection
3. Contacting individual members of laboratory staff

Designation of Ops team	**Name**	**Email**
Operations Service Director [OSD] – Infection Sciences	Elizabeth Ford	elizabeth.ford@synnovis.co.uk
Deputy Operations Service Director [DOSD] – Microbiology	Sunita Gurung	sunita.gurung@synnovis.co.uk
Operational Services Lead [OSL]	Gillian Maloney	gillian.maloney@synnovis.co.uk
Operations Manager	Lisa Bryan	lisa.bryan@synnovis.co.uk
Operations Manager	Ricky Stow	ricky.stow@synnovis.co.uk
Principal Biomedical Scientist [Training, Health and Safety Manager]	Eunice Drakes	eunice.drakes@synnovis.co.uk
Designations of Clinical Scientists	**Name**	**Email**
Consultant Clinical Scientist	Lynda Hadjilah Fourali	lynda.hadjilahfourali@synnovis.co.uk
Clinical Scientist Infection Sciences	Matthew Bruce	matthew.bruce@synnovis.co.uk
Clinical Scientist Infection Sciences	Jasveen Sehmi	Jasveen.Sehmi@synnovis.co.uk

Designations of Quality managers	Name	Email
Senior Quality Manager, (Biochemistry, Immunology, Infection Sciences, Support services)	Michael Makele	michael.makele@synnovis.co.uk
Quality Manager, Infection Sciences	Angela Menezes	angela.menezes@synnovis.co.uk
Interim Quality Manager, Infection Sciences	Natasha Odubade	Natasha.odubade@synnovis.co.uk
Designation of Business Development Manager	**Name**	**Email**
Business Transition Manager Medical Diagnostics SYNLAB UK & Ireland	Dhara Patel	dhara.patel@synnovis.co.uk

Synnovis Microbiology team

This larger team consists of Consultant Clinical Scientist, Clinical Scientist, team of Biomedical Scientists and Scientific Assistant Technical Officers, Operations Manager and Operational Service Manager. The Consultant Clinical Scientist shares responsibility for both Microbiology and Virology. They in turn report to the Deputy Operations Service Director and Operations Service Director supported by a Health & Safety Manager, Quality Manager and Administrative & Clerical team. Together, the team manages a workload of increasing complexity and requiring sophisticated laboratory processing and interpretation.

The routine diagnostic work includes general bacteriology and mycology test repertoires utilising the total laboratory automation platform, Kiestra, including other semi automated and traditional culture methods, employing a range of different platforms and technologies underpinned by our commitment for service development and improvement.

The microbiology laboratory processes more than a million samples per year.

2. Use of the Laboratory

2.1 Laboratory Opening Times

Microbiology at Blackfriars Hub: specimens are accepted 24/7
ESLs: specimens are accepted 24/7

Urgent specimens are prepared and packaged with distinguishable urgent bags and urgent label, following the Urgent Pathway from the ESL site to the Hub Central Specimen Reception (CSR) and are prioritised and directed straight to Floor 3 for receipting and processing.

The following samples and test are on the urgent pathway.

Test Code	EAP Name	Comment

MIC003	ASCITIC FLUID - MICROSCOPY, CULTURE & SENSITIVITIES (M,C&S)	Sterile fluid requires cell count and culture
MIC006	PERITONEAL DIALYSIS FLUID - MICROSCOPY, CULTURE & SENSITIVITIES (M,C&S)	Sterile fluid requires cell count and culture
MIC134	CEREBROSPINAL FLUID - MICROSCOPY, CULTURE & SENSITIVITIES (M,C&S)	Sterile fluid requires cell count, Gram and culture (may need Cryptococcal antigen)
MIC018	CEREBROSPINAL FLUID SHUNT CULTURE - CULTURE AND SENSITIVITIES (C&S)	Sterile fluid requires cell count, Gram and culture
MIC005	NATIVE JOINT FLUID - MICROSCOPY, CULTURE & SENSITIVITIES (M,C&S)	Sterile fluid requires cell count and culture
MIC417	PROSTHETIC JOINT FLUID - MICROSCOPY, CULTURE & SENSITIVITIES (M,C&S)	Sterile fluid requires cell count and culture
MIC010	PERICARDIAL FLUID - MICROSCOPY, CULTURE & SENSITIVITIES (M,C&S)	Any samples where the requester has phoned for an urgent investigation ie Gram or test
MIC242	VITREOUS HUMOUR - MICROSCOPY, CULTURE AND SENSITIVITIES (M,C&S)	Any samples where the requester has phoned for an urgent investigation ie Gram or test
MIC301	AQUEOUS HUMOUR - MICROSCOPY, CULTURE AND SENSITIVITIES (M,C&S)	Any samples where the requester has phoned for an urgent investigation ie Gram or test
MIC0117	CORNEAL SCRAPE - MICROSCOPY, CULTURE AND SENSITIVITIES (M,C&S)	Any samples where the requester has phoned for an urgent investigation ie Gram or test
MIC053	URINE MICROSCOPY AND CULTURE (Paediatric ONLY)	Any samples from paediatric teams for urgent microscopy - on request only
MIC015	HEPATOCYTE / ISLET CELLS – GRAM STAIN	Coming from Liver theatre. Patient on the table

2.4 Requesting Investigations

How to generate EPIC BEAKER routine requests:

Routine requests can be made either by EPIC BEAKER system.

All hospital sites sample requests can be made via EPIC BEAKER (including sexual health and Occupational Health.) Please free text in the clinical details field if you cannot see an intended test on EPIC BEAKER request.

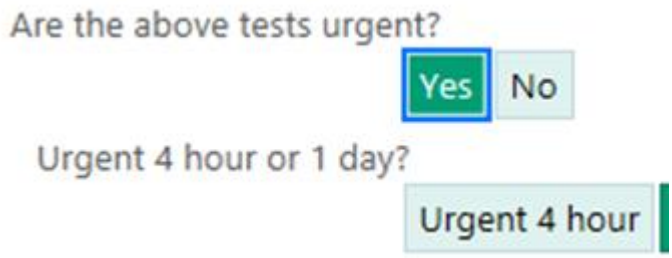
How to generate EPIC BEAKER urgent 1-day requests:

These URGENT 1-day request will lead to automatically generating urgent 25HB labels for the samples.

Within EPIC orders, when the first question on “Are the above tests urgent?” is answered as “Yes”.

How to generate EPIC BEAKER urgent 4-hour requests:

Within EPIC orders, when the first question on “Are the above tests urgent?” is answered as “Yes”, then the following question will appear to ask if it is an urgent 4-hour or urgent 1-day test.



2.2 Electronic requests from GPs

GP surgeries from 6 boroughs in South London send electronic forms using T-Quest system

2.4.1 Request Form for Post mortem samples

The Mortuary Epic Downtime Test Request Form for Microbiology to be used to request testing, including the Tracking form.

If request forms are being hand written please ensure that they are legible. At least three patient identifiers are required on both sample and request form for sample acceptance. A correctly completed request form MUST state to unequivocal identification of the patient and specimen:

Minimum Required Data:

Either EPIC BEAKER-based or a paper-based request must accompany all specimens sent to the laboratory. It should clearly state the following information.

Those in bold are a minimum requirement and without them the sample could be discarded or delayed.

- Patient name
- Unit number/NHS number
- Date of birth (age if DOB not known)
- Sex

- Ward or Address for report
- Requesting Medical Officer/GP name and number
- Date and time specimen taken
- Type of specimen (Specify anatomical site from which vesicle swab / fluid specimens were taken)
- Tests required

Other useful data

- Bleep number or mobile number, in order to phone results both before 5 PM and after 5 PM results
- Patient address
- All relevant clinical details including
    - any antimicrobial treatment (recent, current and intended)
    - History of foreign travel including return dates, countries/regions visited
    - Date of onset and duration of illness, particularly for serology
- Useful epidemiological information, e.g.:
    - Children and suspected influenza - give the name of the school
    - Adults and suspected norovirus - give the place and type of work, (e.g., catering, cruise liner
    - All patients and suspected viral haemorrhagic fever – travel destination, date of return, date of onset of illness, signs and symptoms, malaria smear
- Viral Haemorrhagic Fever Risk status if applicable – MUST BE DISCUSSED WITH MEDICAL VIROLOGY STAFF FOR RISK ASSESSMENT BEFORE SENDING SAMPLE

If uncertain about the exact test and terminology, please give a detailed clinical history as this can help the Microbiology medical staff to decide the most appropriate investigations.

Incorrectly labelled specimens / forms will not be processed as we cannot guarantee that the sample and form match and that the patient identity.

2.4.2 Specimen Labelling

- Use labels for all samples.
- The specimen must be labelled with the same patient details as those on the request form
- Please ensure the full patient name and the date of sample collection are legible
- Please note that mislabelled and unlabelled specimens will not be accepted and these will not be processed and will be discarded
- Please ensure that the sticker is placed on the specimen container in such an orientation that it can be read by a bar code reader. i.e. not wrapped around a specimen tube vertically.
- One specimen test label per container.
- Please do not add labels for other departments on one container (i.e a microbiology and virology test request on one specimen container, both departments follow different specimen pathway, this can cause delays in processing and results).

2.4.3 Requesting Additional Tests

The microbiological value of specimens - especially those from non-sterile sites - usually deteriorates with time as significant bacteria may die-off, or be overgrown by clinically non-significant bacteria. Generally, requests for additional tests on a specimen should be made

to the laboratory on the day the specimen is submitted. Although most specimens are kept for at least 48 hours, for some more easily collected material (e.g. mid-stream urine, superficial skin swab) it is better to send a fresh specimen and request the additional investigation(s). However, sterile fluids and tissues are kept for longer. Additional investigations on these specimens (if sufficient volume) may be warranted and clinically helpful: additional tests should be discussed with the Microbiology SpR or Consultant Microbiologist.

2.4.4 Specimen Collection

The best results are obtained when an appropriate, well-taken specimen in the proper container, is delivered to the laboratory promptly and relevant clinical information provided on the request form. Waste generated as a result of sample collection must be disposed of in accordance with local waste management policies.

General guidelines on specimen collection are:

- Do not send specimens in non-sterile containers. A leak proof CE marked specimen container should be used. Lids must be firmly affixed to prevent leakage
- Collect specimens from the actual site of suspected infection.
- The specimen taken should be representative of the disease process. For example, material swabbed from the opening of a sinus tract is more likely to yield commensal skin micro-organisms than would material obtained by curettage or biopsy of the base of the tract
- Specimens should be obtained before antimicrobial agents have been administered wherever possible
- An adequate quantity of material should be obtained for complete examination. Always send pus rather than a swab of pus, and if possible, a minimum volume of 1mL
- Liquid swabs, please follow site guidance
- Swabs should always be in transport medium rather than dry
- Care must be taken to avoid contamination of the specimen by micro-organisms normally found on the skin and mucus membranes. Sterile equipment and aseptic technique must be used for collecting specimens, particularly for those from normally sterile sites
- Material must be transported promptly to the laboratory. Fastidious organisms may not survive prolonged storage or may be overgrown by less fastidious organisms before culturing
- Other factors affecting results (bacterial serology and PCR)
    - inherent (age, gender, nutritional status, pregnancy, congenital immunological defects)
    - acquired (passively acquired antibody, immune response to immunisation, immunosuppression)
    - biological (lipaemic, haemolysed, high bilirubin content e.g. Liver ITU patients)
    - collection (use of correct blood collection tubes – e.g. serum from clotted blood may underestimate HIV-1 RNA load when compared to EDTA plasma)
    - Sample volume, collection and transportation

Please contact the laboratory if there is any doubt about the best specimen to take or if you have questions about the availability of a test.

2.4.5 Specimen Containers

Leaking specimens, or those received in inappropriate containers, may not be processed (although the laboratory will try to recover leaking unrepeatable samples).

The following are the usual containers used to collect specimens. These are ordered by clinical areas:

- Beckton Dickinson BDFX blood culture bottles: keep bottles of a set together and return any unused bottles. Ensure the stock is used in turn and always within its expiry date. Please do not detach the barcode labels on the bottles or cover the barcodes with the request label.
- Dermapaks for superficial fungal specimens (skin scrapings, hair *etc*)
- Faeces pots
- Sputum pots – including universal for sputum packs
- Bronchoscopy traps – recommend universal pots
- MWE liquid swabs for MRSA and bacteriology investigations
- Swabs with bacteriological Amies transport medium with/without charcoal
- Universal containers (sterile and empty); these must be Sterilin containers.

2.4.6 High Risk Specimens

Separate procedures are used in the laboratory for the safe handling and examination of samples from patients **known, or suspected** to have infection caused by high risk pathogens that pose a risk to laboratory workers and others if handed incorrectly. It is the responsibility of the person taking such a specimen to ensure request forms and specimens are labelled to indicated danger of infection. The request form must give sufficient clinical information to enable experienced laboratory staff to know what special precautions are necessary. These specimens must be placed in a Biohazard specimen bag. The requestor must alert a Specialist Registrar in Microbiology they are sending a high risk specimen to including the following pathogens (please note this list is not exhaustive):

- *Brucella* species
- *Salmonella typhi* and *paratyphi*
- *Mycobacterium tuberculosis*
- Creutzfeldt-Jakob disease (CJD)
- Causative agents of Anthrax, Rabies, Yellow fever, plague.

For pyrexial patients presenting within 3 weeks of arriving from a viral haemorrhagic fever endemic region, malaria should be excluded as *per* policy and then the case discussed with a Consultant Virologist (*via* the Site switchboard out-of-hours) before submitting any further samples to any laboratory or admitting the patient.

Samples known or suspected to contain biological agents in Hazard Group 4 **MUST NOT** be sent to the laboratory without discussion with, and the permission of the Consultant Microbiologist. These include the causative agents of Viral Haemorrhagic Fevers (Lassa fever, Ebola, Marburg).

Special transport arrangements of these samples from Essential Services Laboratory will be made in conjunction with Rare and Imported Pathogens Laboratory (RIPL), UK Health Security Agency (UKHSA), Porton Down, Salisbury, SP4 0JG

We assume all respiratory samples may potentially contain a hazard group 3 pathogen and treat samples accordingly.

2.5 Transport to the Laboratory

2.5.1 General Health & Safety Requirements

Please note:

- Specimens must only be submitted to the laboratory in approved containers
- Needles and other sharps must never be sent to the laboratory
- The outside of containers must be free from contamination by potentially infectious material

Each specimen container should be sent in a sealed plastic specimen bag

- Each specimen container should be sent in a sealed plastic specimen bag
- If a request form is sent with the specimen, it should be kept in a separate from the specimen within the specimen bag

2.5.3 Receipt of Specimens

During normal working hours, specimens are to be delivered to Synnovis Pathology Central Specimen Reception at the ESL sites. For urgent and unrepeatable samples, we request staff delivering to flag to the CSR team (where possible). Most specimens for bacterial culture must be processed within 48 hours of being taken. However, urgent or critical samples must be processed without delay.

2.5.4 Courier and Postal Deliveries

When sending samples from an external laboratory, it is the responsibility of the requesting laboratory to ensure that the samples are packed in accordance with the current postal regulations, contain appropriate paperwork and are labelled correctly (sender and recipient). Samples transported by road are classified as dangerous good and must be packaged and labelled in accordance with the Health & Safety Executive guidance - Carriage of Dangerous Good regulations.

2.6 Reporting of Results

2.6.1 Significant Results

All microbiology test results are released immediately to the patient chart on Epic after final completion of the test with automatic electronic notification to the ordering clinical team. In certain cases, preliminary results will be released to the patient chart before final completion of the test where there is likely to clinical impact, eg. Gram stain result of a positive blood culture before the identification of bacteria and before AST is performed.

Clinically significant results are placed in an 'Alert queue' on Epic for the visibility of microbiology clinicians in addition to being released to the patient chart on Epic. This

enables microbiology clinician oversight of clinically significant results for ward rounds, MDTs and liaison with clinical teams.

Out-of-hours (5pm – 9am) microbiology clinicians are only called on telephone with abnormal urgent fluid microscopy/Gram results, new diagnosis of fungaemia and new diagnosis of auramine smear positive or TB PCR positive.

Significant results include:

- Positive blood cultures
- All sterile fluids / tissues if cell count raised (for fluids) and/or organisms seen on Gram stain
- All significant growth from sterile fluids / tissues / deep abscesses
- All growth from sterile products e.g. stem cell harvests; islet cells, hepatocytes or explanted prosthetic material; also positive Gram stain of islet cell or hepatocyte preparations
- Any positive corneal scrape or vitreous Gram
- Group A streptococci from sites other than throats
- Group B streptococci in pregnant women or neonates
- *N. gonorrhoeae* except those from GUM, RSH, Caldecott Clinic *etc*
- First isolates of Infection Control 'alert organisms'
    - MRSA
    - Glycopeptide-resistant enterococci (GRE) (Vanc/Teic resistant Enterococci)
    - Potential or proven carbapenemase-producing Gram-negatives
    - ESBLs / Gentamicin-resistant *Klebsiella* species / Meropenem-resistant *Acinetobacter* species
    - Group A streptococci from sites other than throats
    - *Listeria* species
    - New *C. difficile* toxin positives
    - All new ZN or culture positive specimens for *Mycobacterium* species
    - New *Salmonella* species (NB: *S. typhi** and *S. paratyphi* *)
    - New *Shigella* species (NB: *S. dysenteriae**)
    - New *Campylobacter* species
    - New *E. coli* 0157*
    - *Vibrio* species*/*Plesiomonas* species / *Aeromonas* species
    - *Neisseria meningitidis** / *Haemophilus influenzae* type b*
    - *Brucella* species
    - *Legionella* species* (including urinary antigen positive)
    - New presumptive *B. cepacia* in CF patients
    - *Cryptosporidium* species
    - New positive cryptococcal antigen from serum or CSF
    - Dimorphic fungi
    - Rarities: *B. anthracis* / *C. diphtheriae* / *Burkholderia pseudomallei etc**

Suspected or confirmed notifiable diseases are to be notified to South London Health Protection Team by the clinical team:-
South London HPT

UK Health Security Agency
5th Floor, 10 South Colonnade
London
E14 4PU

Email london.region@ukhsa.gov.uk

Telephone 0300 303 0450

Urgent out of hours advice for health professionals: 0300 303 0450

Email phe.london.region@nhs.net for notification and enquiries of infectious diseases that contain Patient Identifiable Information.

The list of notifiable diseases is available here:-

https://www.gov.uk/guidance/notifiable-diseases-and-how-to-report-them#list-diseases

2.6.2 Printed Reports

All significant results are authorised by the Microbiology clinical team and then released for printing. Reports for Primary Care are printed and dispatched every working day, Monday to Friday. Apart from negative urines, which can be reported after one working day, most Microbiology culture results are reported after 2-5 days, depending on the investigation. Copies of printed reports can be obtained upon request. Reports are never faxed.

2.6.3 Electronic Reports

Access to completed Microbiology results are available via the EPIC Beaker system. Please look on EPIC before telephoning the department for results.

3. Clinical Advice

A Medical Microbiologist is available for all of the hospital sites 24 hours a day, all year round.

Demand for advice is very high, so please ensure that calls are clinically necessary, that the case/query has been discussed with a senior medical team member (preferably the Consultant in charge), and that all relevant clinical information is to hand before calling the SpR or Consultant Microbiologist. During the day, infection control advice can be obtained from the Infection Control Nurses.

Out of hours (17.00 – 09.00 weekdays and at weekends), a duty Specialist Registrar in Microbiology and duty Consultant Medical Microbiologist are available *via* the ESL switchboard to discuss clinical, diagnostic and therapeutic problems with doctors at any time. Out-of-hours calls should be made to the on-call SpR or consultant, where there is a pressing need for urgent clinical advice, we would expect these calls to be made by a doctor of seniority (SpR and above).

4. Tests Offered by Microbiology

The Medical Microbiology service offers an extensive range of tests. If tests are required that do not appear on the following list, please contact the laboratory.

- Antibiotics assays
- Blood culture
- Beta-D-glucan serology
- Galactomannan
- CSF examination
- Cryptococcal antigen detection
- Samples from normally sterile sites
- Eye, ear, throat and oral infections
- Fungal infections
- Lower respiratory tract infections
- Mycobacterial investigation
- Genital tract infections
- Faeces PCR and culture
- *C. difficile* detection in faeces
- Investigation of ova, cysts and parasites in faeces
- Helicobacter pylori stool antigen testing
- Urine microscopy and culture
- Wound infections
- Screening samples (MRSA, VRE, CPE, *Candida auris*)
- Antimicrobial susceptibility testing

5. Specimen Collection Methods

5.1 Antimicrobial Assays

Under certain circumstances it may be desirable to measure the levels of other antimicrobial agents such as streptomycin (e.g. TB), trimethoprim (e.g. renal failure), chloramphenicol (neonates), teicoplanin (prolonged therapy of serious, deep or complicated infections), Daptomycin, colistin, and certain antifungals (eg flucytosine, itraconazole, voriconazole, posaconazole and Isavuconazole).

Antibacterial assays are conducted in house or as a send away test.

Antimicrobial assays are run on 5mL-10mL clotted blood samples – red or yellow top. Please ensure that the dosage, frequency and timing of samples are stated on the request form. These samples are referred to Antimicrobial Reference Laboratory, Southmead Hospital for testing.

Antibiotic	Timing of Samples	Expected Levels (mg/L)	Re-Assay Interval
Colistin	Approx. 1-2mL of separated serum (the minimum acceptable is 100µL) We recommend a pre dose sample only, taken up to an hour before dosing. Post dose samples will not be processed due to interpretation of the	Pre dose: 2 – 4 mg/L	Day 2-3 (if patient received a loading dose) 5-7 days

	result potentially being misleading.		
Chloramphenicol	Approx. 1-2mL of separated serum (the minimum acceptable is 100µL). We recommend a pre dose sample and a post dose sample, taken 2 hours after the end of either IV administration or oral administration. Chloramphenicol is degraded by light; please ensure the samples are protected from direct sunlight.	Pre dose <10 mg/L Post dose (2h) 10-25 mg/L	5-7 days – assuming initial results are within expected range
Daptomycin	Approx. 1-2mL of separated serum (the minimum acceptable is 100µL). We recommend a pre dose samples and a post dose sample, taken 1 hour after the end of the IV administration.	Pre dose 5-20 mg/L or in severe sepsis 10-20 mg/L Pre dose levels >20 mg/L are associated with increased risk of toxicity	6-8 days – assuming initial results are within expected range
Rifampicin	We recommend a pre dose sample and a post dose sample taken 1 hour after iv administration or three post dose samples, taken 1 hour, 2 hours and 4 hours after oral administration.	Pre <0.5 mg/L Post <4 mg/L sub-therapeutic Post 4-8 mg/L usually adequate Post 8-24 mg/L ideal	Depending on levels and patient progression
Streptomycin	We recommend a pre dose sample and a post dose sample, taken 1 hour after the end of IV/IM administration.	7.5 mg/kg BD Pre dose <3.0 mg/L Post dose 10-25 mg/L	7–28 days
Trimethoprim in Co-trimoxazole	We recommend a pre dose sample and a post dose sample, taken either 1 hour after the end of iv administration or 2 hours after oral administration.	Pre dose 5-7 mg/L Post dose 5-10 but <20 mg/L	6-8 days
Flucytosine*	We recommend pre dose sample and a post dose	Pre dose 20-50 mg/L	4-8 days

	sample, taken 1 hour after the end of IV administration.	Post dose 50-100mg/L Pre dose concentrations <20 mg/L have been associated with treatment failure and emergence of resistance Post dose concentrations >100 mg/L have been associated with toxicity	
Voriconazole*	We recommend a pre dose sample taken immediately before administration	Prophylaxis and therapy – Pre dose 1.0-5.5mg/L or 2.0-5.5 mg/L for bulky or disseminated infections.	4-8 days
Itraconazole*	We recommend a pre dose sample only, taken up to an hour before dosing.	By Chromatographic assay. Prophylaxis:Pre 0.5-4.0mg/L. Therapy: Pre 1.0-4.0mg/L. All pre dose levels to be kept below 4.0mg/L.	4-8 days

*for therapeutic drug monitoring of other anti-fungals please discuss with mycologist. Amphotericin B TDM monitoring not performed.

5.2 Blood Cultures

An adult blood culture set consists of two BDFX bottles and a paediatric blood culture consists of one BDFX PF bottle.

Bottle Type	Blood Volume

Adult Blood Culture		Part of adult blood culture set for standard aerobic culture. This can be used for sterile fluids such as ascitic fluid. Blue top	Maximum volume of 10mL
		Part of adult blood culture set for standard anaerobic culture. This can be used for sterile fluids such as ascitic fluid. Purple top	Maximum volume of 10mL
Paediatric Blood Culture		Paediatric blood culture bottle Pink top	Maximum volume of 4mL

Ensure bottles are used within expiry dates and ensure no obvious signs of damage or contamination (bottom of bottle would appear yellow). Flip the plastic caps and disinfect the top of the bottles. See Appendix 1 for the recommendations for blood culture collection. For adult bottles inoculate with up to 10mLs of blood per bottle; smaller volumes may reduce sensitivity. Inoculate paediatric bottles with up to 4mLs of blood per bottle. Dispose of any sharps in a sharp's container through the correct waste stream. Ensure additional labels DO NOT cover the bottle barcodes and ensure that the tear-off barcode labels are not removed as these are scanned in the laboratory.

During normal laboratory opening hours, bottles should be transported to the laboratory for incubation as soon as possible. Out of normal hours, the bottles should be placed in the red box on top of the fridge located outside the Microbiology laboratory. It is not necessary to contact the on-call BMS for blood cultures taken out-of-hours.

5.3 Cerebrospinal fluid (CSF)

CSF is always treated as an urgent sample.

Transfer 1mL of CSF into each three sequentially numbered, sterile universal containers labelled '1', '2' and '3' (1mL is about 20 drops). Smaller volumes will be accepted however it may not be possible to perform additional tests e.g. PCR. For investigation of tuberculous meningitis, a large volume (>6mL) should be collected as small numbers of organisms may be present.

All positive results of microscopy, Gram stain and any positive cultures are released straight to the patient chart on Epic.

In suspected meningitis please send in addition:

- Whole blood in an EDTA for meningococcus and pneumococcus PCR (sendaway test to Manchester)
- Blood culture set
- Urine for pneumococcal antigen test
- Throat swab culture and sensitivity

If suspected viral meningitis/encephalitis send CSF for Varicella zoster virus (VZV), Herpes simplex virus (HSV) and Enteroviruses (at least 1 mL).

If suspected subarachnoid haemorrhage (SAH) and the specimen is blood stained, the 1st and 3rd samples. Always inform the laboratory that SAH is a possibility by providing the differential diagnoses in the clinical information.

CSFs from patients thought to have an non-infective aetiology (e.g. degenerative diseases) are not processed out-of-hours from the Programmed Investigation Unit.

5.4 Cryptococcal Antigen Detection

CSF

A minimum of 0.5mL is required in a sterile universal.

Serum

Collect 5-10mL of blood in a blood collection tube usually red topped or yellow topped (serum separator) tubes.

Aspirates and Fluids from Sterile Sites

Fluids from normally sterile sites such as ascitic fluid, peritoneal fluid or joint fluids require a minimum volume of 1mL. Collect the specimen with a sterile syringe. Large volumes specimens such as peritoneal fluid may contain very low numbers of organisms which require concentration in order to increase the likelihood of successful culture. Transfer a maximum of 20mL into a sterile container. Ensure the cap is tightly screwed on. Ascitic fluids may also be inoculated in to a blood culture set (but a sample in a sterile container is required for microscopy). Small volume fluids such as synovial fluids may be received in insufficient volumes. This may impede the recovery of organisms.

Peritoneal dialysis fluid

Using a fine needle and syringe, aspirate fluid from the peritoneal dialysis bag. Transfer 20mL into a sterile universal container. A blood culture set may also be inoculated but a sterile container is required for microscopy.

5.5 Eye, Ear, Throat and Oral Infections

Eye Swabs

A swab should be gently rotated against the conjunctiva in the lower eye lid. Any visible pus should be sampled. Swabs should be placed in the Transwab MWE containing liquid medium.

A sample taken for gonorrhoea culture only should be collected with charcoal agar gel swab. Liquid swabs will not isolate N. gonorrhoea by culture.

The nucleic acic amplification test for Chlamydia trachomatis and Neisseria gonorrhoea utilises an aptima swab and is performed in the virology department. Nose and throat swab for respiratory viruses and atypical bacteria utilises swabs in viral transport media and is also performed in virology. Please see the Virology Laboratory User's Manual.

Corneal Scrapes
These samples should be collected by an Ophthalmic surgeon. Agar plates (chocolate, blood agar, fastidious anaerobic and Sabouraud) and a microscope slide are supplied by the Microbiology laboratory when required to inoculate at the patient's side. The agar plates should be inoculated first; if there is sufficient material then prepare slides. A separate set of plates should be used for each eye. Material should be spread from the scalpel blade directly onto the surface of the plates using short streaks. Spread material directly onto the surface of the labelled glass slide. Culture plates and microscope slides should be sent back to the laboratory promptly. All plates and slides should be labelled with patient details and the date. The slide should be labelled on the side it is inoculated.

Acanthamoeba Culture
Corneal scrapings should be collected into a small volume (1-2mL) of sterile water or saline. These vials should be labelled with the patients details and transported promptly to the laboratory. Contact lens washing fluid or lenses in contact lens fluid sent in sterile containers will also be accepted.

Ear Swabs
Swabs should be placed in the TRANSWAB mwe containing liquid medium
Nasal Swab – Anterior Nares
Nasal swabs are usually taken to detect staphylococcal or meningococcal carriage. Moisten the swab before swabbing with sterile saline. Swab the anterior nares by gently rotating the swab in each nostril. Swabs should be placed in the TRANSWAB mwe containing liquid medium.

Pernasal Swabs
Pernasal swabs for culture of Bordetella pertussis are only performed on consultant microbiologist request. If suspecting whooping cough in secondary care, then please send a nose and throat swab in viral transport media for respiratory panel/respiratory virus testing. The Ausdiagnostics multiplex panel in use has targets for Bordetella spp. DNA. If in primary care, then please contact your local HPT for an oral fluid testing kit or speak to your local microbiology team.

Throat Swabs
Throat swabs are cultured for Haemolytic Streptococci and *Corynebacterium diphtheriae* (if clinically indicated). The patient's tongue should be depressed using a spatula, before quickly and gently rubbing the swab over the tonsillar fossa and/or posterior pharynx or any region with a lesion of visible exudates. Touching other areas of the mouth such as the tongue and uvula should be avoided. Throat swabs should not be taken if the epiglottis is inflamed as sampling may cause serious respiratory obstruction. Swabs should be placed in the TRANSWAB mwe containing liquid medium.

Mouth Swabs
Sample pus if present otherwise sample any lesions or inflamed areas. A tongue depressor or spatula may be helpful to aid vision and avoid contamination from other parts of the mouth. Swabs should be placed in the TRANSWAB mwe containing liquid medium

5.6 Fungal Infections

Skin Scrapings

Patients' skin and nails can be swabbed with 70% alcohol prior to collection of the specimen, this is especially important if creams, lotions or powders have been applied. The edges of skin lesions yield the greatest quantities of viable fungus. Lesions should be scraped with a blunt scalpel blade. Send material to the laboratory in a Dermapak, if these are unavailable, place sample into a sterile universal. At least 5mm^2 of skin scrapings are required.

Nail clippings

Material should be taken from any discoloured, dystrophic or brittle parts of the nail. The affected nail should be cut as far back as possible through the entire thickness and should include any crumbly material. Nail drills, scalpels and nail elevators may be helpful but must be sterilized between patients. It should be specified whether the sample is from the fingernails or toenails.

When there is superficial involvement (as in white superficial onychomycosis), nail scrapings may be taken with a curette. If associated skin lesions are present samples from these are likely to be infected with the same organism and are more likely to give a positive culture. Sample from associated sites should be sent in separate Dermapaks.

Hairs

Hairs should be plucked never cut from affected areas to include scalp scales and hair stumps. Skin scrapings from associated scalp lesions should also be sent with the hairs in a Dermapak.

Please do not refrigerate the above samples for mycological investigation.

Laboratory tests for the diagnosis of invasive fungal infections can be discussed with the consultant microbiologist lead for mycology.

5.7 Lower Respiratory Tract Infections

Antral Washings

Ideally an ENT surgeon should collect the specimen. Transfer to a sterile universal container. Ensure the cap is tightly screwed on.

Broncho-Alveolar Lavage (BAL) Samples

A segment of lung should be 'washed' with sterile saline after insertion of a flexible bronchoscope. As large a volume as possible should be collected. After collection remove the cap and the tubing of the sterile suction container and apply the screw cap to the container. BAL samples will be cultured for routine pathogens, *Mycobacterium tuberculosis* and fungi.

Sputum

Sputum samples should contain material from the lower respiratory tract, expectorated by deep coughing. When the cough is dry, physiotherapy, postural drainage or inhalation of an aerosol before expectoration may be helpful. Saliva and pernasal secretions are not suitable and will not be processed. A minimum of 1mL should be collected into a sterile universal container. Do not collect shortly after the patient has been eating, drinking or cleaning their teeth.

5.8 Mycobacterial Investigations

Sputum

Early morning freshly expectorated sputum is recommended for *Mycobacterium* species. Sputum specimens should be relatively fresh (less than 1 day old) to minimise contamination. Purulent specimens are best. When the cough is dry, physiotherapy, postural drainage or inhalation of an aerosol before expectoration may be helpful. Three samples of ≥ 5mL should be collected on at least 3 consecutive days approximately 8-24 hours apart. Samples should be sent to the laboratory with 48 hours. Urgent Auramine Phenol for Acid Fast Bacilli (AFB) is available during normal working hours.

BAL Samples
These may be sent if spontaneous or induced sputum is unavailable or if such specimens are AFB smear negative. Note: Contamination of the bronchoscope with tap water, which may contain environmental *Mycobacterium* species, should be avoided. A minimum sample size is preferably 5mL.

Urine
When sterile pyuria is noted, three early morning urines (EMU) should be collected in 24hr urine large containers (that does not contain boric acid) taken on different days. The entire voided urine should be collected as soon as possible after waking and at the same tie each morning if more than one specimen is being collected. Samples should be sent to the laboratory on a daily basis.

Sterile Body Fluids (CSF, pleural fluids, pericardial fluid)
These samples should be sent in a sterile universal container with a minimum of 1mL, ideally >6mL of fluid is required. Pleural or pericardial fluids are not very sensitive samples for the detection of *M. tuberculosis*, and that a concurrent pleural or pericardial biopsy taken with the fluid is more useful. A negative result on these fluids does not rule out the diagnosis.

Tissues and Biopsies
Specimens should be collected aseptically and placed in a sterile universal container without preservatives and sterile distilled water added to prevent desiccation. Tissues biopsy specimens received in formalin are unacceptable and will not be processed.

5.9 Genital Tract Infections

High/Low Vaginal Swabs
The swab should be used to obtain a sample from the mucosal membrane of the vaginal vault after removal of secretions or discharge. It is important to avoid vulval contamination. Samples can be taken with the aid of a speculum. If there are obvious candida plaques, swab the lesions. Swabs should be placed in the TRANSWAB mwe containing liquid medium. Vaginal swabs are routinely examined for the presence of Candida species, Beta Haemolytic Streptococci and Bacterial Vaginosis. For *Trichomonas vaginalis*, swab the posterior fornix. Please indicate on the request form is investigation for *T. vaginalis* is required. Vaginal swabs will not be tested for *Neisseria gonorrhoeae* culture unless chain of evidence case. An endocervical or urethral swab is preferred for GC culture. The swab should then be placed in Amies transport medium with charcoal.

Cervical Swabs

After introduction of the speculum to the vagina, the swab should be rotated inside the endocervix. The swab should then be placed in Amies transport medium with charcoal.

If pelvic infection disease (PID) is suspected, please send an APTIMA cervical swab for gonorrhoea and Chlamydia testing.

Urethral Swabs

Avoid contamination with micro-organisms from the vulva or the foreskin. Small swabs are available for this purpose. The patient should not have passed urine for at least 1 hour. For males, if discharge is not apparent attempt to "milk" it out of the penis. Pass the swab gently through the urethral meatus and roll around. Place the swab in the plastic transport sheath containing Amies medium with charcoal.

Penile Swabs

After retracting the prepuce, the swab should be gently rotated to collect any secretions in the urethral meatus. Place the swab in the plastic transport sheath containing Amies medium with charcoal.

For *Chlamydia trachomatis* investigation a self-taken vaginal swab, cervical swab, male urethral swab or mid-stream urine specimen should be sent for Nucleic Acid Amplification Test (NAAT) testing using the appropriate transport medium (refer to Virology User Manual).

Semen for Culture

Specimens should be collected by masturbation directly into the sterile container. Fasten lid securely.

Intra-Uterine Contraceptive Device (IUCD)
Send the entire device in a sterile container.

5.10 Faeces PCR/Culture

Send 5-10mL if liquid or an equivalent sized portion in a sterile container. A minimum of 1-2g or a ‘pea sized’ portion is required for PCR/culture alone. Ask the patient to defecate into a clean bedpan or other convenient container if at home. Use the plastic spoon to transfer a portion of faeces into the pot. For liquid faeces use a plastic medicine spoon. Take care not to contaminate the outside of the faeces pot. Select a representative portion of the specimen.

Please provide relevant clinical details as these affect processing and test selection of the sample. Please state if :

- The patient has returned from abroad and the date of return
- Food poisioning is suspected
- The patient is on antibiotics or has been on antibiotics in the last four weeks

All faeces samples are investigated routinely :

- *Gastro Panel 2 – detects Salmonella enterica spp., Shigella spp./Enteroinvasive E. coli (EIEC), Campylobacter jejuni/coli/lari, Cryptosporidium parvum/hominis, Giardia lamblia and VTEC (stx1 / stx2 genes, indicating Shiga toxin-producing E. coli)*

Additional investigations for other enteric pathogens are performed based on age, clinical picture and travel history.

- *DX Panel 2 – Includes all Gastro Panel 2 targets, plus Yersinia enterocolitica, Vibrio cholerae / Vibrio parahaemolyticus and Entamoeba histolytica*

5.11 *Clostridioides difficile* Detection in Faeces

C.diificile will be tested on LIQUID stool only if the following criteria are met:

- All samples from in-patients over 1 year old.
- All other patients with liquid stools that have requested CDT testing or with clinical details stating recent antibiotics/recent hospital admission.
- All other patients over 65 years old with clinical details of diarrhoea and/or colitis.
- A previous positive result reported in the last 2 weeks of the new request.

5.12 Investigation of Ova, Cysts and Parasites in Faeces

If parasites are of particular concern, send three separate samples in sterile universal containers collected over no more than a 10-day period with the relevant clinical details, including travel history, completed or the test may not be performed. It is usually recommended that specimens are collected every other day and sent to the laboratory (as parasites may be intermittently excreted). Faeces samples should be ideally collected between 10pm and midnight, or early morning before defecation or bathing. Faeces may be passed directly into a sterile wide mouthed container or passed into a clean, dry bedpan or similar container and transferred into a sterile container. Tapeworm ova are rarely found in faeces, please send a segment or suspected parasite whenever possible.

Fresh faeces specimens are essential for the examination of Protozoan trophozoites. For examination of amoebic trophozoites, the specimen must reach the laboratory within 30 minutes of its production. It is advisable to arrange this examination with the laboratory in advance.

Sellotape Slide

For investigation of *Enterobius vermicularis* (threadworm), a Sellotape slide is the most appropriate sample. For a Sellotape slide, cut a 4 inch strip of clear Sellotape and apply to the perianal region, pressing the adhesive side of the tape firmly against the left and right perianal fold several times. Smooth the tape back on the slide, adhesive side down. Ensure the slide is labelled with the patient details and placed within a slide container.

Urine

For investigation of *Schistosoma haematobium*, 10mL of terminal urine (including the last few drops) should be collected between 10am and 2pm when ova numbers are highest in the urine. Alternatively, a 24-hour collection of terminal urine samples may be obtained. Samples should be collected into sterile containers with no preservatives such as boric acid. Patients with haematuria, ova may be found trapped in the blood and mucus in the terminal portion of the urine specimen.

A minimum volume of 1mL of CSF, pus or aspirates should be collected.

5.13 *Helicobacter pylori* Stool Antigen Testing

Faeces should be passed into a clean, dry sterile disposable bedpan or similar alternative before being transferred into a leak proof universal container. Antibiotics, proton pump inhibitors and bismuth preparations are known to suppress growth of *H. pylori*. Stool sampling must be performed not earlier than after 2 weeks of termination of ingestion proton pump inhibitors and bismuth preparations and 4 weeks after termination of ingestion of antibiotics. It

should be noted that there is insufficient evidence at present to recommend the use of the stool antigen test as a test-of-cure.

5.14 Urine Microscopy and Culture

Urine

If transport of urine specimens to the laboratory is delayed, they should be refrigerated. A routine automated microscopy detects white blood cells, red blood cells, bacteria, yeasts and epithelial cells. If casts are required please specify on the request.

Midstream Urine (MSU)

The first part of voided urine is discarded and, without interrupting the flow, approximately 10mL is collected into a sterile universal container preferably containing Boric acid. A minimum of 5mL is required for automated microscopy and culture. Clean voided MSU is the preferred specimen for microscopy and culture. It is recommended that in females the hands and the perineal area are washed with soap and water prior to specimen collection. Part the labia and clean the area around the urethral meatus from front to back. Spread the labia with the fingers of one hand. In males retract the foreskin, if present, and clean the skin surrounding the urethral meatus. To avoid urethral contamination, the patient must be instructed of these specimen collection procedures. The reliability of microscopy and culture results depends on the avoidance of contamination and prompt transportation.

Clean Catch Urine (CCU)

In young children, clean catch urines are preferable to bag urines which are almost always contaminated by perineal flora. Peri-urethral cleaning is recommended before sample collection. A minimum of 5mL is required for automated microscopy and culture.

Catheter Specimen Urine (CSU)

Samples should only be sent if infection is suspected as colonisation of catheters is common and does not usually require treatment. The sample may be obtained either from a transient catherization or from an indwelling catheter. Samples should be obtained aseptically from a sample port in the catheter tubing using a sterile syringe and needle following disinfection of the catheter port with alcohol or by aseptic aspiration of the tubing of indwelling catheters and transferred into sterile container preferably containing Boric acid. The specimen should not be obtained from the collection bag. Inappropriate use of antibiotics in asymptomatic patients with urinary catheters may result in the selection of resistant bacteria.

Supra-Pubic Aspirates (SPA)

Samples should be collected aseptically, directly from the bladder by aspiration with a needle and syringe and transferred into a sterile universal container. Ultrasound guidance should be used to show the presence of urine in the bladder before carrying out SPA collection. The use of this invasive procedure is usually reserved for clarification of equivocal results from voided urines in infants and small children.

Bag and Pad Urines

Bag and pad urine Bag urine is commonly collected from infants and young children, although it should be discouraged as pads are a more comfortable and easier method of collection.

Ileal Conduit Urine

Open the dressing pack and remove the stoma appliance. Clean the area around the stoma. Dry thoroughly. Gently insert a urinary catheter into the stoma to a depth of 2.5-5cm. Drain sufficient urine into a receiver. Remove the catheter and pour urine into a sterile universal container. Attend to the stoma.

Other Urine Specimens

Other specimens obtained during or as a result of surgery include those from cystoscopy, nephrostomy and urostomy, prostatic massage/secretions. Specimens may also be taken after bladder washout.

5.15 Wound Infections

Surface swabs and skin swabs

Rotate the swab on or in the required site. Sample a representative part of the lesion. Swabbing dry crusted areas is likely to yield the causative pathogen. The swab should then be placed in Amies transport medium. Samples of pus/exudates, if present, are preferred to swabs. If copious pus or exudate is present, aspirate with a sterile syringe and transfer to a sterile universal container. If insufficient to aspirate rotate a swab in the centre of the infected area.Swabs should be placed in the TRANSWAB mwe containing liquid medium.

If specimens are taken from ulcers, the debris on the ulcer should be removed and the ulcer should be cleaned with saline. A biopsy or, preferably, a needle aspiration of the edge of the wound should be taken. A less invasive irrigation-aspiration method may be preferred. Place the tip of a small needleless syringe under the ulcer margin and irrigate gently with at least 1mL sterile 0.85% saline without preservative. After massaging the ulcer margin, repeat the irrigation with a further 1mL sterile saline. Massage the ulcer margin again, aspirate approximately 0.25mL of the fluid and place in a sterile universal.

Always state the site and nature of the wound. This is essential, as the laboratory may need to interpret findings against a background of normal flora present in a given part of the body.

Pus

A minimum volume of 1mL of pus should be collected in a sterile universal.

Tissues and biopsies

Under aseptic conditions transfer material to a sterile universal container that does not contain formalin as this inactivates pathogens very rapidly. If the specimen is small, place it in 0.5mL of sterile water to prevent desiccation. If viral aetiology is suspected, please specify which virus.

Investigation of orthopaedic implant infections

If possible stop antibiotics 2 weeks prior to sampling and consider not giving routine surgical prophylaxis until after sampling. In theatres, multiple (3-5) samples should be taken using separate instruments for each sample. Aspirates should be >1 mL, smaller volumes may impede the recovery of organisms. Swabs are not the preferred sample. Prosthetic joint apirates, per-prosthetic biopsies, intra-operative specimens, and prostheses can be sent in a sterile universal container.

Intravascular devices

Line infection is confirmed by semi-quantitative culture of a removed line. After removing a possibly infected line from a patient, cut off the intravascular portion using sterile scissors and place it in a sterile universal container. If infection is suspected in a long line send the

intravascular portion immediately adjacent to the exit site and the tip in separate sterile universal containers.

Animal bite or scratch acquired outside the UK
Please discuss with the SpRs.

5.16 Screening Samples

MRSA
Nose, throat and groin (or perineum) swabs are required for a screen. Other sites such as wounds or line swabs can also be requested. If the patient has a long-term catheter, please send a CSU for MRSA.

CRE
A rectal swab is required for a CRE screen. A swab should be inserted into the anal canal and rotated ensuring visible faecal material is present on the swab. The swab should then be placed in liquid swabs, unless still using amies transport medium. A faecal sample can also be sent.

VRE
A rectal swab is required for a VRE screen. The swab should be inserted into the anal canal and rotated ensuring visible faecal material is present on the swab. The swab should then be placed in liquid swabs, unless still Amies transport medium.

Candida auris
Nose, throat, groin (or perineum) and axillae swabs are required for a screen. Swabs must be collected using Amies transport medium.

5.17 Serology

Serology (e.g. Beta-D-glucan)
Collect 5-10mL of blood in a blood collection tube usually red topped or yellow topped (serum separator) tubes.

6. Quick Guide Table to Specimen Collection

Specimens should be transported and processed as soon as possible

Specimen / investigation	Container and comments
Antral washings	Sterile universal container
Antimicrobial assays	Collect 10mL of blood using the red topped or yellow topped tubes
Aspirates and fluids from normally sterile sites (joint, ascites, peritoneal and pleural fluids)	Sterile universal container
AFB investigations in blood	Collect 5- 10mL of blood and inoculate into BD Mycolytic Bottle Red Top

Specimen / investigation	Container and comments
Beta-D-glucan (pan-fungal marker)	Collect 10mL of blood using the red topped or yellow topped tubes
Galactomannan	Collect 10mL of blood using the red topped or yellow topped tubes
Blood cultures	Take before antimicrobials are given if possible Disinfect skin with 70% isopropyl alcohol for 30 seconds. Place up to 10mL in each blood culture bottle for adults, 4mL in one paediatric bottle for paediatric patients. Ensure prompt transport to the Microbiology laboratory.
Bronchial washings	Sterile container; e.g. 20mL sterile container or sterile universal container
Bronchoalveolar lavage	Sterile container; e.g. 20mL sterile container or sterile universal container
Cervical swab	For the investigation of gonorrhoea use a Microbiology swab in Amies transport medium with charcoal, and transport to the laboratory immediately. Urethral, rectal and throat swabs may also be collected and sent. For the investigation of *Chlamydia* in females a self-taken vaginal or cervical swab should be sent for NAAT testing using the appropriate APTIMA transport medium. This test is performed in Virology.
Cerebrospinal fluid (CSF)	For cell count, Gram staining and culture send at least 2-3mL of CSF in 3 separate sterile universal containers. If meningitis is suspected contact the laboratory and send the specimens immediately. Send separate specimens for glucose and protein analysis to the Biochemistry department.
Cryptococcal antigen detection	A minimum of 0.5mL of CSF is required in a sterile universal. Collect 5-10mL of blood in a blood collection tube usually red topped or yellow topped (serum separator) tubes.
Clostridium difficile stool testing	Send a faecal specimen in sterile container. NB: Only very loose or liquid stools (eg those that adopt the shape of the container) need be sent for testing
Culture for bacterial infections	Pus is the ideal specimen or a biopsy of the infected tissue. Send in a sterile universal container. If only a small sample of tissue is available, add a few drops of sterile water to prevent drying. If swabs are taken, send in Amies transport medium with charcoal.
Ear swab	Send a swab in Amies transport medium with charcoal

Specimen / investigation	Container and comments
Eye swab	For investigation of *Chlamydia trachomatis* infection, send a swab in NAAT transport medium.
Faeces	Send 5-10mL if liquid or an equivalent sized portion in a sterile container
Helicobacter pylori stool antigen testing	With the spatula provided transfer a plum-sized portion of faeces, or equivalent volume of fluid, into a sterile universal container
High vaginal swab (HVS)	Use TRANSWAB mwe containing liquid medium for investigation of *Candida*, *Trichomonas vaginalis* and vaginosis. For PID, gonorrhoea and *Chlamydia* investigations send specimens for Chlamydia and gonococcus NAAT.
Intrauterine contraceptive device –IUCD	Send the device in a sterile universal container
Mouth swab	Send a swab in Amies transport medium with charcoal for Microbiology. For virology send the swab in virus transport medium.
Nasal swab	Use TRANSWAB mwe containing liquid medium for Microbiology. For virology, send the swab in virus transport medium.
Nasopharyngeal aspirate	Traps containing a specimen should be sealed using lid.
Pernasal swab	Use a pernasal swab and transport immediately to the laboratory
Post nasal swab	Use TRANSWAB mwe containing liquid medium
Pus	Transfer into a sterile universal container. Only use Microbiology swabs in Amies transport medium with charcoal if pus cannot be obtained
Seminal fluid	Sterile universal container
Skin, nail and hair for mycology	For skin, nail and hair clippings use black card, Dermapaks or sterile universal. Routine Microbiology swabs in Amies transport medium with charcoal are used for the investigation of *Candida* infections
Sputum	Sputum from deep expectoration and not saliva is required. Send specimen in a 30ml sputum container or universal
Throat swab	Use TRANSWAB mwe containing liquid medium for Microbiology investigations. For virology send the swab in virus transport medium.
Tissues and biopsies	Sterile universal container. If biopsy is small add 0.5ml of sterile saline to prevent it from drying out. Ensure there is NO formalin or other preservative

Specimen / investigation	Container and comments
Tuberculosis	Best specimens are early morning sputum, urine, pus or tissue. For sputum and urine send 3 early morning specimens taken on consecutive days
Sellotape slide	Press Sellotape around the perianal region and transfer to a clean microscope slide. Place this in a slide box
Urine	Collect urine in a sterile universal container. For *Chlamydia trachomatis*. Send a first-catch specimen.
Catheter specimen of urine (CSU)	Transfer urine to a sterile universal container (containing boric acid). If less than 15ml do not use boric acid
Clean-voided midstream specimen of urine	Collect in sterile container and transfer to a sterile universal container (containing boric acid). If less than 15ml do not use boric acid
Early morning urine for tuberculosis	Sterile large volume container
All other urine specimens	Sterile universal container
Urethral swab	For the investigation of gonorrhoea by culture use a Microbiology swab in charcoal-containing Amies transport medium transport to the laboratory immediately. If there is likely to be a delay, keep at 4°C if possible.
Vesicles, ulcers and genital lesions	Send a swab in virus transport medium. Vesical fluid or pus is preferred over a swab.
Wound and ulcer swabs	Use TRANSWAB mwe containing liquid medium

7. Typical Turn-around Times for Common Specimens

Sample Type	Typical Turn-around Times
Urine	Negative 1 day Positive 3-4 days
High vaginal swab	3 days
Eye swab	3 days
Wound swab	3 days
Throat swab	3 days
Faeces	4 days
Sputum	4 days
Helicobacter pylori stool antigen testing	5 days (batched twice / week)
Beta-D-glucan serology	3 days
MRSA / CRE / VRE screen	Negative 1 day Positive 4 days

Mycology routine cultures	3 weeks
TB	8 weeks

Blood cultures are monitored continuously and all results are entered and available on the patient chart 24/7 and some agreed results telephoned out of hours to the requesting clinician as soon as they are available. If there is no growth after 48 hours (of processing, not 48 hours after collection), a report to that effect is sent out automatically, but specimen processing continues for a total of five days. Blood cultures with appropriate clinical details (e.g. endocarditis) are monitored for 14 days. Endocarditis suspected blood cultures are no longer incubated for 14 days routinely as per SMI 12. Extension of incubation may occur on Microbiology Consultant request. Blood cultures with suspected Brucella infection will be routinely incubated for 10 days.

8. Complaints

Complaints may be made directly to the department, or via Synnovis Customer Support. Complaints are handled according to the Synnovis Complaints Policy and Procedure located at http://www.synnovis.co.uk/customer-service.

9. Specialist Laboratory Services Used

The UKHSA provides a comprehensive range of microbiological tests and services as indicated below.
The request form you should use is provided as a link against each test/service. Further information regarding these or other tests can be obtained from the laboratory's user handbooks or direct from the laboratory. Links to both the relevant user manual and laboratory webpage (where you will find contact details) are provided against each test/service.

Services	Test type	Unit
Achromobacter	Species identification, molecular typing and antimicrobial resistance	AMRHAI
Acinetobacter	Species identification, molecular typing and antimicrobial resistance	AMRHAI
Actinomycetes (Aerobic)	Antimicrobial susceptibility	AMRHAI
Actinomycetes (Aerobic)	Identification and confirmation	AMRHAI
Amoebae	Detection, identification and confirmation, serodiagnosis	NPRL
Anaerobes (*Bacteroides*, *Clostridia*, *Fusobacteria*, *Actinomyces* spp., other closely related genera)	Identification	ARU
Anthrax	See *Bacillus anthracis*	
Antibiotic resistance surveys	European antibiotic resistance surveillance scheme (EARSS) and surveillance of resistance	AMRHAI
Antibiotic susceptibility testing	New antimicrobials, susceptibility testing service, beta-lactamases, endocarditis	AMRHAI

Bacillus anthracis	Identification and confirmation, PCR, serology, characterisation (phage, penicillin sensitivity)	RIPL
Bacillus (other than *B.anthracis*)	Identification, Molecular typing, Detection of emetic toxin gene by PCR	GBRU
Bacillus (other than *B.anthracis*)	Antimicrobial susceptibility	AMRHAI
Bacterial Identification Service (BIDS) - isolates	Isolate identification (unknown, atypical, fastidious, emerging bacteria)	AMRHAI
Bacterial Identification Service (BIDS) - clinical samples	Bacterial detection and species identification for culture-negative, unknown clinical samples from normally sterile sites	AMRHAI
Blastomyces dermatidis	Serology, identification and confirmation	MRL
Bordetella spp.	Identification	RVPBRU
Bordetella spp.	Antimicrobial susceptibility	AMRHAI
Bordetella pertussis	Serology: anti-PT IgG antibodies. Not suitable for immune status	RVPBRU
Bordetella pertussis	Oral fluid: anti-PT IgG antibodies. NOT suitable for immune status qPCR	RVPBRU
Brucella spp.	Serodiagnosis, Speciation and characterisation	BRU
Burkholderia spp.	Species identification, molecular typing and antimicrobial resistance	AMRHAI
Burkholderia pseudomallei	Identification and antimicrobial resistance	AMRHAI
Candida spp.	Identification and confirmation	Mycology RL
Campylobacter	Antibiotic susceptibility testing for gram negative GI pathogens	GBRU
Campylobacter	Identification	GBRU
Chlamydia (respiratory)	Only available after discussion and prior agreement with RVPBRU C. pneumoniae, *C. psittacci*, *C. abortus*: PCR assay	RVPBRU
Chlamydia trachomatis	*C. trachomatis*: LGV multiplex PCR	STBRU
Clostridium difficile	16S/23S PCR ribotyping, antibiotic susceptibility testing and toxin A and B assay on isolates	ARU

Clostridium botulinum	Detection and identification of *C. botulinum* from clinical, food or environmental samples by PCR and culture	GBRU
Clostridium botulinum	Detection of botulinum neurotoxins in clinical specimens or food	GBRU
Clostridium perfringens	Identification of enterotoxigenic *C. perfringens* by PCR, molecular typing, detection of *C. perfringens* enterotoxin in faeces by ELISA, *C. perfringens* Toxin (lethal toxins) typing by PCR	GBRU
Clostridium tetani	Detection and identification of *C. tetani* by PCR and culture, Detection of *C. tetani* neurotoxin in serum (note: serum will be first tested for tetanus antibody levels by RVPBRU)	GBRU
Clostridium tetani	Tetanus immunity: serum antibodies	RVPBRU
Coccidioides immitis	Serology, identification and confirmation	Mycology RL
Corynebacterium	Molecular typing and antimicrobial resistance	AMRHAI
Corynebacterium diphtheriae	*C. diphtheriae* and other potentially toxigenic Corynebacteria: identification and toxin testing by PCR and Elek, Diphtheria immunity: serum antibodies	RVPBRU
Corynebacterium jeikeium	*C. jeikeium* antimicrobial sensitivity	AMRHAI
Cronobacter	*C. sakazakii*: confirmation of identification, molecular typing and antimicrobial resistance	AMRHAI
Cystic Fibrosis (CF) pathogens	Identification and molecular typing, Antimicrobial susceptibility	AMRHAI
Cryptococcus spp.	Identification and confirmation	Mycology RL
Cryptosporidium spp.	Detection, identification and confirmation, typing	CRU
Dermatophytes	Identification, confirmation	Mycology RL
Diphtheria (see *Corynebacterium diphtheriae*)		
Ebola virus	Serology, PCR. Please contact lab before sending samples.	RIPL
Elizabethkingia.spp	Identification, molecular typing and antimicrobial resistance	AMRHAI

Enterobacter spp.	Molecular typing and antimicrobial resistance, Species identification, molecular typing and antimicrobial resistance	AMRHAI
Escherichia	Antibiotic susceptibility testing for gram negative GI pathogens, identification and typing, detection and isolation from faeces, E.coli 0157 serodiagnostic service	GBRU
Escherichia	*E. coli* (ACDP HG 2 only): molecular typing and antimicrobial resistance	AMRHAI
Francisella spp., including tularensis	PCR, serology, isolation	RIPL
Gram-negative bacteria non fermenter and fastidious organisms	Molecular typing and antimicrobial resistance	AMRHAI
Gram-positive bacteria (except *C. diphtheriae*)	Molecular typing and antimicrobial resistance	AMRHAI
Haemophilus	*Haemophilus* spp. (excluding *H. ducreyi*): identification, *H. influenzae*: sero typing and capsular genotyping of *H.influenzae*	RVPBRU
Haemophilus spp. and *Aggregatibacter* spp.	Antimicrobial susceptibility	AMRHAI
Helicobacter	Antibiotic susceptibility testing for gram negative GI pathogens, *H. pylori* identification and antibiotic susceptibility	GBRU
Histoplasma capsulatum	Serology, identification and confirmation	Mycology RL
Histology slides	Examination for the presence of fungi	Mycology RL
Hydatid disease or Echinococcosis	Serology	NPRL
Identification of bacterial isolates with no national reference facility (unknowns, atypical, fastidious, emerging	MALDI-TOF-MS, 16s ribosomal sequence analysis	AMRHAI
Klebsiella spp.	Molecular typing and antimicrobial resistance	AMRHAI
Legionella	*L.pneumophila*: in-house urinary antigen EIA assay (confirmation of sending lab testing results only), *L pneumophila* PCR (from urinary antigen positive	RVPBRU

	patients only), Identification and epidemiological typing of clinical or outbreak associated isolates	
Leuconostoc spp.	Antimicrobial susceptibility	AMRHAI
Leptospira spp	Isolation and confirmation, identification, serology	NLS
Listeria spp.	Identification, serotyping and molecular typing of *L.monocytogenes,* Species identification of Listeria	GBRU
Listeria spp.	Antimicrobial susceptibility	AMRHAI
Lyme disease	Serology, PCR	RIPL
Malaria	Blood film diagnosis, antigen detection, PCR, drug resistance markers	Malaria RL
Molluscum contagiosum	Electron microscopy	HPHCU
Moulds	Identification and confirmation, susceptibility testing	Mycology RL
Meticillin-resistant *S. aureus* (MRSA) (see Staphylococcus)		
Mycobacterium spp.	Identification, genotyping, drug susceptibility, molecular diagnosis (e.g. PCR for rapid species identification and detection of resistance genes), molecular epidemiological studies, QuantiFERON®-TB Gold test	NMRS-South
Mycoplasma	*M.hominis* and *Ureaplasma* spp.: PCR and/or culture, Mycoplasma and ureaplasma: biochemical characterisation and molecular methods, *M. pneumoniae*: PCR, Other species: culture, PCR and sequencing when relevant	RVPBRU
Mycoplasma	*M. genitalium*: molecular detection of the adhesion MgPa gene	AMRHAI
Neisseria spp.	*N.gonorrhoeae*: confirmation of identification by phenotypic and molecular methods, Susceptibility testing for third-generation cephalosporin and azithromycin antibiotics, Programme: Gonococcal resistance to antimicrobials surveillance programme (GRASP)	AMRHAI

Neisseria spp.	Molecular confirmation of GC NAAT result	STBRU
Neisseria meningitidis	Culture identification, molecular epidemiological studies, PCR, serology	MRU
Nocardia spp.	Antimicrobial susceptibility	AMRHAI
Opportunistic Pathogens	Molecular typing and antimicrobial resistance	AMRHAI
Pandoraea spp.	Molecular typing and antimicrobial resistance	AMRHAI
Parasites, intestinal protozoa and helminths, blood and tissue protozoa and helminths		NPRL
Penicillium marneffei (now known as Talaromyces marneffei)		Mycology RL
Plasmodium spp.		NPRL
Pseudomonas spp.	*P. aeruginosa* antibodies (serodiagnosis), Molecular typing and antimicrobial susceptibility	AMRHAI
PVL (see Staphylococcus)		
Q fever (*Coxiella burnetii*)		RIPL
Ralstonia spp.	Molecular typing and antimicrobial resistance	AMRHAI
Resistance mechanisms	Molecular detection and confirmation	AMRHAI
Salmonella	Antibiotic susceptibility testing for gram negative GI pathogens	GBRU
Salmonella	Identification and typing	GBRU
Serratia	Molecular typing and antimicrobial resistance	AMRHAI
Shigella	Antibiotic susceptibility testing for gram negative GI pathogens, Identification and typing	GBRU
Staphylococcus	*S.aureus*: molecular typing, Staphylococcus, coagulase negative: species identification and molecular typing, Antimicrobial susceptibility testing, Resistance gene detection, Toxin gene detection (including PVL)	AMRHAI
Staphylococcus	Detection of staphylococcal enterotoxins A, B, C, D or E in foods or beverages.	GBRU

Stenotrophomonas	S.maltophilia: molecular typing and antimicrobial resistance	AMRHAI
Streptococcus	Streptococcus spp. and related genera or Gram positive cocci: identification, *S.pyogenes* (Lancefield Group A) typing, *S.agalactiae* (Lancefield Group B) typing, Lancefield Group C and G typing, *S. pneumoniae*: serological typing	RVPBRU
Streptococcus	Antimicrobial susceptibility	AMRHAI
Tetanus	Tetanus immunity: serum antibodies	RVPBRU
Toxoplasma gondii	Isolation, identification, culture collection, serology (for active infection) molecular diagnostics by PCR	TRL
Treponema	*T. pallidum* (syphilis): serological, *T.pallidum*, *Haemophilus ducreyi*, Herpes Simplex Virus (HSV) complex (Genital ulcer disease): PCR	STBRU
Ureaplasma	Refer to mycoplasma	RVPBRU
Vibrio (including *Plesiomonas shigelloides*)	Antibiotic susceptibility testing for gram negative GI pathogens	GBRU
Vibrio (including *Plesiomonas shigelloides*)	Identification and typing	GBRU
VTEC O157 (See *Escherichia coli*)		
Yeasts	Serodiagnosis	Mycology RL
Yersinia	Antibiotic susceptibility testing for gram negative GI pathogens	GBRU
Yersinia	Identification	GBRU

Bacteriology Reference Department (BRD) UKHSA, 61 Colindale Avenue London NW9 5EQ. Comprising of: **AMRHAI, GBRU, RVPBRU**

BRU Brucella Reference Unit, Liverpool Clinical Laboratories, Virology Department, Royal Liverpool and Broadgreen University Hospital NHS Trust, Prescott Street Liverpool L9 8XP

CDRN Clostridium difficile ribotyping network (CDRN) service, Leeds Reference Laboratory, Leeds General Infirmary, Great George St, Leeds, West Yorkshire LS1 3EX

MRL Mycology Reference Laboratory (Mycology RL) Bristol, UKHSA, South West Laboratory, Myrtle Road, Kingsdown Bristol BS2 8EL

NMRS-S National mycobacterium reference service-South (NMRS-South), National Infection Service 61 Colindale Avenue London NW9 5EQ

ARU Anaerobe reference unit (ARU) Cardiff, Public Health Wales Microbiology Cardiff, University Hospital of Wales, Heath Park Cardiff CF14 4XW

MRU Meningococcal Reference Unit (MRU) Manchester, Clinical Sciences Building 2, Manchester Royal Infirmary, Oxford Road Manchester M13 9WL

NPRL National Parasitology Reference Laboratory, Faculty of Infectious and Tropical Diseases, London School of Hygiene & Tropical Medicine, Keppel Street, London WC1E 7HT

10. Notification of Infectious Diseases

The following infections are notifiable and should be reported to:

South London Health Protection Team

UKHSA
5th floor
10 South Colonnade
London E14 4PU
Tel: 0300 303 0450 (Daytime and Out of Hours)

E-Mail: london.region@ukhsa.gov.uk