Synnovis

South London Specialist Virology Laboratories

Laboratory User's Handbook

www.synnovis.co.uk www.synlab.co.uk

www.kch.nhs.uk www.clinicalvirology.org

Prepared by

Dr M Sudhanva
Consultant Medical Virologist, Synnovis Strategic Clinical Lead Virology and Laboratory Director for Hub Virology

Ayazali Nazafi
Deputy Operations Service Director – Virology

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1. General information on Synnovis laboratory

South London specialist virology laboratories are based at the Blackfriars Hub on Friars Bridge Court, 41-43 Blackfriars Road, London SE1 8NZ, with an Essential Services Laboratory [ESL] on the Denmark Hill site at Kings College Hospital NHS Foundation Trust. We provide an extensive clinical virology service, including infection control services and specialist advice in bacteriology, virology, parasitology and mycology to hospitals and General Practitioners. The laboratory is part of the UK Clinical Virology Network.

Virology is UKAS accredited under the ISO 15189 standards and participates in National Quality Assurance Schemes. The schedule of accredited tests may be found by searching using the accreditation number 8640 at https://www.ukas.com/search-accredited-organisations. All non-accredited tests have a comment stating when they are not accredited.

In October 2010, Virology at King's joined the KingsPath team having previously been the PHLS then HPA and now UKHSA London Regional Laboratory for about 20 years and along with our other colleagues have entered the joint venture with GSTS Pathology who provide pathology services at Guy's & St Thomas's NHS Foundation Trust. This Joint Venture was called Viapath; which was a joint venture between SERCO, Guy's & St Thomas' NHS Foundation Trust and King's College Hospital NHS Foundation Trust.

On 1 April 2021, Guy's and St Thomas' and King's College Hospital NHS Foundation Trusts joined with SYNLAB UK & Ireland to deliver pathology services across the London 4 region as part of NHSE&I pathology network transformation. On 1 October 2022, Viapath was rebranded as Synnnovis, which is a partnership between SYNLAB UK & Ireland, Guy's and St Thomas' NHS Foundation Trust, and King's College Hospital NHS Foundation Trust. As well as delivering pathology services and in line with the NHS's own clinical vision and strategy, SYNLAB is responsible for transforming existing hospital-based laboratory and diagnostic services into an integrated hub and spoke pathology network by 2025.

A state-of-the-art 'hub' laboratory is located at Friars Bridge Court [South London Specialist Virology Hub], in Blackfriars Road, London, providing access to improved services and equipment for routine and some specialist testing. The Denmark Hill site was turned into essential services laboratories (the spoke), focusing on the rapid turnaround of urgent tests, such as those needed for emergency departments, ICU and transplant serology. The hub will become one of the largest, purpose-built pathology laboratories in the UK, capable of processing around 70 per cent of all pathology activity in the Southeast region.

Synnovis and its partners benefit from SYNLAB's global laboratory and diagnostic network, which will provide access to a wide range of clinical, scientific and operational expertise, as well as innovative research and development.
Synnovis (formerly Viapath) is a founding member of The Association of Independent Pathology Providers (AIPP), which is a trade association representing innovative research-based diagnostic testing companies. The AIPP's aim is to work at the heart of policy development and decision-making to ensure that patients are able to benefit from the latest and most advanced pathology tests and most efficient processes.

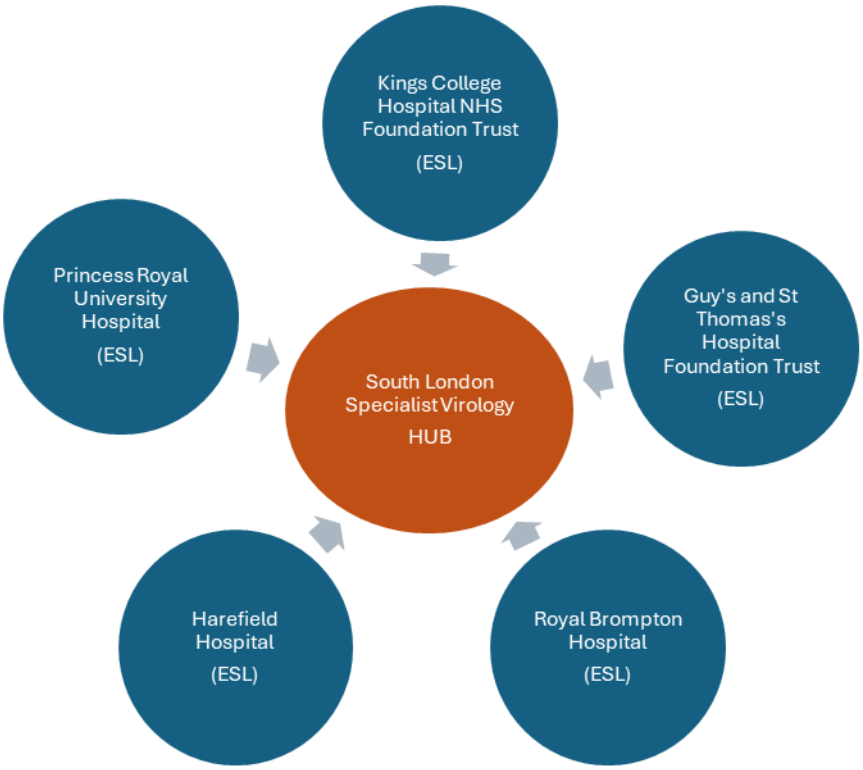


Figure 1. Virology laboratories within South London Specialist Virology Laboratories

1.1 Where to find Virology labs within South London Specialist Virology Laboratories

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	

Website contacts:

www.synnovis.co.uk www.clinicalvirology.org www.synlab.com

1.2 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 and Bromley and Bexley and the county of Kent. The trust operates from 5 sites: Denmark Hill (main) site, Princess Royal University Hospital 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

The Trust 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 fetal 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 College Hospital NHS Foundation Trust has also recently strengthened its research and development infrastructure in order better to support clinical researchers across the organisation.

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

1.3 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

1.4 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.

1.5 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 work 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.

1.6 Surveillance activity in virology:

HIV programme	HIV-1 antiretroviral resistance data sequence for MRC database, HIV avidity for RITA
HCV	Reporting to the National HCV sentinel surveillance study
Norovirus	Diagnosis and outbreak analysis
Influenza	Diagnosis and typing [performed in VRD UKHSA Colindale]
Pregnancy	Screening in pregnancy

South London Specialist Virology Laboratories and Department of Microbiology [together as Synnovis Infection Sciences] provide a full screening service for NHS Infectious Diseases in Pregnancy Screening [IDPS] Programme.

2. Staffing and laboratory details

2.1 KCH virology medical team

The medical virologists include two consultant medical virologists and one consultant medical virologist/ infectious diseases physician and two specialty trainees.

020 329 **9000 (switch) or extension**		
Designation	**Name**	**Telephone extension 0203 299 9000**
Consultant Medical Virologist and Adjunct Reader in Virology, Head of Virology	Dr Mark Zuckerman	36978 / 36970
Consultant Medical Virologist, Strategic Clinical Lead Virology & Laboratory Director of Hub virology	Dr M Sudhanva	36978 / 36971
Consultant Medical Virologist and Infectious Diseases Physician and Lead for ID clinic	Dr Temi Lampejo	36978 / 34367
Higher Specialty Trainee or Combined Infection Trainee	Trainee on rotation	36978
Consultant Medical Microbiologist/ ID Physician, Strategic Clinical Lead Microbiology & Laboratory Director of Hub microbiology.	Dr Anjaneya Bapat	31759

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 [from 1 July 2025] and Consultant Medical Microbiologist/ ID Physician	Dr Caoimhe NICFHOGARTAIGH	36260
Trust Chief of Division A and Consultant Medical Microbiologist	Dr Carmel Curtis	32709

2.2 PRUH microbiology medical team

There are 2 consultant medical microbiologists and 1 medical microbiology / infectious diseases physician along with two clinical fellows. They manage both microbiology and virology clinical issues

01689 863000 **(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	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 [from 1 July 2025] and Consultant Medical Microbiologist/ ID Physician	Dr Caoimhe NICFHOGARTAIGH	36260
Trust Clinical Lead for Infection Sciences and Consultant Medical Microbiologist/ ID Physician	Dr Caoimhe NICFHOGARTAIGH	36260
Chief of KCH NHS FT Division A and Consultant Medical Microbiologist	Dr Carmel Curtis	32709

2.3 GSTT virology medical team

The medical virologists include three consultant medical virologists/ infectious diseases physicians, one specialty doctor and 1 specialty trainee

020 7188 7188 **(switch) or extension +8**		
Designation	**Name**	**Telephone**
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
Trust Clinical Lead for Infection Sciences and Consultant Medical Microbiologist/ ID Physician	Dr Simon Goldenberg	8515

2.4 Royal Brompton Hospital and Harefield Hospital Microbiology team

Designation	**Name**	**Telephone**
Consultant Medical Microbiologist and Infectious Disease Consultant	Dr Imogen Jones	0207 352 8121 extension 82972
Consultant Medical Microbiologist	Dr Saraswathy Murthy	01895 823 727 extension 85728

2.5 Synnovis virology team

This larger team consists of Principal Clinical Scientist, Clinical Scientist, team of Biomedical Scientists and Scientific Assistant Technical Officers, Operation Manager and Service Delivery Manager that report to a Service Operations Manager. An incoming 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 serology, hepatitis and retrovirus serology, and an extensive repertoire of molecular based tests which include both qualitative and quantitative assays as well as antiretroviral resistance testing using semi-automated sequence analysis, employing a range of different platforms and technologies underpinned by our Service Development research.

General microbiology and virology serological tests are sent to the combined Hub Blood Sciences Laboratory in 2nd floor of the Hub, where initial tests are carried out in Abbott track system. Reflex tests, manual tests and confirmations are carried out in 5th floor hub for both microbiology and viral serology. Virology receives specimens from an increasing number of external microbiology laboratories for investigation.

The laboratory also processes >500 dried blood spot cards per week for HIV, HBsAg, HB core total antibody, HCV antibody and HCV RNA.

2.6 Laboratory contact details

Infection Sciences [Microbiology and Virology] 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

Contact list for laboratory at various sites			
Site	Situation / Location	Telephone	Email if available
All sites	Results, add-ons, logistics, consumables	Mon-Friday 08.00-18.00 020 4513 7300	synnovis.customerservices@nhs.net
Hub work for all sites	Microbiology and Virology serology	Mon-Friday 08.00-18.00 0784 957 3535 0204 591 0026	hubserology@synnovis.co.uk
Hub Infections 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	kch-tr.MicrobiologySeniors@nhs.net
	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	kch-tr.MicrobiologySeniors@nhs.net

Contact list for laboratory at various sites

Site	Situation / Location	Telephone	Email if available
GSTT – Guy's Hospital and St Thomas' Hospital	Virology clinical advice	Mon-Friday 9-5 0207 188 3140 Int Ext 83140 Out of hours via GSTT switchboard 0207 188 7188	gstt.virologydoctors@nhs.net
	Virology Laboratory	Mon-Friday 9-5 07708486588	VirologySeniorBMS@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	MicroViroEnquiry@synnovis.co.uk
	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	

Contact list for laboratory at various sites			
Site	Situation / Location	Telephone	Email if available
GSTT – Royal Brompton Hospital and Harefield Hospital	Microbiology laboratory	Mon-Friday 09.00-17.00 020 7351 8451	
	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	

2.7 Medical advice regarding the diagnosis and treatment of infection

During weekdays from 9 am to 5 pm medical advice on interpretation of virology results, antiviral management, blood borne virus exposure incidents and post exposure prophylaxis or any other relevant clinical circumstance 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 [see section 2.6 for this].**
An on-call service medical advice is provided by Trusts for Virology 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 and 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

2.8 Synnovis staff

Synnovis staff		
Designation of Ops team	**Name**	**Email**
Operations Service Director – Infection Sciences	Liz Ford	Elizabeth.ford@synnovis.co.uk
Deputy Operations Service Director – virology	Ayazali Nazafi [Ali]	ayazali.nazafi@synnovis.co.uk
Deputy Operations Service Director – Microbiology	Sunita Gurung	Sunita.gurung@synnovis.co.uk
Operational Services Manager – Infection Science	Vacant	
Hub Virology Manager / Operations Manager STH	Tahira Azim	tahira.Azim@synnovis.co.uk
Service Delivery Manager KCH	Eunice Drakes	eunice.drakes@synnovis.co.uk
Virology Operations Manager - DH	Colleen Gilkes	colleen.gilkes@synnovis.co.uk
Quality-Operations Manager - DH	Gulrukh Ahsan	gulrukh.ahsan@synnovis.co.uk
Operations Manager PRUH	Ricky Stow	ricky.stow@synnovis.co.uk
Interim Operations Manager RBH	Sushma Enjam	sushma.enjam@synnovis.co.uk
Designations of Clinical Scientists	**Name**	**Email**
Consultant Clinical Scientist	Vacant until 1 October 2025	
Senior Clinical Scientist, Infections sciences Virology -STH	Emma Cunningham	Emma.Cunningham@synnovis.co.uk
Clinical Scientist DH	Eleanor Parker	eleanor.parker@synnovis.co.uk
Acting Senior Clinical Scientist / Operational Manager-Liver Virology KCH	Matthew Bruce	matthew.bruce@synnovis.co.uk
Cross-Site / Transformation Clinical Scientist, Infection Sciences	Lynda Hadjilah	lynda.hadjilahfourali@synnovis.co.uk
Clinical Scientist Infection Sciences Virology-STH	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	Florina Mamaische	florina.mamaische@synnovis.co.uk
Quality Officer	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

2.9 Laboratory opening times.

South London Specialist Virology Hub: specimens are accepted 24/7
ESL at DH site: specimens are accepted at the virology laboratory is 24/7

3. Sections within the Hub

There are two diagnostic sections within South London Specialist Virology Hub: Virus Molecular and Virus Serology.

3.1 Molecular Section

Virus detection by molecular techniques is now a routine service daily including weekends. Weekend services are limited. Please note we no longer provide virus isolation or direct immunofluorescence (DIF) diagnostic services. Samples for electron microscopy (EM) are referred to another laboratory if needed.

Molecular diagnostics use real time PCR for the detection of viral nucleic acid in clinical samples. Nucleic acid tests performed routinely are for the detection / quantification of:

Viruses in blood (HCV RNA, HIV-1 RNA, HBV DNA, HEV RNA, BKV DNA, adenovirus DNA, CMV DNA and EBV DNA, HHV-8 DNA, parvovirus B19 DNA)
Respiratory viruses (influenza viruses, RSV, parainfluenza viruses, rhinovirus, metapneumovirus and adenovirus)
Other body sites/fluids (HSV DNA, VZV DNA, adenovirus DNA, enterovirus RNA, JCV DNA, BKV DNA, HHV-6 DNA, HHV-7 DNA)
Sexually transmitted infection (HSV 1 & 2 DNA)

Multiplex PCR's are available for the following viruses as panels:

Gastrointestinal viral panel

- Adenovirus DNA
- Astrovirus RNA
- Rotavirus RNA
- Sapovirus RNA
- Norovirus genogroup 1 RNA
- Norovirus genogroup 2 RNA

24-panel AusDiagnostics respiratory panel has the following

Viruses

- SARS-CoV-2 assays
- Influenza A
- Influenza A typing H1/H3
- Influenza B
- Respiratory Syncytial Virus A
- Respiratory Syncytial Virus B
- Parainfluenza 1
- Parainfluenza 2
- Parainfluenza 3
- Parainfluenza 4
- Metapneumovirus A
- Metapneumovirus B
- Adenovirus groups B, C, E, partially A, D
- Rhinovirus and Enterovirus
- Enterovirus
- Parechovirus
- Seasonal Coronavirus

Bacteria

- Mycoplasma pneumoniae
- Chlamydophila pneumoniae
- Chlamydophila psittaci
- Bordetella IS481 (B. pertussis, partially B. homlesii)
- Bordetella pertussis
- Bordetella IS1001 (B. parapertussis, partially B. bronchiseptica)
- Legionella pneumophila
- Legionella longbeachae

Fungi

- Pneumocystis jirovecii (PJP)

Antiretroviral resistance testing in HIV-1 by nucleic acid sequencing for resistance testing are also provided for RT & protease, integrase regions and CCR5 tropism along with HBV and HCV sequencing: this service will remain at Denmark Hill site for the time being.

3.2 Serology

The South London Specialist Virology Hub serology section detects antibodies to viruses and viral antigens in serum using primarily the Abbott track system linked to Abbott Alinity and Diasorin Liaison XL machines in floor 2 of the Hub. Floor 5 of the Hub performs manual assays including HIV Geenius and HIV InnoLIA assays.

4. Use of the Laboratory

4.1 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.

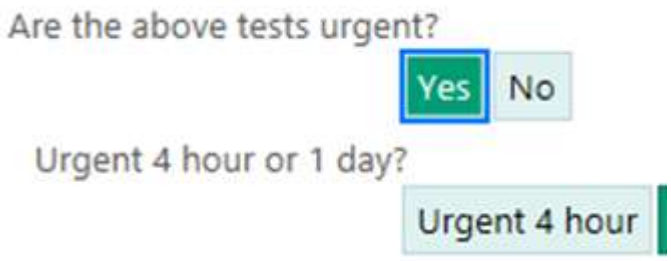
4.2 How to generate EPIC BEAKER urgent 1-day requests:

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”.

4.3 How to generate EPIC BEAKER urgent 4-hour requests:

KCH NHS FT Denmark Hill is the only site with an ESL for Virology tests as 4-hour URGENT test results] 24/7.
These URGENT 4-hour request will lead to automatically generating urgent 25DH labels for the samples.

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.



4.4 Electronic requests from GPs

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

4.5 Types of paper-based request forms:

Multipart single pathology request GPs whose T-Quest system is temporarily available

Dried bloodspot forms Abbott Alere

Transplant donor / recipient as below

1. KCL submitter paper based 5-hour granulocyte donor
2. KCL submitter paper-based Anthony Nolan donor
3. KCL submitter paper-based Apheresis donor [sometimes MRN based]
4. KCH submitter paper-based vessel donor
5. KCH submitter Fertility Sperm or Egg donor
6. KCH Small Intestine Transplant donor / recipient
7. KCH Kidney Transplant donor / recipient

Any handwritten form should be completed legibly.

4.6 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 Virology 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.

4.7 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 unlabelled specimens do not guarantee authenticity of the sample, and these cannot be processed and will be discarded.

4.8 Specimen collection

The best results are obtained when an appropriate, well-taken specimen is in the proper container, is delivered to the laboratory promptly and relevant clinical information is provided on the request form. Please contact the laboratory if there is any doubt about the best specimen to take or you have questions about any test.

General guidelines on specimen collection include:

- Send specimens in sterile containers
- Collect specimens from the actual site of suspected infection. Please do not send just blood samples for 'viral serology' instead of vesicular fluid or throat swab or CSF, as the case may be.
- Take specimens that are representative of the disease process. For example, respiratory specimens are more appropriate than blood for serology in cases of acute respiratory infection.
- An adequate quantity of material should be obtained for complete examination especially vesicle fluid, CSF and NPA
- Take care to avoid contamination of the specimen by microorganisms 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
- All swabs or material from swabs should be immersed in virus transport medium (VTM) and transported promptly to the laboratory. Viruses including (viral nucleic acid) may not survive prolonged storage at room temperature or may be overgrown by bacteria or fungi.
- In the absence of readily available VTM (laboratory issued or commercial), please immerse the swab tips in 1 mL of sterile saline in a universal container

4.9 Specimen limitations affecting assay performance

Factors that can affect assay performance are as follows

- inherent (age, gender, nutritional status, pregnancy, congenital immunological defects)
- acquired (passively acquired antibody, immune response to immunisation, immunosuppression)
- biological (lipemic, haemolysed, high bilirubin content e.g., Liver ITU patients)
- collection container (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
- Time of sample collection to receipt in laboratory

4.10 Requesting Additional Tests

Sample Type	Time limit for requesting extra tests = time for which these are stored
Non-Blood Samples	
CSF	28 days
Fluids	28 days
Swabs	28 days
Faeces	28 days
Dry tissue (Skin and Nails)	28 days
Respiratory tract samples	28 days
Wet tissue	42 days
Dried Blood Spot Cards	4 months
Plasma	
Medico-legal	30 Years
HIV-1 RNA loads (>20 copies/mL)	30 Years
Whole blood samples	7 days
Other plasma	14 days
Serum	
Other sera	~ 1 Year
Medico-legal	~ 2 Years
Pregnant booking	2 Years
Needle stick injuries	30 Years
Pre-transplantation (donor) sera	30 Years

All post-mortem tissues are returned to histopathology when testing is complete. For specific enquiries please contact the medical staff.

4.11 Maximum sample transport times for virology

Sample Type	Maximum Transport time at Ambient Temperature
Non-Blood Samples	
CSF	3 days
Fluids	3 days
Swabs in Universal Transport Medium	3 days
Faeces	3 days
Dry tissue (Skin and Nails)	3 days
Respiratory tract samples	3 days
Wet tissue	3 days
Blood samples	
Serum [yellow SST]	3 days
Dried Blood Spot Cards	3 days
EDTA whole blood samples [purple]	3 days
EDTA plasma [purple]	3 days

4.12 Transport and receipt of specimens (including courier and postal deliveries)

Samples must be delivered to the laboratory in a way to protect the integrity of the sample. Samples must not be exposed to extreme temperature or prolonged transport. If samples are in danger of being exposed to conditions where sample integrity can be compromised, please contact the laboratory to discuss the most appropriate method of transport.

When receiving samples from an external institution or laboratory, it is the responsibility of the sender to ensure that the samples are packed in accordance with the current postal regulations, contain appropriate paperwork and are labelled correctly. Courier / taxi / suitable transport should be arranged by sending institution or laboratory. You may have to contact the on-call BMS staff for out-of-hours' testing to indicate approximate time of arrival of sample at virology. Our experience shows that a considerable amount of time is wasted by our on-call BMS staff just waiting for a sample to arrive because of lack of communication from the test requesting person.

4.13 Transport of ROUTINE SAMPLES:

During normal working hours, all routine samples should be to central specimen reception at respective hospitals manually or via Pneumatic Air Tube Transport System (PATTS).
These are then forwarded to Hub Specimen reception via GSG couriers.

The following 'virology' specimens must not be sent via the air tube:

- any respiratory tract specimen (sputum, bronchoalveolar lavage, respiratory aspirates)
- any specimen from patients known to have, or thought to have:
    - transmissible spongiform encephalopathy (CJD, GSS etc.)
    - a viral hemorrhagic fever (e.g., Lassa virus, Ebola virus etc.)
- any difficult to resample or unrepeatable specimen of any type

4.14 Transport of URGENT SAMPLES:

During working and out-of-hours: for urgent testing, bring the specimen DIRECTLY to the Trust laboratory reception who will forward it to appropriate virology laboratory [ESL or Hub].

4.15 Virology cut-off times for receipt of specimens for a 24-hour TAT

If a sample needs to be processed urgently based on clinical ground, please contact the medical virologist or microbiologist as detailed in section 2.0

Specimen type	Assays	Cut-off time for processing	Results available at:	Weekend runs
Blood for any serology	See section 3.1, 3.3 and 5.3	Any time	Varied	1-2 runs
Respiratory samples Respiratory samples (Combined throat and nasal swab, BAL, NPA, ETA etc.)	Standalone SARS-CoV-2 Routine Altona Real Star	24/7	Within 24 hours	1 run
	AusDiagnostics respiratory panel	24/7	Within 24 hours	1-2 runs
	Cepheid Quadplex [for SARS-CoV-2, influenza A virus, influenza B virus and RSV]	24/7	Within 4 hours in ESLs	
Faeces or rectal swab in VTM or vomitus	Adenovirus DNA Astrovirus RNA Rotavirus RNA Sapovirus RNA Norovirus genogroup 1 RNA Norovirus genogroup 2 RNA	10 AM	3.30 PM	1-2 runs
		3PM	10 AM next day	1-2 runs
CSF	HSV DNA [1 & 2] VZV DNA Enterovirus RNA Parechovirus RNA Adenovirus DNA CMV DNA EBV DNA	10 AM	3.30 PM	1-2 runs
Vesicle fluid	HSV 1 DNA, HSV 2 DNA, VZV DNA, enterovirus RNA, parechovirus RNA	10 AM	3.30 PM	1-2 runs.
EDTA whole blood	CMV DNA, EBV DNA and adenovirus DNA	3 PM	1 PM next day	1-2 runs
	HSV 1 DNA, HSV 2 DNA, VZV DNA, enterovirus RNA, parechovirus RNA	10 AM	3.30 PM	1-2 runs
EDTA plasma	HIV-1 RNA, HCV RNA HBV DNA	3 PM	1 PM next day	1-2 runs
Eye swab	HSV DNA, VZV DNA Adenovirus DNA	10 AM	3.30 PM	1-2 runs

4.16 High risk specimens and safety

Pathogens are classified in hazard groups 1 to 4, with hazard group 1 being non-pathogenic to humans and hazard group 4 the most dangerous pathogens to humans.

Samples from patients with suspected viral haemorrhagic fevers, with a history of having returned within 21 days from Africa, Asia and South America are considered high risk. Contact virology medical staff before taking ANY sample. Special transport arrangements of these samples will be made in conjunction with Rare and Imported Pathogens Laboratory (RIPL), UK HSA Public Health England, Porton Down, SP4 0JG

All blood samples are handled safely in the laboratory and consequently **we do not require "DANGER OF INFECTION" labels**. It is the responsibility of the sender to package samples safe enough for transportation according to regulations.

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

Great care must be taken in obtaining specimens. Equipment such as needles and blades must be immediately disposed of safely in locally approved "sharps" bins and NOT SENT TO LABORATORIES. Specimens should be transported to the laboratory without delay.

4.17 Result availability

Serology		Molecular	
Qualitative	**Quantitative**	**Qualitative**	**Quantitative**
• Positive • Negative • Indeterminate • Insufficient • Not tested • Cancelled • Confirmed by neutralization	• Quantitation with appropriate units (e.g. mIU/mL) • Less than the lower limit of detection (e.g. <10 mIU/mL)	• Positive • Positive at limit of detection • Negative • Inhibitory • Insufficient	• Quantitation with appropriate units and log value • Less than the lower limit of detection • Positive (unable to quantify) • Inhibitory • Insufficient

As a rule, we do not issue Reactive / Non-reactive / Detected / Not detected / Low positive / High Negative / Equivocal results.

This rule is based on

1. possible misinterpretation of results by clinicians and to prevent Serious Untoward Incidents (see "transplant team had misheard "reactive" as "nonreactive" in reference to the donor testing HIV-positive" http://edition.cnn.com/2011/HEALTH/08/30/taiwan.transplant.hiv/).
2. NHS Organ Donation and Transplantation have also recommended using these terminologies (http://www.odt.nhs.uk/pdf/microbiological_screening_in_organ_donation_an_overview_part2.pdf).

Exporting of reports:

- Electronic reports are exported to EPIC BEAKER and Keystone within seconds of authorising.
- Most GP results are returned via GP links (Keystone) but those not on registered on the system are returned as a printed hard copy.

- Camberwell Sexual Health Clinic results are electronically returned and are available in Cyberlab.
- Third party contract results are available either on results online or printed hard copy depending on the negotiated contract.
- South London and Maudsley results are electronically returned.
- Non-EPIC BEAKER reports are printed and dispatched every working day – Monday to Friday. The speed of reporting depends on the frequency of testing and the urgency of the request.
- Copies of printed reports can be obtained by telephoning extension 36155. Reports are never faxed.
- Organ donor test results are emailed as PDF documents by secretaries and On Call BMS.

4.18 Telephoned and emailed results

Significant positive and negative results, urgent requests and rapid requests that may aid the immediate patient management will be telephoned or EPIC messaged or EPIC Cc or emailed by medical virologists/microbiologists to clinical teams within the hospital site. GPs will be emailed according to local arrangements.
However, for external District General Hospitals Virology Customer Services team members will call the corresponding laboratory or nursing staff to convey the results.

Examples include (this is not an exhaustive list):

- Respiratory virus detection by PCR in a respiratory sample
- Faecal norovirus
- CSF nucleic acid test positive result
- Any acute infection diagnosis
- Blood borne virus infection such as new HIV, acute HBV, acute HAV and first HTLV

See section 2.6, 2.7 and 2.8 for contact details

4.19 Visitors

Visitors should introduce themselves at the laboratory reception ground floor of Blackfriars Hub on Friars Bridge Court, 41-43 Blackfriars Road, London SE1 8NZ.
The person they wish to see will come to meet them. It is best to make appointments in advance to ensure the right person is available.

See section 2.6, 2.7 and 2.8 for contact details

4.20 Issue of immunoglobulins and vaccines

As of 1 October 2021, the virology laboratories have stopped having stocks of varicella zoster immunoglobulin (VZIG) and hepatitis B immunoglobulin (HBIG as 500 IU vials).
All requests for VZIG will be on a 'named patient' basis via the Rabies and Immunoglobulin Service RIGS at UK HSA Colindale and if indicated will be issued from the centrally held stock at Movianto through ImmForm.
Before contacting RIGS one has to check if request falls within the Guidance.

Routine service for RIGS [Rabies immunoglobulin]
UKHSA RIgS operates between 8am to 5.30pm Monday to Friday. All requests for replacement vaccine and advice about issuing should be directed to this service (Tel: 0330 128 1020).
Requests for immunoglobulin/vaccine Monday to Friday will be ordered through Movianto for delivery to a named responsible clinician to arrive the next working day before 2pm. However, there may occasionally be

specific urgent situations where HRIG is needed sooner than this, and in these circumstances, UK HSA can issue immunoglobulin through a more rapid delivery.

Out of hours service for RIGS

Clinical advice is available through the Colindale Duty Doctor service, between 9am and 7pm at weekends and bank holidays. Most calls can wait until the next day, so callers after 5:30pm are encouraged to call back the next morning to speak to RIgS or the Colindale Duty Doctor service (see Table 1). Vaccine should be sourced locally and will be replaced through RIgS the next working day. There is no need to talk to the RIgS team or Colindale before arranging this.

If HRIG is required out of working hours and cannot wait until the next working day, the product may be able to be collected from a local stockholder or be issued out of hours for delivery the next day. Arrangements for urgent delivery on non-working days should be made by calling the Duty Doctor between 9am and 7pm.

Table 1. Clinical advice, ordering and issuing of products from Colindale

	Advice, delivery and administration
Weekday working hours	
Monday to Friday 8am to 5.30pm	Contact RIgS.
Monday to Friday 5.30pm to 7pm	Contact Colindale out of hours Duty Doctor service.
Weekday out of hours	
Monday to Thursday 7pm to 8am	Administer vaccine and contact RIgS the next morning.
Weekend out of hours	
Friday 7pm to Saturday 9am	Administer vaccine and contact Colindale out of hours Duty Doctor service the next morning.
Saturday and Sunday 9am to 7pm	Contact Colindale out of hours Duty Doctor service.
Saturday 7pm to Sunday 9.00am	Administer vaccine and contact Colindale out of hours Duty Doctor service the next morning (after 9am).
Sunday 7pm to 8am	Administer vaccine and contact RIgS the next morning.

4.21 Complaints

Official complaints from users of the service may be received by the KCH NHS FT or GSTT NHS FT complaints team, PALs office, Synnovis Customer services or directly by the laboratory.

Complaints from patients will be dealt with according to the Trust official Complaints Policy (see KCH and GSTT website for the current version). The Complaint's Office gives clear deadlines for dealing with complaints and providing investigation reports.

See section 2.6, 2.7 and 2.8 for contact details

A complaint may be raised by:

- A patient
- A relative or carer
- An advocate on the patient's behalf, e.g. an MP or a local councillor
- A member of the public.
- Hospital Medical / Clinical staff
- GP Practises /Integrated Care Boards [ICBs]
- External customer

4. Out of hours' service

4.11 Out of hours' virology tests in the Hub

See section 2.6, 2.7 and 2.8 for contact details

The South London Specialist Virology Hub is expected to work from 8 AM to 8 PM every day with all tests having runs every day. If there is a clinical need for urgency, please contact Synnovis Customer Services [for routine and 1-day-urgent queries] synnovis.customerservices@nhs.net 020 4513 7300 [as in section 2 of this manual]
For clinical discussions, please contact your local microbiology / virology medical team to fast track the testing based on clinical requirements.

Non-serology tests can be carried out after discussion with one of the medical virologists. An example of this is the diagnosis of atypical bacteria and coronaviruses by molecular-based AusDiagnostics respiratory panel

4.12 Out of hours' virology tests in Denmark Hill ESL

These serology tests available for urgent 4-hour testing at the Denmark Hill ESL are as follows along with the most likely clinical scenarios.

	Name of serology test										
Clinical utility	**CMV IgG**	**HAV IgM**	**HAV total antibody**	**HBsAg [+ all markers if**	**Hepatitis B core total antibody**	**HB core IgM**	**HB surface antibody**	**HCV antibody**	**HIV serology**	**HTLV 1 & 2 antibody**	**Additional tests** [**done in Hub** for serology and DH site for molecular]
Acute hepatitis		Yes	Yes	Yes	Yes	Yes		Yes			
Transplant donor / recipient	Yes			Yes	Yes		Yes	Yes	Yes	Yes	The following tests are tested the next working day in the Hub: Treponemal antibody, Toxoplasma IgG, HEV IgG, HEV IgM, HSV IgG, EBV VCA IgG, VZV IgG The following tests are tested the next working day in the DH virology: HEV RNA and HCV RNA.
Unbooked pregnancy				Yes					Yes		Treponemal antibody
Blood-borne virus exposure donor/source				Yes				Yes	Yes	Yes	DH-molecular • HBV DNA • HIV-1 RNA • HCV RNA
Blood-borne virus exposure recipient							Yes				
Stand-alone urgent test	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	

The EPIC labels generated at the time of phlebotomy in DH site are as follows:

	Serology VSE	Serology VSE	Molecular VML
	CMV IgG HAV IgM HAV total antibody HBsAg [+ all markers if positive] Hepatitis B core total antibody HB core IgM HB surface antibody HCV antibody HIV serology HTLV 1 & 2 antibody	Treponemal antibody Toxoplasma IgG HEV IgG HEV IgM HSV IgG EBV VCA IgG VZV IgG	HCV RNA HEV RNA
4-hour URGENT sample label	**25DH** **[for Denmark Hill ESL]**	**25HB** **[for hub, not ESL]**	**25HB** **[for hub]**
24-hour urgent sample label	**25HB** **[for hub, not ESL]**	**25HB** **[for hub, not ESL]**	**25HB** **[for hub]**
Routine sample label			

- Blood sample tested by Cepheid GeneXpert for HIV-1 RNA, HBV DNA, HCV RNA
- Faeces sample tested by Cepheid GenXpert for Norovirus genogroup 1 and Norovirus genogroup 2 RNA [service activated by Trust if needed]
- Respiratory sample tested by Cepheid GeneXpert for Flu / RSV / SARS-CoV-2 RNA [service activated by Trust if needed]

4.13 Out of hours' virology tests in Princess Royal University Hospital (PRUH) ESL

- Faeces sample tested by Cepheid GenXpert for Norovirus genogroup 1 and Norovirus genogroup 2 RNA
- Respiratory sample tested by Cepheid GeneXpert for Flu / RSV /SARS-CoV-2 RNA

4.14 Out of hours' virology tests in St. Thomas' Hospital (STH) ESL

- Faeces sample tested by Cepheid GenXpert for Norovirus genogroup 1 and Norovirus genogroup 2 RNA [service activated by Trust if needed]
- Respiratory sample tested by Cepheid GeneXpert for Flu / RSV /SARS-CoV-2 RNA [service activated by Trust if needed]

4.15 Out of hours' virology tests in Guy's ESL

- Faeces sample tested by Cepheid GenXpert for Norovirus genogroup 1 and Norovirus genogroup 2 RNA [service activated by Trust if needed]
- Respiratory sample tested by Cepheid GeneXpert for Flu / RSV /SARS-CoV-2 RNA [service activated by Trust if needed]

4.16 Out-of-hour virology tests at Royal Brompton Hospital (RBH) ESL

- Respiratory sample tested by SAMBA for Flu / RSV / SARS-CoV-2 RNA

4.17 Out of hours' virology tests in Harefield Hospital ESL

- Respiratory sample tested by SAMBA for Flu / RSV /SARS-CoV-2 RNA

5. List of examinations performed in virology

5.11 Viral nucleic acid tests on respiratory samples

Table 1 with TECHNOLOGY OPTIONS available for Respiratory viruses

Specimen type	Tests performed	Availability, capacity and location of testing	Maximum TAT
RESPIRATORY • Combined throat and nose swab in VTM • Broncho-alveolar lavage • Bronchial lavage • Nasopharyngeal aspirate • Nasopharyngeal swab • Endotracheal aspirate	**ROUTINE** 24-panel AusDiagnostics respiratory panel has the following Viruses • SARS-CoV-2 assays • Influenza A • Influenza A typing H1/H3 • Influenza B • Respiratory Syncytial Virus A • Respiratory Syncytial Virus B • Parainfluenza 1 • Parainfluenza 2 • Parainfluenza 3 • Parainfluenza 4 • Metapneumovirus A • Metapneumovirus B • Adenovirus groups B, C, E, partially A, D • Rhinovirus and Enterovirus • Enterovirus • Parechovirus • Seasonal Coronavirus Bacteria • Mycoplasma pneumoniae • Chlamydophila pneumoniae • Chlamydophila psittaci • Bordetella IS481 (B. pertussis, partially B. homlesii) • Bordetella pertussis • Bordetella IS1001 (B. parapertussis, partially B. bronchiseptica) • Legionella pneumophila • Legionella longbeachae Fungi • Pneumocystis jirovecii (PJP)	8 AM to 8 PM 200 / day Hub virology	12 hours

	ROUTINE SARS-CoV-2 RNA only (Altona RealStar assay) • SARS-CoV-2 S gene • SARS-CoV-2 E gene	Every day 100 /day capacity Hub virology	24 hours
Any respiratory sample	Influenza A virus Oseltamivir resistance H275Y mutation	Whenever necessary [Sent away]	2 weeks
Combined throat and nose swab in VTM	Avian influenza H5N1	Whenever necessary [Sent away]	1 day

5.12 Viral nucleic acid tests on non-blood [non-respiratory samples] samples

Specimen type	Tests performed	Availability	Maximum TAT from receipt of sample
Genital swab in VTM Endocervical swab in VTM urine in universal urethral swab	HSV 1 & 2 DNA VZV DNA	Daily	2 days
	HSV drug resistance testing	Whenever necessary [Sent Away]	4 weeks
Genital swab in APTIMA swab Endocervical swab in APTIMA urine (first catch urine) urethral swab in APTIMA swab	*Chlamydia trachomatis DNA* *Neisseria gonorrhoea DNA* *[Please see Microbiology User Manual for details]*	Daily	2 days
Eye / conjunctival / corneal swab in VTM	Adenovirus DNA, HSV 1 & 2 DNA VZV DNA	Daily	2 days
Eye / conjunctival / corneal Swab in VTM	*Chlamydia trachomatis DNA* *[Microbiology User Manual for details]*	Daily	2 days
Intra-ocular fluid [aqueous fluid and vitreous fluid]	• Adenovirus DNA • CMV DNA • EBV DNA • HSV 1 & 2 DNA • VZV DNA	Daily	2 days
CSF	• Adenovirus DNA • CMV DNA • EBV DNA • Enterovirus RNA • Parechovirus RNA • HSV 1 & 2 DNA • VZV DNA	Daily	2 days
CSF	• JCV DNA • HHV 6 DNA • HHV 7 DNA	Daily	2 days
CSF	• HIV-1 RNA • HIV-2 RNA	Daily Sent away	2 days 20 days
CSF	• HEV RNA	Daily	2 days

Specimen type	Tests performed	Availability	Maximum TAT from receipt of sample during working week
Faeces [stool] or rectal swab or vomitus	ROUTINE in Hub: • Adenovirus DNA • Astrovirus RNA • Norovirus genogroup 1 & 2 RNA • Rotavirus RNA • Sapovirus RNA	Daily	2 days
Faeces [stool] or rectal swab	HEV RNA [in known HEV infected patients]	Daily	2 days
Faeces [stool] or rectal swab or vomitus	URGENT in PRUH ESL • Norovirus genogroup 1 RNA • Norovirus genogroup 2 RNA	Daily	1 day
Faeces [stool] or rectal swab	SARS-CoV-2 RNA or CMV DNA [in select high risk patients after discussions with consultant virologists]	Daily	2 days
Urine	Adenovirus DNA BK virus DNA CMV DNA	Daily	2 days
Skin Swab in VTM	HSV 1 & 2 DNA VZV DNA Enterovirus RNA	Daily	2 days
Skin vesicle swab in VTM	HSV 1 & 2 DNA VZV DNA Enterovirus RNA	Daily	2 days
Skin vesicle swab in VTM	Mpox DNA	Daily	2 days
Tissue / Biopsies	Site specific investigations	Daily (weekdays)	3 days
Mouth swab in VTM Saliva swab	Measles virus RNA Mumps virus RNA Rubella virus RNA	Send away to Micropathology Coventry	2 days

5.13 Viral nucleic acid tests on blood samples

Molecular assays on blood			
Test	**Specimen type**	**Schedule**	**MaximumTAT from receipt of sample during working week**
Adenovirus DNA - quantitative	5mL EDTA blood	Daily	2 days
BK virus DNA - quantitative	5mL EDTA blood	Daily	2 days
CMV DNA - quantitative	5mL EDTA blood	Daily	2 days
EBV DNA - quantitative	5mL EDTA blood	Daily	2 days
Enterovirus RNA	5mL EDTA blood	Daily	2 days
HBV DNA - quantitative	5mL EDTA blood	Daily	2 days
HBV DNA antiviral drug resistance	5mL EDTA blood	Weekly	14 days
HBV genotyping	5mL EDTA plasma	Weekly	14 days
HCV RNA - quantitative	5mL EDTA plasma/ clotted	Daily	2 days
HCV RNA viral - qualitative	DBS	Daily [weekdays]	5 days
HCV genotyping	5mL EDTA plasma	Weekly	14 days
HCV RAS [Resistance Associated Mutations]	5mL EDTA plasma	Sent away	14 days
HDV RNA - quantitative	5mL EDTA blood	Daily	2 days
HEV RNA - quantitative	5mL EDTA blood	Daily	2 days
HHV 6 DNA - quantitative	5mL EDTA blood	Daily	2 days
HHV 7 DNA - quantitative	5mL EDTA blood	Daily	2 days
HHV 8 DNA - quantitative	5mL EDTA blood	Daily	2 days
HIV-1 antiretroviral resistance – Integrase region	5mL EDTA blood	Weekly	14 days
HIV-1 antiretroviral resistance RT and Protease regions	5mL EDTA blood	Weekly	14 days
HIV-1 CCR5 / CXCR4 tropism assay trofile assay	5mL EDTA blood	Weekly	14 days
HIV-1 proviral DNA qualitative	5mL EDTA blood	Sent away	20 days
HIV-1 proviral DNA resistance testing	5mL EDTA blood	Sent away	20 days
HIV-1 RNA - quantitative	5mL EDTA blood	Daily	2 days
HIV-2 antiretroviral resistance	5mL EDTA blood	Sent away	14 days
HIV-2 proviral DNA - qualitative	5mL EDTA blood	Sent away	20 days
HIV-2 RNA - quantitative	5mL EDTA blood	Sent away	20 days
HSV 1 and 2 DNA - qualitative	5mL EDTA blood	Daily	2 days
HTLV proviral DNA - qualitative	5mL EDTA blood	Sent away	20 days
Parvovirus B19 DNA - quantitative	5mL EDTA blood	Weekly	5 days
VZV DNA - qualitative	5mL EDTA blood	Daily	2 days

5.14 Virus sequencing and phenotyping referrals

Test	Sample type	Reference Laboratory	Comments
CMV antiviral resistance testing by sequencing	EDTA blood or DNA extract	UK HSA Birmingham Manchester	On request if clinically indicated.
Enterovirus typing	Enterovirus RNA positive sample	Clinical Services Unit, VRD, UK HSA, Colindale	Routinely sent to characterise the type of enterovirus
HAV RNA	HAV IgM positive sample	Clinical Services Unit, VRD, UK HSA, Colindale	Routinely sent to confirm
HBV sequencing	EDTA plasma	Clinical Services Unit, VRD, UK HSA, Colindale	On request if clinically indicated.
HCV RAS [Resistance]	EDTA plasma	Clinical Services Unit, VRD, UK HSA, Colindale	On request if clinically indicated.
HEV sequencing	EDTA plasma	Clinical Services Unit, VRD, UK HSA, Colindale	On request if clinically indicated.
HIV-1 proviral DNA resistance testing	2 - 5mL EDTA blood	Clinical Services Unit, VRD, UK HSA Colindale	On request with relevant clinical details.
HIV-1 antiretroviral resistance testing by phenotyping and virtual phenotyping	5mL EDTA blood	Clinical Services Unit, VRD, UK HSA Colindale	On request with relevant clinical details. Contact medical staff for advice. (Turnaround time: 4 weeks)
HIV-2 RNA	2 x 5mL EDTA blood CSF	HSL UCLH	On request with relevant clinical details. Contact medical staff for advice
HIV-2 RNA resistance	5mL clotted blood	UK HSA Birmingham	On request with relevant clinical details
HTLV proviral DNA	5mL EDTA blood	Clinical Services Unit, VRD, UK HSA Colindale	On request with relevant clinical details. Contact medical staff for advice
HIV-1 proviral DNA resistance testing	5mL EDTA blood	Clinical Services Unit, VRD, UK HSA Colindale	On request with relevant clinical details. Contact medical staff for advice
HSV antiviral resistance testing by genotyping	HSV DNA positive original sample	Clinical Services Unit, VRD, UK HSA, Colindale	On request if clinically indicated. Contact medical staff for advice
HSV antiviral resistance testing by phenotyping	HSV DNA positive original vesicle fluid / swab	Clinical Services Unit, VRD, UK HSA, Colindale	On request if clinically indicated. Isolation of HSV in cell culture is required. Contact medical staff for advice
Influenza typing	Influenza virus RNA positive original sample	Clinical Services Unit, VRD, UK HSA, Colindale	Routinely sent as part of national influenza surveillance

Test	Sample type	Reference Laboratory	Comments
Measles virus RNA	Mouth swab in VTM CSF For GP patients, saliva kit available from HPU 020 3049 4280	Micropathology Coventry	On request with relevant clinical details. Contact medical staff for advice
MERS CoV RNA	An upper respiratory tract sample (combined throat and nose viral swabs, or nasopharyngeal aspirate) AND if obtainable, a lower respiratory tract sample (sputum, or an endotracheal tube aspirate if intubated)	Hub virology followed by UK HSA Colindale for confirmation	On request with relevant clinical details. Contact medical staff for advice All results on MERS CoV are available the next day by 5 PM
Mpox virus DNA	Lesion swab in VTM [take 2 swabs as primary sample] Throat swab EDTA blood Serum Urine	One lesion swab is tested for HSV DNA, VZV DNA, and mpox DNA locally in Hub. One sample is sent to RIPL UKHSA Porton Down	On request with relevant clinical details. Contact medical staff for advice on non-lesion swab samples
Mumps virus RNA	Mouth swab in VTM CSF Urine Saliva kit available from Health Protection Unit: 020 3049 4280	Clinical Services Unit UK HSA Colindale Sample posted by GP patient to Clinical Services Unit, UK HSA Colindale. Within Kings, this test is available on EPIC BEAKER	On request with relevant clinical details. Contact medical staff for advice Sample posted by patient / clinical staff to Clinical Services Unit, Colindale
Parvovirus B19 DNA quantitative	5mL clotted blood	Clinical Services Unit UK HSA Colindale	On request with relevant clinical details. Contact medical staff for advice
Rubella virus RNA	5mL EDTA blood, mouth swab in VTM, urine, amniotic fluid	Micropathology, Coventry	On request with relevant clinical details. Contact medical staff for advice

Test	Sample type	Reference Laboratory	Comments
HBV DNA + HBV sequencing in Health Care Worker	5mL EDTA blood	Clinical Services Unit UK HSA Colindale	On request with relevant clinical details. Contact medical staff for advice
Rotavirus sequencing	Rotavirus RNA Positive samples	Clinical Services Unit, VRD, UK HSA, Colindale	Routinely sent as part of rotavirus surveillance to differentiate wild-type from vaccine-derived strains
SARS-CoV-2 sequencing	SARS-CoV-2 RNA positive [CT <30]	UK HSA Manchester	Routinely sent as per NHSE guidance

5.15 Virus serology

Test	Laboratory testing this	Clotted blood [YELLOW-topped]	Alternate samples	Schedule	Maximum TAT during working week
CMV IgG	Virology	5mL		Daily	2 days
CMV IgG avidity	Virology	5mL		Daily	2 days
CMV IgM	Virology	5mL		Daily	2 days
EBV VCA IgG	Virology	5mL		Daily	2 days
EBNA IgG	Virology	5mL		Daily	2 days
EBV VCA IgM	Virology	5mL		Daily	2 days
Hepatitis A virus IgG	Virology	5mL		Daily	3 days
Hepatitis A virus IgM	Virology	5mL		Daily	2 days
Hepatitis B core IgM	Virology	5mL		Daily	2 days
Hepatitis B core total antibody	Virology	5mL	DBS	Daily	2 days
Hepatitis B e antibody	Virology	5mL		Daily	2 days
Hepatitis B e antigen	Virology	5mL		Daily	2 days
Hepatitis B surface antibody	Virology	5mL		Daily	2 days
Hepatitis B surface antigen	Virology	5mL	DBS	Daily	2 days
HBsAg confirmation by neutralisation	Virology	5mL		Daily	2 days
HBsAg quantitation	Virology	5mL		Daily	2 days
Hepatitis C virus antibody	Virology	5mL	DBS	Daily	2 days
HDV IgM	Virology	5mL		Daily	2 days
HDV total antibodies	Virology	5mL		Daily	2 days
HEV IgG	Virology	5mL		Daily	2 days
HEV IgM	Virology	5mL		Daily	2 days
HHV-8 antibody	MSL, NHSBT	5mL		Weekly	14 days
HIV antibody - confirmation	Virology	5mL		Daily	2 days
HIV-1 and 2 antibody / antigen	Virology	5mL	DBS	Daily	2 days
HSV type specific IgG	Virology	5mL		Daily	2 days
HTLV 1 and 2 antibody	Virology	5mL		Daily	2 days
Measles virus IgG	Virology	5mL		Daily	2 days

Test	Laboratory testing this	Clotted blood [YELLOW-topped]	Alternate samples	Schedule	Maximum TAT during working week
Mumps virus IgG	Virology	5mL		Daily	2 days
Mumps virus IgM	UK HSA - Colindale	5mL		Daily	2 days
Parvovirus B19 IgM	Virology	5mL		Daily	2 days
Parvovirus B19 IgG	Virology	5mL		Daily	2 days
Rubella virus IgG	Virology	5mL		Daily	2 days
Rubella virus IgM	Virology	5mL		Daily	2 days
SARS-CoV-2 spike antibody	Virology	5mL		Daily	2 days
Varicella zoster virus IgG (quantitative assay)	Virology	5mL		Daily	2 days

One 5mL clotted blood [YELLOW-topped] sample is usually sufficient for multiple serology tests

5.16 Non-Virology serology tests performed in Virology.

Test	Laboratory testing this	Clotted blood [YELLOW-topped]	Alternate samples	Schedule	Maximum TAT during working week
Anti-Streptolysin O (ASO)	Virology	5mL		Daily	2 days
Borrelia (Lyme) Serology	Virology	5mL		Daily	2 days
	Virology	5mL		Daily	2 days
Treponemal Total Antibody (also Treponemal antibodies)	Virology	5mL	EDTA if transplant order	Daily	2 days
Treponemal RPR	Virology	5mL	EDTA if transplant order	Daily	2 days
Treponemal RPR for CSF (send away)	Virology		CSF	Daily	2 days
Toxoplasma Acute serology	Virology	5mL	EDTA if transplant order	Daily	3 days

5.17 Serology panel tests

For certain patient groups the following tests will be performed:

Requests	Tests Performed
Acute hepatitis (jaundice, raised / abnormal LFTs)	HAV IgM, HB surface antigen, HB core IgM, HCV antibody – routine. EBV VCA IgM, CMV IgM and HEV IgM – are optional.
Miscarriage / TORCH screen - Adult	CMV IgM, CMV IgG, Rubella virus IgM, Rubella virus IgG, Toxoplasma IgG, Toxoplasma IgM, Treponemal total antibodies (and CMV IgG avidity if IgG is positive)
TORCH screen - Neonatal	Treponemal total antibodies, CMV IgM, Rubella acute serology/ IgM (depends on age), Toxoplasma acute serology
Pregnancy screening (booking blood)	Treponemal antibody, HB surface antigen and HIV 1 and 2 antibodies (rubella virus IgG testing ceased being antenatal care routine test in April 2016)
Previous / past hepatitis	HAV IgG, HB core total antibody, HCV antibody
Viral screen before transplantation	HCV antibody, CMV IgG, EBV VCA IgG, treponemal total antibody, Toxoplasma IgG (+/- Toxoplasma IgM), HTLV 1 and 2 IgG, VZV IgG, HB surface antigen, HB core total antibody, HIV 1 and 2 antibody /antigen. In addition, HCV RNA and HEV RNA are offered whenever asked.

5.18 Virus serology and molecular referrals

Virus	Sample type	Laboratory method			Reference Laboratory	Comments
		IgM	IgG	RNA / DNA		
Dengue and other Flaviviruses including WNV	5mL clotted blood	√	√	√	RIPL, UK HSA, Porton Down	On request with relevant travel and clinical details. Contact medical staff for advice
Haemorrhagic fever viruses	5mL clotted blood	√	√	√	RIPL, UK HSA, Porton Down	Contact medical staff for advice
Hantaan virus	5mL clotted blood	√	√	√	RIPL, UK HSA, Porton Down	On request with relevant travel and clinical details. Contact medical staff for advice
HTLV antibody confirmation	5mL clotted blood	√	√		Clinical Services Unit, VRD, UK HSA Colindale	Virology medics code this
Measles virus IgG, IgM and RNA	5mL EDTA blood and CSF	√	√	√	Micropathology, Coventry	On request with relevant clinical details. Contact medical staff for advice
	Saliva swab in VTM GPs, please contact health protection team https://www.gov.uk/guidance/contacts-phe-health-protection-teams	√	√	√	Clinical Services Unit, UK HSA Colindale	
Mumps virus IgG, IgM and RNA	5mL clotted blood	√	√	√	Micropathology, Coventry	On request with relevant clinical details
	Saliva swab in VTM GPs, please contact health protection team https://www.gov.uk/guidance/contacts-phe-health-protection-teams	√	√	√	Clinical Services Unit, UK HSA Colindale	use
Polio	5mL clotted blood		√	√	Clinical Services Unit, UK HSA Colindale	On request with relevant clinical details

Virus	Sample type	Laboratory method			Reference Laboratory	Comments
		IgM	IgG	RNA / DNA		
Q-fever (C. burnetii)	5mL clotted blood	√	√	√	RIPL, UK HSA, Porton Down	Contact medical staff for advice. On request with relevant clinical details
Rabies	5mL clotted blood	√	√	√		
Rickettsial antibody (Spotted fever group and epidemic typhus group)	5mL clotted blood	√	√	√		
West Nile virus, Japanese encephalitis virus	5mL clotted blood	√	√	√		

5.19 Post-mortem samples:

Most post-mortem samples of tissues are sent to Micropathology in Coventry.

Respiratory samples from coroners are processed for respiratory viruses in the hub laboratory.

5.20 Antiviral assays

Test	Sample type	Reference Laboratory	Comments
Acyclovir plasma level Ganciclovir plasma levels	5mL clotted blood Label the specimen containers with time of previous dose.	Antimicrobial Reference Lab, Southmead Hospital, Bristol	On request. Contact medical staff for advice with relevant clinical details

5.21 Zika virus testing by referral.

Zika virus testing based on clinical situation	Collect samples	Reference Laboratory
Pregnant woman with current symptoms suggestive of Zika virus infection that began whilst in a country with active Zika virus transmission or within 2 weeks of leaving	Submit 2x blood samples (1x blood sample (YELLOW-topped container) 1x purple topped EDTA container) and 1 urine sample	RIPL, UK HSA Microbiology Services, Porton Down
Male and female with current symptoms or within 2 weeks of resolution of symptoms		
Male and female patients with past symptoms which have resolved beyond 2 weeks of date of collection	Submit 1 blood sample (1x blood sample (YELLOW-topped container) Submit urine if within 21 days of symptom onset	
Asymptomatic or never had symptoms	Samples sent to Virology for storage	NA

6. Specimen collection material and methods

In the absence of readily available VTM (laboratory issued or commercial), please immerse the swab tips in 1 mL of sterile saline in a universal container

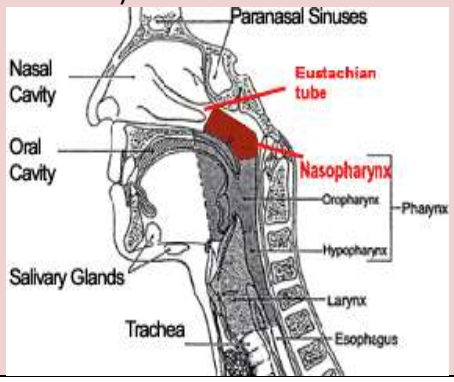
Sample	Material required		Methods
Aspirates from normally sterile sites (joint, ascites, peritoneal and pleural fluids)	Sterile syringe 15 mL or 30 mL sterile universal container		1. Collect the specimen with a sterile syringe. 2. Transfer a maximum of 15 mL into a sterile universal container. 3. Ensure the cap is tightly screwed on.
Biopsies	Biopsy equipment as appropriate 15 mL or 30 mL sterile universal container (not formalin)		1. All biopsies should be placed in sterile saline and not in formalin. 2. Contact medical virology staff for advice with relevant clinical details 3. Please clearly state the clinical diagnosis and the test needed.
Blood Serum	YELLOW topped container (adult and paediatric shown here) Please note that Yellow-topped blood is not for infection sciences	 Adult  Paediatric	1. Collect 5mL of blood in adults and at least 2 mL in children. 2. Serum is used for serological markers for IgG, IgM, total antibody and BBV antigen assays. 3. Heparinised blood (green topped) may cause non-specific reactions in some antigen / IgM assay and so is not recommended.
Blood Whole Blood	Purple / Mauve topped container (EDTA blood) (adult and paediatric shown here)	 Adult	1. Collect 5mL of blood in adults and at least 2 mL in children in one of these blood collection tubes. 2. EDTA whole blood is used to assess CMV DNA, EBV DNA, adenovirus DNA, HIV proviral DNA
Blood Plasma	Purple / Mauve topped container (EDTA blood) (adult and paediatric shown here)	 Paediatric	1. Collect 5mL of blood in adults and at least 2 mL in children in one of these blood collection tubes. 2. EDTA plasma is used to assess HIV RNA, HBV DNA, HCV RNA, HIV genotypic resistance testing, HHV 6 DNA and HHV 7 DNA testing.

Sample	Material required		Methods
Bronchial washings	Bronchial wash equipment (as per the specialist protocols) 15 mL or 30 mL sterile universal container		1. A specialist will collect the specimen in a sterile container according to local protocol. 2. Traps containing a specimen should be sealed by the permanent cap. 3. Please do not use the tubing cap itself to seal the tube (because this invariably leaks in transit).
Bronchoalveolar lavage	Bronchial lavage equipment (as per the specialist involved) 15 mL or 30 mL sterile universal container		1. A specialist will collect the specimen in a sterile container according to local protocol. 2. Traps containing a specimen should be sealed by the permanent cap. 3. Please do not use the tubing cap itself to seal the tube (because this invariably leaks in transit).
Cerebrospinal fluid (CSF)	Lumbar puncture equipment 15 mL or 30 mL sterile universal container		An adequate amount is essential - send at least 2-3mL.
Endocervical swabs for *Chlamydia trachomatis and Neisseria gonorrhoea*	*Please see Microbiology User Manual for details* APTIMA Unisex Swab for Endocervical and Male Urethral Swab specimens swab APTIMA swab specimen transport medium. 		1. Remove excess mucus from the Cervical Os and surrounding mucosa using the cleaning swab (white shaft swab in the package with red printing). Discard this swab. Note: To remove excess mucus from the cervical Os, a large-tipped swab may be used. 2. Insert the specimen collection swab (blue shaft swab in the package 3. Gently rotate the swab clockwise for 10 to 30 seconds in the endocervical canal to ensure adequate sampling. 4. Withdraw the swab carefully; avoid any contact with the vaginal mucosa. 5. Remove the cap from the swab specimen transport tube and immediately place the specimen collection swab into the transport tube. 6. Carefully break the swab shaft against the side of the tube at the score line and discard the top portion of the swab shaft; use care to avoid splashing of contents. 7. Re-cap the swab specimen transport tube tightly.

Sample	Material required	Methods
Cervical swabs *for viruses* *(not for human papillomaviruses)*	Copan FLOQSwab (flocked swabs) in UTM (red-topped) or Virocult swab in VTM (green-topped)  	1. Moisten the swab in sterile saline before taking the specimen. 2. Never moisten swab in VTM. 3. Follow procedures as for the Endocervical swab for CT & GC. 4. Snap off the swab tip into VTM.
Dried Blood Spot (DBS)	BD Microtainer®Contact Activated Lancet DBS sample collection card (Whatman card) 	1. After cleansing chosen finger, activate the BD Microtainer®Contact Activated Lancet by pressing it firmly against the puncture site 2. Apply the hanging blood drops within an outlined circle of the DBS sample collection card (Whatman card) 3. Place the DBS collection card on the drying rack to dry completely before sending it to the laboratory.
Ear swab in VTM (vesicles or part of Bell's palsy investigation)	Copan FLOQSwab (flocked swabs) in UTM (red-topped) or Virocult swab in VTM (green-topped)  	1. Place the swab in the ear canal over any vesicle. Rotate gently over the vesicles / ulcers. Place the swab in VTM.
Eye swab for *Chlamydia trachomatis*:	*Please see Microbiology User Manual for details*	
Eye swab in VTM for *viruses*:	Copan FLOQSwab (flocked swabs) in UTM (red-topped) or Virocult swab in VTM (green-topped)  	Moisten the swab in sterile saline before taking the specimen. Never moisten swab in VTM. Snap off the swab tip into VTM.

Sample	Material required	Methods
Faeces Rectal swab in VTM	Spatula 15 mL or 30 mL sterile universal container or sterile container with built in spatula 	1. Send a 2-3 pea-sized portion" or 5-10mL if liquid faeces. 2. Ask the patient to defecate into a clean bedpan or other convenient container if at home. Use the plastic spatula to transfer a portion of faeces into the pot. If spatula is part of the lid, insert the spatula and close the lid. 3. For liquid faeces use a plastic medicine spoon. 4. Rectal swab in VTM is also accepted 5. Take care not to contaminate the outside of the faeces pot.
Genital tract swabs *for Chlamydia trachomatis and Neisseria gonorrhoae*	*Please see Microbiology User Manual for details* APTIMA Unisex Swab for Endocervical and Male Urethral Swab specimens swab (these are thin swabs) APTIMA swab specimen transport medium. 	The aim is to collect epithelial cells and assess nucleic acid by APTIMA (TMA). Scrape from the endothelium and place the swab in APTIMA collection tube, snip off the shaft and screw the cap on
Genital tract swabs in VTM *for viruses*	Copan FLOQSwab (flocked swabs) in UTM (red-topped) or Virocult swab in VTM (green-topped)  	Moisten the swab in sterile saline before taking the specimen. Never moisten swab in VTM. Snap off the swab tip into VTM.

Sample	Material required	Methods
High vaginal swabs for *Chlamydia trachomatis and Neisseria gonorrhoae*	*Please see Microbiology User Manual for details* APTIMA Multi-test swab and APTIMA swab specimen transport medium. 	Introduce the speculum. Roll the swab firmly over the surface of the vaginal vault. Place the swab in APTIMA swab specimen transport medium.
High vaginal swabs in VTM *for viruses*	Copan FLOQSwab (flocked swabs) in UTM (red-topped) or Virocult swab in VTM (green-topped)  	Introduce the speculum. Roll the swab firmly over the surface of the vaginal vault. Place the swab in VTM.
Mouth swabs in VTM	Copan FLOQSwab (flocked swabs) in UTM (red-topped) or Virocult swab in VTM (green-topped)  	For HSV, enterovirus and VZV within any vesicle lesions or ulcers or inflamed areas – swab the ulcer or vesicle For measles, mumps and rubella – ensure the swab is soaked in saliva [see saliva in VTM below] A tongue depressor or spatula may be helpful to aid vision and avoid contamination from other parts of the mouth. Place the swab in the VTM.

Sample	Material required	Methods
Respiratory **Nasopharyngeal Swab (NPS)** A NPS is the optimal upper respiratory tract specimen collection method. However, such specimens cannot be collected from infants and many older patients may not allow an NP specimen to be collected.	Copan FLOQSwab (flocked swabs) in UTM (red-topped) or Virocult swab in VTM (green-topped)   Virus PCR Sample Solution (VPSS)	1. Tilt patient's head back 70 degrees. 2. Insert swab into nostril 3. Swab should reach depth equal to distance from nostrils to outer opening of the ear. 4. Leave swab in place for several seconds to absorb secretions. 5. Slowly remove swab while rotating it. (Swab both nostrils with same swab.) 6. Place tip of swab into sterile viral transport media tube and snap/cut off the applicator stick.
Respiratory **Nasopharyngeal Aspirate (NPA) or Nasal Aspirate** Note: NPA may not be possible to conduct in infants	Suction pump, sterile suction catheter (usually size 10, smaller for infants) 15 mL or 30 mL sterile universal container Traps containing a specimen should be sealed using a loop of tubing  	1. Attach catheter to suction apparatus. 2. Tilt patient's head back 70 degrees. 3. Insert catheter into nostril. Catheter should reach depth equal to distance from nostrils to outer opening of ear. Stop when you feel a resistance (you have reached the posterior nasopharynx). 4. Begin gentle suction. 5. Catheter should remain in nasopharynx no longer than 10 seconds. Remove catheter while rotating it gently. 6. Traps containing a specimen should be sealed by the permanent cap. Please do not use the tubing cap itself to seal the tube (because this invariably leaks in transit). 

Sample	Material required	Methods
Respiratory **Nasopharyngeal Wash or Nasal Wash** Note: NP wash may not be possible to conduct in infants	Sterile suction catheter/suction apparatus Sterile normal saline 15 mL or 30 mL sterile universal container 	1. Attach catheter to suction apparatus. 2. Tilt patient's head back 70 degrees. 3. Insert several drops of sterile normal saline into each nostril. 4. Insert catheter into nostril. (Catheter should reach depth equal to distance from nostrils to outer opening of ear.) 5. Begin gentle suction. 6. Remove catheter while rotating it gently. 7. Place catheter in sterile viral transport media tube or sterile universal container.
Respiratory **Deep Nasal Swab in VTM**	Sterile polyester swab (aluminium or plastic shaft preferred) or Copan FLOQSwab (flocked swabs) in UTM (red-topped) or Virocult swab in VTM (green-topped)   Virus PCR Sample Solution (VPSS)	1. Tilt patient's head back 70 degrees. 2. While gently rotating the swab, insert swab less than one inch into nostril (until resistance is met at turbinates). 3. Rotate the swab several times against nasal wall and repeat in other nostril using the same swab. 4. Place tip of the swab into sterile viral transport media tube and cut off the applicator stick.
Respiratory **Combined Nasal & Throat Swab in VTM** This is the preferred respiratory sampling in URTI	Copan FLOQSwab (flocked swabs) in UTM (red-topped) or Virocult swab in VTM (green-topped)   Virus PCR Sample Solution (VPSS)	**Nasals swab:** 1. Tilt patient's head back 70 degrees. 2. Take a dry swab, insert into mouth, and swab the posterior pharynx and tonsillar areas (avoid the tongue). 3. Use the same swab and insert it less than one inch into nostril (anterior nares) until resistance is met at turbinates 4. Rotate the swab several times against nasal wall and repeat in other nostril using the same swab. 5. Place tip of the swab into sterile viral transport media tube and cut off the applicator stick.

Sample	Material required	Methods
VirNA Combined Nasal & Throat Swab for SARS CoV-2 RNA testing		Full sampling and labelling instruction provided in the leaflet provided with the kit
Saliva in VTM (for measles, mumps and rubella virus RNA)	Copan FLOQSwab (flocked swabs) in UTM (red-topped) or Virocult swab in VTM (green-topped)  	1. The saliva specimen is obtained by rubbing the swab on the inside of the mouth like a toothbrush until the swab is saturated with saliva. 2. It takes 1 to 2 minutes for the swab to be saturated. 3. The swab is then inserted into the red tube provided.
Saliva in Oracol (for measles, mumps and rubella virus RNA)	If available, Malvern Oracol saliva testing kit 	1. The saliva specimen is obtained by rubbing the sponge which is on a stick (Oracol Saliva Collection System; Malvern Medical Developments Limited) on the inside of the mouth like a toothbrush until the sponge is saturated with saliva. 2. It takes 1 to 2 minutes for the sponge to be saturated. 3. The sponge is then inserted into the plastic tube provided.
Serum	YELLOW-topped container for adults  Adult  Paediatric	Collect 5mL of blood in adults and at least 2 mL in children. Serum is used for serological markers for IgG, IgM, total antibody and some BBV antigen assays. Heparinised blood (green topped) may cause non-specific reactions in some antigen / IgM assay and so is not recommended.

Sample	Material required	Methods
Sputum	15 mL or 30 mL sterile universal container 	1. Ask a physiotherapist to assist if a patient has difficulty in producing satisfactory specimens. 2. Induced sputum or expectorated sputum can be used for virological assessment. 3. Do not collect shortly after the patient has been eating, drinking or cleaning their teeth. 4. It is usually difficult to perform respiratory PCRs on this sample.
Surface swabs and skin swabs	Copan FLOQSwab (flocked swabs) in UTM (red-topped) or Virocult swab in VTM (green-topped)  	Swab the area of concern vigorously. Send swab in VTM Rotate the swab on or in the required site. Place the swab in the VTM.
Tissues and biopsies	Sterile saline. 15 mL or 30 mL sterile universal container	Under aseptic conditions transfer material to a sterile universal container that does not contain formalin as this inactivates pathogens very rapidly. Send in 0.5mL of sterile saline. Please specify which virus is being investigated for virology.
Urethral swabs *Chlamydia trachomatis* and *Neisseria gonorrhoea*:	*Please see Microbiology User Manual for details* APTIMA Unisex Swab for Endocervical and Male Urethral Swab specimens swab APTIMA swab specimen transport medium. 	1. Male urethral swab 2. The patient should not have urinated for at least 1 hour prior to sample collection. 3. Insert the specimen collection swab (blue shaft swab in the package with the green printing) 2 to 4 cm into the urethra. 4. Gently rotate the swab clockwise for 2 to 3 seconds in the urethra to ensure adequate sampling. 4. Withdraw the swab carefully. 5. Remove the cap from the swab specimen transport tube and immediately place the specimen collection swab into the transport tube. 6. Carefully break the swab shaft against the side of the tube at the score line and discard the top portion of the swab shaft; use care to avoid splashing of contents. 7. Re-cap the swab specimen transport tube tightly.

Sample	Material required	Methods
Urine Clean-voided midstream urine is preferred for virology.	15 mL or 30 mL sterile universal container 	1. It is recommended that in females the hands and the perineal area should be 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. 2. In males retract the foreskin, if present, and clean the skin surrounding the urethral meatus. 3. Start passing urine into the toilet, bedpan or urinal. When the urine is flowing freely, collect urine in a clean sterile container. 4. Special urine collection pouches are needed for collection in paediatric patients.
First catch urine for *Chlamydia trachomatis* and *Neisseria gonorrhoea* (not for female *Neisseria gonorrhoea* testing)	APTIMA Urine Specimen Collection Kit 	1. The patient should not have urinated for at least 1 hour prior to specimen collection. 2. Direct patient to provide a first-catch urine (approximately 20 to 30 mL of the initial urine stream) into a urine collection cup free of any preservatives. Collection of larger volumes of urine may result in rRNA target dilution that may reduce test sensitivity. Female patients should not cleanse the labial area prior to providing the specimen. 3. Remove the cap and transfer 2 mL of urine into the urine specimen transport tube using the disposable pipette provided. The correct volume of urine has been added when the fluid level is between the black fill lines on the urine specimen transport tube label. 4. Re-cap the urine specimen transport tube tightly.
Vesicles, ulcers and genital lesions in VTM	Copan FLOQSwab (flocked swabs) in UTM (red-topped) or Virocult swab in VTM (green-topped)  	1. Method 2. Burst a vesicle using a sterile needle and collect with a swab or aspirate the fluid contents of the vesicle. 3. Alternatively, scrape the base of the vesicle or ulcer with a swab so that cellular material is collected. Inoculate this fluid / cellular material into VTM. 4. Always state the site, distribution and nature of the vesicle. This is essential, as the laboratory may need to prioritise between HSV / VZV and enterovirus testing.

7. External Quality Assurance (EQA) scheme participation

Process / Test	EQA Schemes
Adenovirus DNA quantitative	QCMD
Arbovirus serology and molecular	Referred sample
Antistreptolysin-O titre (ASO)	NEQAS & LABQUALITY
Avian influenza A virus H5N1	Referred sample
BK virus DNA	QCMD
CFT for Chlamydia genus, *M. pneumoniae*, *C. burnetii*	LABQUALITY
Chlamydia trachomatis NAAT/ Neisseria gonorrhoea DNA	NEQAS
Cytomegalovirus DNA	QCMD
Cytomegalovirus IgG	NEQAS
Cytomegalovirus IgG avidity	NEQAS
Cytomegalovirus IgM	NEQAS
Cytomegalovirus resistance testing	Referred sample
Dried Blood Spot (DBS) tests for HIV antibody, HBsAg, HB core total antibody, HCV antibody and HCV RNA	No external scheme available
Epstein Barr virus DNA	QCMD & NEQAS
Epstein Barr virus VCA IgG	NEQAS
Epstein Barr virus VCA IgM	NEQAS
Epstein Barr virus VCA IgG (Avidity)	Sample Exchange with GSTT
Electron microscopy	Referred sample
Enterovirus RNA	QCMD
HB core IgM	NEQAS
HB core total antibody	NEQAS
HBeAg	NEQAS
HBeAg	NEQAS
HBV DNA	QCMD
HBV e antibody	NEQAS
Hepatitis B surface antibody level	NEQAS
HBV resistance testing	QCMD
HDV antibody (IgG and IgM)	Referred sample
Hepatitis A virus IgM	NEQAS
Hepatitis A virus RNA	Referred sample

Process / Test	EQA Schemes
Hepatitis A virus total	NEQAS
Hepatitis C virus antibody	NEQAS
Hepatitis C virus RNA	QCMD
HEV antibody (IgG and IgM)	NEQAS
HEV RNA	QCMD
HHV 6 DNA	QCMD
HHV 7 DNA	QCMD
HHV 8 DNA	QCMD
HIV antibody	NEQAS
HIV immunoblot (HIV Line Immunoblot Assay)	NEQAS
HIV-1 p24 antigen	NEQAS
HIV-1 genotypic resistance testing RT, Protease and Integrase	QCMD & UK HSA Colindale panel
HIV-2 genotypic resistance testing	Referred sample
HIV-1 RNA	VQA and NEQAS
HIV-2 RNA	Referred sample
HIV-1 proviral DNA	Referred sample
HIV-1 phenotypic resistance testing	Referred sample
HIV-1 CCR5 Tropism assay	QCMD & UK HSA Colindale panel
HIV-2 integrase inhibitor resistance assay	Referred sample
HSV 1 and 2 DNA	QCMD
HSV IgG	LABQUALITY
HSV IgG type specific serology	Referred sample
HTLV antibody	NEQAS
HTLV proviral DNA	Referred sample
HTLV immunoblot	Referred sample
Influenza A virus RNA (see Respiratory virus RNA / DNA below)	See below
JC virus DNA	QCMD
JC virus HI	Referred sample
Measles IgG	NEQAS
Measles IgM	Referred sample
Measles RNA	Referred sample
Microbiology Send Always (like Lyme serology, schistosomiasis etc.)	Referred sample
Mumps IgG	NEQAS
Mumps IgM	Referred sample
Mumps RNA	Referred sample
Viral Gastroenteritis	QCMD
Parvovirus B19 DNA	QCMD
Parvovirus B19 IgG	NEQAS & LABQUALITY
Parvovirus B19 IgM	NEQAS &LABQAULITY

Respiratory viral RNA / DNA	QCMD & NEQAS UK HSA Colindale panel

Process / Test	EQA Schemes
SARS-CoV-2 RNA	QCMD and NEQAS
Rheumatoid Factor (RF)	NEQAS
Rotavirus RNA	QCMD
Rubella virus IgG	NEQAS
Rubella virus IgG avidity	Referred sample
Rubella virus IgM	NEQAS
Rubella virus RNA	Referred sample
Toxoplasma dye test	Referred sample
Toxoplasma IgG	NEQAS
Treponemal antibody	NEQAS
Treponemal IgM	NEQAS
Treponemal RPR	NEQAS
Virus isolation	QCMD & NEQAS
Varicella zoster virus DNA	QCMD
Varicella zoster virus IgG	NEQAS