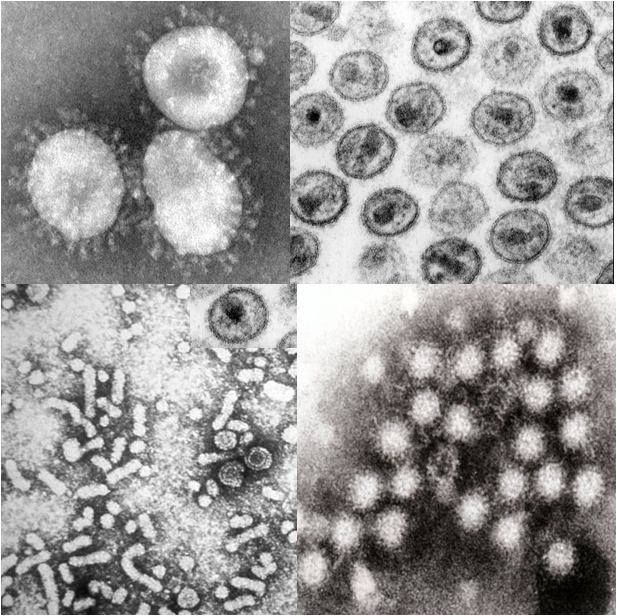


**NHS Greater Glasgow & Clyde**

**West of Scotland Specialist Virology centre**



**User manual**



**Version 13, March 2019, Q-pulse** **MAN-Q-037**

West of Scotland Specialist Virology Centre User manual, Q-pulse document MAN-Q-037 version 13

Document prepared by Dr Samantha Shepherd and Ms Sally Taylor on behalf of the West of Scotland Specialist Virology Clinical Group

Authorised by Dr Rory Gunson, Consultant Clinical Scientist and Virology Clinical Lead/Laboratory director

Pictures on the front: coronavirus (<https://en.wikipedia.org/wiki/Coronavirus#/media/File:Coronaviruses_004_lores.jpg>), HIV (<https://emedicine.medscape.com/article/211316-overview>), norovirus (<https://www.norovirus.com/wp-content/uploads/2014/06/norovirus-e1403938112285.jpg>) and HBV (<https://upload.wikimedia.org/wikipedia/commons/1/12/Hepatitis-B_virions.jpg>)

**Table of Contents**

|  |  |
| --- | --- |
| **Content** | **Page** |
| **West of Scotland Specialist Virology Centre introduction** | **4** |
| **Laboratory location** | **5** |
| **Laboratory delivery details** | **6** |
| **Working hours** | **7** |
| **Contact details** | **7** |
| **Urgent and on-call requests** | **7** |
| **Staff contacts – main laboratory staff** | **8** |
| **Staff contacts – senior clinical team** | **9** |
| **Request forms and specimen criteria** | **10** |
| **How to transport specimens to the laboratory** | **11** |
| **Specimen containers accepted at WoSSVC** | **13** |
| **Symptoms and specimens used for diagnosis** | **16** |
| **Investigations available at WoSSVC and turnaround times** | **22** |
| **User access to results** | **28** |
| **Requesting additional tests** | **28** |
| **Retention of specimens** | **29** |
| **Laboratory policy on protection of personal information** | **29** |
| **Feedback** | **29** |
| **Quality assurance and variability** | **30** |
| **Kits supplied by the laboratory** | **31** |
| **Referral to reference laboratories** | **32** |

**West of Scotland Specialist Virology Centre**

**The West of Scotland Specialist Virology Centre (WoSSVC) forms part of the acute division service within NHS Greater Glasgow and Clyde (NHS GGC).**

**The WoSSVC provides virology services (diagnostic, clinical, educational) for the whole of the Greater Glasgow region. We are also a referral laboratory for the west of Scotland and for regions out with the west of Scotland.**

**The West of Scotland Specialist Virology Centre is UKAS accredited to ISO 15189:2012 - Reference number 9319**

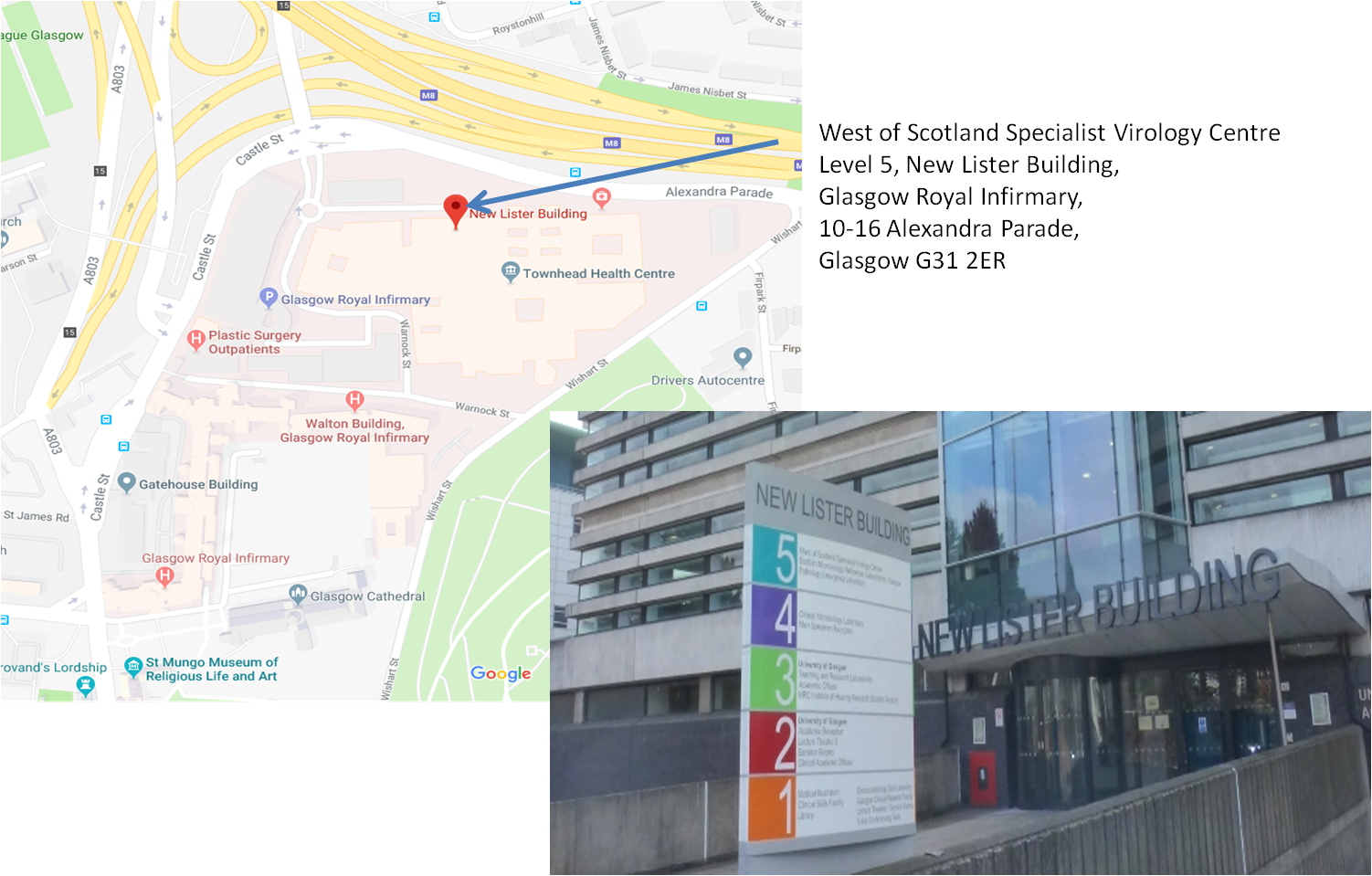
**We have extensive experience in the diagnosis of viral pathogens using a range of commercial and in-house serological and molecular based assays. We have a high throughput serological laboratory offering tests on both BBV and non-BBV pathogens. We also offer serological diagnosis on syphilis. We are one of only two laboratories in Scotland to offer HIV avidity testing. Molecular testing can be performed on respiratory specimens, blood, stool and CSF. We offer *Bordetella pertussis*, *Mycoplasma pneumoniae* and *Aspergillus fumigatus* diagnosis through real-time PCR. We also provide BBV testing of dried blood spots for community addiction teams, prison service and pharmacies.**

**National laboratory responsibilities:**

* **National Respiratory Virus Screening service**
  + **Annual surveillance of respiratory viruses, influenza typing and resistance testing**
* **Specialist Blood Borne Virus testing service for the West and North of Scotland**
  + **HIV resistance testing and subtyping**
  + **HBV resistance testing**
  + **HCV genotyping and resistance testing**
  + **HDV quantitative real-time PCR**
* **Avian Influenza and Middle East Respiratory Syndrome (MERS) coronavirus national testing centre for Scotland (except Lothian, Borders and Fife)**
  + **24/7 testing service available**
* **Designated laboratory (in conjunction with PHE Birmingham) for confirmation of HBV DNA viral loads in healthcare workers who perform exposure prone procedures**

**Laboratory location**

The West of Scotland Specialist Virology Centre is located on Level 5 of the New Lister Building which is located on Alexandra Parade and forms part of the Glasgow Royal Infirmary complex. We share the 5th floor with the Scottish Microbiology Reference Laboratory.



**Laboratory delivery details**

Virology Reception (Level 5)

New Lister Building,

Glasgow Royal Infirmary

10-16 Alexandra Parade

Glasgow G31 2ER

Main Reception (Level 4)

New Lister Building,

Glasgow Royal Infirmary

10-16 Alexandra Parade

Glasgow G31 2ER

DX Address: West of Scotland Specialist Virology Centre

DX number:6491304, DX exchange: Glasgow 94G

Glasgow Royal Infirmary POD system number: 0605

**Urgent samples out-of hours address**

(Do not send to this address unless discussed with on-call staff).

Deliver specimen to the black box marked “microbiology and virology urgent samples drop box” which can be found in the door way of the:

Princess Royal Maternity (Emergency Entrance & drop-off)

Glasgow Royal Infirmary

Wishart Street

Glasgow G31 2HT

**Glasgow G31 2HT**



**Working hours**

Routine Opening hours

Monday to Friday: 0845 – 17:00

Saturday: 09:00 – 14:00

Sunday: 10:00 – 14:00

The laboratory offers an on-call service out with working hours/public holidays (see contact details below)

**Contact details**

Routine Opening times

General phone enquires and results: 0141 201 8722 (internal 38722)

Clinical advice and urgent testing: 0141 201 8721 (internal 38721) alternatively email [west.ssvc@nhs.net](mailto:west.ssvc@nhs.net) (we aim to respond to your email within 1 hour)

To add on tests please email [west.ssvc@nhs.net](mailto:west.ssvc@nhs.net) with clinical details and tests required

Results are available on clinical portal, SCI Store and TrakCare for GGC patients provided a patient CHI has been provided.

Out-of hours (after 5pm Monday – Friday / weekends / public holidays)

Out-of hours and weekends please contact the on-call service via the GRI switchboard (0141 211 4000)

Clinical advice (after 5pm Monday – Friday and weekends) is via the switchboard (0141 211 4000), this is a consultant lead service

Transplant co-ordinator should contact the on-call technical staff via the switchboard (0141 211 4000)

**Urgent and on-call requests**

A limited range of laboratory tests are available outside normal working hours, contact GRI switchboard (0141 211 4000) and ask to speak to the on-call virologist. Organ donor screening can be arranged directly with the duty Biomedical Scientist via the GRI switchboard (0141 211 4000).

**Staff contacts – key laboratory staff**

Mr Stephen Hughes HNC, HND, BA, FIBMS

Technical Services Manager email: [Stephen.Hughes@ggc.scot.nhs.uk](mailto:Stephen.Hughes@ggc.scot.nhs.uk)

Telephone: 0141 201 8744

Ms Ann Hawthorn BSc, PGdip, MSc

Site Lead email: [Ann.Hawthorn@ggc.scot.nhs.uk](mailto:Ann.Hawthorn@ggc.scot.nhs.uk)

Telephone: 0141 201 8738

Ms Jane McOwan BSc(Hon), FIBMS

Integrated Systems Manager email: [Jane.McOwan@ggc.scot.nhs.uk](mailto:Jane.McOwan@ggc.scot.nhs.uk)

Telephone: 0141 201 8739

Ms Christine Ritchie

Office manager email: [Christine.Ritchie@ggc.scot.nhs.uk](mailto:Christine.Ritchie@ggc.scot.nhs.uk)

Telephone: 0141 201 8725

**Staff contacts – senior clinical team**

Dr Rory Gunson BSc, MSc, PhD, FRCPath

Consultant Clinical Scientist email: [Rory.Gunson@ggc.scot.nhs.uk](mailto:Rory.Gunson@ggc.scot.nhs.uk)

Clinical Lead Telephone: 0141 201 8737

Laboratory director

Head of Molecular Development and Specialist Typing

Dr Eleri Wilson-Davies MBBS, MSc, FRCPath

Consultant Medical Virologist email: [Eleri.Davies@ggc.scot.nhs.uk](mailto:Eleri.Davies@ggc.scot.nhs.uk)

Telephone: 0141 201 8736

Dr Celia Jackson MBChB, MRCP, FRCPath

Consultant Infectious Disease email: [Celia.Jackson@ggc.scot.nhs.uk](mailto:Celia.Jackson@ggc.scot.nhs.uk)

& Virology Telephone: 0141 201 8739

Dr Samantha Shepherd BSc(Hon), MSc, PhD, FRCPath

Consultant Clinical Scientist email: [Samantha.Shepherd@ggc.scot.nhs.uk](mailto:Samantha.Shepherd@ggc.scot.nhs.uk)

Telephone: 0141 201 8734

**Request forms and specimen criteria**

Please note NHSGGC request forms are now produced by TrakCare, please refer to the website for further information on how to fill out TrakCare requests: <http://www.nhsggc.org.uk/virology>

The following request forms are available from the website (<http://www.nhsggc.org.uk/virology>):

* Manual WoSSVC generic request form
* WoSSVC Dried blood spot request form
* Hepatitis B DNA testing for healthcare workers (HCW) involved in exposure prone procedures (EPP)

**Specimen essential information**

Full name or unique coded identifier

Date of Birth and or CHI (Community Health Index) number

**Request form essential information**

Full name or unique coded identifier

Date of Birth and or CHI (Community Health Index) number

Investigation(s) required

Clearly marked clinical details (specimens will be stored if NO clinical details given)

Laboratory statement to users:

The laboratory aims to test all specimens within designated turn-around-times. In order for this to occur and the correct investigations to be chosen, we ask that all users fill out the required information clearly on the request forms and that the correct patient identifiers are present on both the specimen and the request form. We ask that specimens are packaged appropriately and are correctly sealed to prevent leakage in transit. For urgent testing please contact the laboratory in advance to arrange when a result can be available.

**How to transport samples to the laboratory**

NHSGGC GP collection service, interlab vans and couriers all deliver to the laboratory from: Queen Elizabeth University Hospital, Gartnavel General Hospital, Royal Alexandra Hospital, Inverclyde Royal Hospital, Sandyford Initiative, Monklands Hospital, Wishaw General Hospital, Hairmyres, Crosshouse and Dumfries & Galloway Royal Infirmary,

Specimens also arrive at the laboratory via Royal Mail post or DX collection (DX number 6491304, DX exchange Glasgow 94G).

Glasgow Royal Infirmary wards can send specimens via the POD system, number 0605

Specimens taken out with working hours of the laboratory should be kept in the fridge at 4oC and sent to the laboratory on the following day.

Delivery address for the laboratory can be found on page 5-6 of this manual

All specimens should be packaged according to national and international regulations. Specimens are classified as Category A or Category B according to the micro-organisms they contain (or be reasonably expected to contain).

**How to transport samples to the laboratory**

Please refer to:

NHSGGC Transport and disposal of specimen containers and specimens policy:<http://www.staffnet.ggc.scot.nhs.uk/Acute/Diagnostics/All%20Laboratory%20Medicine/Mortuary%20Services/SGPathology/Documents/Trans%20of%20Specimen%20Policy%20Oct%2016%20final.pdf>

Transport of specimens guideline: <http://www.nhsggc.org.uk/media/236255/guidance-transport-of-specimens.pdf>

WHO guidance on regulations for the transport of infectious substances 2013-2014: <http://www.nhsggc.org.uk/media/236255/guidance-transport-of-specimens.pdf>

Instructions for DX packaging should be followed, refer to [www.thedx.co.uk](http://www.thedx.co.uk)

Urgent sending of Middle East Respiratory Syndrome (MERs) coronavirus (CoV): **Please contact the clinical team (0141 201 8721) before sending the samples.**  Urgent out of hours Mers-CoV testing please contact the switchboard (0141 211 4000) and ask to speak to the on-call virologist before sending any samples. There are UN3373 boxes marked specifically for MERS-CoV in various locations around NHSGGC which can fit in the laboratory out-of-hours urgent testing box. Further information can be found at:<http://www.nhsggc.org.uk/your-health/infection-prevention-and-control/mers-cov-information-hub/>

**Specimen containers accepted at WoSSVC**

**Swabs ( for CT/NG testing please see page 15)**

Swabs should be used in conjunction with Viral PCR Sample Solution (VPSS), which is available from the laboratory (see page 31). After the swab is taken it should be expressed on the side of the vial and discarded. The cap should be replaced tightly prior to being sent to the laboratory. **Ensure the swab is NOT left in the sample container or the sample will NOT be tested.** We prefer flocked swabs, if these are not available other sample types can be used, if unsure please contact the laboratory.



These swabs can be used in the following areas: Throat, nasal, eye, vesicle, ulcer, mouth and rectal.

Please place swabs into VPSS wherever possible, if you are unable to obtain VPSS prior to sending the sample then the laboratory will accept charcoal and amies swabs.

**White top universal (sterile) containers**

Universal containers can be used for CSF, urine, gargles, sputum, bronchoalveolar lavage (BAL), aqueous humor, corneal scrapings, amniotic fluid, vomit, biopsy and post mortem tissue.



DO NOT send Boric acid containers with urine samples; these will be discarded by the laboratory.

Stool specimens can be sent in a white top universal; alternatively we accept stool sample pot containers (see below).



**Specimen containers accepted at WoSSVC**

**Endotracheal secretions**

Please ensure that the tubing has been removed from the specimen collection device and the lid has been firmly capped and fitted to prevent leakage. If the tubing is left in, the specimen will leak and the laboratory will discard the specimen.

**Nasopharyngeal aspirates**

Collect and send in the trap, make sure secure to prevent leakage

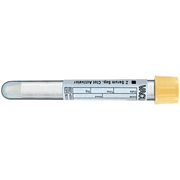
**Blood samples**

Most assays in our laboratory (both serological and molecular) use an EDTA blood.

Please send a single 9ml EDTA blood tube (5ml if paediatric or difficult to bleed, please note that this may be insufficient if confirmatory testing is required on the specimen).

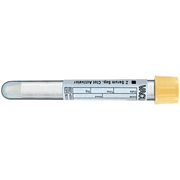


Clotted blood can also be sent to the laboratory as an alternative , if EDTA blood tubes are not available. Clotted blood is also required for by some reference laboratories when a specimen needs to be sent away.



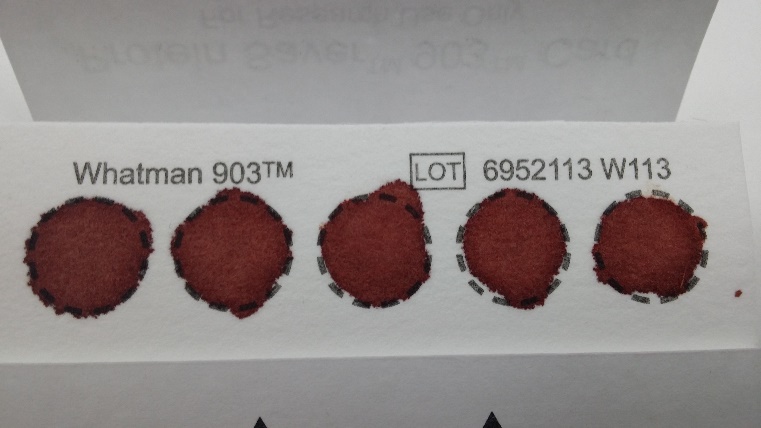
**Procalcetonin testing**

This is a consultant led request and is not availa ble in TrackCare or GPice. Same day testing is avaible if the samples arrive by 3pm (Monday-Friday) and by 12pm (weekends). Clotted blood or lithium heparin plasma ONLY should be sent.



**Dried blood spot**

The DBS sample is an alternative method of screening for HIV, HCV and HBV. Please ensure that all five spots on the card are fully saturated up to the dotted lines both on the front and back of the card. Insufficient saturated sample will result in the card being discarded.



**Specimen containers accepted at WoSSVC**

**Abbott multi-collect specimen collection kit for Chlamydia trachomatis/Neisseria gonorrheae PCR ONLY**

Please make sure the swab remains within the container (only specimen sent to WoSSVC where this should happen)\*.



Please follow the manufacturer’s instructions provided with the kit, this is a commercial assay and therefore all manufacturers’ guidelines on the appropriate way to take these samples should be followed.

Female: Vaginal swab (self-collected and clinician-collected)

Rectal swab\*

Pharyngeal swab

DO NOT SENT URINE for WOMEN

Male: Urine – **MUST BE SENT IN THE ABBOTT COLLECTION TUBE**

Rectal swab\*

Pharyngeal swab

**\*The rectal swabs should be removed from the Abbott multi-collection tube**

**QuantiFERON-TB Gold Plus Tubes:**

The following tubes should be used:

1. QuantiFERON Nil Tubes (gray cap with white ring)

2. QuantiFERON TB1 Tubes (green cap with white ring)



3. QuantiFERON TB2 Tubes (yellow cap with white ring)

4. QuantiFERON Mitogen Tubes (purple cap with white ring)

Each patient MUST have one of each tube type with the correct volume of blood present in each tube

TB Quantiferon Gold Plus tubes are ordered from the users’ local Microbiology department

Immediately after filling the tubes, invert them ten times just firmly enough to ensure that the entire inner surface of the tube is coated with blood, to dissolve antigens on tube walls. Once filled the blood tubes are required to reach the laboratory within 16hrs post collection.

Samples may arrive at the laboratory Monday to Friday up to 5pm.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  | **Symptoms and specimens used for diagnosis** |  | **Specimens for testing**  **Please see pages 21 – 26 for the full range of tests available at WoSSVC and turn-around times** | | | | | | | | | | | | | | | |
| **System involved/**  **clinical group** | **Clinical features** | **Common pathogens** | **Mouth swab / buccal swab** | **Throat swab** | **Gargle** | **NPA** | **Sputum / Induced sputum** | **ETA** | **BAL** | **CSF** | **Eye (swab), aqueous humor, corneal scrapings** | **DBS** | **EDTA** | **Clotted blood** | **Stool** | **Urine** | **Skin / vesicle swab** | **Biopsy** |
| **Respiratory** | URTI/LRTI  (Adults & outpatient paediatrics) | Influenza (A&B), adenovirus, RSV, *Mycoplasma pneumoniae* |  | Any respiratory specimen  (one is enough) | | | | | |  |  |  |  |  |  |  |  |  |
| URTI/LRTI  (Patients in ICU, critical care, immunocompromised or in-patient paediatrics) | Influenza (A&B), adenovirus, RSV, parainfluenza 1-4, coronavirus, rhinovirus/enterovirus human metapneumovirus, *Mycoplasma pneumonia*  Babies < 8 weeks test for *Chlamydia trachomatis* if clinically requested |  | Any respiratory specimen  (one is enough) | | | | | |  |  |  |  |  |  |  |  |  |
| Travel related LRTI | Middle East Respiratory Syndrome (Mers-CoV) | A throat swab, lower respiratory tract specimen and a clotted blood are required for this investigation. Testing must be arranged with the laboratory. DO NOT send any specimens before contacting the laboratory. | | | | | | | | | | | | | | | |
| Avian influenza | A throat swab and/or a lower respiratory sample (if possible) are required for this investigation. DO NOT send any specimens before contacting the laboratory. | | | | | | | | | | | | | | | |
| Immunocompromised  (automatically full extended respiratory screen above) | *Pneumocystis jirovecii / cytomegalovirus (CMV)* |  |  |  |  | √ | √ | √ |  |  |  |  |  |  |  |  |  |
| *Aspergillus* species and *Aspergillus fumigatus* |  |  |  |  |  |  | √ |  |  |  | √ |  |  |  |  |  |
| Whooping cough | *Bordetella pertussis* |  | Any respiratory specimen  (one is enough) | | | | | |  |  |  |  |  |  |  |  |  |
| Parotitis/Mumps | Mumps virus | √ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Symptoms and specimens used for diagnosis**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **System involved / clinical group** | **Clinical features** | **Common pathogens** | **Mouth swab / buccal swab** | **Throat swab** | **Gargle** | **NPA** | **Sputum / Induced sputum** | **ETA** | **BAL** | **CSF** | **Eye swab, aqueous humor, corneal scrapings** | **DBS** | **EDTA** | **Clotted blood** | **Stool** | **Urine** | **Skin / vesicle swab** | **Biopsy** |
| **GI tract** | Gastroenteritis | Norovirus |  |  |  |  |  |  |  |  |  |  |  |  | √  (also vomit) |  |  |  |
|  | Adenovirus, sapovirus, astrovirus, rotavirus  (children <10 years, immunosuppressed & outbreaks only) |  |  |  |  |  |  |  |  |  |  |  |  | √ |  |  |  |
| Hepatitis | Hepatitis A (HAV), Hepatitis E (HEV) |  |  |  |  |  |  |  |  |  |  | √ |  | (√)  Available on request |  |  |  |
| Hepatitis B (HBV), Hepatitis C (HCV), Hepatitis D (HDV) |  |  |  |  |  |  |  |  |  | √  (not HDV) | √ |  |  |  |  |  |
| Gastric ulcer | Helicobacter pylori |  |  |  |  |  |  |  |  |  |  |  | √ |  |  |  |  |
| Crohns  (Pre-biologic screening) | Epstein barr virus (EBV), cytomegalovirus (CMV) |  |  |  |  |  |  |  |  |  |  | √ |  |  |  |  |  |
|  | Crohns  (active colitis) | Epstein barr virus (EBV), cytomegalovirus (CMV) |  |  |  |  |  |  |  |  |  |  | √ |  |  |  |  | √ |

**Symptoms and specimens used for diagnosis**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
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| **System involved/ clinical group** | **Clinical features** | **Common pathogens** | **Mouth swab / buccal swab** | **Throat swab** | **Gargle** | **NPA** | **Sputum / induced sputum** | **ETA** | **BAL** | **CSF** | **Eye (swab), aqueous humor, corneal scrapings** | **DBS** | **EDTA** | **Clotted blood** | **Stool** | **Urine** | **Vesicle swab** | **Biopsy** |  |
| **Nervous system** | Aseptic meningitis, encephalitis | HSV1, HSV2, VZV, Enterovirus/Parechovirus |  | (√)  Enterovirus  Parechovirus  only |  |  |  |  |  | √ |  |  |  |  |  |  |  |  |  |
| Immunocompromised aseptic meningitis/encephalitis | HSV1, HSV2, VZV, Enterovirus/Parechovirus  HHV6, CMV, EBV, JCPyV |  | (√)  Enterovirus  Parechovirus  only |  |  |  |  |  | √ |  |  |  |  |  |  |  |  |  |
| Progressive multifocal leukoencephalopathy (PML) | JCPyV (JC virus) |  |  |  |  |  |  |  | √ |  |  |  |  |  |  |  |  |  |
| Ring enhancing regions | *Toxoplasma gondii* |  |  |  |  |  |  |  | √ |  |  | √ |  |  |  |  |  |  |
| Guillian Barre Syndrome (GBS) | CMV, EBV, enterovirus |  |  |  |  |  |  |  | √ |  |  |  |  |  |  |  |  |  |
| Transverse myelitis | HSV1, HSV2, VZV, CMV, EBV, enterovirus, mycoplasma |  | (√)  Enterovirus  Mycoplasma |  |  |  |  |  | √ |  |  |  |  |  |  |  |  |  |
| MS, demyelination, parethesia and/or peripheral neuropathy | HSV1, HSV2, VZV, enterovirus |  | (√)  Enterovirus  only |  |  |  |  |  | √ |  |  |  |  |  |  |  |  |  |
|  | Febrile Convulsions | HSV1, HSV2, VZV,  HHV6/HHV7  Enterovirus, influenza, lower respiratory tract infection |  | Any respiratory specimen  (one is enough) | | | | | | √ |  |  |  |  |  |  |  |  |  |

**Symptoms and specimens used for diagnosis**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **System involved/ clinical group** | **Clinical features** | **Common pathogens** | **Mouth swab / buccal swab** | **Throat swab** | **Gargle** | **NPA** | **Sputum / induced sputum** | **ETA** | **BAL** | **CSF** | **Eye (swab), aqueous humor, corneal scrapings** | **DBS** | **EDTA** | | **Clotted blood** | | **Stool** | | | **Urine** | | **Vesicle swab** | **Biopsy** | |  |
| **Sexually transmitted diseases/ GUM clinic** | Vaginal discharge, pain on urination, lower abdominal pain, urethritis, fever | *Chlamydia trachomatis*  *Neisseria gonorrheae* | Specimens should be collected in Abbott multi-collect specimen collection kit devices  (refer to page 15 of the user manual) | | | | | | | | | | | | | | | | | | | | | |  |
| Vesicles/ulcers | Syphilis |  |  |  |  |  |  |  |  |  |  | | √ | |  | |  |  | | √ | | |  |  |
| HSV1 and HSV2 |  |  |  |  |  |  |  |  |  |  | |  | |  | |  |  | | √ | | |  |  |
| Blood borne virus infection | HIV-1, HIV-2, HBV, HCV, HTLV-1/HTLV-2 |  |  |  |  |  |  |  |  |  | √  (not HTLV) | | √ | |  | |  |  | |  | | |  |  |
| **Ophthalmic** | Conjunctivitis, keratitis, uveitis, ARN, PORN | Adenovirus, HSV, VZV, *Chlamydia trachomatis* |  |  |  |  |  |  |  |  | √ |  | |  | |  | |  |  | |  | | |  |  |
| **Transplant** | Pre-transplant Donor/Recipient screen (exact tests depend on transplant) | HIV-1/HIV-2, HBV, HCV, HTLV-1/HTLV-2, HEV, CMV, EBV, VZV, HSV, Syphilis, *Toxoplasma gondii* |  |  |  |  |  |  |  |  |  |  | | √ | |  | |  |  | |  | | |  |  |
| Post-transplant surveillance and diagnosis | CMV, EBV, adenovirus, HBV, HEV, HSV, VZV |  |  |  |  |  |  |  |  |  |  | | √ | |  | |  |  | |  | | |  |  |
| Haemorrhagic cystitis | BKPyV, JCPyV |  |  |  |  |  |  |  |  |  |  | | √ | |  | |  | √ | |  | | |  |  |

**Symptoms and specimens used for diagnosis**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | **Specimens for testing**  **Please see pages 21 – 26 for the full range of tests available at WoSSVC and turn-around times** | | | | | | | | | | | | | | | |
| **System involved/**  **clinical group** | **Clinical features** | **Common pathogens** | **Mouth swab / buccal swab** | **Throat swab** | **Gargle** | **NPA** | **Sputum / induced sputum** | **ETA** | **BAL** | **CSF** | **Eye (swab), aqueous humor, corneal scrapings** | **DBS** | **EDTA** | **Clotted blood** | **Stool** | **Urine** | **Skin/ Vesicle swab** | **Biopsy** |
| **Haematological** | Thrombocytopenia | CMV, EBV, B19 |  |  |  |  |  |  |  |  |  |  | √ |  |  |  |  |  |
| Atypical lymphocytes | EBV, CMV , HIV |  |  |  |  |  |  |  |  |  |  | √ |  |  |  |  |  |
| Henoch-Schonleinpurpura | *Mycoplasma pneumonia* |  | Any respiratory specimen  (one is enough) | | | | | |  |  |  |  |  |  |  |  |  |
| Persistent anaemia | CMV, EBV, B19, HIV |  |  |  |  |  |  |  |  |  |  | √ |  |  |  |  |  |
| **Skin and mucosa** | Maculopapular / erythematous | B19, CMV, EBV |  |  |  |  |  |  |  |  |  |  | √ |  |  |  |  |  |
| Enterovirus, HHV6, HHV7, measles, rubella | √ | √ |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Vesicular | HSV1, HSV2, VZV, Enterovirus |  |  |  |  |  |  |  |  |  |  |  |  |  |  | √ |  |
| Erythema mutliforme/Steven Johnson syndrome | HSV, CMV, EBV |  |  |  |  |  |  |  |  |  |  | √ |  |  |  | √ |  |
| *Mycoplasma pneumoniae* |  | Any respiratory specimen  (one is enough) | | | | | |  |  |  |  |  |  |  |  |  |
| Mouth ulcers | HSV, enterovirus |  |  |  |  |  |  |  |  |  |  |  |  |  |  | √ |  |
| **Systemic** | Sepsis | Procalcitonin  (Consultant lead request) |  |  |  |  |  |  |  |  |  |  |  | √ |  |  |  |  |
| Fulminant hepatitis | HBV |  |  |  |  |  |  |  |  |  |  | √ |  |  |  |  |  |
| Lymphadenopathy | EBV, CMV, *Toxoplasma gondii*, HIV-1, HIV-2 |  |  |  |  |  |  |  |  |  |  | √ |  |  |  |  |  |

**Symptoms and specimens used for diagnosis**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | **Specimens for testing**  **Please see pages 21 – 26 for the full range of tests available at WoSSVC and turn-around times** | | | | | | | | | | | | | | | |
| **System involved/**  **clinical group** | **Clinical features** | **Common pathogens** | **Mouth swab / buccal swab** | **Throat swab** | **Gargle** | **NPA** | **Sputum / induced sputum** | **ETA** | **BAL** | **CSF** | **Eye (swab), aqueous humor, corneal scrapings** | **DBS** | **EDTA** | **Clotted blood** | **Stool** | **Urine** | **Skin/ Vesicle swab** | **Biopsy** |
| **Pregnancy** | Antenatal screen | HIV-1, HIV-2, HBV, syphilis |  |  |  |  |  |  |  |  |  |  | √ |  |  |  |  |  |
| Fetal abnormalities on scan, intrauterine death | CMV, B19, *Toxoplasma gondii*, VZV, rubella (rare) |  |  |  |  |  |  |  |  |  |  | √ |  |  |  |  |  |
| Maternal rash | B19, measles, rubella, Enterovirus, HSV1, HSV2, VZV |  | √ |  |  |  |  |  |  |  |  | √ |  |  |  | √ |  |
| Maternal exposure to rash | VZV, B19, measles, rubella (rare) |  |  |  |  |  |  |  |  |  |  | √ |  |  |  |  |  |
| **Neonatal** | Congenital CMV  (samples >21 days may be postnatally acquired CMV) | CMV |  | √ |  |  |  |  |  |  |  |  |  |  |  | √ |  |  |
| Maternal HSV infection  (Discuss with the laboratory prior to sending specimens) | HSV |  | √ |  |  |  |  |  | √ | √ |  | √ |  |  |  | √  (rectal & skin swab) |  |
| Maternal HIV | HIV-1, HIV-2 |  |  |  |  |  |  |  |  |  |  | √ |  |  |  |  |  |
| Septic baby | Enterovirus, parechovirus |  | √ |  |  |  |  |  | √ |  |  | √ |  |  |  |  |  |
| Conjugated bilirubinemia | CMV, HSV, Toxoplasma gondii, syphilis, Enterovirus (rare), rubella (rare) |  | √ |  |  |  |  |  |  |  |  | √ |  |  | √ |  |  |

**Investigations available at WoSSVC**

Recent/current infections can use both serology and/or molecular techniques, depending on the pathogen. Past exposure/immunity requires serology testing only.

Please see “specimen containers accepted at WoSSVC” on page 12, for specimen types accepted at WoSSVC.

Amount of specimen required will depend on the number of investigations requested for that specimen.

In general the following rules apply:

|  |  |
| --- | --- |
| **Specimen** | **Amount** |
| **Clotted blood** | **6ml** |
| **CSF** | **≥0.2ml** |
| **Dried Blood Spot (DBS)** | **5 spots fully saturated back and front** |
| **EDTA blood** | **5ml or 9ml** |
| **Plasma aliquot** | **0.5 -1 ml (1000****l required for molecular)** |
| **Serum aliquot** | **0.5 -1 ml (1000**l **required for molecular)** |
| **Respiratory specimen** | **1ml** |

Turn-around-times are cited below next to each test, please contact the clinical team on 0141 201 8721 (internal 38721) if urgent testing is required. Turn-around-times cited are based on the number of working days.

**Investigations available at WoSSVC**

|  |  |  |  |
| --- | --- | --- | --- |
| **Hepatitis Viruses** | **Test** | **Specimen type** | **Turnaround time (days)** |
| **Hepatitis A**  **(HAV)** | **HAV IgM** | **EDTA** | **1-3** |
| **HAV IgG** | **EDTA** | **1-3** |
| **HAV PCR** | **EDTA**  **Stool** | **3-7** |
| **Hepatitis B**  **(HBV)** | **HBsAg** | **EDTA**  **DBS** | **1-3** |
| **HBsAg neutralisation** | **EDTA**  **DBS** | **1-4** |
| **HBsAg quantification** | **EDTA** | **1-3** |
| **HBcore IgM** | **EDTA** | **1-4** |
| **HBcore IgG** | **EDTA**  **DBS** | **1-4** |
| **Anti-HBs** | **EDTA** | **1-3** |
| **HBV DNA PCR** | **EDTA** | **3-7#** |
| **HBV resistance testing**  **(not routine test)** | **EDTA** | **12** |
| **Hepatitis C**  **(HCV)** | **Antibody** | **EDTA**  **DBS** | **1-3**  **3-7** |
| **Antigen** | **EDTA** | **1-3** |
| **HCV RNA detection/quantification (viral load)** | **EDTA**  **DBS** | **3-7** |
| **HCV genotyping** | **EDTA/clotted blood** | **12** |
| **HCV resistance testing**  **(not routine test, available on request)** | **EDTA/clotted blood** | **12** |
| **Hepatitis D (HDV)** | **RNA detection/quantification** | **EDTA** | **12** |
| **Hepatitis E (HEV)** | **Antibody (IgM / IgG)** | **EDTA** | **5-10** |
| **HEV qualitative PCR** | **EDTA**  **Stool** | **3-7** |
| **Retroviruses** |  |  |  |
| **HIV-1/ HIV-2** | **HIV screen (antigen/antibody)** | **EDTA**  **DBS** | **1-2** |
| **HIV-1/2 antibody differentiation** | **EDTA**  **DBS** | **1-2** |
| **HIV-1 avidity** | **EDTA** | **14** |
| **HIV-1 RNA quantification (viral load)** | **EDTA** | **3-7** |
| **HIV-1 resistance testing** | **EDTA/clotted blood** | **12** |
| **HIV-1 subtyping** | **EDTA/clotted blood** | **12** |
|  | **CCR5 tropism** | **EDTA\*** | **12** |
| **HTLV-1/ HTLV-2** | **Antibody** | **EDTA** | **1-3** |

# HBV DNA PCR testing in HCW samples, TRT within 3-7 days of any individual sample OR test 3-7 days once we have received two samples, if two samples are required.

\*CCR 5 resistance testing varies as per HIV viral load, viral load >1000 copies/ml send at least 5 ml EDTA, viral load <1000 copies/ml send at least 2ml EDTA

**Investigations available at WoSSVC**

|  |  |  |  |
| --- | --- | --- | --- |
| **Herpesviruses** | **Test** | **Specimen** | **Turnaround time (days)** |
| **Cytomegalovirus (CMV)** | **Antibody IgG** | **EDTA** | **1-4** |
| **Antibody IgM** | **EDTA** | **1-4** |
| **IgG Avidity** | **EDTA** | **1-4** |
| **DNA detection**  **(quantification available only on EDTA)** | **Amniotic fluid**  **BAL**  **CSF**  **EDTA**  **Throat swab**  **Urine**  **Biopsy** | **1-3** |
| **Epstein Barr Virus (EBV)** | **Antibody IgG (VCA/EBNA)** | **EDTA** | **1-4** |
| **Antibody IgM** | **EDTA** | **1-4** |
| **DNA detection (quantification available only on EDTA)** | **CSF**  **EDTA**  **Biopsy** | **1-3** |
| **Herpes simplex**  **(HSV1 & HSV2)** | **Antibody IgG** | **EDTA** | **1-4** |
| **DNA detection** | **CSF**  **EDTA**  **Eye**  **Throat swab**  **Rectal swab**  **Skin swab**  **Vesicle swab**  **Biopsy** | **1-3** |
| **Varicella Zoster (VZV)** | **Antibody IgG**  **(past immunity only)** | **EDTA**  **Clotted blood** | **1-4** |
| **DNA detection** | **CSF**  **EDTA**  **Eye**  **Vesicle swab** | **1-3** |
| **Human herpes virus 6 (HHV6)** | **DNA detection** | **CSF**  **EDTA**  **Throat swab** | **1-3** |
| **Human herpes virus 7 (HHV7)** | **DNA detection** | **CSF**  **EDTA**  **Throat swab** | **1-3** |

**Investigations available at WoSSVC**

|  |  |  |  |
| --- | --- | --- | --- |
| **Respiratory pathogens** | **Test** | **Specimen** | **Turnaround times (days)** |
| **Respiratory viruses**  **(Influenza (A and B), Adenovirus, RSV, parainfleunza 1-4, coronaviruses, rhinovirus/Enterovirus, human metapneumovirus** | **RNA detection**  **Influenza typing by PCR**  **Oseltamivir resistance (H1N1 only)**  **Influenza HA1 sequencing (surveillance only)** | **Any respiratory sample** | **1-3** |
| **Middle East Respiratory Syndrome (MERS-CoV)** | **RNA detection** | **Nose/throat swab or NPA in VPSS**  **AND**  **Induced sputum or ETS or BAL**  **AND**  **Clotted blood** | **To be agreed with laboratory** |
| ***Mycoplasma pneumoniae*** | **DNA detection** | **Any respiratory sample** | **1-3** |
| ***Pneumocystis jirovecii* (PCP)** | **DNA detection** | **ETS**  **Sputum**  **Induced sputum**  **BAL** | **1-3** |
| **Bordatella pertussis** | **DNA detection** | **Any respiratory sample** | **1-3** |
| ***Aspergillus* species and *Aspergillus fumigatus*** | **DNA detection** | **BAL**  **EDTA blood** | **1-3** |
| **Cystic fibrosis screen**  ***Pseudomonas aeruginosa***  ***Burkholderia cepacia* complex** | **DNA detection** | **Isolates only (Only available NHSGGC microbiology laboratories)** | **1-4** |

**Investigations available at WoSSVC**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Gastroenteritis** | **Test** | **Specimen** | **Turnaround time (days)** | |
| **Norovirus** | **RNA detection** | **Stool**  **Vomit** | **1-3** | |
| **Rotavirus**  **Adenovirus**  **Sapovirus**  **Astrovirus** | **RNA detection (multiplex PCR)** | **Stool** | **1-3** | |
| **Sexually transmitted pathogens** |  |  |  | |
| **Syphilis** | **Screen (IgM/IgG combination)**  **Antibody IgM**  **RPR**  **TPPA**  **Syphilis line immunoassay**  **DNA detection** | **EDTA**  **Vesicle swab** | **1-3 screen**  **2-7 for confirmation testing**  **1-3** | |
| **HIV** | **See retrovirus section** | | | |
| **HBV** | **See hepatitis virus section** | | | |
| **HSV** | **See herpes virus section** | | | |
| ***Chlamydia trachomatis*** | **Abbott multi-collect specimen collection kit for DNA detection** | **Vaginal swab**  **Rectal swab**  **Pharyngeal swab**  **Urine (men only)** | | **7** |
| **DNA detection** | **Eye swab in VPSS** | | **1-3** |
| ***Neisseria gonorrheae*** | **Abbott multi-collect specimen collection kit for DNA detection** | **Vaginal swab**  **Rectal swab**  **Pharyngeal swab**  **Urine (men only)** | | **7** |
| **DNA detection** | **Eye swab in VPSS** | | **1-3** |
| **Other pathogens** |  |  | |  |
| **Enterovirus** | **RNA detection**  **(NO serology available)** | **CSF**  **EDTA**  **Stool**  **Throat swab**  **Vesicle swab** | | **1-3 for CSF**  **1-7all other samples** |
| **Parechovirus** | **RNA detection**  **(NO serology available)** | **CSF**  **EDTA**  **Stool**  **Throat swab**  **Vesicle swab** | | **1-3 for CSF**  **1-7 all other samples** |

**Investigations available at WoSSVC**

|  |  |  |  |
| --- | --- | --- | --- |
| **Other pathogens** | **Test** | **Specimen** | **Turnaround time (days)** |
| **JC Polyomavirus (JCPyV)** | **DNA detection** | **CSF** | **1-3** |
| **BK Polyomavirus (BKPyV)** | **DNA detection** | **Urine**  **EDTA** | **1-3** |
| **Adenovirus** | **DNA detection**  **(NO serology available)**  **Quantitation (viral load) available on EDTA (transplant ONLY)** | **Any respiratory sample**  **EDTA**  **Eye**  **Urine**  **Stool** | **1-3** |
| **Measles** | **RNA detection** | **Mouth swab**  **Throat swab** | **1-3** |
| **Past immunity IgG antibody** | **EDTA** | **1-3** |
| **Mumps** | **RNA detection** | **Buccal swab**  **Mouth swab**  **Throat swab** | **1-3** |
| **Past immunity IgG antibody** | **EDTA** | **1-3** |
| **Rubella** | **RNA detection** | **Throat swab** | **1-3** |
| **Past immunity IgG antibody (assisted conception ONLY)** | **EDTA** | **1-4** |
| **Parvovirus B19** | **Antibody IgG** | **EDTA** | **1-7** |
| **Antibody IgM** | **EDTA** | **1-7** |
| **DNA detection** | **Throat swab**  **Amniotic fluid**  **EDTA** | **3** |
| **Toxoplasma** | **Antibody IgG** | **EDTA** | **1-3** |
| **Procalcitonin** | **Peptide detection** | **Clotted blood**  **Lithium heparin plasma** | **1-2** |
| **Helicobacter Pylori** | **Antibody IgG** | **Clotted blood**  **EDTA**  **Vacuette tube (5ml)** | **5** |
| **Mycobacterium tuberculosis** | **QuantiFERON-TB Gold Plus** | **Quantiferon Nil**  **Quantiferon TB1**  **Quantiferon TB2**  **Quantiferon Mitogen** | **5** |

**User access to results**

If a patient CHI is available, an electronic copy of the report will be found on Clinical Portal, SCI store and Track Care for all NHSGGC patients. This is the fastest way for results to be picked up is via Clinical Portal or SCI store.

Urgent results are communicated to the user in the manor agreed when the user called to arrange urgent testing – phone call, email or Clinical Portal/SCI Store.

All HIV new diagnosis, acute hepatitis B and acute hepatitis C are phoned to the requesting physician or sending laboratory. In NHSGGC these results are also phoned to public health (HBV and HCV) and the Sandyford clinical (HIV, HBV and acute HCV).

Health Protection Scotland (HPS) receive laboratory reports via ECOSS

Results can be emailed to users and laboratories using a secure NHS account.

Non-electronic reports are printed out and sent via the Royal Mail in envelopes marked confidential.

Users can call the laboratory 0141 201 8722 (internal 38722) to ask for results.

If users require interpretation of results, a member of the clinical team is always available to respond to queries, telephone 0141 201 8721 (internal 38721) or email [west.ssvc@nhs.net](mailto:west.ssvc@nhs.net) Monday to Friday 9am to 5pm.

**Requesting additional tests**

To request additional tests, email [west.ssvc@nhs.net](mailto:west.ssvc@nhs.net) with clinical details and investigations required. Please supply name and contact telephone/page number in case the clinical team need to discuss the request.

For urgent requests including varicella (chickenpox/shingles) and parvovirus B19 (“slapped cheek”) contacts in pregnancy telephone the laboratory (0141 201 8721) or email [west.ssvc@nhs.net](mailto:west.ssvc@nhs.net). Please supply the laboratory with the gestational age at time of contact, nature of exposure and date of contact.

**Retention of specimens**

Routine specimens are stored at -80oC for six months and then discarded.

Specimens sent to the laboratory with no clinical information will be stored for 1 year.

Exceptions are:

Antenatal booking blood samples – stored for 2 years

Needlestick injury stored blood – stored for 2 years

If CT/GC specimens are rejected, the specimen is only stable for 14 days post collection, so testing will only be considered for processing if within this 2 week time period.

**Laboratory policy on protection of personal information**

The West of Scotland Specialist Virology Centre is part of NHSGGC. The laboratory complies with NHS Scotland information security policy when handling and processing personal data.

<http://www.staffnet.ggc.scot.nhs.uk/Corporate%20Services/eHealth/PoliciesandProcedures>

**Feedback**

The laboratory aims to provide a service for all users.  If there are any complaints or positive feedback regarding an aspect of the laboratory service, contact the laboratory technical services manager (telephone: 0141 201 8744 or email: [Stephen.Hughes@ggc.scot.nhs.uk](mailto:Stephen.Hughes@ggc.scot.nhs.uk)). A user survey is also available on the laboratory web page (<http://www.nhsggc.org.uk/about-us/professional-support-sites/microbiology/west-of-scotland-specialist-virology-centre/>)

All positive and negative feedback is stored within the laboratory quality management system.

**Quality assurance and variability**

WoSSVC is UKAS accredited to **ISO 15189:2012** - Reference number **9319.** The full scope of accredited tests offered is available on the UKAS website <http://www.ukas.com>. Any tests reported by the laboratory which are NOT on this scope are clearly identified as such on the report. The laboratory has a quality management system in place to direct and control the laboratory with regard to quality. The laboratory participates in external quality assurance schemes including Quality Control for Molecular Diagnostics (QCMD) and UK National External Quality Assessment Scheme (NEQAS).

There are various factors which can influence testing within the laboratory leading to the factors which can result in random errors. Uncertainty of measurement provides quantitative estimates of the level of confidence that a laboratory has in its analytical precision of test results and therefore represents the expected variability in a laboratory result if the test is repeated a second time. The uncertainty of measurement has been implemented for BBV and serology testing. Internal controls and negative/positive controls are run with all molecular tests

To ensure the highest quality of testing please ensure:

* Whole blood arrives in the laboratory within 3 days of being taken
* The blood specimens are NOT haemolysed or hyperlipaemic
* DBS should arrive in the laboratory within 14 days of being taken
* Herparinised specimens should not be sent for molecular testing
* The specimens are not leaking
* Appropriate specimen is taken for the appropriate test

**Kits supplied by the laboratory**

DBS kits are available from the WoSSVC by emailing [west.ssvc@nhs.net](mailto:west.ssvc@nhs.net). When requesting the order make sure to include the name and address of where the kits are to be sent and the number of kits required. Please indicate if Freepost labels are required.

VPSS – phone specimen reception (0141 201 8742) or email [west.ssvc@nhs.net](mailto:west.ssvc@nhs.net)

Abbott multi-collect specimen collection kit for Chlamydia trachomatis/Neisseria gonorrheae NAAT testing, phone specimen reception (0141 201 8742)

**Referral to other laboratories**

Users may request investigations which are not in the repertoire of WoSSVC and these will be sent to appropriate reference laboratory. Alternatively, WoSSVC may send samples to reference laboratories for confirmation of results.

|  |  |
| --- | --- |
| **Reference Laboratory** | **Testing** |
| PHE Virus Reference Department (VRD), Colindale | Main tests sent from WoSSVC are:  HSV resistance testing  Intrathecal antibody testing (HSV, VZV, JC, measles)  Confirmation of avian influenza (H5, H7 & H9)  HHV8 PCR  JC polyomavirus antibody and tissue PCR  ORF and Molluscum contagiosum  Please refer to VRD website for VRD manual and appropriate forms to fill out and samples to send. Please ensure that the VRD form as well as a TrackCare or manual WoSSVC form are both filled out, send the specimens and both forms to WoSSVC  <https://www.gov.uk/government/collections/virus-reference-department-vrd> |
| Diagnostic Virology Barts Health NHS Trust | HIV-2 RNA viral load (EDTA blood) |
| Regional Antimicrobial Laboratory, Bristol | Therapeutic drug monitoring:  Aciclovir  Ganciclovir |
| Animal and Plant Health Agency (APHA) | Rabies antibody titres (clotted blood) |
| Rare Imported Pathogens Laboratory (RIPL), Porton Down | RIPL offer a wide range of tests on imported fevers, including haemorrhagic fever, arboviruses and bacterial infections including anthrax, riskettsiae, leptospirosis and Q-fever.  Routine tests are run in regional and symptomatic panels. For the most up-to-date list of pathogens tested for please see (<https://www.gov.uk/government/collections/rare-and-imported-pathogens-laboratory-ripl>)  Please refer to RIPL website for RIPL manual and appropriate forms to fill out. Please ensure that the RIPL form as well as a TrackCare or manual WoSSVC form are both filled out, send the specimens and both forms to WoSSVC |

**Referral to other laboratories**

|  |  |
| --- | --- |
| **Reference Laboratory** | **Testing** |
| Manchester Medical Microbiology Partnership (MMMP), Clinical Sciences Centre, Manchester Royal Infirmary | HSV 1 & 2 type specific antibody  <http://www.cmft.nhs.uk/info-for-health-professionals/laboratory-medicine/manchester-medical-microbiology-partnership/how-to-complete-the-request-form/virology-request-forms> |
| Scottish National Blood Transfusion, Herriot Watt University | HTLV 1/2 confirmation |
| PHE West Midlands, Birmingham | HBV testing in HCW  HIV-2 resistance testing  CMV resistance testing |
| Lab 21 Ltd, Cambridge | HIV therapeutic drug monitoring |
| The National Creutzfeldt-Jakob & Surveillance Unit | Please contact WoSSVC prior to sending any samples (<https://www.cjd.ed.ac.uk/>) |
| SBSTIRL Microbiology Department, Edinburgh Royal Infirmary | Lymphogranuloma venereum (LGV) testing  *Neisseria gonorrheae* confirmation |
| Scottish Human Papillomavirus Reference Laboratory (SHPVRL), Edinburgh Royal Infirmary | Please refer to the SHPVRL website for contact information and appropriate request forms (<http://www.edinburghlabmed.co.uk/Specialities/reflab/hpv/Pages/default.aspx>) |
| Scottish National Viral Haemorrhagic Fever Test Service, Royal Infirmary Edinburgh | Please contact RIE directly regarding urgent testing: Ebola, Lassa fever, Marburg, Crimean-Congo haemorrhagic fever virus.  <https://www.hps.scot.nhs.uk/reflab/SNVTS.aspx> |