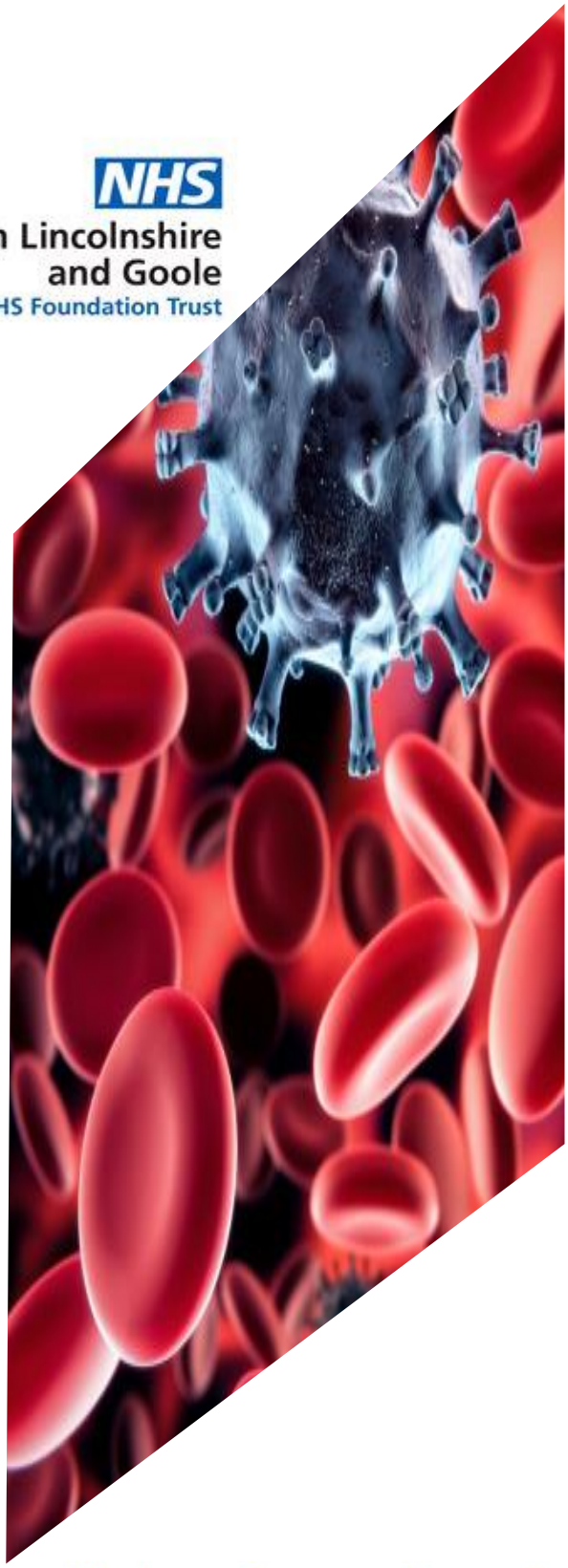
PATH LINKS
NHS PATHOLOGY

NHS
Northern Lincolnshire and Goole
NHS Foundation Trust



PATH LINKS MICROBIOLOGY USER GUIDE

Kindness · Courage · Respect

LOCATIONS OF THE HOSPITAL SITES OF PATH LINKS NHS PATHOLOGY DEPARTMENTS

BOSTON SITE
Pilgrim Hospital
Sibsey Road
BOSTON
Lincolnshire
PE21 9QS Telephone 01205 364801

GRANTHAM SITE
Grantham & Kesteven District Hospital
101 Manthorpe Road
GRANTHAM
Lincolnshire
NG31 8DG Telephone 01476 565232

GOOLE SITE
Goole & District Hospital
Woodland Avenue
GOOLE
North Humberside
DN15 6RX Telephone 01405 720720

GRIMSBY SITE
Diana, Princess of Wales Hospital
Scartho Road
GRIMSBY
North East Lincolnshire
DN33 2BA Telephone 01472 874111

LINCOLN SITE
Lincoln County Hospital
Greetwell Road
LINCOLN
LN2 5QY Telephone 01522 512512

LOUTH SITE
County Hospital Louth
High Holme Road
LOUTH
Lincolnsire
LN11 0EU Telephone 01507 600100

SCUNTHORPE SITE
Scunthorpe General Hospital
Cliff Gardens
SCUNTHORPE
North Lincolnshire DN15 7BH Telephone 01724 282282

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1 Site-Specific Details

1.1 Pilgrim Hospital – Boston: General Information

MICROBIOLOGY KEY PERSONNEL: CONTACT DETAILS

Pilgrim Hospital Switchboard: 01205 364801

Title	Name	Contact Details
Consultant Microbiologist	Dr R Rambani	Via Pilgrim Hospital Switchboard
Laboratory Manager	Mr M Jewsbury	Ext 446334
Microbiology Laboratory		Ext 446321

Boston Laboratory Routine Working Hours		
Laboratory Hours:	0900 - 2100	Monday to Friday
	0900 - 2100	Saturday
	0900 - 2100	Sunday / Bank Holiday

Urgent specimens that require processing after 2000hrs and outside the routine laboratory hours shown above must be notified to the Microbiology Biomedical Scientist (BMS) at the Scunthorpe Hospital Microbiology Laboratory (03033) 306610 Option 2). Blood cultures **do not** need to be notified to the Microbiology Biomedical Scientist, but should be sent to the local pathology laboratory as soon as taken, for incubation. (There is no need for urgent transport (taxi) for these specimens.)

Please contact the laboratory if you have any questions or require assistance.

1.1.1 Specimens Processed Urgently during Routine Working Hours

- CSF Samples
- SARS-CoV-2 PCR samples when requested for clinical/patient flow reasons. These will also be processed outside of routine hours.
- Theatre samples or samples taken by invasive procedure
- Corneal Scrapings
- Joint Aspirates

The Biomedical Scientist for Microbiology **MUST** be informed if you are sending any of these specimens. This will ensure that they are aware that the specimens are coming and they will be looking out for their arrival to ensure prompt processing and transmission of results.

If the requestor feels that a specimen not in the list above requires urgent transport and/or processing, they **MUST** speak to the duty Consultant Microbiologist for advice. If the duty Consultant Microbiologist deems that the specimen should be processed as a matter of urgency, **they** will contact the Biomedical Scientist for Microbiology and inform them of this.

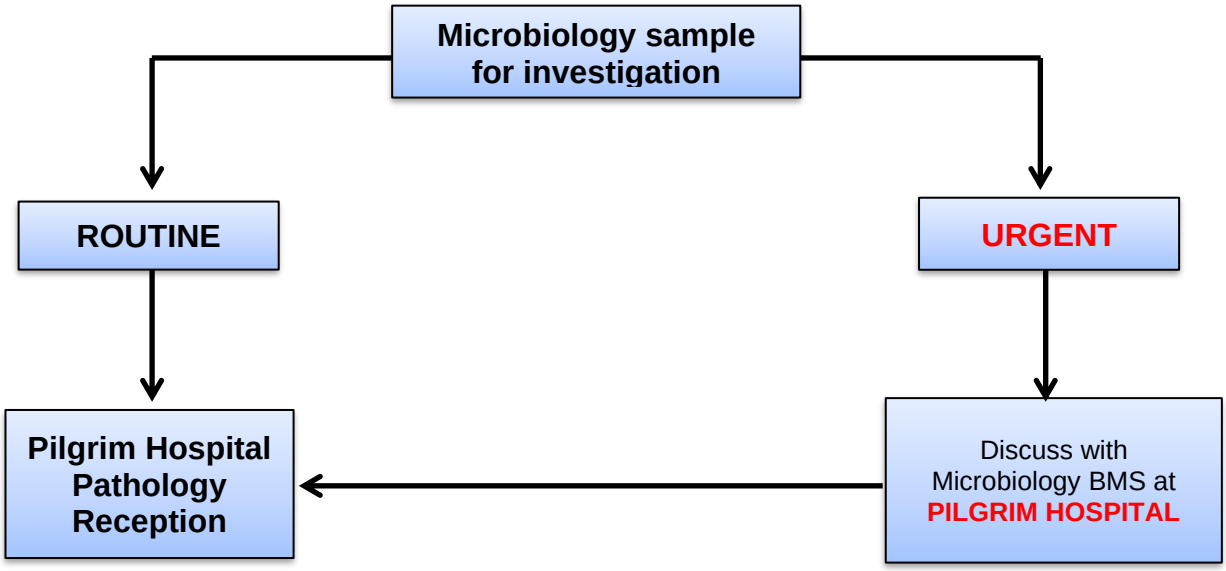
1.1.2 Specimens Processed Urgently outside Routine Working Hours (by Microbiology at Scunthorpe General Hospital)

- **CSF Processing** - All samples on a patient will be sent to the Boston Blood Sciences laboratory who will take the samples they need for biochemical analysis (including xanthochromia studies) and will then contact the Microbiology BMS on the Scunthorpe site to notify that a CSF requires transport to Scunthorpe for processing. The samples for Microbiology will be packaged and labelled in Pathology and taken to Pilgrim Hospital A&E Reception by Blood Sciences in readiness for collection by courier services arranged by Scunthorpe Hospital Microbiology Laboratory.

- **All other urgent samples for Microbiological analysis** (such as joint fluids and ascitic fluids) that have been notified to the Scunthorpe Hospital Microbiology Laboratory can be sent to the Boston Blood Sciences laboratory who should be advised that the sample is for immediate transfer to the Microbiology Department at Scunthorpe Hospital. These will then be packaged and labelled in Pathology and taken to Pilgrim Hospital A&E Reception by Blood Sciences to await collection by courier services arranged by Scunthorpe Hospital Microbiology. (See 1.1.3 & 1.1.4 - Pilgrim Hospital Sample Pathways for Microbiology Requests.)

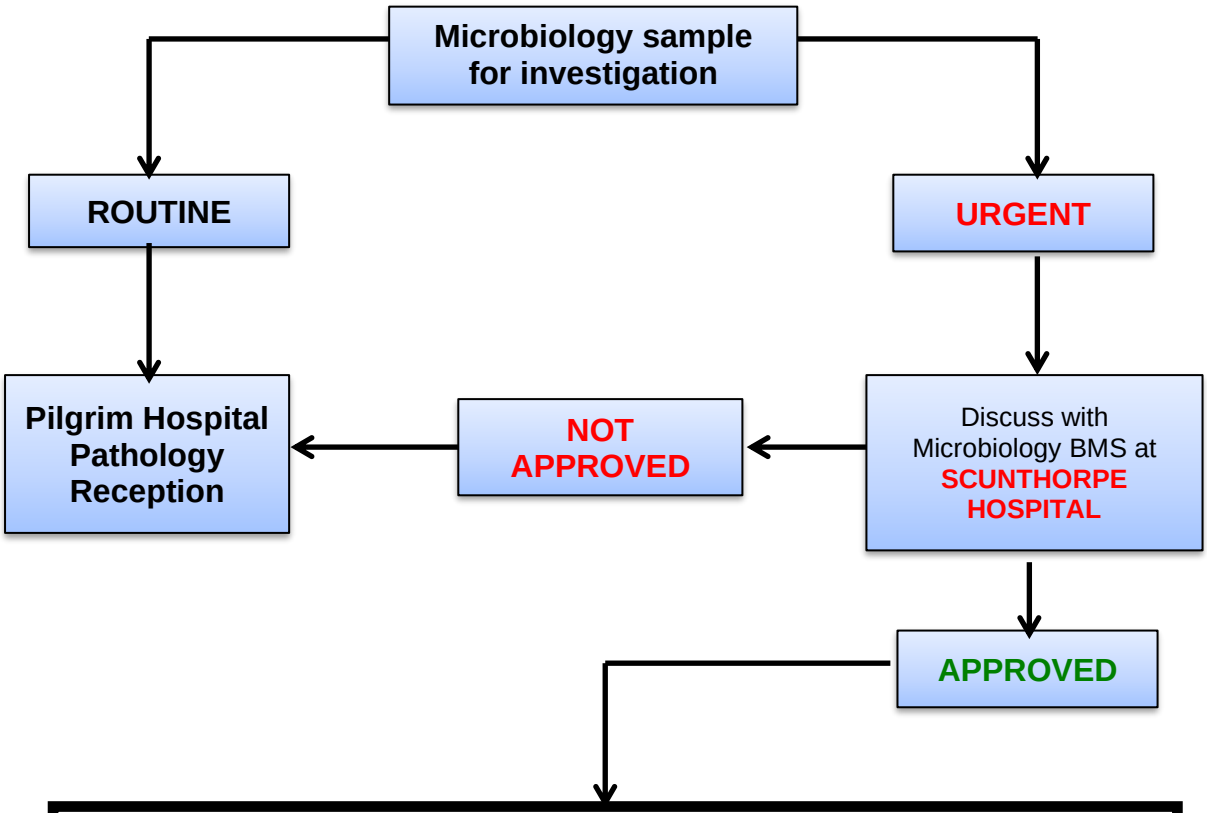
1.1.3 Urgent Microbiology Day-Time Transfer Protocol: Pilgrim Hospital

Pilgrim Hospital Sample Pathway For Urgent Microbiology Requests:
0900hrs – 2000hrs



1.1.4 Urgent Microbiology Transfer Protocol for Samples Taken Outside Routine Laboratory hours excluding SARS-CoV-2 PCR samples: Pilgrim Hospital

2000hrs – 0900hrs: Monday – Friday, All Weekends & Bank Holidays



Immediately take the sample to the Blood Sciences laboratory at Pilgrim Hospital and advise that the sample is for immediate transfer to the Microbiology Department at Scunthorpe Hospital.

The sample will then be packaged and labelled in Pathology and taken to Pilgrim Hospital A&E Reception by Blood Sciences to await collection by courier services arranged by the Microbiology Department at Scunthorpe Hospital.

If CSF is taken, the biochemical analysis will be undertaken at Pilgrim Hospital and the microbiological analysis will be undertaken at Scunthorpe Hospital.

Note: In cases of CSF requests send all samples to the Blood Sciences Department at Pilgrim Hospital. Blood Sciences will process samples for biochemical analysis (including Xanthochromia studies) and will liaise with the Microbiology Department at Scunthorpe Hospital to arrange urgent transport of samples for microscopy, culture and sensitivity.

1.2 Grantham Hospital: General Information

MICROBIOLOGY/SEROLOGY KEY PERSONNEL: CONTACT DETAILS

Grantham Hospital Switchboard:01476 565232

Title	Name	Contact Details
Consultant Microbiologist	Dr B Stoddart	Via Grantham Hospital Switchboard

Urgent specimens must be notified to the Microbiology Biomedical Scientist (BMS) at the Scunthorpe Hospital Microbiology Laboratory (03033) 306610 Option 2). Blood cultures **do not** need to be notified to the Microbiology Biomedical Scientist, but should be sent to the local pathology laboratory as soon as taken, for incubation. (There is no need for urgent transport (taxi) for these specimens.)

Please contact the Boston laboratory if you have any questions or require assistance within routine working hours. In the event of queries/clarifications regarding urgent specimens please contact the Scunthorpe laboratory.

1.2.1 Routine Microbiology Investigations - Grantham & District Hospital

For the Boston and Grantham sites, non-urgent microbiology requests are processed during routine working hours by the Microbiology Laboratory at Pilgrim Hospital, Boston and serology requests are processed by the Serology Laboratory at Scunthorpe.

All urgent microbiology requests are processed by the Scunthorpe Microbiology Laboratory at Scunthorpe General Hospital.

All microbiology and serology samples from both Grantham and Boston Hospitals will be segregated according to the following schedule:

Routine Microbiology Investigations Provided From Boston:

- Blood cultures
- M C & S bacterial pathogens
  - CSF
  - Other body fluids
  - Faeces
  - Swabs (gynae, wound, MRSA, respiratory)
  - Sputum
  - Urine
- TB & atypical Mycobacteria microscopy
- ❑ Fungi – processed at the Scunthorpe laboratory
- ❑ Ova, Cysts & Parasites
- ❑ Therapeutic drug monitoring - Gentamicin & Vancomycin (See Section 8)

All technical enquiries regarding the above test investigations should be made to the Boston laboratory on ext 446321 or 446323. Clinical enquiries should be made to the Duty Consultant Microbiologist.

Serology Investigations Provided From Boston :

Urgent SARS-CoV-2 PCR
Urgent FluA/FluB/RSV PCR

Serology Investigations Provided From Scunthorpe:

Viral serology	- inc Syphilis, Hepatitis, HIV & Rubella serology and Antenatal Screening
Molecular (PCR)	- HIV & HCV viral loads
	- Chlamydia detection by NAATs
	- Neisseria gonorrhoeae detection by NAATs

1.2.2 Routine Microbiology Investigations

All routine samples for microbiology investigations should be sent to the Grantham Pathology Department by air tube (station no 32) or delivered by hand. (CSF and high risk samples including those for the investigation of TB must **not** be sent by air tube. It is not advisable to send blood cultures through the air tube system.)

Regular courier transport between Grantham and Boston operates at the following times:

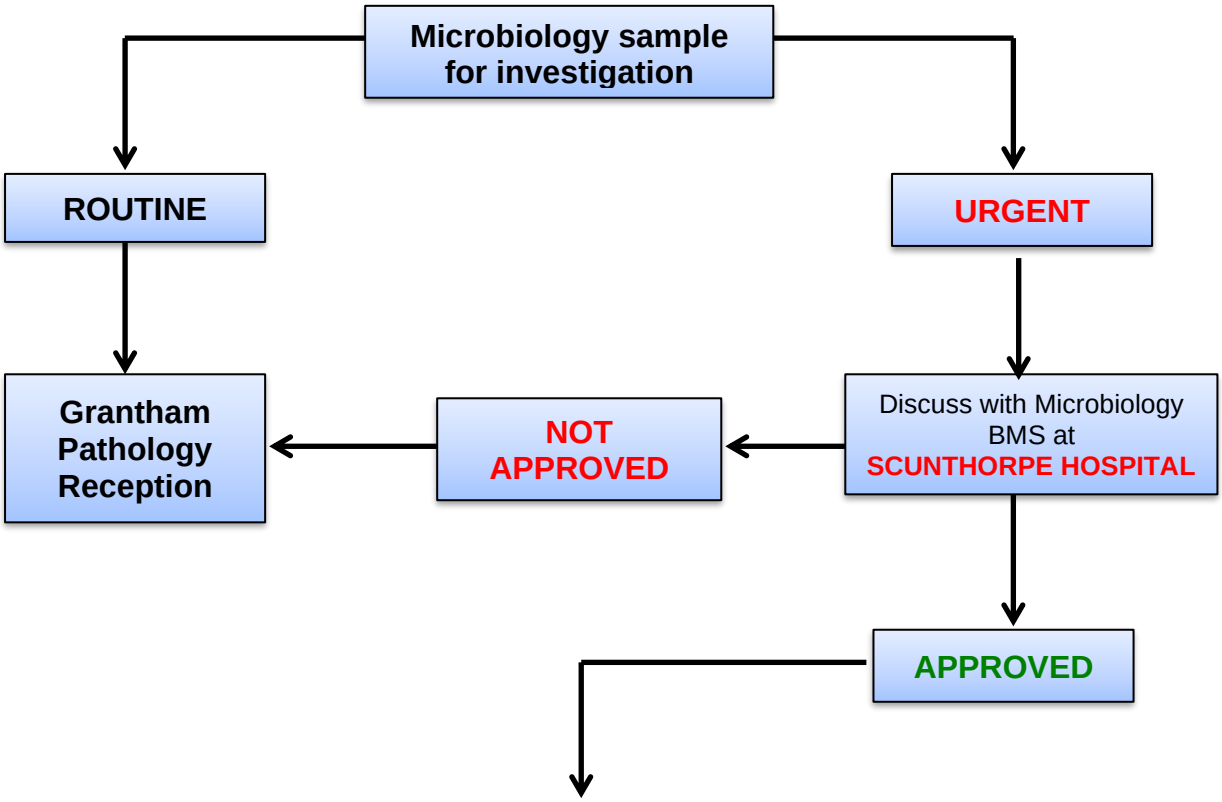
LABORATORY COURIER SERVICE Departure Times From Grantham Pathology Department	
Monday – Friday	**0910**
	1545
Weekends & Bank Holidays	**1100**

Note: Microbiology samples will require some processing in the Grantham laboratory prior to onward despatch and should be received in advance of the courier departure times.

To avoid unnecessary delays, please make every effort to ensure that samples are sent to the laboratory as soon as possible after collection.

1.2.3 Urgent Microbiology Transfer Protocol: Grantham Hospital

Grantham Hospital Sample Pathway For Urgent Microbiology Requests



Locate a Pathology Specimen transfer pack (stock kept in Grantham A&E and EAU).

Complete WEBV /manual request form for Microbiology.

Package the sample according to instructions laid out at 1.2.4 below.

Note: In cases of CSF requests send both the Microbiology and Biochemistry (including Xanthochromia studies) samples / request forms together in the same transport box. DO NOT SEPARATE.

Book a taxi via the Grantham Hospital Switchboard to transfer the sample to Microbiology at Scunthorpe Hospital.

Immediately transfer the sample transit box to collection point and record in despatch log.

Note: Collection point will be Grantham A&E Reception between 0800hrs and 1830hrs daily and EAU ward outside of these times. Where a collection is unlikely to take place before A&E closure for evening, always ensure EAU collection point is utilised.

1.2.4 Transfer Pack Instructions

Stocks of transfer packs for use in transporting urgent microbiological samples are kept in A&E and EAU at Grantham Hospital. These packs are fully compliant with UN 3373 regulations and must be used as instructed. No other type of packing material is to be used for transporting diagnostic samples.

Transfer Pack Contents:

1. Path Links Request Form ❑ Ensure that <u>all</u> details are provided on the form and samples are appropriately labelled. ❑ The use of NHS number is mandatory where available. ❑ Place samples in attached bag and seal.	
2. UN 3373 Transit Container ❑ Place form and attached samples in plastic container and secure lid. ❑ Place container in outer box. ❑ If the contained sample is of known 'high risk', attach 'Infectious Substance' sticker to outside of container as shown. *Refer to outer box for further instructions. NB: Patient identifiable information must **not** be written on the outer box.*	

Further supplies of transfer packs are available from Pathology Reception.

1.2.5 Transfer of Urgent Microbiology Specimens: Grantham A&E/ EAU Collection Points

The central collection point for urgent samples between 0800hrs and 1830hrs daily is located in the Accident & Emergency Department adjacent to the ambulance entrance. Outside of these times, the collection point is the EAU ward. Where a collection is unlikely to take place before A&E closure for the evening, always ensure the EAU collection point is utilised.

The taxi courier will collect the samples within 30 minutes of the call being made so please ensure that samples are taken <u>immediately</u> to this location for subsequent collection and transfer to Scunthorpe Hospital. A despatch log book is provided at the 'Sample Collection Point' to be signed on each occasion.

Please note that the A&E Department and EAU are available for use solely as central delivery/collection points and A&E/EAU staff are not to be involved in the process of receiving or sending samples.

It remains the sender's responsibility to ensure that:

- Forms and samples are appropriately labelled and packaged.
- The taxi is booked.
- The Scunthorpe Microbiology Biomedical Scientist is notified.
- The transit box is taken to A&E (or EAU) for collection/pick up by taxi.
- A record is made in the despatch log book.

1.3 Scunthorpe General Hospital: General Information

MICROBIOLOGY/SEROLOGY KEY PERSONNEL: CONTACT DETAILS

Scunthorpe General Hospital Switchboard: 01724 282282

Title	Name	Contact Details
Consultant Microbiologist	Dr S Dave	Via Scunthorpe Hospital Switchboard
Directorate Operational Manager/Laboratory Manager	Mr N Duckworth	Ext 306275
Pathology Team Leader (Microbiology)	Mrs R Leckie	Ext 302034
Pathology Medical Secretaries	Mrs J Wells (Mon, Tues, & Fri only) 1.56 wte Vacant	Ext 302640
Microbiology Laboratory (Technical queries)		DDI (03033) 306610 Option 2 Internal ext 306610 Option 2
Serology Laboratory		(DDI) (03033) 302477 Internal ext 302477
General Results Enquiries		(03033) 306610 Option 1 Internal ext 306610 Option 1

Scunthorpe Laboratory Working Hours		
Laboratory Hours:	Microbiology:	24 hour service 365 days per year
	Serology:	0900 – 1700: Monday to Friday Saturday and Sundays and Bank Holidays: Contact SGH Microbiology

Urgent specimens that require processing must be notified to the Microbiology Biomedical Scientist via Switchboard. Blood cultures **do not** need to be notified to the Microbiology Biomedical Scientist, but should be sent to the local pathology laboratory as soon as taken, for incubation. (There is no need for urgent transport (taxi) for these specimens.)

Please contact the laboratory if you have any questions or require assistance.

1.3.1 Specimens Processed Urgently

- CSF Samples
- SARS-CoV-2 PCR samples when requested for clinical/patient flow reasons
- Theatre samples or samples taken by invasive procedure
- Corneal Scrapings
- Joint Aspirates

The Biomedical Scientist for Microbiology **MUST** be informed if you are sending any of these specimens. This will ensure that they are aware that the specimens are coming and they will be looking out for their arrival to ensure prompt processing and transmission of results. The laboratory MUST be informed of urgent SARS-CoV-2 PCR samples by emailing details to nlg-tr.covid19rapidswab@nhs.net which is monitored 24/7.

If the requestor feels that a specimen not in the list above requires urgent transport and/or processing, they **MUST** speak to the Duty Consultant Microbiologist for advice. If the Duty Consultant Microbiologist deems that the specimen should be processed as a matter of urgency, **they** will contact the Biomedical Scientist for Microbiology and inform them of this.

1.4 Diana, Princess of Wales Hospital, Grimsby: General Information

MICROBIOLOGY KEY PERSONNEL: CONTACT DETAILS

Diana, Princess of Wales Hospital Grimsby Switchboard: 01472 874111

Title	Name	Internal extension number
Consultant Microbiologist	Vacant	Via Grimsby Hospital Switchboard
Pathology Medical Secretaries	Vacant	

Grimsby Microbiology/Serology Technical Laboratory Service

The microbiology/serology technical laboratory service is provided from Scunthorpe Hospital.

For urgent samples you **must** contact the Scunthorpe Microbiology laboratory Biomedical Scientist staff via switchboard. **Blood cultures do not require a phone call** but should be delivered to the laboratory as soon as possible. (There is no need for urgent transport (taxi) for these specimens.) **In the case of CSF samples (where microbiology is required),** the entire sample (including those for biochemical investigations) should be transferred. The laboratory MUST be informed of urgent SARS-CoV-2 PCR samples by emailing details to nlg-tr.covid19rapidswab@nhs.net which is monitored 24/7.

Please contact the Scunthorpe laboratory if you have any questions or require assistance.

1.4.1 Microbiology & Serology Services

The **microbiological** investigation of specimens for pathogens, (primarily by microscopy, culture and sensitivity) is provided by the Microbiology Laboratory at Scunthorpe as are investigations involving **serological or molecular** (PCR) means according to the following schedule:

Investigations Provided From Microbiology/Serology at Scunthorpe:

- Blood cultures
- M C & S bacterial pathogens
  - CSF (telephone in advance)
  - Other body fluids
  - Faeces (inc H pylori antigen testing)
  - Swabs (gynae, wound, MRSA, respiratory)
  - Sputum
  - Urine
- TB & atypical Mycobacteria
- Fungi
- Ova, Cysts & Parasites

All technical enquiries regarding the above test investigations should be made to the Scunthorpe Microbiology laboratory on (03033) 306610 (Option 2)**. Clinical enquiries should be made to the Duty Consultant Microbiologist.**

Viral serology	- Syphilis, Hepatitis, HIV & Rubella serology
Molecular (PCR)	- Chlamydia & Neisseria gonorrhoeae detection by NAATs,HIV & Hepatitis C viral loads, and SARS-CoV-2 PCR
Urgent serology requests	- Contact Consultant Microbiologist

All technical enquiries regarding the above test investigations should be made to the Scunthorpe laboratory on ext 302477. Clinical enquiries should be made to the Duty Consultant Microbiologist.

Microbiology/serology samples will be transported between hospital sites by a Pathology-managed courier service.

LABORATORY COURIER SERVICE Departure Times From Grimsby Pathology Department	
Monday – Friday	**1100**
	1430
	1730
Weekends & Bank Holidays	**1300**

Note:
Microbiology/Serology samples will require some processing in the Grimsby laboratory prior to onward despatch and should be received in advance of the courier departure times. To avoid unnecessary delays, please make every effort to ensure that samples are sent to the laboratory as soon as possible after collection.

1.4.2 Specimens Processed Urgently (by Microbiology/Serology at Scunthorpe General Hospital):

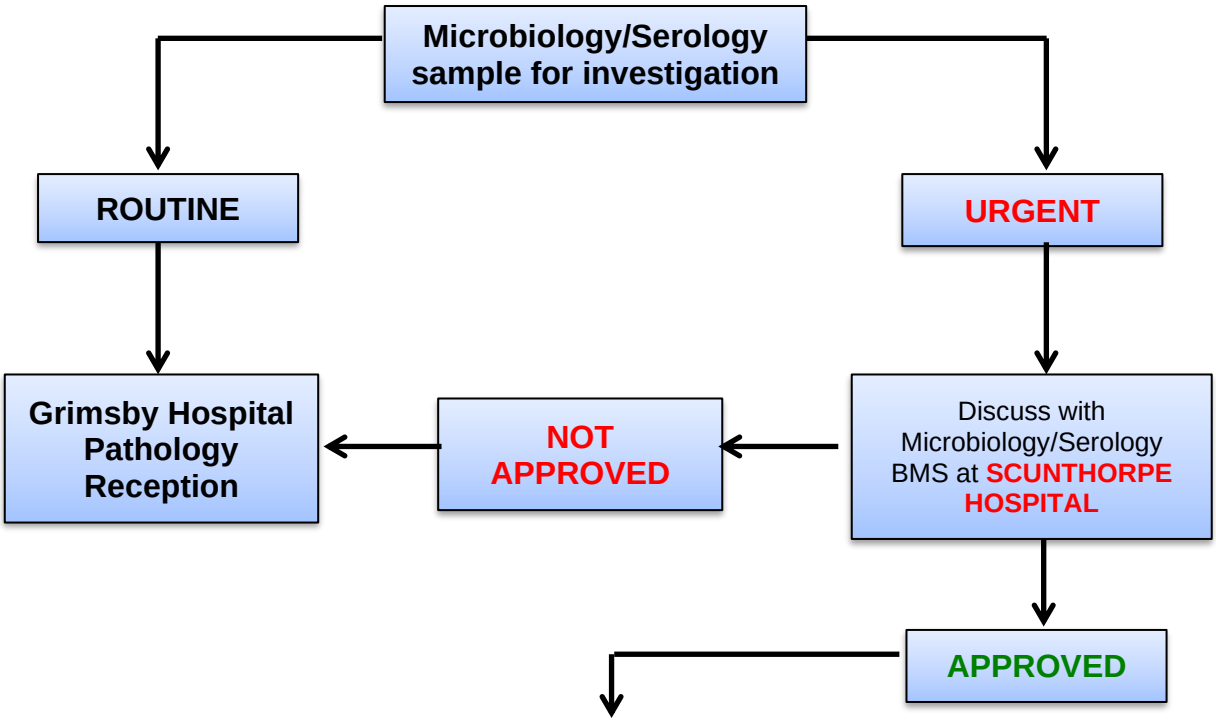
- CSF Samples
- SARS-CoV-2 PCR samples when requested for clinical/patient flow reasons other than A&E or admission samples which can be tested in Grimsby Blood Sciences.
- Theatre samples or samples taken by invasive procedure
- Corneal Scrapings
- Joint Aspirates

All urgent microbiology/serology requests will be transferred to Scunthorpe Hospital by taxi.

Grimsby laboratory staff will be available in the Pathology Dept to receive the samples, pack and arrange the transfer by taxi to the Microbiology/Serology Dept at Scunthorpe. Urgent results will be telephoned back to the wards as usual.

1.4.3 Urgent Microbiology/Serology Day-Time Transfer Protocol: Grimsby Hospital

0900 – 1700: Monday - Friday



1. Collect the appropriate specimen for the required investigation into a designated sample container.
2. Fully complete Microbiology/Serology request forms.
3. Label samples and seal in attached specimen bag.
4. **DO NOT USE AIR TUBE FOR URGENT SAMPLES**. Immediately transfer sample and form to the DPOW Pathology Reception ensuring that both are handed to a member of staff. Inform the member of staff that these are urgent and that they have been approved for transport by the Consultant Microbiologist.

DPOW PATHOLOGY STAFF WILL THEN:

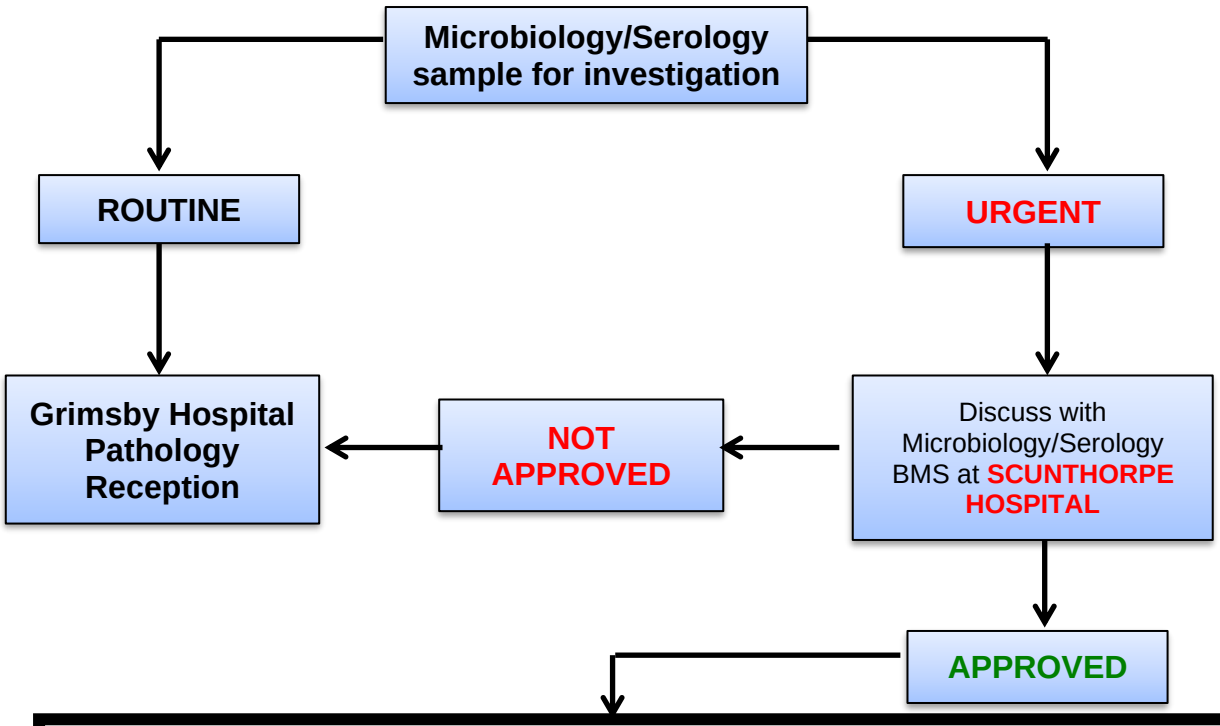
5. Contact the Microbiology Department (x306610, Option 2) or Serology (x302477) at Scunthorpe to inform of impending arrival.
6. Organise onward transfer of sample to Scunthorpe General Hospital

IMPORTANT NOTES

Ensure forms and samples are appropriately labelled in compliance with the Trust 'Pathology samples & request form labelling' policy.
Always use the NHS Number
Ensure samples are properly secured and sealed to avoid leakage

1.4.4 Urgent Microbiology/Serology Transfer Protocol for Samples Taken Outside Routine Laboratory Hours: Grimsby Hospital

1700 – 0900: Monday – Friday, All Weekends & Bank Holidays



1. Collect the appropriate specimen for the required investigation into a designated sample container.
2. Fully complete Microbiology/Serology request forms.
3. Label samples and seal in attached specimen bag.
4. Contact Microbiology Biomedical Scientist at Scunthorpe via Switchboard.
5. Immediately transfer sample and form to the DPOW Pathology on call 'hatch'.

DO NOT USE THE AIR TUBE FOR CSF SAMPLES

PATHOLOGY STAFF WILL THEN:

6. Organise onward transfer of sample to Scunthorpe General Hospital.

IMPORTANT NOTES

Ensure forms and samples are appropriately labelled in compliance with the Trust 'Pathology samples & request form labelling' policy.
Always use the NHS Number
Ensure samples are properly secured and sealed to avoid leakage

1.5 Lincoln County Hospital: General Information

MICROBIOLOGY KEY PERSONNEL: CONTACT DETAILS

Lincoln County Hospital Switchboard: 01522 512512

Title	Name	Contact Details
Consultant Microbiologists	Dr T Sloan Dr M Motukupally	Via Lincoln Hospital Switchboard
Pathology Medical Secretary	Ms A Neve (Tues – Fri 9am – 2pm only)	

1.5.1 Microbiology Service

All microbiology investigations on samples from Lincoln hospital inpatients and outpatients are provided from the Microbiology laboratories at Scunthorpe General Hospital and Pilgrim Hospital, Boston.

GP samples are tested at Scunthorpe except for approximately 15,000 pa GP samples from practices south of the city which are transported to and tested at Pilgrim Hospital Boston.

Serology samples continue to be transferred to the Serology Laboratory at Scunthorpe Hospital.

1.5.2 Scunthorpe Microbiology Laboratory – Working Hours

The Microbiology laboratory at Scunthorpe General Hospital operates a 24-hour service, 365 days per year.

Routine Microbiology Investigations Provided From Scunthorpe:

- Blood cultures
- M C & S bacterial pathogens
  - CSF
  - Other body fluids
  - Faeces (inc H pylori antigen testing)
  - Swabs (wounds, MRSA, respiratory, genital)
  - Sputum
  - Urine
- TB & atypical Mycobacteria
- ❑ Fungi
- ❑ Parasites

All technical enquiries regarding the above test investigations should be made to the Scunthorpe laboratory on ext 306610 (Option 2). Clinical enquiries should be made to the Duty Consultant Microbiologist.

Serology Investigations Provided From Scunthorpe:

Viral serology	- inc Syphilis, Hepatitis, HIV & Rubella serology
Molecular (PCR)	- Chlamydia & Neisseria gonorrhoea detection by NAATs
& Specialised serology for referral	- HIV & Hepatitis C viral loads, and SARS-CoV-2 PCR

All technical enquiries regarding the above test investigations should be made to the Scunthorpe laboratory on 03033 302477. Clinical enquiries should be made to the Duty Consultant Microbiologist.

1.5.3 Routine Microbiology Investigations – Lincoln Hospital

All routine samples for microbiology investigations should be sent to the Lincoln Pathology department by air tube (station no. 300) or delivered by hand. (CSFs and high risk samples must **not** be sent by air tube. It is not advisable to send blood cultures through the air tube system.)

Samples will be redirected via courier transport to the appropriate testing laboratory.

Additions made to the regular courier transport between Lincoln and Scunthorpe provides regular specimen transport to Scunthorpe throughout the day.

LABORATORY COURIER SERVICE Departure Times From Lincoln Pathology Department	
Monday – Friday	**0845**
	1330
	1615
	1700
Weekends & Bank Holidays	**1100**

Note: Microbiology samples will require some sorting in the Lincoln laboratory prior to onward despatch and should be received in advance of the courier depart times. To avoid unnecessary delays, please make every effort to ensure that samples are sent to the laboratory as soon as possible after collection.

1.5.4 Specimens Processed Urgently (by Microbiology at Scunthorpe General Hospital)

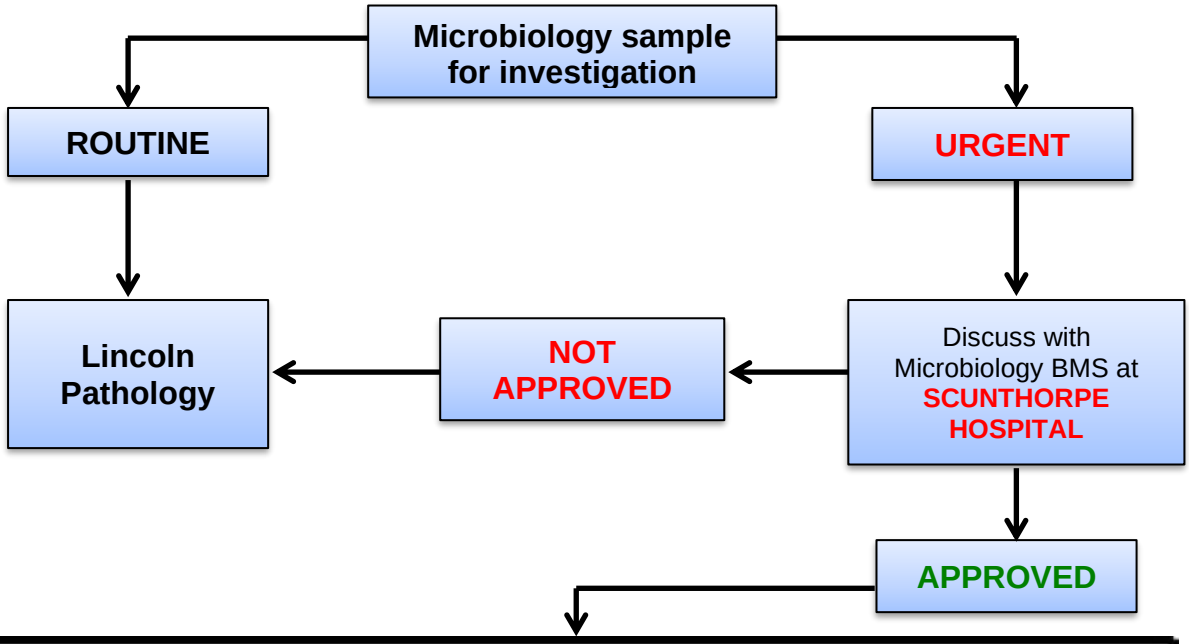
All urgent microbiological investigations are undertaken in the Scunthorpe Microbiology Laboratory except urgent rapid A&E/admission SARS-CoV-2 tests (non-PCR) which are performed by Lincoln Blood Sciences. Urgent SARS-CoV-2 PCR samples from United Lincolnshire Hospitals Operations Team must be emailed to the Boston Microbiology Laboratory using the generic mailbox microbiology.pilgrim@ulh.nhs.uk, and Scunthorpe Microbiology using the generic mailbox **nlg-tr.covid19rapidswab@nhs.net**. Both mailboxes are constantly monitored by Microbiology staff.

The following comprehensive protocols and supporting information are provided to assist users with the process of transferring urgent samples and avoid unnecessary delays. Whilst every effort has been applied to ensure accuracy and clarity, please contact the laboratory if you experience problems or require further information.

CSF, Theatre samples or samples taken by invasive procedure, urgent SARS-CoV-2 PCR, corneal scraping & joint aspirates	❑ **All** these samples submitted for microbiology investigations are to be classified as urgent requiring immediate transfer **by taxi to Scunthorpe**. ❑ The entire sample (including those CSF samples for blood science investigations) should be transferred. ❑ See also ***Transfer Protocol for Samples Taken Outside Routine Pathology Transport Times*** below.
Other Samples	❑ Other sample types may also be considered as being urgent depending on circumstance and clinical need. With the exception of those samples indicated above, the decision to categorise a microbiology request as urgent requires Consultant Microbiologist approval. Please contact the Duty Consultant Microbiologist via your local Switchboard for authorisation prior to dispatch. ❑ For samples during working hours (09.00am – 5.30pm, Mon – Fri) **label as "Urgent" and deliver as normal to Pathology Reception.** ❑ See also ***Transfer Protocol for Urgent Samples Taken Outside Routine Pathology Transport Times***
Transfer Packs	❑ Transfer packs for use in transporting urgent microbiological samples are provided and available in each ward location. Each pack has detailed instructions on the outside of the pack. These packs are fully compliant with UN602 regulations and must be used as instructed. No other type of packing material is to be used for transporting diagnostic samples.
Collection Point	❑ For samples outside routine pathology transport times the central collection point for taxi transfer to Scunthorpe General Hospital is located in the Accident & Emergency Department.

1.5.5 Urgent Microbiology Transfer Protocol For Samples Taken Outside Routine Pathology Transport Times: Lincoln Hospital

1700 – 0900: Monday – Friday, All Weekends & Bank Holidays



1. Fully complete a Microbiology request form.
2. Label samples and seal in attached specimen bag.
3. Place specimens in the plastic transit container.
4. Complete the “sender details” on the outer cardboard box.
5. If the patient or specimen is “High Risk” put a “Danger of Infection” sticker on the outside of the box.
6. Place container in the outer cardboard box and affix security seal.
7. ☎ Contact Switchboard (dial 0) and ask them to transfer you to Scunthorpe Switchboard who you should ask to put you through to a Biomedical Scientist (BMS) in Microbiology. Inform them you have an urgent specimen. The BMS will ask you to order a taxi if the specimen is identified as being urgent or will refer you to the Consultant Microbiologist on duty.
8. Immediately transfer sample transit box to the collection point at Lincoln Hospital Main entrance and record in “Urgent Microbiology Specimen, Taxi log”.

IMPORTANT NOTES

Ensure forms and samples are appropriately labelled in compliance with the Trust ‘Pathology samples & request form labelling’ policy.
Always use the NHS Number
Ensure samples are properly secured and sealed to avoid leakage

2 General Introduction to Microbiology

The quality of microbiological results depends upon the quality of specimens received ie poor quality samples do not produce high quality results.

2.1 Storage and Transport

- All samples should be transported to the laboratory as soon as possible after collection.
- The user must telephone the receiving laboratory of any sample transfer by the send away laboratory or user when using taxi, car or blood bike instead of routine Path Links Transport. This applies to urgent and non-urgent samples.
- Where delay is unavoidable, specimens must be stored at 4ºC, but even at this temperature some fastidious organisms on swabs and other specimens, and white cells in body fluids e.g. CSF may deteriorate.
- Blood Cultures should be stored at ROOM temperature.

2.2 High Priority Samples

Certain samples merit immediate attention due to clinical conditions implied by their collection. For all of the following, the laboratory must be warned of their arrival by telephone and a provisional telephoned result requested:

- CSF
- Urgent SARS-CoV-2 PCR for clinical/patient flow reasons
- Synovial fluid
- Corneal scrapes, aqueous and vitreous fluids
- Pleural fluid
- Pericardial fluid
- Peritoneal dialysis effluent in peritonitis
- Supra pubic aspirate
- Urine from renal pelvis or ureters
- Pus or tissue obtained during surgical operations / biopsy material
- Antibiotic assays (See Section 5 Antibiotic Assays)

2.3 Requesting Additional Tests

Additional tests may be requested on specimens already submitted to the laboratory as follows:

- For routine microbiology: additional tests may be requested up to 3 days after the specimen was sent (excluding sputum, faeces and urine, where a fresh sample will need to be sent).
- For CSF, post mortem fluids (excluding urine) and tissue samples, additional tests may be requested up to 7 days after the specimen was sent.
- For Serology investigations, including NAATs testing, additional tests may be requested up to 7 days after the specimen was sent.

To request additional tests on a routine microbiology sample already submitted to the laboratory:

A telephone call to a technical member of laboratory staff requesting additional tests will suffice in the first instance. Following verbal requests of this nature, the laboratory will ask the authorised requestor of the test to provide a subsequent electronic or written request form to be sent to the laboratory within 30 days to document the additional test. The laboratory will annotate the Laboratory Information Management System (LIMS) accordingly.

To request non blood borne virus additional tests on a serology sample already submitted to the laboratory:

A telephone call to a technical member of laboratory staff requesting additional tests will suffice in the first instance. As above, following a verbal request of this nature, the laboratory will ask the authorised requestor of the test to provide a subsequent electronic or written request form to be sent to the laboratory within 30 days to document the additional test(s) and will annotate the LIMS accordingly.

Additional requests for blood borne virus testing on samples sent to the laboratory:

These additional requests will require a telephone call to a technical member of the Serology laboratory staff followed by the submission, within 30 days, of an electronic or written request form clearly stating 'Additional Test(s) required'. Laboratory staff will annotate the LIMS accordingly.

2.4 Turnaround Times

The Directorate will discuss and agree appropriate turnaround times whilst considering the needs of service users. These turnaround times will be reviewed and amended as appropriate. Turnaround times for tests performed within Path Links laboratories, together with instructions for specimen collection are detailed at section 4.5. Turnaround times for virological testing and those tests referred to specialist laboratories are detailed at sections 6 and 7 respectively.

2.5 Measurement of Uncertainty

The Directorate has ascertained the measurement of uncertainty for all of its tests. It has also identified tests where measurement of uncertainty would be critical in relation to the result obtained. Where this is the case, the measurement of uncertainty will be applied to the result.* Users requiring any information on measurement of uncertainty should contact the relevant processing laboratory.

Note: There will be a marginal degree of uncertainty around the reported value for cell counts on ascitic fluids. The true cell count may be slightly above or below the reported value and this should be taken into account when considering the cell count in conjunction with other tests to make a diagnosis.

2.6 Consultant Advice

Consultation about investigation and management of infection is welcomed. For clinical advice on diagnosis and the interpretation of microbiology results, antimicrobial use and infection control contact the Duty Consultant Microbiologist.

3 Request Form & Sample Labelling

USE MICROBIOLOGY OR SEROLOGY FORMS ONLY.

Each request form (whether hard copy or electronically generated) needs to be completed accurately, comprehensively and legibly.

It is **ESSENTIAL** that the person requesting and collecting the sample ensures that they have correctly identified the patient prior to sample collection.

Samples must be labelled at the time of collection by the person collecting the sample. They must not be labelled prior to or remotely from the patient after collection.

3.1 Electronic Request (Trust WebV 'Request & View'/Dart OCM Forms)

Access to WebV and DART OCM is available to members of staff who have an identified need to access the system in order to be able to undertake their role. No one can have access to WebV or DART OCM requesting without appropriate training, in accordance with the NHS Care Record Service Acceptable Use Policy.

All blood and microbiology test requests are available from WebV.

When making an electronic pathology request:

- Patient details should be searched using the NHS Number. If the NHS Number is not available then the user must revert to making a manual request.
- You must ensure that patient details are carefully checked each time a request is made to ensure correct patient identification. Check all displayed details thoroughly with the patient health record and wrist band (where available).
- Please do not handwrite additional tests onto electronic request forms. Contact your local laboratory if you cannot locate the test you require on the Web V menu.
- Check the print quality of all labels including barcodes. Faded, speckled or poor quality labels may cause delays in processing.

3.2 Written Request Forms

Correct request form(s) should be used appropriate to the nature and type of investigation required. If the wrong request form is used and sent to the laboratory, investigations may be missed or result in unnecessary delays.

Path Links manual request forms are available from the local laboratory.

ALL sections of manual request forms should be completed in legible handwriting. If addressograph labels are used, patient details on the labels must be carefully checked to ensure correct patient identification; these must also be legible and affixed to all copies of any multi-part forms.

3.2.1 Important Notes For Completing Request Forms:

The following are **MANDATORY** criteria that **MUST** be entered on the request form:

NHS Number*

Surname

Forename

Date of Birth

High Risk Status (if relevant)

Use of addressograph labels on the request form to provide the above criteria is permitted.

*Hospital Number is an acceptable alternative for non-UK residents where NHS number is unavailable.

The following are **CRITICAL** criteria that **SHOULD** be entered on the request form:

Location / Clinician – Enables requests to be traced to originating source and reports to be sent to the correct locations. Please use Practice / GP codes where available. State full GP and Practice name (Inc. town / village) if code is not known. Hospital site should be stated for secondary care requests to avoid misdirection of reports. 'Copy to' field must be completed in full where results need to be sent to an additional location

Date & Time of Collection – Ensures results are presented in correct chronological order. Failure to comply may impact on clinical process or present a patient safety issue*

Clinical Details / Treatment Details – Enables interpretative advice or advice regarding appropriate treatment

Sample Type & Site (Microbiology) – Ensures correct tests are performed and appropriate antimicrobials recommended

Address & Postcode (Microbiology)

Gender – Ensures results are reported against correct reference ranges

Name & Signature of Requestor

* Date of onset is also required for Virology requests

Unknown / Unconscious patients: When the sample is from an unknown / unconscious patient, a unique identifier e.g. Accident and Emergency number must be supplied. Full details of the patient when they become known and confirmed as accurate, must be passed to the Laboratory as soon as possible to enable records to be updated.

Confidential patients: Where the patient identity is confidential e.g. GUM patients, as much information as possible should be written on both request form and sample to enable positive identification. This must include the provision of a specific patient identification number on both sample and form. GUM patients should also provide gender and date of birth.

3.3 Specimen details

3.3.1 Electronic Request (Trust WEBV 'Request & View' / DART OCM) Samples

It is **ESSENTIAL** that the person requesting and collecting the sample ensures that they have correctly identified the patient prior to collection.

- Order communication specimen labels must be attached to the samples at the time of collection and in the presence of the patient.
- Specimen labels must be applied laterally and not 'wrapped around' the specimen tube to ensure that they may be subsequently read on receipt in the laboratory.
- Specimen labels must be legibly initialled by the collector to the right of the barcode (avoid overwriting the barcode itself).

3.3.2 Written Request Samples

All samples **MUST** be labelled clearly by HAND in the presence of the patient.
Addressograph labels must **not** be used. The patient should be asked for their full name and DOB to avoid discrepancy or errors.

The following are **MANDATORY** criteria that **MUST** be recorded on **ALL** manual request samples:

Surname*

Forename

Date of Birth

High Risk Status (if relevant)

* Or other specific identifier eg GUM number in the case of confidential or unconscious patient

The following are **CRITICAL** criteria that **SHOULD** be recorded on **ALL** manual request samples:

NHS Number or Hospital Number

Date & Time of Collection*

Signature of Person Collecting the Sample

Location

***** Site of collection and specimen type should also be included for Microbiology/Serology specimens

For slide specimens

Glass slides sent to the laboratory must be labelled in PENCIL on the side the slide is inoculated with the following;

- Surname
- Forename
- DOB

The laboratory will not process samples and will reject the request where samples and/or requests have not met the mandatory criteria (or minor discrepancy criteria described in *Expected Standards of Pathology Request Form and Sample Labelling* (EXT-STD-9)).

Where we are unable to read hand writing, we will not be able to assess whether the mandatory criteria have been met and will reject the request.

3.4 High Risk Samples

Specimens are regarded as "HIGH RISK" if taken from patients **known or suspected** of being infected with a blood borne virus such as Hepatitis B virus and HIV or other serious infectious diseases such as tuberculosis or typhoid. These specimens must be labelled "HIGH RISK" on both the container and the request form by attaching a yellow "Danger of Infection" label.

High risk specimens, CSFs, SARS-CoV-2 PCR samples and those in glass sample containers **must not** be sent to the laboratory via the air tube system.

4 Specimen Collection

4.1 Introduction

Specimen collection involves the sampling of tissue or fluid for laboratory examination, to allow for the isolation and identification of micro-organisms that cause disease and to determine their antibiotic sensitivity to assist with the selection of appropriate antimicrobial therapy.

The quality of the specimen received in the laboratory can have a major impact on the subsequent microbiological and clinical diagnosis and valid results rely on the specimen being of the required quantity, collected in an aseptic manner and stored appropriately prior to laboratory examination.

Inaccurate or misleading may occur if specimens are kept for prolonged periods before examination in the laboratory as some organisms may outgrow others whilst other delicate organisms may not survive.

It is important that the request form is completed as fully as possible by the requestor as the laboratory staff will use the details provided to decide which tests to perform on the sample. Details such as age, gender and certain clinical information (eg pregnancy, diabetes, immunosuppression) will alter the tests that are performed by the laboratory and additional pathogenic organisms will be looked for. These details will also affect how laboratory staff interpret the results that are obtained. Additionally, Microbiology requests require the patient's address and postcode in order that Public Health functions can be undertaken in the event of a positive notifiable organism being isolated.

Tests undertaken within Microbiology include the growth and identification of bacteria, viruses, fungi and protozoa, as well as mycobacteriological and serological investigations.

4.2 Principles For The Collection of Specimens

The first step in the accurate diagnosis of infectious disease is to obtain appropriate and adequate specimens for microbiological examination. Where there are signs of infection (eg fever), a careful clinical assessment should be carried out to ensure the most appropriate and useful laboratory samples are obtained. The clinical assessment should assist to:

a. Identify the need for and the importance of microbiological investigation.

b. Initiate, if appropriate, the taking of a swab or specimen, eg during wound dressing.

c. Identify the appropriate investigation to be undertaken so as to avoid indiscriminate specimen collection that wastes time and money.

Close communication between the requesting healthcare professional and the laboratory is important, especially when unusual infections are suspected or the patient is immunosuppressed, as the infection may be caused by unusual organisms whose identification requires special techniques.

4.3 Collection of Specimens

Specimens must be obtained using safe techniques and practices. Compliance with local health and safety and infection control policies/guidelines eg Standard Infection Control Precautions and Hand Hygiene is paramount when collecting specimens. Appropriate

personal protective equipment (eg gloves and aprons) must always be worn when collecting/handling blood, body fluids and tissue specimens/samples.

Medical, nursing, phlebotomy, laboratory, portering and any other staff involved in the collection and handling of specimens must be appropriately trained to do so.

The types of specimens that may be required for microbiological investigation include swabs taken from wounds, eyes and nose as well as sputum and urine samples.

Local guidelines/procedures should be followed for the collection of specimens and if not in place the 'The Royal Marsden Hospital Manual of Clinical Nursing Procedures' may be followed.

If specimens of poor quality are sent to the microbiology department, then the results may be of little or no clinical use. The greater the quantity of material sent for laboratory examination, the greater the chance of isolating a causative organism. However, specimen containers should not be overfilled (eg with urine and faeces) and the tops must be securely closed to prevent leakage in transit (which may lead to the specimen being unsuitable for testing by the laboratory).

When collecting specimens the following should apply:

- Only use specimen containers provided by the Pathology Department.
- Local written guidelines/procedures should be followed.
- The correct specimen must be taken at the correct time.
- The specimen must be taken aseptically avoiding contamination of the specimen with other microorganisms from the patient and/or from any outside source eg the person collecting the specimen.
- An adequate quantity and appropriate number of specimens need to be sent.
- The specimen transport container must be appropriate for the infection being investigated.
- The specimen must be safely contained and clearly labelled.
- Accurate information about the patient's illness and treatment is important for test selection by the laboratory staff and the interpretation of the results.
- Where possible and practical specimens should be taken *before* antimicrobial therapy is started.

Most electronically generated 'Order Comms' requests will guide the requestor as to which type and how many specimen containers are required. Advice should be sought from the Microbiology department with regard to the specimen container required for unusual specimens.

Material from skin and mucous membranes can be collected by a swab, which generally contains transport medium (either viral transport medium for viral studies and Amies with charcoal for bacteriological studies). Bacteriological transport media are designed to preserve microorganisms, while preventing the multiplication of rapidly growing commensal organisms, making isolation and identification of pathogenic organisms easier.

Unfortunately, only a limited amount of material can be collected using a swab. Therefore, pus should be collected in a sterile syringe and then transferred to a CE marked leak-proof container.

Specimens are readily contaminated by poor technique. Aseptic technique must be used when collecting specimens to avoid inadvertent contamination of the site of the sample or the specimen. Specimens should be collected in CE/UKCA marked leak-proof containers with close-fitting lids and swabs must never be removed from their sterile containers until everything is ready for taking the sample.

Ideally, samples should be collected before commencing treatment such as antibiotics or antiseptics. If antimicrobial therapy has already been instigated this must be indicated on the request form and the antibiotics that the patient is taking should be listed. Both antibiotics and antiseptics may destroy organisms and could affect the outcome of the laboratory test.

Information regarding the collection of urine samples by patients can be found at https://www.nhs.uk/chq/Pages/how-should-i-collect-and-store-a-urine-sample.aspx and information regarding the collection of faecal samples by patients can be found at https://www.nhs.uk/chq/Pages/how-should-i-collect-and-store-a-stool-faeces-sample.aspx?CategoryID=69

4.3.1 Documentation

Any specimens collected and sent for laboratory investigation should be recorded in the patient's/client's notes. Incorrectly or unlabelled specimens will normally be discarded. Requests for microbiological investigations must be completed in accordance with Section 3 Request Form & Sample Labelling. It is important to note that the forename and surname of the requesting doctor must be stated on the request form. For example 'Alan J Smith' will be easier to correctly identify as an approved requesting clinician than 'A Smith' or 'AS' – not least because the laboratory computer system contains the requesting clinicians for the whole of Lincolnshire and beyond. In addition, when a copy to the patient's GP is requested, the name of the patient's GP and the practice at which the patient's GP is based should be clearly annotated on the request. It is not sufficient to place a tick in the 'copy to' box or to write 'Copy to GP' as the person entering the request onto the laboratory computer system will not have any knowledge of who the patient's GP is.

4.4 Transport of Specimens

Potentially infectious material presents a hazard when it is being transported and care must be taken to ensure that risk to other people is kept to a minimum. The Health Services Advisory Committee (1998) recommends procedures for the safe transport of specimens, which include carriage in leak-proof boxes, and a procedure for dealing with spillages. Specimens that need to be transported outside the hospital/unit/clinic eg by van, car, taxi or by post, must be transported in an adequate leak-proof primary container, a leak-proof secondary container and an outer box to comply with United Nations Packing Instructions UN3373.

The person collecting the specimen has a responsibility to ensure that:

- The specimen container is leak-proof and securely sealed.
- All traces of body fluid have been removed from the outside of the container.
- The specimen container is not overfilled.

- Biohazard or ‘High Risk’ labels are placed on the container and request form where appropriate (eg from patients with known or suspected blood borne viruses, SARS-CoV-2, TB or Salmonella typhi/paratyphi). THIS IS A LEGAL REQUIREMENT. These must be double-bagged.

- The specimen is accompanied by a fully completed request form in a separate pocket or an approved ‘Order Comms’ request bag.

- The container is sealed inside a plastic bag.

- The sooner a specimen arrives in the laboratory, the greater the chance of organisms present surviving and being identified. If specimens cannot be sent to a laboratory immediately, they should be stored as follows:

  - Blood culture samples should be kept at room temperature.

  - All other specimens in a specimen refrigerator at a temperature of 2 - 8ºC, where the low temperature will slow the bacterial growth and preserve serology samples.

Specimens from patients who have recently been treated with toxic therapy ie, gene therapy, drugs, radioactivity or active metabolites need to be handled with caution. Local guidelines should be adopted and complied with which will outline how such specimens should be labelled, bagged and transported to the laboratory. Advice should be sought from local laboratory staff if required.

4.5 Specimen Collection - Procedure Guidelines

a. Explain and discuss the procedure with the patient and ensure privacy while the procedure is being carried out.

b. Wash hands using a skin disinfectant and water or use alcohol hand rub / gel.

c. If the swab needs to be moistened before use, then immerse the swab into sterile saline or water rather than into the transport medium.

d. Take the sample as per guidance in sections below, taking care to minimise the risk of contamination e.g. proper MSU, deeper swabs of ulcers after removing slough etc.

e. Place specimens and swabs in the appropriate correctly labelled containers.

f. Despatch specimens promptly to the laboratory with the completed request form.

4.5.1 Eye Swab

CONTAINER Bacteriological swab containing Amies charcoal transport medium (black gel). 	
Manufacturer's Pre-use Storage Instructions:	Store at 5^0C – 25^0C
MINIMUM SPECIMEN VOLUME	N/A. Ensure swab fully rotated on site of specimen to maximise material collection on to swab.
SPECIAL INSTRUCTIONS	Hold the swab parallel to the cornea and gently rub the conjunctiva in the lower eyelid.
TURNAROUND TIME	Final results on negative samples are usually available 48 hours after receipt. In some circumstances anaerobic cultures and susceptibility testing on potential pathogens may result in the report being issued after 48 hours.

4.5.2 Nose Swab

CONTAINER Bacteriological swab containing Amies charcoal transport medium (black gel). 	
Manufacturer's Pre-use Storage Instructions:	Store at 5^0C – 25^0C
MINIMUM SPECIMEN VOLUME	N/A. Ensure swab fully rotated on site of specimen to maximise material collection on to swab.
SPECIAL INSTRUCTIONS	a. Insert the swab into the nasal cavity. b. Move the swab from the anterior nares and direct it upwards into the tip of the nose. c. Gently rotate the swab. d. One swab can be used for both anterior nares.
TURNAROUND TIME	Final results on negative samples are usually available 48 hours after receipt. In some circumstances anaerobic cultures and susceptibility testing on potential pathogens may result in the report being issued after 48 hours.

4.5.3 Pernasal Swab

CONTAINER Pernasal Transwab: Use a special soft-wire mounted dacron tipped pernasal dry swab (blue capped swab containing no transport media). 	
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	N/A. Ensure swab fully rotated on site of specimen to maximise material collection on to swab.
SPECIAL INSTRUCTIONS	a. Only PCR is performed for *Bordetella pertussis*. Culture is no longer performed in the laboratory. b. Gently insert the swab into one nostril straight back (not upwards) until it reaches the posterior wall. The distance from the nose to the ear gives an estimate of how far back the swab should be inserted. If obstruction is encountered, try the other side. c. Rotate the swab gently a few times, loosening the cells in the mucus cavity and then remove. d. Place the dry swab back into the labelled container and send to the laboratory.
TURNAROUND TIME	7 – 14 days

4.5.4 Sputum

CONTAINER Use a 60ml wide necked CE/UKCA marked leak-proof container. 	
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	As much sputum as possible to represent patient's sputum condition. Do no overfill container. Ensure material collected is sputum and not saliva.
SPECIAL INSTRUCTIONS	**Remember:** Sputum is a poor sample on which to base diagnostic decisions. If tuberculosis is suspected send 3 early morning specimens of sputum taken on consecutive days. Remember to label the sample as 'High Risk'. a. Care should be taken to ensure that the material sent for investigations is sputum, not saliva. b. Encourage patients who have difficulty producing sputum to cough deeply first thing in the morning. Alternatively, a physiotherapist should be called to assist. Send any sputum specimen to the laboratory immediately.
TURNAROUND TIME	• 2 - 3 days after receipt depending on growth obtained. • 3 days are required if sensitivity testing is performed. • TB culture takes longer – see below.

4.5.5 Sputum for TB

CONTAINER Use a 60ml wide necked CE/UKCA marked leak-proof container. 	
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	As much sputum as possible to represent patient's sputum condition. Do no overfill container. Ensure material collected is sputum and not saliva.
SPECIAL INSTRUCTIONS	**Remember:** • Sputum is a poor sample on which to base diagnostic decisions. • If pneumocystis investigation is required, please send induced sputum or bronchial lavage. If tuberculosis is suspected send 3 early morning specimens of sputum taken on consecutive days. Remember to label the sample as 'High Risk'. a. Three samples should be taken on separate days. These samples should be sent to the laboratory on the day they are produced and not sent together in a batch. b. Encourage patients who have difficulty producing sputum to cough deeply first thing in the morning. Alternatively, a physiotherapist should be called to assist.
TURNAROUND TIME	• Microscopy within 1 working day of receipt at processing laboratory. • TB culture takes up to 12 weeks.

4.5.6 Nasopharyngeal Aspirate

CONTAINER 30ml CE/UKCA marked leak-proof container (white top) supplied by the laboratory 	
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	As much liquid specimen as possible. **Remember:** Please send aspirate fluid not tube in a sample container. The laboratory will reject tubes received containing no discernible sample. Do not overfill container.
SPECIAL INSTRUCTIONS	PLEASE NOTE: these are no longer processed within Path Links and will be referred away when requested. The preferred sample is a viral PCR swab for RSV which CAN be undertaken in-house – please see Section 6.8 Virology. a. Once collected Nasopharyngeal aspirates, should be transferred into a 30ml CE/UKCA marked leak-proof container (white top) supplied by the laboratory. Equipment used for collecting the samples may be capped by the

	person taking the specimen or the vacuum lines sealed off but, when these are transported, they often leak, thereby increasing the chance that the specimen will be rejected by the laboratory. b. Nasopharyngeal secretions are aspirated through a sterile catheter connected to a mucus trap and fitted to a vacuum source. c. The catheter is gently inserted into the nostril parallel to the palate. d. The vacuum is applied and the catheter is slowly withdrawn in a rotating motion. e. Mucus from the other nostril may be collected using the same catheter in a similar manner. f. After mucus has been collected, the catheter is flushed with 3 - 5ml sterile normal saline. The sample should be sent to the laboratory immediately. If results are required urgently, please telephone the microbiology laboratory and speak to a member of the technical staff who will be able to advise on appropriate transport of the specimen to the laboratory (and they will also know that the specimen is coming).
TURNAROUND TIME	Results for RSV on NPA samples are usually available in 7-10 days.

4.5.7 Bronchial washings/Broncho-alveolar lavage (BAL)

CONTAINER 30ml CE/UKCA marked leak-proof container (white top) supplied by the laboratory 	
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	As much liquid specimen as possible – between 2 – 5ml. Do not overfill container.
SPECIAL INSTRUCTIONS	**Remember:** If pneumocystis investigation is required, please send induced sputum or bronchial lavage. If tuberculosis is suspected remember to label the sample as "high risk". a. Once collected Bronchial washings/lavage should be transferred into a 30ml CE/UKCA marked leak-proof container (white top) supplied by the laboratory. Equipment used for collecting the samples may be capped by the person taking the specimen or the vacuum lines sealed off but, when these are transported, they often leak, thereby increasing the chance that the specimen will be rejected by the laboratory. b. The use of bronchial brush/washing/lavage specimens for culture is not a routine procedure. The techniques for these procedures are best performed by a trained individual. c. Please note that investigations for *Pneumocystis* can only be performed on BAL specimens and induced sputum.
TURNAROUND TIME	• 2-3 days after receipt depending on growth obtained. • 3 days are required if sensitivity testing is performed. • Microscopy within 1 working day of receipt at processing laboratory. • TB culture takes up to 12 weeks.

4.5.8 Throat Swab

CONTAINER Bacteriological swab containing Amies charcoal transport medium (black gel). 	
Manufacturer's Pre-use Storage Instructions:	Store at 5^0C – 25^0C
MINIMUM SPECIMEN VOLUME	N/A. Ensure swab fully rotated on site of specimen to maximise material collection on to swab.
SPECIAL INSTRUCTIONS	a. Ask the patient to sit in such a position that he/she is facing a strong light source. b. Depress the patient's tongue with a spatula. c. Quickly, but gently, rub the swab over the prescribed area, usually the tonsillar fossa or any area with a lesion or visible exudates. d. Avoid touching any other area of the mouth or tongue with the swab.
TURNAROUND TIME	Final results on negative samples are usually available 24 hours after receipt. In some circumstances anaerobic cultures and susceptibility testing on potential pathogens may result in the report being issued after 48 hours.

4.5.9 Ear Swab

CONTAINER Bacteriological swab containing Amies charcoal transport medium (black gel). 	
Manufacturer's Pre-use Storage Instructions:	Store at 5^0C – 25^0C
MINIMUM SPECIMEN VOLUME	N/A. Ensure swab fully rotated on site of specimen to maximise material collection on to swab.
SPECIAL INSTRUCTIONS	a. No antibiotics or other chemotherapeutic agents should have been used in the aural region for 3 hours before taking the swab. b. Place the swab into the outer ear – rotate gently.
TURNAROUND TIME	Final results on negative samples are usually available 48 hours after receipt. In some circumstances anaerobic/fungal cultures and susceptibility testing on potential pathogens may result in the report being issued after 48 hours.

4.5.10 Wound Swab

CONTAINER Bacteriological swab containing Amies charcoal transport medium (black gel). 	
Manufacturer's Pre-use Storage Instructions:	Store at 5^0C – 25^0C
MINIMUM SPECIMEN VOLUME	N/A. Ensure swab fully rotated on site of specimen to maximise material collection on to swab. A few millilitres of pus is a better sample than a swab if it can be sent to the Lab immediately. If not rotate transwab on required site, sheathe and send to Laboratory.
SPECIAL INSTRUCTIONS	a. Wounds should be cleaned (with normal saline solution, not antiseptics) prior to wound swabbing. b. Rotate swab gently in the wound bed, sampling inflamed or purulent areas. c. Deep wound specimens are optimal as the predictive value of superficial swabs is low. Where there is significant purulent discharge, it is preferable to collect discharge using a sterile syringe and then transferring the material to a CE marked leak-proof container (white top).
TURNAROUND TIME	Final results on negative samples are usually available 48 hours after receipt. In some circumstances anaerobic cultures and susceptibility testing on potential pathogens may result in the report being issued after 48 hours.

4.5.11 Vaginal Swab

CONTAINER Bacteriological swab containing Amies charcoal transport medium (black gel). 	
Manufacturer's Pre-use Storage Instructions:	Store at 5^0C – 25^0C
MINIMUM SPECIMEN VOLUME	N/A. Ensure swab fully rotated on site of specimen to maximise material collection on to swab.
SPECIAL INSTRUCTIONS	An endocervical swab is a better sample than an HVS for detecting genitourinary pathogens with the exception of T. vaginalis. The laboratory cannot culture for *Neisseria gonorrhoea* on HVS swabs. Clean the *os cervicis* with gauze, insert swab into the os and rotate. Sheathe and send to the laboratory. a. Introduce a speculum into the vagina to separate the vaginal walls. Take the swab as high as possible in the vaginal vault. b. For *Trichomonas,* swab the posterior fornix. If there are obvious candida plaques swab the lesions. Please note that we routinely use wet microscopy for this organism which is not as sensitive as molecular or culture. Please contact the Operational Manager to discuss if molecular or culture detection is required. c. If pelvic infection is suspected, swab the cervical os. d. It is important to prevent vulval contamination of the swab.
TURNAROUND TIME	Final results on negative samples are usually available 48 hours after receipt. In some circumstances anaerobic cultures and susceptibility testing on potential pathogens may result in the report being issued after 48 hours.

4.5.12 Endocervical Swabs for Culture of *Neisseria gonorrhoeae*

CONTAINER Bacteriological swab containing Amies charcoal transport medium (black gel). 	
Manufacturer's Pre-use Storage Instructions:	Store at 5^0C – 25^0C
MINIMUM SPECIMEN VOLUME	N/A. Ensure swab fully rotated on site of specimen to maximise material collection on to swab.
SPECIAL INSTRUCTIONS	a. Moisten the speculum with warm water. Lubricants may be toxic to *Neisseria gonorrhoeae*. b. Remove any mucous or vaginal material. c. Gently compress the cervix with the blades of the speculum. d. Collect the endocervical discharge onto the swab or insert the swab into the cervix.
TURNAROUND TIME	Final results on negative samples are usually available 48 hours after receipt. In some circumstances anaerobic cultures and susceptibility testing on potential pathogens may result in the report being issued after 48 hours.

4.5.13 Penile Swab

CONTAINER Bacteriological swab containing Amies charcoal transport medium (black gel). 	
Manufacturer's Pre-use Storage Instructions:	Store at 5^0C – 25^0C
MINIMUM SPECIMEN VOLUME	N/A. Ensure swab fully rotated on site of specimen to maximise material collection on to swab.
SPECIAL INSTRUCTIONS	a. Retract prepuce if required and clean the skin surrounding the urethral meatus with soap and water or 0.9% sodium chloride solution. b. Rotate swab gently around the area of infection (glans penis, foreskin or catheter exit site).
TURNAROUND TIME	Final results on negative samples are usually available 48 hours after receipt. In some circumstances anaerobic cultures and susceptibility testing on potential pathogens may result in the report being issued after 48 hours.

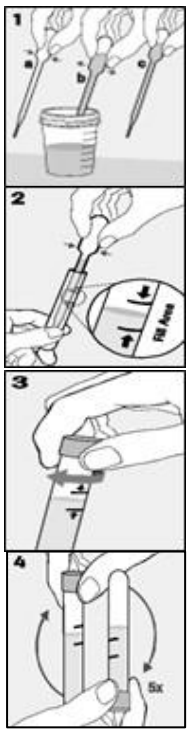
4.5.14 Urethral swabs

CONTAINER Use a thin wire shafted bacteriological swab containing Amies charcoal transport medium (black gel). 	
Manufacturer's Pre-use Storage Instructions:	Store at 5^0C – 25^0C
MINIMUM SPECIMEN VOLUME	N/A. Ensure swab fully rotated on site of specimen to maximise material collection on to swab.
SPECIAL INSTRUCTIONS	a. Avoid contamination with microorganisms from the vulva or the foreskin. b. The patient should not have passed urine for at least 1 hour. For males, if discharge is not apparent attempt to 'milk' it out of the penis. Pass the swab gently through the urethral meatus and roll around.
TURNAROUND TIME	Final results on negative samples are usually available 48 hours after receipt. In some circumstances anaerobic cultures and susceptibility testing on potential pathogens may result in the report being issued after 48 hours.

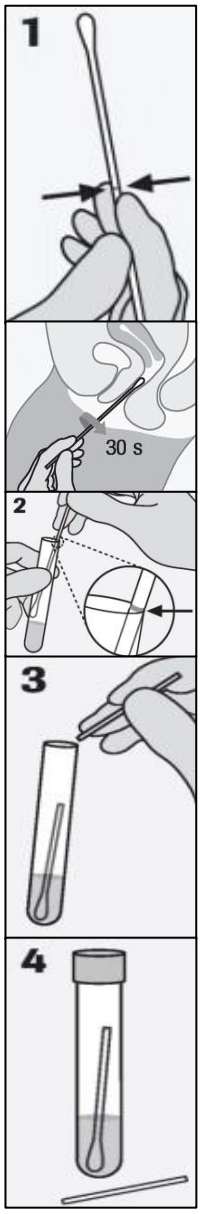
4.5.15 Chlamydia trachomatis/Neisseria gonorrhoea (CT/NG) PCR

All specimens for CT/NG PCR should be taken into a Roche PCR sample container.

4.5.15.1 Urine

CONTAINER	Cobas PCR Urine Sample Kit 
Manufacturer's Pre-use Storage Instructions:	Store at 15^{0}C – 30^{0}C
MINIMUM SPECIMEN VOLUME	See points c and f in Special Instructions below for procedure.
SPECIAL INSTRUCTIONS 	a. The patient should not have urinated for at least one hour prior to sample collection. b. Using a urine specimen collection cup, the patient should collect the first 10 to 50 mL of voided urine (the first part of the stream). c. Unscrew the Cobas PCR media tube cap, taking care not to spill the transport buffer within. d. Handle the cap and tube carefully to avoid contamination, including the outside of the transport tube and cap. e. Transfer the urine into the Cobas PCR media tube using the provided disposable pipette. f. Ensure the correct volume of urine has been added. The fluid level must be between the two black lines on the tube label. If the liquid level is above or below these lines, the specimen has not been collected properly and cannot be used for testing. g. Tightly re-cap the Cobas PCR Media tube. h. Invert the tube 5 times to mix. i. Label the transport tube with sample identification information, including the date of collection, using an adhesive label. Take care not to obscure the fill window on the transport tube.
TURNAROUND TIME	Results available with 5 working days of receipt.

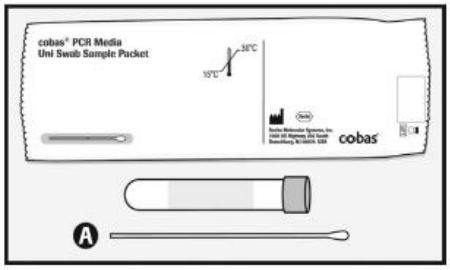
4.5.15.2 Clinician-Collected Vaginal Swab

CONTAINER	Cobas® PCR Media Uni Swab Sample Kit 
Manufacturer's Pre-use Storage Instructions:	Store at 15^0C – 30^0C
MINIMUM SPECIMEN VOLUME	N/A. Ensure swab fully rotated on site of specimen to maximise material collection on to swab.
SPECIAL INSTRUCTIONS 	a. WARNING: DO NOT PRE-WET SWAB IN cobas® PCR MEDIA BEFORE COLLECTION! b. In one hand, hold the swab with the scoreline above your hand and insert the swab about 5 cm (2 inches) into the vaginal opening. c. Gently turn the swab in a clockwise direction for about 30 seconds while rubbing the swab against the walls of the vagina d. Withdraw the swab carefully. Do not let the swab touch any surface before placing it into the collection tube. e. Remove the cap from the cobas® PCR Media Tube and lower the swab specimen into the tube until the visible scoreline on the swab is aligned with the tube rim. The tip of the swab should not be submerged into the liquid prior to breaking the shaft. f. Carefully leverage the swab against the tube rim to break the swab shaft at the scoreline. g. Tightly re-cap the cobas® PCR Media Tube. The specimen is now ready for transport. Discard the top portion of the swab. h. Label the transport tube with sample identification information, including date of collection.
TURNAROUND TIME	Results available with 5 working days of receipt.

4.5.15.3 Self collected Vaginal Swab Instructions

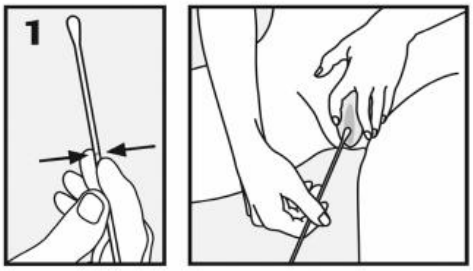
Vaginal swab specimen- self-collection in a clinical setting

WARNING: DO NOT PRE-WET SWAB IN cobas® PCR MEDIA BEFORE COLLECTION!

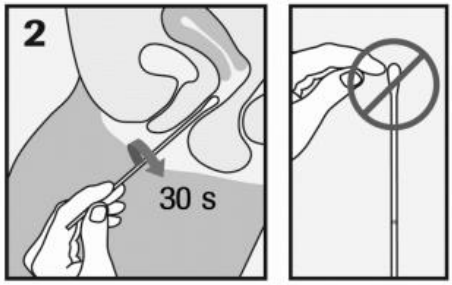


The **cobas®** PCR Media Uni Swab Sample kit contains:

cobas® PCR Media Tube
Woven Swab: A

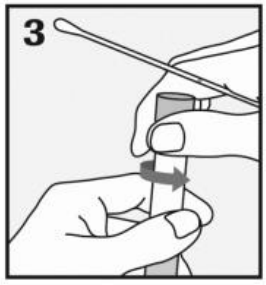


1. **POSITION:** In one hand, hold the woven swab (Swab A) with the scoreline above your hand and with the other hand separate the folds of skin around the vaginal opening (labia).

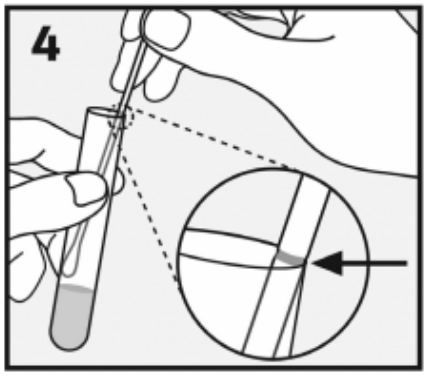


2. **COLLECT:** Insert the swab about 5 cm (2 inches) into the vaginal opening. Gently turn the swab in a clockwise direction for about 30 seconds while rubbing the swab against the wall of the vagina. Remove the swab carefully.

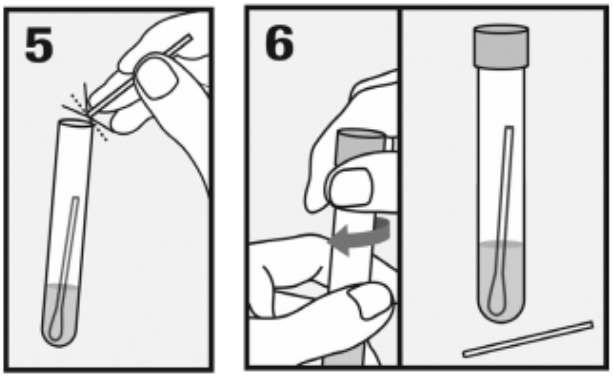
Do NOT touch the swab to any surface before placing into the collection tube.



3. **OPEN TUBE:** While holding the swab in the same hand, remove the cap from the tube as shown above.



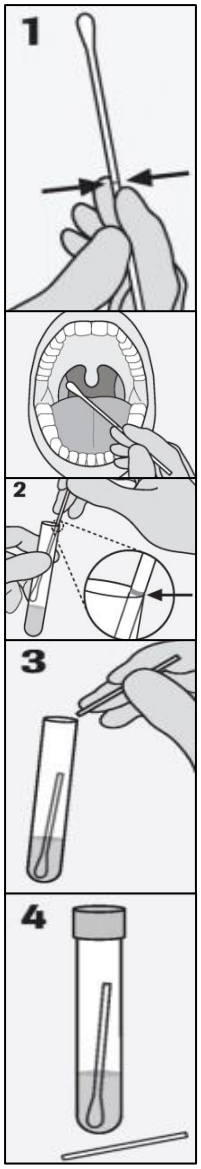
4. **ALIGN:** Lower the swab into the tube until the visible scoreline on the shaft is lined up with the tube rim.



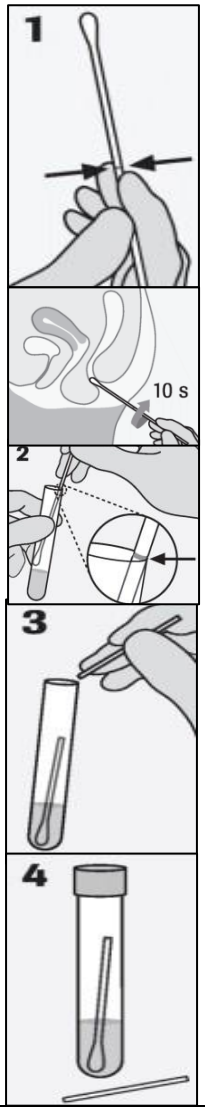
5. **BREAK:** Carefully lean the swab against the tube rim to break the swab shaft at the scoreline.

6. **CLOSE: Tightly** close the **cobas®** PCR Media Tube. Return the sample to your healthcare provider as instructed. Discard the top portion of the **swab**.

4.5.15.4 Oropharyngeal Swab

CONTAINER	Cobas® PCR Media Uni Swab Sample Kit 
Manufacturer's Pre-use Storage Instructions:	Store at 15^0C – 30^0C
MINIMUM SPECIMEN VOLUME	N/A. Ensure swab fully rotated on site of specimen to maximise material collection on to swab.
SPECIAL INSTRUCTIONS 	a. WARNING: DO NOT PRE-WET SWAB IN cobas® PCR MEDIA BEFORE COLLECTION! b. To collect the specimen, hold the swab with the scoreline above your hand and insert the swab into the mouth and collect the specimen from the bilateral posterior pharynx, both tonsils and the uvula. Withdraw the swab carefully. c. Do not let the swab touch any surface before placing it into the collection. d. Remove the cap from the cobas® PCR Media Tube and lower the swab specimen into the tube until the visible scoreline on the swab is aligned with the tube rim. The tip of the swab should not be submerged into the liquid prior to breaking the shaft. e. Carefully leverage the swab against the tube rim to break the swab shaft at the scoreline. f. Tightly re-cap the cobas® PCR Media Tube. The specimen is now ready for transport. Discard the top portion of the swab. g. Label the transport tube with sample identification information, including date of collection.
TURNAROUND TIME	Results available with 5 working days of receipt.

4.5.15.5 Rectal Swab

CONTAINER	Cobas® PCR Media Uni Swab Sample Kit 
Manufacturer's Pre-use Storage Instructions:	Store at 15^0C – 30^0C
MINIMUM SPECIMEN VOLUME	N/A. Ensure swab fully rotated on site of specimen to maximise material collection on to swab.
SPECIAL INSTRUCTIONS 	a. WARNING: DO NOT PRE-WET SWAB IN cobas® PCR MEDIA BEFORE COLLECTION! b. To collect the specimen, hold the swab with the scoreline above your hand and insert the swab about 3 to 5 cm (1-2 inches) into the anal canal. Gently turn the swab in a clockwise direction for about 5-10 seconds while running the swab against the walls of the rectum. If the swab is grossly contaminated with feces, discard and repeat the collection. c. Do not let the swab touch any surface before placing it into the collection. d. Remove the cap from the cobas® PCR Media Tube and lower the swab specimen into the tube until the visible scoreline on the swab is aligned with the tube rim. The tip of the swab should not be submerged into the liquid prior to breaking the shaft. e. Carefully leverage the swab against the tube rim to break the swab shaft at the scoreline. f. Tightly re-cap the cobas® PCR Media Tube. The specimen is now ready for transport. Discard the top portion of the swab. g. Label the transport tube with sample identification information, including date of collection.
TURNAROUND TIME	Results available with 5 working days of receipt.

4.5.16 IUCDs

CONTAINER Use a 60ml wide necked CE/UKCA marked leak-proof container. 	
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	N/A.
SPECIAL INSTRUCTIONS	a. The laboratory only processes IUCDs when there are clinical indications of infection such as PID or other inflammatory conditions. Such clinical details must be indicated on the request form as IUCDs with no/inappropriate clinical details will not be processed. b. Remove the IUCD and place into the container. c. Ensure the cap is tightly closed and send to the laboratory.
TURNAROUND TIME	• Final results on negative routine culture are usually available 48 hrs after receipt. • In some circumstances, anaerobic cultures and susceptibility testing on potential pathogens may result in the report being issued after 48 hours. • Actinomyces culture: 10 days

4.5.17 Rectal Swab for CPE screening

CONTAINER Bacteriological swab containing Amies charcoal transport medium (black gel). 	
Manufacturer's Pre-use Storage Instructions:	Store at 5^0C – 25^0C
MINIMUM SPECIMEN VOLUME	N/A. Ensure swab fully rotated on site of specimen to maximise material collection on to swab.
SPECIAL INSTRUCTIONS	**Remember:** Rectal swabs are not suitable for the detection of enteric pathogens. a. Pass the swab, with care, through the anus into the rectum. b. Rotate gently.
TURNAROUND TIME	Final results on negative samples are usually available 24 hours after receipt. In some circumstances susceptibility testing on potential pathogens may result in the report being issued after 24 hours.

4.5.18 Faeces

If examination is required for cysts or ova, PLEASE indicate this on the form. A labour-intensive concentration technique is required. **This is not done unless requested and the following details are given:**

- Details of foreign travel
- Eosinophilia
- Diarrhoea for > 3 weeks

Microscopy and Giardia testing is only performed on liquid samples.

Samples will be screened for Rotavirus on patients <5yrs of age.

Samples are screened routinely for *C difficile* if:

- Patient is an in-patient and a liquid sample is provided.
- Patient is an outpatient, >65 years of age and a liquid sample is provided.
- At least 21 days having lapsed since the patient last screened C. diff. toxin positive and a liquid sample is provided.

Please also note:

In acute gastro-enteritis one sample is usually sufficient to establish the diagnosis.

Clearance samples should only be sent on the advice of CCDC or an Environmental Health Inspector. Please state on form.

For trophozoites of Entamoeba histolytica and Giardia lamblia a HOT stool sample should be sent to the laboratory. Please speak to a Consultant Microbiologist before sending such a specimen.

CONTAINER Use a CE/UKCA marked leak-proof specimen container with an integral spoon (brown top). 	
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	See point c in Special Instructions below. Depending on the number of tests requested, smaller samples may be accepted but may not be representative of the specimen as a whole and may affect the result.
SPECIAL INSTRUCTIONS	a. Where possible, ask the patient to defaecate into a clinically clean bedpan or a container that has been sterilised with boiling water. Alternatively, plastic wrap may be placed over the opening to the toilet and the specimen can be produced onto the plastic wrap.

	b. Stool samples unavoidably contaminated with urine may be sent for microbiological investigation. c. Scoop enough material to fill a third of the specimen container using the spatula / spoon, incorporated in the specimen container. (In the case of liquid faeces, approximately 15mls should be collected). d. Examine the specimen for such features as colour, consistency and odour, and record your observations. The laboratory does not use the Bristol Stool Chart for the grading of faeces as the consistency of the faecal matter received by the laboratory is often not the same as it was when the sample was produced by the patient. The laboratory will grade the sample as liquid, semi formed or formed. e. Segments of tapeworm are seen easily in faeces and any such segments should be sent to the laboratory for identification. f. Please contact the Consultant Microbiologist if you suspect your patient as suffering from amoebic dysentery.
TURNAROUND TIME	Final results will be available in 48-72 hours from receipt within the testing laboratory. N.B. Pathogens are often isolated after 48 hours incubation.

4.5.18.1 Faeces samples for Norovirus Testing

Norovirus is the commonest cause of infectious gastroenteritis in United Kingdom and Ireland and is spread following contact with an infected person, contaminated surfaces or objects, or by consuming contaminated food or water. Being highly transmissible and stable in the environment, Norovirus is very contagious, requiring only a few virus particles to cause disease symptoms. Asymptomatic carriage is commonplace, making the control of outbreaks especially challenging within semi-closed environments such as hospitals, nursing homes, schools and cruise liners. As a general rule, isolates of Norovirus Genogroup I (GI) tend to be responsible for sporadic cases, whilst Genogroup II (GII) is normally responsible for outbreaks. Since the clinical symptoms of the disease (nausea, projectile vomiting and watery diarrhoea) are normally self-limiting within 1-2 days, cases of GI are less likely to be reported and therefore not often detected in the routine laboratory.

CONTAINER Use a CE/UKCA marked leak-proof specimen container with an integral spoon (brown top). 	
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	See point c in Special Instructions below. Depending on the number of tests requested, smaller samples may be accepted but may not be representative of the specimen as a whole and may affect the result.
SPECIAL INSTRUCTIONS	**Remember:** Norovirus studies are only performed on samples from patients on wards that the Infection Control Team have instructed the lab to test.

	a. Where possible, ask the patient to defaecate into a clinically clean bedpan or a container that has been sterilised with boiling water. Alternatively, plastic wrap may be placed over the opening to the toilet and the specimen can be produced onto the plastic wrap. b. Stool samples unavoidably contaminated with urine may be sent for microbiological investigation. c. Scoop enough material to fill a third of the specimen container using the spatula / spoon, incorporated in the specimen container. (In the case of liquid faeces, approximately 15mls should be collected). d. Examine the specimen for such features as colour, consistency and odour, and record your observations. The laboratory does not use the Bristol Stool Chart for the grading of faeces as the consistency of the faecal matter received by the laboratory is often not the same as it was when the sample was produced by the patient. The laboratory will grade the sample as liquid, semi formed or formed.
TURNAROUND TIME	Results for Norovirus are usually available within a few hours from the time the sample is received in the lab.

4.5.18.2 Faeces for Ova, Cysts and Parasites (OCP)

CONTAINER Use a CE/UKCA marked leak-proof specimen container with an integral spoon (brown top). 	
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	Depending on the number of tests requested, smaller samples may be accepted but may not be representative of the specimen as a whole and may affect the result.
SPECIAL INSTRUCTIONS	A concentrate for ova, cysts and parasites will also be performed where there is relevant history of foreign travel. It is therefore important to indicate foreign travel on the request form to allow the laboratory to undertake appropriate testing. The laboratory will test liquid samples for *Cryptosporidium* and *Giardia*.
TURNAROUND TIME	Final results will be available in 48 hours from receipt within testing laboratory.

4.5.18.3 Faeces samples for *Helicobacter pylori* Testing

CONTAINER Use a CE/UKCA marked leak-proof specimen container with an integral spoon (brown top). 	
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	See point c in Special Instructions below. Depending on the number of tests requested, smaller samples may be accepted but may not be representative of the specimen as a whole and may affect the result.
SPECIAL INSTRUCTIONS	NICE guidelines recommend the use of faecal antigen testing in diagnosis. Stool antigen testing has been proven to be a significant improvement over antibody testing and is both more sensitive and specific than serological tests. As such, this is now the only locally provided/in-county test for *H. pylori* provided by Path Links Microbiology. a. The patient should be prepared to produce the specimen as per the faeces instructions above. b. This is a stool antigen test which is a non-invasive enzyme immunoassay (EIA) test that has shown high sensitivity and specificity for both primary diagnosis and to confirm eradication. It detects the presence of *H. pylori.* c. The test cannot be performed within 2 weeks of taking a PPI (Protein Pump Inhibitor) or within 4 weeks of antibiotics as both these suppress bacteria and can cause false negatives.
TURNAROUND TIME	Final results will be available within a week from receipt.

4.5.18.4 Pinworm/threadworm detection

CONTAINER	Use a sellotape slide and transport to the laboratory in a slide carrier.
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	N/A
SPECIAL INSTRUCTIONS	a. Diagnosis of pinworm infection of the rectal canal is made by demonstrating *Enterobius vermicularis* ova. b. The ova are best detected using clear (not frosted) tape that is placed on a microscope slide after ova 'collection'. c. Optimal recovery of pinworm ova is best achieved if the specimen is obtained early in the morning prior to bathing or using the toilet. d. A 3 - 4 inch strip of tape, with the middle 2 inches of the sticky side should be applied to the perianal folds of a patient suspected of having pinworm infection. This is then placed adhesive side down on a

	microscope slide. The microscope slide should be labelled with the patient's details. e. Since the female worms migrate to the anus to deposit eggs on a sporadic basis, a series of four to six specimens may be necessary to demonstrate the infection. f. Adult female worms may be seen on the surface of stool specimens. However, routine diagnosis by faecal examination is unreliable because eggs are not introduced into the faecal stream, but are instead laid on the surface of the faecal material as it passes through the rectum.
TURNAROUND TIME	Final results will be available in 48 hours from receipt within testing laboratory

4.5.19 Urine

CONTAINER	Use an ISS CE/UKCA marked leak-proof container with Boric Acid (red top).  If sterile pyuria is indicated, both a white and red topped container should be sent in order that the laboratory can look for fastidious organisms  
Manufacturer's Pre-use Storage Instructions:	Red topped Boric acid containers must be stored room temperature. White topped plain universal: Not stated
MINIMUM SPECIMEN VOLUME	At least enough urine to dissolve the boric acid completely is required. Optimal volume = to fill line on container. The absolute minimum volume for microscopy, culture & sensitivity = 2ml.
SPECIAL INSTRUCTIONS	a. White topped urine containers will not be tested by the laboratory unless accompanied by a red topped boric acid containing sample for Sterile pyuria testing. It is important that the boric acid is not removed from red-topped urine containers in order that the laboratory can identify whether the specimen has or has not been sent in boric acid and an appropriate comment can be appended to the final result. b. Specimens of urine should be collected as soon as possible after the patient wakes in the morning and at the same time each morning if more than one specimen is required. c. Dispatch all specimens to the laboratory as soon after collecting as possible.
TURNAROUND TIME	Results of negative urines will be available within 24 - 48 hours of receipt. Results of positive urines will be available within 48 - 72 hours of receipt.

4.5.19.1 Guidance for the Interpretation of Urine Culture

The following matrix is intended for guidance only. Results should be interpreted in conjunction with the clinical picture.

Growth cfu/L	No. Isolates		Specimen type	Clinical details/microscopy influencing report*	Laboratory interpretation	Susceptibility testing recommended	Comments to consider
$\geq 10^8$	1		Any	None	Probable UTI	Yes	If old specimen or no pyuria consider repeat to confirm. Consider SPA or CCU if bag specimen
	2	Each org $\geq 10^8$ or $\geq 10^8$ and $\geq 10^7$	MSU, CCU, SCU, BAG	WBC present Symptomatic	Possible UTI – colonisation, faulty collection or transport	Yes	Consider repeat to confirm
			CSU, (IL)	Indwelling catheter Neurogenic bladder	Probable colonisation	No – consider keeping plates $\leq$ 5d in case patient becomes septic	Consider discuss if patient systematically unwell and therapy required
	2	1 organism predominant at $\geq 10^8$ or 10^7	Any	None	Possible ITU - ?colonisation, faulty collection or transport	Yes – predominant organism	If old specimen or no pyuria consider repeat to confirm. Consider SPA or CCU if bag specimen
	≥ 3	Mixed growth – none predominant	Any	None	Faulty collection or transport	No	Heavy mixed growth – probable contamination. Consider repeat if symptomatic
10^7 - 10^8	1		Any	WBC present Symptomatic	Possible UTI – patient evaluation necessary	Yes	Consider repeat to confirm
	2	1 predominant at $\geq 10^7$	Any	WBC present Symptomatic Children	Probable UTI with predominant species. 2nd isolate probable contamination	Yes – predominant organism but supress results	Consider repeat of SPA/CCU Sensitivities are available if required
		1 at $<10^7$ or -10^8 but not predominant		None	Probable contamination	No	Mixed growth – probable contamination
	≥ 3	1 organism predominant at $\geq 10^7$	Any	WBC present Symptomatic	Possible UTI with predominant species. Other probable contamination	No – keep plates $\leq$5d if catheter specimen in case patient becomes septic	Mixed growth – consider repeat if symptomatic
		Any combination	CSU	Indwelling catheter Neurogenic bladder	Colonisation	No – keep plates $\leq$5d in case patient becomes septic	Please discuss if therapy indicated
10^6 - 10^7	1		MSU, CCU, CSU, IL	Symptomatic female Prostatitis WBC present	Possible UTI – clinical evaluation necessary	Yes	Consider repeat to confirm
	2	Each org>10^6 including possible pathogen, e.g. E.coli	Any		Possible UTI – clinical evaluation necessary	Yes	Consider repeat to confirm
10^5 - 10^8	1		SPA, CYS, (SCU)	None	Probable UTI	Yes	
	2	Each $\geq 10^6$		WBC present	Probable UTI – patient evaluation necessary	Yes	
	≥ 3	1 organism predominant at $\geq 10^6$		WBC present	Probable UTI – patient evaluation necessary	Yes – predominant organism	Mixed growth: consider repeat to confirm
No Growth		i.e.: $<10^6$ if 1µL loop used $<10^5$ if 10µL loop used	Any	None or asymptomatic	No UTI		

Key to Specimen Types: MSU – Midstream specimen; CCU – clean catch; SPA – Suprapubic aspirate; IL – Ileal conduit; CSU – catheter; SCU – Single, intermittent catheter ("in and out"); CYS – Cystoscopy

4.5.19.2 Catheter specimen of urine (CSU)

CONTAINER Transfer catheter urine into an ISS CE/UKCA marked leak-proof container with Boric Acid (red top). 	
Manufacturer's Pre-use Storage Instructions:	Red topped Boric acid containers must be stored room temperature. White topped plain universal: Not stated
MINIMUM SPECIMEN VOLUME	At least enough urine to dissolve the boric acid completely is required. Optimal volume = to fill line on container. The absolute minimum volume for microscopy, culture & sensitivity = 2ml.
SPECIAL INSTRUCTIONS	a. White topped urine containers will not be tested by the laboratory unless accompanied by a red topped boric acid containing sample for Sterile pyuria testing. It is important that the boric acid is not removed from red-topped containers in order that the laboratory can identify whether the specimen has or has not been sent in boric acid and an appropriate comment can be appended to the final result. b. A sample of freshly voided urine should be taken from the sample port – not from the catheter bag. c. The use of clamps is not recommended as the removal of the clamps at the end of the procedure can easily be forgotten. However, if required, if there is no urine in the tubing, clamp the tubing below the rubber cuff / access port until sufficient urine collects. The clamp must be removed at the end of the procedure. d. Clean the access point with an isopropyl alcohol swab and using a sterile syringe (and needle if necessary) aspirate 10-15ml urine. e. Re-clean the access point with an isopropyl alcohol swab and place the urine sample into the container as described in (a).
TURNAROUND TIME	Results of negative urines will be available within 24 - 48 hours of receipt. Results of positive urines will be available within 48 - 72 hours of receipt.

4.5.19.3 Midstream specimen of urine (MSU): male

CONTAINER Use an ISS CE/UKCA marked leak-proof container with Boric Acid (red top). 	
Manufacturer's Pre-use Storage Instructions:	Red topped Boric acid containers must be stored room temperature. White topped plain universal: Not stated
MINIMUM SPECIMEN VOLUME	At least enough urine to dissolve the boric acid completely is required. Optimal volume = to fill line on container. The absolute minimum volume for microscopy, culture & sensitivity = 2ml.
SPECIAL INSTRUCTIONS	a. White topped urine containers will not be tested by the laboratory unless accompanied by a red topped boric acid containing sample for Sterile pyuria testing. It is important that the boric acid is not removed from red-topped containers in order that the laboratory can identify whether the specimen has or has not been sent in boric acid and an appropriate comment can be appended to the final result.

	b. Retract the prepuce and clean the skin surrounding the urethral meatus with soap and water or 0.9% sodium chloride solution. c. Ask the patient to direct the first and last part of his stream into a urinal or toilet but to collect the middle part of his stream into the container as described in (a).
TURNAROUND TIME	Results of negative urines will be available within 24 - 48 hours of receipt. Results of positive urines will be available within 48 - 72 hours of receipt.

4.5.19.4 Midstream specimen of urine (MSU): female

CONTAINER Use an ISS CE/UKCA marked leak-proof container with Boric Acid (red top). 	
Manufacturer's Pre-use Storage Instructions:	Red topped Boric acid containers must be stored room temperature. White topped plain universal: Not stated
MINIMUM SPECIMEN VOLUME	At least enough urine to dissolve the boric acid completely is required. Optimal volume = to fill line on container. The absolute minimum volume for microscopy, culture & sensitivity = 2ml.
SPECIAL INSTRUCTIONS	a. White topped urine containers will not be tested by the laboratory unless accompanied by a red topped boric acid containing sample for Sterile pyuria testing. It is important that the boric acid is not removed from red-topped containers in order that the laboratory can identify whether the specimen has or has not been sent in boric acid and an appropriate comment can be appended to the final result. b. If necessary, clean the urethral meatus with soap and water or 0.9% sodium chloride solution. c. Use a separate cotton-wool ball for each cleansing swab. d. Clean from the front to the back. e. Ask the patient to micturate into a bedpan or toilet. Ideally the labia should be held apart with freshly washed hands. Place a sterile receiver or a wide mouthed container under the stream and remove before the stream ceases. f. Transfer the specimen into the container as described in (a) above.
TURNAROUND TIME	Results of negative urines will be available within 24 - 48 hours of receipt. Results of positive urines will be available within 48 - 72 hours of receipt.

4.5.19.5 24-hour Urine Collection

Please see the Chemical Pathology User Guide for details of 24-hour urine collection.

4.5.19.6 Early Morning Urine (EMU) for TB Investigations

CONTAINER	Use special CE/UKCA marked leak-proof 250ml EMU sample containers specifically for TB investigations from urine.
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	N/A. 3 complete EMUs required.

SPECIAL INSTRUCTIONS	a. Testing for TB from urine requires 3 complete early morning urines taken on consecutive days. b. The patient should be prepared to take the specimen as per the MSU instructions above. c. The specimen required is the first urine passed upon waking. d. The entire specimen should be produced into the specimen container. e. Ideally, the samples should be transferred to the pathology laboratory as soon as they are produced.
TURNAROUND TIME	TB culture takes up to 12 weeks.

4.5.19.7 Urine for Pneumococcal Urinary Antigen Testing & Legionella Antigen Testing

The commercially available pneumococcal and legionella urinary antigen testing kits are now sufficiently sensitive and specific to warrant their use in severe community-acquired pneumonia (CAP) investigations.

The British Thoracic Society Guidelines for the Management of Community-Acquired Pneumonia in Adults was updated in 2009 and the routine use of urinary antigen kits as part of the investigation of severe CAP was recommended.

The routine use of these tests is **NOT** recommended for non-severe CAP. Please do not request urinary antigen testing for non-severe CAP unless agreed with the Consultant Microbiologist.

CONTAINER 30ml CE/UKCA marked leak-proof container (white top) supplied by the laboratory 	
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	1ml. Optimal volume = to fill line on container.
SPECIAL INSTRUCTIONS	a. Please telephone the laboratory to alert them to the sample. b. A freshly voided urine sample should be provided. c. Please **do not send multiple samples on the same patient,** these tests are expensive and multiple results will not affect clinical management.
TURNAROUND TIME	Results are available on the day of receipt of the sample in the testing laboratory.

4.5.19.8 Urine for Schistosomiasis

CONTAINER 30ml CE/UKCA marked leak-proof container (white top) supplied by the laboratory 	
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	Optimal volume = to fill line on container with terminal portion of the specimen. Minimum volume = 10ml.
SPECIAL INSTRUCTIONS	a. Boric Acid (red top) containers must not be used. b. The patient should be prepared to take the specimen as per the MSU instructions above. c. In patients with haematuria, eggs maybe found trapped in the blood and mucus in the terminal portion of the urine specimen. Peak egg excretion occurs between noon and 2pm. Therefore, collect a terminal specimen of urine at around midday in a sterile container.
TURNAROUND TIME	Final results will be available in 48 hours from receipt within testing laboratory.

4.5.20 Semen

The Microbiology laboratories only process semen samples where infection is suspected. Post vasectomy and infertility specimens are processed by the Andrology department.

CONTAINER Use a 60ml wide necked CE marked leak-proof container. 	
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	N/A. Full ejaculate required.
SPECIAL INSTRUCTIONS	a. A fresh masturbated specimen must be collected in a sterile container and delivered to the laboratory as soon as possible after of the collection of the specimen. b. Avoid the use of lotions, lubricants and condoms to take the sample as these may contain antimicrobial agents or introduce contamination into the specimen. c. Avoid using all forms of sexual intercourse to aid in the collection of the sample as this can introduce contamination into the specimen.
TURNAROUND TIME	Final results on negative samples are usually available 48 hours after receipt. In some circumstances anaerobic cultures and susceptibility testing on potential pathogens may result in the report being issued after 48 hours.

4.5.21 Antibiotic assays

These samples are not processed in Microbiology. Please see Section 5 – Antibiotic Assays.

4.5.22 Antral washings

CONTAINER Use a plain 30ml CE/UKCA marked leak-proof container (white top) to transfer the antral washings into. 	
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	As much liquid specimen as possible, preferably between 2 – 5 ml. Do not overfill container.
SPECIAL INSTRUCTIONS	a. Ideally an ENT surgeon should collect the specimen. b. Transfer to the specimen container. Ensure the cap is tightly screwed on.
TURNAROUND TIME	Final results on negative samples are usually available 48 hours after receipt. In some circumstances anaerobic cultures and susceptibility testing on potential pathogens may result in the report being issued after 48 hours.

4.5.23 Aspirates and fluids from normally sterile sites

CONTAINER Use a plain 30ml CE/UKCA marked leak-proof container (white top) to transfer the aspirate and fluids from normally sterile sites into. 	
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	As much liquid specimen as possible, preferably between 2 – 5 ml. Do not overfill container.
SPECIAL INSTRUCTIONS	a. Collect the specimen with a sterile syringe. b. Transfer a maximum of 20ml into the container. Ensure the cap is tightly screwed on. c. Where only very small amounts of fluid are aspirated into the syringe, the syringe can be capped off and sent to the laboratory for processing. **Under no circumstances should the needle be sent with the syringe – this must be removed prior to transport to the lab.**
TURNAROUND TIME	Final results on negative samples are usually available 48 hours after receipt. In some circumstances anaerobic cultures and susceptibility testing on potential pathogens may result in the report being issued after 48 hours.

4.5.24 Cerebro-Spinal Fluid (CSF)

Whether during the routine working day or 'out-of-hours', the testing laboratory MUST be contacted when sending a CSF specimen. ***(This also applies if testing is to be undertaken by another Pathology discipline eg protein & glucose testing by Blood Sciences (Chemical Pathology))***

The clinician taking the CSF specimen is required to phone the technical staff at the testing laboratory to inform them that the sample has been taken and appropriate advice and/or urgent transport can be arranged by the laboratory.

CSF Samples must NEVER be sent through the air tube system.

It is vital that the correct CSF specimens are sent to the laboratory for investigation, since a second identical specimen is rarely available and involves a second unpleasant and potentially dangerous diagnostic procedure.

3 specimens are required:

- Specimen 1 and 3 should be sent to Microbiology for microscopy and culture.
- Specimen 2 will be processed in Blood Sciences. Refer to the Chemical Pathology Handbook (available on the Path Links hub via NLAG intranet) for more specific information about CSF samples for protein, glucose and Xanthochromia.

Under no circumstances should CSF samples from patients with possible CJD be sent to the laboratory without prior discussion with the Consultant Microbiologist.

CONTAINER 30ml CE/UKCA marked leak-proof container (white top) supplied by the laboratory 	
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	As much liquid specimen as possible. Due to the limits of sample collection, not all tests requested may be performed. Optimal sample volume = 2 – 5ml.
SPECIAL INSTRUCTIONS	a. CSF-obtained either by subdural tap, ventricular aspiration or lumbar puncture should be obtained by the clinician under sterile operative conditions. b. Ideally, CSF should be collected sequentially into 3 30ml CE/UKCA marked (white top) containers labelled 1, 2 and 3. c. Microbiology will usually only process the 3rd, keeping the other specimens unopened in case molecular testing is required at a later date. d. If there is a clinical suspicion of subarachnoid haemorrhage (SAH), the testing laboratory will process the 1st and 3rd samples. e. For certain neurological conditions, only a cell count may be required. If this is the case, please identify this clearly on the request, otherwise a culture will be processed by default.

	f. NB – the Microbiology laboratory does not offer a spectrophotometric assay for xanthochromia. This test is performed in the Blood Sciences department on the 4th specimen (which must be protected from the light during transport). Please see Chemical Pathology User Guide for further information. g. Requests for PCR will be vetted by the Microbiology Consultants before they can be referred, unless they meet specific laboratory criteria.
TURNAROUND TIME	Microscopy results (cell count and Gram Stain) are usually available within an hour of receipt into the laboratory Culture results on negative samples are usually available 48 hours after receipt. In some circumstances anaerobic cultures and susceptibility testing on potential pathogens may result in the report being issued after 48 hours.

4.5.25 Intravascular devices (Line Tips)

CONTAINER 30ml CE/UKCA marked leak-proof container (white top) supplied by the laboratory 	
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	N/A
SPECIAL INSTRUCTIONS	a. Line infection is confirmed by semi-quantitative culture of a removed line. b. After removing a possibly infected line from a patient, cut off the intravascular portion using sterile scissors and place it into the container. c. If infection is suspected in a long line send the intravascular portion immediately adjacent to the exit site and the tip in separate sterile universal containers. d. Urinary catheter tips are **NOT** processed. Please send a urine sample.
TURNAROUND TIME	Final results on negative samples are usually available 48 hours after receipt in the testing laboratory. In some circumstances anaerobic cultures and susceptibility testing on potential pathogens may result in the report being issued after 48 hours.

4.5.26 MRSA Screens

CONTAINER Bacteriological swab containing Amies charcoal transport medium (black gel). 	
Manufacturer's Pre-use Storage Instructions:	Store at 5^0C – 25^0C
MINIMUM SPECIMEN VOLUME	N/A. Ensure swab fully rotated on site of specimen to maximise material collection on to swab.
SPECIAL INSTRUCTIONS	These swabs are taken on the advice of the Infection Control team or to comply with hospital protocols. They are taken to ascertain whether a patient is colonised or has an MRSA infection. • **Nasal** – Rotate the swab gently but firmly around the anterior nares of each nostril. One swab can be used for both nostrils. • **Groin** – Rotate the swab gently but firmly over each area. One swab can be used for both groins. • **Wound swabs (from devices/ulcers etc)** – Rotate the swab gently but firmly over each area.
TURNAROUND TIME	Final results on negative samples are usually available 24 hours after receipt in the testing laboratory. In some circumstances susceptibility testing on potential pathogens may result in the report being issued after 24 hours.

4.5.27 Peritoneal dialysis fluid

CONTAINER 30ml CE/UKCA marked leak-proof container (white top) supplied by the laboratory 	
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	See point b in Special Instructions below.
SPECIAL INSTRUCTIONS	a. Using a fine needle and syringe, aspirate fluid from the peritoneal dialysis bag. b. Transfer 20ml of this fluid into the container. c. Ensure the cap is tightly screwed on and send to the laboratory.
TURNAROUND TIME	Final results on negative samples are usually available 48 hours after receipt in the testing laboratory. In some circumstances anaerobic cultures and susceptibility testing on potential pathogens may result in the report being issued after 48 hours.

4.5.28 Skin, Nail and Hair for Mycology

CONTAINER Use a special Mycotrans envelope for mycological specimens. If these are unavailable, use a plain 30ml CE/UKCA marked leak-proof container (white top).	 
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	As much material as possible from infected areas. Small specimen collections will limit the number of agar inoculations possible in the laboratory and may affect the result.
SPECIAL INSTRUCTIONS	• **Skin** – Patients' skin and nails can be cleaned wit 70% alcohol prior to collection of the specimen. This is especially important if creams, lotions or powders have been applied. Skin scrapings should be taken by gently shaving off material from the active edges of the lesion using a blunt scalpel blade. • **Nails** – Material should be taken from any discoloured, dystrophic or brittle parts of the nail. The affected nail should be cut as far back as possible through the entire thickness and should include any crumbly material. Take nail scrapings if the infection is superficial. • **Hair** – Hairs should be plucked from affected areas together with skin scrapings from associated scalp lesions. Cut hairs are not suitable for direct examination as the infected area is usually close to the scalp surface. At least 5mm of skin scrapings are required.
TURNAROUND TIME	Final results on negative samples are usually available 3 weeks after receipt in the testing laboratory. In some circumstances re-culture and ID techniques on potential pathogens may result in the report being issued after 3 weeks.

4.5.29 Tissues and biopsies

CONTAINER	For hospital theatre users a microbiology sterile pack is available in theatre stores. Please place the sample aseptically in the 30ml CE/UKCA marked leak-proof container which contains 5ml sterile saline and beads. Further packs are obtainable on request from Microbiology at Boston and Scunthorpe. 
	For other users please use a plain 30ml CE/UKCA marked leak-proof container (white top). 
nufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	N/A. The tests the laboratory is able to perform may be limited by small specimen volume.
SPECIAL INSTRUCTIONS	a. Under aseptic conditions transfer material to the container (formalin should not be used as this rapidly inactivates pathogens and the specimen will be unsuitable for microbiological examination). b. If a plain 30ml sterile universal is used then please add 0.5ml of sterile saline to the container to prevent the tissue drying out in transit. Sterile pack containers already contain the sterile saline and do not require this step.
TURNAROUND TIME	Final results on negative samples are usually available 48 hours after receipt in the testing laboratory. In some circumstances anaerobic cultures and susceptibility testing on potential pathogens may result in the report being issued after 48 hours.

4.5.30 Bone Marrow

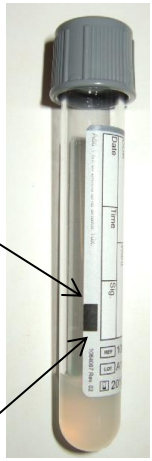
This is a specialist procedure. Please refer to the Consultant Haematologist for advice and protocols for taking such specimens.

CONTAINER Use a plain 30ml CE/UKCA marked leak-proof container (white top) to send the sample to the laboratory. 	
Manufacturer's Pre-use Storage Instructions:	Not stated
MINIMUM SPECIMEN VOLUME	As large a sample as possible. However, specimens of >3ml are likely to be contaminated with peripheral blood giving a dilution effect.
SPECIAL INSTRUCTIONS	Cap the container tightly and transport immediately to the laboratory.
TURNAROUND TIME	Final results on negative samples are usually available 48 hours after receipt in the testing laboratory. In some circumstances anaerobic cultures and susceptibility testing on potential pathogens may result in the report being issued after 48 hours.

4.5.31 Quantiferon TB Gold specimens

This is best performed in Phlebotomy or hospital Occupational Health Departments as the correct blood draw is critical for this test. Over or under filled tubes cannot be tested and a repeat will be required.

Routinely samples can only be accepted when taken and received into the laboratory on a Monday, Tuesday, Wednesday and Thursday. If this is not possible please contact the laboratory to discuss alternative arrangements.

CONTAINER Use the specific 4-tube Quantiferon blood collection tube set. 	
Manufacturer's Pre-use Storage Instructions:	Store at 4^0C – 25^0C
MINIMUM SPECIMEN VOLUME	Between 0.8 – 1.2ml per tube required. (See fill line on specimen container.)
SPECIAL INSTRUCTIONS	a. Ensure that tubes are at room temperature (17-25^0C) before filling. Care must be taken not to mix the Quantiferon tubes up with other blood collection tubes. b. For each patient collect 1ml of blood by venepuncture directly into each of the 4 Quantiferon collection tubes. <u>Note 1</u>. As the 1ml tubes draw blood relatively slowly, keep the tube on the needle for 2-3 seconds once the tube appears to have completed filling to ensure the correct volume is drawn. <u>Note 2.</u> The black mark on the side of the tubes indicates the fill volume. This method has been validated for volumes ranging from 0.8 to 1.2ml. If the level of blood in any tube is not within the indicator line, it is recommended to repeat the test. i.  **Illustration of minimum (0.8mL) and maximum (1.2mL) volumes required for testing. Tubes containing too little or too much blood are unsuitable for testing.**

	c. If a 'butterfly needle' is being used to collect blood, a purge tube should be used to ensure that the tubing is filled with blood prior to the Quantiferon TB tubes being used. d. Immediately after filling tubes, invert them 10 times just firmly enough to ensure the entire inner surface of the tube is coated with blood. NB. Over-energetic shaking may cause gel disruption and could lead to aberrant results. e. Label the tubes appropriately and send them to the laboratory as soon as possible. The tubes and request form must be sent to the Microbiology laboratory within 16 hours of collection. f. Do not refrigerate or freeze the blood samples.
TURNAROUND TIME	5 working days after receipt in the testing laboratory

4.5.32 Blood Sample for Mycobacterium chimera

CONTAINER	3.2% sodium citrate blood tube 
Manufacturer's Pre-use Storage Instructions:	Store at 4^0C – 25^0C
MINIMUM SPECIMEN VOLUME	4ml
SPECIAL INSTRUCTIONS	Follow routine phlebotomy guidelines.
TURNAROUND TIME	6 weeks

4.5.33 Viral Serology

CONTAINER	Please see VACUETTE® selection chart or guidance. **Adult**  **Paediatric** 
Manufacturer's Pre-use Storage Instructions:	Store at 4^0C – 25^0C
MINIMUM SPECIMEN VOLUME	See point e in Special Instructions below. If multiple tests are required, it is preferable to send 2 vials of clotted blood.
SPECIAL INSTRUCTIONS	a. Samples which are highly haemolysed or hyperlipaemic should not be sent. b. The Laboratory is unable to process samples received in Lithium Heparin tubes. The Heparin may participate in the reaction yielding aberrant results. c. It is very important to give full clinical details, including any recent exposure; travel history and onset date so that the correct tests are selected. It is not helpful to request simply "Serology" or "Virology". The more information that is provided, the more useful the results will be.

	d. Failure to provide relevant clinical information may introduce an unnecessary delay since such samples will be stored pending relevant clinical information. e. Where there is difficulty in selecting the appropriate investigations, it is always best to discuss with a Consultant Medical Microbiologist. f. In general, 3.5ml of clotted blood (ochre top) is required (minimum 1ml per test). Paediatric samples can be sent in a paediatric tube.
TURNAROUND TIME	On site tests- 5 working days after receipt in the testing laboratory. Referred tests see section 7.1

4.5.34 Molecular (PCR) Tests on Blood Samples

CONTAINER	Please see VACUETTE® selection chart for guidance. **Adult**  **Paediatric** 
Manufacturer's Pre-use Storage Instructions:	Store at 4^0C – 25^0C
MINIMUM SPECIMEN VOLUME	See point d in Special Instructions below. If multiple tests are required, it is preferable to send 2 vials of EDTA.
SPECIAL INSTRUCTIONS	a. Samples which are highly haemolysed or hyperlipaemic should not be sent. b. It is very important to give full clinical details, including any recent exposure; travel history and onset date so that the correct tests are selected. It is not helpful to request simply "Serology", "Virology" or "PCR". The more information that is provided, the more useful the results will be. c. Failure to provide relevant clinical information may introduce an unnecessary delay since such samples will be stored pending relevant clinical information. d. Where there is difficulty in selecting the appropriate investigations, it is always best to discuss with a Consultant Medical Microbiologist. e. Most PCR tests (e.g. to diagnose meningococcal infections or CMV require a 3.5ml EDTA specimen. Paediatric samples can be sent in a paediatric EDTA tube. If in doubt, contact the Serology department.
TURNAROUND TIME	On site tests- 5 working days after receipt in the testing laboratory. Referred tests see section 7.1

4.5.35 Viral Load Testing (HIV, HCV and HBV)

CONTAINER	Please see VACUETTE® selection chart for guidance. **Adult**  **Adult**  **Paediatric** 
Manufacturer's Pre-use Storage Instructions:	Store at 4^0C – 25^0C
MINIMUM SPECIMEN VOLUME	Adult- K2E K2EDTA Separator 5ml, EDTA 3.5ml x 2. Paediatric EDTA x2
SPECIAL INSTRUCTIONS	a. The preferred sample type for HCV and HBV viral loads is an EDTA but clotted/ SST blood can be used. b. Viral load testing should not be used for screening. c. The sample must be sent to the laboratory within 24 hours of collection. d. Failure to provide relevant clinical information may introduce an unnecessary delay since such samples will be stored pending relevant clinical information.
TURNAROUND TIME	5 working days after receipt in the testing laboratory.

4.5.36 Molecular (PCR) Tests on other Samples

CONTAINER	Viral Transport Media- Oropharyngeal, nasopharyngeal, eye, buccal and vesicle swabs. 	Dry swabs. A+E rapid SARS-CoV-2 testing only. 	Sterile white topped universal: Urine, BAL, CSF and tissue. 
Manufacturer's Pre-use Storage Instructions:	Viral transport media (VTM) Store at 2^0C – 30^0C Dry swabs not stated White Top Universal not stated		
MINIMUM SPECIMEN VOLUME	Not applicable for VTM Urine, BAL and CSF- 0.5-1.0 ml		
SPECIAL INSTRUCTIONS	a. It is very important to give full clinical details, including any recent exposure; travel history and onset date so that the correct tests are selected. It is not helpful to request simply "Serology", "Virology" or "PCR". The more information that is provided, the more useful the results will be. b. Failure to provide relevant clinical information may introduce an unnecessary delay since such samples will be stored pending relevant clinical information. c. Where there is difficulty in selecting the appropriate investigations, it is always best to discuss with a Consultant Medical Microbiologist.		

	d. For collection of swabs from vesicular lesions a sterile needle should be used to lift the edge of the lesion. Rub the base of the lesion with the swab to collect vesicle fluid. e. Eye swabs requiring Chlamydia trachomatis/Neisseria gonorrhoea (CT/NG) PCR must have a separate swab collected and sent in an Abbott Multi-collect Transport Tube. f. Dry swabs for rapid SARS-CoV-2 swabs must be sent to the laboratory within one hour. Samples can be sent in the air tube system.
TURNAROUND TIME	On site tests: 5 working days after receipt in the testing laboratory. Referred tests: See section 7.1

4.5.37 Corneal scrape

CONTAINER	Use a corneal scraping kit that contains agar plates and a slide with slide holder. These are available locally or can be ordered from the Microbiology laboratories.
Manufacturer's Pre-use Storage Instructions:	Store at 2^0C – 8^0C
MINIMUM SPECIMEN VOLUME	N/A. The laboratory requires as much material as possible for inoculation onto slide and agar plates.
SPECIAL INSTRUCTIONS	a. The corneal scrape should be undertaken by an ophthalmologist in a clinical setting. b. The use of fluorescein on a patient before the sample has been collected may affect the results. c. The corneal scrape material should be inoculated onto the agar plates and microscope slide. d. The agar plates and microscope slide should be labelled with the patient details and sent to the laboratory.
TURNAROUND TIME	Final results on negative samples are usually available 48 hours after receipt. In some circumstances anaerobic cultures and susceptibility testing on potential pathogens may result in the report being issued after 48 hours.

4.5.38 Blood cultures

a. Manufacturer's pre-use storage instructions for uninoculated blood culture bottles = 15^0C – 30^0C. Storage below these temperatures may result in delicate organisms experiencing cold shock which may affect the result.

b. Use either a pair of blood culture bottles (aerobic and anaerobic) or a paediatric bottle as required. There may also be a proprietary blood culture collection pack available with all of the equipment required for taking the blood cultures. Alternatively, the elements may be available individually in the ward.

c. For patients with central lines *in situ*, a sample must be taken from the central line and in addition a peripheral stab sample must also be submitted at the same time to facilitate meaningful interpretation of the results.

d. It is desirable to sample the blood when the bacterial population is at its peak. The best indication for this is the patient's temperature: Positive results are more likely if the blood is taken when the temperature is rising. It is better taken when the temperature is falling.

e. If the patient is afebrile, which occasionally occurs in bacteraemia, there is no indication of the optimum time for culture. A positive culture is then most likely to be achieved if three blood cultures are taken at intervals on the same day. (NB: Not all patients with bacteraemia have a fever. Blood cultures should still be obtained before administering antibiotics.)

f. Blood cultures are stable at room temperature and there is NEVER any need to taxi them between laboratories. They are quite safe to travel on the next routine transport.

g. The system's efficiency depends on the quality of the sample. The following key points can help to ensure a good quality test result:

- Fill aerobic bottle (blue) first.
- Collect the blood culture before any other blood tests are taken and don't inject or withdraw blood through the disinfectant used to clean the patient's skin or the cap of the blood culture bottle.
- Take the sample before antibiotics are administered where possible.
- Don't over fill the bottle – this will lead to false positives.
- Don't tear off any barcodes; these are needed in the laboratory.

4.5.38.1 Procedure for taking a blood culture sample

Equipment preparation:

- Wash and dry your hands with soap and water thoroughly.
- Gather all equipment: either a proprietary blood culture pack or individual components (See Step 1 below)
- Ensure additional labels do not obscure the barcodes on the blood culture bottle and that any tear–off barcode labels are not removed.
- Check the bottom of the blood culture bottle and do not use if there is a central yellow spot that indicates the bottle is contaminated.

a. **Step 1** – Prepare to take the specimen

- Wash hands with soap and water and dry thoroughly.
- Equipment required (if no proprietary blood culture collection kit available):

Sterile pack
Safety butterfly with holder
Sterets/Chloraprep
Blood culture bottles (blue top aerobic & purple top anaerobic)
Tourniquet
Microbiology request form
Clean injection tray with sharps bin attached

- Take equipment and identify patient, explain procedure to the patient and gain consent for the procedure.
- Place instrument tray and blood culture bottles upright on a secure surface.
- Flick off plastic cap on culture bottles with fingers clean rubber top of each blood culture bottle with an individual alcohol wipe and leave to air dry.
- Open sterile pack onto tray and then open butterfly set. Prepare a length of tape to secure butterfly onto patient's arm.
- Clean your hands again.
- Apply tourniquet (if taking further blood samples, release within 1 – 2 minutes).
- Select vein and clean venepuncture site with steret/chloraprep solution for 30 seconds. Allow to air dry completely to kill skin flora bacteria.
- Whilst skin is drying put on sterile gloves.

b. **Step 2** – Taking of the specimen

- Taking hold of the butterfly needle flanges between thumb and forefinger, place the holder in palm of hand.
- Puncture the vein with butterfly needle.
- Secure butterfly in place with tape across the flanges – this allows the needle to retract into the safety shield at end of procedure.
- Your fingertips are now not sterile, so ensure you do not touch the bottle top. Keeping the culture bottle upright pick up aerobic bottle away from the cap and place into the butterfly holder.
- Position holder and bottle below puncture site to prevent reflux of culture medium back into vein.
- Fill the aerobic (blue top) bottle with 8-10mls of blood (see scale gradient on the side of the bottle.
- Repeat this process with the anaerobic bottle (purple top).
- Be aware the bottles are not a pre-set vacuum and will continue to fill beyond the amount required.
- Having taken both samples of blood for culture any further blood samples required can now be taken following the order of the draw.

c. **Step 3** – Removal of butterfly needle

- Place a piece of gauze over the puncture site and needle. Hold gently with the forefinger, then place your thumb of the same hand on the butterfly flanges. With the other hand, press on both sides of the safety hub.

- Maintain gentle pressure on the butterfly flanges (not the needle), carefully slide the safety hub backwards. As the needle retracts and leaves the skin, press firmly on the puncture site to stop the bleeding.

- An audible click confirms the needle is completely locked in the shield (if no click is heard, the needle will still be exposed and you are potentially at risk of a needle stick injury.

- Dispose of the butterfly set immediately into a sharps container

- Remove gloves and wash your hands.

4.5.38.2 Paediatric Bottles

These bottles contain a larger volume of 30ml of clear liquid media that contains absorbent polymeric beads. This formulation is designed to enhance the performance of the culture only. Storage of pre-inoculated bottles remains the same: store at room temperature away from direct sunlight. Inoculation procedures also remain the same: inoculate with 4ml of patient blood and transport to the microbiology without delay.

4.5.38.3 Other normally sterile fluids

Other normally sterile fluids may be inoculated into blood culture bottles. However, the fact that a fluid has been inoculated into the bottles and not blood must be clearly indicated on the request form. Fluids with a high white cell count, when inoculated into blood culture bottles, may lead to the blood culture analyser signalling the bottles as falsely positive as the respiration of the white cells mimics CO2 production by bacteria (the process detected by the analyser).

4.5.38.4 Turnaround times

Specimens in blood culture bottles are incubated on an automated analyser for up to 5 days. An interim negative result will be automatically generated after the sample has been on the analyser for 24 hours, and a final result will be automatically generated after 5 days. At any point during incubation, the sample may flag as positive. In general, culture results from positive blood culture bottles become available 48 hours after the bottle has signalled positive. Reports on highly unusual or resistant organism may take longer to release.

4.5.39 Endophthalmic Specimens & Sharps

As a general rule, “sharps” represent an unacceptable hazard to the laboratories and any sample found to contain one will be discarded untested, the sender notified and an incident form will be raised to report a breach of Health & Safety rules.

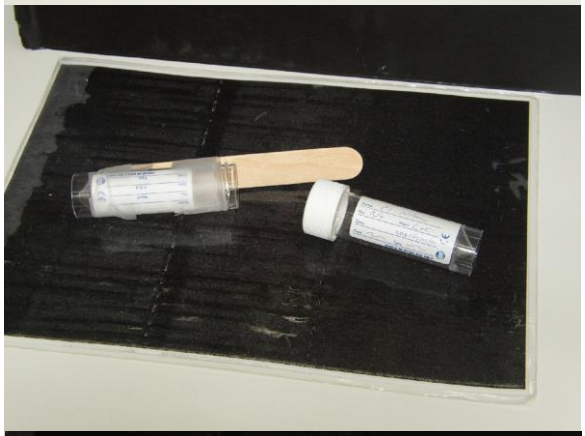
There are, however, a small number of instances where, not only is a “sharp” acceptable in the laboratory, due to the nature and small volume of the sample, sending a sharp may actually be required because the specimen may actually be inside the needle itself. The commonest situation where this arises is in the sending of intra-ocular samples.

4.5.39.1 Procedure

This procedure must be strictly followed in order to maximise both diagnostic accuracy and staff safety.

1. Telephone the laboratory in advance and advise them to expect such a specimen. If outside routine laboratory hours, this will also ensure that there is somebody there to process the sample.

2. Obtain the following equipment: Two plain (white topped), sterile universal containers, a wooden tongue depressor and a roll of surgical tape.



3. Tape the tongue depressor to one of the universals as shown. Label the second universal with the relevant patient details.

4. Place the syringe in the labelled universal needle first, taking care not to touch the outside of the universal with the syringe/needle.

   DO NOT ATTEMPT TO RE-SHEATH THE NEEDLE UNDER ANY CIRCUMSTANCES.

5. Tape the first universal and tongue depressor securely to the second universal to form a rigid cylinder that is closed at both ends, as shown below. Complete the request form and transport to the laboratory as fast as possible.

DO NOT USE AIR TUBE

5 Antibiotic Assays

Routine levels of Vancomycin, Gentamicin and Tobramycin are performed in Path Links Blood Sciences laboratories. Guidance for instructions as to how and when to monitor can be found in the Path Links Antibiotic Formulary and Prescribing Advice for Adult Patients and also for Paediatric patients other than neonates. Current versions of each of these documents are available on the NLAG Hub and ULH Intranet.

Assays for other antimicrobials such as co-trimoxazole (Sulphamethoxazole-Trimethroprim), Teicoplanin, Amikacin, Streptomycin, Daptomycin and others are available by prior arrangement with the laboratory. As a rule, these assays are only available Monday to Thursday because they are required to be sent out of county.

6 Virological Investigations

6.1 Introduction

The majority of specimens received in our laboratories are tested by our Serology laboratory at Scunthorpe. A small proportion of requests that require specialist equipment or expertise will be referred on to a specialist reference laboratory for testing.

A list of requests referred to specific reference laboratories is provided in Section 7 Referred Investigations**.**

The tests carried out locally will be either performed daily or "batched" and carried out once, twice or three times a week. As a result these tests will generally have a much faster turnaround time (TAT) than those the laboratory has to refer on to a specialist reference laboratory for testing.

The tests performed on the samples received in the laboratory usually fall into 2 categories:

- Tests to identify a possible Microbiological cause for the patient's current condition i.e. identify the causative agent.
- Tests to confirm immunity of previous exposure to one of many infectious agents.
- Screening (eg antenatal or Occupational Health)

6.2 Virological Diagnosis

This is usually made by:

a. Examination of a single serum sample can help in establishing a diagnosis in certain cases where tests are available. Detection of specific IgM during the first 8 weeks of illness indicating a recent infection with that particular agent (eg Hepatitis A IgM, EBV IgM, Parvovirus IgM).

b. Demonstration of specific markers in the blood by ELISA. (eg HBsAg, HIV Ab /Ag)

c. Detection of virus by PCR

6.3 Confirmation of Immunity/Past Infection

This is normally made by testing a single serum sample for specific IgG antibody (eg Hepatitis A IgG, Rubella IgG, Measles IgG, VZ IgG).

6.4 General Instructions

Samples for SARS-CoV-2 PCR in Viral Transport Media **MUST** not be sent by the air tube system.

All urgent samples must be notified to the laboratory as per guidance in Section 1 of this document. Urgent specimens can be sent to the Virology Reference Laboratory by quicker means of transport provided the request is made by a Consultant.

Specimens should be collected into the appropriate leak-proof container, clearly labelled and accompanied by a properly filled request form containing adequate patient identifiers. (See Section 3 Request Form & Sample Labelling.)

If numerous in-house tests, or a mixture of in-house and referred away tests are required, please send 2 appropriate 4ml blood samples.

In general, all specimens should be sent to the laboratory with a minimum of delay.

6.5 Varicella Zoster Test

For immunosuppressed patients in contact with a vesicular rash please contact Consultant Microbiologist to discuss.

For pregnant women in contact with a case of vesicular rash please contact the serology laboratory, it may be possible to test the patients booking blood for immunity.

Please provide the following information; this will enable the Consultant Microbiologist to give an opinion on the results

- Requester-including direct dial or mobile phone number and OOH contact details.
- Gestation- Date of contact
- Date of rash in index case
- Type of VZ disease in the index case.
- Duration of contact

6.6 Blood-borne virus exposure

Please see the Trust guidelines available on the intranet.

Please ensure the Source patient is clearly marked on the request form to prevent delays in testing.

6.7 Virology Specimen Collection – Procedure Guidelines

See section 4.5

6.8 In-house Tests

The table below provides information regarding assays performed on requests received, the appropriate sample to collect and usual turnaround time of results.

REQUEST	ASSAY PERFORMED	SAMPLE TYPE	PERFORMED AT	TURNAROUND TIME FROM RECEIPT
Chlamydia	Chlamydia PCR	First void urine sample or swab in Cobas PCR media	Scunthorpe	Within 5 working days
CMV immunity	CMV IgG	2 - 4mls Clotted blood	Scunthorpe	Within 5 Working days
CMV screen	CMV IgM	2 - 4mls Clotted blood	Scunthorpe	Within 5 Working days
Coronavirus antibodies	N antibody S antibody	2 - 4mls Clotted blood	Grimsby Blood Sciences	Within 5 Working days
Epstein Barr screen	EBV VCA IgG EBV VCA IgM EBV NAG IgG	2 - 4mls Clotted blood	Scunthorpe	Within 5 Working days
Hepatitis A infection	Hepatitis A IgM	2 - 4mls Clotted blood	Grimsby Blood Sciences	Within 5 Working days
Hepatitis B immunity	Anti-HBs	2 - 4mls Clotted blood	Grimsby Blood Sciences	Within 5 Working days
Hepatitis B infection	HBsAg (& HB core Ab)	2 - 4mls Clotted blood	Scunthorpe/ Grimsby Blood Sciences	Within 5 Working days
Hepatitis B infection markers	HBeAg, anti-HBe and anti-core IgM	2 - 4mls Clotted blood	Scunthorpe	Within 5 Working days
Hepatitis B viral load	Hep B PCR (Quantitative)	5 mls EDTA Gel separator tube	Scunthorpe	Within 5 Working days
Hepatitis C infection	Hepatitis C Ab	2 - 4mls Clotted blood	Grimsby Blood Sciences	Within 5 Working days
Hepatitis C viral load	Hep C PCR (Quantitative)	5 mls EDTA Gel separator tube	Scunthorpe	Within 5 working days
Hepatitis E	Hepatitis E IgG/IgM	2 - 4mls Clotted blood	Scunthorpe	Within 5 working days
Hepatitis Screen	Hep A IgM, HBsAg, HCV Ab	2 – 4mls Clotted blood	Grimsby Blood Sciences	Within 5 Working days
HIV infection	HIV 1+2 Ab /Ag.	2 – 4mls Clotted blood	Scunthorpe/ Grimsby Blood Sciences	Within 5 Working days
HIV viral load	HIV PCR (Quantitative)	5 mls EDTA Gel separator tube	Scunthorpe	Within 5 Working days
Measles immunity	Measles IgG	2 - 4mls Clotted blood	Scunthorpe	Within 5 Working days
Mumps immunity	Mumps IgG	2 - 4mls Clotted blood	Scunthorpe	Within 5 Working days
Mycoplasma pneumoniae	Mycoplasma pneumoniae IgM	2 - 4mls Clotted blood	Scunthorpe	Within 5 Working days
Neisseria gonorrhoreae	Neisseria gonorrhoreae	First void urine sample or swab in cobas PCR media	Scunthorpe	Within 5 working days
Parvovirus	Parvo B19 IgM/IgG	2 - 4mls Clotted blood	Scunthorpe	Within 5 working days
Quantiferon (TB Serology)	Quantiferon	Qiagen Quantiferon tubes supplied by Laboratory	Scunthorpe	Within 5 working days
Respiratory PCR	Coronavirus SARS-CoV-2, Influenza A, Influenza B and RSV PCR	Nose & throat swab in viral transport media	Scunthorpe Boston	Within 24 hours
Extended Respiratory PCR	Adenovirus, Bordetella pertussis, Coronavirus SARS-CoV-2, Human metapneumovirus, Influenza A, Influenza B, Legionella pneumophila, Rhinovirus/ Enterovirus, RSV, Mycoplasma pneumoniae, Parainfluenza group by PCR	Nasopharyngeal swab in viral transport media	Scunthorpe	Within 24 hours
Rubella immunity	Rubella IgG	2 - 4mls Clotted blood	Scunthorpe	Within 5 Working Days
Syphilis infection	TPEIA (IgG/IgM)	2 - 4mls Clotted blood	Grimsby Blood Sciences	Within 5 Working days
Syphilis (Monitoring/confirmation)	TPHA VDRL	2 - 4mls Clotted blood	Scunthorpe	Within 5 Working days
Toxoplasma gondii	Toxo IgG	2 - 4mls Clotted blood	Scunthorpe	Within 5 Working days
Varicella zoster immunity	VZ IgG	2 - 4mls Clotted blood	Scunthorpe	Within 5 Working days

7 Referred Investigations

There are certain investigations that are not carried out locally. Specimens are sent to specialist laboratories.

The greatest problem associated with these investigations is that, in the majority of cases, **there is no relevant information** provided as to why a test is being requested. The clinical information is an essential prerequisite to performing tests and in the interpretation of results. Reference laboratories often decline to undertake specialist work without a valid clinical reason.

7.1 Investigations Performed by Reference Laboratories

The following tests are currently sent by Path Links to specialist laboratories for testing:

TEST NAME	SPECIMEN TYPE	LABORATORY	TAT
16s ID/Typing	Blood Culture/Isolate	Colindale, AMRHAI	15 days
16s PCR & sequencing	Sterile Fluids	Birmingham UKHSA	15 days
Acanthamoeba	Contact lens/fluid	London SHTM [Parasitology]	5 - 7 days
Aciclovir Assay	2 - 4mls clotted blood	Antibiotic Reference Laboratory (ARL)	2-3 days
Adenovirus PCR	5mls EDTA	Synnovis College Hospital	2 days
Alphavirus (Ross River) IgG	2 - 4mls clotted blood	RIPL Porton Down	2 - 4 days
Amikacin level	2 - 4mls clotted blood	Antibiotic Reference Laboratory (ARL)	<1 day
Amoebic CAP	2 - 4mls clotted blood	Liverpool STM	7 - 10 days
Amoebic IFAT	2 - 4mls clotted blood	Liverpool STM	7 - 10 days
Anaerobe ID	Isolate	Cardiff	14 days
Antibiotic testing/mechanisms	Isolate	Colindale, AMRHAI	15 days
Anti-DNAse B Titre	2 - 4mls clotted blood	Synnovis Kings College Hospital	5 days
Anti-Poliovirus Type 1 titre	2 - 4mls clotted blood	Colindale, VRD	15 days
Anti-Poliovirus Type 2 titre	2 - 4mls clotted blood	Colindale, VRD	15 days
Anti-Poliovirus Type 3 titre	2 - 4mls clotted blood	Colindale, VRD	15 days
Anti-streptolysin O titre	2 - 4mls clotted blood	Synnovis Kings College Hospital	5 days
Arboviruses (bunyaviridae, flaviviridae, togaviridae)	2 - 4mls clotted blood	RIPL Porton Down	5 days
Aspergillus, Galactomannan	2 - 4mls clotted blood	Microbiology, Leicester	2 days
B. pseudomallei	2 - 4mls clotted blood	Colindale, AMRHAI	15 days
Bacillus anthracis (ID & confirmation)	Isolate	RIPL Porton Down	10 days
Bacillus anthracis PCR	4.5 mls EDTA blood	RIPL Porton Down	3 days
Bartonella	2 - 4mls EDTA, tissue	Micropathology Ltd	2 - 3 days
Beta Glucan antigen	2 - 4mls clotted blood	Microbiology, Leicester	2 days
BK PCR (Polyoma)	5mls EDTA, Urine	Micropathology Ltd	7 days

TEST NAME	SPECIMEN TYPE	LABORATORY	TAT
Blastomycosis serology	2 - 4mls clotted blood	Bristol UKHSA (MRU)	7 days
Bordetella PCR	Dry pernasal swab	Birmingham UKHSA	7 - 10 days
Bordetella serology	2 - 4mls clotted blood	Virology, Severn Pathology	10 days
Borellia Burgdorferi screen	2 - 4mls clotted blood	RIPL Porton Down	5 - 7 days
Brucella ELISA IgG	2 - 4mls clotted blood	Liverpool – RLUH	7 days
Brucella ELISA IgM	2 - 4mls clotted blood	Liverpool - RLUH	7 days
Campylobacter	Faeces/slope	Colindale, GBRU	12 days
Chlamydia trachomatis IgG	2 - 4mls clotted blood	Manchester UKHSA	2 - 3 days
Chlamydia PCR (LGV strain)	Swab/Urine in Multicollect tube	Micropathology Ltd	- 4 days
Chlamydia Pneumoniae PCR	Respiratory Swab, BAL	Micropathology Ltd	2 - 3 days
Chlamydia Psittaci PCR	Respiratory Swab, BAL	Micropathology Ltd	2 - 3 days
Clostridium difficile ribotyping	Faeces	Leeds UKHSA	14 days
Clostridium difficile PCR	Faeces	Leeds UKHSA	14 days
Coccidioidomycosis Serology	2 - 4mls clotted blood	Bristol UKHSA (MRU)	7 days
Coronavirus by PCR	Sputum, BAL	Microbiology, Leicester	2 days
Coxiella PCR (Q fever)	EDTA whole blood, BAL and tissues	Micropathology Ltd	2 - 4 days
Crimean Congo haemorrhagic fever serology (PCR)	2 - 4mls clotted blood & EDTA	RIPL Porton Down	2 days
Cryptococcal antigen	2 - 4mls clotted blood, CSF	Synnovis Kings College Hospital	2 days
Cryptosporidum typing	Faeces	Cryptosporidium Reference Unit (CRU)	5 -10 days
Cysticerosis Serology	2 - 4mls clotted blood	Health Serviced Laboratories (Parasitology)	10 days
Cytomegalovirus PCR	5mls EDTA, CSF, NPA, BAL	Synnovis Kings College Hospital	2 days
Cytomegalovirus PCR	Buccal swab, biopsy and serum	Micropathology, Ltd	2 - 3 days
Daptomycin Assay	2 - 4mls clotted blood	Antibiotic Reference Laboratory (ARL)	2-3 days
Dengue Fever Abs	2 - 4mls clotted blood	RIPL Porton Down	5 days
E. coli 0157	Isolate	Colindale, GBRU	8 days
Ebola virus	2 - 4mls clotted blood	RIPL Porton Down	2 days
Entamoeba histolytica IFA	2 - 4mls clotted blood	Liverpool STM	7 - 10 days
Enterovirus characterisation (subsequent to detection from CSF by PCR)	CSF	Colindale, VRD	Contact laboratory
Enterovirus PCR	2 - 4mls clotted blood & EDTA, CSF, NPA, BAL	Synnovis Kings College Hospital	3 days
Epstein Barr PCR	5mls EDTA, CSF	Synnovis Kings College Hospital	2 days
Ethambutol levels	2 - 4mls clotted blood	Antibiotic Reference Laboratory (ARL)	2-3 days
Fasciola serology	2 - 4mls clotted blood	Liverpool STM	10 days
Filaria ELISA	2 - 4mls clotted blood	Liverpool STM	7 - 10 days
Flavivirus EIA	2 - 4mls clotted blood	RIPL Porton Down	5 days
Flucytosine	2 - 4mls clotted blood	Antibiotic Reference Laboratory (ARL)	2-3 days

TEST NAME	SPECIMEN TYPE	LABORATORY	TAT
Francisella serology	2 - 4mls clotted blood	RIPL Porton Down	5 days
Francisella spp. inc tularensis PCR, serology, isolation	2 - 4mls EDTA blood, isolate, tissue, wound swab	RIPL Porton Down	3 days
Fungal ID	Isolate	Bristol UKHSA (MRU)	5 days
Fungal PCR	Isolate	Bristol UKHSA (MRU)	Contact lab
Fungal sensitivity testing	Isolate	Bristol UKHSA (MRU)	10 days
Galactomannan EIA Test	2 - 4mls clotted blood, BAL	Microbiology, Leicester	2 days
Group A Strep PCR	CSF, EDTA/citrated whole blood, tissue	Micropathology Ltd	2 - 4 days
Group B Strep PCR	CSF, EDTA/citrated whole blood, tissue	Micropathology Ltd	2 - 4 days
Group B strep typing	Isolate	Colindale, AMRHAI	6 days
Haemophilus influenzae	Isolate	Colindale, RVPBRU	12 days
Haemophilus influenzae typing	Isolate	Colindale, RVPBRU	12 days
Hantavirus	2 - 4mls clotted blood	RIPL Porton Down	3 - 5 days
HCV Genotypic Susceptibility	0.6mL serum/plasma	Colindale, VRD	2-4 days
HDV by PCR	2 - 4mls EDTA blood	Colindale, VRD	Contact laboratory
Helicobacter culture	Biopsy in pylori transport medium	Colindale, GBRU	15 days
Hepatitis A IgG	2 - 4mls clotted blood	Synovis Kings College Hospital	3 days
Hepatitis A IgM confirmation.	2 - 4mls clotted blood	Colindale, VRD	Contact laboratory
Hepatitis BsAg confirmation	2 - 4mls clotted blood	Colindale, VRD	8 days
Hepatitis C genotyping subtype	5mls EDTA	Micropathology Ltd	2 - 4 days
Hepatitis D	2 - 4mls clotted blood	Colindale, VRD	Contact laboratory
Hepatitis E PCR	10ml EDTA	Micropathology Ltd	7 days
Herpes Simplex IgG	2 - 4ml Serum	Manchester UKHSA	10 days
Herpes Simplex PCR	10mls EDTA, Swab VTM, CSF	Synnovis Kings College Hospital	2 days
Herpes Simplex type 1 IgG	2 - 4ml Serum	Manchester UKHSA	10 days
Herpes Simplex type 2 IgG	2 - 4ml Serum	Manchester UKHSA	10 days
Histoplasma capsulatum serolgy	2 - 4mls clotted blood	Bristol UKHSA (MRU)	3 - 6 days
HIV (Vertical transmission)	2 - 4mls clotted blood	Colindale, VRD	8 - 10 days
HIV 2 Resistance testing	4mls EDTA blood	Birmingham UKHSA	21 days
HIV 2 Viral Load	4mls EDTA blood	UCLH	21 days
HIV confirmation	2 - 4mls clotted blood	Colindale, VRD	8 days
HIV drug resistance	10ml plasma	Micropathology Ltd	14 days
HIV incidence test	2-4mls clotted blood	Colindale VRD	14 days
HIV point mutation (Tropism)	10ml plasma, CSF	Colindale VRD	14 days
HIV proviral DNA	4mls EDTA blood	Colindale, VRD	8 days
HIV Therapeutic Drug Monitoring	4mls EDTA blood	Cambridge Clinical Laboratories	14 - 21 days
HTLV 1 antibodies	2 - 4mls clotted blood	Micropathology Ltd	8 days

TEST NAME	SPECIMEN TYPE	LABORATORY	TAT
HTLV 2 antibodies	2 - 4mls clotted blood	Micropathology Ltd	8 days
HTLV type-specific PCR	2 - 4mls EDTA blood	Colindale, VRD	Contact laboratory
Human herpesvirus 6 by PCR	2 - 4mls EDTA blood, CSF, bone marrow biopsy	Micropathology Ltd	2 - 4 days
Human herpesvirus 7 by PCR	2 - 4mls EDTA blood, CSF	Micropathology Ltd	2 - 4 days
Human herpesvirus 8 by PCR	2 - 4mls EDTA blood, CSF	Micropathology Ltd	2 - 4 days
Hydatid/Echinococcus EIA	2 - 4mls clotted blood	Liverpool STM	7 - 10 days
Itraconazole	2 - 4mls clotted blood	Antibiotic Reference Laboratory (ARL)	2-3 Days
JC PCR (Polyomavirus)	2-4 mls EDTA, Urine, CSF	Micropathology Ltd	7 days
Lassa virus	2 - 4mls clotted blood, Urine and Throat swab in Viral Transport Medium	RIPL Porton Down	2 days
Legionella confirmation	Urine & Sputum	Colindale, RVPBRU	Urgent samples notified by phone
Legionella PCR	Lower respiratory tract samples. Other clinical samples in a universal	Colindale, RVPBRU	Urgent samples notified by phone
Leishmaniasis Antibody Test	2 - 4mls clotted blood	Liverpool STM	7 - 10 days
Leptospira - microscopy & culture	Blood/Blood Culture	RIPL Porton Down	<8 weeks
Leptospira - serology	2 - 4mls clotted blood	RIPL Porton Down	2 - 7 days
Leptospira PCR	2 - 4mls EDTA blood	RIPL Porton Down	5 days
Linezolid Assay	2 - 4mls clotted blood	Antibiotic Reference Laboratory (ARL)	3-5 Days
Listeria PCR	CSF, EDTA	Micropathology Ltd	2 -4 days
Lyme Disease	2 - 4mls clotted blood	RIPL Porton Down	5 - 7 days
Malaria Abs	2 - 4mls clotted blood	Liverpool STM	7-10 days
Marburg virus	2 - 4mls clotted blood	RIPL Porton Down	5 days
Measles by PCR	Throat swab in virus transport media	Colindale, VRD	10 days
Measles IgM	2 - 4mls clotted blood	Colindale VRD	7 days
Meningococcal ID & sens	Isolate	Manchester UKHSA (MRU)	7 - 10 days (type results phoned at 1 day)
Mumps by PCR	Mouth/saliva Swab	Colindale, VRD	10 days
Mumps IgM	2 - 4mls clotted blood	Colindale, VRD	7 days
Mycobacterial culture	Specimen/Isolate	Birmingham UKHSA	<10 weeks
Mycobacterial ID & Sens	Isolate	Birmingham UKHSA	ID 1 day Sens 14 days
Mycobacterial microscopy	Specimen/Isolate	Birmingham UKHSA	1 day
Mycoplasma genitalium	Urine or Genital Swab	Micropathology Ltd	4 days
Mycoplasma genitalium resistance testing	Urine or Genital Swab	Micropathology Ltd	4 days
Neisseria gonorrhoeae confirmation	Isolate	Colindale, AMRHAI	6 days
Neisseria gonorrhoeae sensitivity testing	Isolate	Colindale, AMRHAI	7 days
Neisseria Meningitidis PCR	CSF/EDTA	Manchester UKHSA (MRU)	3 - 5 days

TEST NAME	SPECIMEN TYPE	LABORATORY	TAT
Neisseria Meningitidis serology	2 - 4mls clotted blood	Manchester UKHSA (MRU)	5 - 10 days
Nipah and Hendra virus	2 - 4mls clotted blood	RIPL Porton Down	5 days
Paracoccidioidomycosis Serology	2 - 4mls clotted blood	Bristol UKHSA (MRU)	7 days
Parasite ID	Parasite	Liverpool STM	7 days
Parasite ID	Parasite	London SHTM [Parasitology]	1 - 6 days
Parechovirus PCR	CSF	Synnovis Kings College Hospital	2 days
Parvovirus B19 PCR	2-4 mls clotted blood, EDTA, amniotic fluid. Frozen placenta, foetal tissue.	Micropathology Ltd	10 days
Parvovirus IgM confirmation	2 - 4mls clotted blood	Colindale VRD	10 days
Pneumococcal PCR	2 - 4mls EDTA blood/CSF	Manchester UKHSA (MRU)	3 - 5 days
Pneumocystis PCR	BAL, Induced Sputum	Micropathology Ltd	2 - 4 days
Rabies IgG	2 - 4mls clotted blood	Animal and Plant Health Agency (Weybridge)	7 - 10 days
Rickettsial Antibodies (Typhus and Spotted Fever groups, Scrub Typhus group)	2 - 4mls clotted blood	RIPL Porton Down	7 days
Rifampicin Assay	2 - 4mls clotted blood	Antibiotic Reference Laboratory (ARL)	2 - 3 days
Rubella IgM antibodies	2 - 4mls clotted blood	Colindale VRD	7 days
Rubella PCR	Throat swab in Virus transport media	Colindale, VRD	10 days
Salmonella ID & typing	Isolate	Colindale, GBRU	17 days
Schistosoma ELISA	2 - 4mls clotted blood	Liverpool STM	7 - 10 days
Shigella	Isolate	Colindale, GBRU	14 days
Staph. Aureus antibiotic	Isolate	Colindale, AMRHAI	15 days
Staph. Aureus typing & PVL	Isolate	Colindale, AMRHAI	1 - 15 days
Strep pneumoniae typing	Isolate	Colindale, RVPBRU	10 days
Strep pyogenes typing	Isolate	Colindale, RVPBRU	12 days
Strongyloides	Faeces	Liverpool STM	7 days
Sulphamethoxazole	2 - 4mls clotted blood	Antibiotic Reference Laboratory (ARL)	2-3 days
Syphilis (discrepant not confirmed results)	2 - 4mls clotted blood	Colindale, STBRU	8 days
Syphilis (Vertical transmission)	2 - 4mls clotted blood	Colindale, STBRU	8 days
Syphilis IgM	2 - 4mls clotted blood	Colindale, STBRU	1 day
Syphilis testing (CSF)	CSF	Colindale, STBRU	8 days
T. pallidum by PCR	CSF, Swab (Viral Transport Medium)	Micropathology Ltd	2 days
Teicoplanin level	2 - 4mls clotted blood	Antibiotic Reference Laboratory (ARL)	1-2 days
Tickborne encephalitis virus IgG	2 - 4mls clotted blood	RIPL Porton Down	5 days
Toxocara	2 - 4mls clotted blood	Health Services Laboratories (Parasitology)	10 days
Toxoplasma dye test	2 - 4mls clotted blood	Toxoplasma Reference Unit	10 - 14 days
Toxoplasma IGM	2 - 4mls clotted blood	Toxoplasma Reference Unit	10 - 14 days
Toxoplasma PCR	2 - 4mls EDTA blood	Toxoplasma Reference Unit	10 - 14 days

TEST NAME	SPECIMEN TYPE	LABORATORY	TAT
Trichinella IF	2 - 4mls clotted blood	Health Services Laboratories (Parasitology)	10 days
Trichomonas vaginalis PCR	Genital Swab	Micropathology Ltd	4 days
Trimethoprim	2 - 4mls clotted blood	Antibiotic Reference Laboratory (ARL)	2-3 days
Trypanosoma cruzi serology	2 - 4mls clotted blood	Liverpool STM	7 - 10 days
Trypanosoma gambesi serology	2 - 4mls clotted blood	Liverpool STM	7 - 10 days
Ureaplasma	Genital Swab (Viral Transport Medium)	Micropathology Ltd	6 days
Varicella zoster PCR	5mls EDTA, Swab VTM, CSF	Synnovis Kings College Hospital	2 days
Voriconazole level	2 - 4mls clotted blood	Antibiotic Reference Laboratory (ARL)	2-3 days
West Nile virus	2 - 4mls clotted blood	RIPL Porton Down	5 days
Yellow fever virus	2 - 4mls clotted blood	RIPL Porton Down	5 days
Yersinia identification & typing	Isolate	Colindale, GBRU	14 days
Zika IgG	2 - 4mls clotted blood	RIPL Porton Down	10 days
Zika IgM	2 - 4mls clotted blood	RIPL Porton Down	10 days
Zika PCR	4 mls EDTA or Urine	RIPL Porton Down	10 days

8 Tropical Diseases

Testing is by arrangement with the Consultant Microbiologist.

Many tropical infections, including viral haemorrhagic fevers such as Ebola, are either imported or very uncommon in this country. Therefore, many hospital laboratories have only limited experience with these agents.

8.1 Laboratory Diagnosis

PROTOZOAL INFECTIONS	LABORATORY DIAGNOSIS
Amoebiasis (*Entamoeba histolytica*)	Trophozoites in fresh liquid stools, or biopsies. Examination of 3-6 samples collected on different days. Serological tests are strongly positive in invasive disease.
Giardiasis (*Giardia intestinalis*)	Demonstration of trophozoites or cysts in liquid stools or cysts in formed stools. Examination of 3 or more specimens collected on alternate days for cysts. Demonstration of trophozoites in jejunal aspirate.
Malaria (Plasmodium falciparum, vivax, malariae and ovale). Also P. knowlesi	Demonstration of parasites in the peripheral blood. Done by Haematology Dept.
Visceral Leishmaniasis Kala Azar (*Leishmania donovani*)	Demonstration of amastigotes in bone marrow smear and splenic and lymphnode aspirate. Culture infected material on suitable media (NNN).
Trypanosomiasis Sleeping sickness (Trypanasoma gambiense & rhodesiense)	Demonstration of trypanosomas in peripheral blood and lymphnode aspirate. – serology.

INFECTIONS CAUSED BY NEMATODES	LABORATORY DIAGNOSIS
Ascariasis/Roundworm infection (Ascaris lumbricoides)	Recovery of an adult worm and presence of ova in faeces
Enterobiasis (Threadworm), pinworm infection (Enterobius vermicularis)	Examination of clear adhesive tape prints taken from the perianal area for ova (examination) of 4 prints taken on different days may be necessary
Ancylostomiasis/Hookworm infection (Ancylostoma duodenale, Necator americanus)	Presence of ova and rhabtidiform larvae in faeces
Strongyloidiasis (Strongyloides stercoralis)	Presence of Strongyloides larvae in stool and duodenal contents
Toxocariasis Viscera larva migrans in man (Toxocara canis or cari)	Serology – obtain special request form from laboratory before sending blood sample
Trichuriasis (Trichuris trichuia)	Presence of ova in stools.
Filariasis lymphatic (eg Wuchereria bancrofti)	Presence of microfilariae in peripheral blood thick film. Some species have diurnal variation also serological test available.
Skin: Onchocerciasis (Onchocerca volvulus)	Skin shavings

INFECTIONS CAUSED BY TREMATODES	LABORATORY DIAGNOSIS
Schistosomiasis (Bilharziasis, urinary schistosomiasis, Schistosoma haematobium)	Presence of terminal-spined ova in urine best collected at midday.
Intestinal schistosomiasis (Schistosoma mansoni and japonicum)	Presence of lateral-spined ova in faeces.

INFECTIONS CAUSED BY CESTODES	LABORATORY DIAGNOSIS
Taeniasis (Taenia saginata – beef tapeworm)	Presence of mature segments on surface of stools and occasionally ova.
Hydatid disease (Echinococcus granulosus and multilocularis)	Suspected clinically and confirmed by serological tests.
Hymenoleiasis (Hymenolepsis nana)	Repeated examination of faces for ova which are excreted irregularly in small numbers

8.2 Serodiagnosis of Parasitic Infections

Serological tests are available for a number of parasitic infections such as:

Amoebiasis
Ascaris antigen (screening for invasive helminthiasis)
Dirofiliaria immitis antigen*
Fasciola hepatica
Filiariasis
Hydatid disease
Leishmaniasis
Malaria (chronic recurrent fever) should not be used to diagnose acute infection
Schistosomiasis
Toxocariasis
Toxoplasmosis
Trypanosomiasis (brucei)**

* Rare in man. Dog heart worm confined to Australia
** *T. rhodesiense* and *T. gambiense* are sub species of *T. brucei*

9 Microbiological Analysis of Endoscopy, Hydrotherapy & Dialysis Waters

9.1 Introduction

Evaluation of the microbiological quality of water employed in Endoscopy, Hydrotherapy and Dialysis procedures is of key importance in ensuring patient safety. Path Links Pathology provides a testing service that fulfils service user requirements in line with legislation and expert guidance. This testing is centralised at the Microbiology Department, Pilgrim Hospital, Boston.

9.2 Sample Requirements

Samples from Hydrotherapy and Dialysis should be collected in 500ml sterile sample bottles containing 1.8% m/v Sodium thiosulphate preservative. The bottle should be filled with 500ml of the water to give the optimal working concentration of the Sodium thiosulphate preservative. Samples from Endoscopy should be collected into plain 500ml sterile sample bottles without preservative.

Samples must be processed within 24 hours of collection and must be refrigerated at 2 - 8^{o}C if they cannot be processed immediately.

Sample integrity must be assured during transit by the use of correctly maintained and packed cool boxes. All samples must be clearly labelled and accompanied by a request form.

Incorrect storage and processing delays of greater than 24 hours can lead to falsely raised counts. Poorly taken samples may also affect the quality of the results obtained.

Samples not collected into the designated containers will not be processed.

9.3 Turnaround Times

Sample testing is undertaken Monday - Friday (excluding Public Holidays). Under exceptional circumstances, and with prior discussion with the testing laboratory, it may be possible to undertake testing at other times. Currently, turnaround times for water samples are:

Endoscopy Waters (routine investigation)	5 days from receipt of sample – *Pseudomonas aeruginosa* count and interim Total Viable Count issued at 2 days. Final Total Viable Count issued at 5 days
Endoscopy Waters for Environmental Mycobacteria	28 days from receipt of sample
Dialysis Waters	7 days from receipt of sample – An interim Total Viable Count issued at 2 days and a final Total Viable Count issued at 7 days
Hydrotherapy Waters	3 days from receipt of sample

10 Complaints, Concerns, Comments and Compliments

Path Links adheres to Northern Lincolnshire & Goole NHS Foundation Trust complaints policies and procedures. As such please refer to the Trust policy: Policy and Procedure for The Management of Feedback from Complaints, Concerns, Comments and Compliments (DCP071) which is available on the NLAG Hub site at the following link:

Policy & Procedure for the Management of Feedback from Complaints, Concerns, Comments and Compliments [DCP071)