



Public Health
England

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Meningococcal Reference Unit User manual

October 2020



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Executive summary

This document contains information on reference services for:

- *Neisseria meningitidis* (meningococcal) isolate characterisation (including polysaccharide antigen detection (serogrouping), Porin B (PorB) serotyping and Porin A (PorA) serosubtyping)
- *Neisseria meningitidis* (and *Streptococcus pneumoniae*) DNA detection and meningococcal capsular grouping by polymerase chain reaction (PCR) vaccine response (pre- and post- immunisation)

DX address: DX 6962410
Manchester 90 M

Courier address: Meningococcal Reference Unit
Public Health England
Manchester Public Health Laboratory
Manchester Medical Microbiology Partnership
Clinical Sciences Building 2
Manchester Royal Infirmary,
Oxford Road
Manchester, UK M13 9WL

Postal address (paper mail):

Meningococcal Reference Unit
Public Health England
Manchester Medical Microbiology Partnership
PO Box 209
Clinical Sciences Building 2
Manchester Royal Infirmary,
Oxford Road
Manchester, UK M13 9WZ

Telephone: +44(0)161 276 6757 / 8788 enquiries (automated filter)
Out-of-hours Telephone: +44(0)161 276 1234 (ask for Medical Microbiologist on-call)

Authorised By:
Prof Ray Borrow (Deputy Head of Meningococcal Reference Unit)

Effective Date: October 2020

Introduction

Meningococcal Reference Unit Overview

The PHE Meningococcal Reference Unit (MRU) for England and Wales and Northern Ireland (NI) has been situated in Manchester since 1978. Originally established to provide phenotypic characterisation of meningococci isolated from cases of invasive meningococcal disease throughout the country, the nature and scope of the confirmation and surveillance activity has widened as has the range of tests available.

The MRU is located at the Manchester Royal Infirmary (MRI) and is an integral component of the Manchester Medical Microbiology Partnership (MMMP). The MMMP is part of the recently established Manchester University NHS Foundation Trust (MFT), formerly Central Manchester Foundation Trust (CMFT).

The MRU is part of the PHE Reference Microbiology Services Division of the National Infections Service and works closely with other parts of the PHE, particularly the Immunisation and Countermeasures Department, to optimise meningococcal disease ascertainment through enhanced surveillance, often with direct communication with PHE Health Protection teams.

Accredited to ISO 15189, the MRU has been a world leader in developing and making nationally available tests for non-culture case confirmation of meningococcal infection by PCR. Initially designed to identify the major disease-causing serogroups (A, B, C, Y and W), the test repertoire has been extended to provide more detailed additional characterisation utilising molecular techniques including DNA sequencing from cultured isolates and directly from clinical specimens, where possible. Since July 2010 all invasive disease isolates undergo whole genome sequence analysis.

The optimised surveillance, along with serological studies performed in the co-located PHE Vaccine Evaluation Unit, were key elements in supporting and monitoring the successful introduction of the meningococcal serogroup C conjugate vaccine in the UK in 1999, the introduction of serogroup A conjugate vaccine in sub-Saharan Africa from 2010, and serogroup B (MenB) and ACWY vaccination in the UK in 2015, and have contributed significantly to establishing the international reputation of the MRU.

In addition to providing confirmatory laboratory services, staff from the MRU advise on the investigation and management of individual cases and outbreaks.

The PHE MRU and PHE Colindale have been active in the establishment of a network of national and regional reference laboratories, collaborating to harmonise and optimise surveillance throughout Europe and sharing this experience with other interested groups

worldwide. This has resulted in the establishment of the European Meningococcal and Haemophilus Disease Society (EMGM). The MRU supports work-packages in the European Centre for Disease Control (ECDC) Invasive Bacterial Diseases Laboratory Network (IBDIabnet), with particular regard to the provision of External Quality Assessment (EQA) in collaboration with PHE Colindale and UK NEQAS. The MRU was until recently a global reference laboratory for the World Health Organization (WHO) Invasive Bacterial Diseases EQA but since 2013 has managed WHO EQA panels (with PHE and UK NEQAS) for WHO Regional, National and Sentinel Laboratories.

National meningococcal immunisation programmes

On the 1st September 2015, a MenB vaccine (Bexsero®) was added to the National Infant Immunisation Programme in England to help protect children against meningitis and septicaemia, which are serious and potentially fatal illnesses. Infants are offered the MenB vaccine with the other routine vaccinations at 2 months, 4 months and 12 months of age. Vaccinating infants at these times helps protect them when they are most at risk of developing MenB disease. Infants under 1 year of age are most at risk of MenB and the number of cases peaks at around 5 to 6 months of age.

(<https://www.gov.uk/government/collections/meningococcal-b-menb-vaccination-programme>).

The national surveillance protocol for invasive meningococcal disease in England has been extended in recognition of changes to the meningococcal group C conjugate (MCC) vaccination programme, including the removal of the infant MCC dose at 3 months and the introduction of an adolescent ACWY vaccine in August 2015

(<https://www.gov.uk/government/publications/meningococcal-disease-enhanced-surveillance-plan>).

There was a slow and steady increase in invasive meningococcal disease due to capsular group W (MenW) since 2009

(<https://www.gov.uk/government/publications/meningococcal-disease-laboratory-confirmed-cases-in-england-and-wales>).

This increase was due to expansion of a single hyper-virulent strain belonging to the ST-11 clonal complex (cc11) and has been observed across all regions. MenW cases were not associated with travel, indicating that this strain was now endemic in England (Lucidarme J et al., 2015). Since 2011, MenW cases have been diagnosed across all age groups and are associated with a higher case fatality rate than the more common MenB cases.

Further information, with links to related resources, can be found at the meningococcal disease: guidance, data and analysis web page

(<https://www.gov.uk/government/collections/meningococcal-disease-guidance-data-and-analysis>)

Contact Information

General MRU result enquiries	
<ul style="list-style-type: none"> identification, phenotypic characterisation (serogroup, serotyping, subtyping), molecular characterisation (eg. porA or fhbp sequencing) and antibiotic susceptibility testing of isolates, minimum inhibitory concentration (MIC) 	<p>Initial contact for most MRU enquiries: Tel: 0161 276 8788 or 8854 or 6757 (Mon to Fri, 9am to 5pm)</p> <p>Xilian Bai PhD Pre-registration Clinical Scientist Tel: +44(0)161 276 6764 Xilian.bai@phe.gov.uk</p> <p>Jay Lucidarme PhD Senior Scientist Tel: +44(0)161 276 5689 Jay.lucidarme@phe.gov.uk</p>
<ul style="list-style-type: none"> antigen detection 	<p>Stephen Clark PhD Senior Scientist Tel: +44(0)161 276 5689 Stephen.clark@phe.gov.uk</p>
<ul style="list-style-type: none"> PCR 	
Medical enquiries	
<ul style="list-style-type: none"> patient investigation and clinical advice interpretation of results outbreak investigation and management advice 	<p>Prof Ray Borrow PhD., FRC/Path, Consultant Clinical Scientist HCPC: CS00231 Deputy Head of MRU Head of PHE Vaccine Evaluation Unit (VEU) Tel: +44(0)161 276 8850 ray.borrow@phe.gov.uk</p>
Other key staff	
<ul style="list-style-type: none"> vaccine evaluation, research and development 	<p>Vaccine Evaluation Unit (VEU) General enquiries- Serum bactericidal assays Tel: +44(0)161 276 6793</p>
<ul style="list-style-type: none"> vaccine response assessment 	<p>Prof Ray Borrow PhD., FRC/Path,</p>

<ul style="list-style-type: none">• proposed research projects• service and molecular research projects	<p>Deputy Head of MRU Head of PHE Vaccine Evaluation Unit (VEU) Tel: +44(0)161 276 8850 ray.borrow@phe.gov.uk</p>
<ul style="list-style-type: none">• immunisation queries	<p>Dr Mary Ramsay Consultant Epidemiologist Immunisation and countermeasures. PHE Colindale Tel: +44(0)20 8200 6868 mary.ramsay@phe.gov.uk</p> <p>Dr. Shamez Ladhani shamez.ladhani@phe.gov.uk</p> <p>Dr. Sema Mandal sema.mandal@phe.gov.uk</p> <p>Helen Campbell PhD helen.campbell@phe.gov.uk</p>

Telephone contact

The MMMP call centre uses an automated filter system. Select option 1 for authorised MRU (including PCR and culture) results.

Clinical enquiries will be directed to an available consultant, or select option 4 for VEU/MRU clinical advice.

Weekend enquiries

For urgent clinical enquiries contact via the consultant medical microbiologist rota through Manchester Foundation Trust switchboard on 0161 276 1234.

MRU Services and Resources

- clinical advice for case and outbreak investigation and management
- meningococcal cultured isolate confirmation and characterisation
- meningococcal DNA detection by PCR for non-culture (DNA positive only) case confirmation
- molecular characterisation of meningococcal isolates and non-culture material
- technical laboratory advice and support for large scale investigations and carriage studies
- meningococcal vaccine evaluation
- determination of response to meningococcal vaccination
- collection of >50,000 phenotypically characterised meningococcal isolates
- collection of >4,000 fully sequenced meningococcal case isolates (by whole genome sequencing)
- selected collection of clinical samples (under HTA licence)
- computerised database of laboratory confirmed cases since 1984
- computerised database of all submitted isolates since 1995
- support for collaborative scientific projects and audits

Meningococcal isolate characterisation

Species confirmation

Phenotypic confirmation of *Neisseria meningitidis* isolates based on morphology, conventional biochemical and serological reactions.

Meningococcal phenotyping

- serogroup: identification of capsular polysaccharide antigens by serological reactions: co-agglutination using in-house polyclonal antibodies, commercial latex antigen kits or preferably by an in-house dot-blot ELISA using monoclonal antibodies (supplied by NIBSC)
- serotype: identification of PorB (class 2/3) outer membrane proteins by in-house dot-blot ELISA using monoclonal antibodies (supplied by NIBSC)
- serosubtype: identification of PorA (class 1) outer membrane proteins by in-house dot-blot ELISA using monoclonal antibodies (supplied by NIBSC)

Meningococcal genotyping

Whole genome sequence (WGS) analysis: Since July 2010, all meningococcal case isolates undergo WGS as part of invasive meningococcal disease surveillance. The indexed genomic data is stored in Meningitis Research Foundation Meningococcus Genome Library (<http://www.meningitis.org/research/genome>).

WGS allows the characterisation of the majority of (if not all) meningococcal genes including typing and vaccine antigens. From this data, high resolution genomic analyses can be performed to determine the relatedness of isolates. This can be utilised in outbreak/cluster scenarios to support public health decisions.

WGS is currently outsourced and is routinely performed on isolates in batches. Turn-around times for WGS can vary widely. However, WGS on isolates of particular interest can be expedited, if required.

Vaccine antigen sequencing: Whilst WGS provides characterisation of vaccine antigen genes, the lead time for WGS can vary. In urgent cases, individual characterisation of vaccine antigens (for example, Factor H-Binding Protein (fHbp) and PorA) can be performed by PCR-sequencing when requested.

Antibiotic susceptibility testing

Minimum Inhibitory concentrations (MICs) for benzylpenicillin, cefotaxime, rifampicin and ciprofloxacin are routinely determined using commercial gradient diffusion strip methodology and reported for all submitted isolates. Other antibiotic susceptibility tests may be available upon request.

Antimicrobial breakpoints are defined by The European Committee on Antimicrobial Susceptibility Testing (EUCAST). These breakpoints can be found at http://www.eucast.org/clinical_breakpoints/

Please note that it is not unusual to observe reduced susceptibility to penicillin for meningococcal case isolates. Approximately 30% of isolates show reduced susceptibility. However, if penicillin is used, effective therapeutic levels may be achieved. Please discuss with the MRU if there are concerns. Isolates with penicillin MICs > 0.5 mg/L should warrant further investigation.

PCR and Molecular Testing

Meningococcal screening and genogrouping assays

Meningococcal-specific real-time PCR (ABI Taqman™ or Roche LightCycler™ (Flow flex system)) assays are used to detect *N. meningitidis* DNA and determine the capsular group (genogroup) where possible.

The MRU screening assay is performed on all submitted specimens. This 4-component multiplex assay comprises the following 4 gene targets:

- meningococcal *ctrA*: This target confirms the presence of *N. meningitidis* DNA (specifically encapsulated meningococci as *ctrA* is part of the capsular polysaccharide locus (*cps*)) (Guiver et al., 2011; Gray et al., 2014; McHugh et al., 2015)]
- meningococcal *siaDB* (or *csb*): Also part of the *cps*, this target is capsular group B-specific
- pneumococcal *ply*: Used for detection of *Streptococcus pneumoniae*
- in-house internal control (IC): Target DNA added during extraction. Screening assay results valid only if IC is positive. A negative IC could indicate presence of PCR inhibitors

Upon confirmation of *ctrA* positivity **and** in absence of *siaDB* positivity (i.e. probable non-group B meningococcus), secondary group-specific PCR assays based on capsular polysaccharide synthesis genes are used. Firstly, samples are tested for groups C (*siaDc/csc*), W (*siaDw/csw*) and Y (*siaDy/csy*). Finally, if negative, a group A-specific (*mynA*) may be used, although group A is rare in the UK.

It is possible for low level positives (i.e. low DNA concentration) to be weakly positive with the sensitive *ctrA* screening assay but not detected with the specific *siaD* capsular grouping assays. Hence meningococcal DNA may be detected but genogroup not determined.

Pneumococcal detection

The samples found positive with the pneumolysin (*ply*) PCR screen in the 4-component multiplex PCR assay are tested for confirmation using a pneumococcal specific autolysin (*lytA*) PCR. Samples found to be positive with both *ply* and *lytA* are reported as pneumococcal PCR positive.

Samples that are only *ply* positive alone may indicate detection of a non-pneumococcal streptococcal species and are reported as pneumococcal PCR negative.

DNA from pneumococcal carriage can be detected in the blood samples of children under the age of 2 years. Consequently, clinical interpretation of the molecular results is recommended for all positive pneumococcal reports among children less than 2 years of age (Dagan et al., 1998). A comment is made therefore on all MRU pneumococcal PCR positive reports for children <2 years to that effect.

Meningococcal Serology

The following serum bactericidal antibody (SBA) assays are performed by the PHE Vaccine Evaluation Unit (VEU), co-located with the MRU at Manchester Royal infirmary.

MenACWY rSBA

This assay measures functional (bactericidal) antibody titres against capsular polysaccharide among group A, C, Y and/or W meningococcal control strains. The assay utilises baby rabbit serum as an exogenous complement source. An rSBA titre of $\geq 1:8$ is the internationally recognised surrogate for protection against group C strains.

MenB hSBA

This assay measures functional (bactericidal) antibody titres against sub-capsular protein antigens expressed by a panel of serogroup B meningococcal strains. This assay utilises exogenous human complement. An hSBA titre of ≥ 4 is the internationally recognised surrogate for protection against group B strains.

Serodiagnosis of meningococcal disease is not available.

MRU Specimen Archive (under the Human Tissue Act)

In 2006, the MRU began storing a sub-set of meningococcal PCR-positive clinical specimens under an MMMP HTA licence for the purposes of quality control, assay development, epidemiological investigations and/or experimental research. In more recent years, all residual PCR-positive clinical material from living persons (at time of collection) is retained under the licence.

The specimens in this archive are available for use in relevant external projects with appropriate ethical approvals. Please contact MRU staff (page 7) for further information. Details on MRU specimen retention and HTA compliance can be found on page 20.

Submitting samples to the MRU

Submitting meningococcal cultures

Suspected meningococcal isolates must be submitted along with a completed PHE MRU Request Form (<https://www.gov.uk/government/publications/meningococcal-reference-unit-request-form>) in accordance with the [Specimen Acceptance Policy](#). Please see page 4, above, for shipping address.

Please send pure, viable cultures from all positive sites of invasive meningococcal disease cases: sterile (CSF, blood, joint fluids etc.) and any non-sterile sites (for example, nose, throat, bronchial lavage, sputum), if available.

Meningococcal isolates from genitourinary tracts should not be routinely submitted unless they appear resistant (penicillin MICs of ≥ 0.25 mg/L and/or ciprofloxacin MICs >0.03 mg/L) or are clinically significant (in particular urethritis/proctitis, Brooks et al., 2020) or believed to be epidemiologically-linked to cases of invasive disease.

N. gonorrhoeae, other *Neisseria* spp and *Moraxella* spp should be referred to PHE Colindale for confirmation.

The preferred medium for transport is agar slopes (chocolate (heated) blood agar slopes, blood agar slopes or Dorset egg slopes) after establishing growth by overnight incubation at 37°C. Short-term storage of sloped cultures at 30°C is optimal if there are delays before submission.

Should it be necessary to submit an un-incubated culture, apply a heavy inoculum to ensure survival of the organism during transport. Please indicate on the request form if the material (slope) has not been incubated.

Specific transport swabs in Amies medium are accepted, although the presence of charcoal may interfere with direct, rapid agglutination reactions if urgent results are required.

The use of liquid transport swabs is not recommended as there is a risk of leakage during transport and receipt. Liquid transport systems for (automated) clinical investigation may not be appropriately designed for pure culture shipment: If in doubt please discuss with MRU staff before submission.

It is acceptable to submit frozen liquid suspensions of viable cultures (in accordance with safety considerations and correct transport documentation) following prior discussions

with MRU staff to ensure material is either sub-cultured upon receipt or appropriately stored. This is the preferred method for large studies.

The following can also be accepted following prior arrangement with the MRU:

- small numbers of silica gel packages (WHO Manual, 2nd Edition, 2011)
- freeze-dried cultures

Submitting specimens for PCR testing

Samples for PCR testing must be sent alongside a completed PHE MRU Request Form (<https://www.gov.uk/government/publications/meningococcal-reference-unit-request-form>) following the [Specimen Acceptance Policy](#) (see page 4, above, for address).

Samples should be stored at 4°C (not frozen) prior to transport. Freeze-thawing may reduce the likelihood of positivity with low genome copy samples and can result in cracked or broken containers.

It is recommended that samples for meningococcal PCR are collected less than 48 hours following disease onset, admission to hospital or administration of antibiotics. The likelihood of a positive PCR result decreases with time following antimicrobial administration. Blood samples for PCR taken more than 48 hours after commencement of antibiotic therapy are unlikely to remain positive, however, CSF may remain 'positive' for longer periods.

The MRU DNA extraction platforms and PCR assays have been validated for: EDTA (whole blood), CSF, coagulated whole blood, serum, plasma and joint fluids; however, EDTA whole blood and CSF are the preferred specimens. Heparinised or citrated samples can be tested, but EDTA is preferred.

Plasma or serum can be examined, although sensitivity may be compromised. Only the serum fraction of coagulated bloods can be tested.

Original CSF (uncentrifuged) or re-suspended CSF deposits are preferred to CSF supernatants in order to increase the sensitivity of detection. Definitive laboratory confirmation of meningococcal meningitis can only be made by analysis of a CSF sample.

A minimum of 400 µL (0.4 mL) of fluid (e.g. EDTA, CSF) is required for extraction without dilution. Smaller volumes will be diluted as required but will result in reduced detection sensitivity. Greater volumes (up to 2 mL) are preferred to allow repeat testing.

DNA extracts:

The MRU undertakes *N. meningitidis* (and *S. pneumoniae*) confirmatory testing of submitted DNA extracts from primary molecular laboratories. This may provide specific or wider genogroup confirmation for meningococcal cases. In addition, it facilitates inclusion of confirmed case information in the PHE national dataset as well as additional investigations e.g. vaccine antigen genotyping for case/contact/outbreak management and enhanced surveillance.

(Note: submitted DNA extract testing precludes the inclusion of the internal control in the multiplex assay).

Unusual specimens:

Other specimens from normally sterile sites (e.g. tissue samples/blocks) may be examined after prior consultation with the MRU. They are not currently considered a routine investigation as they require bespoke manual processing with concomitant increases in turnaround time.

The nucleic acid extraction processes are validated for fluid samples. Results from other sample types should be considered 'unvalidated' samples should be treated with caution.

Submitting specimens for non-culture antigen detection

Please contact MRU as this service is no longer available: submission of samples for PCR is encouraged.

Submitting samples for meningococcal serology

For serum bactericidal antibody (SBA) assays, all samples should be submitted along with the completed Vaccine Preventable Serology request form - <https://mft.nhs.uk/app/uploads/2018/10/veuformjune2014.pdf> - in accordance with the [Specimen Acceptance Policy](#).

A minimum sample volume of clotted blood or serum of 500 µL is required.

Post-vaccination samples of clotted blood or serum should be collected 3 to 8 weeks following vaccination.

It is important that the patient's relevant immunisation details, eculizumab therapy or any current antibiotics are recorded on the request form.

Urgent specimens (via courier)

Arrangements to accept urgent couriered samples must be agreed with the MRU **before** the samples are despatched. Failure to do so may result in the specimen(s) not being tested in a timely fashion.

Submitting samples via an OVERNIGHT courier to arrive 8:30am the following day has proven to be the most robust and effective transport.

We strongly discourage sending urgent couriered samples for receipt out of hours (after 5:30pm, Monday to Friday, at weekends, or on Bank Holidays). If unavoidable, specimens should be addressed to:

'Virologist*' / 'Microbiologist*' 'On-Call'
Meningococcal Reference Unit – URGENT SPECIMEN
Public Health England
Manchester Medical Microbiology Partnership
Clinical Sciences Building 2
Manchester Royal Infirmary
Oxford Road
Manchester
M13 9WL

***'Virologist' for PCR testing and 'Microbiologist' for serogroup or other characterisation**

If an urgent courier delivery is expected to arrive out of hours, it should be left at the Manchester Royal Infirmary Autolab reception (the ground floor of Clinical Sciences Building 2, or the drop-off point / 'hatch' of Autolab, accessible via the Main Boulevard under the link-bridge).

Turnaround times and result reporting

The estimated turnaround times for MRU services are outlined in the table below. These are given as a general guide and may vary widely depending on the time of receipt, sample type and the analyses performed.

All times include working days only (i.e. Monday to Friday)

MRU Service	Time to provisional telephone result	Time to final printed report
Isolate characterisation	24 to 72 hours	7 to 10 days
Meningococcal PCR testing	24 hours	48 hours
Non-culture latex agglutination testing	No longer available	No longer available
Meningococcal serology - serum bactericidal antibody assay - per target	28 working days	working days

PCR samples must be received at the MRU by 10am weekdays to be tested the same working day.

PCR negative and meningococcal group B positive results are typically available within 24 hours of receipt. Samples requiring additional meningococcal genogrouping or *S. pneumoniae* (pneumococcal PCR) confirmation are typically available within 48 hours.

Results are telephoned up to 5:30pm or the following morning of the next working day. Urgent samples may be processed more rapidly provided the laboratory is notified in advance of receipt.

From late 2018 there has been a phased roll-out of MRU eLab (electronic) reporting for submitting laboratories in order to reduce reporting and therefore overall turnaround times. Contact Mr Mark Hasselholdt for MRU eLab enquiries.

mark.hasselholdt@phe.gov.uk

Although hardcopies of the PCR results are sent to the PHE Centre (PHEC), based on the patient's postcode, it is currently the responsibility of the requesting laboratory to inform their local Consultant in Communicable Disease (CCDC) or Health Protection Team (HPT) of positive meningococcal PCR results in an appropriate, timely fashion.

Charges

Isolate characterisation and meningococcal PCR testing are provided free of charge for users in England and Wales as part of the PHE reference service.

Users from Northern Ireland will be charged for PCR testing.

Users will be charged for meningococcal serology requests (vaccine response testing) if not initiated as part of an MRU or PHE epidemiological or case investigation. Current prices can be obtained from Mr Mark Hasselholdt (mark.hasselholdt@phe.gov.uk).

Specimen Acceptance Policy

All samples/cultures/specimens must be submitted in appropriately sized and correctly labelled containers and accompanied by an adequately completed request form in order to minimise specimen rejection or delays in result reporting.

Samples/cultures

All samples/cultures must be labelled with the following:

- NHS Number
- surname
- forename
- date of Birth

Plus:

- sender reference number
- date of collection of specimen
- clinical site (for cultures)

It is the responsibility of senders to comply with the current transport legislation and safety recommendations.

Samples (including clinical samples for PCR and viable cultures) must be submitted in packaging appropriate for the transport of biological substance category B (UN3373) in the consideration of airfreight within the UK. Refer to IATA category B Packing Instruction 650 -

<https://www.iata.org/contentassets/b08040a138dc4442a4f066e6fb99fe2a/dgr-61-en-pi650.pdf>

Request forms

Please ensure all information included on request forms matches the information on the corresponding sample/culture.

Request forms must include the following information:

- name of requestor
- contact number for requestor
- address for the report / requesting laboratory
- sender reference number
- consultant, GP, CCDC (Consultant in Communicable Disease Control)
- time and date of sample collection
- tests required
- patient details
- relevant clinical information

If important information is missing, sending laboratories may be contacted to supply details before testing is performed.

Additional testing can be requested on samples received by the laboratory up to 2 months after the receipt of the sample by telephone or letter. Please note, however, that archived samples may have a limited residual volume.

Data and tissue handling

MRU policies strictly adhere to the guidelines set out by EU General Data Protection Regulations (2016), the Caldicott Report (1997) and the Human Tissue Act (2004).

Data handling

The recommendations of the Caldicott Report (1997) and The General Data Protection Regulation GDPR (2016) have been adopted by Public Health England and by the National Health Service as a whole. These recommendations relate to the security of patient identifying data (PID) and the uses to which they are put. MRU, as an integral part of Manchester Medical Microbiology Partnership, observes Caldicott guidance in handling PID. The MMMP has appointed its own Caldicott Guardian who advises on confidentiality issues and is responsible for monitoring the physical security of PID. This also applies to the transfer of results of investigations to and from MMMP, whether by mail services, telephone or fax. The value of 'safe haven' arrangements or other means of the sender and receiver of information identifying themselves to each other before data are transferred is emphasized.

MMMP has to audit the security of its PID in collaboration with its customers. Customers are invited to review our arrangements in conjunction with the Caldicott Guardian. Customers are also asked to draw to the Caldicott Guardian's attention any instances where PID security has been threatened or has broken down. Uses that PID are put to outside clinical diagnostic services generally allow patient identifiers to have been removed before hand, and when PID is used for research purposes the proposals are considered first by the National Research Ethics Committee. All enquiries about the security and use of PID should be addressed to the Caldicott Guardian, William Welfare (Tel: 0161 234 9473), e-mail william.welfare@phe.gov.uk.

Data containing patient information will not be sent using fax. Sending patient information via email is discouraged. Only email accounts that can guarantee data encryption (i.e. secure/closed email systems) are used for this purpose.

Human Tissue Act (HTA) compliance

The MRU adheres to the HTA and its application within the Manchester University NHS Foundation Trust site.

Tissue samples (CSF, whole blood, joint fluid, etc.) from patients are submitted to the MRU with their consent (obtained at time of sampling) for disease confirmation, epidemiological or public health investigations. Samples are tested and retained in accordance with the MRU specimen retention policy. Any residual original sample is retained for 1 year following initial processing.

Since 2006 in accordance with the HTA, post mortem samples or samples from the deceased (patients known by the MRU to have died at the time of submission) have been returned if requested or destroyed sensitively.

Where possible, all meningococcal PCR positive residual clinical samples (from persons living at time of collection) are retained for quality control, assay developments or epidemiological investigation under the local R & D HTA license.

Should it be necessary to contact the MRU regarding a HTA issue, the nominated persons within MMMP are: R & D Person Designated (PD) is Professor Ray Borrow and Post Mortem PD (MFT Bacteriology), Mr Ben Kirkman (Tel. 0161 276 8851).

References

Lucidarme J, Hill DM, Bratcher HB, Gray SJ, du Plessis M, Tsang RS, Vazquez JA, Taha MK, Ceyhan M, Efron AM, Gorla MC, Findlow J, Jolley KA, Maiden MC, Borrow R. 2015. Genomic resolution of an aggressive, widespread, diverse and expanding meningococcal serogroup B, C and W lineage. *J Infect* 71;5: 544-52.

Brooks A, Lucidarme J, Campbell H, Campbell L, Fifer H, Gray S, Hughes G, Lekshmi A, Schembri G, Rayment M, Ladhani S, Ramsay ME, Borrow R. Arrival of the United States *Neisseria meningitidis* urethritis clade in the UK and the emergence of multiple antibiotic resistance – a call for vigilance. *Euro Surveill* 2020;25: doi: 10.2807/1560-7917.ES.2020.25.15.2000375.

Guiver M, Corless CE, WJ Marsh, Gray SJ, Newbold LS, Borrow R, Kaczmarek EB. 2011. Modifications to a Published *ctrA* PCR Assay for the Improved Non-Culture Confirmation of Meningococcal Disease in England and Wales. Meningitis Research Foundation meningitis and septicaemia in children and adults conference 4-5th November 2011, London, UK. Poster abstract. <http://www.meningitis.org/posters>

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