



Histopathology User Manual

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ON-CALL OUT OF HOURS

On-call Paediatric Pathologist Mobile phone via GOS Switchboard

On-call Neuropathologist Mobile phone via GOS Switchboard

Duty Biomedical Scientist 07712 403978 via GOS Switchboard

For availability of clinical advice, i.e., same day results, please refer to the relevant section (page 18).

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LOCATION AND OPENING HOURS

The department is accommodated on Level 3 and Level 0 in the Camelia Botnar Laboratories. The main laboratory and consultant office are located on Level 3. The mortuary is located on Level 0, in the basement of the laboratory complex. Opening hours are **Monday to Friday from 09.00 am to 5.30 pm**. The department is closed on Saturday, Sunday, and statutory holidays.

Full Postal Address:

**Histopathology Department
Level 3
Camelia Botnar Laboratories
Great Ormond Street Hospital NHS FT
85 Lamb's Conduit Street
London
WC1N 3NN**

ON-CALL OUT-OF-HOURS SERVICE

The department provides a limited on-call service to facilitate urgent clinical diagnosis out of hours. There are three members of staff on call (on separate rotas). All should be contacted via switchboard.

| | Service provided | On-Call Hours | | |
|--|---|----------------|---------------|----------------|
| | | Working day | Weekends | Bank holidays |
| Paediatric Pathology Consultant | Diagnosis and advice on non-neurological samples taken out of hours | 8.30am-9:00pm | 8.30am-9:00pm | |
| Neuropathology Consultant | Intraoperative diagnosis for neurosurgical procedures | 10:30am-7:00pm | Not available | 10:00am-4:00pm |
| Biomedical Scientist (BMS) | Technical support for samples taken out of hours | 8.30am-9:00pm | 8.30am-9:00pm | |

The consultants and BMS are contactable by phone via the switchboard who hold copies of the on-call rotas.

The out of hours service is designed to provide the tests required to make an urgent diagnosis that will affect clinical management before the next working day, rather than to recapitulate the full service that would be offered in working hours. Therefore, the pathology consultant and referring clinical consultant will need to consider the risks and benefits of offering a diagnosis out of hours versus the alternative of rapidly processing the sample the next working day. This requires specialist clinical and pathological knowledge, and therefore a referral for an out of hours diagnosis should be made by the clinical consultant to the pathology consultant. In order to facilitate this discussion and the arrival of the consultant and BMS in the hospital, the pathology consultant should be contacted as soon as it is decided that a patient will be taken to theatre, and in all cases, at least 2 hours before the tissue arrives in the department.

In exceptional circumstances, a clinical consultant may request an opinion out of hours on a patient undergoing a planned procedure during working hours. Such cases should be discussed with the laboratory director/clinical lead (or his/her deputy) or the Chief of Laboratory Medicine.

TRAINING

Specialist Registrars in paediatric pathology or neuropathology train in the department under the supervision of the reporting consultants.

RESEARCH

The department has an active research programme. It also offers a research service for scientists and clinicians at GOSH, UCL and further afield.

Contact e-mail for the Research Histopathology Service: Research.Histo@gosh.nhs.uk

RELATED POLICIES

Quality Manual – SQU 100

Scope and Strategy – SOR 001

SCOPE OF ROUTINE DIAGNOSTIC SERVICE

Autopsy

The department offers a comprehensive paediatric autopsy service.

Particular areas of expertise include the investigation of complex childhood deaths (including forensic autopsies, and deaths involving neurological, cardiac or metabolic disease) and minimally invasive autopsies.

The principal categories of cases include:

1. Consented post-mortems: Patients in whom consent for post-mortem examination has been granted by the family. These fall into two broad categories:

a. Perinatal autopsies: These are autopsies undertaken on fetuses who have suffered an intra-uterine death or from pregnancies that have been terminated for an antenatally detected abnormality. The principal purposes are to assist families in coping with their loss and to support counselling for future pregnancies including any subsequent genetic investigations. Subject to consent, these autopsies can also support governance of clinical services, training and research. The Trust has a contract with NHS England to provide a perinatal autopsy service, and this is offered to a wide range of obstetric units across the southeast of the country. Depending on the clinical indication and consent, the department can offer full post-mortem examinations, limited post-mortems, minimally and non-invasive post-mortems using MicroCT, USS and MRI imaging techniques, and placental examination.

b. Post-natal deaths: These are investigations undertaken where the death is not being investigated by the coroner (e.g., the cause of death is known) but that the family have granted consent for a post-mortem investigation. The purpose of these cases varies but may be to answer questions raised by the family, to answer questions raised by the clinicians, or to contribute to a better understanding of the disease from which the child suffered including through research.

2. Post-mortems undertaken under coronial authority:

a. Coroners' post-mortems are undertaken at the request of coroners in London, the Home Counties and further afield. The purpose is to establish a cause of death. Many of these are sudden unexpected deaths in infancy or childhood.

b. Special forensic post-mortems are undertaken at the request of the police, for example cases where non-accidental injury or homicide is suspected. These are performed by a paediatric pathologist in conjunction with a forensic pathologist. The department also has a specialist service for the examination of the nervous system in such cases.

3. Referred post-mortem material for specialist opinion. These are usually brains, hearts, or slides and/or blocks.

Neuropathology

The neuropathology service supports the specialist neuroscience services at Great Ormond Street Hospital, which include the largest paediatric neuro-oncology service in the UK and the largest childhood epilepsy surgery service. In addition, we provide the only dedicated specialised paediatric neuropathology service in the UK, and one of only a few in Europe. Therefore, we offer a national and international referral service.

The service is closely linked to the north Thames Genomics Laboratory Hub through which it offers a specialist service for molecular pathology.

In addition, it provides specialist support for the autopsy service where the death may involve pathology of the nervous system, including forensic cases.

The service can offer expert opinion in the full range of paediatric neuropathology but has particular expertise in tumour and molecular pathology, epilepsy pathology, inflammatory muscle and brain disease in children, metabolic disease and post-mortem investigation.

The principal case types include:

- Tumour biopsies and resections
- Intraoperative diagnosis for children undergoing neurosurgery
- Epilepsy surgery
- Spinal malformations
- Muscle biopsies, and combined muscle/skin biopsies
- CSF cytology
- Ophthalmic pathology
- Post-mortem brains, spinal cords and dura

The department supports a formally constituted multidisciplinary team (MDT) meeting in neuro-oncology. In addition, we support a clinicopathological meeting for neurology.

Paediatric surgical pathology

The departments offer a diagnostic service for samples taken at biopsy or resection from a wide range of specialist clinical services at Great Ormond Street Hospital, which include the largest paediatric oncology service in the UK, and specialist paediatric services for cardiology and cardiothoracic surgery (including transplants), rheumatology and orthopaedics, gastroenterology, renal medicine (including transplants), dermatology and ENT.

The department offers a national and international referral service for surgical pathology.

The service can offer expert opinion in the full range of paediatric surgical pathology but has particular expertise in tumour, renal, cardiac, pulmonary, placental, skin and gastrointestinal pathology.

The principal case types include:

- Tumour biopsies and resections
- A rapid frozen section service for rectal suction biopsies in cases of suspected Hirschsprung's disease
- Intraoperative diagnosis for a range of clinical scenarios and in particular Hirschsprung's disease, and persistent hyperinsulinaemic hypoglycaemia of infancy (PHHI)
- Renal biopsies (native and transplant)
- Cardiac biopsies and explants
- Lung biopsies and explants
- Gastrointestinal biopsies and resections
- Placentas
- Skin biopsies and excisions
- Bone marrow trephines

The department supports two formally constituted multidisciplinary team (MDT) meetings, one in oncology (non-CNS tumours) and one in haemato-oncology. In addition, we offer clinicopathological meetings across a broad range of clinical services.

Electron microscopy and metabolic disease

The department offers a highly specialist service in electron microscopy (EM) and metabolic disease. This not only offers routine EM services (e.g., for renal and muscle biopsies) but also support the diagnosis of a range of metabolic and genetic disease in children. Particular areas of expertise include:

- Diagnosis and monitoring of lysosomal storage diseases (using blood films, buffy coats, bone marrow and urine samples).
- Diagnosis of genetic disorders using microscopy of hair samples
- A pre-natal diagnostic service for metabolic disorders on chorionic-villus samples
- Examination of platelets for Hermansky-Pudlak syndrome
- Ultrastructural examination for rare paediatric disorders including childhood enteropathies such as microvillous inclusion disease, lung surfactant disorders
- Ultrastructural interpretation and support for research and clinical trials is encouraged

The department also provides service to the EM service at Epsom and St Helier's Trust and the National Hospital for Neurology and Neurosurgery.

SUBMISSION OF SPECIMENS

Please note that our laboratory does not accept any form of oral requests, although oral notification / discussion may be required for certain specimens.

Specimen container

When a specimen is routinely fixed in 10% buffered formalin, please make sure that it is placed in a pot of adequate size, and in an adequate amount of formalin (at least x20 the volume of the tissue). Containers should be histopathology specific, with a secure lid. The pot must be labelled properly according to Trust Labelling Policy with the patient's name, hospital number, consultant, and the nature of the specimen (EPIC Generated container label for Internal cases). All pots containing formalin must also carry a COSHH hazard label. All pots supplied by Histopathology are pre-labelled with COSHH information and individual stickers are also supplied by the department.

Sterile containers must be used for any specimen type.

If a specimen is likely to be infectious, and particularly if the specimen is sent fresh, it must have a biohazard label and the possibility of infection should be clearly indicated (i.e., Hepatitis B positive).

Ordering histopathology investigation on EPIC (Internal)

Please refer to the Theatre Specimen Management Standard Operating Procedure and to ASOP 004a Sending Samples to the Laboratory (Sample Transport SOP).

To ensure the appropriate order is placed on EPIC i) the person making the request must be familiar with the case; ii) a clinical question must be clearly asked; iii) relevant contact details must be specified.

When requesting external histopathology material to be reviewed at GOSH you must also raise the histopathology order on Epic. In these instances, you do not need to collect the specimen, as the lab will collect once the material is received. Any material that arrives in our department to be reviewed without an histopathology order on Epic is considered to be a patient safety risk (e.g., delay in reporting and risk of misplacing and losing material) and will be raised as a nonconformance in the quality management system (Datix).

If you're requesting the material for MDT review, you must specify in the Clinical Question:

1. MDT review, no histological review requested
2. MDT review, following histological review of a single case
3. MDT review, following review of multiple / historic cases

Please note that we will not accept tissue specimens that need to be split/shared with Microbiology. Tissue specimens that need to be tested by both laboratories must be submitted separately to each laboratory, with the relevant orders on EPIC, and the appropriate labels on the containers. The onus of collecting AND splitting the tissue is on the clinician obtaining the specimen, as to ensure accurate diagnosis. Any delay to place the specimens in the appropriate medium, or in getting the specimens to the appropriate laboratory for processing, introduces pre-analytical variables that condition the quality of the results, and subsequent diagnosis and patient management. Failure to comply with the collection requirements, as outlined by the testing laboratories, is considered by our regulator (UKAS) to be a patient safety risk, as per ISO 15189:2022, and any such events will have to be recorded on DATIX.

Transport of specimens to the laboratory (Internal)

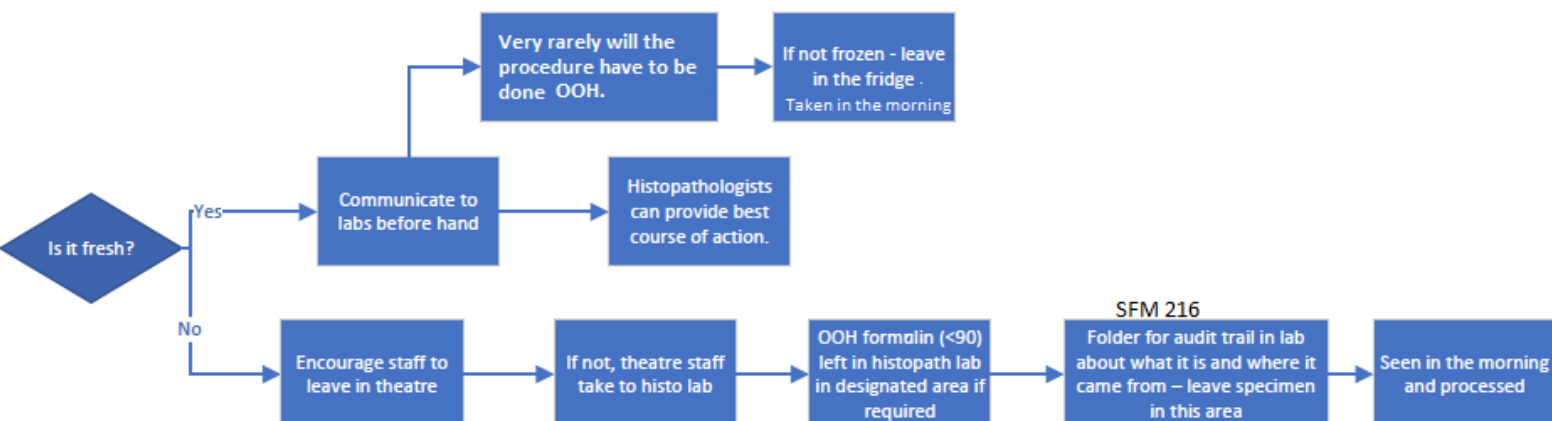
Routine specimens are collected with their request forms from the operating theatres, wards, and out-patient clinics. They are delivered to the laboratory by a porter, nurse, or clinician present during procedure. Occasionally samples are delivered to laboratory via the pneumatic tube system (No 031). **Urgent intra-operative frozen section specimens should be booked at least a day in advance.** The specimen must be immediately brought to Histopathology specimen reception, with the correct container label. **Other specimens requiring urgent handling should be discussed in advance with a Consultant Pathologist.**

Please **DO NOT** send fresh specimens by the pneumatic tube system.

Out-of-Hours (OOH)

Specimens from operations performed out of hours which do not require urgent pathological examination **should be left in formalin** for collection in the operating theatres in the normal way. Alternatively, they can be left in the Histopathology Specimen Reception, but you must ensure SFM 216 - Out of hours specimens (formalin fixed) form is completed.

Please **DO NOT** leave fresh specimens out of hours in any circumstances.



Completion of requests forms (External)

External organisations should complete the appropriate form depending on type of specimen / tests required. **NHS number must always be provided for patients from England and Wales.**

The forms to be completed (SFM 217, SFM 218 & SFM 230) can be found at:

<https://www.gosh.nhs.uk/wards-and-departments/departments/laboratory-medicine/>

All sections, apart from 'LABORATORY USE ONLY' and 'CHARGE', must be completed. **Please note that incomplete forms or forms with discrepant information will not be processed.**

Transport of specimens to the laboratory (External)

Please ensure any specimens, including blood samples for Electron Microscopy, include reference to IATA (International Air Transport Association), and UK UN3373. **Only one sample must be submitted per one appropriately labelled specimen bag.**

<https://www.gov.uk/government/publications/packaging-and-transport-requirements-for-patient-samples-un3373/packaging-and-transport-requirements-for-patient-samples-un3373>

<https://www.iata.org/en/publications/store/infectious-substances-shipping-regulations/>

Formalin Specimens (including endomyocardial biopsies, renal transplant biopsies, Bone Marrow Trepines, skin punches, resections, etc.)

Must be sent in a formalin container. Ensure formalin is at least x20 the volume of the tissue. Leave at room temperature. Do **not** refrigerate or freeze.

Fresh Specimens

It is recommended that the following specimens are sent 'fresh' (unfixed) to the laboratory (i.e., in a sterile specimen pot with no formalin). Full clinical details are always essential. Please note that the following list is not exclusive. If in doubt advice should be sought from either the Pathologist or Biomedical Scientist.

Any biopsy querying a metabolic disorder in the differential diagnosis

Send fresh in saline soaked gauze or on saline moistened filter paper in a sterile pot. These specimens must be discussed with consultant pathologist prior to sending.

Any biopsy querying a bacterial or viral infection

Only the specimen being sent to Microbiology should be sent fresh in a sterile pot. The specimen being sent to Histopathology should be sent in formalin. A request order for both departments should be raised on EPIC. Clearly mark nature of possible infection on the containers.

Blood for metabolic screen

Send at least 2ml of EDTA blood. Blood samples may be sent via haematology.

Liver Biopsies

Send fresh in saline in a sterile pot.

Lymph node biopsies

Send fresh in a sterile pot. Clearly indicate differential diagnosis.

Non-Gynae Cytology (in a paediatric pathology context)

CSF, the volume of CSF that is taken is a safety question for the responsible clinician, but for the laboratory, the minimum is 0.6ml and large volumes (e.g., >3ml) may be associated with fewer false negatives.

BAL, fresh in a sterile container (universal) minimum volume of 0.6 ml

Urine, fresh in a sterile container (universal) minimum volume of 0.6 ml

Rectal Suction Biopsies – for suspected Hirschsprung's disease

Send fresh on saline moistened filter paper in a sterile pot.

Clearly mark the level of the biopsy on the specimen pot.

Renal biopsies

Must be pre-booked (Ext. 5475/5476) to be collected by histopathology staff. Urgent biopsies should be discussed in advance with the Consultant Pathologist.

Skin biopsy for Electron microscopy

Send fresh on saline soaked gauze and in a sterile pot.

Tumour biopsies and tumour resection specimens

Send fresh, in a sterile pot of saline for biopsies and dry for resection specimens.

Neuropathology Specimens

Brain

The brain should be removed according to PM best practice, severing the spinal cord as low in the foramen magnum as possible.

Do not leave fresh brain for more than 15 minutes on the bench before fixing as two frequently encountered artefacts will occur:

- 1) Distortion and flattening of the base or curvature of the cerebrum.
- 2) Drying artefact, which produces discolouration of the outer 1cm of the coronal slices.

After weighing, the brain should be suspended by strong thread, looped under the Basilar artery, in a 5-litre bucket containing a sufficiency of strong formalin (ideally 20% formalin in 1% saline). This fixative should be changed after 24 hours, taking care to support the brain while in the unbuoyed state.

Great care should be taken to avoid disruption of the tissue (particular with soft fetal brains).

Spinal Cord

The spinal cord should be dissected out, preferably attached to representative spinal ganglia. It is not necessary to suspend the cord or open the Dura; it will fix perfectly well in the 5-litre bucket with the brain.

The optimal time to fix is at least 2 weeks but this may need to be reduced where necessary.

Decant the formalin and wrap the brain and cord in couch roll soaked with a little formalin to prevent drying.

Double-bag the wrapped tissues in a labelled, leak proof polythene bag. Place in a rigid container, such as a histopathology specimen bucket, with adequate padding around the tissues to prevent disruption in transit.

Referrals

All referrals should be discussed with the consultant neuropathologist prior to dispatch. Please give adequate notice of the impending arrival by telephoning:

020 7829 8663 Ext. 5484 or E-mail: gos-tr.histopathology@nhs.net

Ensure all relevant patient identifiable information is attached to the container, along with any local pathology/PM reports and consent documentation and then dispatch with a reliable carrier or courier service to:

Prof. T.S. Jacques

Consultant Neuropathologist
Histopathology,
Level 3, Camelia Botnar Laboratories
Great Ormond Street Hospital for Children NHS Trust
85 Lamb's Conduit Street
LONDON
WC1N 3JH

Muscle Biopsies

Handling guidelines

Skeletal muscle presents particular difficulties in biopsy as a result of its contractile properties, its marked susceptibility to ice crystal and saline artefact and the necessity for the muscle fibres to be orientated in transverse section (TS).

Good communication between theatre/sender and laboratory ensures rapid and timely handling. Muscle tissue does not autolyse rapidly, but the delay between excision and freezing should not exceed 2 hours absolute maximum. The quicker the sample is received into the laboratory, orientated, and frozen, the better.

Clinical details

Please include as much relevant clinical information as possible when you answer the clinical question when placing your order on EPIC as this determines the work-up required within the laboratory. Please state which muscle has been biopsied. Any queries, please contact the neuropathologist.

Sample size

The minimal optimum sample size is a cylinder of tissue 1cm long and 0.5cm diameter with the long axis parallel with the grain of the muscle fibres.

Instructions for dispatch for Internal cases (GOSH)

Please contact the histopathology department on extension 5475/5476 to inform of biopsy expected arrival time, preferably before 4:30pm unless otherwise arranged.

The sample for histochemistry and electron microscopy must be wrapped in saline **dampened** gauze. Please do not over soak the gauze as this causes saline artefact, equally if the sample is too dry this affects the tissue quality.

All samples must be delivered rapidly to Histopathology, level 3, Camelia Botnar Laboratory. Biopsies must come to the laboratory as soon as possible as the enzymes we try to demonstrate begin to degrade soon (20mins) after removal from the patient. This must be made very clear to the portering staff. It is preferable if the SpR involved with the case brings the tissue to the lab, if possible.

If a specimen is collected outside the on-call out-of-hours service the tissue must be taken to Chemical Pathology, Level 5, Camelia Botnar Laboratories, so that it can be frozen there and collected by histopathology staff the next working day.

If tissue is for Respiratory Chain Enzyme Assay, please request mitochondrial respiratory chain enzymes on EPIC and follow the Sample Handling instructions on the form. If further clarification is required, please call extension Ext 7874.

Where skin biopsies are taken alongside muscle biopsies, please send the skin specimen on saline dampened gauze in a separate specimen container.

If you require Fibroblast culture on a skin biopsy, you will need skin transport medium which is available from Chemical Pathology, Level 5, Camelia Botnar Laboratories. Ext 1785 (working Hours), 5009 (Out of Hours). The sample is then sent to the Enzyme Lab in the ICH, via Chemical Pathology.

Instructions for dispatch for External cases

Samples must be sent snap-frozen locally, transported on dry ice to histopathology from external hospitals outside of London or if transport is likely to exceed 1 hour. In addition, part of the sample must be taken and placed in 2.5% glutaraldehyde for transport.

The tissue must be handled on site as above (rapidly in saline dampened gauze) and then frozen in such a way as to avoid ice crystal artefact.

The recommended snap freezing method is with liquid nitrogen and isopentane. Alterne

Please contact the neuropathologist and/or the laboratory to inform of expected time of arrival of the muscle biopsy, confirming when dispatched on dry ice. Receipt of the sample will be confirmed to the sender.

If tissue is for Respiratory Chain Enzyme Assay, please contact the Neurometabolic Unit NHNN for sample requirements and collection instructions.

Dr Amanda Lam, Principal Clinical Scientist, Mitochondrial Biochemistry, Neurometabolic Unit, NHNN, UCLH; (Joint position UCLH and GOSH)

Amanda.lam@gosh.nhs.uk; amanda.lam@nhs.net

Tel. 0203 448 3818 / 3844

Rejection conditions

Specimens that are sent to the laboratory unlabelled or with the wrong container label will be returned to source and kept unprocessed until the error is corrected.

Please note that as per ISO 15189:2022 clause 7.2.4.3 The laboratory shall obtain the informed consent of the patient for all procedures carried out on the patient. The laboratory is not in direct contact with patients. It is therefore accepted practice that the referring clinician is ultimately responsible for obtaining consent for testing and possible storage of patient material.

Key pre-analytical factors known to affect test performance or interpretation of results

- Inadequate sampling.
- Labelling errors.
- Poor fixation (e.g., due to insufficient volume of fixative or prolonged ischaemia time).
- Delayed transport of fresh specimens to the laboratory, delayed freezing, inappropriate freezing method.
- Insufficient/inadequate clinical information.

A pathological report is an opinion, and, like all consultant opinions, it is conditioned by the clinical information supplied to the reporting pathologist by their clinical colleagues. Any complicated case should be discussed in advance of the biopsy with the pathologist so that the tissue can be handled in the most appropriate way.

POST-MORTEMS

The post-mortem service is available Monday to Friday 8.30 to 5pm. Post-mortem examinations are not performed out of hours under any circumstances and are not performed on weekends, national or statutory hospital holidays. An out of hours post-mortem service is not routinely provided. It is recommended that the ward booklet 'When a Child Dies' is read for details of death certification, registration, and the reporting of cases to HM Coroner.

Consented post-mortem

It is recommended that a pathologist be consulted before consent is obtained, particularly for limited post-mortem examinations. A consent form must be properly completed, dated, and signed and the Mortuary informed that a post-mortem is requested. Verbal or telephoned consent is not normally acceptable. An e-mailed consent form is acceptable, provided it is countersigned by the doctor who has taken the consent (in the case of an e-mailed consent form this may be the GP or a doctor from another hospital).

If the family is reluctant to consent to a full post-mortem examination, the option of a partial/limited post-mortem examination may be offered. This option should be discussed with the pathologist before the consent form is signed, to make sure that the examination can answer the questions being asked.

The post-mortem examination is performed as soon as practicable, but it is recommended that families are offered at least a 24-hour cooling-off period before commencing the post mortem examination during which time they can change their minds (unless, for religious or other reasons, the family specifically requests that the post mortem examination be conducted within 24 hours. Please note, however, that this depends on availability and the request will need to be discussed with the mortuary team and the pathologist. Members of the clinical team are encouraged to attend. The final report may take up to 6 weeks to complete, and sometimes longer for more complex cases, such as those requiring full neuropathological examination.

Coroners' post-mortems

Cases in which a Medical Certificate of Cause of Death cannot be completed (see the inside cover of the Death Certificate Book for details) should be referred to HM Coroner (St Pancras Coroner's Office, 0207 387 4884, Monday to Friday 9 am to 3.30pm). The case may be referred by the Coroner to another hospital for independent post-mortem.

In a Coroner's post-mortem the pathologist acts as the agent of the Coroner: the post mortem report is sent to the Coroner and all enquiries should be directed through the Coroner's Office. The Pathologist is not permitted to discuss the case with the clinical team without the express permission of the Coroner, until the Coroner's enquiry is complete.

Children dying out of hours from a suspected metabolic disorder

In a child dying out of hours from a suspected metabolic disorder, there is a protocol whereby, having obtained appropriate consent, immediate post-mortem muscle and liver biopsies are taken by the clinical team. The specimen is sent to Chemical Pathology laboratory where the on-call BMS stores the specimens in the freezer and passes them to the Histopathology Department on the next working day. The consent form used must either be the standard GOSH post-mortem consent form or the slightly amended version of the GOSH consent form, which is now available on NICU / PICU (see Protocol for Perimortem Sampling on the Paediatric and Neonatal Intensive Care Units).

N.B.: If a Medical Certificate of Cause of Death cannot be issued, the death needs to be referred to the Coroner and specimens cannot be taken.

Histopathology Investigations NOT provided by GOSH

Jaws and other Maxillo-facial Excisions

Please send it to us as normal. While we maybe be able to process small samples, such as biopsies, we may not have the facilities/equipment to process other samples. The Consultant Histopathologist will review the sample and the clinical details, and decide if it can be reported at GOSH, or if the sample is to be referred by us to UCLH.

Limbs and other Bone Excisions

These specimens should be sent directly to the Royal National Orthopaedic Hospital.

We are only able to accept small bone biopsies, such as Bone Marrow Trephines (BMT), since our department does not have a bone saw.

Relevant contacts for the Cellular and Molecular Pathology (Histopathology) and its User Manual can be found on:

<https://www.rnoh.nhs.uk/services/cellular-and-molecular-pathology>

Skin biopsy for Alopecia

These skin biopsies should be sent in formalin directly to the Dermatopathology Laboratory at St Thomas' Hospital.

The Request Form and the User Guide can be downloaded from:

<http://www.viopath.co.uk/departments-and-laboratories/dermatopathology-laboratory-at-st-thomas>

Skin biopsy for immunofluorescence (IMF)

Two separate pieces of skin must be collected:

- One piece of skin (lesion) to be placed in a formalin container and sent to Histopathology at GOSH.
- One piece of skin (biopsy site dependant on clinical question/condition¹) to be placed in Michel's Medium container and to be sent directly by you to St John's Institute or Dermatology.

| Condition | No. of biopsies requested | Biopsy site(s) for DIF studies |
|--|---------------------------|--|
| Pemphigus (all forms) | 1 | Peri-lesional uninvolved |
| Pemphigoid (all forms) | 1 | Peri-lesional uninvolved |
| Pemphigoid gestationis | 1 | Peri-lesional uninvolved |
| Epidermolysis bullosa acquisita (EBA) | 1 | Peri-lesional uninvolved |
| Linear IgA bullous dermatosis (LABD) | 1 | Peri-lesional uninvolved |
| Dermatitis herpetiformis (DH) | 1 | Peri-lesional uninvolved |
| Discoid lupus erythematosus (DLE) | 1 | Lesional |
| Systemic lupus erythematosus (SLE) | 2 | Lesional and uninvolved (non-sun) |
| Lichen planus (LP) | 1 | Lesional |
| Porphyria | 1 | Lesional |
| Vasculitis | 1 | Lesional |
| Amyloidosis | 1 | Lesional |

NB For accurate direct immunofluorescence diagnosis of the immunobullous diseases in bold above, biopsy of **normal perilesional** skin or mucosa is essential. Lesional and/or heavily inflamed biopsies are sub-optimal for this technique and are unlikely to yield diagnostically useful results.

¹Table from St John's Dermatology, Immunodermatology User Guide DMI-MP-1 Rev 2.4 Issue Date: October 2022

The Histopathology Department will **not** accept fresh specimens, or specimens that need to be split for histopathology / IMF investigations. The onus of collecting / splitting the skin biopsy is on the clinician obtaining the biopsy, as to ensure accurate diagnosis.

Skin biopsies that only require IMF investigations must be sent directly to St John's Institute of Dermatology in Michel's Medium. We are unable to accept these samples, since no Histopathology requisition/order exists. To obtain containers with Michel's Medium contact immunodermatology@gstt.nhs.uk or viapath.imf@nhs.net

You should send the package containing the specimen in Michel's Medium, the Request Form, and the Packing List by courier to:

Immunodermatology Laboratory
St John's Institute of Dermatology
St Thomas' Hospital
Westminster Bridge Road
London
SE1 7EH
Tel: 020 7188 6364

The Request Form and the User Guide can be downloaded from:

<http://www.viapath.co.uk/departments-and-laboratories/immunodermatology-laboratory-at-st-thomas>

If unsure whether a specimen should be sent to us, please contact the laboratory before the specimen is collected from the patient.

AVAILABILITY OF CLINICAL ADVICE

Paraffin sections - Same day result

These cases must be discussed in advance with a Consultant Pathologist by a Consultant from the clinical team. In cases of genuine clinical urgency, a small specimen may be rapidly processed. For a large tumour specimen, this means one representative block. If specimens are received in the laboratory by midday, **and if agreed by the Consultant Pathologist**, a section will be available for microscopic examination later the same day - a report will be telephoned and entered on the laboratory information system. A specimen arriving past midday will only be available for reporting by 10.00am the following morning.

Frozen sections

All planned fresh and frozen should be communicated by the consultant surgeon to the consultant histopathologist (N.B.: There is a specific consultant on rota for neurosurgical samples and one for all other samples) a day IN ADVANCE. This is to allow the lab to plan appropriately for the specimen.

Intra-operative frozen sections of rectal biopsies in suspected Hirschsprung's disease

These must be discussed with a pathologist by a member of the clinical team of, consultant level. In cases of genuine clinical urgency (i.e., Hirschsprung's disease is diagnosed, the case will proceed to a colostomy on the same day) a rapid frozen section of a rectal suction biopsy will be performed and, provided the biopsy is adequate, an answer will be phoned through within an hour.

Intra-operative frozen sections of pancreas for persistent hyperinsulinaemic hypoglycaemia of infancy

These cases are discussed in advance by the medical and surgical team and the pathologists, and a clear strategy is agreed by all **before** the operation. Intra-operative biopsies are discussed with the surgeon, and an appropriate surgical strategy agreed.

Intra-operative frozen sections in other clinical situations

A surgeon may request an intra-operative frozen section for diagnosis or guidance in resection of a tumour. This is carried out at the discretion of the pathologist, after discussion with the surgeon regarding the expectations of the procedure.

Intra-operative brain smears/frozen sections

Please notify neuropathology consultant of a smear one day before surgery or in case of emergency 2 hours before the smear is required. The specimen should be placed in a labelled universal bottle containing a small quantity of saline to keep the sample moist. A properly completed request form should be completed on EPIC including the telephone number to which the result needs to be reported. The sample should be sent to laboratory immediately after removal. The result will be phoned through to the theatre.

Routine cases

A report is usually issued within four working days of receipt of the specimen for small biopsies or within 7 working days for large resection specimens, unless an alternative agreement with local clinicians has been made. Where special techniques are performed on the sections, an interim report is issued, with an indication of when the final report can be expected. A consultant paediatric pathologist and a consultant neuropathologist is available for clinical advice during the working day (see on call details on the respective section). Clinical advice is given by telephone or by direct consultation.

REPORTS

Reports for **internal cases** are made available on EPIC. Requesting clinicians will be notified once the report is made available.

Reports for **referred cases** are made available on 'Outreach', our online results portal, and must be accessed directly from the portal via <http://www.labs.gosh.nhs.uk/laboratory-services/results-portal>. **We will no longer be sending results via e-mail.**

For any Outreach enquiries and technical support contact: gos-tr.outreach@nhs.net We advise that you sign up to 'Outreach' with a GENERIC NHS.net email address rather than your own personalised NHS.net email address. For example, gos-tr.histopathology@nhs.net rather than a personal email such as jane.doe@nhs.net – the reasons for this are:

1. To prevent the one individual receiving mass email notifications that the results/report is available to view.
2. To ensure that the relevant individuals will have access to view the portal and in the event an individual leaves the Trust, you can all still gain access to the portal with the generic NHS.net email address.

If your department does not have a generic NHS.net email address, please contact your IT department for them to create one, and then sign up to 'Outreach' once this has been arranged.

Please note that the histopathology report is a diagnostic opinion offered by the pathologist. This contrasts with reports in some other laboratory specialties that give quantitative measurements or factual findings only. The Histopathology Department at Great Ormond Street Hospital is a UKAS accredited medical laboratory (No. 8661). Our accreditation is limited to those activities described on our UKAS schedule of accreditation. Please access the UKAS website for official confirmation. Newly developed test may be out of the UKAS schedule of accreditation during an initial period but are performed to the same standards as accredited tests from the moment they are integrated in our Quality Management System. The laboratory frequently applies to Extension to Scope to update the schedule of accreditation and include new tests.

The histopathology report often integrates multiple pieces of information based on the examination of the tissue using several different tests, but the conclusion of the report is the integration of all these tests together with the clinical information. It represents a diagnostic opinion, not the individual tests per se.

The practice at Great Ormond Street Hospital (GOSH) often involves super-specialised samples, for which national or international reporting guidelines are not available or are not appropriate because they focus on common or adult diseases. Therefore, care is required when applying such guidance to the service at GOSH. Furthermore, because of the variety of rare samples received, standard operation procedures for reporting documents cannot cover every scenario but aim to provide a framework that covers the most common situations. It follows that the content of a histopathology report will change in individual cases at the discretion of the pathologist, in order that they can communicate in the most effective and accurate manner their opinion of the case.

Measurement Uncertainty (MU) values and descriptions are not routinely included in reports but the values are available should a clinician request them. All measured values carry a degree of uncertainty, for example, through biological variation and sampling-related variability, and quoting estimates of uncertainty on every report might introduce undesirable ambiguity, with the risk for clinical misinterpretation. Despite measurements being taken for some samples, these measurements do not constitute biological reference intervals, as they are not indicative of a diagnosis on its own. In the context of rare diseases with variable phenotypes, it is not possible to define a biological reference range; as such, interpretation of findings (including measurement) requires the context of clinical, histological, and genetic data, along with MDT input to determine appropriate diagnostic and clinical parameters.

Clinicopathological Meetings

Members of the department are involved in a range of clinicopathological meetings and Multidisciplinary Team (MDT) meetings.

Names of patients for discussion at clinicopathological meetings must be supplied to the Histopathology Office by the relevant clinical team **at least 2 working days** before the date of the meeting.

Incidents

Incidents or errors that are internal to GOSH are reported onto the Quality Management Systems (DATIX and Q-Pulse) in line with the Department Internal Quality Control and External Quality Assurance policy SQU 001, and Identification and Control of Non-Conformities policy SQU 0014.

Complaints

All complaints should be channelled through the Clinical Lead and will be addressed in accordance with the Departments Complaints Policy AQU 013.

Compliments

Laboratory staff rarely have the opportunity to witness the positive impact of their efforts, thus receiving a compliment can be a rewarding and motivating experience. The Histopathology Department welcomes any compliments from its service users.

Confidentiality

The Department of Histopathology follows the GOSH Trust policy on Confidentiality of Personal Information. Internal Users can view the policy at http://goshweb.pangosh.nhs.uk/document_library/Corporate%20Library/Confidentiality%20Policy.pdf External Users may request a copy of the document by contacting the Histopathology Departmental manager.

Referral Laboratories

In some cases, the laboratory will seek second opinion or will refer samples to other laboratories for testing. The laboratory has a procedure for selecting and reviewing referral laboratories. Refer to Appendix 1 for a list of referral laboratories used.

Appendix 1: List of referral laboratories

| REFERENCE LABORATORY | UNIT | TYPE OF SAMPLE REFERRED | UKAS ACCREDITATION NUMBER |
|---|---|--|---------------------------|
| Health Service Laboratory (HSL) | Cellular Pathology | Specialised histochemistry tests (technical work) | 9706 |
| Health Service Laboratory – Advanced Diagnostics (HSL-AD) | Advanced Diagnostics | Specialised Immunohistochemistry and In-Situ Hybridisation tests (technical work) | 9007 |
| University College London Hospitals (UCLH) NHS Foundation Trust | Cellular Pathology | Histopathological samples such as Haematolymphoreticular for second opinion and Maxillo-facial pathology for primary reporting | 9706 |
| National Hospital for Neurology and Neurosurgery (NHNN) UCLH NHS Foundation | Cellular Pathology (Neuro) | Neuro(muscular)pathology | 8116 |
| Institute of Ophthalmology UCLH NHS Foundation | Department of Eye Pathology | Eye Pathology | 8609 |
| Imperial College Healthcare NHS Trust North West London Pathology | Cellular Pathology | Specialised Immunohistochemistry and In-Situ Hybridisation tests | 9615 |
| Royal National Orthopaedic Hospital NHS Trust | Cellular Pathology | Specialist unit for bone and soft tissue diseases | 8680 |
| King's College Hospital NHS Foundation Trust | Liver Pathology | Liver Pathology | 8805 |
| St John's Institute of Dermatology St. Thomas' Hospital | Dermatopathology and Immunodermatology | Skin Pathology including Skin Immunofluorescence (IMF) | 8126 |
| The Royal Marsden NHS Foundation Trust | Histopathology/ Cytopathology | Histopathological samples | 9929 |
| Nottingham University Hospitals NHS Trust | Cellular Pathology | Neuropathology Samples | 8162 |
| NHS Lothian Royal Infirmary of Edinburgh | Scottish Human Papillomavirus Reference Laboratory (SHPVRL) | HPV genotyping | 9546 |
| St Jude's Children's Research Hospital – Memphis, USA | Neuropathology | Neuropathology Samples | N/A |