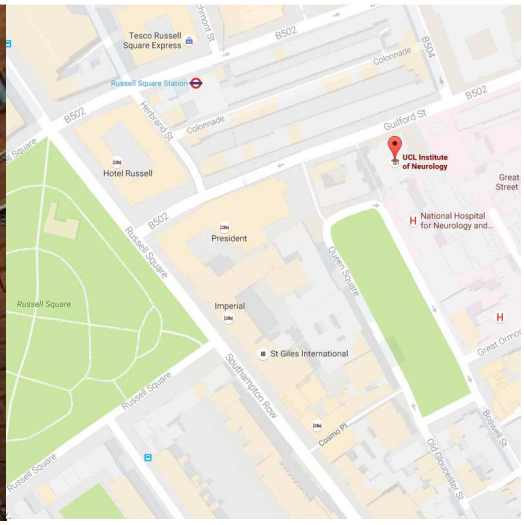
USER MANUAL

DEPARTMENT OF NEUROPATHOLOGY

The National Hospital for Neurology and Neurosurgery



Location, postal address, and main contact details:

UCL Institute of Neurology, Queen Square House, London WC1N 3BG

Department of Neuropathology:

Queen Square House 1st floor, or mailbox 126

Telephone (office): 020 3448 4234

Fax (office): 020 3448 4486

Email for patient enquiries: uclh.office.neuropathology@nhs.net

Website: www.ucl.ac.uk/ion/divisions/neuropathology.htm

UCL IQPath:

Queen Square House Basement

Telephone: 020 3448 4006

Email: ucl.iqpath@ucl.ac.uk

Website: https://www.ucl.ac.uk/ion/divisions/neuropathology/ion-histology

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Contents

Introduction

The Department of Neuropathology is situated on the 1st floor of the UCL Institute of Neurology, adjacent to the National Hospital for Neurology and Neurosurgery. Organisationally, it is part of the National Hospital for Neurology and Neurosurgery (NHNN) Specialist Hospitals Board, Queen Square Division.

This guide is intended to provide our users with information relating to our clinical and laboratory services, ensuring an accessible and efficient service.

Note: in the organisational context of University College London Hospitals (UCLH) the correct designation is "Department of Neuropathology" whilst within the organisational context of University College London, Institute of Neurology the correct designation is "Division of Neuropathology".

The Department of neuropathology provides a comprehensive histopathological diagnostic service for diseases of the central nervous system, and the neuromuscular system.

Contact information

The range of working hours (shift system) are Monday to Friday between 08:00 and 18:00. This may be modified during times of staff shortage and holiday period.

For all **laboratory enquiries**: 020 3448 4236.

For **Specimen Reception**: extension 84246. External callers dial 020 3456 7890 for UCLH switchboard and ask for connection.

For **results and general departmental enquiries:** 020 344 84234 (Please check results via CDR before calling).

Key contacts

Position	Name	Telephone	Email
Please find all neuropathology contacts and our services also on our website https://www.ucl.ac.uk/ion/divisions/neuropathology			
Head of Department	Sebastian Brandner	020 3448 4435	sebastian.brandner@nhs.net
Head BMS	Linda Herbert	020 3448 4237	linda.herbert1@nhs.net
Office, general enquiries	Sharon Snook	020 3448 4234	uclh.office.neuropathology@nhs.net
Neuropathology laboratory	Vijay Stopps	Specimen reception	uclh.laboratory.neuropathology@nhs.net

Position	Name	Telephone	Email
		020 3448 4246	
Molecular neuropathology	Monika Dutt	020 3448 4240	uclh.molecular.neuropathology@nhs.net
UCL IQPath	Angela Richard-Loendt	020 3448 4006	ucl.iqpath@ucl.ac.uk

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Services provided

- A speedy, high quality diagnostic service for surgical neuropathology, neuromuscular diagnostics, epilepsy, and molecular neuropathology of brain tumours
- A wide range of diagnostic test methods, including special stains, immunostainings, in situ hybridisation, PCR, resin sections and electron microscopy. We provide digital pathology services (whole slide scanning and management)
- Intraoperative surgical assessment (frozen section/smear service (24 hours Monday-Friday, on request on weekends)
- Provision of a full mortuary and post-mortem service.
- Experimental and research services including image analysis are provided by UCL IQPath.

Department of Neuropathology: case numbers per year (2014, 2015, 2016)

Workload and diagnostic activities in the Division of Neuropathology in 2014 and 2015	2014	2015	2016
Surgical pathology and diagnostic brain biopsies from NHNN	**861**	**912**	**1099**
Epilepsy lobes	47	41	30
Neuropathology referrals (surgical only)	739	996	962
Adult Muscle biopsies (incl referrals)	207	248	191
Paediatric muscle biopsies including referrals	146	106	190
Peripheral nerve biopsies (incl referrals)	91	121	88
Molecular pathology tests NHNN	247	228	264
Molecular pathology tests referrals	456	488	627
Electron microscopy requests	58	64	29
CSF cytology requests	**807**	**952**	**755**
Neuropathological post mortem (incl referrals)	91	68	68
Intraoperative assessments (frozen sections and smear preparations)	384	421	540
Total Neuropathology requests	**4234**	**4645**	**4843**

Request forms and specimen labelling

Histology or cytology must be chosen according to the specimen. Please use the correct form as it ensures that the specimen is delivered to the correct laboratory. Cytology specimens are referred first to the Neuroimmunology lab, where the cell count and other parameters are determined. The Neuroimmunology laboratory then submits a CSF samples to our Department.

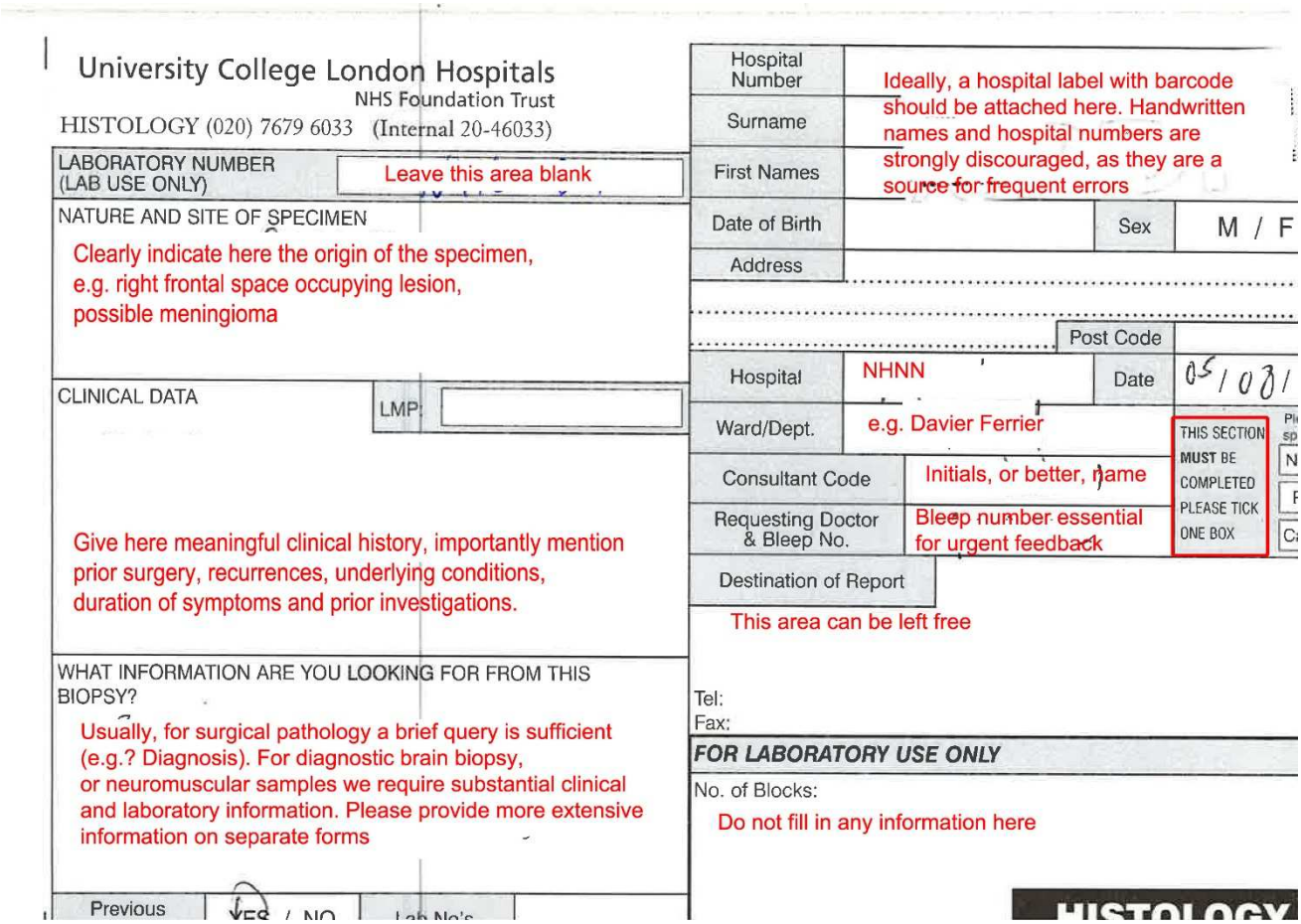
Please fill in the form as completely and as clearly as possible. All information requested is pertinent to an accurate histological or cytological diagnosis. Incorrectly or insufficiently labelled request forms and/or specimen containers cannot be processed and may require a visit from the requesting clinician to authorise the specimen identity. We strongly discourage the use of handwriting to fill in patient details. This is source for frequent and potentially dangerous error.

Patient labels should be used at all times.

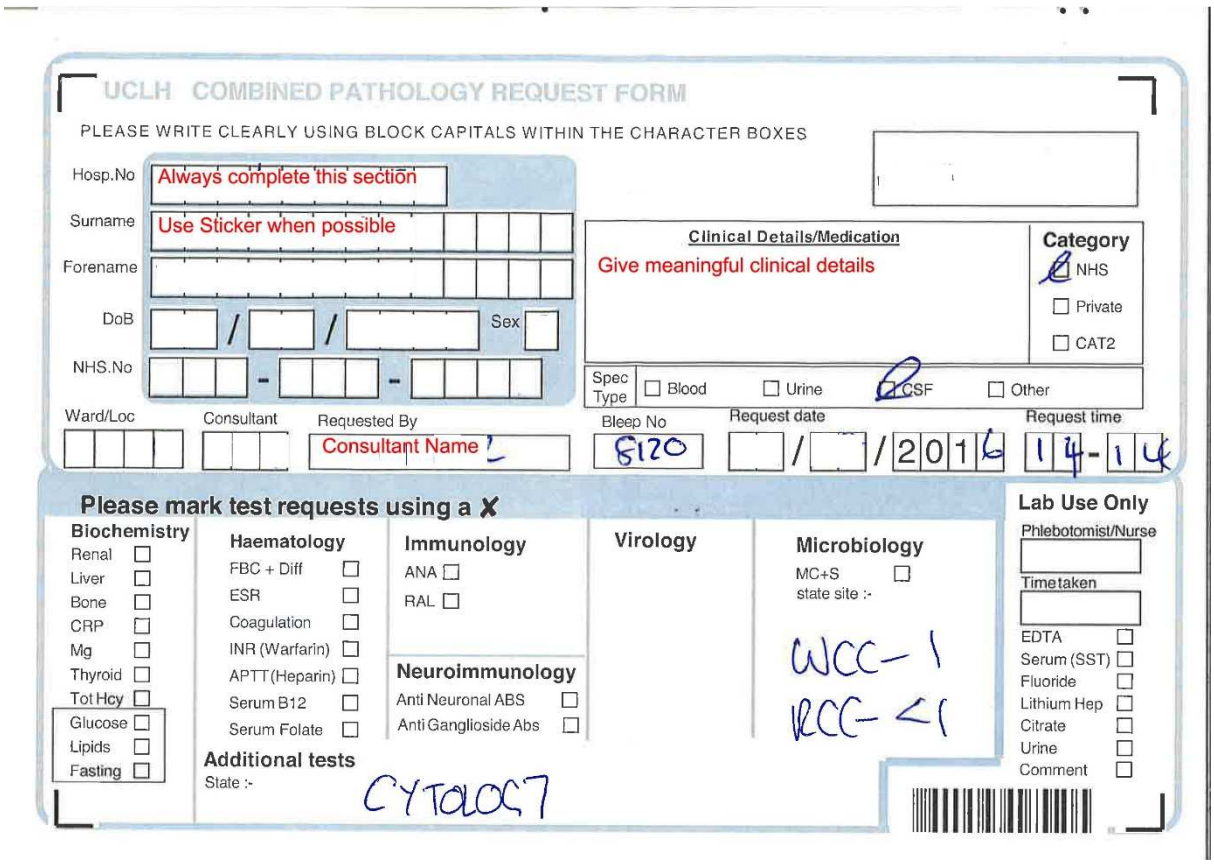
If there is a known risk of infection to laboratory staff this must be clearly written on the request form along with clinical history. This will result in a delay in the final diagnosis. The laboratory cannot take responsibility for any incorrectly labelled specimens or forms.

A bag is attached to the form and this is for the specimen pot; if the specimen is too large for a 60ml container please use a snap-top plastic bucket.

Histology request form. Indication of important fields to be completed



Cytology request form: indication of important fields to be completed


UCLH COMBINED PATHOLOGY REQUEST FORM

PLEASE WRITE CLEARLY USING BLOCK CAPITALS WITHIN THE CHARACTER BOXES

Hosp.No — Always complete this section

Surname — Use Sticker when possible

Forename

DoB / / Sex

NHS.No - -

Clinical Details/Medication — Give meaningful clinical details

Category: NHS ☑ Private ☐ CAT2

Spec Type: ☐ Blood ☐ Urine ☑ CSF ☐ Other

Ward/Loc | Consultant | Requested By: Consultant Name | Bleep No: 8120 | Request date: / / 2016 | Request time: 14-14

Please mark test requests using a ✗

Biochemistry: Renal, Liver, Bone, CRP, Mg, Thyroid, Tot Hcy, Glucose, Lipids, Fasting

Haematology: FBC + Diff, ESR, Coagulation, INR (Warfarin), APTT (Heparin), Serum B12, Serum Folate

Immunology: ANA, RAL

Neuroimmunology: Anti Neuronal ABS, Anti Ganglioside Abs

Virology

Microbiology: MC+S, state site :- WCC-1 RCC-<1

Additional tests: State :- CYTOLOGY

Lab Use Only: Phlebotomist/Nurse, Time taken, EDTA, Serum (SST), Fluoride, Lithium Hep, Citrate, Urine, Comment

Preparation and submission of specimens

All pots must be approved rigid containers that are properly closed and clearly labelled. The porters are instructed not to collect pots which are damaged or leaking. If any such pots do reach the laboratory, this will be logged as an adverse incident and the Risk Management Office may be notified.

All referrals to:

Division of Neuropathology

UCL Institute of Neurology

1st Floor, Queen Square House

London WC1N 3BG

External users refer/send the specimens to the Division of Neuropathology (mail address see above).

Internal users: There are collection points for specimens in theatres, wards and clinics, and it is important that specimens are left at these designated places. If unsure, send the specimen through the NHNN porter to the specimen reception (room 124) Division of Neuropathology, 1st floor Queen square house.

Acceptance criteria

Samples that are received into the Department of Neuropathology are **never rejected** but if the specimen destination is not for this department we will send on to the necessary department/hospital. If samples are incorrectly or insufficiently labelled, we will not book them in until this has been clarified with the sender. We will always try to get in touch with the sender to inform about incorrect labelling and seek clarification.

Histopathology specimens:

Scope of tests:

The main roles of histopathology is the examination of biopsy tissues. Surgical pathology material is usually obtained during neurosurgical interventions and is submitted for the identification, often with removal of a neoplastic or inflammatory, or otherwise pathological lesion. The scope of surgical pathology examinations is given in great detail in the guidelines published by the Royal College of Pathologists.

https://www.rcpath.org/resourceLibrary/g069-cnsdataset-jan16-pdf.html

Other diagnostic material comprises diagnostic brain biopsies, nerve, and muscle biopsies, which are described below.

Unlike laboratory requests, where the clinical teams have to specify the test requested, no such instructions need to be given for histopathology specimens. All decision-making processes will start after receipt of the specimen in the Neuropathology Department. The spectrum of tests will strongly depend on the nature of the specimen, the disease process involved, and is also highly dependent on the pertinent clinical questions. The decision-making may be influenced by discussions on multidisciplinary meetings.

Specimen requirements:

Internal referrals: During working hours, the preferred specimen referral from NHNN is fresh. The increasing involvement in research studies, clinical trials, whole genome sequencing, derivation of cell lines but also the necessity of diagnostic brain biopsies to undergo protein analysis or next-generation sequencing for e.g. viral diseases, make it increasingly or desirable or necessary to receive specimens or FRESH. Specimens that are predicted to arrive outside working hours should be submitted in routine fixative (formalin).

Referrals from external hospitals: By default, all specimens must be sent in fixative as otherwise specimens would deteriorate during the transport.

Fixative: The routine fixative is formal saline (also known as formalin), which is a hazardous reagent, and instructions for dealing with it should be followed carefully. Please use a container large enough to accommodate the specimen without forcing it in, and sufficient volume of fixative (at least 10x the volume of the specimen). Specimens left without fixative will undergo autolysis and putrefaction and will not yield a reliable histological diagnosis. Please ensure that pots are firmly locked and prevented from leaking. Always place the specimen pot into a designated envelope containing blotting paper or absorptive tissue.

Specimen labelling: specimens taken from patient with known or suspected transmissible diseases such as HIV, hepatitis or Creutzfeldt Jakob Disease or Must be labelled with a "high risk" label. This is also strongly recommended for any samples from patient with unclear new degenerative disorders, as they may turn out to be prion disease.

Cytology specimens:

Scope of test:

The main role of CSF cytology is:

- In the investigation of **neoplastic or malignant meningitis**.
- It is debatable how useful CSF cytology is in the investigation of inflammatory or infectious disease as the findings are non-specific. Please see also the Royal College of Pathologist's guidelines for the indication for CSF cytology. https://www.rcpath.org/profession/publications/cancer-datasets.html .
- The main justification in this clinical situation is the confirmation of an inflammatory versus neoplastic process, to distinguish an acute from chronic inflammatory response and the identification of some organisms (e.g. cryptococcus).
- The examination of cyst fluid, for example in the context of a brain tumour (this is technically not CSF but will be prepared in the same way).
- CSF cytology can also confirm the presence of siderophages following suspected subarachnoid haemorrhage
- CSF cytology is often of little value in the investigation of patients with neurodegenerative diseases and low CSF cell counts.

Specimen requirements

Minimum required volume of CSF: 1ml. Without the required volume, we may not be able to process all required slides and we may not have sufficient material to carry out a supplementary examinations that may become necessary.

- Specimens should be in clean, rigid sided containers **without fixative**. Generally, 30ml and 60ml sterile Sterilin plastic containers should be used for fluid samples.
- Diagnostic cytology fluid specimens that have missed the lest delivery to the laboratory should be refrigerated overnight.
- Fluids, such as serous fluids, cysts, drains, washings, sputa should be placed in a 30/60 ml Sterilin container.
- It is essential that CSF specimens are received and processed in the lab ideally within a few hours after they are taken in order to avoid deterioration of sample and cell preservation.
- In cases where underlying leptomeningeal tumour is clinically suspected (eg carcinomatous meningitis) larger volumes of CSF are recommended for cytology (approx. 5ml) to allow a broader immunocytochemical panel.

Intraoperative smear or frozen sections

Scope of test:

Rapid assessment of neurosurgical biopsies during surgery to establish type of lesion. It is not recommended for small biopsies such as Stereotaxic tissue cores, which are very small in volume. Intraoperative diagnosis are usually only indicative and almost never definitive. Definitive answers can usually only made by paraffin histology, and therefore it is not recommended to submit stereotaxic biopsies for intraoperative tests as this will reduce the specimen available for a precise intraoperative diagnosis which may also include molecular pathology assessment.

Specimen requirements

All material must be submitted fresh. During regular working hours (8 AM-5 PM) no specific arrangement needs to be made. The Department of Neuropathology has a full cover for intraoperative specimens during weekdays (see above). If an out-of-hours arrival (after 5 PM) is expected, please get in touch with the laboratory and/or the consultant on-call. The Department can arrange receipt of late coming biopsies.

Weekend assessments need to be confirmed with a consultant on-call by Friday afternoon, ideally no later than 3 PM, so the Department can arrange the laboratory cover.

The transport of specimen during working hours can be through a pneumatic tube system or, through a porter system depending on the current transport arrangements at NHNN.

Complex, unusual and high risk cases (prion disease, HIV, hepatitis and other transmissible dangerous pathogens) should be discussed in advance with one of the consultants, via the Neuropathology secretaries on 020 3448 4234

Muscle biopsy requests

Scope of test:

A muscle biopsy is taken to assess the skeletal muscle system for abnormalities, such as inflammatory conditions (polymyositis, dermatomyositis), genetic disorders such as muscular dystrophy, or other degenerative processes.

Specimen requirements

To ensure that you obtain the best results possible from the muscle biopsy, please follow the protocol below as closely as possible.

A muscle biopsy protocol guidance can be downloaded from the website of the Division of Neuropathology

https://www.ucl.ac.uk/ion/divisions/neuropathology/diagnostic_services/download

Please telephone the neuropathology laboratory 020 3448 4236 or email UCLH.laboratory.neuropathology@nhs.net as far in advance as possible when planning to send a muscle biopsy from outside the NHNN. A biopsy must be taken early enough in the day to arrive in our laboratory no later than 3pm Monday – Friday, in order to be subsequently processed in our laboratory.

For **external referrals it is essential, that a confirmation is made with a person** (senior biomedical scientist or consultant) in the Division of Neuropathology and arrangements for the transport have been explicitly made.

Further information can be found on the website of the Royal College of Pathologists, non-neoplastic tissue Pathways.

https://www.rcpath.org/resourceLibrary/neuropathology-tissue-pathways-jan-15.html (valid on August 2017)

Nerve biopsy requests

Scope of tests

A nerve biopsy is taken to assess pathological changes in the peripheral nervous system, such as inflammation, amyloidosis, degeneration, or genetic causes.

Specimen requirements:

To ensure that you obtain the best results possible from the nerve biopsy, please follow the protocol below as closely as possible. An up-to-date nerve biopsy protocol guidance can be downloaded from the website of the Division of Neuropathology.

https://www.ucl.ac.uk/ion/divisions/neuropathology/diagnostic_services/download

Please telephone the neuropathology laboratory 020 3448 4236 or email neuropathology.lab@uclh.nhs.uk as far in advance as possible when planning to send a nerve biopsy. A biopsy must be taken early enough in the day to arrive in our laboratory no later than 3pm Monday – Friday.

For external referrals it is essential, that a confirmation is made with a person (senior biomedical scientist or consultant) in the Division of Neuropathology and arrangements for the transport have been explicitly made.

Further information can be found on the website of the Royal College of Pathologists, non-neoplastic tissue Pathways. https://www.rcpath.org/profession/publications/cancer-datasets.html (valid June 2018)

Molecular pathology

Scope of tests:

Molecular pathology tests refine the histological diagnosis of brain tumours, or are in some occasions essential to establish a correct diagnosis of brain tumours. In many instances these tests are essential for planning enrolment into clinical trials or to decide for the optimum therapeutic regimen.

For further details, including pricing and the request form for the molecular pathology service, please visit our website:

https://www.ucl.ac.uk/ion/divisions/neuropathology/diagnostic_services/molecular_tests

Specimen requirements:

In most instances, we can accept paraffin blocks or unstained sections as specified in our request form.

Key contacts for queries regarding molecular tests:

Nirosha Suraweera, clinical scientist (n.suraweera@ucl.ac.uk; uclh.molecular.neuropathology@nhs.net)

Monika Dutt, Biomedical Scientist (monika.dutt@nhs.net; uclh.molecular.neuropathology@nhs.net

Sebastian Brandner, Professor of Neuropathology and Honorary Consultant Neuropathologist (sebastian.brandner@nhs.net)

Zane Jaunmuktane, Clinical Lecturer and Honorary Consultant Neuropathologist (zane.jaunmuktane@nhs.net)

Post-mortem examination

Scope of test:

We provide a neuropathology post-mortem service to the NHNN and to external customers. We provide a specialised service to establish the diagnosis of prion disease (Creutzfeldt Jakob Disease, CJD). This includes Coronial requests to establish not only the cause of death but also if the death is related to CJD.

Specimen requirements:

The examination of a brain for the presence of prion disease is a highly involved procedure and requires coordination between the sender, the UCLH mortuary where the examination will take place, and the neuropathologist carrying out the examination. In most instances we will accept referrals for brain only examinations.

Process:

Please get in touch via email with sebastian.brandner@nhs.net or zane.jaunmuktane@nhs.net to discuss the referral.

We will be able to confirm or exclude prion disease within 5-8 days after PM depending which day the PM takes place.

If prion disease is excluded: Full PM can go ahead in the local (referring) mortuary, to which we would return the body on the day of the PM. We will continue to examine the brain in greater detail for other causes of neurological illness, with a detailed final report of all the findings in the brain usually available within 2-3 weeks.

If prion disease is be confirmed, we will state in our report that we do not recommend full PM on this patient.

We usually would ask that the referring clinical team or coroner's officer for a favour to discuss with the next of kin the possibility of consenting either the whole brain or at least tissue pieces to be used for research. To do this, we will return a set of documents for completion:

- A document "*Consent Form*". This form must be completed together with relatives according to the instructions in the document "Instructions how to fill in the consent form"
- A document "*Instructions how to fill in the consent form*". This document explains in detail how to fill in the consent form and indicates the importance of consent form and tissue donation for research. I am happy to explain this to the relatives myself if you feel this would be more appropriate.
- A Document "*Simple guide to Post Mortem investigation*". This document explains the PM procedure in simple terms and should be given to relatives to read prion filling in the consent form.

Please note, that our fee for a brain only examination in patients with suspected prion disease is £1600. In addition, the referring hospital or coroner will have to cover the cost for the transfer to UCLH mortuary and return.

Turnaround times

The agreed turnaround times in the Department of Neuropathology and UCL IQPath are detailed below. Please note that the time taken to process and report a specimen can depend on its size, and the complexity of the case. The table below indicates the agreed targets for different types of specimens and how our Department benchmarks against these targets

Specimen type	TAT target
Surgical pathology and diagnostic brain biopsies from NHNN	90%/5d
Epilepsy lobes	80%/20d
Neuropathology referrals	80%/20d
Adult Muscle biopsies	80%/20d
Paediatric muscle biopsies	80%/30d
Paediatric muscle biopsies the National commissioning Group referrals (NCG)	n/a
Peripheral nerve biopsies	80%/20d
CSF cytology requests	98%/3d
Neuropathological post mortem	75%/3mo

Communication of results

Summary reports of neuropathology requests are available via the clinical data repository, (CDR) also known as electronic patient record. On CDR, results are available as soon as the report has been electronically authorised by the consultant pathologists; no printed report will be sent to internal UCLH locations. It is helpful if you can check results on the computer before ringing the secretaries.

Clinicians are welcome at all times to visit the laboratory to discuss their cases and view the slides. Please arrange with the neuropathology specialist trainee off with the consultant in charge, through uclh.office.neuropathology@nhs.net . Samples requiring specialist opinion, for example soft tissue pathology or haematopathology are routinely referred to other laboratories.

Referral specimens are communicated electronically by sending PDF files of the report to NHS.net email addresses, either a collective address at the pathology department or personally to NHS.net addresses of referring clinicians or pathologists.

Storage of tissue:

Neuropathological specimens in excess to diagnostic and research requirements are kept in formalin fixative for six months and are then disposed of after checking that the case has been fully reported. Should the clinical team for any reason require further examinations must therefore be requested within 5 months. All neuropathology and diagnostic cytology slides are kept per policy for a minimum of 30 years; blocks for a minimum of thirty years, however in reality our archive dates back to 1965 for surgical pathology and further back for post-mortem material.

Whole brain post-mortem material, stored in formalin fixative deteriorates continuously over the years and is therefore disposed of after 20 years.

Research studies are communicated directly to researchers. A written report is issued in all cases where scientific assessment has been agreed. Research studies involving the technical part only (e.g. embedding, sectioning or staining only) were not result in a written report. A complete quotation, itemised with the workload will be agreed before the project commences and is payable upon completion of the study.

User satisfaction

The Department of Neuropathology is committed to producing a high quality product in a timely and competitive manner for the good of the patient and to the specifications of its users.

The Department of Neuropathology covers a wide range of diagnostic activities with a particular expertise in neuro-oncology, epilepsy, inflammatory diseases of the CNS, neurodegenerative diseases including prion diseases, peripheral nerve and adult and paediatric muscle.

All medical and biomedical staff are members of the relevant professional bodies.

To ensure user satisfaction the department will:

- Adhere to a quality management system.

- Set quality objectives.
- Ensure all personnel are familiar with the departmental quality manual.
- Commit to health, safety and welfare of all its staff and visitors.
- Comply with the Human Tissue Act.
- Comply with the Data Protection Act.
- Uphold professional values and adopt UCLH/UCL policies.

It is an essential prerequisite of a quality service that the organisation and management of the laboratory relates to the needs and requirement of its users. We are always keen to receive any comments you may have in which we might be able to improve the service. Once a year we will send out an online user satisfaction questionnaire and make improvements where necessary.

Please contact the Queen Square Division Laboratory Quality Manager vaneeshagibbons@nhs.net with any comments or suggestions.

Policies, accreditation and standards:

The laboratory follows UCLH trust data protection policy.

The laboratory is accredited through the United Kingdom accreditation system (UKAS), according to ISO standards 15189.

Laboratory complies with Human Tissue Act.

Complaint forms are available on the UCLH Neuropathology website (intranet only, access through UCLH login).

http://insight/departments/MedicineBoard/Pathology/Neuropathology/Pages/default.aspx