

Department of Musculoskeletal Pathology

Laboratory Manual

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MP11	
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The Royal Orthopaedic Hospital NHS Foundation Trust

1. Introduction and Service Provided

The Department of Musculoskeletal Pathology is located in premises at the University Of Birmingham and is located in the Robert Aitken Building. The Department was established in June 1997 in response to demands for a more dedicated Histopathology Service than had previously been provided to the Royal Orthopaedic Hospital NHS Foundation Trust and in particular the Birmingham Orthopaedic Oncology Service.

The Birmingham Orthopaedic Oncology Service is one of the five national supra-regional bone tumour treatment centres and treats approximately 40% of the United Kingdom's primary malignant bone tumours. It is one of the largest bone tumour services in the world. As such, the pathological material is a rare and valuable resource of international interest.

The department provides a diagnostic histology service including a frozen section service. Within the histology service there are tinctorial, immunohistochemical, reverse-transcriptase polymerase chain reaction techniques and fluorescent in-situ hybridisation (FISH) applied by the staff to aid the diagnoses of the rare tumours seen at The Royal Orthopaedic Hospital NHS Foundation Trust. The sequencing of PCR products is carried out by The Functional Genomics, Proteomics and Metabolomics Facility, University of Birmingham.

Please note that haematology, blood transfusion, clinical chemistry and microbiology are provided by University Hospital Birmingham Clinical Laboratory Services under a Service Level Agreement. A clinical immunology service is provided by the Immunology Department of the University of Birmingham. This is based in the University Medical School.

2. Quality Management

The Department of Musculoskeletal Pathology is subject to external accreditation by CPA (Clinical Pathology Accreditation [UK] Ltd).

The Department of Musculoskeletal Pathology runs a comprehensive quality management system and participates in a number of relevant National Quality Assessment Schemes. There is also a schedule of internal quality audits and corrective action which are presented to CQC (Care Quality Committee) on a quarterly basis.

The Department is also recognised for training by the Royal College of Pathologists and has approval for the training of biomedical scientists by the Institute of Biomedical Sciences. All work is carried out with due care for the health and safety of staff and with proper regard to the environment. The department is licensed by the environment agency as a

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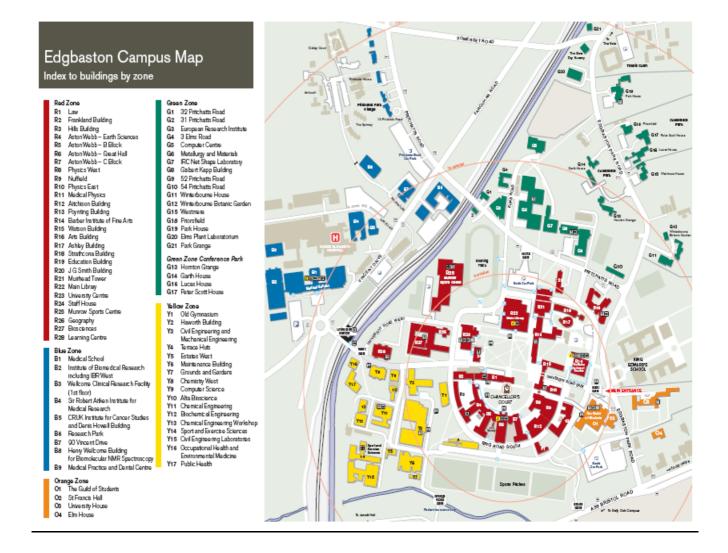
producer of clinical waste and the department complies with all safety procedures including the Control of Substances Hazardous to Health.

The Department also has a broad based tissue research programme and is licensed by the Human Tissue Authority (HTA) to store tissue for research.

3. Key Information

3.1. **Current Location of the Department**

The Department is located on the third floor of the Robert Aitken Institute of Clinical Research, Vincent drive, University of Birmingham B15 2TT. This is **building B4** on the map below.



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3.2. Opening Hours

Weekdays

A full laboratory service is available from 08:30 until 17:00 hours Monday to Friday. Staff will stay outside these hours if requested and if there is a genuine clinical requirement. Please telephone the department to arrange this.

Saturdays, Sundays and Public Holidays

There is no service at weekends or on public holidays.

3.3. Out of hours service policy

Owing to the nature of work carried out, an out of hours service is not normally required. Any specimens that miss the last scheduled collection by the NSL driver (4pm) should stay at the hospital until the next morning (refer to the document 'Specimen Collection and Transport to the Laboratory').

Large specimens should be kept in the Theatre specimen refrigerator until the next morning, with the exception of Fridays, when staff may (by prior arrangement) wait to accept delivery of large resection specimens. Amputations should ideally be received in the laboratory on Fridays or before a public holiday. If this is not possible then the theatre should telephone the laboratory **(415 8766/415 8767)** for advice. All larger FRESH specimens that are awaiting despatch until the following morning / Monday should be stored in the Theatre fridge. Smaller specimens i.e. biopsies, should be placed in fixative.

It is essential that specimens are not dispatched by any method other than the scheduled daily NSL service that runs until 4pm each day. Specimens sent by any other method without prior arrangement with Laboratory scientific staff may not arrive until after the Department is closed and therefore their safe receipt cannot be assured.

If a frozen section is required out of normal working hours, then the surgeon should telephone the department to discuss this with a pathologist before attempting to send the specimen.

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4. Contact Information

The Department of Musculoskeletal Pathology

Robert Aitken Institute of Clinical Research, Vincent Drive, University of Birmingham Birmingham B15 2TT

•	General Enquiries	0121 - 41 4 7641
	(Requests for Reports)	
•	Laboratory Enquiries	0121 - 41 5 8766/8767
•	Fax	0121 - 41 4 7640

5. Clinical Specimens Health and Safety

There are safety and security implications at all stages of the collection process and the storage and transport of clinical specimens. All biological specimens should be treated as infectious and staff should take care to protect themselves and others even though the specimen might be contained within a specimen container.

6. Manual Handling

(Please see the Trust Manual Handling Policy)

Small biopsies may not be an issue; however a large number of specimens are very heavy and care should be taken.

All staff are subject to the Manual Handling Operations Regulations (1992) and should attend yearly manual handling training. Use the correct technique when lifting and use appropriate manual handling aids if available.

7. Security of Specimens and Patient Data

The security of a collected specimen and its associated paperwork should be treated as a priority. Many specimens are unique and cannot be repeated, or if they can will require another clinical intervention. All clinical areas should have designated and secure areas for specimens prior to dispatch.

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8. Histology Specimens – Documentation

All histology specimens must be accompanied by a correctly and properly completed histology form AND a 'consent for the use of tissue for research' form. Ensure that the request form is legible and completed as fully as possible. The correct request form must be completed and accompany the specimen to the laboratory. The consent form should be completed and signed by the patient (or representative, if appropriate) and the consenting clinician. To avoid contamination forms should be separated from specimens using plastic wallets designed for that purpose.

Patient safety is paramount and the laboratory takes considerable precautions to ensure that the correct sample, belonging to the correct patient is analysed.

The normal (minimum) laboratory standard is to have three points of positive identification, the **patient name** and two from the following list:

- Date of birth
- Hospital number
- NHS number

Please complete the request form as comprehensively as possible; include the source of the specimen (theatre or clinic number), the date and time the specimen was taken, the name of the requesting Consultant and a destination for the report if this differs from the requesting Consultant. A brief clinical summary, including any treatment - e.g. radiotherapy or drugs should always be given. The department recognizes that as it is off-site then rejecting a specimen may mean that the specimen may "go missing" therefore if the specimen is unlabelled or request form is incorrectly labelled then no work will commence on the specimen until the error is corrected. Laboratory staff will contact clinicians or theatre staff responsible for the procedure, to confirm and correct as necessary.

9. Clinical and Technical Advice (including unforeseen problems)

Clinical and technical advice can be obtained by ringing the department on the numbers already given. Outside these hours the pathologists and pathology manager can be contacted via the hospital switch board.

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10. Specimen Collection and Transport to the Laboratory

10.1. Specimens from Oncology Theatres (Usually Theatre 2)

The majority of specimens for this laboratory come from operations carried out in this theatre. Specimens may be of three types:

- A. Biopsies
- B. Resection specimens
- C. Amputations

Biopsies

Biopsies should be sent in two containers:

- 1. <u>A dry container with a yellow lid</u> so that the specimen may be sampled for the tumour bank and if appropriate for DNA/RNA studies.
- 2. <u>A container with a white or orange lid containing 10% neutral buffered formalin</u> for routine histology.
- 3. The containers should have an appropriate patient identification label attached to the outside.

Biopsy pots should be obtained from the department (Tel: 0121 414 7641/7644)

Resection Specimens

Resection specimens should be sent dry and if small enough should be placed in a dry plastic pot. An appropriate patient identification label should be attached to the outside of the container.

If the specimen is too large then the specimen should be wrapped or placed in a plastic bag and then further wrapped in theatre paper and then sealed. Appropriate patient identification labels should be attached to the outside. In each case the specimen should be then placed in a sealed plastic bag.

Amputation Specimens

Amputation specimens should be wrapped in the same way as a large resection specimen and placed in a yellow 'Griff bin", correctly identified with patient identification labels.

All specimens should be accompanied by an appropriately filled in histology request form which has been signed by a member of the theatre team and a copy of a fully completed patient consent form for the Use of Tissue for Research and Teaching **(See SOP - GN 12)**. The histology request form and the consent for the Use of tissue for Research and Teaching should be placed in the plastic sleeve of a specimen transport

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bag. The specimen in its container and the histology request form and patient consent forms should not be allowed to come into contact with each other.

IF THE SPECIMEN CONTAINS METAL or there is a suspicion that the specimen could BE INFECTIOUS E.G. H.I.V, T.B. HEPATITIS B this should be indicated on the form.

Specimens should be placed in the fridge in theatres reception to await collection by the NSL driver. The driver will collect the specimen/s from Theatre Reception. The driver will place the specimens in a suitable transport box. Amputation specimens should be carried in the "Griff Bin"

The driver should take the box (or Griff Bin), place it securely in his vehicle and drive straight to the laboratory.

Specimens should NOT normally require delivery to department outside the driver's normal delivery schedule. Should a specimen require delivery to the Department outside this schedule, theatre staff should phone the department PRIOR TO DESPATCH to discuss the urgency and, if necessary, alternative delivery arrangements. The department is not open after 5pm and so specimens sent by any means other than the NSL driver **cannot** be delivered to the correct place.

10.2. Specimens from Other Theatres and Outpatients Department

These specimens should be placed in white or orange-lidded plastic specimen pots containing formal saline and labelled on the outside with a patient identification label. Specimens which are too large for the small formalin pots provided should be placed in the larger dry pots. It is not necessary to add formalin to these pots. The specimen should be accompanied by a histology request form and patient consent form for the Use of Tissue for Research and left at theatre reception for collection and transport to the laboratory along with the Oncology specimens.

Specimens should NOT normally require delivery to department outside the driver's normal delivery schedule. Should a specimen require delivery to the Department outside this schedule, theatre staff should phone the department PRIOR TO DESPATCH to discuss the urgency and, if necessary, alternative delivery arrangements. The department is not open after 5pm and so specimens sent by any means other than the NSL driver cannot be delivered to the correct place. All specimens that are being kept overnight before despatch should be stored in the Theatre fridge.

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10.3. Specimens from C.T clinic (See appendix (v))

These specimens should be placed in white or orange-lidded plastic specimen pots containing neutral buffered formalin and labelled on the outside with a patient identification label. The specimen should be placed in a plastic specimen bag accompanied by a histology request form and completed consent form and left at theatre reception for collection and transport to the laboratory. It is the responsibility of Theatre staff to ensure the safe transit of the specimens to the laboratory

A list of the specimens taken from each clinic should be included with the specimens to the Department. It is then the responsibility of the laboratory staff to check the specimens received against each list and to contact the relevant area if the specimens are not received.

10.4. Amputations not for histological diagnosis

All amputation specimens not requiring histological diagnosis should be sent to the department in the same way as those requiring histological diagnosis i.e. in a Griff-Bin. The limb **must** be labelled with the patient's registration details and must be accompanied by a completed histology request form indicating that the limb is for disposal. On receipt the limb will be booked in onto the departmental database and will be macroscopically examined and a report will be issued. Four weeks after reporting the limb will be sent for incineration.

11. Requests for Frozen Sections

When a frozen section is required the laboratory should be contacted on **0121 414 7641**. Please give 24 hours' notice wherever possible.

The case should be discussed with a Consultant Pathologist who will require the following information:

- 1. Patient's name
- 2. consultant
- 3. site of specimen (including provisional diagnosis)
- 4. date and time of procedure
- 5. theatre being used (including phone number)
- 6. any possible infection risk

If a frozen section is required outside normal working hours (9.00am – 5.00pm Monday – Friday) the Consultant Pathologist on call should be contacted.

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As soon as the patient reaches theatre the appropriate transport should be arranged (usually the normal NSL driver will make himself / herself available, if sufficient notice is given, otherwise the on-call drivers should be contacted via the porters).

The specimen should be transferred to a dry container and dispatched to the laboratory fully labelled and with a completed and signed request form stating that a frozen section is required and a contact number to which the report can be telephoned. Ideally the laboratory should be contacted at this point to say that the specimen is on its way. A fully completed and signed patient consent form should be included

The specimen should reach the laboratory within 20 minutes of being removed.

A verbal report will be telephoned to the theatre as soon as possible – usually within 15 minutes of receipt of the specimen.

A written confirmatory report will follow a few days later after the specimen has been through normal laboratory procedure.

Any further specimens from the same patient, which do not require a frozen section, should be handled in the normal way. They will require a separate request form.

12. Procedure for Release of Tissue for Ritual Burial

12.1. Preamble

This procedure should be followed in the event of a patient's request for the release of human tissue to be taken for the purpose of ritual burial. The Trust wishes to protect the public, so far as is reasonably practicable, from any hazards which may be present in human tissue and will not release such tissue unless reasonably satisfied that it is for ritual burial.

12.2. Procedure for requesting the release of tissue

Tissue will only be released to an undertaker on behalf of a patient and cannot be collected by the patient or relative in person.

The patient must complete the form "Request and Authorisation for Release of Human Tissue. A photocopy of the completed form should be retained in the patient notes and the original forwarded to the Department of Musculoskeletal Pathology.

The Department of Musculoskeletal Pathology will liaise with the undertaker acting on behalf of the patient to arrange a date for release of the tissue.

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12.3. Procedure for the release of tissue

Following receipt of the "Request and Authorisation." form and liaison with the undertakers, the tissue will be related as soon as possible after the department has completed necessary tests and release preparations.

The tissue will be well fixed and the fixative removed by through washing prior to dispatch.

The tissue will be wrapped and sealed so that its nature is obscured. It will be placed in a sealed container

Tissue will be released on the agreed date/time to the authorised undertaker. The undertaker upon the release of the tissue must sign the form "Removal of Specified Human Tissue".

Upon the release of the tissue, the undertaker is responsible for the safe handling and burial of the tissue.

The Trust cannot guarantee that specimens are non-infectious and non-toxic.

13. Procedure for the Return of Metal Implants

It is the policy of the department to discourage the return of implants to patients.

14. Procedure for Requests for Images or Slides from Patients

Any request from a patient for images or slides of their resection, should be discussed with their consultant. The patient then should put his request to the pathology manager in writing. The department will then consider each request on its merit and will endeavour to meet the patient's request.

15. Procedure for the Release of Blocks and Slides to a Referring Hospital

It is the policy of the department not to release original slides or paraffin blocks to a referring hospital. A referring hospital that wishes to review slides from a patient that they have referred to the Royal Orthopaedic Hospital NHS Trust must first put their request in writing and fax or mail their request. A haematoxylin and eosin stained section and unstained sections from an appropriate block will then be sent.

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16. Procedure for the Release of Blocks and Slides for Second Opinion

It is the policy of the department to assist a patient who wishes to have his/her case reviewed by another pathologist of their choice. The department will require from the patient written authority from the patient to release sections, address and packaging instructions from the pathologist's laboratory. The department may charge for post and packaging and will require an agreement to pay before the slides are dispatched.

17. Procedure for Requests for Outside Material

It is the policy that all patients referred to the Oncology Department from another hospital will have their histology reviewed by one of the department's consultant pathologists. The Oncology office will issue a standard letter (see appendix iv) requesting that slides or blocks be sent for review to the Oncology Office. The Oncology secretaries will give a list of requests to the MDT co-ordinator each week who will check that the histology has been received. Once the histology has been received, a note should be made in the patient's notes on the Oncology database and the slides/blocks forwarded to the department of Musculoskeletal Pathology. If the histology review is received directly at the Department of request that the receipt is added to the patients' notes.

18. Issuing of Reports.

Reports on Oncology patients are taken to the regular MDT meetings. Reports on patients under any other Consultant are sent via internal mail on a regular basis, addressed to the Consultant. Reports are currently not available on screen.

Following analysis of workload trends and previous figures, the anticipated turnaround times for specimens received into the department are, as follows:

90% of diagnostic biopsies are reported, confirmed and authorised within 7 calendar days of procedure (as recommended by the Royal College of Pathologists).

90% of all other surgical specimen are reported, confirmed and authorised within 10 calendar days of procedure (as recommended by the Royal College of Pathologists).

90% of all outside histology cases are reported, confirmed and authorised within 10 calendar days of receipt of the sample (as recommended by the Royal College of Pathologists).

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Completed reports to all clinicians other than Oncology are placed in the internal post on the day of authorisation and therefore should be delivered to Consultants within 24 hours.

The department will, of course, continue to issue reports on most specimens received well within the times quoted, however occasional specimens will present us with diagnostic challenges requiring input from colleagues in other centres or additional molecular techniques. In these situations an interim report will be issued to indicate this.

19. Formalin Spillage.

A spillage kit for formalin is carried by the Driver and one is located in Theatre 2 (see appendix (viii) for procedure), if further advice is required, please ring the department.

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<u>Consultant Patholog</u> Dr V P Sumathi (Clinic Consultant Pathologis	al Lead)	0121 41 4 76	41
Professor C Fisher Consultant Pathologis	t	0121 41 4 76	43
Dr R Merard Consultant Pathologis	t	0121 41 4 76	44
Dr M Subramaniam Consultant Pathologis	t	0121 41 5 87	69
Laboratory Staff			
Dr Graham Caine	Pathology Manager		0121-41 4 7642
Satveer Kaur	Histology Laborator	y Manager	0121- 41 4 7642
Kulvinder Gill	Biomedical Scientist (Specimen Reception		0121- 41 5 8766
Elaine Haywood	Senior Biomedical Sc (Laboratory Enquiries)	ientist	0121- 41 5 8766
Karen Joynes	Biomedical Scientist (Research Enquiries)	:	0121- 41 5 8767
Angela Niblett	Senior Biomedical Sc (Molecular Enquiries)	ientist	0121- 41 4 7790
<u>Clerical Staff</u>			
Departmental Secreta	ry 0121 – 41 4 7	641	

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21. Appendix II

Consultant Orthopaedic Oncologists:

Michael Parry, FRCSExt. 55614Johnathan Gregory, FRCSExt. 55345Johnathan Stevenson, FRCSExt. 55719Roger M. Tillman, FRCSExt.55176Adesegun Abudu. FRCSExt.55176Lee Jeys FRCSExt.55176Nurse Consultant:Ext.55176

Nul se consultant:

Consultant Radiologists: Dr A. M. Davies, FRCR Dr N. Evans, FRCR Dr. S James FRCR Consultant Pathologists: Dr R. Merard, FRC.Path Dr V. P. Sumathi, MRC.Path Consultant Oncologists: Dr M. Jafri, MRCP Dr D. Peake, MRCP

Hospital Number:

Date:

Histology Department Letter to Whom It May Concern

Dear Sir or Madam

This patient has been referred here to us from

We would like to see this patient as soon as possible.

Could you send the histology slides and blocks to our Consultant Histopathologist for review as soon as possible please? Block(s) would be preferred, but if sending unstained sections, please ensure that they are on <u>coated slides</u> suitable for immunohistochemistry. To avoid delays and inconvenience to you for the lymphoma and soft tissue tumour cases, please send representative block (s) or a minimum of twelve unstained sections from representative block (s). Please send a copy of the relevant report (s).

Please address the slides to: Consultant Histopathologists Bone Tumour Office The Royal Orthopaedic Hospital Bristol Road South Northfield Birmingham B31 2AP

With many thanks.

Yours sincerely

Mr M Parry FRCS

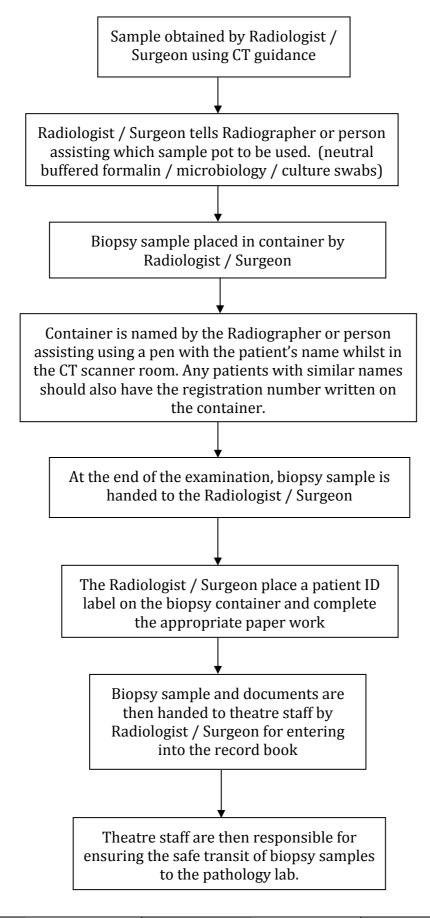
Consultant Orthopaedic Oncologist

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The Royal Orthopaedic Hospital Oncology Service Tel: 0121 685 4000 Fax: 0121 685 4146

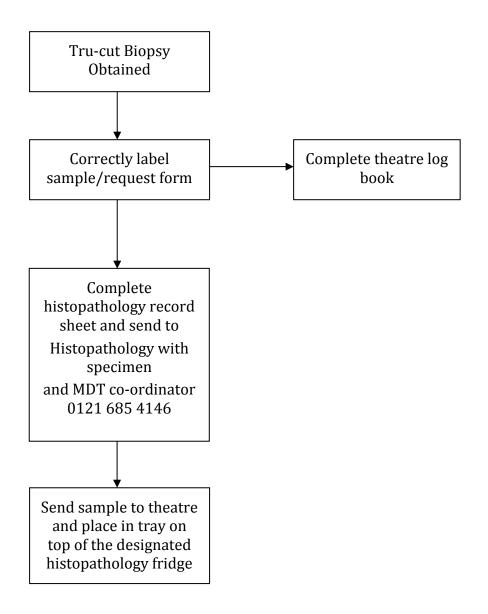
22. Appendix III - Procedure for naming CT guided biopsy samples

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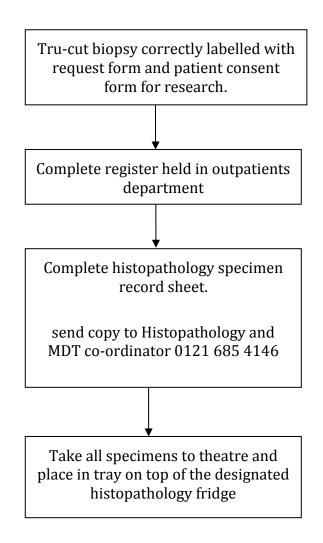
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23. Appendix IV - Procedure for Samples Obtained On Ward 12 / CT Biopsies and Ultrasound Biopsies Performed In X-Ray



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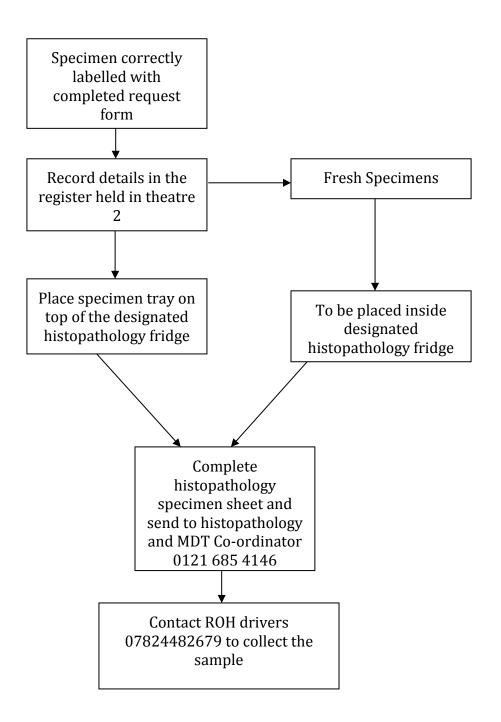
24. Appendix V - Procedure for Specimens Taken In Out-Patients for Transfer to Histopathology



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25. Appendix VI - Procedure for Storing and Transferring Specimens from Theatre to Histopathology



IT IS THE RESPONSIBILITY OF THE THEATRE CO-ORDINATOR AT THE END OF THE DAY TO ENSURE ALL SPECIMENS HAVE BEEN SENT AND TO ENSURE THE RECORD SHEET HAS BEEN FAXED TO HISTOPATHOLOGY AND THE MDT CO-ORDINATOR

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26. Appendix VII – Histology / Microbiology Specimens

Ward..... Theatre..... Clinic area.....

Surgeon..... Date.....

NAME	HISTO	MICRO	OPERATION PERFORMED	STAFF NAME (SIGN AND PRINT)

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27. Appendix VIII - Protocol for Formaldehyde Spills

COSHH Assessment No: 055, 262, Risk Assessment No: 152

Equipment:

PPE – gloves, laboratory coat, mask or respirator, aldehyde extraction equipment, safety signage, spillage kit.

Method:

- 1. Evacuate the area
- 2. Use the spillage kit and safety equipment provided
- 3. Contain the spill by applying F.C.G (formalin control granules) around the perimeter of the liquid. Continue to apply inward until all liquid is absorbed with F.C.G. Avoid splashing.
- 4. Carefully mix, add more F.C.G if necessary to absorb liquid.
- 5. Allow mixture to stand. Formaldehyde solutions 15% to 37% in concentration will solidify in 10 to 20 minutes. Solutions less than 15% require slightly longer because of the high percentage of water present and will polymerize the formaldehyde, but procedure a slurry rather than a solid mass.
- 6. Dispose of polymerized product in accordance with local, state and federal regulations (contact Health and Safety advisor at ROH for details).
- 7. Wash spill area with cold water.
- 8. Use F.C.G only for formaldehyde spills. Do not use to treat acid, base or solvent spills. Before treating a spill, make sure that proper safety equipment such as a respirator, chemical splash goggles, gloves and protective clothing are worn. Provide adequate ventilation. The polymerization reaction generates a small amount of heat this is normal.

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27.1. First Aid

Eve: Flush with large amounts of water for at least 15 minutes whilst holding eyelids open. Seek medical advice.

Skin: Wash with large amounts of soap and water, rinse. If irritation persists, seek medical advice.

Inhalation: Remove victim to fresh air, apply artificial respiration if necessary. Seek medical advice.

Ingestion: Do not induce vomiting. If victim is conscious, give large amounts of water. Seek medical advice.

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