INTRODUCTION

Surgical, anatomical and consultative pathology services are available through pathologists in the Department of Pathology. The services available include:

- Routine surgical biopsies
- Frozen section service
- Specialised biopsies:
  - Renal biopsies
  - Bone marrow trephine biopsies
  - Gastrointestinal biopsies
  - Liver biopsies
- Immunofluorescence for renal and skin cases
- Immunohistochemistry
- Electron microscopy
- Polymerase chain reaction (PCR)
- Autopsy service
SPECIAL INSTRUCTIONS ON SPECIMEN HANDLING

1. Specimens for routine surgical biopsies should be sent in clean containers or bags with 10% buffered neutral formalin, unless otherwise stated.
2. Specimens for frozen sections should be sent without fixative.
3. Whenever possible, there should be one specimen per container. If multiple specimens are placed in one container, they should be clearly identified by size or suture marking. This information should be included in the Histopathology Request Form.
4. Multiple small specimens, such as gastrointestinal biopsies, should be mounted on a piece of filter paper and properly labelled.
5. Large specimens such as colons should be opened out, the contents cleaned out and specimen pinned on a cork board if possible. The specimen should be completely immersed facing downwards in formalin and containers tightly secured.
6. Do not force a large specimen into a small container. Large specimens must be completely immersed in formalin for proper fixation.
7. For specimens where orientation is important, mark or tag the specimen e.g. axillary tail of mastectomy specimens, specimens with important margins.
8. Do not crush specimens with forceps, haemostats or other instruments. Avoid using cautery.
9. Label each container with the patient’s name, identity card or admission number, the source of the specimen and nature of specimen. Use the printed sticky label.
10. Specimens for routine histopathology examination will be collected by porter services as specified under specimen collection services. Do not despatch specimen via the telelift system.
11. Urgent specimens should be marked prominently and despatched immediately by clinic/theatre staff.
THE HISTOPATHOLOGY REQUEST FORM

All specimens should be accompanied by a Histopathology Request Form. The request form must include:

- Patient’s name, age, sex and identification number
- The hospital and ward number, or name of clinic and telephone number, as this facilitates despatch of reports
- Summary of clinical history
- Operative findings
- Type of sample and anatomical site
- Provisional diagnosis
- Name of physician/surgeon in charge of case
- Previous biopsy number or date of previous operation

Failure to provide all the above information will delay turnaround time for the Histopathology report.

When more than one specimen is sent from the same patient at the same operation, use only one form.
ROUTINE BIOPSY SPECIMENS

Specimens submitted for routine histology are categorised as indicated below, with a separate charge for each category.

SPECIMEN CATEGORIES

1. One small, uncomplicated biopsy specimen, under 1 cm diameter.
2. Specimens sent in two containers (each with small uncomplicated specimens, under 1 cm diameter).

OR

Medium specimens between 1 cm to 4 cm diameter or small complicated specimens. These require examination by a pathologist prior to processing.

3. Specimens sent in three containers, each with small uncomplicated samples under 1 cm diameter.
4. Large specimens more than 4 cm diameter requiring gross description and sampling of tissue by a pathologist.
5. Complex specimens e.g. Wertheim's hysterectomy, block neck resection, amputated limbs, etc.
6. Specialised biopsies, e.g. gastrointestinal endoscopic biopsies, bone marrow trephine biopsies.

SUBMISSION REQUIREMENTS

1. Submit specimens individually in containers with 10% neutral buffered formalin.
2. Label the container with the patient's name, NRIC number, and anatomical source of specimen.
3. For large specimens, ensure that specimen is entirely submerged in formalin.
4. Submit a request form with the specimen(s). One request form for one patient should be used, irrespective of number of specimens submitted.
5. The request form should be completely filled in with patient's details, clinical history and operative findings. The laboratory cannot process the specimen if the request form is incompletely filled or if data are discrepant. This will result in delay of the turnaround time for the histopathology report.
SPECIALISED INVESTIGATIONS

TYPE OF EXAMINATION AND THEIR SUBMISSION REQUIREMENTS

FROZEN SECTION
1. Frozen section service is provided at the frozen section lab in the Operating Theatre Suite at SGH from Monday to Friday, 8.30 am to 5.00 pm. Contact Tel No. 6321 3530/3763. If frozen section is required outside these hours, please contact the laboratory at Tel: 6321 4008.
2. Submit specimens in fresh state as soon as possible. Containers should not contain formalin.
3. Label containers with patient’s name, NRIC number and anatomic source of specimen.
4. Fill up request form as for routine biopsy specimens. Include telephone number and/or intercom contact number for verbal communication of results.

LYMPH NODES FOR SPECIALISED STUDIES
1. Contact laboratory (Tel: 6321 4956 or 6326 6632)
2. Submit specimens in fresh state as soon as possible. Containers should not contain formalin.
3. Label containers and fill up request forms as for routine biopsy specimens.

LIVER BIOPSES
1. Place in container with 10% buffered formalin.
2. Label containers and fill up request forms.

MUSCLE AND NERVE BIOPSIES
Directly contact the technologist-in-charge at the National Neuroscience Institute of Singapore, Neuromuscular Laboratory (Tel: 6357 7126), preferably at least one day before the biopsy is scheduled.

GASTROINTESTINAL BIOPSIES
These have different charges depending on the number of specimens.
1. Gastrointestinal biopsies are best orientated so that the plane of sectioning is perpendicular to the mucosal surface. Whenever possible, endoscopic biopsies of the gastrointestinal tract should be mounted on to a piece of filter paper, numbered and put immediately into fixative.
2. The anatomical sites of the biopsies should be marked on a diagram on the request form, and the specimens similarly numbered on the strip of filter paper.
3. Preferably, biopsies from different anatomical sites e.g. stomach, ascending colon, transverse colon etc, should be placed in separate containers.

Note: Make sure that the ink does not dissolve in the formalin fixative.
SURGICALLY RESECTED GASTROINTESTINAL SPECIMENS, E.G. COLON, STOMACH

1. The specimen should be opened and the contents cleaned out.
2. Pin out specimen on a cork or styrofoam board if possible, and immerse the entire specimen, face downwards, in 10% buffered formalin.
3. Make sure that the entire specimen is submerged completely in formalin.

RENNAL BIOPSIES

1. Label containers and fill up request form.
2. Renal biopsies are subjected to examination by light microscopy, electron microscopy and immunofluorescence. After collection, the biopsy which should not be allowed to dry out, must be divided carefully using a sharp blade. The pieces of tissue are to be placed as quickly as possible into suitable containers with appropriate fixatives as indicated:
   (a) Light microscopy – modified Bouin’s fluid (Dubossey fixative)
   (b) Electron microscopy – 2.5% glutaraldehyde in cacodylate buffer (the time for which the tissue is placed into fixative must be recorded)
   (c) Immunofluorescence – Fresh tissue is required. Specimen is wrapped in aluminium foil, placed in a cryotube and delivered to the lab on ice. Contact the laboratory (Tel: 6321 4008) for further information, if necessary.

TESTICULAR BIOPSIES

1. Submit specimens in Bouin’s fluid. It may be necessary to contact the laboratory (Tel: 6321 4008) for the necessary fixative.
2. Label containers and complete request forms.

BONE MARROW TREPbine BIOPSIES

1. Specimens should be placed in 10% buffered formalin.
2. Label containers and complete request forms.

IMMUNOHISTOCHEMISTRY

Contact laboratory (Tel: 6321 4956) for stains or for further information, if necessary.

IMMUNOFLUORESCENCE

Fresh tissue is required. Specimen is wrapped in aluminium foil, placed in a cryotube and delivered to the lab on ice.

Contact the laboratory (Tel: 63214008) for further information, if necessary.
ELECTRON MICROSCOPY

Specimen is placed in 2.5% glutaraldehyde in cacodylate buffer (the time for which the tissue is placed into fixative must be recorded).

Contact the laboratory (Tel: 6321 4008) for further information, if necessary.

POLYMERASE CHAIN REACTION (PCR)

This is for assessment of IgH gene and T-cell receptor gamma gene rearrangements and evaluation of the clonality of B and T cell lymphoproliferative disorders. Paraffin embedded or fresh/frozen tissue is required.

Contact laboratory (Tel: 6321 4008 or 6326 5698) for further information.

HISTOPATHOLOGY

Prepared histopathology slides from consultation outside source. If available, paraffin blocks may be submitted together with the prepared glass slides.

AUTOPSY SERVICE

Contact pathologist-on-duty (Tel: 6321 4008) for information on procedure.

SPECIMEN COLLECTION SERVICES

(a) SGH Operating Theatres
  - By Operating Theatre porters:
    9.00 am & 3.00 pm (Monday – Friday)
    9.00 am only (Saturday)
  - By laboratory porters:
    11.00 am & 3.00 pm (Monday – Friday)
    No collection service on Saturday

**Do not despatch specimens via the telelift system**

(b) SGH Specialist Outpatient Clinics, Endoscopy Centre, Wards and Diagnostic X-ray

The porters from these departments will deliver the specimens to the laboratory.

**Do not despatch specimens via the telelift system**

(c) Non-SGH sources

Collected by Client Services as arranged. Please call Tel: 6326 5353
<table>
<thead>
<tr>
<th>Type of examination</th>
<th>Turnaround time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine Histopathology</td>
<td>2 – 3 days</td>
</tr>
<tr>
<td>Urgent Histopathology</td>
<td>12 hours</td>
</tr>
<tr>
<td>(NB: If specimen is small and sent before mid-day, results may be available in the same afternoon.)</td>
<td></td>
</tr>
<tr>
<td>Specialised tests, e.g.</td>
<td></td>
</tr>
<tr>
<td>Immunohistochemistry</td>
<td>5 days</td>
</tr>
</tbody>
</table>

**Note:** Urgent results may be requested for by telephone (Tel: 6321 4930/4931) and a summary diagnosis will be given. Please note that the printed histopathology report is the final diagnosis.

An inadequately-filled histopathology request form will result in delay of turnaround time.