

Document History:

Title: **Liver Biopsy Protocol** **Site(s):** **Shared Health Diagnostic Services**
HSC, SBH, WL, GGH, VGH,
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Details of Recent Revision

- Changed LIVP protocol under 2.5.3.7 to save 3 slides.

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1.0 **PURPOSE:**

A liver biopsy is a procedure whereby small pieces of liver tissue are removed in order to be sent to a [laboratory](#) for examination.

There are several potential approaches to procuring tissue for a liver biopsy. These are discussed below.

Liver biopsies involve high risk procedures for obtaining the sample and as a result they should be handled with utmost care. There are significant risks of complications from these procedures if they are not done correctly and repeating or re-biopsying increases the risk to the patient. It is essential that these specimens are handled as outlined in this procedure.

Percutaneous Liver Biopsy

In a [percutaneous](#) liver biopsy procedure, local [anesthesia](#) is used to [numb](#) the skin where a small [incision](#) is made. A needle the diameter of a pen refill is then passed through the skin and into the liver, where a specimen is obtained. Multiple biopsies may be taken. In these circumstances, the physician establishes where the liver lies by percussing or tapping on the skin overlying the liver and listening to the sound to find an area of dullness, under which the liver lies.

Percutaneous Image-Guided Liver Biopsy

A percutaneous image-guided liver biopsy is similar to the one described above except that the needle is guided by [CT scan](#) or [ultrasound](#) images. This is often helpful when the disease process is localized to discrete spots in the liver.

Transjugular Biopsy

The transjugular technique is more invasive than the percutaneous approach, but is useful in patients with a bleeding diathesis or in whom the percutaneous technique is otherwise contraindicated. This procedure, also called a transvenous biopsy, may be required when the patient has a significant problem with blood clotting or a large amount of fluid within the abdomen.

Open Surgical Liver Biopsy

Open liver biopsies are rarely performed today unless they are part of another operative procedure for example gallbladder surgery. When an open biopsy is done, the [surgeon](#) may choose to use a biopsy needle or may surgically [excise](#) a small wedge of liver tissue.

There are two main reasons for performing a liver biopsy.

Diagnosis: A liver biopsy is a very important and helpful test in the diagnosis of numerous diseases that affect the liver and [bile](#) ducts. A small piece or pieces of tissue are removed from the liver and sent for examination. In most cases, this allows establishment of a very specific diagnosis.

Monitoring: A liver biopsy can monitor the effectiveness of [therapy](#) that patients are receiving for diseases which affect the liver. Likewise, it can provide a warning if certain therapies are damaging the liver.

2.0 **PROCEDURE**

NOTE: Previous biopsy history must accompany the stained sections. HSC will check for previous reports and send them to SBH. In Winnipeg all liver biopsies should be sent to SBH EXCEPT for cases with an associated fine needle aspiration biopsy which will remain at HSC.

2.1 **Sample Receipt in laboratory:**

- 2.1.1 Deliver samples directly to a lab technologist. Do NOT place into a refrigerator.
- 2.1.2 Ensure that all patient information is correct and all information is available according to the Specimen Acceptance Policy
- 2.1.3 If all information is complete, register specimens according to the appropriate CoPath procedure. HSC will register the case in Delphic LIS prior to shipping to SBH.
- 2.1.4 If the liver biopsy comes with another specimen, i.e. gallbladder, register the entire case together and send both to SBH.

2.2 **Shipping Instructions:**

- 2.2.1 Ship pathology specimens according to "Shipping Histology and Cytology Specimens", SOP # 170-10-08.
- 2.2.2 Ship to referral site as soon as possible (If submitted in formalin, send on next scheduled run).
- 2.2.3 Liver core biopsies are routinely submitted in 10% neutral buffered formalin. Rare exceptions may occur including, fresh samples and small portions of biopsies submitted in glutaraldehyde for EM in cases for suspected metabolic disease.
- 2.2.4 If liver biopsies are submitted fresh or in any other solution, immediately contact St. Boniface Hospital pathology at (204) 237-2490 weekdays from 0800-1615. After hours call (204) 237-2055 or via the pager: (204) 931-4847.

NOTE: Whenever a fresh liver biopsy is received, the pathologist should be contacted immediately to discuss the case before formalin is added to the container. In very rare cases, a small piece for frozen section may be required to assess for microvesicular steatosis.

2.3 **Pathology Cutting Room (St. Boniface):**

- 2.3.1 Process all liver biopsies immediately if the requisition indicates this is a RUSH or transplant patient.
- 2.3.2 No tissue is submitted for EM unless requested on the requisition and approved by a liver pathologist.
- 2.3.3 If more than one core is received with a request for iron or copper quantification, Label the cassette with DO NOT CUT.
 - 2.3.3.1 If two cores are received, submit them in two separate cassettes. (only 1 core per cassette)
- 2.3.4 Differentiate between carcinoma and other on cassette. LIVP is for non-carcinoma, LIVC is for carcinoma.

2.4 **Pathology Cutting Room (HSC):**

- 2.4.1 Register specimen into LIS.
- 2.4.2 HSC will ship out liver biopsies to SBH cutting room as per SOP 170-10-8. SBH will accession specimen into LIS.

NOTE: if cores and fragments are received, the fragments are put in their own cassette.

2.5 **Histology Laboratory:**

2.5.1 **Processing:**

2.5.1.1 Process on overnight run on a short tissue processor run (either VIP or Peloris). All liver core biopsies should be processed using the short program. Larger biopsies (i.e. wedges) should be processed on the routine program.

2.5.2 **Embedding:**

2.5.2.1 Embed from wax bath which is filled with molten wax.

2.5.2.2 Press or use tamper (embedding tool) to ensure the cores are flat in the block; this will facilitate full face/ complete sections.

2.5.3 **Microtomy:** (liver biopsy protocol: 11 slides)

2.5.3.1 Ensure the water bath is at an appropriate temperature (~40-42°C) prior to cutting liver biopsies.

NOTE: Most special stains, especially those for silver stains, are to be picked up on positively charged slides (New silane or similar). All spare slides are to be treated in the same manner and are also on charged slides. IHC (LIVC) should be picked up on Newcomer or similar charged slides.

2.5.3.2 All sections must be cut at 4 µ.

2.5.3.3 Always ensure you have full face [complete] sections. It is critical that full face sections are obtained on liver biopsies. When the section is not complete, it is often the portal areas that are not seen, which are the most important component to assess in many of these biopsies, particularly the hepatitis C cases in which specimen adequacy depends upon the number of portal areas present in the biopsy.

2.5.3.4 If it does not appear to be full face, cut a few extra sections on charged slides.

2.5.3.5 Check the water bath to ensure the liver tissue sections are free of folds, nicks and scores. If folds are present, leave sections on water bath a little longer. Check water bath temperature.

2.5.3.6 LIVC Protocol (1 H+E with 2 sections, 8 unstained)

1. H+E- first section at the top of slide. Then cut spares 2-9 (place these unstained sections at the bottom of charged slides. Then the first section after unstained at the bottom of H&E slide.

2.5.3.7 LIVP Protocol (1 H+E, 2 unstained, 1 H+E, 3 unstained, 1 H+E) with 3 serial sections per slide for the H+E (as long as 3 fits-2 if not) and 2 serial sections per slide for the unstained.

2.5.3.8 Check the waterbath to ensure the liver tissue sections are free of folds, nicks and scores. If folds are present, leave sections on waterbath a little longer and check the waterbath temperature. Only H+E slides are put on the slide warmers. All other speciality slides are put in the 37-degree oven.

2.6 **Issue of Slides St. Boniface:**

2.6.1 Slides are labeled and placed on a slide tray.

2.6.2 The slides are matched up with the requisition and put on the QC bench.

2.6.3 The QC tech will review them and then take them to the Assigning bench.

2.6.4 The QC technician will assign and issue the case to a liver pathologist.

2.7 **Issue of Slides WL:**

2.7.1 The case is rush assigned to pathologist on rushes.

2.8 **Requests for** Quantitative Copper and Iron Analysis are ordered by the Pathologist.

3.0 **REFERENCES**

3.1 www.emedicinehealth.com/liver_biopsy/page6_em.htm

3.2 [uwmedicine.washington.edu/PatientCare/MedicalSpecialties/SpecialtyCare/UWM EDICALCENTER/Radiology/transjugularliverbiopsy.htm](http://uwmedicine.washington.edu/PatientCare/MedicalSpecialties/SpecialtyCare/UWM_EDICALCENTER/Radiology/transjugularliverbiopsy.htm)