Provincial Liver Mass Primary Care Pathway

Quick Links: Primer & Expanded details | Provider resources | Patient resources | Provide feedback

Diagnostic imaging findings in the liver are common. The following pathway is designed to identify patients at higher risk of malignancy and to provide additional guidance for management of other causes. It should be used to supplement the reporting radiologist's recommendations.

Patients are considered **high risk of liver malignancy** if they have a history of cirrhosis, chronic viral hepatitis, and/ or any prior malignancy*.

Cysts- regardless of risk of malignancy

Simple/ minimally complex cyst

These are benign.

No follow up required

Complex cyst (see expanded details for characteristics)

Investigations: MRI Liver - alternative is triphasic CT (referral to HPB concurrently)

Refer to **Hepatobiliary (HPB) Surgery**

Red Flag for solid mass lesion(s)

Episodic epigastric or RUQ pain, accompanied by hypotension in patients with any solid mass may indicate possible hemorrhage.

These patients require emergency care.

Solid lesion- Pt is low risk of malignancy

Hemangioma: Benign, no follow up required.

Exception: if recommended by radiology or >5cm and possibly symptomatic:

Refer to **Hepatobiliary (HPB) Surgery**

Focal Nodular Hyperplasia: usually requires MRI to define - benign if definitively FNH then no follow up required.

Exception: unless otherwise recommended by radiology

Refer to **Hepatobiliary (HPB) Surgery**

Adenoma or indeterminate or suspicious lesions**

Hepatology referral for further advice

****Adenomas during pregnancy require timely referral**

Solid lesion - Pt is high risk of malignancy*

- **Suspicion of Metastatic disease**
- **Prior Malignancy, any location**

- **History of Cirrhosis**
- **Chronic viral hepatitis**

Investigations:

Labs: CBC, Electrolytes, Creatinine, ALT, ALP, AST, GGT, INR, Bilirubin, AFP, Albumin, HB Core, HBSAg, HBSAb, HCV Ab

Patients with prior malignancy:

Diagnostic Imaging: MRI Liver or CT Chest Abdomen/Pelvis may be required. **Concurrent referral to prior oncology team should be made.**

New finding of metastatic disease

Contact Specialty Care for advice:
Medical Oncology or HPB surgery (Depending on patient's previous history)

Patients with Cirrhosis/Chronic viral hepatitis:

Diagnostic Imaging: MRI Liver is preferred; alternative is triphasic CT

Hepatology referral for further work up and management for **all patients with cirrhosis or chronic viral hepatitis**

Consider:
Integrating An Early Palliative Approach to Advanced Cancer Care (Shared Care)
- If required call RAAPID for Palliative Care advice

This primary care pathway was co-developed by primary and specialty care and includes input from multidisciplinary teams from all five zones, Patient and Family Advisors, and the Provincial Pathways Unit. It is intended to be used in conjunction with specialty advice services, when required, to support care within the medical home.

EXPANDED DETAILS

Pathway Primer

In Canada, benign liver lesions are relatively common especially in adults over 40. It is estimated that about 1 in 3 people over 40 have a benign liver lesion. Incidental liver lesions are detected in up to 33% of radiological studies. Benign liver lesions are not cancerous and often don't require treatment [9].

However, in Canada, liver cancer incidence is rising, with approximately 3,500 new cases diagnosed annually and a 5-year survival rate of around 22% [10,11]. The Canadian estimate in 2024 is there will be 4700 new cases of liver and intrahepatic bile duct cancer. Around 75% of primary liver cancer is hepatocellular carcinoma. Liver cancer is the fourth leading cause of cancer death worldwide; therefore, timely and appropriate care is required to properly characterize liver lesions. **The purpose of this pathway is to assist with expediting care for liver lesions that are high risk for malignancy by reducing the number of unnecessary referrals to specialty care and reduce testing that is not required. It should be used in conjunction with (not replacing) the advice of the reporting radiologist when available.**

Important Considerations:

- **High-risk patients:** Individuals at increased risk for developing liver cancer – such as those with chronic viral hepatitis infection, cirrhosis, or history of malignancy – should have any liver lesions further investigated
- **Benign liver masses are often asymptomatic:** Many people are unaware they have a benign liver mass until it is discovered during imaging for another reason.
- **Treatment is rarely required:** Most benign liver masses do not need treatment unless they cause symptoms or complications.
- **Follow-up is important:** In some cases, follow-up imaging is recommended to monitor the size and growth of a benign liver mass.
- **Diagnosis and management:** A biopsy may be necessary to confirm the diagnosis of certain types liver masses.

Risk Factors of Liver Cancer

High risk factors:

- Chronic Hepatitis B and C are common viral infections and can cause liver cancer. Chronic inflammation leads to repeated cellular regeneration thus increasing the risk of tumour formation [1,2].
- Scarring of the liver (cirrhosis) [1,2].
    - Excessive alcohol use can lead to liver cirrhosis.
    - Metabolic dysfunction- associated steatotic liver disease (MASLD) (formerly Non-Alcoholic Fatty Liver Disease (NAFLD)) occurs when too much fat is stored in the liver and is not from alcohol intake. It is the most common liver disease in Canada, affecting approximately 25% of the population. If it progresses it can lead to severe conditions like MASH (Metabolic Dysfunction-Associated Steatohepatitis), which can become cirrhosis and liver failure. Risk factors for MASLD include obesity and type 2 diabetes [12,13].
    - Other, though less frequent, causes of cirrhosis are autoimmune hepatitis, primary sclerosing cholangitis, primary biliary cirrhosis, alpha-1 antitrypsin deficiency, hereditary hemochromatosis, and Wilson´s disease.
- History of malignancy: the liver is a common site for metastasis from solid tumors, these patients are at higher risk for metastatic disease [1, 2, 8].

Other common risk factors:

- Smoking tobacco, risk increases with pack year history.
- Aflatoxin B1 exposure: eating foods that contain aflatoxin B1 (poison from a fungus that may grow on foods stored in hot and humid places (e.g. corn and nuts). It is most common in sub-Saharan Africa, Southeast Asia, and China. It is particularly carcinogenic when it co-occurs with chronic HBV infection [25].
- Diabetes and obesity [25].

Symptoms

There are a wide range of symptoms for liver malignancy**,** persistent or worsening symptoms should be evaluated [14].

- Jaundice- patients with jaundice and jaundice with fever need expedited work up
- Pain in the right upper quadrant (RUQ), back and shoulder
- Ascites
- Fatigue and weakness
- Mental confusion or disorientation
- Itchiness
- Peripheral Edema
- Loss of appetite
- Nausea
- Dark urine
- Easy bruising
- Hepatomegaly and splenomegaly

Preventing liver cancer

Important preventative measures, according to Liver Canada [15] are:

- Vaccination against hepatitis B
- Screening for hepatitis C
- Screening for hepatitis B [23]
- Maintaining a healthy weight – for information: cg_quick_ref-ldc_rapide_ref-eng.pdf
- Reducing alcohol consumption- for information: Canada's Guidance on Alcohol and Health, Public Summary: Drinking Less Is Better
- Early detection through regular monitoring by a doctor can improve treatment outcomes
- Coffee consumption- potentially beneficial

Hepatocellular Carcinoma Screening/Surveillance

Patients that are at high risk for HCC should undergo regular screening that includes a liver ultrasound and serum AFP every 6 months [21]. This has been shown to reduce mortality of HCC by finding malignancy in earlier stages and receiving curative treatment. Alternate imaging includes CT, MRI, and CEUS where available. Monitoring AFP levels alone is not adequate [22].

Screening and surveillance should be performed in patients with: [16,17,18, 19, 20]

- History of chronic Hepatitis B infection with or without cirrhosis if any of the following apply:
  - Family history of HCC
  - Active hepatitis (e.g., elevated serum ALT) and/or high viral load (i.e., >100,000 copies/mL [20,000 international units/mL])
  - Males from an Asian country who are >40 years of age
  - Females from an Asian country who are >50 years of age
  - Patients from Africa who are > 20 years of age [22]
- Patients with Cirrhosis Child Pugh class A and B, class C only if awaiting transplant
- Patients with acute hepatic porphyria's require HCC screening starting at the age of 50

For further/ detailed information: Hepatocellular Carcinoma- CCA Guidelines and Resource Unit

Other types of common liver masses

Hemangiomas:

Hepatic hemangiomas (cavernous hemangiomas) are the most common benign liver lesions and are more often found in females [1]. Usually they are solitary lesions, though it is possible to have multiple hemangiomas. The majority of patients with hepatic hemangioma are asymptomatic [3].

Hepatic hemangiomas typically show either very slow or no growth and routine follow-up imaging is not required. Although there is a potential association with estrogen causing growth of hepatic hemangiomas, generally estrogen does not need to be stopped.

Patients should be counselled on the above information. If this lesion is felt to be causing symptoms, referral to hepatobiliary surgery could be considered. Generally, patients are asymptomatic, and typically only symptomatic when they are significantly enlarged (>5 cm) [24].

Focal Nodular Hyperplasia (FNH):

FNH is the second most common benign liver lesion. FNH is a common incidental finding among patients undergoing abdominal imaging for other reasons [4]. FNH can present as a single lesion or there may be many [5]. FNH is not associated with an increased risk of developing liver cancer.

Focal nodular hyperplasia are benign liver lesions with an estimated prevalence of up to 3% of the population. FNH has no malignant potential. In most cases, these are asymptomatic. FNH typically remains stable in size; routine follow-up imaging of these lesions is not required. FNH has no association with estrogen therefore treatment with estrogen does not need to be stopped [24].

Hepatocellular Adenomas:

These benign tumors are less common than hemangiomas and FNH and are associated with the use of certain medications, particularly oral contraceptives. Hepatic adenomas carry a small risk of becoming cancerous or spontaneous hemorrhage. The presence of an adenomas during pregnancy represents a unique clinical scenario in which a timely referral is essential.

Hepatic adenomas are found both incidentally and in symptomatic patients. Symptomatic patients generally present with episodic epigastric and/or right upper quadrant (RUQ) abdominal pain, which may result from an enlarged liver, bleeding from the adenoma, or necrosis [7].
Due to the risk of hemorrhage and malignancy, these patients should be referred to hepatology for review [7].

Liver Cysts:

Simple

Liver simple cysts are fluid-filled sacs that do not connect with the bile ducts inside the liver. They rarely grow large, and it's even more unusual for them to produce symptoms [6].

Hepatic cysts are very common, with an estimated prevalence of 2.5% or higher in the population. Generally, routine follow-up of hepatic cysts is not required. If there are elevated liver enzymes or symptoms that may be attributable to the hepatic cysts, repeat imaging should be considered [24].

Complex

A complex liver cyst is a fluid-filled lesion in the liver that demonstrates features beyond those of a simple cyst. These may include wall thickening or irregularity, multiple or thickened septations, internal nodules, enhancement, calcification, or new hemorrhagic or proteinaceous contents. Such features may indicate a higher risk of malignancy or complications compared to simple liver cyst [6]. **Due to the risk of malignancy, it is important that appropriate imaging is performed in a timely manner (see pathway for guidance).**

Metastatic Cancer and Supportive Care

Contact Specialty Care for advice:

Medical Oncology or HPB surgery (depending on patient's previous history)- see below

Click the links below to learn more about supportive care:

- Integrating an Early Palliative Approach into Advanced Cancer Care
- Onecarepath.albertahealthservices.ca

- **Local Tips for Providers:**
  - Calgary Zone
  - Edmonton Zone
  - Red Deer / Central Zone
  - South Zone

Advice Options

If a patient needs to be directed to hospital through RAAPID or the ER. Call RAAPID for on-call medical specialty or 911.

Zone	Program	Online Request	Phone Number
Urgent Telephone			
All Zones	RAAPID RAAPID Referral, Access, Advice, Placement, Information & Destination	N/A	**North:** 1-800-282-9911 or 780-735-0811 **South:** 1-800-661-1700 or 403-944-4486
Non-Urgent Electronic			
All Zones	Netcare eReferral eReferral		N/A
Non-Urgent Telephone on next page			

Non-Urgent Telephone			
Calgary	Specialist Link	Online Request	403-910-2551
Edmonton, North	ConnectMD	Online Request	1-844-633-2263

Referral Process

HPB Surgery:

HPB surgery can be accessed via FAST in all zones- Provincial Adult General Surgery Referral Pathway

Hepatology:

Hepatologists are available in Calgary and Edmonton, follow the link below:

- Calgary and Area: Calgary Zone and Area - Hepatology Central Access and Triage | Alberta Health Services
- Edmonton and Area: EZ CAT- Alberta Referral Directory - CAT Service At Facility Details

Oncology: As per zone practices

PROVIDER RESOURCES

Hepatitis C Clinic | Hepatitis Outreach Services — CUPS Calgary	Clinician Information | Cumming School of Medicine | University of Calgary
HCC Screening Program - Calgary - EFW Radiology	Royal Alexandra Hospital - Liver Clinic | Alberta Health Services
Hepatitis Clinic | Alberta Health Services	Cirrhosis Care Clinic - InformAlberta.ca
Hepatology Clinic - InformAlberta.ca	Hepatitis Support Program (HSP) - Kaye Edmonton Clinic - Where to?
Shelter-based hepatitis C treatment at the Calgary Drop-in Centre | CATIE - Canada's source for HIV and hepatitis C information	Hepatocellular Carcinoma- CCA Guidelines and Resource Unit

For physicians: Cirrhosiscare.ca (Hepatocellular Carcinoma - Cirrhosis Care)

Nutrition Services:

To refer your patient to a Registered Dietitian:

• Visit Alberta Referral Directory and search for nutrition counselling.

• To learn more about programs and services offered in your zone, visit Nutrition Services | Alberta Health Services

• Health Link has Registered Dietitians available to answer nutrition questions. If a patient has a nutrition question, they can complete a self-referral at Health Link | Alberta Health Services or call 811 and ask to talk to a dietitian

PATIENT RESOURCES

This section is intended to list resources that primary care providers may find useful to share with patients to help support self-management and care in the medical home.

Understanding Liver Cancer risks and prevention: youtu.be/JPulhFLWuv0?si=9AdPQUAzHE59FfS-	Liver Cancer: Care Instructions myhealth.alberta.ca/Health/aftercareinformation/pages/conditions.aspx?hwid=ut3445
Liver Cancer | Liver Canada liver.ca/liver-cancer	Cirrhosis – What is liver cancer? myhealth.alberta.ca/Health/Pages/cirrhosis-liver-cancer.aspx
Liver cancer | Canadian Cancer Society cancer.ca/en/cancer-information/cancer-types/liver	Liver Lesions: What They Are, Types, Symptoms & Causes my.clevelandclinic.org/health/diseases/14628-liver-lesions
www.ahs.ca/NutritionResources	www.ahs.ca/NutritionWorkshops

For patients: Cirrhosiscare.ca (Hepatocellular Carcinoma (HCC) - Cirrhosis Care)

BACKGROUND

About this pathway

- This pathway was developed in collaboration with Cancer Care Alberta.
- Condition-specific clinical pathways are intended to offer evidence-based guidance to support primary care providers in caring for patients with a range of clinical conditions.

Authors and conflict of interest declaration

- Names of the content creators and their conflict-of-interest declarations are available on request by emailing AlbertaPathways@primarycarealberta.ca.

Pathway review process, timelines

Primary care pathways undergo scheduled review every two to three years, or earlier if there is a clinically significant change in knowledge or practice. The next scheduled review is November 2028. However, we welcome feedback at any time. Please email comments to AlbertaPathways@primarycarealberta.ca.

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