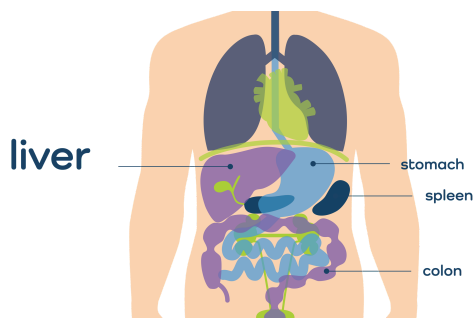


# MASLD & MASH

# Your liver and why it's so important!

Your liver is one of the largest and hardest-working organs in your body. Located under your ribs on the right side of your abdomen, your liver:



- Filters harmful substances from your blood
- Helps digest food by producing bile
- Stores nutrients and energy
- Fights infections
- Produces, regulates, and balances hormones

## What is MASLD?

Metabolic Dysfunction–Associated Steatotic Liver Disease (MASLD), previously known as non-alcoholic fatty liver disease, exists when too much fat builds up in the liver. It's linked to metabolic issues like obesity, high blood sugar, high cholesterol, and high blood pressure. MASLD is defined by at least 5% of fat accumulation in liver in combination with one or more metabolic risk factors (overweight or obesity, diabetes, high blood pressure, abnormal cholesterol/triglyceride, insulin resistance, etc.).

MASLD and MASH can be reversed. With healthy habits and lifestyle changes, many people have successfully reduced liver fat and improved their liver health.



**MASLD is the most common form of liver disease in Canada, affecting about 1 out of 3 of the general population**

## What is MASH?

Metabolic Dysfunction–Associated Steatohepatitis (MASH) is a more advanced form of MASLD. It happens when fat buildup in the liver leads to chronic inflammation and further liver damage. MASH was previously called non-alcoholic steatohepatitis, but the name was updated to better reflect what we now understand about the disease and use more respectful, less stigmatizing language.

**About 1 in 4 people with MASLD may go on to develop MASH.** Without treatment, MASH can cause serious liver damage and may lead to cirrhosis or liver cancer.

# Why does fat accumulate in the liver?

When we consume more energy than our body uses through metabolism and daily activities, the excess energy can be stored as fat in the liver, causing fat to build up in liver cells. Over time, this buildup can lead to the fat accumulation seen in MASLD and increased risk of liver complications.



**One of the liver's key jobs is to process the fats and sugars we eat.**

## What are the symptoms?

In its early stages, MASLD often has no noticeable symptoms. But as the disease progresses, signs may begin to appear.

### Early symptoms may include:



**Unexplained weight loss**



**Pain in the upper right abdomen**



**Fatigue and weakness**



**Yellowing of the eyes and skin (jaundice)**

### In advanced stages, some people may experience:



**Shortness of breath**



**Swelling in the legs, ankles, feet, and/or abdomen**



**Mental confusion (hepatic encephalopathy)**



**Loss of appetite**



**Itchy skin**



If your symptoms are lasting or getting worse, it's important to see your healthcare provider. Even if you don't have symptoms, it doesn't always mean your liver is healthy. Regular monitoring and taking care of your liver can help prevent disease from progressing.

# What causes MASLD?

MASLD is not caused by one single factor. It usually develops as a result of a combination of factors. Factors that may increase the risk of MASLD include, but are not limited to:

- Overweight and obesity
- Sleep apnea
- PMOS (polyendocrine metabolomic ovarian syndrome)
- Eating a diet high in added sugars, refined carbohydrates, or unhealthy fats
- Heart disease or high blood pressure
- Getting older, as the risk tends to increase with age
- Physical inactivity
- Certain metabolic conditions, including diabetes, insulin resistance, and high cholesterol

## What you can do to lower your risk

- Maintain a healthy weight
- Eat balanced meals
- Perform daily physical activity
- Avoid or limit alcohol consumption
- Follow medication dosage recommendations
- Manage pre-existing conditions that may contribute to MASLD, such as type 2 diabetes, high cholesterol, and high blood pressure

# How are MASLD & MASH diagnosed?



- Blood tests (liver function tests):** Elevated liver enzymes can be an early sign of liver inflammation or damage.
- Imaging tests:** Ultrasound, MRI, CT scan, or FibroScan can help detect fat in the liver and assess liver stiffness.
- Liver biopsy:** If more clarity is needed, a small sample of liver tissue may be taken to check for inflammation or scarring. This is the most accurate way to diagnose advanced liver disease or MASH.

A healthcare professional may also ask about weight, diabetes, cholesterol, blood pressure, diet, physical activity, medications, and alcohol use.

Early diagnosis and action are key, so stay proactive and work with your care team to protect your liver.



# How is MASLD treated?

The good news? With healthy habits and lifestyle changes, liver fat can be reduced and liver health can be improved.

The first step in treatment of MASLD focuses on lifestyle changes to reduce liver fat and manage related metabolic conditions.

## Key recommendations include:



### Weight loss:

Losing 7–10% of your body weight can significantly reduce liver fat and inflammation.



### Balanced eating:

Try a Mediterranean-style meal pattern that's rich in healthy fats, lean proteins, whole grains, fruits, and vegetables.



### Regular physical activity:

Aim for about 150 minutes of moderate to vigorous physical activity each week.



### Managing related conditions:

Work with your care provider to establish healthy habits and find the right medication(s).

**Semaglutide (GLP-1 receptor agonist)** may be an option for some adults with MASH and moderate-to-advanced liver fibrosis (F2–F3) who do not have cirrhosis. It is used alongside healthy eating and physical activity. Your doctor will determine whether it is appropriate based on your overall health, weight, and liver condition.

## How to implement lifestyle changes:

Lifestyle changes look different for everyone, the key is finding what fits your life. Here are a few tips to get started:



**Choose what you enjoy:** You're more likely to stick with exercise and nutrition habits you genuinely like.



**Set SMART goals:** Make your goals **S**pecific, **M**easurable, **A**chievable, **R**elevant, and **T**ime-bound to stay on track.



**Lean on your support system:** Surround yourself with people who encourage and support you on your journey.

**Be patient with yourself. Focus on progress, not perfection.  
Make small changes one step at a time.**



# MASLD and MASH in Children

It is possible for children to develop MASLD and MASH. Children living with obesity or type 2 diabetes are at a higher risk. Studies suggest up to 30% of children experiencing these conditions may be affected. Other risk factors include sedentary lifestyles, abnormal fat levels in the blood (dyslipidemia), and having a family history of liver or metabolic diseases.



**MASLD is currently the most common chronic liver disease among children.**

## Treatment options for children:

Treatment for children with MASLD focuses on healthy lifestyle changes and managing any pre-existing conditions that may affect their overall health. Treatment options may include:



**Balanced eating:** Focus on whole grains, lean proteins, healthy fats, fruits, vegetables and limiting processed foods.



**Limiting screen time:** Reducing screen time can help encourage movement throughout the day.



**Staying active:** Help your child find activities they enjoy. Encourage them to join a sports team or participate in outdoor play.



**Healthy weight management:** This should be gradual and guided by a healthcare provider.



**Healthy sleep habits:** Children should aim for 9–11 hours of quality sleep. Getting enough rest supports the body and the liver.



**Regular checkups:** Follow-up visits every 3–6 months can help track liver enzymes and overall health.

Children at risk for MASLD should begin screening around age 9. Doctors may use blood tests, waist measurements, and non-invasive scans such as ultrasound or FibroScan to look for early signs. If MASLD or MASH is suspected or confirmed, your child may be referred to a pediatrician, pediatric gastroenterologist/hepatologist, dietitian, or multidisciplinary care team for additional support and regular follow-up. There is currently no Health Canada–authorized medication specifically for treating MASH in children, so treatment typically focuses on lifestyle changes and managing related conditions such as type 2 diabetes, high cholesterol or triglycerides, high blood pressure, sleep apnea, and other metabolic risk factors.

# Questions to ask your doctor

Asking the right questions is an important step in taking charge of your liver health. Here are a few to help guide your conversations with your doctor:



## Your diagnosis:

- What stage of MASLD do I have?
- Do I have any signs of liver inflammation or fibrosis?
- Is it possible that I have progressed to MASH?
- Should I have additional tests to check the health of my liver, such as a, FibroScan, MRI, or liver biopsy?

## Causes and risk factors:

- What likely caused my MASLD?
- Do I have, or am I at risk of other metabolic conditions, like insulin resistance or diabetes?
- How does MASLD impact my heart health?

## Lifestyle and treatment options:

- In my case, is it possible to reverse MASLD?
- What is a healthy weight for me to improve my condition?
- Is there a specific meal pattern that I should be following?
- Are there any medications or supplements that I should avoid?
- Are there any medications I can take or clinical trials I can participate in to treat MASLD?

## Next steps and monitoring:

- Should my children be tested for MASLD?
- Should I see other healthcare providers, like specialists (e.g. hepatologists, gastroenterologists) or registered dietitians?
- How often should I have liver function tests or imaging done to monitor my condition?
- What signs or symptoms should I watch for that might mean my condition is worsening?



**You are not alone in your diagnosis. Liver Canada is here for you for every step of your liver health journey. Contact our patient support team via our Toll Free Help Line at 1-800-563-5483.**

For more information and educational resources about MASLD and MASH, visit [liver.ca](https://liver.ca).

# Liver disease affects 1 in 3 Canadians. From newborns to older adults. It can impact anyone, at any stage of life.

Liver Canada was first established in 1969 out of the passion and concern of a group of business leaders and doctors who believed that liver disease needed a champion. Since then, we've relentlessly driven advancements in research, treatment, and support.

With the help of donors, volunteers, researchers, health professionals, corporate supporters, and community members, we are changing the future of liver health for those living in Canada.

**To help fund liver health support services, education and research, visit: [liver.ca/ways-to-give](https://liver.ca/ways-to-give).**

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