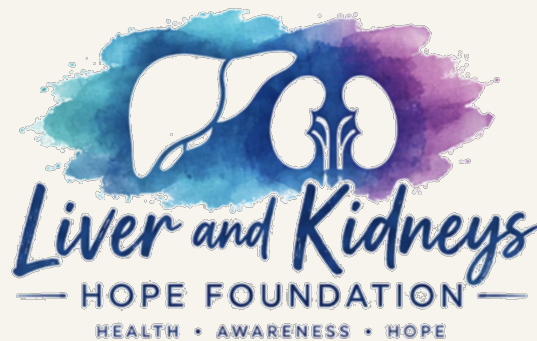




PATIENT & COMMUNITY EDUCATION SERIES

Understanding MASLD

Metabolic dysfunction-Associated Steatotic Liver Disease — a plain-language, comprehensive guide to what it is, why it matters, and how it can be managed.

Formerly known as Non-Alcoholic Fatty Liver Disease (NAFLD)

Health Education Series · EDU-LIV

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First Edition

Important: This guide is provided for general educational purposes only. The Liver and Kidneys Hope Foundation is a nonprofit focused on liver-health education, community support, and outreach — it is **not a medical provider** and does not offer diagnosis, treatment, or medical advice. Nothing here should replace a conversation with a qualified, licensed healthcare professional who knows your history.

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HOW TO USE THIS GUIDE

Look for the colored boxes throughout. **Key Point** boxes highlight the essentials, **Did You Know?** boxes add context, and **Talk With Your Clinician** boxes flag things worth raising at your next appointment. A plain-language glossary begins on the questions page.

SECTION 1 Your Liver: A Quiet, Hardworking Organ

Before we talk about what can go wrong, it helps to appreciate just how much your liver does every single day — usually without you noticing.

Your liver is the largest solid organ inside your body, weighing roughly 1.4 kg (about 3 pounds) in an adult. It sits just under your rib cage on the right side, tucked below the diaphragm and above the stomach and intestines. Reddish-brown and wedge-shaped, it is divided into a larger right lobe and a smaller left lobe — the same two-lobed shape you see cradled in our Foundation's logo.

What makes the liver remarkable is not its size but its versatility. Scientists have identified more than **500 distinct functions** the liver performs. Almost all of the blood leaving your stomach and intestines passes through the liver first, where it is filtered, processed, and sent on. In this sense the liver is your body's central chemical-processing hub.

What your liver does for you

- **Processes nutrients.** After you eat, the liver decides what to store, what to release, and what to convert. It helps keep your blood sugar steady between meals by storing glucose as glycogen and releasing it when you need energy.
- **Manages fats.** It packages and ships fats (including cholesterol and triglycerides) around the body and makes bile, a fluid that helps you digest and absorb dietary fat.
- **Filters and detoxifies.** It neutralizes alcohol, medications, and natural waste products such as ammonia, converting them into forms your body can safely remove.
- **Makes essential proteins.** Including albumin (which keeps fluid in your blood vessels) and most of the clotting factors that stop you from bleeding.
- **Stores vitamins and minerals.** Such as vitamins A, D, E, K, B12, and iron.
- **Supports your immune system.** Specialized cells in the liver help trap and clear bacteria and toxins that arrive from the gut.

DID YOU KNOW?

The liver is one of the only human organs that can **regenerate**. If part of it is removed or injured, healthy remaining tissue can regrow. This is why some people can donate a portion of their liver. But this ability is not unlimited — repeated or long-standing injury can lead to permanent scarring that the liver cannot undo on its own.

Why "silent" injury is a problem

The liver has very few nerve endings that sense pain, and it has a large amount of spare capacity. Together, these two facts mean the liver can be under strain for years while you feel completely well. Damage often builds quietly and is discovered by accident — on a blood test or a scan ordered for another reason. That is exactly why understanding conditions like MASLD, and catching them early, matters so much.

KEY POINT

A healthy liver keeps hundreds of body systems running smoothly. Because it rarely complains until it is seriously stressed, protecting it is a matter of **prevention and early attention**, not waiting for symptoms.

SECTION 2

What Is MASLD? Understanding the New Name

MASLD is a condition in which extra fat builds up in the liver of a person who also has one or more signs of metabolic imbalance — such as excess weight, higher blood sugar, or higher blood pressure.

MASLD stands for **Metabolic dysfunction-Associated Steatotic Liver Disease**. Let's unpack that name, because each word is doing important work:

- **Steatotic / Steatosis** simply means "containing fat." Hepatic steatosis is the medical term for a fatty liver.
- **Metabolic dysfunction-associated** tells you *why* the fat is there — it is tied to how the body handles energy, sugar, and fat, rather than to a virus, a medication, or heavy alcohol use.

A small amount of fat in the liver is normal. Doctors generally consider a liver "fatty" when more than about **5% of its cells contain fat droplets**. In MASLD, that fat accumulation is paired with metabolic risk factors and is not explained by other causes.

Why the name changed from NAFLD

You may know this condition by its older name, **NAFLD** — Non-Alcoholic Fatty Liver Disease. In 2023, a large international panel of liver specialists agreed to retire that term. There were good reasons:

- The old name defined the disease by what it *was not* ("non-alcoholic") rather than by what actually drives it.
- Some patients and families felt the words "fatty" and "alcoholic" were stigmatizing.
- The new name points to the true underlying issue — **metabolic health** — which also points toward what can be done about it.

DID YOU KNOW?

Under the updated system, **MASH** (Metabolic dysfunction-Associated Steatohepatitis) replaces the older term **NASH**. MASH is the more active, inflamed form of the disease, which we cover in Section 3.

The bigger family: Steatotic Liver Disease (SLD)

The 2023 update created an umbrella term, **Steatotic Liver Disease (SLD)**, that covers *all* causes of a fatty liver. MASLD is the most common branch, but there are others:

Term	What it means
SLD	Steatotic Liver Disease — the umbrella term for any fatty liver, whatever the cause.
MASLD	Fatty liver <i>plus</i> at least one cardiometabolic risk factor, with little or no alcohol involvement. The focus of this guide.
MASH	The inflamed, injury-causing form of MASLD that is more likely to progress.
MetALD	MASLD in a person who also drinks a moderate-to-higher amount of alcohol — both factors contribute.
ALD	Alcohol-associated liver disease, where alcohol is the main driver.
Other SLD	Fatty liver from a specific cause such as certain medications, rare genetic conditions, or malnutrition.

KEY POINT

MASLD is not a "lifestyle failing" or a moral judgment. It is a common medical condition rooted in how the body manages energy — and, importantly, it is often **manageable and, in its early stages, reversible**.

SECTION 3 The Spectrum: From Extra Fat to Cirrhosis

MASLD is not one fixed thing. It is a spectrum that ranges from a liver that simply holds extra fat, all the way to serious scarring. Knowing where a person sits on this spectrum is the single most important question in their care.

Most people with MASLD never move far along the spectrum. But because the earlier stages are silent, it is worth understanding the whole path so you know why doctors focus on *scarring* above all else.

Stage 1 — Simple steatosis (MASL)

The liver contains extra fat, but there is little or no inflammation and no significant injury to liver cells. Many people stay at this stage for life without problems. Still, it is a signal that metabolic health deserves attention.

Stage 2 — Steatohepatitis (MASH)

Here the fat is accompanied by **inflammation** and **injury to liver cells** (pathologists describe swollen, "ballooned" cells). This active injury is what can, over years, trigger scarring. MASH is the form most likely to progress, which is why identifying it matters.

Stage 3 — Fibrosis

When liver cells are repeatedly injured, the body lays down scar tissue (fibrosis), much as skin forms a scar over a wound. Fibrosis is graded in stages, often written F0 to F4:

Stage	What it describes
F0	No scarring.
F1	Mild scarring, limited to small areas.
F2	Moderate scarring that has begun to spread ("significant" fibrosis).
F3	Advanced scarring bridging across the liver, but not yet cirrhosis.
F4	Cirrhosis — widespread, permanent scarring.

KEY POINT — WHY FIBROSIS IS THE HEADLINE

Across many studies, the **stage of fibrosis is the strongest predictor** of long-term liver outcomes — stronger than the amount of fat or inflammation. This is why modern testing focuses on finding out whether scarring is present, not just whether fat is present.

Stage 4 — Cirrhosis

Cirrhosis is the end stage, where scar tissue has replaced so much healthy tissue that the liver's shape and function are disrupted. Early ("compensated") cirrhosis may still cause no symptoms. If the liver begins to fail ("decompensated" cirrhosis), problems can include fluid buildup in the abdomen (ascites), swollen veins that can bleed (varices), confusion from toxin buildup (hepatic encephalopathy), and jaundice (yellowing of the skin and eyes). Cirrhosis also raises the risk of liver cancer.

DID YOU KNOW?

Movement along this spectrum is **not a one-way street**. With meaningful changes in metabolic health — and, increasingly, with medication — fat and inflammation can decrease, and even some fibrosis can improve. The earlier action is taken, the more the liver can recover.

A note on pace: progression is usually slow, measured in years, and varies enormously from person to person depending on genetics, other health conditions, and how metabolic risk factors are managed.

SECTION 4 How Common Is It? Who It Affects

MASLD is now the most common chronic liver condition in the world. If you have it, you are far from alone.

Estimates vary by region and method, but researchers believe MASLD affects roughly **one in three adults worldwide** — on the order of 30% or more of the global adult population. Rates have climbed alongside rising rates of obesity and type 2 diabetes over recent decades, and the condition is being found in younger and younger people.

Groups with higher rates

- **People with type 2 diabetes.** Prevalence is dramatically higher — many studies find that more than half of people with type 2 diabetes have MASLD, and they are more likely to have the progressive MASH form.
- **People carrying excess weight,** particularly around the abdomen.
- **People with metabolic syndrome** — the cluster of higher blood sugar, higher blood pressure, abnormal cholesterol, and central weight gain.
- **Certain family and genetic backgrounds.** Some inherited gene variants raise risk, and prevalence differs across populations partly for genetic reasons.

DID YOU KNOW?

MASLD is **not only an adult condition**. With the rise in childhood obesity, it has become one of the most common chronic liver conditions in children and teenagers in many countries — which is why Section 17 addresses younger patients specifically.

A growing reason for liver transplants

As other causes of liver disease (such as hepatitis C) become more treatable, MASH-related liver disease has become one of the fastest-growing reasons people need a liver transplant. Public-health experts expect the burden of MASLD to keep rising unless the metabolic trends behind it change.

KEY POINT

Because MASLD is so common and so quiet, many people have it without knowing. Awareness — the very thing this guide exists to build — is one of the most powerful tools we have.

SECTION 5 Causes & Risk Factors

MASLD develops when the body's handling of energy goes out of balance and the liver ends up storing more fat than it can comfortably manage. Several factors usually work together.

The central engine: insulin resistance

Insulin is the hormone that helps your cells take in sugar (glucose) from the blood for energy. In **insulin resistance**, cells respond less well to insulin, so the body makes more of it to compensate. This state pushes the liver to take in more fatty acids and to manufacture new fat (a process called *de novo* lipogenesis), while making it harder to clear that fat away. The result is fat accumulating inside liver cells. Insulin resistance is the thread connecting MASLD to diabetes, weight, and heart disease.

The five cardiometabolic risk factors

To diagnose MASLD, clinicians look for a fatty liver *plus at least one* of five "cardiometabolic" criteria. You do not need all five — one is enough. Seeing them listed together helps explain why MASLD is considered a whole-body, not just a liver, condition.

#	Risk factor	Typical adult threshold used by clinicians*
1	Excess weight / central adiposity	Body mass index at or above 25 (23 for many Asian populations), or an enlarged waist measurement.
2	Higher blood sugar	Fasting glucose at or above 100 mg/dL, an elevated HbA1c, type 2 diabetes, or treatment for it.
3	Higher blood pressure	At or above 130/85 mmHg, or taking blood-pressure medication.
4	Higher triglycerides	At or above 150 mg/dL, or taking medication to lower them.
5	Lower "good" cholesterol (HDL)	Below about 40 mg/dL (men) or 50 mg/dL (women), or on treatment.

*Thresholds are approximate and are adjusted for age, ethnicity, and clinical context. Only a clinician can apply them to you.

Other contributors

- **Genetics.** Variants in genes such as *PNPLA3* and *TM6SF2* can make the liver more prone to storing fat and to scarring. This helps explain why some people with few obvious risk factors still develop MASLD, and why others with many risk factors do not.
- **Diet patterns.** Diets high in added sugars (especially sugar-sweetened drinks and fructose), refined carbohydrates, and ultra-processed foods push the liver toward making and storing fat.
- **Low physical activity** and long periods of sitting.
- **Disrupted sleep**, including obstructive sleep apnea.
- **Polycystic ovary syndrome (PCOS)** and certain hormonal or thyroid conditions.
- **Rapid weight change** and some medical treatments, which a clinician can help you weigh.

DID YOU KNOW? — "LEAN" MASLD

An estimated 1 in 10 to 1 in 5 people with MASLD have a **normal body weight**. In these cases, genetics, body-fat distribution, and hidden metabolic issues play a larger role. A normal number on the scale does not rule MASLD out — see Section 17.

TALK WITH YOUR CLINICIAN

If several of these risk factors sound familiar, it is reasonable to ask your primary-care provider whether your liver should be checked — especially if you also have type 2 diabetes.

SECTION 6 The Metabolic Connection & Your Heart

One of the most important — and most surprising — facts about MASLD is this: for most people with the condition, the greatest threat to health is not the liver at all. It is the heart and blood vessels.

MASLD rarely travels alone. It clusters with the other features of **metabolic syndrome**, and shares the same root of insulin resistance. Because of this, MASLD is best thought of as the liver's expression of a body-wide metabolic imbalance.

MASLD and cardiovascular disease

People with MASLD have a higher risk of heart attacks, strokes, and other cardiovascular problems. In fact, **cardiovascular disease is the leading cause of death among people with MASLD** — more common than death from liver disease itself. This is why good MASLD care always includes attention to blood pressure, cholesterol, and blood sugar, and why quitting smoking matters so much.

KEY POINT

Managing MASLD is not only about protecting your liver. The same steps — improving blood sugar, blood pressure, cholesterol, weight, and activity — also protect your heart, which is statistically the bigger danger.

Other connected conditions

- **Type 2 diabetes.** The relationship runs both ways — each condition raises the risk and severity of the other.
- **Chronic kidney disease.** MASLD is associated with a higher risk of kidney problems.
- **Certain cancers.** Beyond liver cancer, MASLD has been linked with a modestly higher risk of some other cancers, likely through shared metabolic pathways.
- **Sleep apnea and PCOS,** which both share metabolic roots with MASLD.

DID YOU KNOW?

Because these conditions are so intertwined, a visit about your liver may lead your clinician to also check your heart-disease risk, kidney function, and diabetes control. That is good, joined-up care — not a sign that something has gone wrong.

SECTION 7 Signs, Symptoms & Why It's Often Silent

Most people with MASLD feel completely normal. The condition is usually discovered by chance, not because of symptoms — which is both reassuring and a reason to stay alert.

In its earlier stages, MASLD typically causes **no symptoms at all**. When symptoms do appear, they tend to be vague and easy to attribute to everyday life:

- **Fatigue** or a general lack of energy.
- A dull ache, fullness, or discomfort in the **upper right side of the abdomen**, where the liver sits.
- Difficulty concentrating or a feeling of "brain fog," which some patients describe.

These are non-specific — meaning many other things can cause them — so they are not a reliable way to detect the condition. That is precisely why blood tests and imaging matter.

Signs that suggest more advanced disease

The following can appear when scarring has become significant. They are warning signs to take seriously and discuss with a clinician promptly:

- Yellowing of the skin or the whites of the eyes (jaundice).
- Swelling of the abdomen or the legs and ankles.
- Easy bruising or bleeding.
- Persistent itching.
- Confusion, disorientation, or unusual drowsiness.
- Vomiting blood or passing black, tarry stools.

SEEK MEDICAL CARE PROMPTLY

Signs such as vomiting blood, black tarry stools, sudden confusion, or a swollen, painful abdomen can indicate a serious complication. These are reasons to seek medical attention without delay. This guide cannot assess urgency — a clinician can.

KEY POINT

Feeling fine does **not** mean the liver is fine. Because MASLD is usually silent, the way it is found is through testing prompted by risk factors — not by waiting for symptoms.

SECTION 8 How MASLD Is Diagnosed

Diagnosis has two goals: first, to confirm that fat is present and rule out other causes; and second — most importantly — to find out whether any scarring (fibrosis) has developed.

Step 1 — The story and a physical exam

A clinician will ask about weight history, diet, activity, alcohol use, medications, family history, and other conditions such as diabetes. This context shapes everything that follows.

Step 2 — Blood tests

There is no single blood test that says "MASLD." Instead, several tests are used together:

- **Liver enzymes** (ALT, AST, GGT, ALP). These can be mildly raised — but many people with MASLD, even with scarring, have *normal* enzyme levels, so normal results do not rule it out.
- **Tests to exclude other causes**, such as viral hepatitis B and C, autoimmune liver disease, iron overload (hemochromatosis), and thyroid problems.
- **Metabolic tests**, including fasting glucose or HbA1c, a cholesterol/triglyceride panel, and markers of liver function such as albumin, bilirubin, and platelet count.

Step 3 — Estimating the risk of scarring (non-invasive tests)

Modern care leans heavily on tests that estimate fibrosis *without* a biopsy. A common first step is a simple calculation:

- **FIB-4 index.** A score calculated from age and three routine blood values (AST, ALT, and platelet count). It sorts people into low, indeterminate, or higher likelihood of advanced scarring, and helps decide who needs more testing or a specialist referral.
- **Other blood-based scores** and specialized panels (for example, tests that measure markers of fibrosis directly) may also be used.

Step 4 — Imaging

Test	What it shows
Ultrasound	A common first scan. Good at detecting moderate-to-large amounts of liver fat; less reliable for small amounts or for measuring scarring.
Transient elastography (often called FibroScan / VCTE)	A quick, painless bedside test that measures liver stiffness as a stand-in for scarring, and can also estimate fat.
MRI-based tests (MRI-PDFF, MR elastography)	Highly accurate at measuring both fat and stiffness. Often used in specialist care and research.

Step 5 — Liver biopsy (only sometimes)

A biopsy — taking a tiny sample of liver tissue with a needle — remains the most detailed way to see inflammation and scarring under a microscope. Because non-invasive tests have improved so much, biopsy is now reserved for situations where the diagnosis is unclear, other conditions are suspected, or precise staging is needed.

DID YOU KNOW?

A typical journey looks like this: a routine test hints at a fatty liver → blood work and a FIB-4 score are done → if scarring looks possible, an elastography scan follows → and if concern remains, a referral to a liver specialist (hepatologist) is made. Most people never need a biopsy.

TALK WITH YOUR CLINICIAN

Good questions to ask: "Do my results suggest any scarring?" "What is my FIB-4 score, and what does it mean for me?" and "How and when should we re-check?"

SECTION 9 Related Conditions: MetALD, ALD & Others

A fatty liver can have more than one cause at the same time. The updated naming system was designed to reflect that reality honestly.

When alcohol is also part of the picture: MetALD

Many people have both metabolic risk factors *and* drink some alcohol. The category **MetALD** was created for exactly this situation: a person meets the criteria for MASLD but also drinks a moderate-to-higher amount of alcohol, so both metabolic factors and alcohol are contributing. Recognizing both drivers matters, because addressing only one may not be enough.

Category	Main driver(s)
MASLD	Metabolic factors; little or no alcohol.
MetALD	Both metabolic factors <i>and</i> a moderate-to-higher alcohol intake.
ALD	Alcohol is the predominant cause.

TALK WITH YOUR CLINICIAN — HONESTLY

It can feel uncomfortable, but being candid about how much you drink helps your clinician classify the condition correctly and give advice that actually fits your situation. There is no judgment in an accurate picture — only better care.

Other causes worth ruling out

Before settling on MASLD, clinicians consider other reasons a liver might hold fat or show injury, including:

- **Certain medications** that can cause steatosis in some people.
- **Viral hepatitis** (especially B and C).
- **Autoimmune liver conditions.**
- **Inherited conditions** such as hemochromatosis (iron overload) or Wilson disease (copper overload).
- **Rapid weight loss, malnutrition, or specific metabolic disorders.**

This is why the blood tests in Section 8 cast a wide net — the goal is to make sure the right condition is being treated.

KEY POINT

These categories are not rigid boxes. A person's situation can shift over time — for example, if alcohol intake or metabolic health changes — and their care should shift with it.

SECTION 10 Possible Complications

Most people with MASLD will never develop serious liver complications. But understanding what can happen — and how rarely — helps put the condition in perspective and explains why monitoring matters.

Liver-related complications

- **Progression to cirrhosis.** In a minority of people, years of inflammation and scarring lead to cirrhosis (F4). The risk is highest in those with MASH and advancing fibrosis.
- **Complications of cirrhosis.** These include fluid buildup (ascites), swollen veins that can bleed (varices), confusion (hepatic encephalopathy), and jaundice.
- **Liver cancer (hepatocellular carcinoma).** The risk rises substantially once cirrhosis is present, which is why people with cirrhosis are offered regular surveillance scans.

Complications beyond the liver

- **Cardiovascular disease** — as covered in Section 6, the most common cause of death in MASLD.
- **Type 2 diabetes** and worsening blood-sugar control.
- **Chronic kidney disease.**

DID YOU KNOW?

For people with cirrhosis of any cause, doctors often recommend **vaccination against hepatitis A and B** and regular **liver-cancer surveillance** (typically an ultrasound every six months). These simple steps are protective, which is a hopeful part of the story.

KEY POINT — KEEPING PERSPECTIVE

The presence of MASLD does not mean these outcomes are likely. It means they are worth *preventing* — and the tools to do so (managing metabolic health and monitoring for scarring) are within reach for most people.

SECTION 11

Treatment & Management: The Big Picture

There is real reason for optimism. MASLD often responds well to changes in metabolic health, and for the first time there are medicines specifically aimed at the disease. Care is built in layers.

Layer 1 — The foundation: lifestyle and metabolic health

For nearly everyone, the cornerstone of treatment is improving the metabolic factors driving the disease. This is not a consolation prize — it is genuinely the most powerful, evidence-backed approach, and it can reduce liver fat, calm inflammation, and improve scarring.

Weight change, where appropriate, has a dose-related effect on the liver:

Approximate body-weight reduction	Typical liver benefit reported in studies
Around 3–5%	Meaningful reduction in liver fat.
Around 7–10%	Reduction in inflammation and resolution of MASH in many people.
10% or more (sustained)	Best chance of improving fibrosis (scarring).

Figures are general and drawn from research averages; individual results vary. Weight loss is not the right or the only goal for everyone — a clinician can help set realistic targets.

Diet, physical activity, and habit change each get their own section next (Sections 12–14) because they matter so much.

Layer 2 — Treating the conditions that travel with MASLD

- **Blood sugar.** Good diabetes management benefits the liver, and some diabetes medicines have added liver and heart benefits.
- **Cholesterol.** Statin medications are generally considered **safe** in MASLD and are important for reducing cardiovascular risk. A fatty liver is not, by itself, a reason to avoid them.
- **Blood pressure.** Keeping it controlled protects the heart, kidneys, and blood vessels.

Layer 3 — Medications aimed at the liver disease itself

This is a rapidly changing area. Depending on individual circumstances and stage of disease, clinicians may discuss:

- **A newer medication approved specifically for MASH with moderate-to-advanced scarring.** In 2024, the first medicine designed for this purpose received approval in the United States, used alongside diet and exercise for eligible patients. Its availability marks a turning point in the field.
- **Certain weight-loss and diabetes medications** — including the GLP-1 class — which in studies have improved metabolic health and, in some, the liver disease itself. These are particularly relevant when diabetes or significant excess weight is also present.
- **Other agents** (such as pioglitazone or vitamin E) that a specialist may consider for selected patients, each with its own benefits and cautions.

A WORD OF CAUTION ON MEDICINES AND SUPPLEMENTS

Which medication — if any — is right depends heavily on your individual situation, stage of disease, and other conditions. **This guide cannot recommend specific drugs or doses.** Please make these decisions with a qualified clinician, and be cautious about over-the-counter "liver detox" or herbal products, some of which can actually harm the liver (see Section 15).

Layer 4 — Procedures and advanced care

- **Metabolic (bariatric) surgery** can, for eligible people with significant obesity, produce large improvements in metabolic health and the liver.

- **Liver transplantation** is a life-saving option for carefully selected people with end-stage liver disease.

KEY POINT

The most reliable, universally beneficial treatment remains improving metabolic health. Medicines are a powerful and growing addition — but they work best *alongside* the foundation, not instead of it.

SECTION 12 Eating for Liver Health

No single food causes or cures MASLD. What matters is the overall pattern of eating over weeks, months, and years. The good news is that a liver-friendly diet is simply a heart-friendly, everyday-healthy diet.

The most studied pattern: Mediterranean-style eating

Across the research, a **Mediterranean-style diet** stands out for liver and metabolic health. It is not a rigid program but a flexible pattern emphasizing:

- Plenty of **vegetables, fruits, legumes (beans and lentils), and whole grains**.
- **Healthy fats**, especially olive oil, nuts, and seeds, in place of butter and processed fats.
- **Fish and seafood** a couple of times a week, with poultry in moderation.
- Less **red and processed meat**, and fewer sweets and sugary drinks.

What to cut back on

Cut back on...	Why it matters for the liver
Sugar-sweetened drinks & added sugars	Fructose and rapidly absorbed sugars push the liver to make and store fat. Sweet drinks are a common, high-impact place to start.
Ultra-processed foods	Often high in sugar, refined starch, unhealthy fat, and salt, and easy to over-eat.
Refined carbohydrates	White bread, pastries, and similar foods spike blood sugar and feed fat production.
Excess saturated fat	Found in fatty processed meats and many fried and packaged foods.

A few evidence-informed extras

- **Coffee.** Observational studies link regular coffee (with limited added sugar) to lower rates of liver scarring. It is not a treatment, but it appears to be a liver-friendly habit for those who enjoy it.
- **Fiber.** Vegetables, fruit, beans, and whole grains support steadier blood sugar and a healthier gut.
- **Portion awareness** rather than extreme restriction. Sustainable, gentle change beats a crash diet the liver-wise — very rapid weight loss can sometimes stress the liver.

TALK WITH A PROFESSIONAL

A **registered dietitian** can tailor these principles to your tastes, budget, culture, and any other conditions (such as diabetes or kidney disease). Ask your clinician whether a referral is possible — personalized guidance tends to stick far better than a generic plan.

NOTE

This section describes general dietary patterns for education only. It is not a personalized nutrition prescription. If you have diabetes, kidney disease, an eating disorder history, or other conditions, please seek individualized advice before making significant changes.

SECTION 13 Moving More: Physical Activity

Exercise helps the liver in a special way: it can reduce liver fat even when the number on the scale barely changes. Movement is medicine for MASLD.

Why activity works

Physical activity improves how the body uses insulin, burns fat that would otherwise accumulate in the liver, and reduces inflammation. Studies show benefits to liver fat from exercise **independent of weight loss** — encouraging news for anyone who has struggled with the scale.

A practical target

General guidelines many clinicians point to include:

- **Aerobic activity:** aiming toward roughly 150 minutes per week of moderate activity (such as brisk walking, cycling, or swimming) — for example, 30 minutes on most days. Any amount is better than none, and it is fine to build up gradually.
- **Strength / resistance training** two or more days a week. Building muscle improves how the body handles sugar and supports metabolism.
- **Less sitting.** Breaking up long periods of sitting with short movement breaks helps too.

KEY POINT

The best exercise is the one you will actually keep doing. Consistency matters more than intensity. Walking counts. Gardening counts. Dancing counts.

BEFORE YOU START

If you have heart disease, are new to exercise, or have other health concerns, check with your clinician about what type and intensity of activity is safe for you to begin with.

SECTION 14 Weight, Habits & Lasting Change

Knowing what to do is rarely the hard part. Doing it consistently, in a busy life, is where most of us struggle. This section is about making change realistic and kind.

Set goals you can actually keep

- **Small and specific beats big and vague.** "A 15-minute walk after lunch on weekdays" is easier to start and sustain than "get fit."
- **Aim for direction, not perfection.** Even modest, sustained improvements in weight, activity, and diet meaningfully help the liver.
- **Anchor new habits to existing ones.** Tie a walk to your morning coffee, or stretching to a favorite show.

Handle setbacks gently

Lapses are part of every long journey, not a sign of failure. What matters is returning to your routine, not never slipping. Self-criticism tends to make change harder, not easier; self-compassion is a practical strategy, not just a nice idea.

Build support around you

- **Enlist people.** A friend, family member, or community group makes change more durable and more enjoyable.
- **Use your care team.** Dietitians, physiotherapists, diabetes educators, and counselors can all help — ask what is available to you.
- **Track what motivates you,** whether that is energy, sleep, lab numbers, or how your clothes fit — not only the scale.

DID YOU KNOW?

The Liver and Kidneys Hope Foundation's community programs exist partly for this reason — because change is easier when you are not doing it alone. Peer support and shared learning are powerful tools for sticking with healthy habits.

A NOTE ON SAFETY

Extreme diets, crash weight loss, and unregulated "fat-burner" or "detox" products can be counter-productive or even harmful to the liver. Sustainable, moderate change — guided by professionals — is safer and works better over time.

SECTION 15 Alcohol, Medications & Supplements

Your liver processes nearly everything you consume. A few mindful choices in this area can make a real difference — and a few common mistakes are worth avoiding.

Alcohol

Because the liver is already under metabolic strain in MASLD, alcohol adds a second source of stress. Even amounts once considered "moderate" may contribute to injury, and higher intake moves a person toward the MetALD or ALD categories described in Section 9. Many clinicians advise people with MASLD to **minimize or avoid alcohol**, and to avoid it entirely if there is significant scarring. Your own clinician can give advice tailored to your stage of disease.

Everyday medications

- **Acetaminophen (paracetamol)** is generally acceptable in normal doses for many people, but the total daily amount matters and can be lower if the liver is significantly affected — ask your clinician what is safe for you, and watch for it hidden in combination cold-and-flu products.
- Always tell every prescriber and pharmacist that you have a liver condition, so they can check that new medicines are appropriate.
- Do not stop prescribed medicines (such as statins) on your own out of worry about the liver — many are beneficial and safe. Raise concerns with your clinician first.

"LIVER DETOX" AND HERBAL PRODUCTS — BE CAREFUL

Products marketed to "cleanse," "detox," or "boost" the liver are not proven to help MASLD, and some supplements and herbal remedies have actually caused liver injury. High-dose herbal extracts, weight-loss supplements, and certain botanicals are of particular concern. **Check with a clinician or pharmacist before taking any supplement**, and treat bold marketing claims with healthy skepticism.

Vaccinations and other protections

People with chronic liver conditions are often advised to stay current on vaccinations, including hepatitis A and B, to avoid additional liver insults. Your clinician can advise what is right for you.

TALK WITH YOUR CLINICIAN OR PHARMACIST

Bring a full list of everything you take — prescriptions, over-the-counter medicines, vitamins, and supplements — to your appointments. It is one of the simplest ways to keep your liver safe.

SECTION 16 Monitoring & Your Care Team

MASLD is a long-term condition, and it is monitored over time rather than "fixed" in a single visit. Knowing what ongoing care looks like helps you be an active partner in it.

What monitoring usually involves

- **Periodic blood tests** to track liver enzymes, metabolic markers, and fibrosis scores such as FIB-4.
- **Repeat elastography or imaging** at intervals your clinician judges appropriate, to watch for any change in scarring.
- **Attention to the whole metabolic picture** — blood pressure, cholesterol, blood sugar, and weight — because these drive both liver and heart risk.

- **For those with cirrhosis**, additional surveillance such as regular liver-cancer screening and checks for other complications.

Who might be on your team

Primary care provider

Hepatologist / gastroenterologist

Registered dietitian

Diabetes / endocrine specialist

Cardiologist

Nurse educator

Pharmacist

Mental-health professional

Community & peer support

Not everyone needs all of these. Many people are managed well in primary care, with a specialist involved when scarring is a concern or the picture is complex.

KEY POINT — YOU ARE THE CONSTANT

Clinicians come and go, but you are present at every appointment. Keeping your own records — lab results, scores, medications, and questions — makes your care smoother and more effective. Consider a simple folder or phone note.

MAKE THE MOST OF APPOINTMENTS

Write your top two or three questions before each visit. Ask for numbers and what they mean. Ask what the plan is until the next visit, and what would be a reason to check in sooner.

SECTION 17 Special Situations

MASLD looks a little different across different groups. Here are a few situations that deserve their own note.

Children and teenagers

With rising childhood obesity, MASLD has become one of the more common chronic liver conditions in young people. Care centers on the whole family — supportive changes to eating and activity that involve everyone, rather than singling out a child. Because young people have many years ahead of them, early attention is especially valuable. Pediatric specialists guide diagnosis and any treatment.

"Lean" MASLD

A meaningful minority of people with MASLD have a normal body weight. Their disease is more often shaped by genetics and by *where* the body stores fat, and it still deserves the same careful evaluation of metabolic health and scarring. A normal weight should never be a reason to dismiss liver findings.

People with type 2 diabetes

Because MASLD is so common and often more advanced in people with type 2 diabetes, many guidelines suggest actively checking for liver scarring in this group — for example, calculating a FIB-4 score. Some diabetes treatments also offer added benefits for the liver and heart, which a clinician can factor in.

Pregnancy

MASLD can be associated with certain pregnancy complications, and some medications used for metabolic health are not suitable during pregnancy. Anyone who is pregnant or planning a pregnancy should discuss their liver and metabolic health with their care team so the plan can be adjusted safely.

Older adults

In older age, MASLD often sits alongside several other conditions and medications. Care emphasizes balancing benefits and risks, protecting heart health, and maintaining strength, mobility, and quality of life.

TALK WITH YOUR CLINICIAN

If any of these situations apply to you or a family member, mention it directly — it may change what testing, monitoring, or treatment makes sense.

SECTION 18

Living Well: Mind, Mood & Community

A diagnosis touches more than the body. Caring for your emotional wellbeing is a legitimate and important part of living well with MASLD.

Feelings are normal — and worth tending

It is common to feel worried, frustrated, or even ashamed after a diagnosis, particularly given the stigmatizing language the condition has carried in the past. These feelings are understandable. They are also worth addressing, because stress and low mood can make healthy routines harder to maintain.

Practical supports

- **Talk to someone.** Sharing your experience with trusted people, a support group, or a counselor can lighten the load and keep you motivated.
- **Protect sleep.** Good sleep supports metabolic health and mood, and disrupted sleep is common in MASLD.
- **Manage stress** in ways that work for you — movement, time outdoors, creative activities, faith or community, or relaxation practices.
- **Reframe the goal.** You are working toward energy, longevity, and wellbeing — not chasing perfection or a number.

On stigma

MASLD is a medical condition with strong biological and genetic roots. It is not a character flaw or a punishment. The shift away from older, blaming language is deliberate — and you deserve care and information delivered with respect.

IF YOU ARE STRUGGLING

If you are experiencing persistent low mood, hopelessness, or thoughts of harming yourself, please reach out to a healthcare professional or a local crisis line. You do not have to manage those feelings alone, and support is available.

COMMUNITY MATTERS

Connection is protective. Foundations, patient groups, and peer networks — including the programs offered by The Liver and Kidneys Hope Foundation · exist so that no one has to navigate liver health in isolation.

SECTION 19 Prevention

Much of what helps treat MASLD also helps prevent it. Whether you are trying to lower your own risk or support a loved one, the same handful of habits do most of the work.

The core of prevention

- **Aim for a healthy weight** and, in particular, watch waist size, which reflects the metabolically active fat around the organs.
- **Eat mostly whole foods** in a Mediterranean-style pattern, and go easy on sugary drinks and ultra-processed foods.
- **Move regularly**, combining aerobic activity with some strength work, and sitting less.
- **Keep your metabolic numbers in range** — blood sugar, blood pressure, and cholesterol — with your clinician's help.
- **Be moderate with alcohol**, or avoid it.
- **Don't smoke**, which compounds cardiovascular and liver risk.
- **Prioritize sleep** and address problems like sleep apnea.

Know your risk, get checked

If you have risk factors — especially type 2 diabetes, excess weight, or metabolic syndrome — a simple conversation with your clinician about whether your liver should be assessed is one of the most valuable preventive steps you can take. Catching changes early keeps more options open.

KEY POINT

Prevention is not about perfection or a dramatic overhaul. It is a set of ordinary, repeatable choices that protect your liver, your heart, and your future all at once.

SECTION 20 Myths vs. Facts

Misunderstandings about fatty liver disease are widespread. Clearing them up is one of the simplest ways to reduce fear and encourage the right action.

Myth	Fact
"Only heavy drinkers get a fatty liver."	MASLD is driven by metabolic factors and can occur in people who drink little or no alcohol. That is the whole point of the "metabolic" name.
"If I feel fine, my liver is fine."	MASLD is usually silent. People can have significant scarring while feeling completely well. Testing, not symptoms, reveals it.
"Thin people can't have it."	An estimated 1 in 10 to 1 in 5 people with MASLD have a normal weight ("lean" MASLD). Body weight is not the whole story.
"There's nothing I can do about it."	Early MASLD is often reversible, and improving metabolic health helps at every stage. There are now medicines for advanced cases, too.
"A detox tea or supplement will cleanse my liver."	No supplement is proven to treat MASLD, and some have caused liver injury. Everyday habits — not products — do the real work.
"Normal liver enzymes mean I'm in the clear."	Liver enzymes can be normal even when MASLD or scarring is present. That is why other tests, like FIB-4 and elastography, are used.
"MASLD is only a liver problem."	It is closely tied to heart disease, diabetes, and kidney health — and heart disease is the most common cause of death in people with MASLD.
"Losing weight fast is best for my liver."	Very rapid weight loss can stress the liver. Steady, sustainable change is safer and more effective.

KEY POINT

If you remember only one thing from this page: MASLD is common, usually silent, closely tied to overall metabolic health, and — especially early — very often improvable.

SECTION 21 Questions for Your Doctor & Glossary

Walking into an appointment with a few questions ready helps you get more from it. Here are some worth considering — and a glossary to decode the terms you may hear.

Questions you might ask

- Do my results suggest I have MASLD, and how was that decided?
- Is there any sign of liver scarring (fibrosis)? What is my FIB-4 score?
- Do I need any imaging, such as a FibroScan, or a referral to a liver specialist?

- What are my numbers for blood sugar, blood pressure, and cholesterol, and are they where they should be?
- What changes would help me most, and can I see a dietitian?
- Are any of my current medicines or supplements a concern for my liver?
- Should I be vaccinated against hepatitis A or B?
- How and when will we re-check my liver? What would be a reason to contact you sooner?
- What is my overall risk to my heart, and how do we lower it?

Glossary

Term	Plain-language meaning
ALT / AST	Liver enzymes measured in blood; can rise when liver cells are stressed, but may be normal in MASLD.
Cirrhosis	Advanced, permanent scarring of the liver (fibrosis stage F4).
Elastography (FibroScan/ VCTE)	A painless scan that measures liver stiffness as a stand-in for scarring.
Fibrosis	Scar tissue in the liver, graded from F0 (none) to F4 (cirrhosis).
FIB-4	A score from age and routine blood tests that estimates the chance of advanced scarring.
Hepatologist	A doctor who specializes in the liver.
Insulin resistance	When the body responds less well to insulin; the central driver of MASLD.
MASH	The inflamed, injury-causing form of MASLD (formerly NASH).
MASLD	Metabolic dysfunction-Associated Steatotic Liver Disease (formerly NAFLD).
MetALD	MASLD in a person who also drinks moderate-to-higher amounts of alcohol.
Metabolic syndrome	A cluster of raised blood sugar, blood pressure, triglycerides, low HDL, and central weight gain.
Steatosis	The medical word for fat accumulation — here, in the liver.

CLOSING Resources, References & Disclaimer

About The Liver and Kidneys Hope Foundation

The Liver and Kidneys Hope Foundation (TLHF) is a Nevada-based 501(c)(3) nonprofit dedicated to liver-health education, community support, and outreach. Through educational materials like this guide, community programming, our chapter network, volunteer efforts, and fundraising initiatives, we work to raise awareness of liver conditions and to support the people affected by them. The Foundation is not a medical provider and does not deliver clinical care.

How to keep learning safely

When looking for further information about MASLD, favor sources you can trust: your own healthcare team, and established professional liver and health organizations. Because guidance in this field is evolving quickly — the disease naming was updated in 2023 and new treatments have followed — always check that information is current, and bring anything you read back to your clinician to discuss how it applies to you.

A NOTE ON SOURCES AND CURRENCY

This guide reflects widely accepted, general medical understanding of MASLD intended for patient education. It does not cite individual studies, and the science continues to advance. For the most current, individualized information, your healthcare professional is the best resource. If any statement here appears to conflict with advice from your care team, follow your care team.

Full disclaimer

PLEASE READ

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