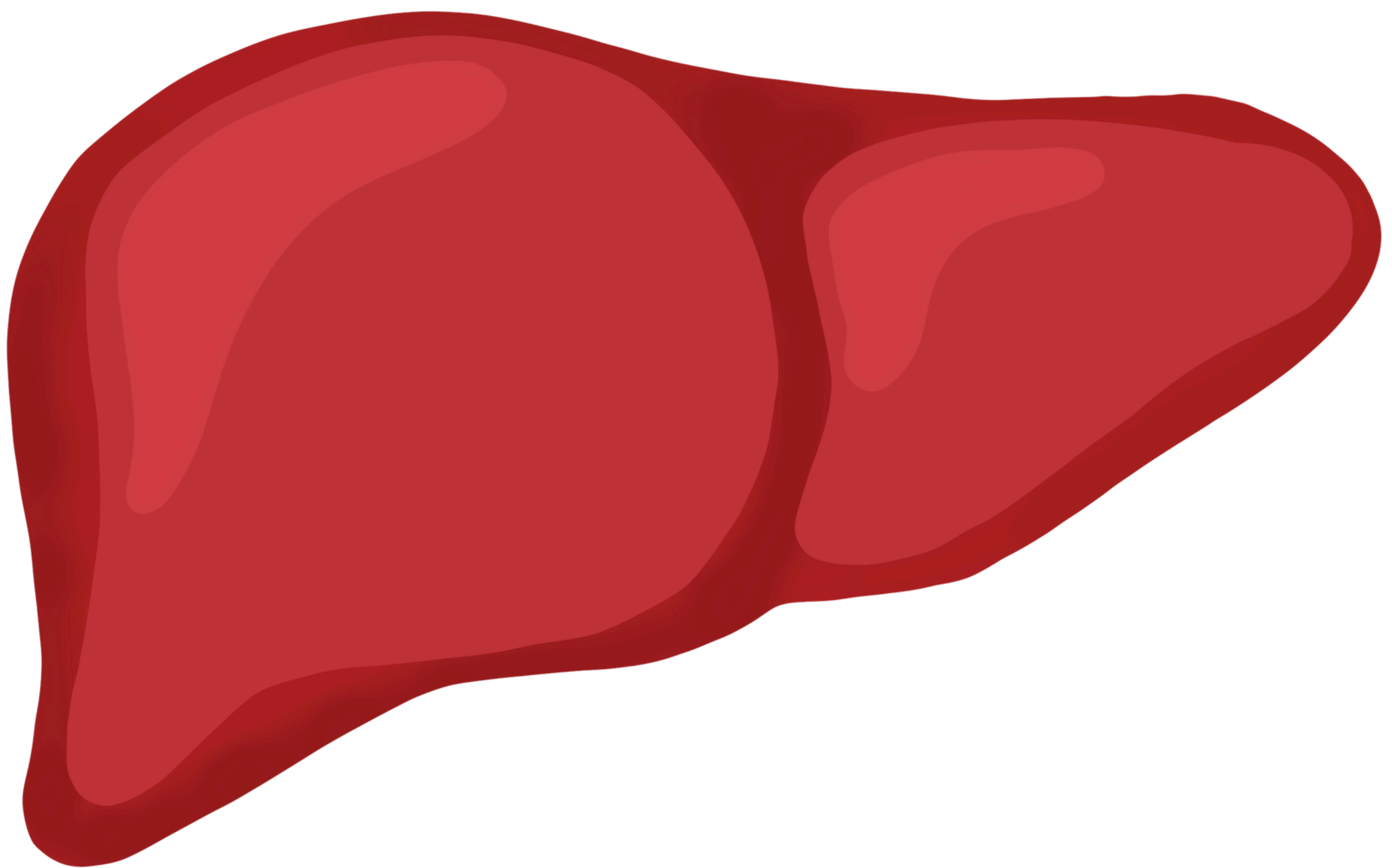


**Steatotic Liver Disease**  
**(known as *Fatty Liver Disease* until June 2023)**

**information about 14 important topics for people  
who have, or who are at high risk of developing,  
steatotic liver disease**



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**patient advocate hepatology**

# Steatotic Liver Disease

(known as *Fatty Liver Disease* until June 2023)

## Information about 14 important topics for people who have, or who are at high risk of developing Steatotic Liver Disease.

### Steatotic Liver Disease

Steatotic Liver Disease was known as Fatty Liver Disease until June 2023.

Patient organizations and the international scientific associations European Association for Study of the Liver (EASL) and the American Association for Study of the Liver (AASLD) initiated a name change. The name Fatty Liver Disease as well as the names of the subdivision were felt to be stigmatizing.

The current name Steatotic Liver Disease is one that again has a subdivision by cause.

In June 2023, the name Non-Alcoholic Fatty Liver Disease (NAFLD) was changed internationally to Steatotic Liver Disease. This is a general term; there are a number of subdivisions. In the Dutch setting, the name steatotic liver disease is used, which similarly has subdivisions.

14 important topics for people who have, or who are at high risk of developing steatotic liver disease. The brochure was originally written in Dutch, but in response to multiple requests has been translated into English.

### Background

This brochure is based on the brochure in Dutch, developed and edited by the Dutch Liver Patients Association (Nederlandse Leverpatiënten Vereniging / NLV). They represent all liver conditions, including steatotic liver disease. This English translation is adopted by the umbrella organization Liver Patients International, an umbrella organisation for liver patients organizations.

This brochure is an adaptation of the international Non-Alcoholic Fatty Liver Disease (NAFLD)\* guidelines, prepared by the European Association for Study of the Liver (EASL). This guideline was developed from a patient perspective. The full (revisited) English-language guideline can be found on the website of EASL and Liver Patients International

This international guideline was developed by patients, patient representatives, doctors and scientists, and is based on the latest scientific knowledge and recommendations.

[https://www.jhep-reports.eu/article/S2589-5559\(21\)00098-7/fulltext](https://www.jhep-reports.eu/article/S2589-5559(21)00098-7/fulltext)

This brochure is intended for anyone with, or at risk of, steatotic liver disease (fatty liver). Our thanks go to everyone who has contributed to this brochure, and especially to the patients, both with and without steatotic liver disease, who have tirelessly shared with us what information is important to them.

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# Introduction

## **Steatotic liver disease: a serious matter**

Steatotic liver disease means that the liver is fatty. This can cause damage to the liver that can range from mild to severe. This damage can lead to scarring of the liver. If there is too much scarring, the liver may stop functioning properly at some point. Steatosis not only causes problems in the liver but also increases the risk of cardiovascular disease, type 2 diabetes mellitus and some cancers.

Steatotic liver disease includes a number of forms of steatosis of the liver. These forms are:

- steatosis due to unhealthy lifestyle (unhealthy diet and too little exercise),
- steatosis due to excessive alcohol consumption,
- steatosis due to the use of medications,
- steatosis caused by viral infections,
- steatosis due to rare congenital disorders.

The two most common forms are steatosis due to an unhealthy lifestyle (unhealthy diet and too little exercise) and steatosis due to excessive alcohol consumption.

This brochure deals with steatosis caused by an unhealthy lifestyle. This is internationally referred to as MASLD (Metabolic-dysfunction Associated Steatotic Liver Disease).

When this brochure mentions steatotic liver disease, this refers specifically to metabolic-associated steatotic liver disease. It is important to know what steatosis is and how to reduce or prevent the risk of liver damage and other health problems. It is important that you remain in control. This can of course always be done in consultation with your healthcare provider.

This brochure presents 14 topics to help understand what steatosis and steatotic liver disease are, what the consequences can be and what lifestyle rules are important to observe. This brochure can also help family members, friends and colleagues understand what steatotic liver disease is and what is associated with it. In addition, it can help in discussions with your GP or other healthcare providers.

## 1. What does the liver do?

The liver can be thought of as the body's "chemical factory." The liver performs exceptionally complex functions, including cleansing the blood of waste products. In the intestines, nutrients are absorbed into the blood. This blood then passes through the portal, vein to the liver. This is a vein that goes directly from the gut to your liver. Thus, nutrients from food reach the liver through the intestines.

Nutrients can be divided into three groups: carbohydrates (including sugars), proteins and fats.

The liver plays a central role in processing these nutrients. The liver processes these nutrients and then releases them as building blocks for the other organs to use for energy and growth. In this way, the liver is closely connected to many other organs. Building blocks that are not immediately consumed by the body are stored as fuel, including in the form of fat, until the body needs these building blocks. However, if the body has an excess of fuel, the supply of fat, stored in the form of fat droplets in the liver cells and other forms in the body, increases.

Other important functions of the liver include processing medicines for example, as well as detoxifying harmful substances, the production of bile and substances important for blood clotting and transport through the blood.

The liver is therefore extremely important, but normally you notice little or nothing of its function. You feel your heart beating, you feel your lungs expand when you breathe, but you feel nothing from the liver. If the liver is having problems or is diseased, it rarely causes any pain. This is because there are few sensory nerves in the liver itself. Because you don't notice much of what is going on in the liver, it often takes a long time before liver disease is noticed. This also includes steatotic liver disease and its consequences.

## **2. What is Steatotic Liver Disease and how does it occur?**

Steatotic liver disease is referred to internationally as Steatotic Liver Disease, often abbreviated as SLD. This term encompasses the various forms of liver steatosis, such as steatosis caused by an unhealthy lifestyle (improper diet, too little exercise), steatosis caused by excessive alcohol consumption, steatosis caused by medication use, by viral infections, and steatosis caused by rare congenital diseases. This brochure deals with steatosis caused by an unhealthy lifestyle: eating unhealthy foods and too little exercise. Alcohol intake can of course play a role in this. People who are extremely overweight are at high risk. But people with just a few pounds too many and an unhealthy lifestyle are also at risk of steatotic liver disease.

### **How does steatosis occur in the liver?**

The liver plays a central role in processing fat particles (lipids) in the body, but under normal circumstances, it will not store fat itself. When we take in too much energy/calories, the body stores it in the form of fat in adipose tissue, which is made for that purpose. However, when more fat needs to be stored than the adipose tissue can handle, the liver comes under pressure - fat in the form of fat droplets is stored in liver cells and steatosis of the liver occurs. When at least five percent of the liver cells are full of fat, this is referred to as Steatotic Liver Disease.

The increase of fat in the liver is usually caused by a combination of eating more calories than the body needs plus too little exercise. Therefore, it often occurs in combination with obesity. However not everyone who is overweight has steatotic liver disease. People with type 2 diabetes mellitus or its early stages are also more likely to have steatosis of the liver.

Steatosis caused by drugs or alcohol use does not fall under the "old" term of non-alcoholic steatosis or the new term - metabolic-associated steatotic liver disease. If excessive alcohol use is the main cause of the steatosis, we refer to it as "alcoholic steatosis." It is also true that several causes of steatosis can occur together, such as a combination of alcoholic, metabolic or viral steatosis as well as steatosis due to medication use. It is therefore important that all possible causes are considered and none is neglected when steatosis is diagnosed.

### **Diabetes mellitus type 2 and steatosis**

Diabetes mellitus type 2 increases the risk of steatosis of the liver. This also applies the other way around: a fatty liver does not respond as well to insulin, which in turn can contribute to the development of type 2 diabetes mellitus. If you already have type 2 diabetes mellitus, steatosis of the liver makes regulating type 2 diabetes mellitus and blood sugar more difficult.



### **How does steatosis occur in the liver**

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### **3. What is the effect of excess stored fat in the liver?**

Extra fat particles in the liver cells are not necessarily harmful to the liver, nor does this necessarily cause the liver to work less well. Problems arise when the amount of fat in the liver is too great or the liver is exposed to this excess fat for a long time. This fat can cause an inflammatory process in the liver. This inflammatory process is called MASH: Metabolic Associated Steato-Hepatitis. MASH leads to further damage to the liver. Scar tissue develops in the liver as a result of the inflammatory process; this is called liver fibrosis. When this inflammatory process persists and the liver becomes completely scarred, this is referred to as cirrhosis. In some cases, this chronic process of damage can lead to liver cancer. In some people, therefore, persistent steatotic liver disease can have serious long-term consequences.

#### **The liver no longer recovers**

The liver has a restorative capacity, right? That's correct. The liver has the unique ability to repair organ damage by creating new, healthy liver tissue. However, when the damage continues to accumulate, the liver's ability to create enough healthy tissue and repair the damage becomes depleted. Not only can this disrupt the liver's function, but it also changes its shape and structure. The liver then changes from being smooth and elastic to being small, jagged in shape and stiff. The increased stiffness of the liver can affect the blood pressure in the portal vein, the blood vessel that carries all the blood from the abdominal cavity and intestines to the liver. It's also striking that this blood vessel is not completely watertight; increased pressure can force fluid out of the portal vein. This fluid then accumulates in the abdominal cavity. This is called ascites. In addition, other blood vessels in the abdominal cavity - for example around the oesophagus, navel and rectum - can become dilated due to the increased blood pressure in the portal vein and thus turn into varicose veins.

#### **Liver cell cancer**

As damage to the liver increases, so does the risk of developing a form of liver cell cancer. This is fortunately rare. Liver cell cancer resulting from steatotic liver disease is most common in people with cirrhosis but can also occur in people without cirrhosis in cases of steatotic liver disease. The risk of liver cell cancer is also increased if there is obesity and excessive alcohol consumption on top of steatosis of the liver.

Liver cell cancer is a form of liver cancer that arises from the liver cells and is not a metastasis (spread) from other organs, such as colon or breast cancer, to the liver. That is a different form of liver cancer.

## 4. How does steatosis in the liver affect general health?

Steatotic liver disease not only causes problems in the liver but can also have consequences outside the liver. Steatotic liver disease not only causes problems in the liver but can also have consequences outside the liver because the diseased liver no longer performs several functions properly and as a result it allows all kinds of substances to circulate in the body through the blood.

This can lead to:

- the presence of inflammatory substances in the blood. This contributes to the development of atherosclerosis (arteriosclerosis) and other cardiovascular diseases such as heart failure;
- a higher risk of certain types of cancer, including not just liver cancer, but also colon cancer;
- deterioration of kidney function. It is not yet known exactly how this connection works.

### **Impact on health and quality of life**

Physical fatigue and reduced stamina due to fatty liver can have a major effect on daily life in particular. In addition, the perception that you are 'not healthy', the risk of complications and the need to adjust your lifestyle can also have a major impact on mental well-being. It is important to pay attention to this too and seek help if necessary. As scarring of the liver increases, symptoms may worsen. It is important to always report increases in symptoms to your usual doctor.

### **Stigma and prejudice**

Stigma is a strong negative label that people apply to others. It affects the way we see each other and ourselves. A stigma is always motivated by prejudice.

All liver diseases, but also type 2 diabetes mellitus and cardiovascular disease, for example, have a stigma attached to them. The same applies to steatotic liver disease. 'It's your own fault' is a common comment. Even if steatotic liver disease is due to choices (from the past), no one has the right to judge in this way. These 'wrong' choices often have an underlying reason. That reason is not always visible nor obvious, but the judgement has already been made.

Fear of this stigma - which unfortunately can also occur among caregivers - makes it even more difficult to acknowledge the diagnosis and to seek and ask for help. This was a major reason for the international name change from fatty liver disease to steatotic liver disease.



## **5. Who is at increased risk of steatotic liver disease?**

### **All ages**

Steatotic liver disease occurs in people of any age, even children. It is usually linked to excessive intake of calories or unhealthy food (large amounts of sugar), too little exercise and obesity, regardless of age.

### **Obesity and type 2 diabetes mellitus**

People who are overweight, have diabetes mellitus type 2 or have elevated blood fats (triglycerides) and high blood pressure have an increased risk of steatotic liver disease. This risk increases as people get older. Furthermore, as people become more overweight, the risk of steatotic liver disease as well as severe forms of it increases. However, it can also occur in people who are not overweight. Here an inactive lifestyle and unhealthy diet often also play a role.

### **How to detect and monitor steatotic liver disease?**

Healthcare providers, including general practitioners and medical specialists, are becoming increasingly aware of this disease. More and more often doctors will check liver values in people with obesity, type 2 diabetes mellitus and/or cardiovascular disease.

The blood test is usually repeated several times over a period of at least six months. Sometimes an abdominal ultrasound is also done. An abdominal ultrasound may also be done for some other reason and the fatty liver is then found by chance. If elevated liver values persist, this may be a reason for further investigation and a referral to an internist or gastroenterologist follows.

Follow-up investigations in the hospital usually involve a FibroScan. This is a name commonly used for elastography. This is done with a special ultrasound machine that uses sound waves to measure the stiffness of the liver. Based on this stiffness, a doctor can estimate whether, and to what extent, there is fibrosis or cirrhosis (presence of scar tissue) of the liver.

When there is uncertainty about the diagnosis or the stage of the disease, a doctor may consider taking a liver biopsy. This can provide more information about the status of the liver, for example, whether there is inflammation of the liver and whether scarring (fibrosis) has already occurred. It is important to carefully consider the pros and cons of a liver biopsy. This is an examination that comes with certain risks. A liver biopsy is always done in the hospital.

## **6. What are the symptoms?**

Many people with steatotic liver disease have no symptoms or only vague symptoms that they do not directly attribute to the liver. Some people experience fatigue, general lethargy, mild pain in the right upper abdomen or itching.

The symptoms mentioned are not specific to steatotic liver disease and are usually caused or partly caused by other factors. It is therefore important to rule out other causes. Complaints may get worse as the severity of steatotic liver disease increases.

Symptoms often only appear when scarring increases and/or there is inflammation in the liver. Associated symptoms include unexplained weight loss, jaundice (a yellowing of the skin and the white part of the eyes), itchy skin and swelling of the legs or abdomen.

Because steatotic liver disease causes no or few symptoms at first, a doctor may recommend blood tests even if you have no symptoms in the case that you are at increased risk of steatosis (fatty degeneration) of the liver. For example, if you are (severely) overweight, have type 2 diabetes mellitus and/or have cardiovascular disease. But it can also be the case that steatotic liver disease is present even though the results of blood tests and additional investigations are not abnormal.

## 7. What happens after diagnosis?

If you are diagnosed with steatotic liver disease, you will be told that lifestyle changes are necessary. These include dietary adjustments and making use of opportunities to exercise more.

Lifestyle modification is the basis for treatment. There is currently a medicine registered to treat steatotic liver disease. At this stage, it is approved by the FDA (Food and Drugs Administration – USA) and pending at the EMA (European Medicine Agency, May 2024).

Some medicines to treat type 2 diabetes mellitus or obesity may also affect the development of steatotic liver disease. In cases of severe (morbid) obesity (BMI  $\geq 40$  kg/m<sup>2</sup> or 35 kg/m<sup>2</sup> together with medical complaints), you can consider having bariatric surgery. Bariatric surgery is a surgical procedure that helps to reduce weight. Bariatric surgery is not reimbursed in all countries. Check this with your healthcare professional or insurance company.

Because no specific medicines to treat steatotic liver disease are available, weight loss is usually very important. This can be achieved through changes in your diet. The impact is even greater when combined with increased exercise. Dietary changes do not always produce the desired weight loss. However, scientific research shows that a healthier lifestyle through dietary modification and more exercise can have a positive effect on steatosis (fatty degeneration) of the liver, even in the absence of weight loss.

A healthier lifestyle reduces the amount of fat and inflammation in the liver. Even if scarring (fibrosis) has already formed in the liver, improvement can still occur. If the liver scarring is very severe, it is certainly also possible to achieve an improvement, but much more difficult. It is therefore important to detect the disease as early as possible and start lifestyle modification as soon as possible.

Such a difficult change takes time. Maintaining a healthy lifestyle is also very important. This is because the liver can then largely repair itself and damage to the liver is reduced. It also reduces the risk of cardiovascular disease, type 2 diabetes mellitus and liver cancer.

## 8. What else is examined?

As part of diagnosing steatotic liver disease, a doctor will check for other liver diseases. These include viral infections such as hepatitis B and C, as well as accumulation of iron in the liver (hemochromatosis) and autoimmune diseases. All risk factors for cardiovascular disease are also checked and treated, if necessary, of course.

## 9. Lifestyle change

Lifestyle change usually means switching over to healthy eating habits and more exercise. This is not an easy process for many people. It demands a lot from a person. You need to look into why an unhealthy lifestyle has crept in over time, what motivates someone to change it and what opportunities does someone see to adjust their habits?

### **You can ask for help with that**

In some countries, there are programs run in cooperation with your General Practitioner practice or community centres, for example. In addition, many lifestyle programs exist in the form of courses, apps and books. It is especially important to look for something that suits you.

An example of such a lifestyle intervention is CLI (Combined Lifestyle Intervention). This is made up of a combination of different lifestyle programs. Different countries may have different names for such programs; in some countries, such programs are available free-of-charge or may be covered by health care insurance. This depends on where you live, so it's worth checking. Your doctor, local town council or health insurance company may also be able to provide you with more information.

### **Change is not easy**

Every conscious change requires an effort from the individual themselves. The world around us offers many temptations as well as a lot of convenience. This does not always match with a healthy lifestyle. Being able to say no and keeping up motivation demand a lot from an individual.

The new lifestyle that has to be learned must also suit an individual. What is the family situation, does someone live in a single-person household, or perhaps there are physical limitations or other issues that require extra attention? These are all factors that come into play. They do not make adjusting your lifestyle impossible, but it does help to see how you can fit a new lifestyle into personal circumstances such as these.

## **You are not alone**

Staying motivated to keep up with changes in lifestyle over the long term is the most difficult thing. Professional counselling can then play a useful role. But people often have more support from a buddy - someone who knows what you are going through. Sharing difficult moments and helping each other through them works. Sharing fun moments and tips as well as celebrating good results together can also have a stimulating effect and make it easier to persevere.

Is there no-one nearby who can help? Perhaps social media can be a solution. For example, take a look on Facebook to see if there is a local group, or even start one yourself. Patient organizations can sometimes help. But not every country has a patient organization, or the organization that there are do not specialize in steatotic liver disease. It's always worth asking. You can try searching for one on the internet using Google – start by entering 'liver patient organizations' and the name of your country.

## **A healthy diet and losing weight**

Often someone is told 'you need to lose weight'. For overweight people, losing weight is certainly a way for many individuals to become healthier. This is no different for people who are overweight and also have steatotic liver disease. However, losing weight should not be the main goal. It's more about maintaining a healthy diet. For people who are overweight, losing weight is then the result of healthier eating. Even a small loss in weight has a positive effect on the liver. In particular, blood levels (liver enzymes) improve, fat levels in the liver decrease, as do any liver inflammation and scar tissue (fibrosis).

## **What is a healthy diet?**

There are many choices. Every healthy diet can lead to results, having an effect on general health and on the liver in particular. Exactly which healthy diet suits you and which you can keep up for a longer period of time varies from person to person.

Remember: the more colors there are on the plate, the more vitamins/minerals you get. In addition, whole grain products and legumes are recommended, as well as healthy fats. Healthy fats are found in (olive) oil, fish and nuts. Be careful with nuts: they contain healthy substances but are also high in calories. Limit nuts to an amount that fits in the palm of your hand per day. In general, this involves limiting:

- caloric intake,
- consuming highly processed foods (convenience foods, fast food),
- eating processed meat (processed meats),
- intake of sugar\* (e.g. many soft drinks),
- intake of saturated fat (hard fats).

## Caution

Products like palm oil and coconut oil are high in saturated fat and are very bad for your health, including for the liver.

## **Recommended diets/nutritional patterns**

Scientific research shows that a calorie-restricted diet has the most effect in the long run (over a period of three years and more). In addition, high-fiber foods are always recommended.

### The calorie-restricted diet

This involves setting the number of daily recommended calories and looking for food products that are low in calories but have sufficient protein and other necessary nutrients. Portion size is also very important here.

### The Mediterranean diet

This diet is high in vegetables and unsaturated fats, low in carbohydrates and low in (red) meat. Fish is an important part of the Mediterranean diet.

### The low-carb diet

This diet avoids carbohydrates. These are mainly found in potatoes, rice, pasta and bread. The body does need carbohydrates, but preferably so-called "slow carbs" and not "fast carbs" (sugars). Slow carbs are found in whole meat products and in certain vegetables. Fast carbs are mainly found in fast food, biscuits and sweets. Note that replacement products, such as low-carb bread, are often high in fats. This diet has quick results, but is difficult to maintain in the long run.

### Speed or crash/fast diets

This includes things such as shakes instead of meals, five-day single-food diet regimens (also known as a mono diet, in which you eat only one food type or one food item) and the like. These can have an effect on your weight within a few days, but whether they lead to a healthier liver is not known. We think that they do not, and we do not recommend these types of diets.

### The fasting diet (intermittent fasting)

In intermittent fasting, you don't eat, or you eat less than you normally do during a certain period of the day. As a result, you lose weight. And losing weight has many positive effects on the body. Always discuss this with a doctor first, though. It may not be suitable for you, especially if you already have cirrhosis and other chronic diseases.



### **Exercise more or do sport?**

Both are good. Exercise or moving more plays an important role in reducing liver fat. More exercise can also help reduce the risk of other diseases such as type 2 diabetes mellitus, cardiovascular disease and obesity (severe overweight). The World Health Organization recommends exercising for at least two and a half hours each week, spread over three to five sessions per week. A combination of fitness training (endurance) and strength training (activities that make your muscles stronger) is ideal.

This does not mean that you have to visit a gym. Of course, it is fine to do so, but you can also find ways to do this closer to home: go for extra walks, do some gardening, and walk up and down the stairs an extra time. Anything extra is a bonus. Any sport you do doesn't have to be at the Olympic level! Many sports can also be played at a lower level, and you don't have to compete with top athletes. Fun is an important factor in keeping it up. For example, find a sport that you used to enjoy previously!

All forms of exercise are also always good for the mind! You may not feel this immediately, but exercise is relaxing and people often start to enjoy it more and more. All of which contribute to feeling positive.

### **Here are some ideas to get more exercise:**

Walking is cheap, effective and can be done anywhere. All you need is a pair of sturdy shoes and maybe a raincoat. Go a little further each time, visit a different park or maybe a forest or other types of outdoor location; that way walking stays fun. Walking alone is a reason that many give it up quickly.

Therefore, it's a good idea to find a walking buddy. Ask someone with a dog to walk with you! The dog needs to get out anyway, even if the weather is not so nice or it's raining.

Cycling is not only good for the body, but also for the mind. Cycle a little further each time. There is bound to be a lot to discover in the area, even on an electric bike!

Go for a swim with a friend, your children or your grandchildren. Exercising in water is very good for the body and is also a great social activity to do together.

Football/soccer: did you used to play football/soccer? Many secretly miss it. See if a local football/soccer club has a team for people who just want to play a fun game of football and not in a "serious" league. There are also clubs where you are not allowed to run too fast, but where there you can play a game of 'walking' football/soccer.

Tennis is fun to just play for many people. Without even noticing it, you are actually doing some rather intense movement. As for other sports, playing tennis doesn't need to be about winning – it's more about being active together.

**More ideas:**

- if you travel by bus, tram or underground rail: get off a stop earlier and walk a little bit further than you usually do;
- go shopping by bike or on foot instead of by car;
- do you usually drive in your car to take part in activity? From now on, go by bike or on foot.

**Summary**

Changing eating habits and being more active are key components in any lifestyle change. This often leads to weight reduction and also lowers the risk of other chronic diseases. Simply put, your overall health improves because the liver gets healthier.

Lifestyle change can only be achieved on the basis of personal preferences and tailored to the daily routine and fitness at the time when you start exercising more . This is the only way to increase your chances of success in the long run. Setting (achievable) goals can help you get started and stay with it.

Find a form of exercise you enjoy and find someone who can support you in making and maintaining these changes This could be a professional trainer but can also just be a buddy.

## 10. Treatment

Treatment of steatotic liver disease starts with a healthy(er) lifestyle. For many people, a healthy lifestyle often leads to weight reduction and thus has a positive impact on steatotic liver disease, as well as on the risk of other conditions such as type 2 diabetes mellitus and cardiovascular disease. But even without weight reduction, there is a positive effect on liver health.

### Medicines

There is a lot of scientific research being conducted internationally on medicines for the treatment of steatotic liver disease. In March 2024 the first drug was approved by the FDA for use by people in the USA. It can take quite some time before it is approved and available in other countries.

However, some medicines can help lose weight. These drugs have a supportive function in losing weight and are not a cure-all for drastic weight loss. In most countries, you need a doctor's prescription for this. Whether a person is eligible for these drugs is subject to strict rules. Steatotic liver disease is mainly a condition related to a poor lifestyle and can be improved with a healthy(er) lifestyle in the first place!

Caution: some medicines are offered for sale on the internet. Be careful. You do not know what the effect is on your body and certainly not whether this is indeed real medicine.

### Stomach reduction surgery (bariatric surgery)

There are two forms that are applied. The choice depends on the patient's situation. The first option involves only a reduction in the size of the stomach (sleeve). The second option involves both stomach reduction and a re-routing to the small intestine (gastric bypass).

The procedures can be very effective for weight loss and maintenance of weight loss. There are also studies showing that these surgeries can be effective in severe forms of steatotic liver disease. Nevertheless, permanent lifestyle modification is unavoidable even with these surgeries.

Surgery always involves risk. The operations take place under general anaesthetic, there is often post-operative pain, and you will usually have to have checkups in the hospital on a lifelong basis. The procedure is not a cure-all and does not guarantee weight loss. The advantages are that only limited food intake is possible and weight loss, especially in the first year, can be rapid. Another advantage is that bariatric surgery has almost an immediate beneficial effect on blood sugar levels, including type 2 diabetes mellitus and steatotic liver disease.

## 11. Check-ups for steatotic liver disease

How often checks are needed depends on your individual situation, the severity of the condition and whether you are under the care of your general practitioner or a medical specialist. Your GP will first determine whether referral to a medical specialist, an internist (sometimes called an internal medicine doctor) or a gastroenterologist is necessary.

This is basically done on the basis of the results of an abdominal ultrasound and blood tests. Your GP will usually recommend adopting a healthy lifestyle initially. If that does not lead to an adequate result, a referral usually follows.

Your doctor will perform a physical examination, order additional blood tests and, if necessary, have the liver stiffness measured using a FibroScan® device (elastography). The FibroScan® can reveal whether, and to what extent, there is fibrosis or cirrhosis. Not every hospital has a FibroScan®.

Patients are often referred to another hospital for the FibroScan®. Checks may be carried out a little more frequently after diagnosis to see if lifestyle changes are having sufficient effect on the condition of the liver.

## 12. How do I know if the treatment helps?

The treatment consists mainly of lifestyle changes. The effect of this can be monitored in two ways.

### **Monitoring by the general practitioner or medical specialist (internist/ internal medicine doctor, gastroenterologist)**

These healthcare professionals check the health of your liver on the basis of a blood test and an ultrasound. If there is fibrosis or cirrhosis, the medical specialist may also check the status by measuring liver stiffness. The blood test looks at whether the liver enzymes values are falling. Additional tests can show whether the steatosis has reduced and liver stiffness has decreased, which is in turn related to the degree of fibrosis or cirrhosis. Any check is only snapshot of the situation at that moment. It is therefore important to repeat them over a longer period of time.

### **Self-monitoring**

The effect of lifestyle adjustments is easy to self-monitor, to a certain extent. It's obviously not possible to do blood tests yourself at home, but there are many other ways to monitor the effect of lifestyle changes.

The easiest way to do this is to measure your waist circumference and check your weight. If you do this every week or month, you will be able to monitor your progress well. Taking these measurements every day doesn't make sense (they tend to fluctuate somewhat) and can negatively impact your motivation. It can also certainly be the case that you don't lose any weight and the condition of your liver still improves. This often occurs because while fat tissue decreases, muscle mass increases. The decrease in abdominal girth is particularly important.

You can also calculate your Body Mass Index (BMI) yourself. Divide your weight (in kilograms) by your height (in meters squared). For example, for a weight of 75 kilograms and a height of 1.75 meters, the following applies:  $75 \text{ kilograms} / (1.75 \times 1.75 \text{ meters}) = 24.5$ . The BMI is then 24.5 kg/m<sup>2</sup>.

You can also find many apps on the internet to calculate your BMI that also take your gender into account.

.There are multiple ways to keep track of your fitness. For example, record each week how many stairs you climbed or how many steps you took in a day. Or if you were able to make your usual walking route longer without any problems. It's possible that you will experience tiredness or fatigue. If your fatigue from increasing activity persists for several weeks or gets worse, contact your usual doctor.

If you see an improvement and can maintain it, the effects on your liver and your life will be significant.

## **13. Take care of yourself!**

When steatotic liver disease is diagnosed, it is time for action, with the aim of reducing the risk factors for serious liver disease and other health problems such as type 2 diabetes mellitus and cardiovascular disease.

Deterioration of the condition of the liver due to steatosis is in itself a slow process. This also gives you the opportunity to influence it yourself by improving your lifestyle. It's been mentioned many times already: eat healthy and exercise more!

Getting up from your chair more often and take a short walk, take the stairs, use the bike instead of the car, and get off the bus one stop earlier. Opt for less sitting and more exercise moments a day, for example, start exercising more. Sport is always good for both body and mind. Exercising together with a buddy is both fun and a great distraction (from food!). In terms of sport, you can think about walking, swimming, cycling and/or strength training to make muscles stronger. Exercise at least three times a week.

### **Shame, sadness, anger and stigma**

People who are overweight know for themselves that this is not healthy. Facing the fact that it actually leads to a health problem is very confronting. Shame, sadness, anger and feeling stigmatized are understandable emotions. "It's all your own fault" can often be the reaction of others around you, and perhaps also yourself. It's very easy to say. It's true that people consume too much and unhealthy food themselves. But changing that habit is difficult and a long process.

### **To talk about it or not to talk about it**

This varies from person to person. Some people need support from those around them, while others don't want to think about it. If you tell people you have to lose weight, everyone often has well-meaning advice and gets involved. Above all, make your own plan in consultation with your doctor. A dietician experienced in counselling people with steatotic liver disease can help.

### **Changing is often not so hard, keeping up with the change is**

Starting to change lifestyle is not that difficult for many people. The motivation is there – a whole new world opens up. But, the long term... Therein lies the problem for most. That's when support can play an important role. For this reason, combined lifestyle programs have been set up. They are often offered by GP practices, community centres and health insurers – this depends on where you live. There are also apps that allow you to track what you eat and how much you exercise.

### **Don't give up**

There are days when it is difficult to stick to your healthy lifestyle.

Don't give up right away: tomorrow is another day! Every little bit helps to improve the condition of your liver and thus also lowers your risk of other diseases.



## **14. Where to find more information?**

The diagnosis and treatment of steatotic liver disease require good cooperation between general practitioners, specialists and other healthcare professionals, such as the practice nurse. Discuss which healthcare provider can best help you and who can support you in finding the right information.

This brochure is based on the English-language guidelines developed from a patient perspective “Nonalcoholic fatty liver disease: A patient guideline - JHEP Reports (2021)” ([www.jhep-reports.eu](http://www.jhep-reports.eu)) This guideline will be revised in 2024.

### **And more..**

The name change has been in effect internationally since June 2023. For the time being it's likely that both the old and new names (NAFLD and MASLD) will be used. The NLV uses the new names as much as possible. Names of organizations will not be changed (immediately, at least).

Some suggestions for more information and support are provided below.

Look for information on a patient association website, etc., in your own country. International information can be found on various websites, including <https://liverpatientsinternational.org/>.

### **This brochure in your own language?**

The owner of this brochure has given permission for this brochure to be translated into any language. The only condition is that a native-speaking healthcare professional has checked the text prior to publication and that the translation is shared with Liver Patients International and the Dutch Liver Patients Association (Nederlandse Leverpatienten Vereniging)

### **For questions, please send an email to:**

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## Editorial information

This brochure was published in Dutch with the approval of the European Association for the Study of the Liver (EASL), the Dutch Association for Hepatology (NVH) and the Belgian Association for the Study of the Liver (BASL). Following requests, we translated the Dutch version into English.

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You find this English brochure on the website of Liver Patients International. Feel free to download and share this brochure.

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