

## What does the liver do?

The liver is in the upper right hand side of the abdomen (above the stomach).

It stores fuel (glycogen), and makes cholesterol and proteins (including some that make the blood clot).

The liver also removes toxins from your body and produces bile to help digest fat.

## What is NAFLD?

Fatty liver disease refers to a range of conditions that come from changes in the way fat is stored in your liver. Usually this means a build up of fat inside liver cells.

Although alcohol can be a cause of fatty liver, NAFLD refers to when alcohol is not involved.

Also, although being overweight is a common risk, many people with NAFLD can have a normal weight.

## How common is NAFLD?

**Around 1-in-3 people have NAFLD, and it is also at least this common in HIV positive people.**

## How serious is NAFLD?

**Like most health problems, symptoms for fatty liver disease can range from mild to severe.**

The risks from mild disease are very low. Without testing most people don't know they have it.

**A healthy liver contains only small amounts of fat. Slight increases of fat in early stage NAFLD generally don't cause problems.**

In later stages, with more fat build up, NAFLD causes fibrous tissue. This can develop into severe scarring (cirrhosis). In some cases, this can lead to liver failure or liver cancer.

NAFLD can also be linked to other serious problems including poor sleep, diabetes, heart disease, stroke and kidney disease.

The earlier NAFLD is diagnosed and treated, the easier it is to stop or reverse these conditions and risks.

## What causes fatty liver?

**Although high alcohol use is a common cause of fatty liver disease, there are equally important non-alcoholic causes.**

NAFLD is mainly caused by changes in body processes linked to sugar and fat. Some people may be genetically at greater risk of developing NAFLD.

NAFLD is often linked to:

- Being overweight (BMI >30) especially with belly fat.
- Increased waist. This is above 40"/102 cm in men and above 35"/88 cm in women.
- High blood pressure.
- High levels of bad cholesterol (LDL and triglycerides) or low levels of good cholesterol (HDL).

- Insulin resistance and type 2 diabetes when cells don't respond normally to the hormone insulin so that sugars stay longer in the bloodstream.

**Fatty liver can also be caused by other conditions:**

- Untreated hepatitis B or C.
- A side effect from other medicines including some antidepressants, steroids and other hormones.
- Other rarer causes eg iron build up, coeliac disease, rapid weight loss.

Additionally, some HIV-related factors may be associated with higher risk of fatty liver:

- Lipodystrophy.
- Some early HIV meds (older NRTIs and PIs).
- Additionally, HIV may play a role in fatty liver disease, for example, by causing inflammation, immune activation and changes to lipid levels.

**NAFLD can affect people at any age, including children.**

It is more common though in adults older than 50 years and more common in men compared to women.

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*This leaflet is part of i-Base guide to HIV and your quality of life. The full guide including references is online: <http://i-base.info/guides/side>*

## How is NAFLD diagnosed?

**Unless it progresses, most people with mild NAFLD are not diagnosed.**

A blood test is often an important signal if liver enzymes (ALT and/or AST) are increased. Routine HIV monitoring includes these liver enzyme tests.

However, NAFLD can be present even when these tests are normal.

When NAFLD is suspected, imaging scans can be more accurate. These include ultrasound, CT and MRI scans. A Fibroscan can show how much fibrosis (scarring) is present. Biopsy is only recommended when there is a high risk or uncertain diagnosis. This is when a sample of liver tissue is removed and looked at under a microscope.

## Stages of NAFLD

The main stages of NAFLD are:

- Simple steatosis. This is mild fat accumulation without inflammation: 80-90% people with NAFLD.
- Non-alcoholic steatohepatitis (NASH) is a more advanced form of NAFLD: 10-20% of people with NAFLD. NASH involves the stage where extra fat in your liver has caused liver inflammation.
- Fibrosis: 25-50% of people with NASH.
- Cirrhosis: 2-5% per year of people with fibrosis.
- Hepatic cancer: 2-3% per year of people with cirrhosis.

## Treatment and management

**The main management for NAFLD usually involves lifestyle changes.**

- Diet changes and weight loss if your NAFLD is linked to being overweight. A 10% weight loss can significantly reduce the amount of fat in your liver.
- Being active. Exercise has additional benefits to just reducing weight.
- Monitoring response to weight loss.
- Treating dyslipidaemia - ie reducing triglycerides and bad cholesterol.
- Reducing alcohol.

Vitamin E and pioglitazone are sometimes used to treat late stage NAFLD. The evidence for their use is not strong and they may have serious side effects.

Bariatric surgery to reduce weight can be used to manage NAFLD.

Other approaches involve treating the complications that are linked to NAFLD, for example, to reduce high blood pressure or high triglycerides or to treat diabetes.

## Future research

Several ongoing studies are looking at other drugs to reduce inflammation or fibrosis. These include elafibranor, obeticholic acid, selonsertib, simtuzumab (a monoclonal antibody) and cenicriviroc.

Studies in HIV positive people include using aramchol, maraviroc, metformin, raltegravir and tesamorelin.

# HIV and fatty liver disease

- Fatty liver disease is linked to a range of other liver problems.
- It is very common in the general population and also affects one-third of HIV positive people.
- HIV is associated with more advanced fatty liver disease.

Fatty liver disease involves a build up of fat in the liver. In most cases this can be mild and without symptoms. Greater fat changes increase the risk of serious complications.

Fatty liver disease can sometimes be caused by high alcohol use.

This leaflet is mainly about non-alcoholic fatty liver disease (NAFLD).