Non-Alcoholic Fatty Liver Disease: A Patient’s Guide

National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health
Non-alcoholic Fatty Liver Disease: 
A Patient’s Guide

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To Our Patients

Obesity is one of the leading causes of death world-wide and with this disease comes a series of medical conditions. Non-Alcoholic Fatty Liver Disease (NAFLD) is one of the diseases associated with obesity. Currently the goal of treatment is to reduce the risk factors associated with NAFLD. Awareness of this condition and lifestyle changes is key to changing the progression of the disease.

Let the handbook guide you to ask your healthcare provider for more information about your particular situation. Sometimes the information provided during a clinic visit is much more than you can absorb right away. You may forget to ask what is most important to you or you may think of a question later.

We hope you will read this handbook and share it with family, friends and your other health care providers.
Your Liver

What is the Liver?

Your liver is one of the largest organs in your body. The liver is located in the upper right-hand part of your abdomen and is protected by the ribs. A healthy liver is reddish-brown in color.

What Does the Liver do?

Your liver works behind the scenes performing over 500 functions. The liver acts like a factory and a filter in the following ways:

- Processes and stores vitamins, sugars, fats and other nutrients from the food you eat
- Makes substances that your body needs to stay healthy
  - Albumin: protein made by liver
  - Bile: digestive juice which helps the body absorb fat from the gut to the bloodstream
- Breaks down harmful products, such as alcohol and toxins
- Removes some wastes from your blood
- Changes extra glucose (energy) into glycogen (energy storage). Glycogen can be changed back to glucose when your body needs extra energy
- Helps with blood clotting
A Sick Liver?

When the liver does not work well, you can get very sick, or even die if you liver stops working.

When the liver does get injured, one of the earliest ways we can tell is by blood tests that show high levels of liver enzymes in the blood, and sometimes by yellowing of the skin, known as jaundice.
Lab Tests for your Liver

When trying to determine the health of your liver, your health care provider will order lab tests that can give information about whether or not your liver has been damaged.

Name of the Tests

The most common tests that are used to check how well your liver is working are called the Liver Function Tests (LFTs). The most common tests are:

- Alanine Aminotransferase (ALT/SGPT)
- Aspartate Aminotransferase (AST/AGOT)
- Total Bilirubin (T.Bili)
- Albumin
- Prothrombin Time/ International Normalized Ratio (PT/INR)

The ALT/SGPT Test

This is an enzyme made in liver cells. If the cells in the liver are damaged, ALT enzymes are released into the bloodstream and result in higher ALT levels. It is important to remember a high ALT may mean a high degree of cell damage. ALT levels can vary and do NOT always reflect the degree of liver cell damage nor do they assess actual function of the liver.
The AST/SGOT Test

This enzyme, much like ALT is made in liver cells. High levels of AST can indicate liver injury. However, factors not related to liver disease can cause higher AST levels, such as other illnesses or certain medications.

The T. Bili. Test

Bilirubin is the yellow breakdown product of heme which is found in hemoglobin. Bilirubin is removed from the blood by the liver, but when the liver is not working well, bilirubin levels can rise. High levels of bilirubin suggest the liver is not working well. Signs of high levels of bilirubin include yellowing of the skin and whites of the eyes (called jaundice).

The Albumin Test

Albumin is a protein made only in the liver. If the amount of albumin is low, it suggests that the liver may not be working well.

The PT/INR Test

This test measures how well your blood clots. If the prothrombin time is high, it may mean that the liver cannot produce enough of the clotting proteins.
Other Lab Tests

Your provider may order other tests. It is important to keep in mind that just because you may have abnormal levels of an enzyme on a test, it does not mean you liver is failing. Also, liver enzymes may be normal. Your provider is there to interpret these tests and work with you.

Other Things That Can Affect the Liver

- Virus (Hepatitis A, B, C, D)
- Alcohol
- Liver Cancer
- Obesity
- Prescription Drugs
- Street Drugs

- Marijuana
- Tobacco
- Over-the-counter drugs
Non-alcoholic Fatty Liver Disease (NAFLD)

What is NAFLD?
Liver diseases ranging from fatty liver (steatosis) to cirrhosis from NASH (steatohepatitis).

What is Fatty Liver?
The buildup of fat in the liver not caused by an over use of alcohol. Fatty liver (steatosis) occurs when the liver has more than 5-10% of its weight in fat. Fatty liver does not damage the liver, however nonalcoholic steatohepatitis (NASH) which is a severe form of NAFLD can cause inflammation and damage to the liver.
Who Gets NAFLD?

- 20-30% of Americans have a form of NAFLD
  - 2-5% of Americans have NASH
  - About 25% of Americans have fatty liver
- Found in 80% of obese individuals
- Male and females
- Adults and children
- All ethnic groups

What Happens When you Have NAFLD?

**Fatty Liver:** Fat enters the liver cell. Next the cell swells and changes which causes liver injury.

**NASH:** A bad case of liver injury which can progress to cirrhosis or severe scarring of the liver. Not everyone with NASH will develop cirrhosis.

**Cirrhosis:** A scarred liver from years of damage.

How Do I Know if I Have NAFLD?

Routine blood tests your healthcare provider ordered (discussed earlier) may have shown to be high. Additional testing may be required to eliminate other possible causes of the high blood tests.
The healthcare provider may order an ultrasound, a computed tomography (CT) scan or magnetic resonance imaging (MRI) scan which can show a presence of fat in the liver or fatty liver.

The diagnosis of fatty liver versus NASH is done by liver biopsy.

**What is a Liver Biopsy?**

A liver biopsy is a simple procedure where a medical doctor places a needle through your skin into the liver to get some cells. The cells are then sent to the lab to be looked at under a microscope.
What are the Symptoms of NAFLD?

Non-alcoholic Fatty Liver Disease can be considered a silent disease in which the person may not notice any symptoms. Symptoms may be divided in the following categories:

- **Early Symptoms:**
  - None
  - Tired / Fatigue
  - Pain in right upper abdomen

- **Late Symptoms:**
  - Weight loss
  - Fluid in the abdomen (Ascites)
  - Yellowing of skin (Jaundice)
  - Itchiness

- **Other Symptoms:**
  - Enlarged liver
  - Obesity

What are My Risk Factors for NAFLD?

The cause of NAFLD is not completely known, however NAFLD can take years to develop. Occurs most often in people with the following:

- **Central obesity** (around your abdomen)
- **Non insulin dependent diabetes**
- **Insulin resistance**
  - Cells in the body do not respond to insulin
- **Dyslipidemia** (fats found in blood which are needed for health, but sometimes become abnormal)
  - High triglycerides (a fatty substance in the blood)
  - High LDL (bad cholesterol)
  - Low HDL (good cholesterol)
- **Less Common Risk Factors**
  - Rapid and excessive weight loss
  - Poor diet and exercise habits
  - Middle age (but can be found in children)
  - Family or personal history
  - Polycystic Ovary Syndrome (PCOS) is a health problem that can affect a woman's menstrual cycle, ability to have children, hormones, heart, blood vessels, and appearance.

If more than one of the above risk factors are present than you may have metabolic syndrome. Metabolic syndrome is associated with a higher risk of developing NAFLD.
Treatment/Prevention

How is NAFLD/NASH Treated?

- **Lifestyle Changes:** Key factor in treatment
  - Physical Activity (Aerobic and Resistance)
  - Diet Changes
  - Weight Loss (*MOVE!* Program)

- **Physical Activity (Aerobic and Resistance)**
  - Always check with your provider before beginning an exercise routine
  - Increasing physical activity through aerobic and resistance type activities reduce risk factors
  - If you aren’t used to exercising start small and increase as tolerated
  - Goal: 30 minutes of exercise 3 to 5 days per week
  - Find ways to add more activity in your day
    - Take the stairs instead of the elevator
    - Park further away at the grocery store
  - Keep an exercise journal to track your progress
Diet Changes

- Good nutrition is part of an effective treatment for NAFLD

What Diet Changes Can I Make?

- Eat breakfast daily
  - Breakfast gives you energy to start the day
  - A healthy breakfast is important for everyone
- Watch portion sizes to manage your calorie intake
  - Using smaller plates, bowls and glasses can help you keep your portions under control
- Eat a diet rich in fruits and vegetables
  - Make fruits and vegetables cover at least half of your plate
  - Add fruits and vegetables to snacks
  - Aim for 2 1/2 cups of vegetables daily and 2 cups of fruit daily
• Reduce the amount of saturated fat in your diet
  • Select lean cuts of meat and low-fat dairy products
  • Switch to oils when preparing food
  • Select healthy unsaturated fats, such as those found in fish, olive oil and nuts

• Make at least half your grain servings whole grains
  • Choose whole grain breads and cereals, brown rice and whole wheat pasta

Keep a food journal to track your progress

Weight Loss (MOVE! Program)

• Weight loss is important in the treatment of NAFLD. However, too rapid of a loss can lead to worsening liver function.

• Recommend to have a 5% to 10% loss of body weight over 6 to 12 months of gradual weight loss not exceeding 2 pounds/week.

• Rapid weight loss may place you at risk for progression of liver disease and liver scarring.
**MOVE! Weight Management Program**

- *MOVE!* is a free national VA program designed by the VA National Center for Health Promotion and Disease Prevention (NCP), a part of the Office of Patient Care Services, to help veterans lose weight, keep it off and improve health. Designed with you in mind *MOVE!* works with you to make practical changes for lasting results.

**What are the *MOVE!* Program Features?**

- Your health and wellness are most important
- Healthy eating, exercise and good habits get results
- We work with you as partners
- We offer choices to best meet your needs
- Group Support
- *TeleMOVE!* from your local clinic
- *TeleMOVE!* from your home
- Regular follow-up and support from a professional VA provider
- Free Pedometer
The MOVE! Program Has Options to Meet Your Needs!

- Individual appointments
- Weekly group Classes
- Monthly group classes
- Home program

Individual Appointments

- Meet with a Registered Dietitian
- Appointments in person, by telephone or via TeleMOVE! at your local clinic
- Goal setting with help from professionals
- Regular follow-up and support to track progress and help meet Veteran's weight management goals

Support Groups

- Weekly classes with different providers and monthly group classes are available
- These classes are taught in-person and some are available via TeleMOVE! at our community based outpatient clinics
Home *TeleMOVE!*

- To help keep you motivated between appointments, you can get support from our home *TeleMOVE!* home program
- This is a 90-day commitment
- A landline telephone, computer router or a cell phone can be used
- You will be provided with the equipment you need to track your progress
- A VA provider will work with you to help meet your weight management goals.

Also, check out the *MOVE!* website: [www.move.va.gov](http://www.move.va.gov)

**Take Care of Your Liver**

- Do not drink alcohol if you have NASH, abnormal liver enzymes or have Hepatitis B or C
- Before taking any medications including over the counter and herbal medications discuss with your health care provider
- Physical activity is important in treating fatty liver
- Eat a balanced diet low in saturated fats and high in fiber
- Keep your cholesterol, blood pressure and blood sugar under control
- If you have a question ASK!
Herbs to Avoid!

If you are curious about alternative and complementary therapies, then you should ask your health care provider whether it would be safe for you to try them.

The herbs listed below are known to be dangerous, which means that they are bad for your liver, especially since you have liver disease.

- Artemisia
- Atractylis gummifera
- Bush tea
- Callilepis laureola
- Chaparral leaf (creosote bush, greasewood)
- Comfrey (Symphytum officinale)
- Crotalaria
- Germander
- Gordolobo yerba tea
- Green tea extract
- Heliotropium
- Jin-Bu-Huang
- Kava
- Kombucha mushroom (tea)
- Ma-Huang (Ephedra sinica)
- Margosa oil
- Mistletoe
- Pennyroyal (squaw mint oil)
- Tansy Ragwort (variation of Ragwort)
- Sassafras
- Senecio aureus
- Senna
- Skullcap
- Symphytum
- Valerian root
Making Smart Goals

A healthy living goal is something YOU want to do to improve your health or well-being. Chances are you have set and met many goals in life already.

Setting clearly defined goals can be helpful in making a difficult lifestyle change, such as quitting drinking or losing weight. Try the steps below:

**My goal for next week is:** (Be specific: what, where, how much, and how often) Example: I will walk at least 3 times this week for 15 minutes after I get home from work.)

**Things that might get in my way:** (Examples: weather, pain, time)

**What I can do to overcome these things:** (Examples: exercise indoors, walk with a friend)

**I believe that I can reach my goal:** (Circle the number that matches how confident you feel).

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**Keep Track** of your progress and let us know how you are doing:

- If you met your goal, terrific!
- If you had trouble, re-work your goal so you can succeed
Definitions

**Aerobic Exercise:** Type of exercise that requires oxygen and gets your heart pumping.

**Ascites:** Fluid in the belly.

**Cholesterol:** A fat substance that is found in the bodies of people and animals. Too much cholesterol in your body may cause heart disease.

**Cirrhosis:** Scarring of the whole liver which makes the liver shrunken and hard. Cirrhosis is the result of something that damages the liver for a long time.

**CT Scan (CAT Scan):** A type of X-ray that takes pictures of parts of your body from many angles. Often a dye is used to make the target body part easier to see.

**Enzymes:** A chemical substance in animals and plants that helps to cause natural processes (such as digestion). Helps chemical changes to take place in the plant or animals.

**Glucose:** The main type of sugar in the blood and is the major source of energy for the body’s cells. Glucose comes from the foods we eat or the body can make.

**Glycogen:** Energy stored in the liver and muscle. The body uses this energy when needed.

**HDL (Good Cholesterol):** A type of cholesterol that carries bad cholesterol (LDL) away from your arteries and back to your liver, helping to protect you against heart disease.
**Hormones:** A natural substance that is produced in the body and that influences the way the body grows or develops. A chemical substance produced by your body that influences its growth, development, and condition.

**Inflammation:** A condition in which a part of your body becomes red, swollen, painful and feels hot.

**Insulin:** A hormone released by the pancreas whose job is to help use or store glucose as glycogen.

**Jaundice:** When your eyes and skin turn yellow. It is a sign that the liver is not working well. You can also become jaundiced if your bile ducts are blocked.

**LDL (Bad Cholesterol):** A type of cholesterol that can turn into a hard substance which can stop your blood flowing properly and can eventually cause heart disease.

**Metabolic Syndrome:** A medical condition characterized by obesity, insulin resistance, hypertension and dyslipidemia.

**MRI:** A test that takes pictures of a body part using a magnet, radio waves and a computer.

**Pancreas:** A large gland of the body that is near the stomach and that produces insulin and other substances that help the body digest food.

**PCOS:** Polycystic Ovary Syndrome (PCOS) is a health problem that can affect a woman's menstrual cycle, ability to have children, hormones, heart, blood vessels, and appearance.

**Resistance Exercise:** Type of exercise which includes weight lifting.
**Saturated Fats:** A type of fat commonly found in animal products that is thought to be less healthy than other kinds of fat from vegetable oils or fish.

**Steatosis:** Abnormal buildup of fat in the liver.

**Steatohepatitis:** A form of inflammation in the liver in which there is a buildup of fat in the liver.

**Symptoms:** A change in the body or mind which could show that a disease is present.

**Treatment:** Something that is done to help someone who is injured or ill.

**Triglycerides:** One of the main fatty substances in the blood that can clog arteries.

**Ultrasound (U/S):** A type of test that uses sound waves to take pictures of parts of the body.

**Unsaturated Fats:** A type of fat found in food such as nuts, seeds, avocados, and fish.
Website Resources

- **MOVE!** website: [www.move.va.gov](http://www.move.va.gov)
- Healthy eating tips: [www.choosemyplate.gov](http://www.choosemyplate.gov)
- American Liver Foundation: [www.liverfoundation.org](http://www.liverfoundation.org)
- Diabetes website: [www.diabetes.org](http://www.diabetes.org)
- VHA National Center for Health Promotion and Disease Prevention: [www.prevention.va.gov](http://www.prevention.va.gov)
- Healthfinder: [www.healthfinder.gov](http://www.healthfinder.gov)
- 1-800-GO-LIVER (1-800-465-4837): To talk with someone in person, you can call the American Liver Foundation.
- VA’s Hepatitis C Program [www.hepatitis.va.gov](http://www.hepatitis.va.gov) (Other booklets found on this website):
  - *Cirrhosis: A Patient Guide*
  - *National Liver Transplant Guide*
  - *Liver Tumors: A Patient Guide*