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## Caring for Your Liver [1]

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## Liver Basics

Your liver is one of the most important organs in your body. It is also the largest ? about the size of a football. It is protected from injury behind the lower right section of your ribs.

The liver acts as your body's chemical processing plant. Its functions include:

- Changing food into chemicals and [nutrients](#) [2] that your body needs to stay healthy
- Storing nutrients from the foods you eat
- Breaking down drugs and alcohol
- Removing waste from your blood
- Producing enzymes and bile that help you digest food
- Making proteins needed by the [immune system](#) [3] to help your body resist infection

For people living with HIV (HIV+), the liver is particularly important because it processes many of the drugs used to treat HIV. Unfortunately, sometimes HIV drugs can cause liver damage, which can prevent the liver from working properly.

## Symptoms of Liver Damage

Symptoms of liver damage or liver disease include:

- Pain
- Enlarged liver
- Fatigue (extreme tiredness)
- Nausea
- Dark urine
- Clay-colored stool
- Jaundice (yellowing of the skin, eyes, and mucous membranes)

If you have these symptoms it is important that you contact your health care provider. However, there are frequently no obvious signs of liver damage until it reaches a late stage. That is why it is important to have blood tests that can detect liver problems before symptoms arise.

## Tests for Liver Damage

Simple blood tests called liver function tests (LFTs) or liver enzyme tests are one of the best ways to find out if you have liver damage. LFTs should be part of routine HIV blood work. High enzyme levels can indicate liver damage caused by medications, alcohol, hepatitis (inflammation of the liver), street drugs, or other medical conditions.

High levels of bilirubin may indicate liver problems. Bilirubin is a blood pigment and by-product of the breakdown of red blood cells. Taking the HIV drug Reyataz (atazanavir) can increase bilirubin levels. However, in people living with HIV who are taking Reyataz, this elevation in bilirubin is a harmless [side effect](#) [4] of how the medication is processed by the body. If the whites of your eyes become yellow (a sign of jaundice), it is important to talk with your health care provider so that she or he can make sure there are no other causes of jaundice and can change your HIV drugs if necessary.

## The Liver and HIV

While it is possible for any HIV drug in any of the six [HIV drug classes](#) [5] to cause liver damage, some drugs are more likely to cause damage than others.

**Some drugs are more likely to cause damage than others.** Certain drugs in the nucleoside reverse transcriptase inhibitor class (NRTI) are more likely to have negative side effects that may lead to liver problems. One such side effect is mitochondrial toxicity. . Mitochondria are our cells' energy producers. They use oxygen and sugar in the blood to make energy. At the same time, they produce lactic acid as a waste product. Normally, the body breaks down lactic acid and gets rid of it.

In mitochondrial toxicity, the mitochondria are damaged and lactic acid is not broken down. This can cause levels of lactic acid to rise. If the levels of lactic acid become too high, a rare, but serious condition called lactic acidosis can occur.

[Lactic acidosis](#) [6] can result in liver problems, including a buildup of fat in and around the liver and liver inflammation. This condition is more common in women living with HIV than in men living with HIV. It is also more likely to occur in pregnant or obese women.

Non-nucleoside reverse transcriptase inhibitors (NNRTIs), especially Viramune (nevirapine), can cause liver problems. Research has shown that women with more than 250 CD4 cells are 12 times more likely to develop life-threatening liver problems when they use Viramune. Viramune should not be used as first-time treatment in women with [CD4 counts](#) [7] over 250. In addition, women with over 250 CD4 cells should not switch to Viramune unless there are no other options. In men, liver problems are more likely to occur if the CD4 count is above 400 at the time of starting HIV treatment with Viramune for the first time.

The greatest risk of liver problems occurs during the first six weeks of treatment with Viramune. It is important that your health care provider order liver function tests before you start taking Viramune and test your blood frequently during the first three to four months of treatment.

Protease inhibitors (PIs), especially full-dose Norvir (ritonavir) and Aptivus (tipranavir) given with Norvir, are also associated with liver damage. Unlike Viramune, PIs may cause liver damage at any time. Patients infected with both HIV and [hepatitis C](#) [8] may be at higher risk for developing liver damage while taking PIs.

In addition, people living with HIV may have liver damage or stress on their livers caused by:

- Other prescription medications, repeated doses of over-the-counter drugs such as Tylenol (acetaminophen), repeated use of antibiotics, or exposure to chemicals
- AIDS-related [opportunistic infections](#) [9] (OIs) such as MAC (mycobacterium avium complex), TB ( [tuberculosis](#) [10]), CMV (cytomegalovirus), or cryptosporidiosis
- Hepatitis usually caused by infection with the hepatitis [A](#) [11], [B](#) [12], or [C](#) [8] virus
- [Alcohol or drug abuse](#) [13]

# Liver Disease and Women

Some liver problems occur during [pregnancy](#) [14] or affect women more often than men. These include:

- Gallstones
- Biliary cirrhosis (bile duct damage)
- Autoimmune liver diseases (liver cells are attacked by our own immune cells)
- Non-alcoholic fatty liver disease
- Hepatic adenomas (non-cancerous fatty liver tumors)

Women tend to develop alcohol-related liver disease, particularly cirrhosis (scarring of the liver) and hepatitis (inflammation of the liver), more quickly than men.

Oral contraceptives ([birth control](#) [15] pills) can cause an increase in hepatic adenomas (fatty liver tumors) and should not be used by women who have had these benign (non-cancerous) tumors.

## Caring for Your Liver

The liver has a special ability to repair itself under most circumstances. Unfortunately, permanent damage can also occur.

**Good nutrition and a healthy lifestyle will go a long way toward supporting this hardworking organ.** If your HIV drugs are causing damage to your liver, it may be possible to switch to other drugs. This may not be an option for everyone. It is important to balance the need for HIV drugs with their potential to cause liver damage and to talk with your provider so that you can make the best decision for you.

There are many things you can do to protect your liver from damage, help it heal, and support its function.

### Avoid Alcohol and Street Drugs

- Heavy drinking can cause cirrhosis (scarring)
- Many HIV drugs and other medications should not be combined with alcohol
- Avoid alcohol completely if you also have hepatitis
- Using some street drugs may affect your liver

### Get Tested for Hepatitis

- Hepatitis [A](#) [11] (HAV) and [B](#) [12] (HBV)
  - If you test negative, get vaccinated against HAV and HBV
  - If you test positive, talk to your health care provider about treatment
- [Hepatitis C](#) [8] (HCV)
  - If you test negative, there is no vaccination. You can avoid exposure to the HCV virus by avoiding contact with infected blood or needles
  - If you test positive, it is important that your health care provider monitor both HIV and HCV and provide appropriate care and treatment

### Eat Healthy Food and Be Physically Active

- Maintain a healthy body weight through [healthy](#) [2] foods and regular [physical activity](#) [16]
- Eat plenty of fruits and vegetables, especially dark green leafy vegetables and orange and red colored

fruits and vegetables

- Drink large amounts of fluids, especially water
- Avoid high-fat dairy products, processed vegetable oils (hydrogenated fats), deep-fried foods, and fatty meats

## Be Cautious with Vitamins and Supplements

- Take a multivitamin with antioxidants
- Do not take high doses of vitamin A or carotenoids (beta-carotene) if you have liver disease
- Avoid high levels of iron
- Herbal therapies, such as milk thistle (silymarin), have been widely used to treat the liver. Some herbs are toxic to the liver and some interact with HIV drugs. It is important to tell your health care provider if you are using any herbs or [supplements](#) [17].

## Taking Care of Yourself

When your liver is damaged it cannot perform all of its important functions properly. Since there may not be any obvious symptoms of liver damage, it is important to check your liver health with regular medical visits and lab tests. Talk with your health care provider to find what HIV drugs are best for you and your liver. In addition, good nutrition and a healthy lifestyle will go a long way toward supporting this hardworking organ.

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- [hepatotoxicity](#) [20]
- [liver damage](#) [21]
- [Opportunistic Infections](#) [22]
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## Additional Resources

Select the links below for additional materials related to liver health.

[3 Steps to Love Your Liver \(Love Your Liver\)](#) [32]

[10 Foods for a Healthy and Clean Liver \(Huffington Post\)](#) [33]

[HIV and Hepatotoxicity \(AIDSinfo\)](#) [34]

[Liver Function Tests \(Mayo Clinic\)](#) [35]

[HIV and Your Liver \(POZ\)](#) [36]

[Liver Basics: Entire Lesson \(USVA\)](#) [37]

[Liver Disease and Cirrhosis \(USVA\)](#) [38]

[Liver Function Tests \(AIDSmap\)](#) [39]

[Liver Health and Wellness \(American Liver Foundation\)](#) [40]

[Fatty Liver Disease \(Canadian Liver Foundation\)](#) [41]  
[Alcohol and Liver Disease \(DrinkAware\)](#) [42]

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**Links:**

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- [2] <http://www.thewellproject.org/hiv-information/nutrition-and-hiv>
- [3] <http://www.thewellproject.org/hiv-information/understanding-immune-system>
- [4] <http://www.thewellproject.org/hiv-information/side-effects>
- [5] <http://www.thewellproject.org/hiv-information/hiv-drugs-and-hiv-lifecycle#Approved%20HIV%20Drugs>
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- [9] <http://www.thewellproject.org/hiv-information/what-are-opportunistic-infections>
- [10] <http://www.thewellproject.org/hiv-information/tuberculosis>
- [11] <http://www.thewellproject.org/hiv-information/hepatitis>
- [12] <http://www.thewellproject.org/hiv-information/hepatitis-b>
- [13] <http://www.thewellproject.org/hiv-information/substance-abuse-and-addiction>
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- [30] <http://www.thewellproject.org/tags/liver-damage-symptoms>
- [31] <http://www.thewellproject.org/tags/liver-damage-tests>
- [32] <http://loveyourliver.org.uk/3-steps-to-love-your-liver/>
- [33] [http://www.huffingtonpost.ca/2012/09/13/foods-for-liver\\_n\\_1880715.html](http://www.huffingtonpost.ca/2012/09/13/foods-for-liver_n_1880715.html)
- [34] <http://aidsinfo.nih.gov/education-materials/fact-sheets/22/67/hiv-and-hepatotoxicity>
- [35] <http://www.mayoclinic.org/tests-procedures/liver-function-tests/basics/definition/prc-20012602>
- [36] <https://www.poz.com/basics/hiv-basics/hiv-liver>
- [37] <http://www.hepatitis.va.gov/patient/basics/liver-single-page.asp>
- [38] <http://www.hiv.va.gov/provider/manual-primary-care/liver-disease.asp>
- [39] <http://www.aidsmap.com/Liver-function-tests/page/1045192/>
- [40] <http://www.liverfoundation.org/abouttheliver/liverhealth/>
- [41] <http://www.liver.ca/liver-disease/types/fatty-liver.aspx>
- [42] <https://www.drinkaware.co.uk/check-the-facts/health-effects-of-alcohol/effects-on-the-body/alcohol-and-your-liver>