



OFFICE OF DISEASE PREVENTION AND EPIDEMIOLOGY  
HIV CARE & TREATMENT PROGRAM

## MY LIVER—HOW IT WORKS

This fact sheet was created to summarize:

- Amazing facts about the liver
- What we know about lab tests that monitor liver function
- What can harm your liver
- Symptoms and treatment of liver damage / disease
- What you can do to keep your liver healthy



### Amazing Facts:

The liver is the largest organ in the body, about the size of a football weighing 3-4 pounds. The liver is able to regenerate itself. This is important after surgery, injuries or diseases that destroy portions of the liver. The liver is always trying to repair itself. It is especially important to people living with HIV because it plays an important role in metabolizing HIV medications as well as other drugs.

We can't live without a functioning liver. Almost all cells and tissues in the body depend upon the liver. The liver serves as the body's filter and warehouse. A little over 1 1/2 quarts of blood pump through the liver every minute, allowing it to quickly and effectively remove toxins and waste products from the blood stream. It also acts as a warehouse to hold onto substances like vitamins, minerals and glucose that the body will need later. The liver helps to manage cholesterol, hormones and sugar. It regulates fat storage and blood clotting factors. Wow, no wonder it is such an important organ!

### Lab Tests:

Liver Function Tests (LFT's) give your doctor some indication of what's going on inside the liver. They also help determine which additional tests are needed. They give a picture over time - has the liver condition stabilized, improved, resolved or worsened.

ALT and AST- an elevated ALT and AST measure inflammation and damage to the liver. These tests give a "clue". More tests are needed. GGT and ALP hint at a possible blockage of the bile duct. When a blockage occurs, the GGT and ALP can overflow like a backed up sewer and seep out of the liver into the blood stream.

Normal Lab Values<sup>1</sup>: ALT: 8-20 UL AST: 8-20 UL GGT (Females): 0-45 UL GGT (Males): 0-65 UL ALP: 44-147 UL

<sup>1</sup>Lab values vary per lab.

## Lab Tests, Continued:

Bilirubin is the yellow-colored pigment that the liver produces when it recycles worn-out red blood cells. Elevated bilirubin is usually associated with worsening liver disease or bile duct blockage.

Clotting Factors are manufactured by the liver to stop bleeding. PT ( Prothrombin Time) tests the time it takes to produce a clot. Platelets are the blood cells that help the blood form clots. The spleen plays a role in the storage of platelets. In people with cirrhosis, the spleen works overtime to make up for the decreased function of the liver. This results in an enlarged spleen and low platelet count.

Normal Lab Values<sup>1</sup>: Bilirubin: 0-1.2 mg/dL PT: 11-15 seconds Platelets: 150,000-350,000/mL

<sup>1</sup>Lab values vary per lab.

## What Can Harm Your Liver:

**Medications**—Acetaminophen (Tylenol) is usually well tolerated in prescribed doses but overdose is the most common cause of drug induced liver disease and acute liver failure worldwide. Other common medications such as Aspirin and the TB treatment INH can potentially harm the liver.

**Natural Products** such as mushrooms—There are 600 species of Amanita mushrooms which are responsible for approximately 95% of fatalities from mushroom poisoning.

**Industrial Toxins**—including arsenic (found in water), carbon tetrachloride which is in Halon, Freon, refrigerants, cleaning agents, and vinyl chloride (which, until 1974, was used as aerosol spray propellant).

**Some herbal and alternative remedies**—such as Blue-green algae, Borage, Bupleurum, Chapparal, Comfrey, Dong Quai, Germander, Jin Bu Huan, Kava, Mistletoe, Pennyroyal, Sassafras, Shark Cartilage, Skullcap and Valerian.

## Infections that Affect the Liver:

**Hepatitis:** Hepatitis means inflammation of the liver. It is relatively common in people with HIV. Common causes are the viruses Hepatitis A, B, C, which can not only cause health problems but can also limit HIV treatment options. It's very important to know your hepatitis status. Many HIV medications can cause increased liver enzymes and this can be more of a problem with persons with a history of Hepatitis B and C.

### Hepatitis A

Hepatitis A is spread by food or drink contaminated by human feces containing Hepatitis A virus, and sexually from oral-anal contact (rimming). You can only get Hepatitis A one time as your body develops immunity.

### Hepatitis B

Hepatitis B is passed on from mother to child, by contact with contaminated blood or through unprotected anal, oral or vaginal sex.

### Hepatitis C

Hepatitis C is spread via contaminated blood products, the sharing of needles and syringes for injecting drugs and from mother to child. All blood products are now routinely screened for Hepatitis C. There have been outbreaks of sexually transmitted hepatitis C in HIV-Positive gay men. Risk factors include fisting, group sex, drug use and unprotected sex. The primary risk is due to blood-to-blood contact.

## Symptoms and Treatment of Liver Damage / Disease:

**Liver Damage:** If the liver sustains damage for whatever reason, normal liver tissue can become:

- fibrous (fibrosis),
- fatty (steatosis)
- scarred (cirrhosis).

**What are symptoms of liver damage?** Fatigue, loss of appetite, nausea and vomiting, fever, itchy skin, abdominal pain, jaundice (yellowing of the eyes and skin), dark urine and pale stools.

**Treatments for Liver Disease** vary depending on the cause. Treatments can include rest, avoiding tea, coffee, alcohol and recreational drugs, sometimes a change of prescription drugs (HIV medications). There are drugs available to treat Hepatitis C if that is the cause of liver damage. Surgery or liver transplant may be an option for advanced liver disease.

## Tips for a Healthy Liver:

1. **Drink alcohol in moderation**—especially if you are a woman. Women are more susceptible to adverse effects of alcohol on the liver. Heavy and sustained alcohol use can cause liver damage.
2. **Maintain normal weight**—1/3 of Americans are obese. 75% of obese people have a fatty liver which affects the liver function.
3. **Avoid cigarettes**—smoking is linked to development of liver cancer and may enhance the toxic effects of some medications such as Tylenol on the liver.
4. **Avoid sushi** and partially cooked clams, oysters, mussels and scallops. These foods often live in Hepatitis A contaminated rivers and seas.
5. **Practice safer sex**—to protect against Hepatitis B & C by preventing the possibility of blood contact. Risk is reduced by using condoms and latex gloves and not sharing lubrication and sex toys.
6. **Avoid injection drug use**—IDU is a common mode for transmission of Hepatitis B & C. If using, don't share needles or works and utilize needle exchange programs.
7. **Get tested for Hepatitis C**—testing is recommended for persons who have experimented with IDU or received blood products before 1992. Treatment is available!
8. **Receive Hepatitis A & B vaccines**—these are both preventable infections that can harm your liver.
9. **See your doctor regularly**—some HIV meds can increase your liver enzymes so monitoring is important, especially for persons with a history of Hepatitis B & C.
10. **Don't share toothbrushes and razors**—as they can transmit Hepatitis B & C if contaminated with blood.
11. **Want to have a tattoo or other body piercings?** Go to a place that is clean and follows strict sterilization practices to avoid blood contact.

## Resources:

To read more about liver health, please see:

- American Liver Foundation [www.liverfoundation.org](http://www.liverfoundation.org)
- Medline Plus [www.nlm.nih.gov/medlineplus/liverdisease](http://www.nlm.nih.gov/medlineplus/liverdisease)
- Up To Date [www.uptodate.com/patients](http://www.uptodate.com/patients)
- HCV Advocate [www.hcvadvocate.org](http://www.hcvadvocate.org)