



What is Fibrosis?

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Forward

Chronic infection with hepatitis C or hepatitis B virus (HCV or HBV) can lead to long-term liver damage including fibrosis, cirrhosis, and hepatocellular carcinoma (liver cancer). It is estimated that about 10-25 percent of people with chronic hepatitis C will develop cirrhosis, a process that usually takes 20-30 years. This fact sheet will discuss fibrosis.

The Fibrosis Process

Liver fibrosis refers to the accumulation of tough, fibrous scar tissue in the liver. Formation of scar tissue is a normal bodily response to injury, but in fibrosis this healing process goes wrong. When hepatocytes (functional liver cells) are injured due to infection with a virus, heavy alcohol consumption, toxins, trauma, or other factors, the immune system is activated to repair the damage. The injury or death (necrosis) of hepatocytes stimulates inflammatory immune cells to release cytokines, growth factors, and other chemicals. These chemical messengers direct support cells in the liver called hepatic stellate cells to activate and produce collagen, glycoproteins (such as fibronectin), proteoglycans, and other substances. These substances are deposited in the liver, causing the build-up of extracellular matrix (nonfunctional connective tissue). At the same time, the process of breaking down or degrading collagen is impaired. In a healthy liver, the synthesis (fibrogenesis) and breakdown (fibrolysis) of matrix tissue are in balance. Fibrosis occurs when excessive scar tissue builds up faster than it can be broken down and removed from the liver.

Fibrosis Risk Factors

Liver fibrosis does not occur at the same rate in all individuals, and in some people with chronic hepatitis C or B fibrosis remains stable or may even regress over time. Several factors influence fibrosis progression. Fibrosis occurs more rapidly in men than in women, and also in older people – particularly those over age 50. Progression does not seem to be linear; that is, the process appears to accelerate as more damage occurs. Immune system compromise, for example due to coinfection with HIV or use of immunosuppressive drugs after a liver transplant, also

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The information in this fact sheet is designed to help you understand and manage HCV and is not intended as medical advice. All persons with HCV should consult a medical practitioner for diagnosis and treatment of HCV.

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has been shown to accelerate fibrosis. Heavy alcohol consumption is strongly associated with worsening fibrosis and cirrhosis. Finally, studies indicate that steatosis (fatty liver) and insulin resistance are associated with more rapid and severe fibrosis. In contrast, HCV viral load does not appear to have much effect on fibrosis progression. There is some evidence that HCV genotype 3 may play a role in the formation of steatosis, but the exact mechanism of action is not completely understood.

Genotype 3 has also been found to increase the rate of fibrosis, cirrhosis and liver cancer compared to HCV genotype 1. HCV genotype 2 appears to have a lower risk of disease progression than HCV genotype 1.

Measuring Fibrosis

There are many tests to measure fibrosis and cirrhosis. The most common test is the percutaneous liver biopsy. This outpatient procedure involves inserting a biopsy needle through the ribcage into the liver. It is usually preceded by an ultrasound to look for any nodules and to locate a section of the liver to remove a portion of liver tissue. The liver tissue sample is removed and examined by a pathologist who will issue a report on the health of the liver.

There are various non-invasive tests that are used to replace the liver biopsy. In 2013 the Food and Drug Administration (FDA) approved the Fibroscan. The Fibroscan is a machine that sends vibration waves through the liver to estimate the amount of scarring.

But since HCV treatment cure rates are approaching 100% many medical providers are less likely to perform a liver biopsy or Fibroscan unless there is evidence of serious disease progression or if insurance companies are requiring a test as a condition of approval of treatment.

For more information about diagnostic tests see [HCSP fact sheet Overview Diagnostic Tests](#)

Effects of Fibrosis

In the early stages of fibrosis, the liver functions relatively well and few people experience symptoms. But as the inflammation and liver injury continue, scar tissue builds up and connects with existing scar tissue, which can eventually disrupt the metabolic functions of the liver. If the disease progresses, it can lead to cirrhosis, a condition in which the liver is severely scarred, its blood flow is restricted, and its ability to function is impaired.

Treatment and Future Prospects

It was once thought that fibrosis was irreversible, but research has shown that treatment for hepatitis C can slow or halt fibrosis progression, and potentially even reverse existing liver damage. Studies have shown that fibrosis stabilization and regression are most likely when HCV positive individuals treated with HCV therapy achieve a sustained virological response (SVR or cure, continued undetectable HCV viral load 12 weeks after the completion of therapy), but improvement has also been seen in some partial responders and nonresponders.

It is very important to know the fibrosis stage or health of the liver so that the appropriate decisions can be made for managing hepatitis C. There are many steps people can take to help slow down HCV disease progression:

- Consider HCV medical treatments, which can slow disease progression and possibly reverse fibrosis.
- Get regular exercise and rest.
- Learn about and practice stress reduction measures.
- Eat a healthy, well-balanced diet that follows the USDA's guidelines at www.choosemyplate.gov/. This diet is low in fat and salt, high in whole-grain products, and has enough protein. Protein is in meats, chicken, turkey, cheeses, nuts and beans
- Don't use recreational drugs.

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- Don't drink alcohol, or at the very least, limit how much you drink.
- Take your prescriptions as instructed by your doctor.
- Be careful when mixing over-the-counter drugs, prescription drugs, herbal supplements, street drugs and/or alcohol.
- Stay away from poisonous liquids and fumes including solvents, paint thinners, and bug killers. If you have to use such chemicals, cover your skin, wear gloves and a mask and keep the windows open to allow air in.
- Do not eat raw or undercooked shellfish, which may have diseases that can be harmful to the liver.
- Ask your doctor to give you both the hepatitis A and the hepatitis B vaccinations, if not already immune.
- Become a strong self-advocate by learning as much as you can about hepatitis C.

Related Publications:

HCV Disease Progression: What is Acute Hepatitis C?
www.hcvadvocate.org/hepatitis/factsheets_pdf/Acute_HCV.pdf

HCV Disease Progression: What is Cirrhosis
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HCV Disease Progression: What is Steatosis
www.hcvadvocate.org/hepatitis/factsheets_pdf/steatosis.pdf

For more information

- **Americans with Disability Network**
<https://adata.org/>
- **Centers for Disease Control and Prevention**
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- **Mayo Clinic**
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