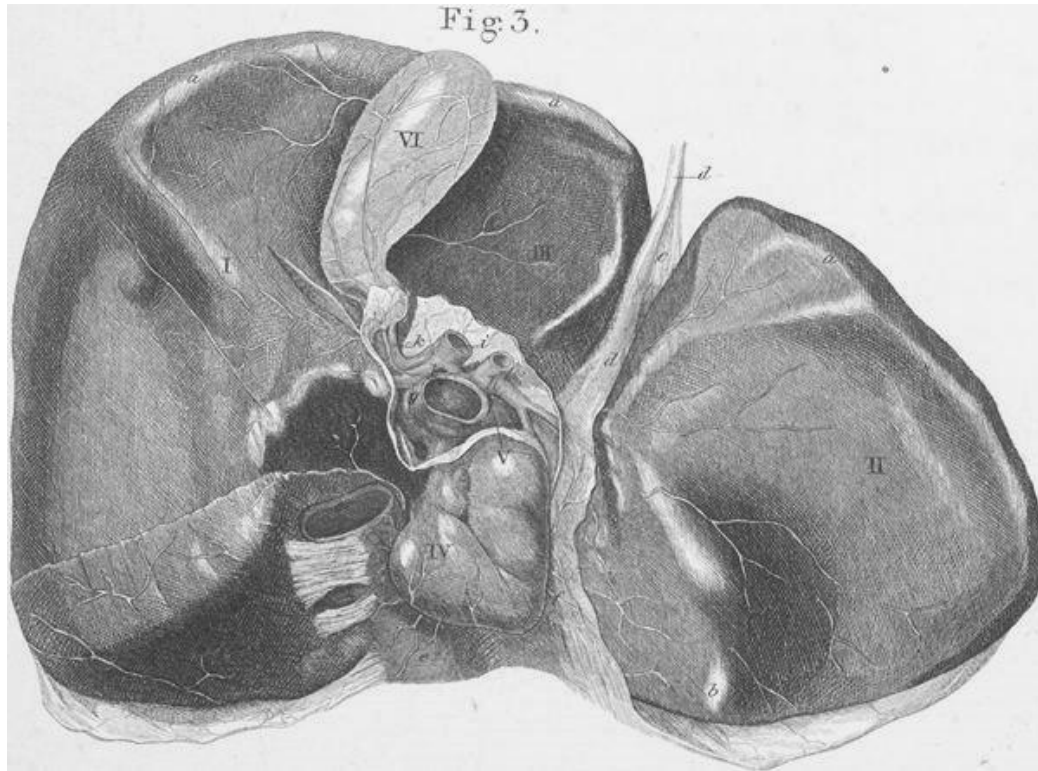


An anatomical illustration of the human torso, showing the ribcage, spine, and internal organs. The liver is highlighted in a bright orange color, contrasting with the blue-toned background of the rest of the body. The text "HEPATITIS" is centered over the liver.

HEPATITIS

Inflammatory Diseases of the Liver

What is Hepatitis?



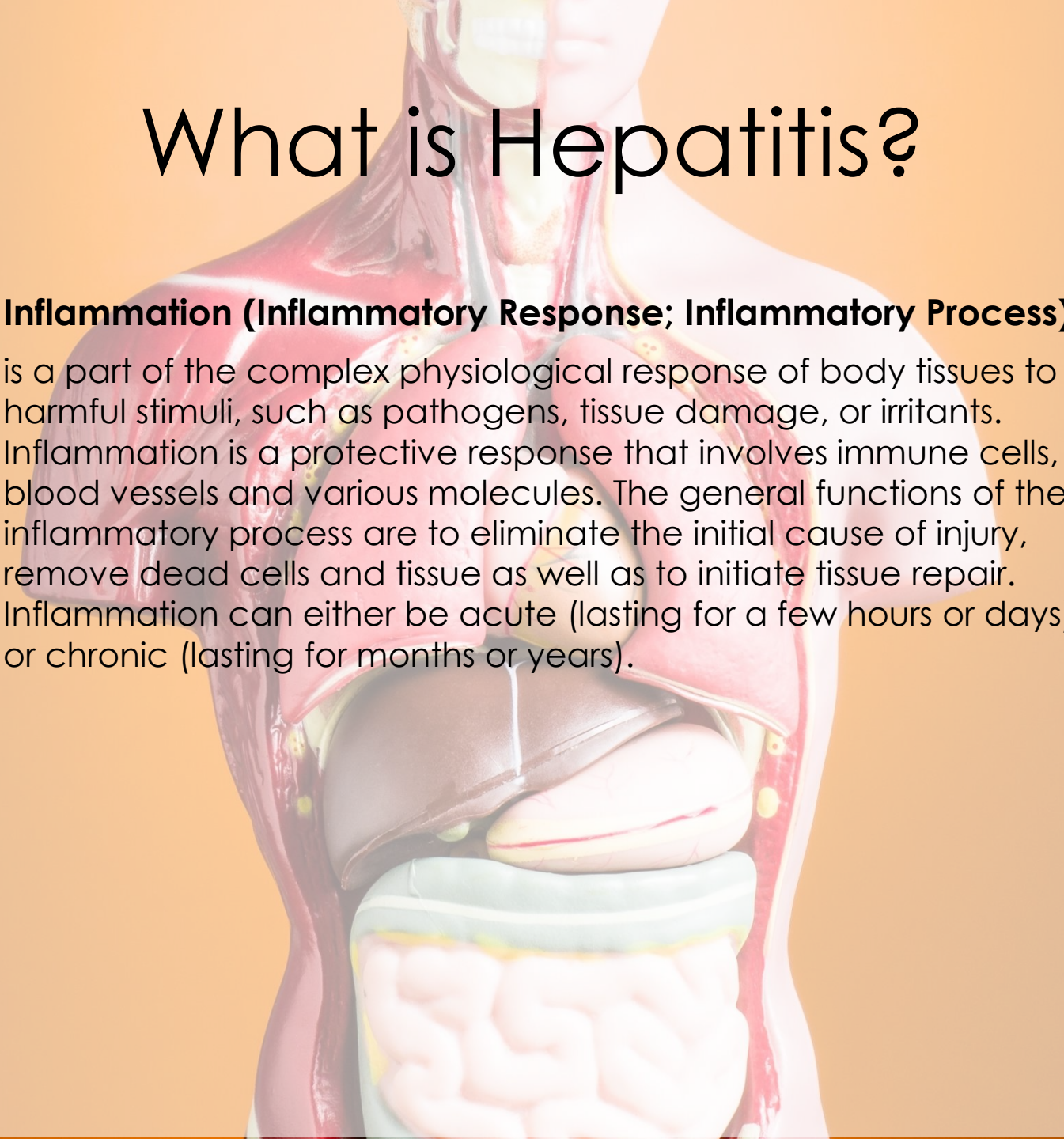
Hepatitis refers to inflammation of the tissues of the liver. The term Hepatitis does not identify the cause or underlying illness that resulted in this inflammation rather it merely indicates that an inflammatory process affecting the liver is present.

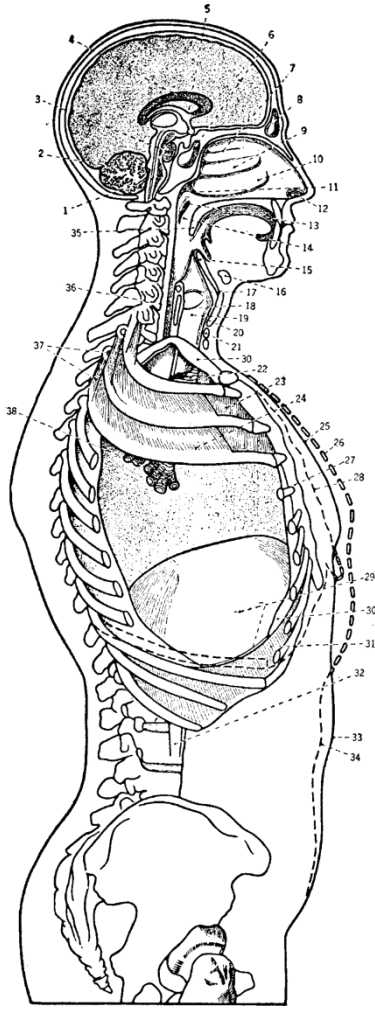
The liver is an organ only found in vertebrates which helps to detoxify the body, synthesizes several vital biochemicals, aids in digestion and functions as a storage organ. In humans, the liver is located in the Right upper quadrant of the abdomen just below the diaphragm.

What is Hepatitis?

Inflammation (Inflammatory Response; Inflammatory Process)

is a part of the complex physiological response of body tissues to harmful stimuli, such as pathogens, tissue damage, or irritants. Inflammation is a protective response that involves immune cells, blood vessels and various molecules. The general functions of the inflammatory process are to eliminate the initial cause of injury, remove dead cells and tissue as well as to initiate tissue repair. Inflammation can either be acute (lasting for a few hours or days) or chronic (lasting for months or years).





Main Types of Hepatitis

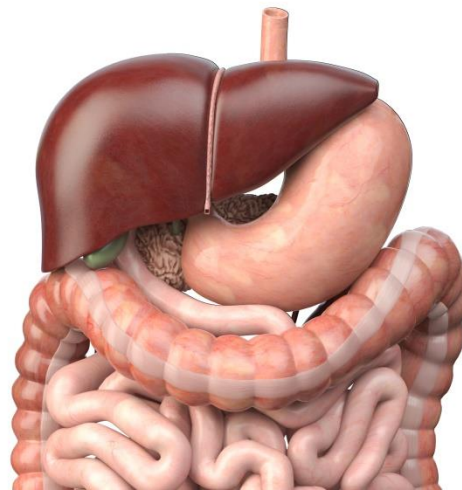
- Infectious (Viral, Parasitic, Bacterial)
- Metabolic (Alcoholic, Toxic, Drug-Induced)
- Auto-Immune (Transplant Patients, Immune System Dysfunctions)
- Genetic (Wilson's Disease, Hemochromatosis)
- Ischemic (Shock, Heart Failure)
- Miscellaneous (various less common causes)

Infectious Hepatitis

Infectious Hepatitis can be caused by many types of infectious organisms including bacteria such as *Escherichia coli* and *Klebsiella pneumoniae*, parasites such as worms and protozoa; however, the most common type of infectious hepatitis, indeed the most common type of any hepatitis world-wide, is viral hepatitis. Most infectious hepatitis is treatable.

Viral Hepatitis

- Viral hepatitis is acute and/or chronic liver inflammation due to a viral infection.
- The most common causes of viral hepatitis are the five hepatotropic viruses Hepatitis A, B, C, D, and E. There are other viruses that can also cause hepatitis such as Cytomegalovirus, Epstein-Barr Virus, Herpes Simplex Virus and Yellow Fever Virus.
- The most common types of viral hepatitis can be vaccinated against or treated.



Hepatitis A

Hepatitis A also known as Infectious Jaundice is caused by Hepatitis A Virus (Hepatovirus A, HAV). HAV is transmitted by the fecal-oral route (swallowing the virus) and is often associated with eating contaminated food or close contact with an infected person. It causes an acute form of Hepatitis and does not have a chronic stage. Upon infection, the patient's immune system makes antibodies against HAV that confer immunity against future infection.

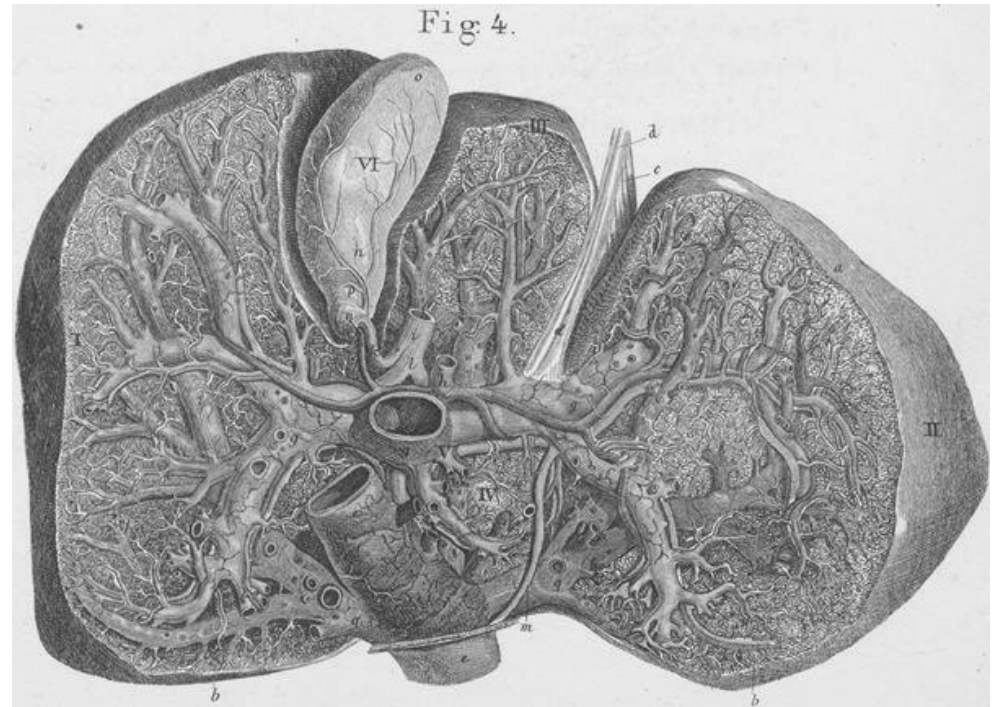
Many cases have **few or no symptoms**. If symptoms do occur, they usually develop between two and six weeks after infection and they typically last eight weeks and may include **nausea, vomiting, diarrhea, jaundice (yellowing of the skin and/or eyes caused by excess bilirubin in the blood), fever and abdominal pain**. A small percent of patients experience a recurrence of symptoms during the six months after the initial infection. Acute liver failure may rarely occur though this is more common in the elderly. In rare cases, it can be fatal.

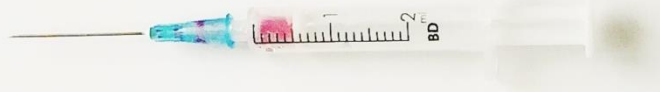
Hepatitis A: Treatment & Prevention

- The treatment for Hepatitis A is supportive care as no specific treatment for HAV Infection exists.
- Injectable vaccines for Hepatitis A exist and are approved for use. The vaccines generally confer immunity to HAV for 20 years or more and are about 95% effective. The vaccine is generally given in 2 doses separated by one year. The first dose provides about one year of immunity and the second dose confers the long-lasting immunity.
- Vaccination against HAV is generally recommended.

Hepatitis B

Hepatitis B is caused by the Hepatitis B Virus (HBV) which can cause both acute and chronic Hepatitis B. Chronic Hepatitis B develops in about 15% of people who are unable to suppress the virus after an initial infection. Individuals that do not progress to Chronic Hepatitis B are not technically immune as HBV DNA remains in their body and can reactivate to overt disease in up to 50% of patients. Alcohol and immunosuppressive drugs are frequent causes of reactivation.

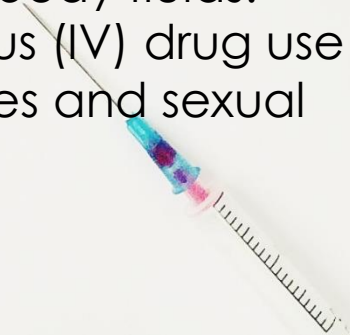




Hepatitis B

Many people have no symptoms during the initial infection. However, during acute infection, some may develop symptoms which may include vomiting, jaundice, fatigue, dark urine and abdominal pain. Often these symptoms last a few weeks and rarely can result in death. It may take one to six months for symptoms to appear following infection with HBV. Most of those with chronic disease have no symptoms; however, cirrhosis (liver dysfunction due to scarring of the liver) and liver cancer (Hepatocellular Carcinoma) may eventually develop. Cirrhosis or liver cancer occur in about 25% of those with chronic Hepatitis B.

HBV is contracted by exposure to infected blood or body fluids. The most common means of infection are intravenous (IV) drug use due to the use of HBV contaminated needles/syringes and sexual intercourse with an infected partner.



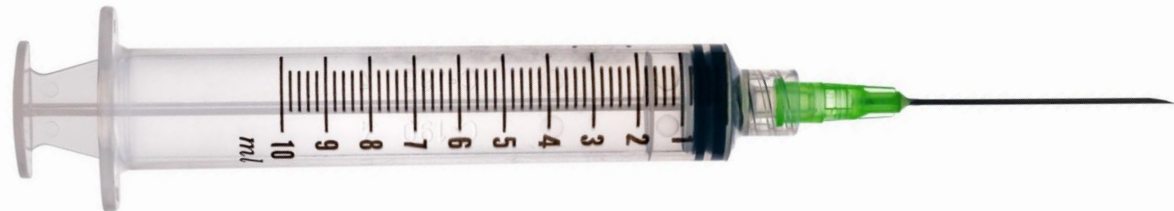
Hepatitis B: Treatment and Prevention

Though there is **no cure for Hepatitis B**, there are a variety of treatments that are used to diminish viral replication and attempt to decrease viral loads (amount of virus in the body). These treatments and therapies vary in success between individuals and success rates are dependent on a number of factors such as the exact type of HBV as well as the underlying health of the patient. Treatment regimens last at least 6 months but are frequently longer. In the vast majority of cases, only Chronic Hepatitis B is treated. A new treatment that attempts to keep HBV out of liver cells has recently emerged and is being evaluated.

Hepatitis B: Treatment and Prevention

Vaccines for Hepatitis B exist and are generally recommended. The vaccines are typically delivered over the course of months and confer effective immunity (about 95% up to 40 years post dose; 90% after 40 years post dose; 75% after 60 years post dose). Boosters may be recommended for certain groups.

Certain other measures such as immunoglobulin may be provided to pregnant women to prevent mother to child transfer.



Hepatitis C

Hepatitis C is caused by the Hepatitis C virus (HCV). HCV is only transmitted through contact with HCV infected blood and can cross the placenta. It is important to note, however, that any blood contact during sex can transfer the virus. Less than 40% of HCV infections resolve spontaneously. Hepatitis C usually leads to Chronic Hepatitis which creates risk of developing related complications.

Hepatitis C often remains asymptomatic for decades, though some symptoms such as jaundice, fatigue, dark urine, nausea, vomiting, abdominal pain and decreased appetite may occur after a few weeks or months.

Hepatitis C

- Patients with Hepatitis C are notably more susceptible to severe Hepatitis if they contract either Hepatitis A or Hepatitis B, so all patients with Hepatitis C should be immunized against both Hepatitis A and Hepatitis B as well as avoid consuming alcohol.
- HCV infection can also lead to the development of liver cancer. The risk of both liver cancer and death are markedly increased with co-infection with HCV and HBV.
- The major risk factors for contracting HCV include Injectable Drug Abuse, accidental healthcare related exposure and body modification (including tattooing).

Hepatitis C: Treatment and Prevention

There are various treatments available for Hepatitis C. Approximately 90% of chronic cases clear with appropriate treatment. Treatment with antiviral medication is recommended in all people with confirmed Chronic Hepatitis C who are not at high risk of dying from another cause otherwise. The initial recommended treatment depends on the type of Hepatitis C Virus, any previous Hepatitis C treatments and the functional status of the patient's liver. Treatments typically persist for months. For appropriate HCV patients with advanced disease, liver transplantation may be considered.

No vaccine for Hepatitis C is currently available.

Prevention is by risk reduction only.

Hepatitis D

Hepatitis D is caused by the Hepatitis Delta Virus (HDV). HDV is unusual and is considered to be a satellite because it can propagate only in the presence of the Hepatitis B Virus. Transmission of HDV can only occur either by simultaneous infection with HBV (coinfection) or if the target already carries HBV (superinfection). HDV transmission and risks for contracting essentially mirror HBV.

HDV and HBV infecting a person simultaneously is generally considered the most serious type of viral hepatitis due to its frequency and severity of complications. These complications include a greater likelihood of liver failure during acute infections due to a rapid progression to cirrhosis and an increased risk of developing liver cancer in chronic infections. Thus, in combination with HBV, Hepatitis D has the highest fatality rate of all the viral hepatitis infections.

Hepatitis D: Treatment and Prevention

- Due to the nature of HDV's dependence on HBV, the vaccine for HDV is the vaccine for HBV.
- There is a very new treatment that attempts to prevent HDV and HBV from entering liver cells available and long-term efficacy is being evaluated.
- Another treatment for HDV is also available, however, it has limited efficacy and typically requires life-long use.



Hepatitis E

Hepatitis E is caused by the Hepatitis E Virus (HEV) and is very similar to Hepatitis A. Hepatitis E is typically only problematic in Southeast Asia, thus, it has limited significance in the United States and in most developed countries. HEV is transmitted by the fecal-oral route (swallowing the virus) and is often associated with eating contaminated food or close contact with an infected person. It causes an acute form of Hepatitis and does not typically have a chronic stage, though a chronic stage is rarely possible in patients with a compromised immune system. Pregnant women are at particularly risk of complications from HEV infection.



Hepatitis E: Treatment and Prevention

- The treatment for Hepatitis E is supportive care as no specific treatment for HAV Infection exists.
- A vaccine for Hepatitis E exists but is not approved for use outside of certain countries in Asia. Infection is best prevented by good sanitary practices and eating only well cooked foods.
- The last major outbreak of HEV occurred in Africa in 2018.

Alcoholic Hepatitis



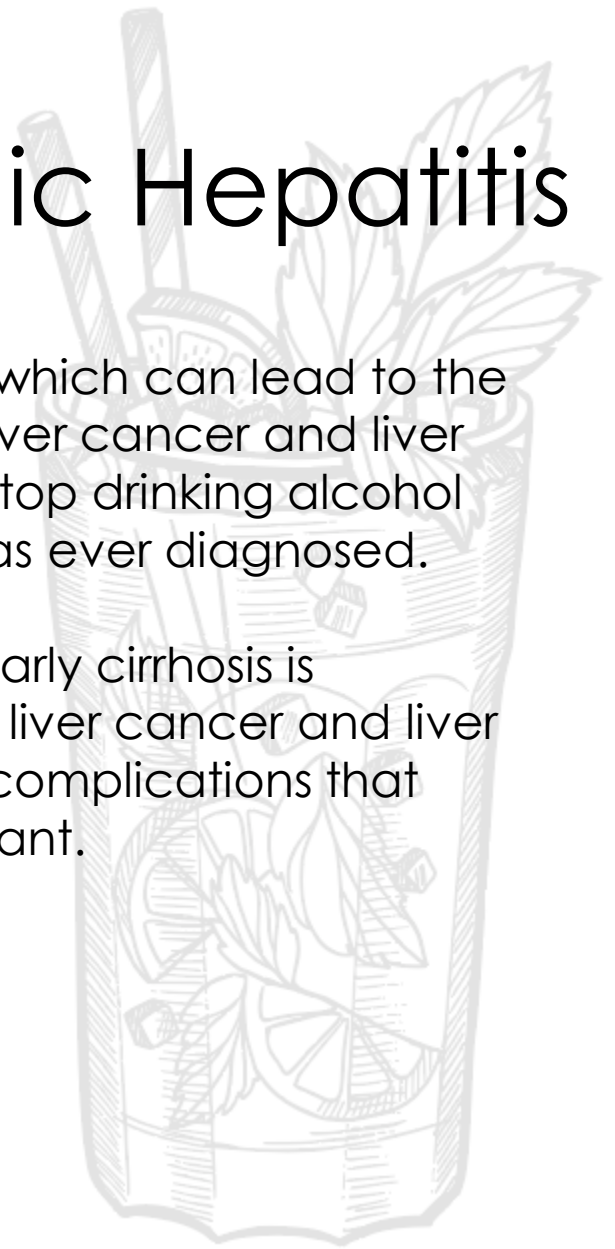
Alcoholic Hepatitis falls into the category of a Metabolic Hepatitis and is due to excessive intake of alcohol. Patients with Alcoholic Hepatitis typically have a history of many years of heavy alcohol intake, typically a minimum of 8 drinks per day.

Alcoholic Hepatitis, like other forms of Hepatitis, can advance to chronic liver conditions such as cirrhosis, liver cancer and liver failure. About 33% of chronic alcohol users will develop Alcoholic Hepatitis. About 70% of those with persistent Alcoholic Hepatitis will progress to cirrhosis. The risk factors for development are simply volumes of EtOH consumed and duration of consumption. Signs, symptoms and complications are similar to the other Hepatitis illnesses. Early disease is reversible.

Prevention of Alcoholic Hepatitis

The best and only way to prevent this illness which can lead to the potentially devastating illnesses of cirrhosis, liver cancer and liver failure is not to drink alcohol to excess or to stop drinking alcohol completely if any Substance Use Disorder was ever diagnosed.

Early Alcoholic Hepatitis is reversible. Even early cirrhosis is manageable. However, advanced cirrhosis, liver cancer and liver failure are very difficult to manage plus the complications that present with them are typically very unpleasant.



CONCLUSION

There are many causes of Hepatitis. This presentation has focused on those that are most commonly an issue in the Substance Use Disorder population. Most of the Hepatitis illnesses, regardless of cause, result in similar constellations of signs, symptoms and complications. The largest differences outside of cause are treatment, prevention and course of the illness.

The liver is an extremely important organ and its functionality and health must be preserved.