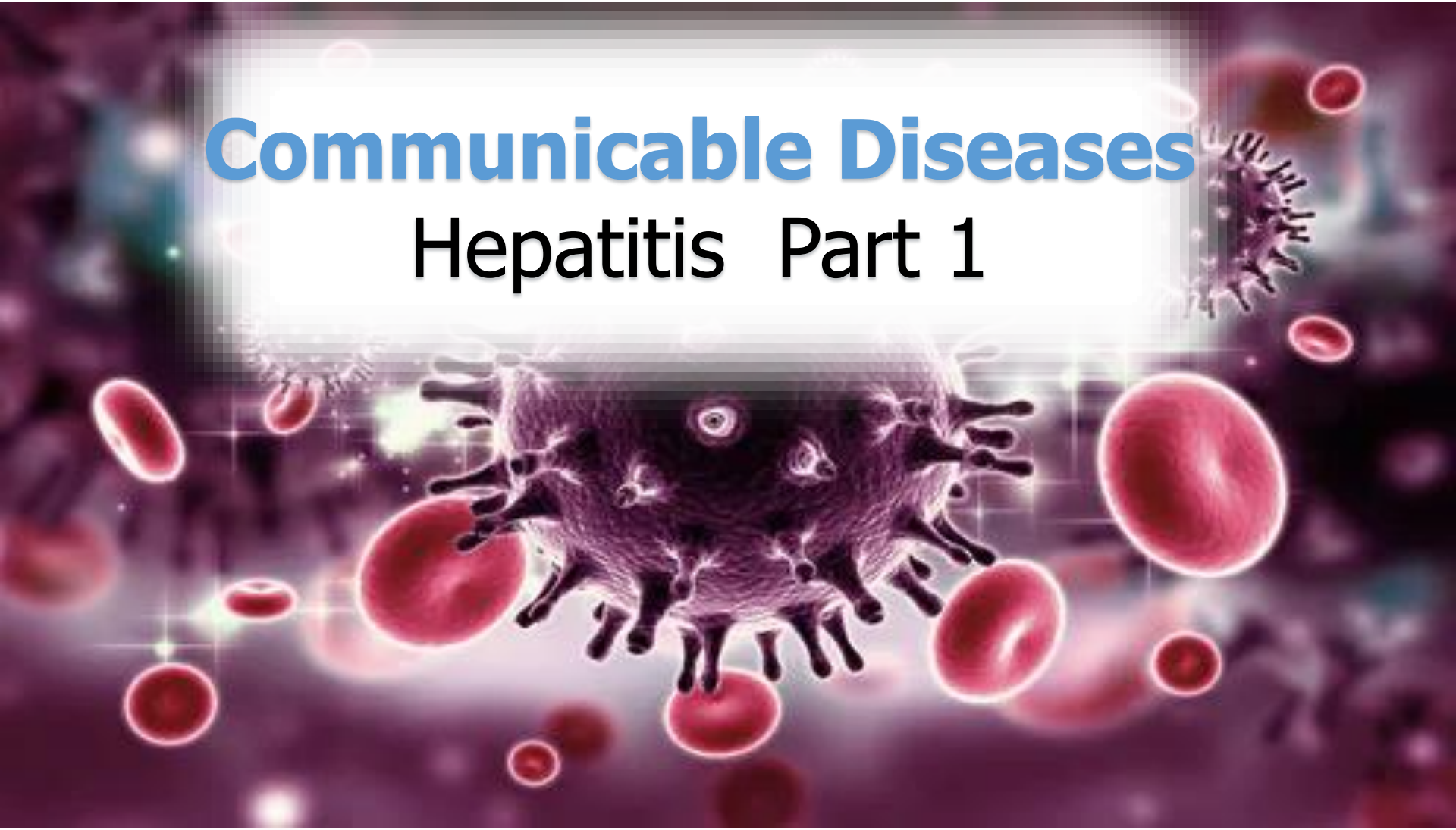
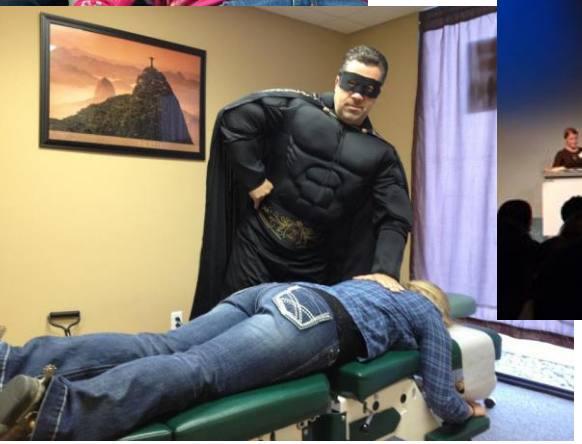


Communicable Diseases

Hepatitis Part 1

Introduction: Dr. Bryan Hawley DC



Housekeeping

- Questions
- info@drbryanhawley.com

- Hepatitis (2 CEs)
- Session 1
- Session 2
- 2 CEs NCBTMB approved provider #485

Noninfectious hepatitis

Excessive alcohol consumption can cause liver damage and inflammation. This is sometimes referred to as alchoholic hepatitis. The alcohol directly injures the cells of your liver. Over time, it can cause permanent damage and lead to liver failure and cirrhosis, a thickening and scarring of the liver.
Other toxic causes of hepatitis include overuse or overdose of medications and exposure to poisons.

Infectious hepatitis

What we are going to be focusing the majority on here

What causes alcoholic hepatitis?

When alcohol gets processed in the liver, it produces highly toxic chemicals. These chemicals can injure the liver cells. This injury then leads to inflammation, and alcoholic hepatitis. Although heavy alcohol use leads to alcoholic hepatitis, doctors aren't entirely sure why the condition develops. Alcoholic hepatitis develops in a minority of people who heavily use alcohol — no more than 35 percent according to the *American Liver Foundation*. It can also develop in people who moderately use alcohol.

What are possible risk factors for alcoholic hepatitis?

Because alcoholic hepatitis doesn't occur in all people who excessively use alcohol, other factors may influence the development of this condition. These include:

- genetic factors that affect how the body processes alcohol
- the presence of liver infections or other liver disorders, such as hepatitis B hepatitis C, and hemochromatosis
- malnutrition
- being overweight
- timing of drinking in relation to eating (drinking during mealtimes lowers the risk of developing alcoholic hepatitis

Women are at a greater risk of developing alcoholic hepatitis. This may be due to the differences in how the bodies of men and women absorb and break down alcohol.

What are the symptoms of alcoholic hepatitis?

The symptoms of alcoholic hepatitis vary depending on the amount of damage to the liver. If you have a mild case of the disease, you may not experience any symptoms. However, as more damag occurs, you may begin to experience:

- changes in appetite
- dry mouth
- weight loss
- nausea and vomiting
- pain or swelling in the abdomen
- jaundice, or yellowing of the skin or eyes
- fever
- changes in your mental state, including confusion
- fatigue
- easy bleeding or bruising

How is alcoholic hepatitis diagnosed?

If you have symptoms of alcoholic hepatitis, your doctor will ask you about your health history and alcohol consumption. Your doctor will also perform a physical exam to see if you have an enlarged liver or spleen. They may decide to order tests so they can confirm your diagnosis. These tests could include:

- complete blood count (CBC)
- liver function test
- blood clotting tests
- abdominal CT scan
- ultrasound of the liver

Toxic hepatitis

Toxic hepatitis is an inflammation of your liver in reaction to certain substances to which you're exposed. Toxic hepatitis can be caused by alcohol, chemicals, drugs or nutritional supplements. In some cases, toxic hepatitis develops within hours or days of exposure to a toxin.

In other cases, it may take months of regular use before signs and symptoms appear. The *symptoms* of toxic hepatitis often go away when exposure to the toxin stops. *But toxic hepatitis can permanently damage your liver,* leading to irreversible scarring of liver tissue (cirrhosis) and in some cases to liver failure, which can be life-threatening.

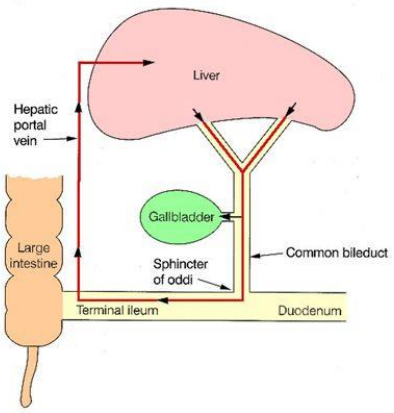
Toxic hepatitis

Overdoses of some medications, such as acetaminophen (Tylenol, others), can lead to liver failure. Signs and symptoms of a possible acetaminophen overdose include:

•Loss of appetite
•Nausea and vomiting
•Upper abdominal pain
•Coma

First Pass Effect

- Drugs that are absorbed via the GIT are circulated to the liver first via the hepatic portal vein
- Liver then acts as a filter
- Only part of the drug is circulated systemically
- The combination of processes is termed the 'First Pass' effect



Herbs and supplements.

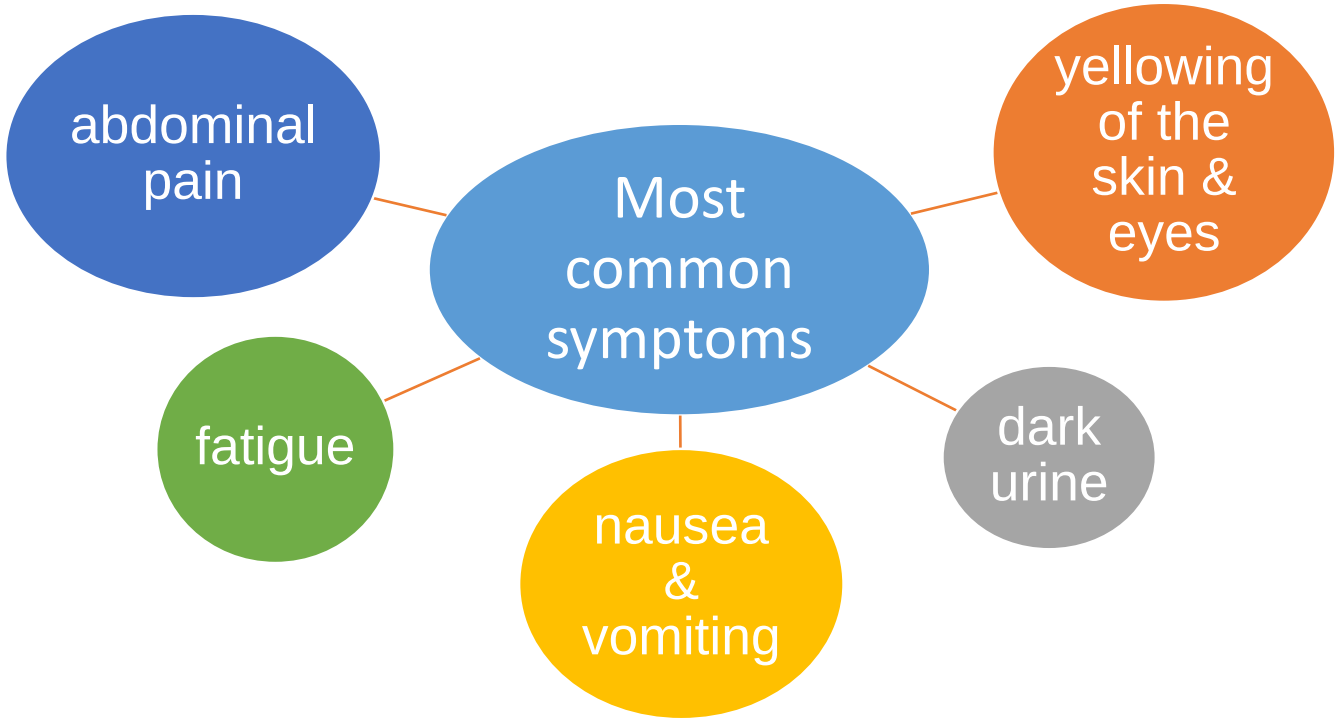
Some herbs considered dangerous to the liver in higher doses include aloe vera, black cohosh, cascara, chaparral, comfrey, kava and ephedra. There are many others.

https://livertox.nih.gov/Herbals_and_Dietary_Supplements.htm

Infectious hepatitis/Viral Hepatitis

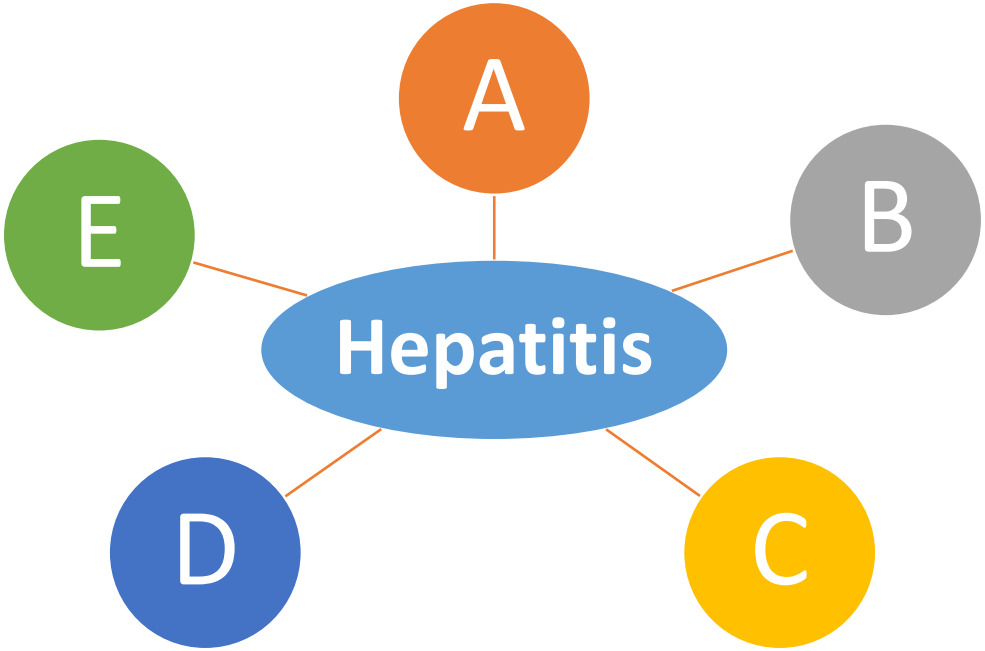
Now lets shift gears and dive into another form of hepatitis

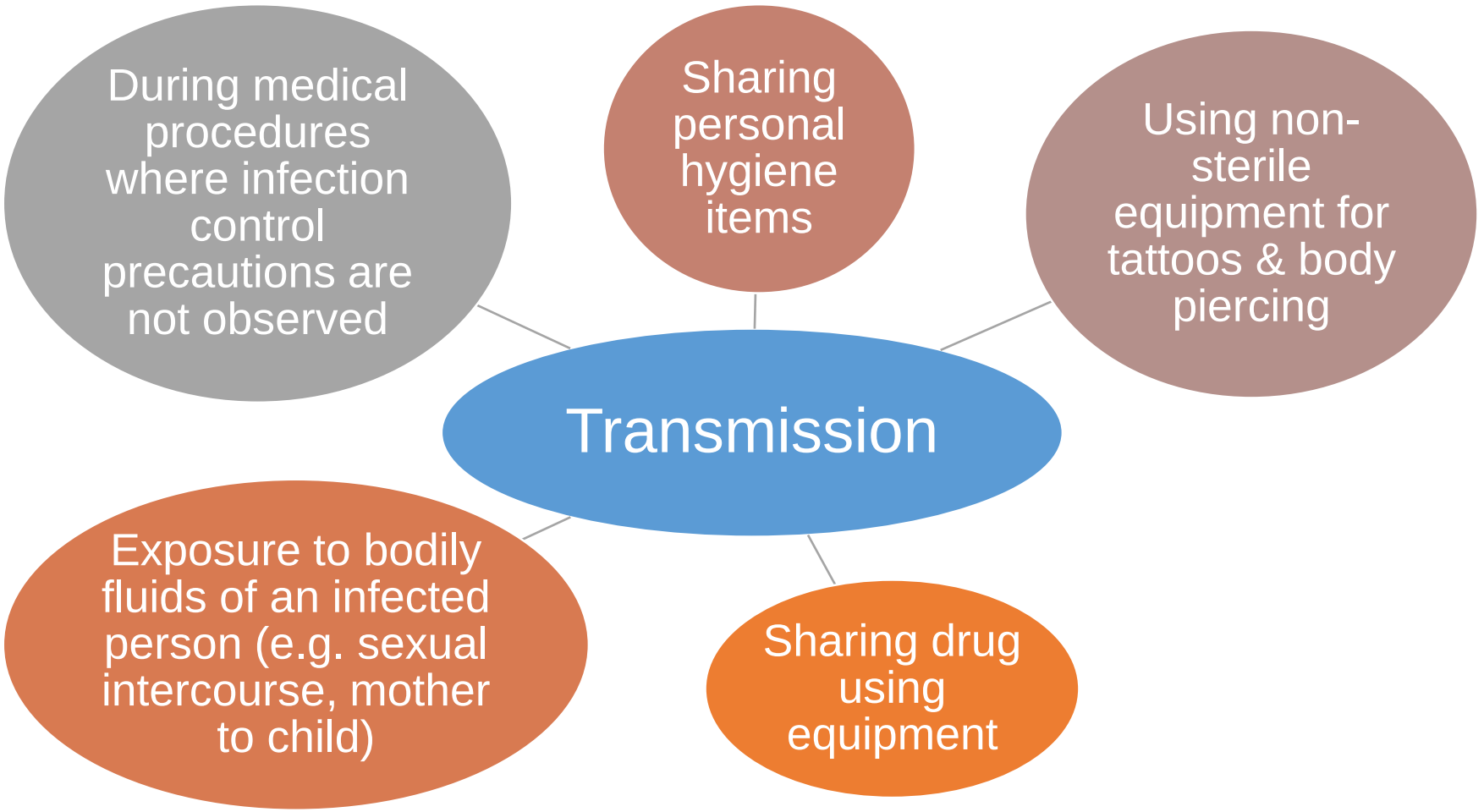
- Viral hepatitis' symptoms may not be obvious until serious liver damage has occurred



What is Hepatitis

- Disease caused by viruses that attack the liver
- There are **5** different types of hepatitis:




During medical procedures where infection control precautions are not observed
Sharing personal hygiene items
Using non-sterile equipment for tattoos & body piercing
Transmission
Exposure to bodily fluids of an infected person (e.g. sexual intercourse, mother to child)
Sharing drug using equipment

Viral Hepatitis

- Viral hepatitis is the leading cause of liver cancer and the most common reason for liver transplantation
- In the United States, an estimated 1.2 million Americans are living with chronic Hepatitis B and 3.2 are living with chronic Hepatitis C
  - Many do not know they are infected
- Each year an estimated 21,000 persons become infected with Hepatitis A; 35,000 with Hepatitis B, and 17,000 with Hepatitis C

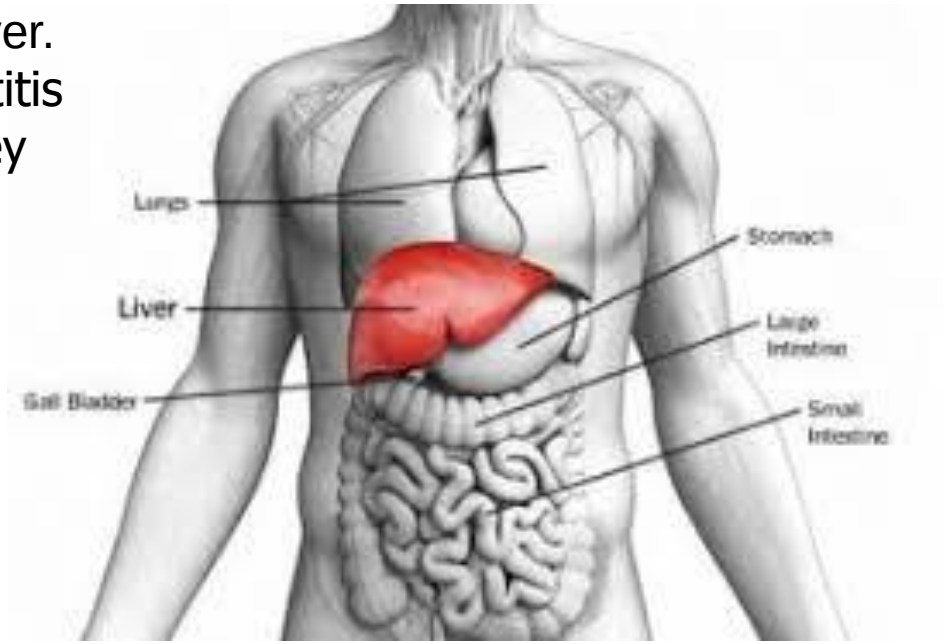
Viral Hepatitis

- When they occur, the signs and symptoms of viral hepatitis can include:
  - Fever
  - Fatigue
  - Loss of appetite
  - Nausea
  - Vomiting
  - Abdominal pain
  - Jaundice
  - Dark urine
  - Clay-colored stool
  - Joint pain

What is Hepatitis?

Hepatitis is an umbrella term that describes a situation involving inflammation of the liver. Scientists have identified 5 unique hepatitis viruses, while all cause liver disease, they vary in important ways.

Hepatitis A virus (HAV)
Hepatitis B virus (HBV)
Hepatitis C virus (HCV)
Hepatitis D virus (HDV)
Hepatitis E virus (HEV)



It is important to emphasize from the beginning that exposure to any one of these viruses provides no protection from any of the others. These are completely distinct pathogens; the only thing they share is a predilection for liver cells.

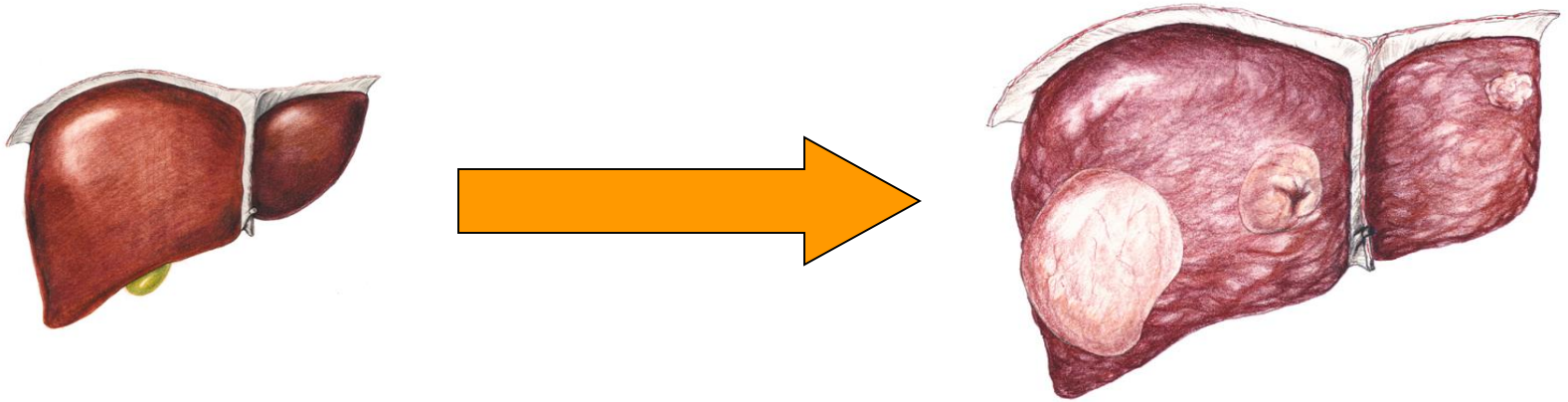
Characteristics of Hepatitis Viruses

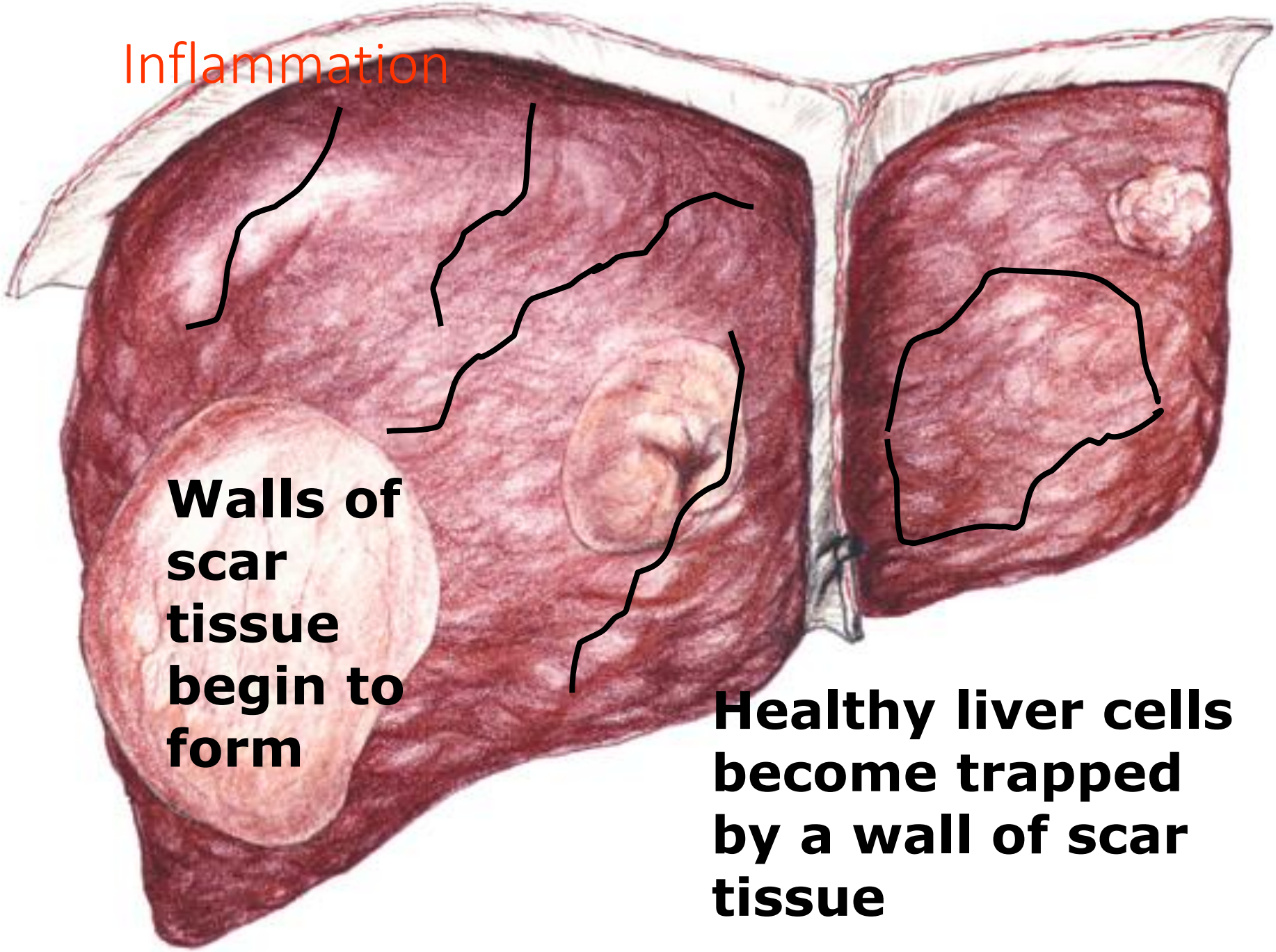
Virus	Nucleic Acid	Routes of Transmission	Mortality	Risk of Chronic Illness
HAV	Unenveloped single-stranded RNA	Fecal-oral	Low	None
HBV	Enveloped double-stranded DNA	Parenteral (sex, perinatal)	Moderate-high	High
HCV	Enveloped single-stranded RNA	Parenteral (sex, perinatal)	Moderate-high	High
HDV	Enveloped single-stranded RNA	Parenteral (sex)	High	High
HEV	Unenveloped single-stranded RNA	Fecal-oral	Low-moderate	None

Nelson KE, Thomas DL. Viral hepatitis. In *Infectious Disease Epidemiology*, 2nd ed., Nelson KE, Williams CM (eds). Jones & Bartlett, Sudbury MA, 2007; p. 898.

What Is Hepatitis?

- Hepatitis means inflammation of the liver
  - Hepat (liver) + itis (inflammation)= Hepatitis
- Viral hepatitis means there is a specific virus that is causing your liver to inflame (swell or become larger than normal)




Inflammation
Walls of scar tissue begin to form
Healthy liver cells become trapped by a wall of scar tissue

Disease Progression

- 10-25% of HCV positive people progress on to serious disease over 10-40 years
  - Fibrosis
    - Light scarring
  - Cirrhosis
    - Compensated vs. decompensated
      - **Decompensated cirrhosis** is defined by the development of jaundice, ascites, variceal hemorrhage, or hepatic encephalopathy. Survival is poor in patients with **decompensated cirrhosis** and they should be considered for liver transplantation.
      - **Compensated Cirrhosis**

      If you have compensated cirrhosis, you won't have any symptoms. Your liver can still do its job because there are enough healthy cells to make up for the damaged cells and scar tissue caused by cirrhosis. You might stay in this stage for many years.
  - Steatosis
    - Fatty deposits in the liver

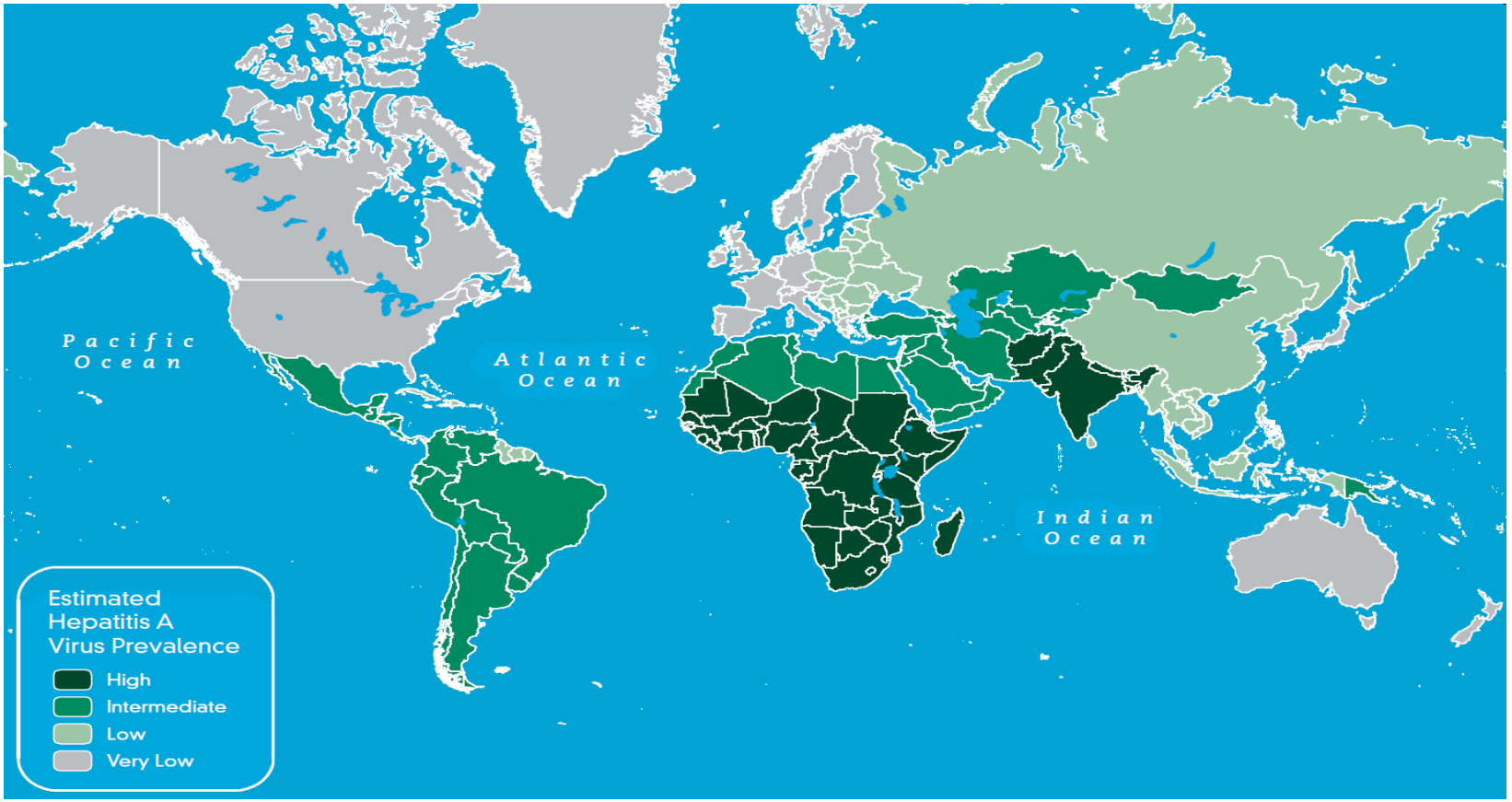
Hepatitis A (HAV)

Hepatitis A is the least serious of all the hepatitis infections. This virus concentrates in the digestive tract, so it is spread most easily through oral-fecal contamination. We occasionally hear about outbreaks of hepatitis A where fecal matter has entered the food or water supply.

The good news about hepatitis A is that one infection imparts lifelong immunity, (that's if you survive especially in underserved countries) and that this virus is only rarely associated with serious consequences. For most people, it is an inconvenience with unpleasant symptoms that may last several weeks, but it is not a threatening infection.

Most people in areas of the world with poor sanitation have been infected with this virus. Safe and effective vaccines are available to prevent HAV.

Hepatitis A Epidemiology



Prevalence of antibody to hepatitis A virus, 2010

Source: CDC YellowBook

Transmission & Risk Groups for Hepatitis A

Transmission: fecal-oral, contaminated food, water, sexual

Risk groups: international travellers, MSM, child care-givers, persons with chronic liver disease, injection drug users

Period of communicability: 1-2 weeks before symptoms, to one week after onset of jaundice

Endemic areas: Central & South America, Middle East, Asia, and western Pacific

Reservoir: Humans

Hepatitis A

- Hepatitis A has an incubation period of approximately 28 days (range: 15–50 days)
- HAV replicates in the liver and is shed in high concentrations in feces from 2 weeks before to 1 week after the onset of clinical illness
- HAV infection produces a self-limited disease that does not result in chronic infection or chronic liver disease
- *Humans are the only natural host*

Hepatitis A Features

Incubation period: 28-30 days

Symptoms: None (especially children <5 years old)

- Fever
- Malaise
- Anorexia
- Nausea
- Jaundice
- Fulminant $\rightarrow$ death (acute)
- Likelihood of clinical disease increases with age

Duration: 25-30 days

Hepatitis A
Acute Illness

- In children aged <6 years, 70% of infections are asymptomatic; if illness does occur, it is typically not accompanied by jaundice.
- Among older children and adults, infection is typically symptomatic, with jaundice occurring in >70% of patients.
- Symptoms usually last less than 2 months, although 10%–15% of symptomatic persons have prolonged or relapsing disease for up to 6 months.

Diagnosis, Treatment of Hepatitis A

Diagnosis: Anti-IgM detectable 5-10 days before symptoms; disappears by six months
Anti-IgG – convalescent, life-long, confers protection

Treatment: Supportive

Hepatitis A Vaccine Recommendations

- International travelers
- Close contact with an international adoptee from a country of high or intermediate endemicity
- Men who have sex with men
- Persons who use illegal drugs
- Persons who have a clotting factor disorder
- Persons with occupational risk
- Persons with chronic liver disease

Hepatitis A Postexposure Prophylaxis

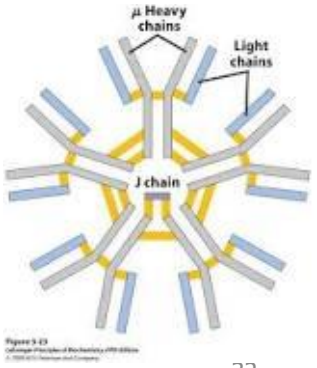
- **For healthy persons 12 months through 40 years of age:**
  - single-antigen hepatitis A vaccine should be administered as soon as possible after exposure
- **For persons older than 40 years:**
  - immune globulin is preferred
  - vaccine can be used if IG cannot be obtained

MMWR 2007;56(No.41):1080-4

IG *After* a Hepatitis A Exposure

- Children who are less than one year old should use IG.
- People older than 12 months, but are 40 years old or younger (and do not have any chronic medical conditions) should receive the hepatitis A vaccine instead of IG.
- People who are 41 years old or greater, IG is preferred.
- People who have compromised immune systems (due to an organ transplant or diseases such as cancer or AIDS) or chronic liver disease or are allergic to the vaccine should use IG.

An antibody, also known as an immunoglobulin, is a large, Y-shaped protein produced mainly by plasma cells that is used by the immune system to neutralize pathogens such as pathogenic bacteria and viruses. The antibody recognizes a unique molecule of the pathogen, called an antigen



Hepatitis B

Hepatitis B virus (HBV) is transmitted through exposure to infective blood, semen, and other body fluids. HBV can be transmitted from infected mothers to infants at the time of birth or from family member to infant in early childhood.
It causes long-term, low-grade inflammation that leads to scarring around and between hepatocytes; this interferes with liver function, and has wide-ranging implications for general health. Hepatitis B is a slow-acting virus that can silently and progressively destroy the liver. HBV also poses a risk to healthcare workers who sustain accidental needle stick injuries while caring for infected-HBV patients. Safe and effective vaccines are available to prevent HBV

Two of the unique features of the hepatitis B virus are

1. its stability outside of a host, and
2. its high concentration in the blood.

This means that it can last on surfaces for many hours, and it can be transmitted with very minimal contact: a shared toothbrush or razor may be all that it takes. Used hypodermic needles, tattoo equipment, or piercing equipment are also possible vectors. Hepatitis B can also be spread through other intimate fluids, including semen and vaginal secretions.

Hepatitis B Epidemiology

Unlike hepatitis C, people with **hep B** are at risk for liver**cancer** even if they do not have cirrhosis. ... Primary refers to**cancer** that starts in the liver. The most common primary liver **cancer** in adults is hepatocellular carcinoma (HCC), sometimes called hepatoma.

Worldwide, HBV is the primary cause of liver cancer if left untreated

- For males, it is the third leading cause of cancer mortality
- For females, it is the sixth leading cause of cancer mortality

An estimated 800,000–1.4 million persons in the United States have chronic HBV infection.
Chronic infection is an even greater problem globally, affecting approximately 350 million persons.
An estimated 620,000 persons worldwide die from HBV-related liver disease each year.

Hepatitis B Clinical Features

- Incubation period 45-160 days (average 120 days)
- Nonspecific prodrome of malaise, fever, headache, myalgia
- Illness not specific for hepatitis B
- At least 50% of infections asymptomatic

Hepatitis B Complications

- Fulminant hepatitis
- Hospitalization
- Cirrhosis
- Hepatocellular carcinoma
- Death

Chronic Hepatitis B Virus Infection

- Chronic viremia
- Responsible for most mortality
- Overall risk 5%
- Higher risk with early infection

Final Housekeeping

- Questions
- info@drbryanhawley.com
- Email us the answers and how you want your name to appear on your certificate and with what credentials

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