An Overview of Viral Hepatitis

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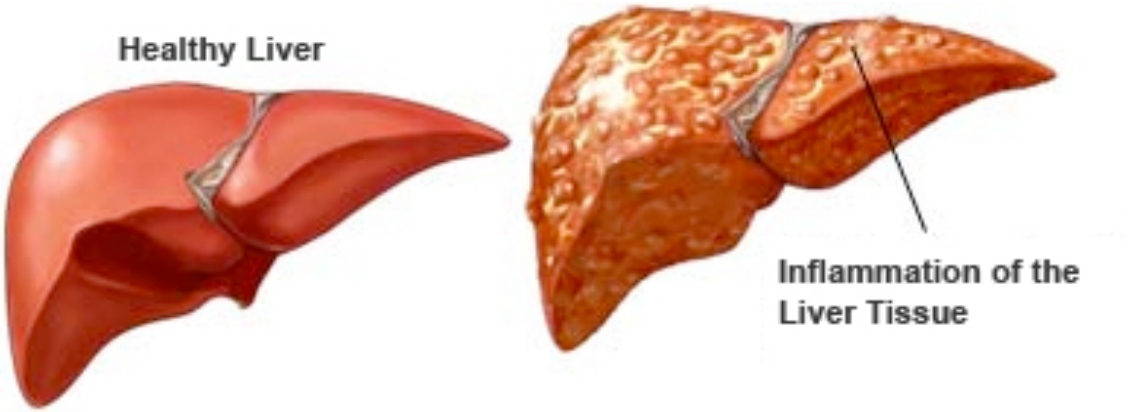
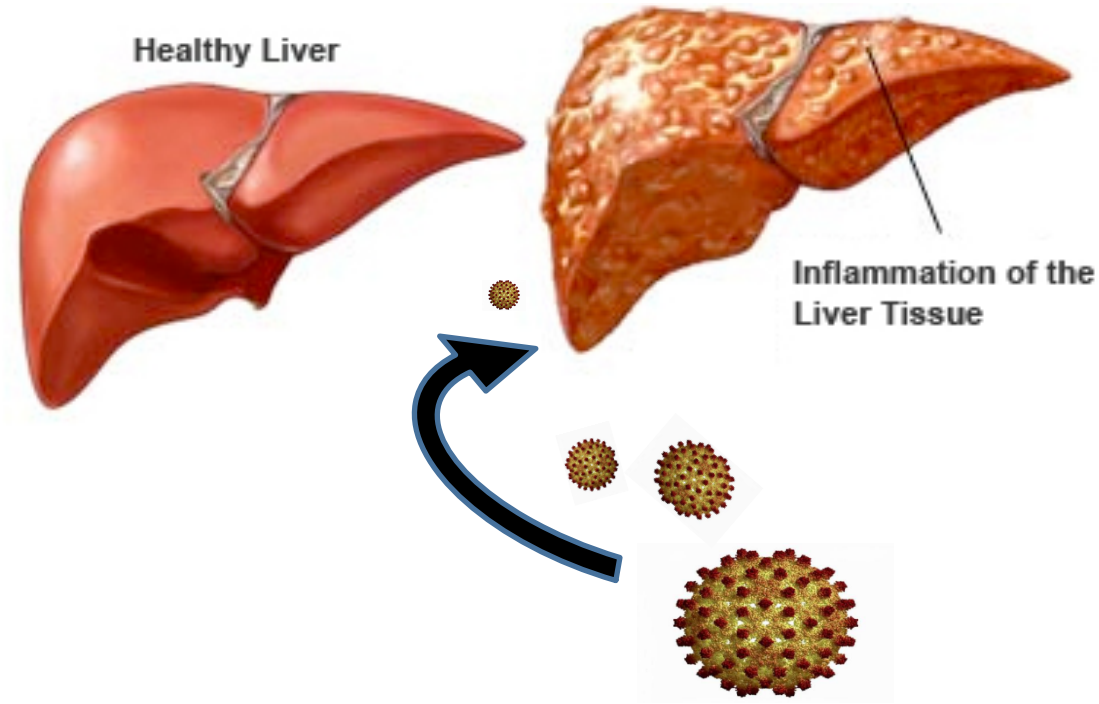
Hepatitis



- In 2007, there were 85,000 new cases of acute hepatitis in the U.S.
- There are an estimated 4.4 million people living with chronic hepatitis in the U.S.
- Viral hepatitis is the leading cause for liver cancer and liver transplants.

Viral Hepatitis



Functions of the Liver

- Regulates metabolism
- Hematological regulation
- Bile production
- Stores vitamins, glycogen
- Removes wastes

Viral Infection

Hepatitis A Virus	Hepatitis B Virus	Hepatitis C Virus

Hepatitis: Acute and Chronic

Acute Hepatitis

-Liver dysfunction (Jaundice)

-Liver failure

Chronic Hepatitis

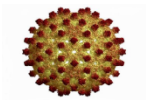
-Liver dysfunction (Jaundice)

-Liver failure

-Permanent liver damage (Cirrhosis)

-Liver cancer

Etiological Agents

	Hepatitis A Virus	Hepatitis B Virus	Hepatitis C Virus
Virus Characteristics	▪ **Picornavirus** (virus family) ▪ Single-stranded RNA (+sense) ▪ 7.5kb ▪ Non-enveloped ▪ Seven genotypes	▪ **Hepadnavirus** (virus family) ▪ Partly double-stranded DNA, circular ▪ 3.2kb ▪ Enveloped ▪ Eight genotypes	▪ **Flavivirus** (virus family) ▪ Single-stranded RNA (+sense) ▪ 10kb ▪ Enveloped ▪ Six genotypes
Hosts/Vectors	**Humans**	**Humans**	**Humans**
Organ Systems Affected/Infected	Liver and possibly small intestine	Liver	Liver and possibly lymphoid cells
Modes of Transmission	**Fecal-oral** ▪ **Contaminated food or water** ▪ **Close person-to-person contact** ▪ Sexual activity	**Contact with blood or blood containing fluids** ▪ **Sexual activity** ▪ Intravenous drug use ▪ Unsanitary tattooing or acupuncture ▪ Recipients of improperly screened organ tissue transplants and blood transfusions ▪ Mother-to-child ▪ Needle-stick injuries of health care workers	**Large or repeated exposures to blood** ▪ **Intravenous drug use** (80% of all cases) ▪ Birth from a HCV-infected mother (5%) ▪ Sexual contact ▪ Recipients of blood products and organ tissues prior to 1992 ▪ Unsanitary tattooing and body-piercing

Susceptibility and High Risk Groups

	Hepatitis A Virus	Hepatitis B Virus	Hepatitis C Virus
Susceptibility to infection and disease	▪ Everyone who has not been vaccinated or previously exposed ▪ Infants and young children are the lest susceptible to disease progression	▪ Everyone who has not been vaccinated or previously exposed ▪ Infants and young children are the least susceptible to disease progression	▪ Everyone
At risk groups	▪ **Household members or caregivers of an infected person** ▪ **International travelers** ▪ Persons engaging in sexual activity with an infected individual ▪ MSM ▪ Illegal drug users ▪ Persons with clotting-factor disorders	▪ **Persons engaging in sexual activity with an infected person** ▪ **MSM** ▪ Infants born to HBV-positive mothers ▪ Intravenous drug users ▪ Health care workers or others exposed to infected blood ▪ Hemodialysis patients ▪ Recipients of blood products or organ tissues that are not properly screened	▪ **Intravenous drug users** ▪ Recipients of blood transfusions or donated organs prior to July 1992 ▪ Health care workers or others exposed to infected blood ▪ Persons infected with HIV ▪ Infants born to HCV-positive mothers ▪ Hemodialysis patients (long-term)

Characteristics of Acute and Chronic Hepatitis

	Hepatitis A Virus	Hepatitis B Virus	Hepatitis C Virus
Acute Disease	▪ **< 10% children <6 years have jaundice** ▪ **70%-80% persons >14 have jaundice** ▪ **Typically, no lasting liver damage** ▪ Incubation: 5-50 days (average, 28)	▪ **Persons >5 years experience symptoms 30%-50% of cases.** ▪ **Acute HBV resolved in 95%-99% of cases for otherwise healthy adults** ▪ **Most persons with acute disease recover with no lasting liver damage** ▪ Incubation: 45-160 (average, 120) ▪ Children 1-5 years experience symptoms 5%-15% of reported cases	▪ **20%-30% of newly infected persons develop symptoms** ▪ 14-180 (average, 45)
	Viral hepatitis A, B, and C are symptomatically indistinguishable Symptoms: fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, gray-colored feces, joint pain, jaundice		
Chronic Disease	▪ **No potential for chronic manifestation**	▪ **> 90% of infants (unimmunized)** ▪ **15%-25% chronic carriers develop liver disease (cirrhosis, liver failure, and liver cancer)** ▪ Occurs in 6%-10% of person >5 years	▪ **75%-85% of infected persons develop chronic infections, the remainder clear the virus** ▪ 60%-70% of chronically infected persons develop chronic liver disease ▪ 1%-5% will die from cirrhosis or liver cancer

Diagnosis of Hepatitis

- For all three forms (HAV, HBV, and HCV) serologic tests
  for infections are conducted.

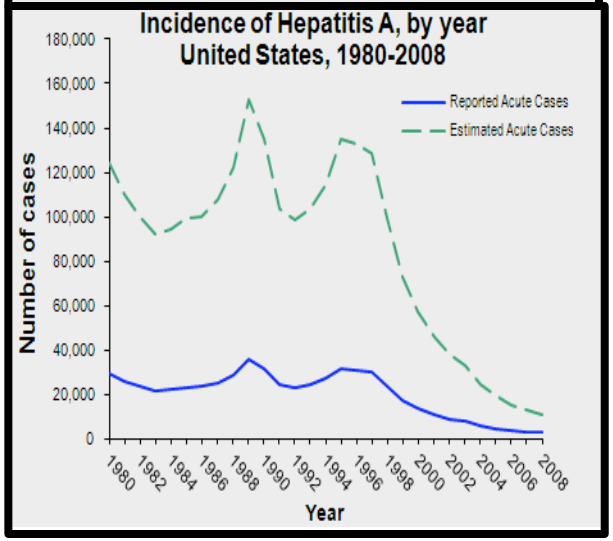
- However for HCV,
  there is no serologic marker for
  acute infection.

Screening Recommendations

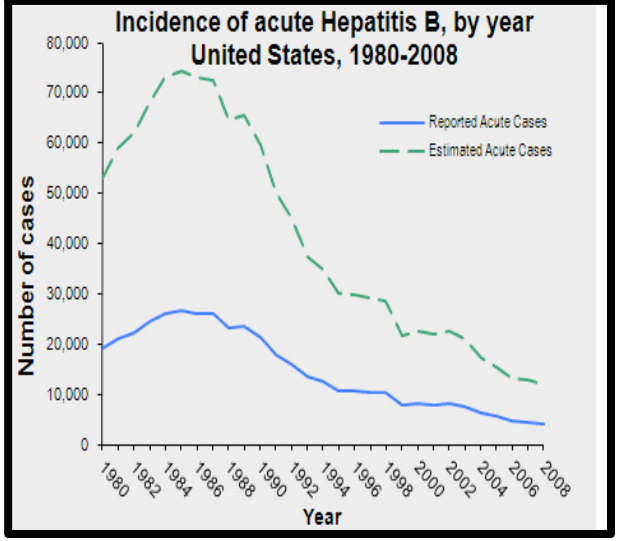
Hepatitis A Virus	Hepatitis B Virus	Hepatitis C Virus
▪ Not applicable, no chronic infection	Testing recommended for these groups: ▪ All pregnant women ▪ Persons born in areas with high prevalence ▪ Infants born to infected mothers ▪ Household of, needle sharing, sex contacts with positive persons ▪ Male with male sex partners ▪ IV drug users ▪ Hemodialysis patients ▪ HIV infected persons ▪ Donors of blood,	Testing recommended for these groups: ▪ IV drug users (past history also) ▪ Recipients of transfusions before July 1992 ▪ Long-term hemodialysis patients ▪ HIV infected persons ▪ Person with known exposures to HCV (health workers after needlesticks, organ or blood donor recipients from donor who tested positive) ▪ Patients with signs of liver disease ▪ Donors of blood, plasma, organs, tissues, or semen

Incidence of Acute Hepatitis, United States

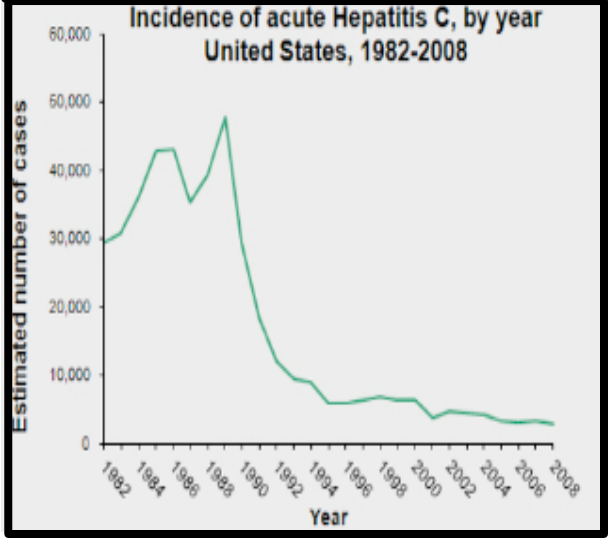
Hepatitis A



Hepatitis B



Hepatitis C



<u>Incidence rate for 2007</u>

-Hepatitis A: 25,000

-Hepatitis B: 43,000

-Hepatitis C: 17,000

Prevention, Treatment, Control

Hepatitis A Virus	Hepatitis B Virus	Hepatitis C Virus
▪ Proper sanitation (hand washing) and hygienic practices, particularly for food handlers and caregivers ▪ Passive immunization with IG for those infected within 2 weeks of exposure ▪ HAV vaccine effective, 2 doses, 6 months apart; safe for infants >1 year.	▪ Limit exposure to HBV infected blood ▪ No sharing of devices exposed to human blood (i.e., razors) ▪ Strict screening of blood products and transplant organs ▪ Use of latex condoms ▪ Effective HBV vaccine available	▪ No HCV vaccine ▪ Control and prevention focus on limiting spread of pathogen in blood-to-blood contact. ▪ Cannot be treated, but managed ▪ Consult with liver specialist, sleep, nutrition ▪ Two medicines used: interferon and ribavirin

Reporting Requirements, Oregon

All Oregon physicians, health care providers, and labs required to report all cases/suspected cases of HAV, HBV, and HCV within 1 local public health authority working day to local health authority in the state of Oregon. If not possible, report to state Department of Human Services.