



# **Hepatitis 2003**

## **STARS Program**

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# Outline

- **Hepatitis A**

- Epidemiology and screening
- Transmission

- **Hepatitis B**

- Epidemiology and screening recommendations
- Transmission

- **Hepatitis C**

- Epidemiology and screening
  - Transmission
-

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# The Liver

What is my liver?

**Your liver is a large and important organ in your body**

Where is my liver?

Your liver is located behind the lower right part of your ribs



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# The Liver

## What does my liver do?

- Stores vitamins, sugars, fats and other nutrients from the food that you eat
- Builds chemicals that your body needs to stay healthy
- Breaks down harmful substances, like alcohol and other toxic (poisonous) chemicals
- Removes waste products from your blood
- Makes sure that your body has just the right amount of other chemicals that it needs



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# Viral Hepatitis

What is hepatitis?

**Hepatitis is a disease that affects the liver. It is often caused by viruses such as the**

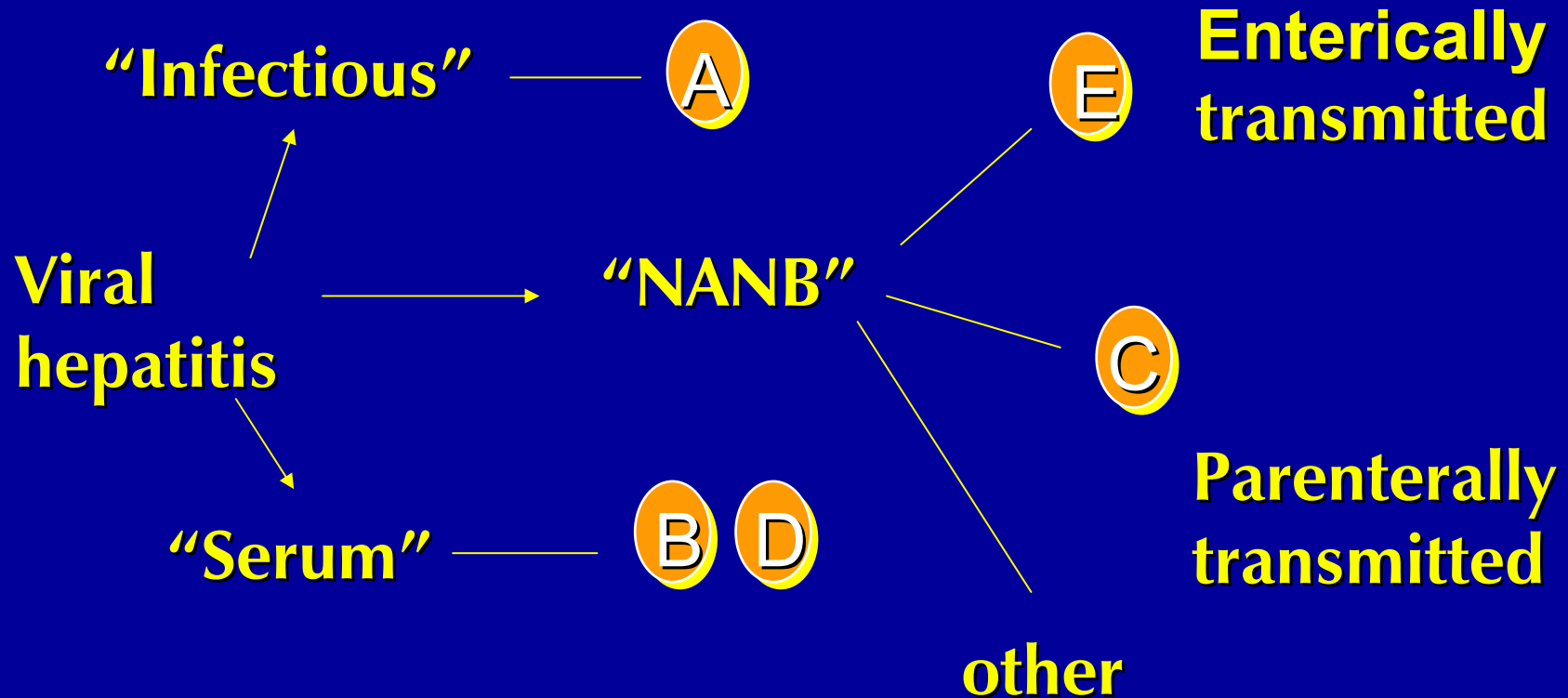
- hepatitis A virus (HAV)
- hepatitis B virus (HBV)
- hepatitis C virus (HCV)

**According to government estimates, almost 4 million people in the U.S. have been infected with the hepatitis C virus.**

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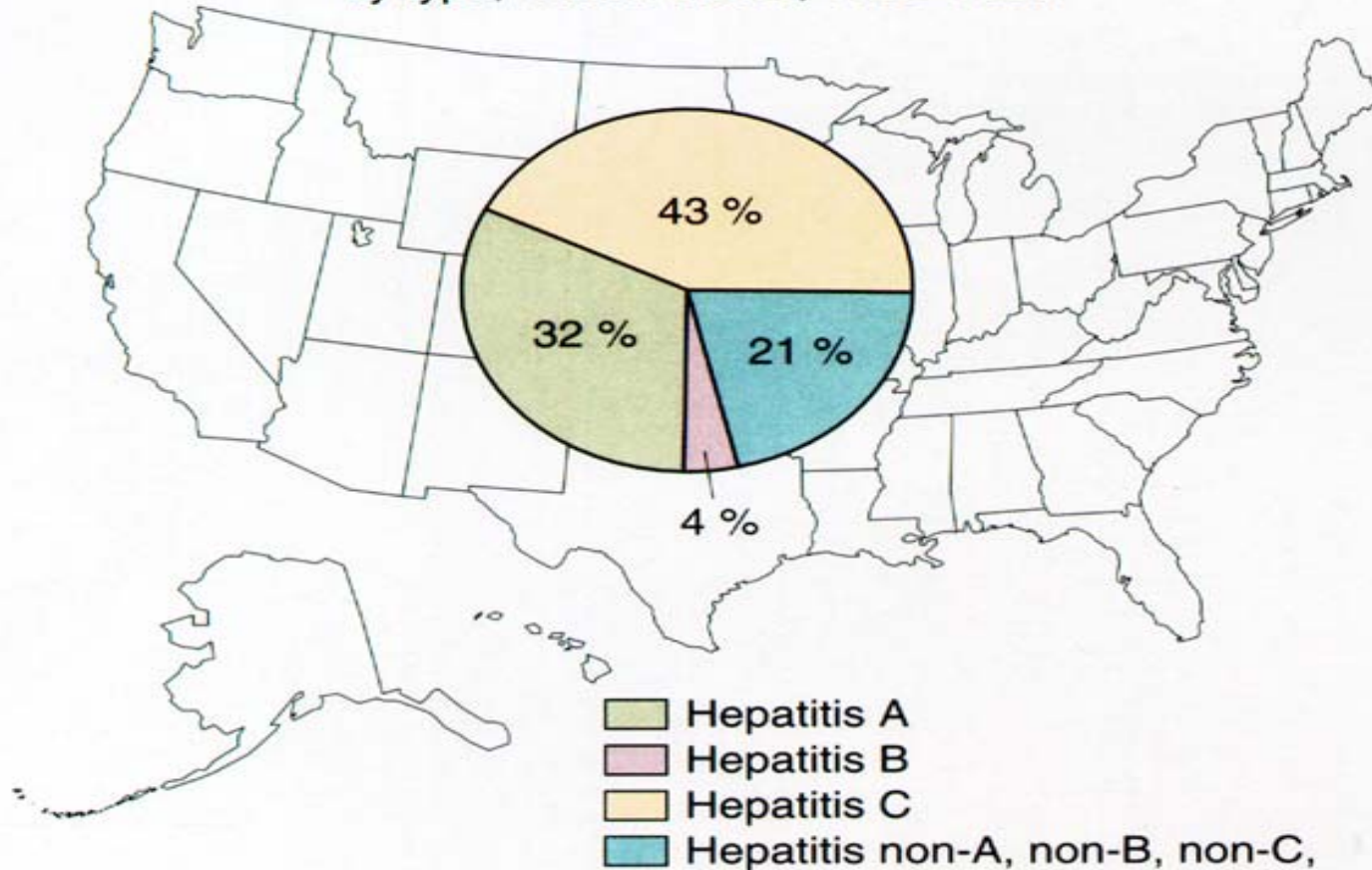
# VIRAL HEPATITIS

## HISTORICAL PERSPECTIVE



# Prevalence

Relative proportions of acute viral hepatitis by type, United States, 1982–1990





# REPORTED CASES OF SELECTED NOTIFIABLE DISEASES PREVENTABLE BY VACCINATION, UNITED STATES, 2001

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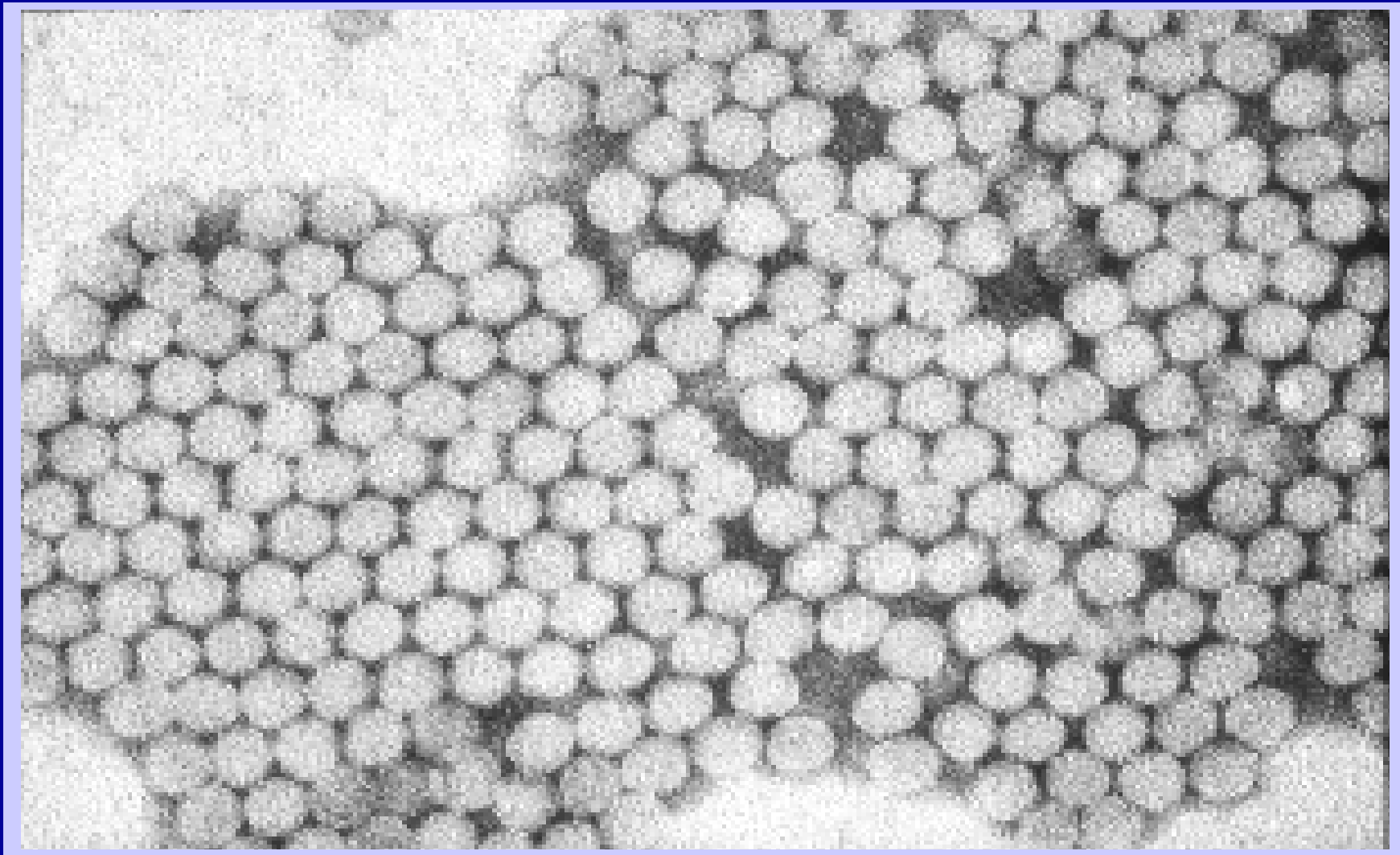
<b>Hepatitis A</b>	<b>10,609</b>
<b>Hepatitis B</b>	<b>7,843</b>
<b>Mumps</b>	<b>266</b>
<b>Measles</b>	<b>116</b>

Source: NNDSS, CDC





# HEPATITIS A VIRUS





# HEPATITIS A VIRUS

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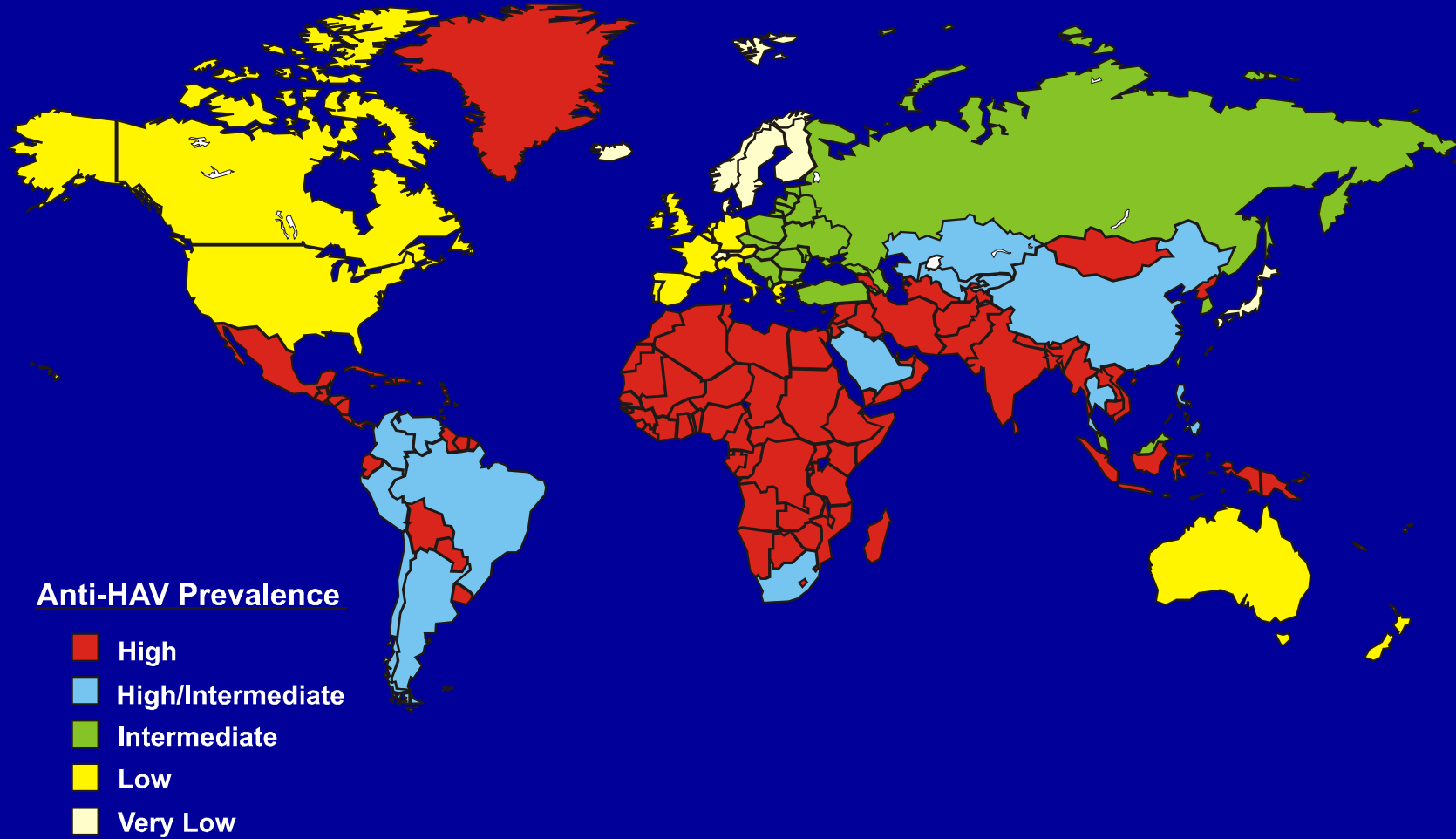
- **RNA Picornavirus**

- Single serotype worldwide
- Acute disease and asymptomatic infection

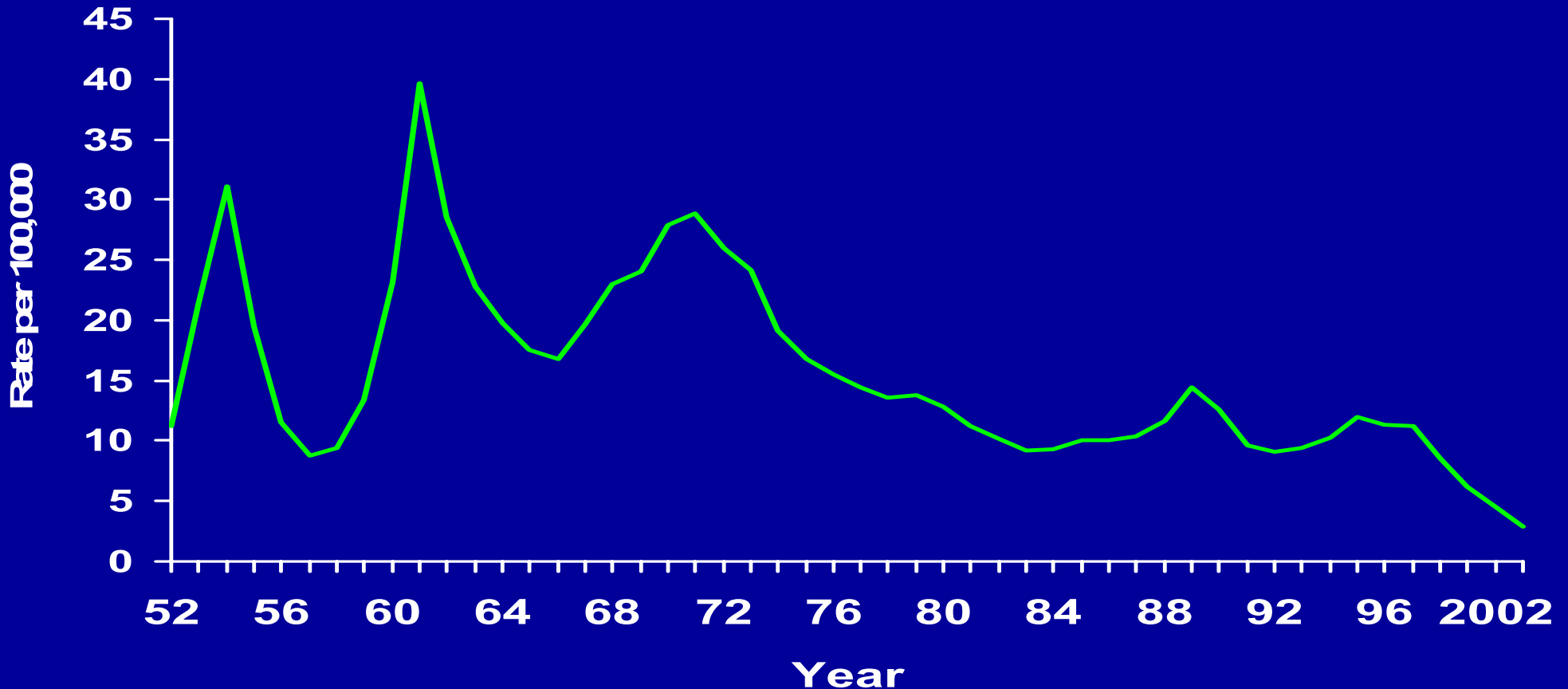
- **No chronic infection**

- Protective antibodies develop in response to infection - confers lifelong immunity
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# GEOGRAPHIC DISTRIBUTION OF HEPATITIS A VIRUS INFECTION



# REPORTED CASES OF HEPATITIS A, UNITED STATES, 1952-2002



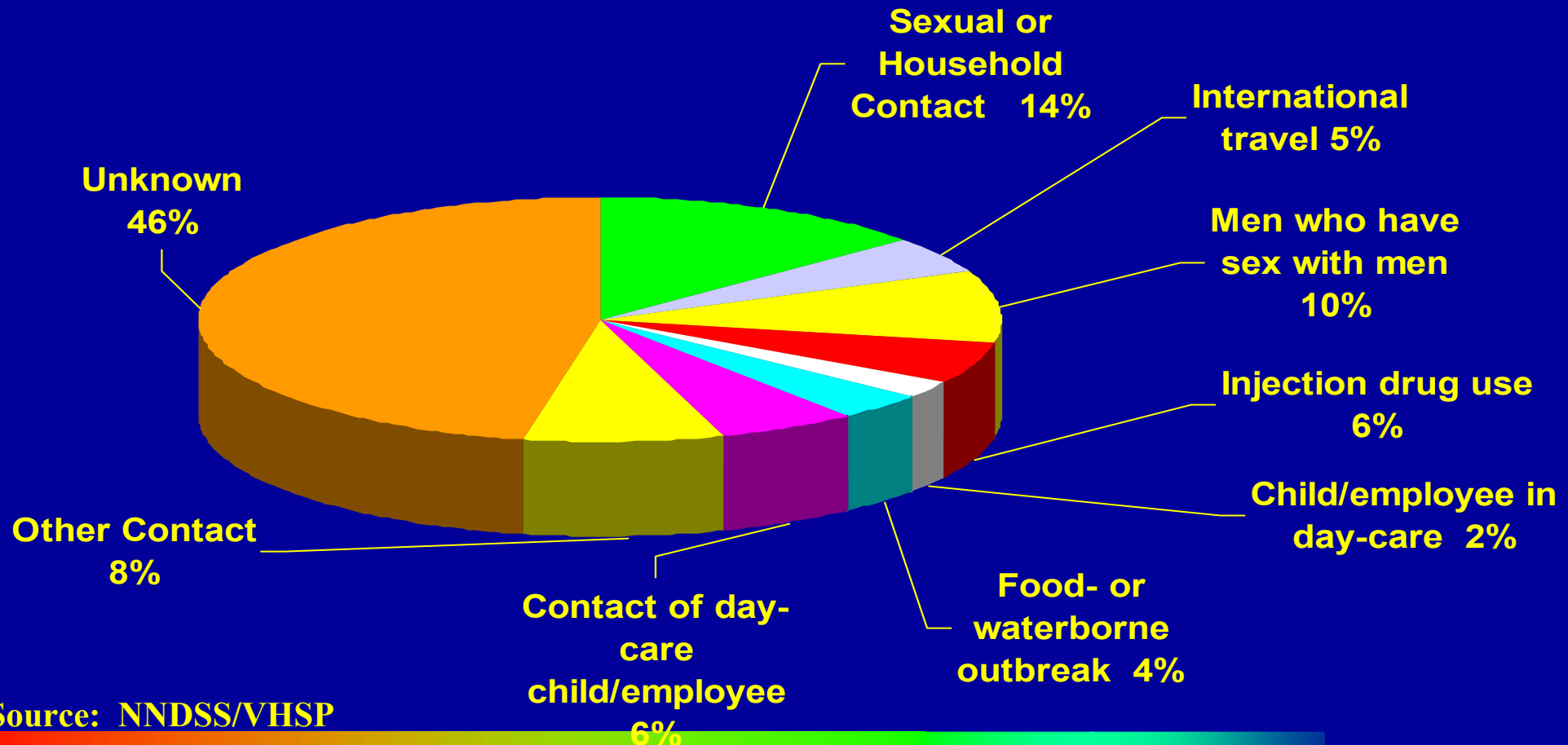
Source: NNDSS, CDC

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# HEPATITIS A VIRUS TRANSMISSION

- Close personal contact  
(e.g., household contact, sex contact, child day-care centers)
  - Contaminated food, water  
(e.g., infected food handlers)
  - Blood exposure (rare)  
(e.g., injection drug use, rarely by transfusion)
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# RISK FACTORS ASSOCIATED WITH REPORTED HEPATITIS A, 1990-2000, UNITED STATES




Source: NNDSS/VHSP

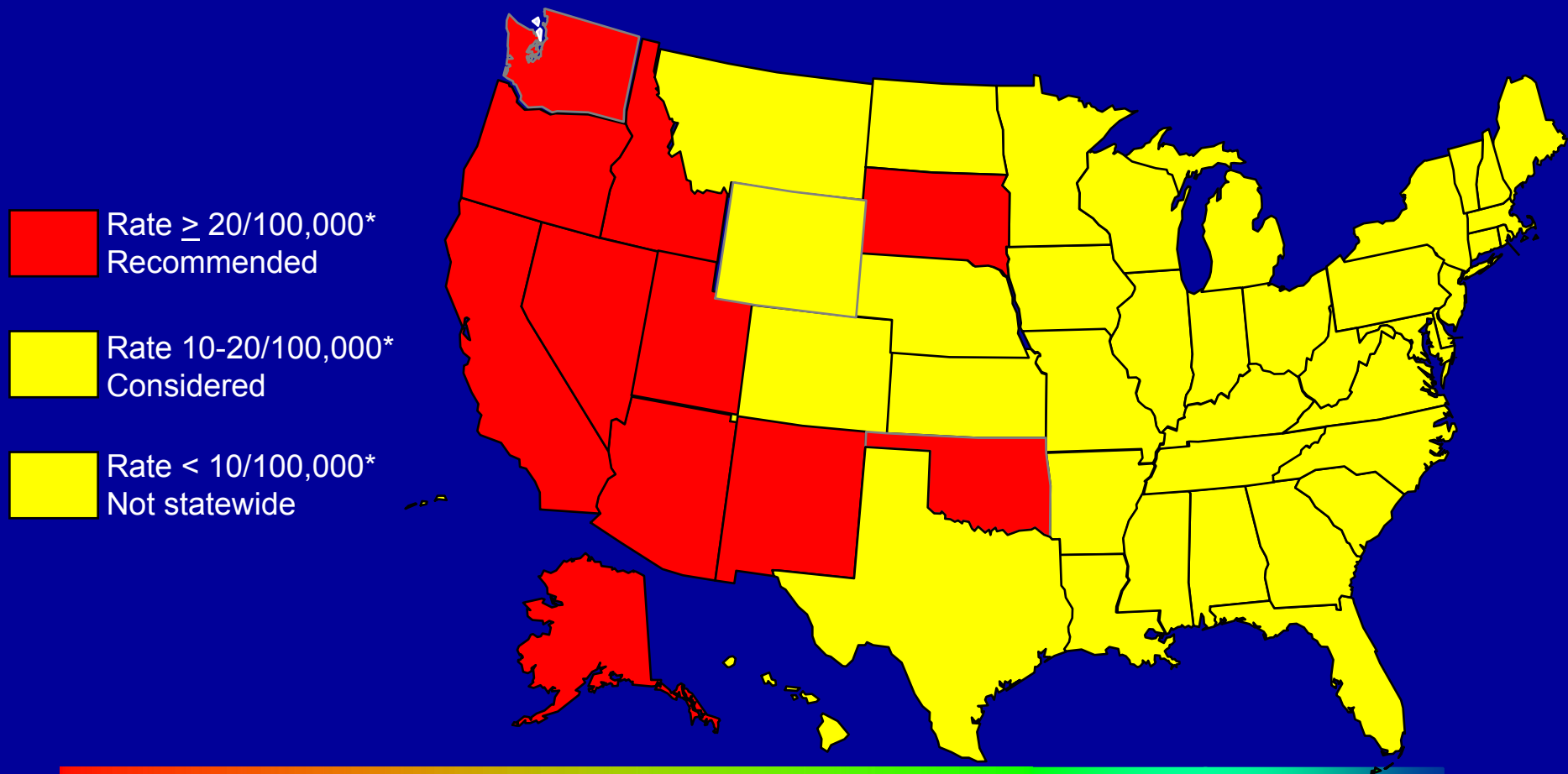


## PREVENTING HEPATITIS A

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- Hygiene (e.g., hand washing)
  - Sanitation (e.g., clean water sources)
  - Hepatitis A vaccine (pre-exposure)
  - Immune globulin (pre- and post-exposure)
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# 1999 ACIP RECOMMENDATIONS FOR STATEWIDE ROUTINE HEPATITIS A VACCINATION OF CHILDREN



\* Based on average incidence rate during baseline period (1987- 97)



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## ACIP RECOMMENDATIONS PERSONS AT INCREASED RISK OF INFECTION, 1996

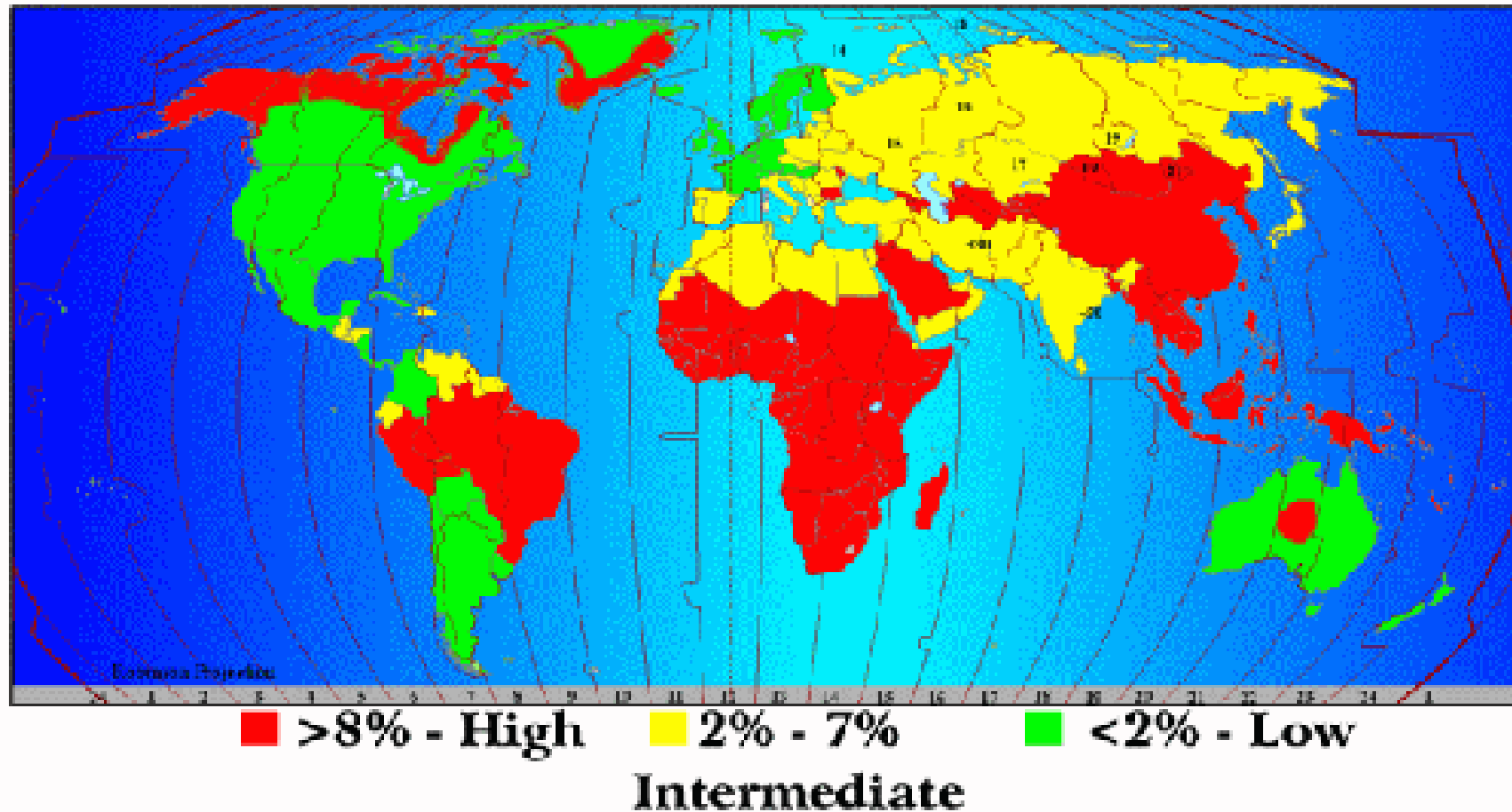
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- **Men who have sex with men**
  - **Illegal drug users**
  - **International travelers**
  - **Persons who have clotting factor disorders**
  - **Persons with chronic liver disease**
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# SAFETY OF HEPATITIS A VACCINE

- Most common side effects
  - Soreness/tenderness at injection site - 50%
  - Headache - 15%
  - Malaise - 7%
- No severe adverse reactions attributed to vaccine
- Safety in pregnancy not determined – risk likely low
- Contraindications - severe adverse reaction to previous dose or allergy to a vaccine component
- No special precautions for immunocompromised persons

# Global Distribution of Chronic Hepatitis B Infection



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# Hepatitis B Epidemiology

- **Transmission**
    - perinatal, percutaneous and sexual exposures as well as close person to person contact
  - **HBV can survive outside the body for prolonged periods.**
  - **The risk of developing chronic HBV after acute exposures**
    - 90% in newborns of HBeAg positive mothers to 25-30% in infants and children < 5 and less than 10% in adults.
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# Fulminant Hepatitis B



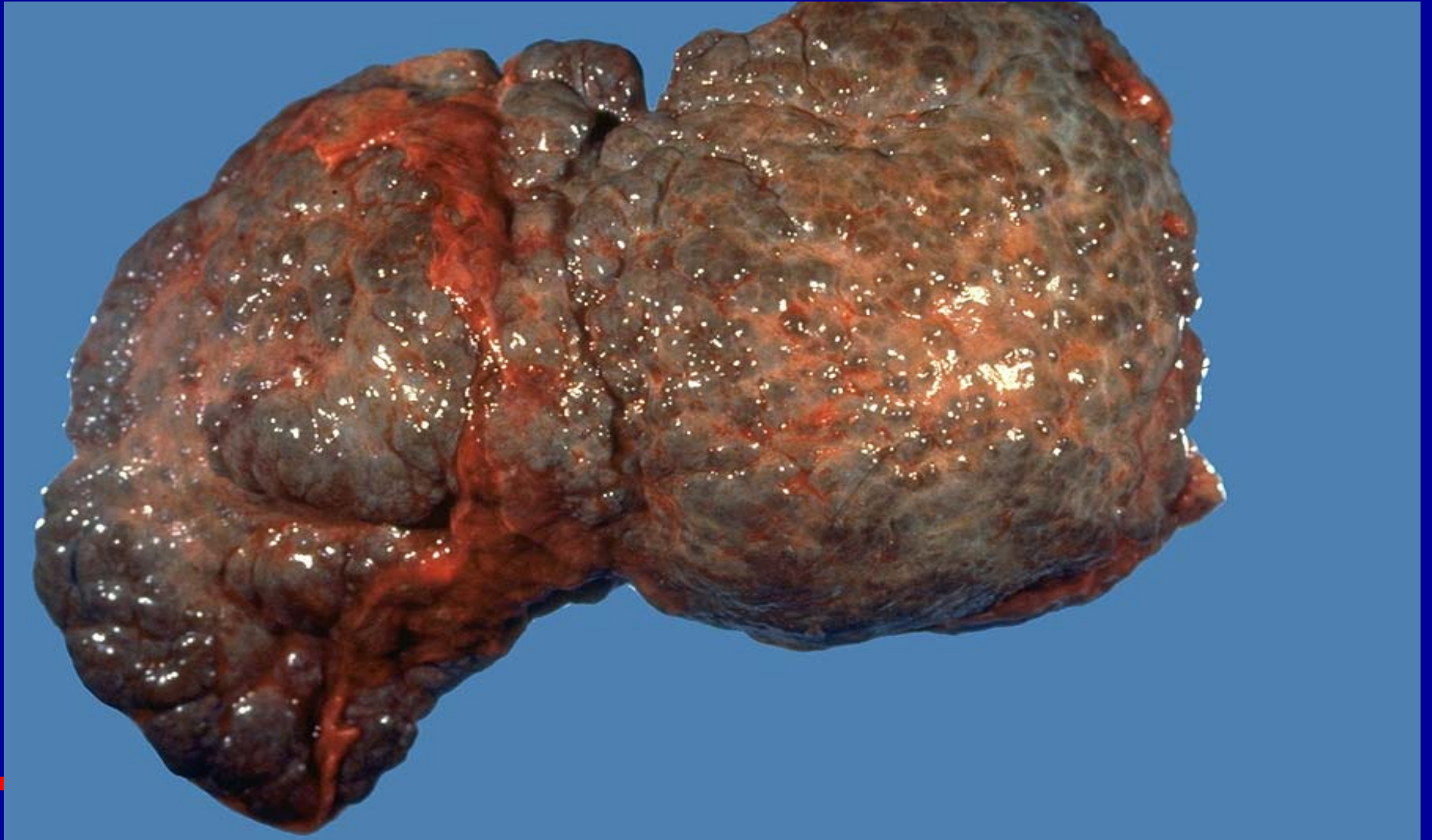
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# Clinical Status -Hepatitis B

- Chronic Hepatitis B
    - HBsAg positive > 6 months
    - Serum HBV DNA >10<sup>5</sup> copies /ml
    - Elevation in Liver Tests
    - Liver biopsy showing inflammation and injury
  - Inactive HBsAg Carrier State
    - HBsAg positive > 6 months
    - No detectable HBV DNA
    - Normal Liver Tests
    - Liver biopsy without inflammation and injury
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# Cirrhosis- Chronic Hepatitis B



# Ascites and Other Manifestations of Cirrhosis





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## Recommendations for screening for HBV infections

- **Persons born in hyperendemic areas**
  - **Homosexual**
  - **Injection drug users**
  - **Dialysis patients**
  - **HIV infected individuals**
  - **Pregnant women**
  - **Family members, household members and sexual contacts of HBV infected persons.**
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# Vaccinations for patients with chronic Hepatitis B

- All persons with chronic hepatitis B not immune to hepatitis A should receive 2 doses of hepatitis A vaccine 6 to 18 months apart
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## Counseling and Prevention of Hepatitis B

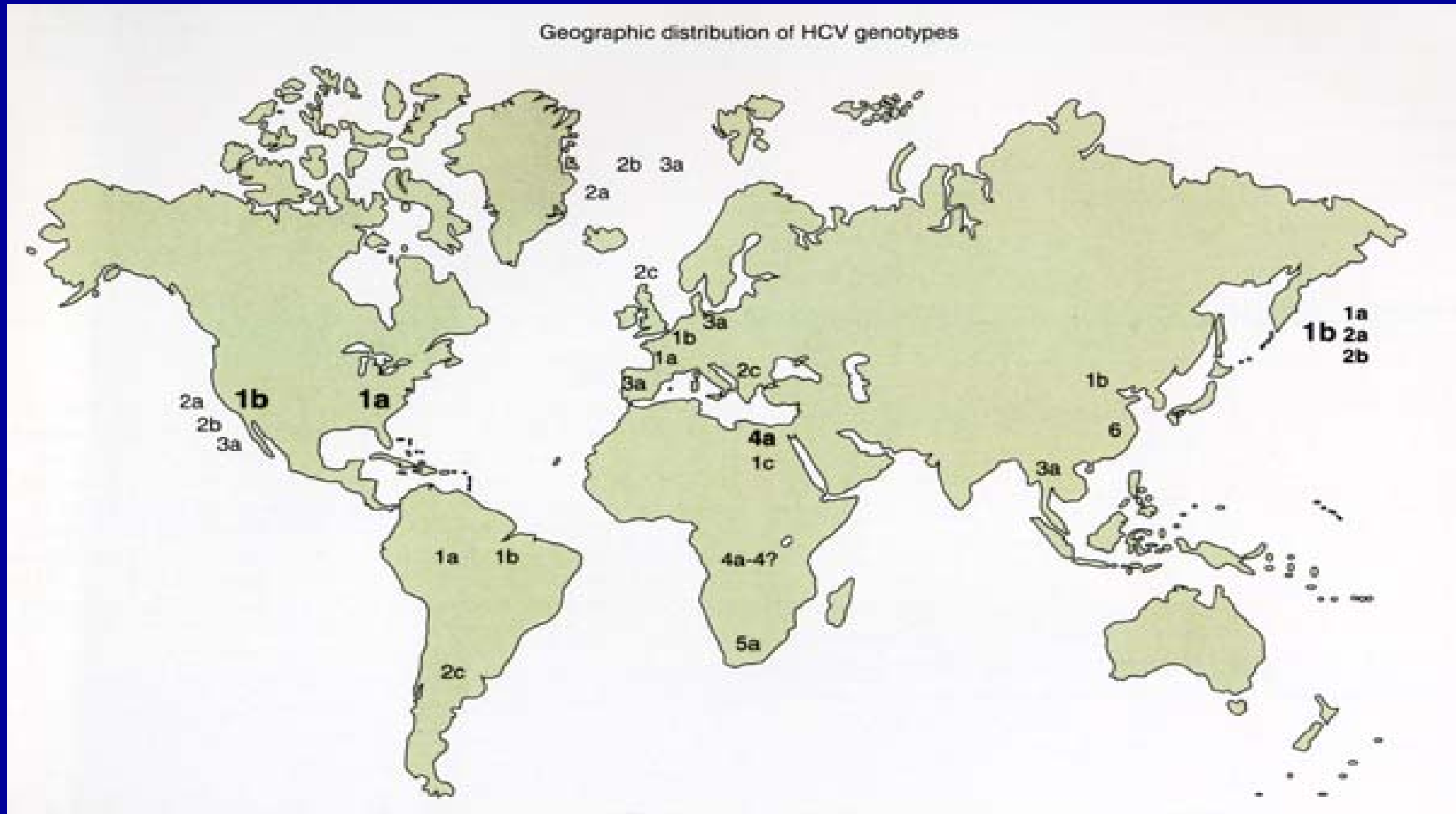
- Heavy use of alcohol have been associated with higher ALT levels and development of cirrhosis and HCC at a younger age.
  - Carriers of HBV counseled as to the **risk of transmission**
  - Household members should be vaccinated if negative for HBV serologic markers.
  - Screening should be performed by **testing for HBsAg and anti-HBsAb.**
  - **Steady sexual partners** should be tested and vaccinated.
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# COMBINED HEPATITIS A HEPATITIS B VACCINE

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- Approved by the FDA in United States for persons  $\geq 18$  years old
  - Contains 720 EL.U. hepatitis A antigen and 20  $\mu\text{g}$ . HBsAg
  - Vaccination schedule: 0,1,6 months
  - Immunogenicity similar to single-antigen vaccines given separately
  - Can be used in persons  $\geq 18$  years old who need vaccination against both hepatitis A and B
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# Worldwide distribution of HCV Genotypes



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# How Is the Hepatitis C Virus Spread?

The hepatitis C virus is spread through contact with the blood of an infected person. Some of the ways that people have been infected include having

- had a blood transfusion or organ transplant before 1992
- a clotting factor problem, and being given a blood product before 1987
- used a contaminated needle to inject drugs like heroin or cocaine, even if it was only once, many years ago
- been on long-term kidney dialysis

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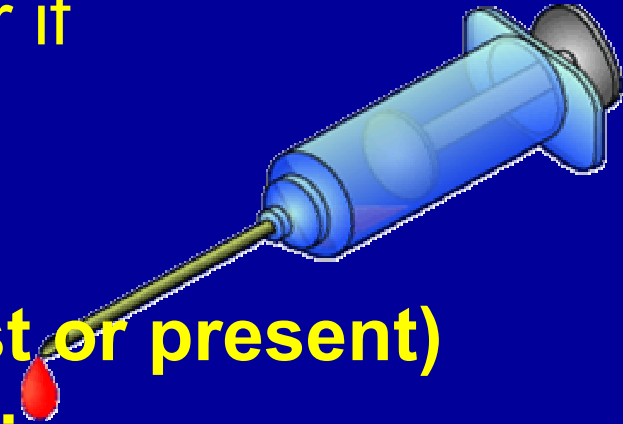
- been a health care worker and having had contact with blood in the workplace, especially through needle stick injuries
  - been born to a woman who had hepatitis C when she gave birth to you
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# How Can I Decide If I Am at Risk for Hepatitis C?

Talk with your health care provider if

- **you had a blood transfusion before 1992**
- **you have injected drugs (past or present)**
- **you have unexplained liver disease**
- **you have unexplained/abnormal ALT levels**
- **you have a history of drinking alcohol excessively**



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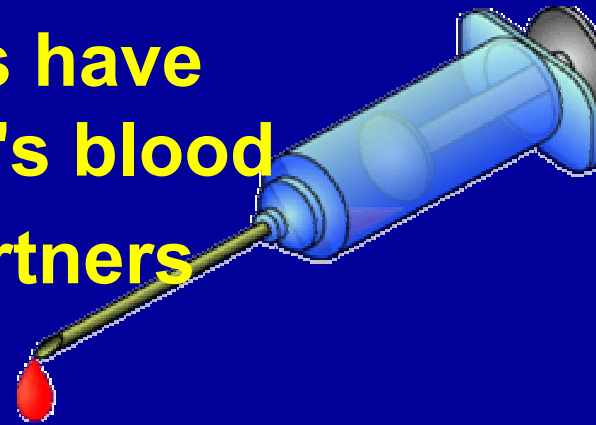


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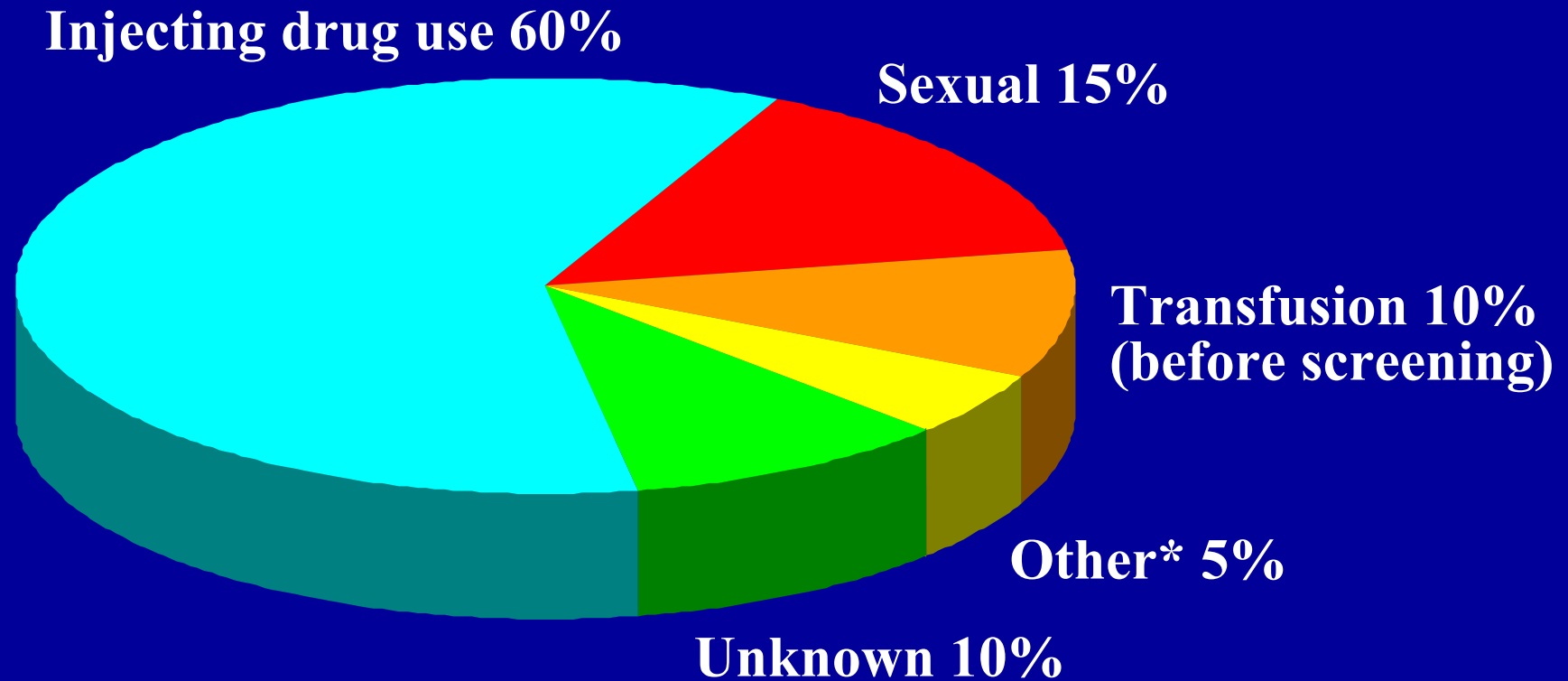
# How Can I Decide If I Am at Risk for Hepatitis C?

Talk with your health care provider if

- **your skin or mucous membranes have been exposed to another person's blood**
- **you have had multiple sexual partners**
- **you were on hemodialysis**
- **you have tattoos or repeated body piercings**
- **you have a history of snorting cocaine**



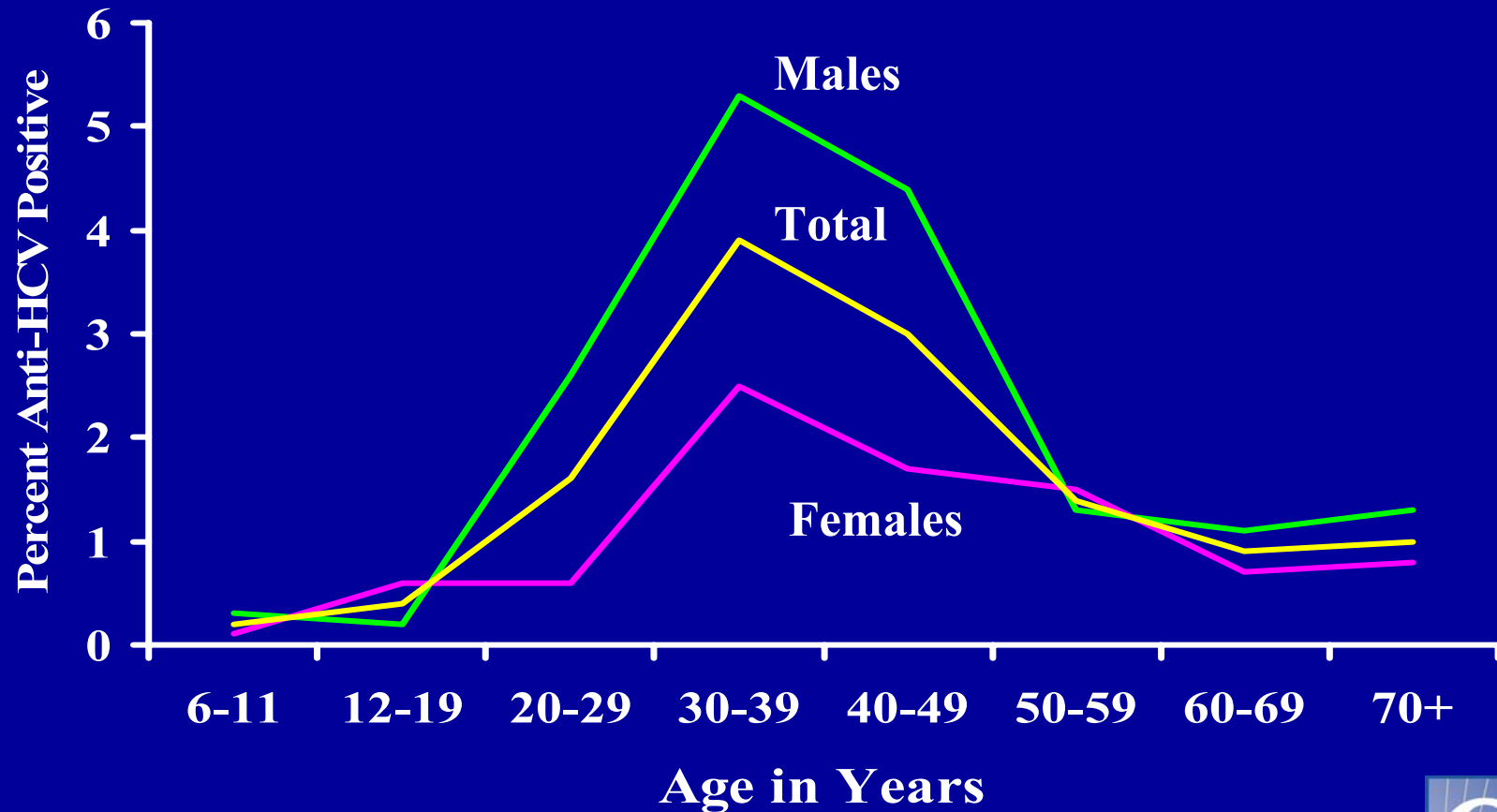
# Sources of Infection for Persons with Hepatitis C



\*Nosocomial; Health-care work; Perinatal

Source: Centers for Disease Control and Prevention

# Prevalence of HCV Infection by Age and Gender, United States, 1988-1994



Source: CDC, NHANES III

# Prevalence of HCV Infection United States, 1988-1994

<u>Group</u>	<u>Anti-HCV Positive</u>	<u>Est. Infections millions (95% CI)</u>	<u>Percent of Infections</u>
<b>Total</b>	<b>1.8%</b>	<b>3.9 (3.1-4.8)</b>	<b>100%</b>
<b>Race/ethnicity</b>			
<b>White</b>	<b>1.5%</b>	<b>2.4 (1.8-3.1)</b>	<b>61%</b>
<b>Black</b>	<b>3.2%</b>	<b>0.8 (0.6-1.0)</b>	<b>20%</b>
<b>Mex American</b>	<b>2.1%</b>	<b>0.3 (0.2-0.3)</b>	<b>7%</b>
<b>Other</b>	<b>2.9%</b>	<b>0.5 (0.3-1.0)</b>	<b>13%</b>

Source: NEJM 1999;341:556-62

# Transmission of HCV

- **Nosocomial**

- Primarily in outbreaks
- Contaminated equipment
  - hemodialysis\*
  - endoscopy
- Unsafe injection practices
  - plasmapheresis,\*  
phlebotomy
  - multiple dose medication vials
  - therapeutic injections

- **Household**

- Rare but not absent

- **Occupational**

- Inefficiently transmitted
- Average incidence 1.8% following needle stick from HCV-positive source
- Case reports of transmission from blood splash to eye
- Prevalence 1-2% among health care workers
  - Lower than adults in the general population
  - 10 times lower than for HBV infection

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# Percutaneous Exposure in Other Settings

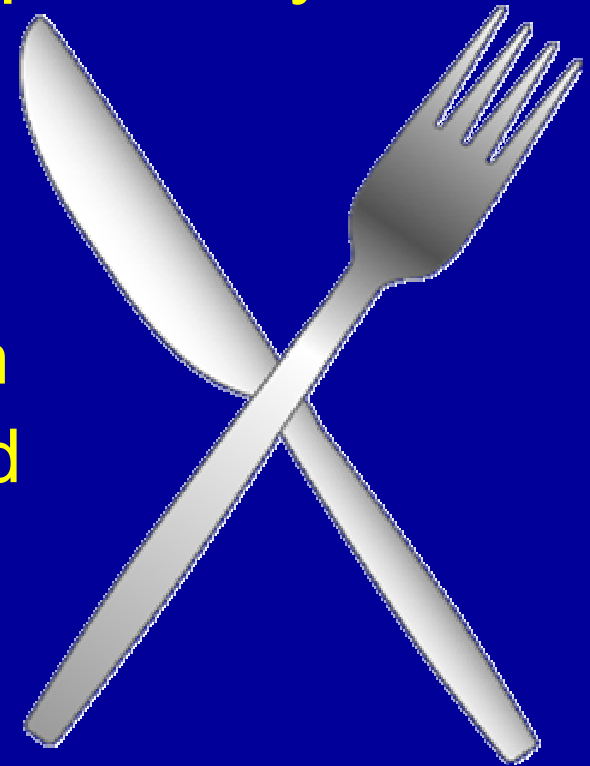
- **No reported association between HCV infection and these types of exposures:**
    - **Tattooing**
    - **Body piercing**
    - **Commercial barbering**
    - **Acupuncture**
  - **Further studies are needed to determine if these types of exposures are risk factors for HCV infection in the United States**
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# What Are Some Ways in Which the Hepatitis C Virus Is NOT Spread?

The hepatitis C virus is **not** spread by

- holding someone's hand
- hugging or kissing someone
- being coughed or sneezed on
- sharing eating utensils or food
- eating food or drinking water
- donating blood



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# What Are the Symptoms of Hepatitis C?

Symptoms of hepatitis C are usually very mild. You may not have any symptoms at all. Even though hepatitis C might not make you feel sick, it is still a serious illness. In most cases, hepatitis C never goes away. Over time, it can cause other problems, including **cirrhosis** and liver cancer.

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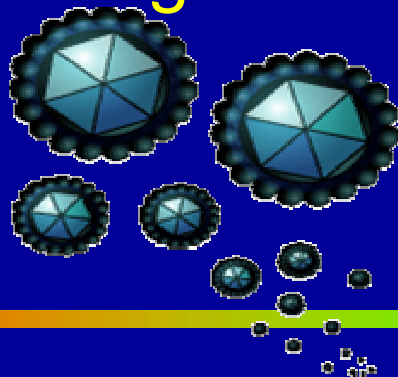


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# Can I Get a Vaccine Against Hepatitis C?

There is **not** a vaccine that will keep you from getting hepatitis C. There are vaccines that can keep you from getting *other* kinds of hepatitis, such as **A** and **B**.

Ask your health care provider about getting vaccinated against hepatitis A and B.



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# How Can I Prevent Myself from Getting or Spreading the Hepatitis C Virus?

- **Don't inject drugs**

If you can't stop, use a clean needle every time, and never share your needle or works with anyone else.

- **Practice safe sex**

Use a latex barrier, such as a rubber (condom), to prevent the spread of other sexually transmitted diseases.

- **Don't share personal items that might have blood on them**

Don't share items such as razors, toothbrushes, or personal medical supplies.

- **Talk with your health care provider about hepatitis C**

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## Reduce or Eliminate Risks for Acquiring HCV Infection

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- **Screen and test donors**
- **Virus inactivation of plasma-derived products**
- **Risk-reduction counseling and services**
  - Obtain history of high-risk drug and sex behaviors
  - Provide information on minimizing risky behavior, including referral to other services
  - Vaccinate against hepatitis A and/or hepatitis B
- **Infection control practices**

MMWR 1998;47 (No. RR-19)

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# Postexposure Management for HCV

- **Follow-up after needlesticks, sharps, or mucosal exposures to HCV-positive blood**
    - Test source for anti-HCV
    - Test worker if source anti-HCV positive
      - Anti-HCV and ALT at baseline and 4-6 months later
      - For earlier diagnosis, HCV RNA by PCR at 4-6 weeks
    - Confirm all anti-HCV results with RIBA
  - **Refer infected worker to specialist for medical evaluation and management**
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# HCV Counseling

- **Prevent transmission to others**
    - **Direct exposure to blood**
    - **Perinatal exposure**
    - **Sexual exposure**
  - **Refer to support group**
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# Preventing HCV Transmission to Others

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## Avoid Direct Exposure to Blood

- **Do not donate blood, body organs, other tissue or semen**
- **Do not share items that might have blood on them**
  - personal care (e.g., razor, toothbrush)
  - home therapy (e.g., needles)
- **Cover cuts and sores on the skin**

# Persons Using Illegal Drugs

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- **Provide risk reduction counseling, education**
  - **Stop using and injecting**
  - **Refer to substance abuse treatment program**
  - **If continuing to inject**
    - **Never reuse or share syringes, needles, or drug preparation equipment**
    - **Vaccinate against hepatitis B and hepatitis A**
    - **Refer to community-based risk reduction programs**

## Mother-to-Infant Transmission of HCV

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- **Postexposure prophylaxis not available**
- **No need to avoid pregnancy or breastfeeding**
  - Consider bottle feeding if nipples cracked/bleeding
- **No need to determine mode of delivery based on HCV infection status**
- **Test infants born to HCV-positive women**
  - Consider testing any children born since woman became infected
  - Evaluate infected children for CLD



## Sexual Transmission of HCV

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### Persons with One Long-Term Steady Sex Partner

- **Do not need to change their sexual practices**
- **Should discuss with their partner**
  - Risk (low but not absent) of sexual transmission
  - Routine testing not recommended but counseling and testing of partner should be individualized
    - May provide couple with reassurance
    - Some couples might decide to use barrier precautions to lower limited risk further

# Sexual Transmission of HCV

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## Persons with High-Risk Sexual Behaviors

- **At risk for sexually transmitted diseases, e.g., HIV, HBV, gonorrhea, chlamydia, etc.**
- **Reduce risk**
  - Limit number of partners
  - Use latex condoms
  - Get vaccinated against hepatitis B
  - MSMs also get vaccinated against hepatitis A

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# Are There Medicines to Treat Hepatitis C?

There are treatments for hepatitis C. However, these treatments are not right for everyone. Treatments for hepatitis C that have been approved by the Food and Drug Administration (FDA) include

- ◆ interferon combined with ribavirin (called *combination therapy*)
- ◆ long-acting interferon (called *pegylated interferon*)

