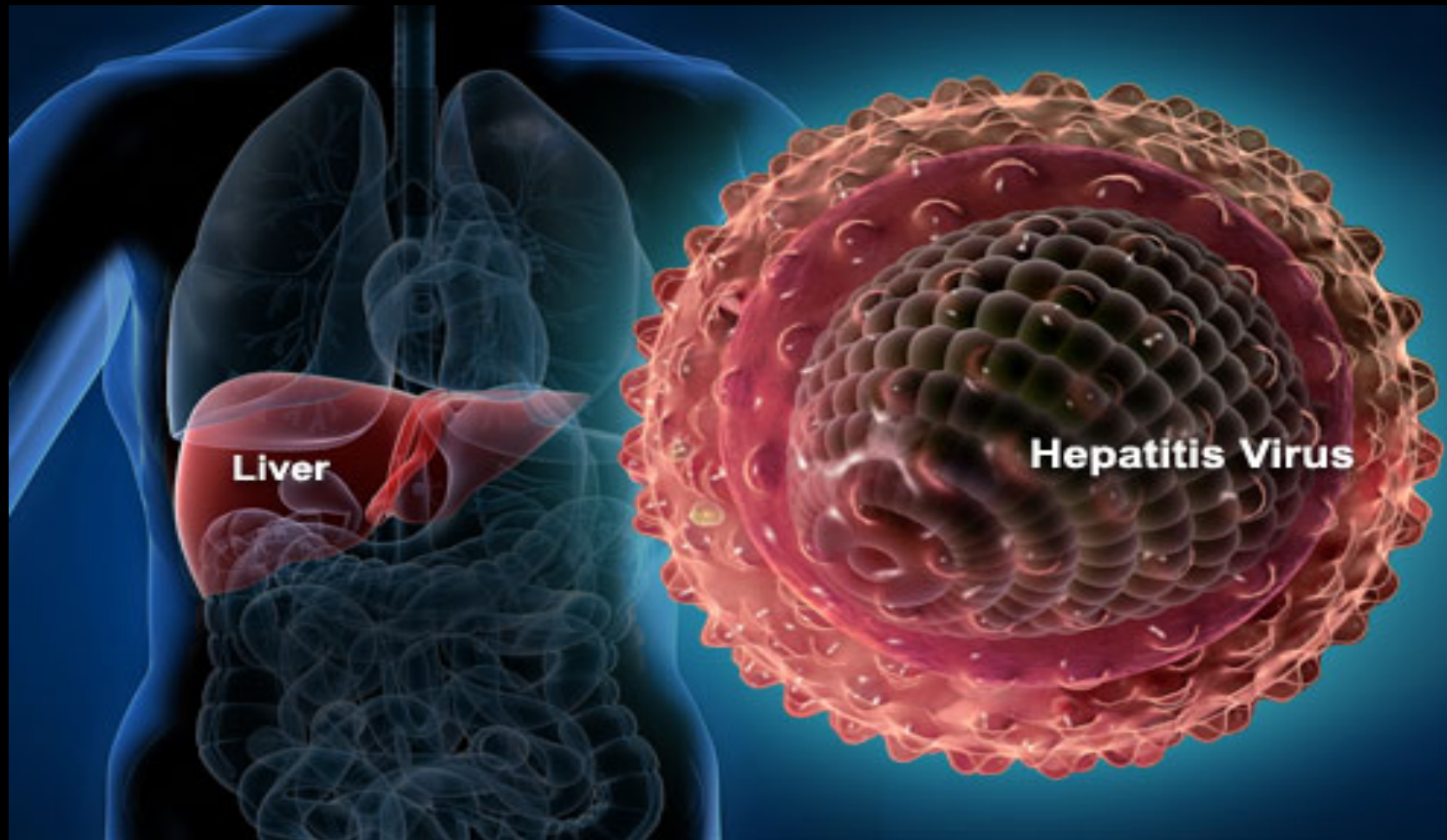


# Hepatitis C: The Silent Epidemic

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# Objectives

- By the end of the presentation, the participant will:
  - Verbalize risk factors for hepatitis C.
  - Identify appropriate screening populations and diagnostic tests for hepatitis C.
  - State potential complications of hepatitis C.



# Hepatitis

- Inflammation of the liver
  - Presents with elevation of liver enzymes
- Infectious or noninfectious
  - Acute or chronic

# Infectious Hepatitis

- Hepatitis A
- Hepatitis B
- Non-A; non-B
  - Hepatitis C
  - Hepatitis D
  - Hepatitis E
  - Hepatitis G
  - Hepatitis ?

# Comparing HBV and HCV

- HBV

- DNA virus
- Found in all body fluids
- Commonly sexually transmitted
- Transmitted through sharing drug paraphernalia
- Vaccine available

– Source- Lok, A & McMahon, J. 2009. Chronic Hepatitis B: Update 2009. *Hepatology*. 50(3):1-36.

# Comparing HBV and HCV (continued)

- HCV

- RNA virus
- Found primarily in the blood
- Rarely sexually transmitted
- Transmitted through sharing drug paraphernalia
- Vaccine not available

- Source- Ghany, M, et al., 2009. Diagnosis, Management and Treatment of Hepatitis C: An update. *Hepatology*. 49(4):1335-1374.

# Hepatitis C

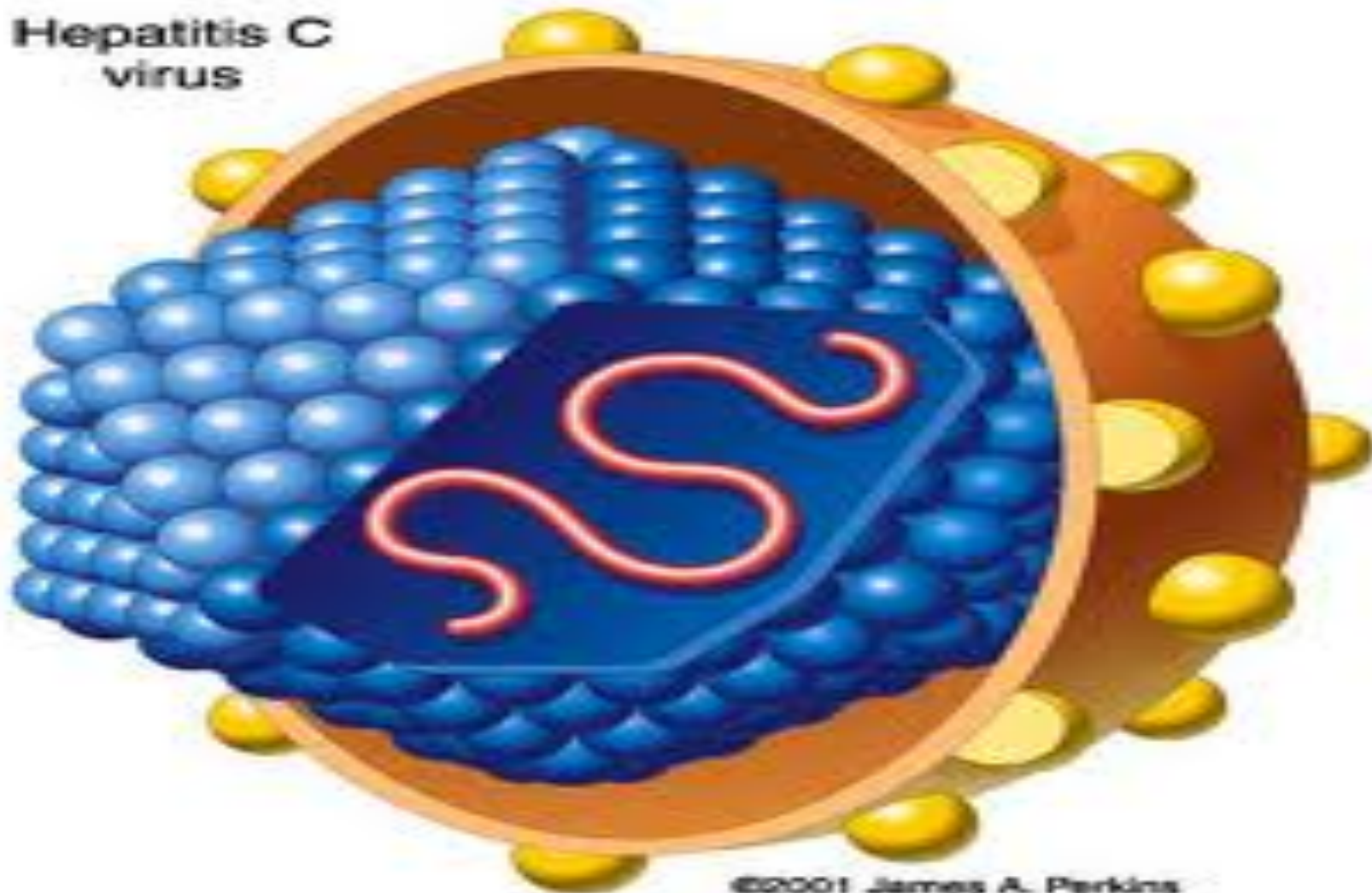
- The most common chronic blood-borne infection in the US.
  - #1 reason for liver transplant in the US
- 10-20% will develop cirrhosis 20-30 years after exposure.
- Up to 5% will develop liver cancer.
  - Source- Wise, M, et al., *Hepatology*. 2008;47:1128-1135

## Hepatitis C (continued)

- 15% of those exposed will clear spontaneously but retain the hepatitis C antibody. (85% will remain viremic.)
- Leading cause of death in HIV patients
  - 4 million Americans have HCV.

— Source- Wise, M, et al., *Hepatology*. 2008;47:1128-1135

Hepatitis C  
virus



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# Symptoms of HCV

- Acute infection (<6 months)
  - Generally asymptomatic, but jaundice occurs in 20% of cases.



## Symptoms of HCV (cont.)

- Chronic infection (>6 months)
  - Generally asymptomatic, but may have elevated liver enzymes.
- Advanced disease
  - Ascites, varices, encephalopathy

# Asymptomatic Disease in HCV

- 75% are undiagnosed.
- 80% are asymptomatic.
- End stage liver disease generally occurs 20 years after exposure.

## Risk Factors for HCV

- Clotting factors prior to 1987
  - 85%
- Injection drug use
  - 80%
- Hemodialysis
  - 10-20%
- Multiple sex partners
  - 4-6%

## Risk Factors for HCV (continued)

- Sexual contact with infected partner
  - 2-3%
- Blood transfusion prior to July 1992
  - 5%
- Infants born to infected women
  - 4-7%

## Risk Factors for HCV (continued)

- Organ recipients prior to 1992
  - 5%
- Healthcare workers (needle stick, etc.)
  - 2%
  - Source- Ghany, M, et al., 2009. Diagnosis, Management and Treatment of Hepatitis C: An update. *Hepatology*. 49(4):1335-1374.

# Possible Risk Factor



# Diagnosis of Hepatitis C

- Health history
  - Most reliable method available to assess risk
- Physical exam
  - Not reliable!!!
- Abnormal liver enzymes (ALT)
  - Not reliable!!!

# Diagnosis of Hepatitis C (continued)

- Hepatitis C antibody
  - Indicates exposure (15% have cleared.)
- Hep C RNA by PCR (Heptimax<sup>®</sup>)
  - Indicates current infection
  - Viral load (benchmark)
    - Source- Ghany, M, et al., 2009. Diagnosis, Management and Treatment of Hepatitis C: An update. *Hepatology*. 49(4):1335-1374.

# Who to Screen

- Anyone with a risk factor for hepatitis C
- Anyone with elevated liver enzymes

– Source- Kuritzky L, et al. Family Practice Recertification. 2006; 28(2)41-57.

## Who to Screen (continued)

- Those born between 1945-1965 (baby boomers) should be offered a 1 time screening for hepatitis C.
  - 5 times more likely than other adults to have hepatitis C
  - 75% of adults with hepatitis C are baby boomers.
    - Source-  
<http://www.cdc.gov/features/HepatitisCTesting/index.html>,  
accessed 3.7.13.

# Diagnostic Codes

- Abnormal liver enzymes: 794.8
- Acute hepatitis C: 070.51
- Chronic hepatitis C: 070.54
- Exposure to hepatitis: V01.8

# Serologic Tests

- Hepatitis C antibody
- Hepatitis C RNA
- Hepatitis C genotype
- Liver biopsy



# Serologic Tests (continued)

- Hepatitis C antibody
  - Screening test for exposure to HC
  - Immune cell that is made to fight off HC
  - All of those exposed will generate an antibody but 15% will clear the virus.
  - 85% of those with an antibody will be currently infected.
    - Source- Ghany, M, et al., 2009. Diagnosis, Management and Treatment of Hepatitis C: An update. *Hepatology*. 49(4): 1335-1374.

# Serologic Tests (continued)

- Hepatitis C RNA
  - “Viral load”
  - Indicates current infection
  - Value does not correlate with degree of liver damage or clinical symptoms
    - Source- Ghany, M, et al., 2009. Diagnosis, Management and Treatment of Hepatitis C: An update. *Hepatology*. 49(4):1335-1374.

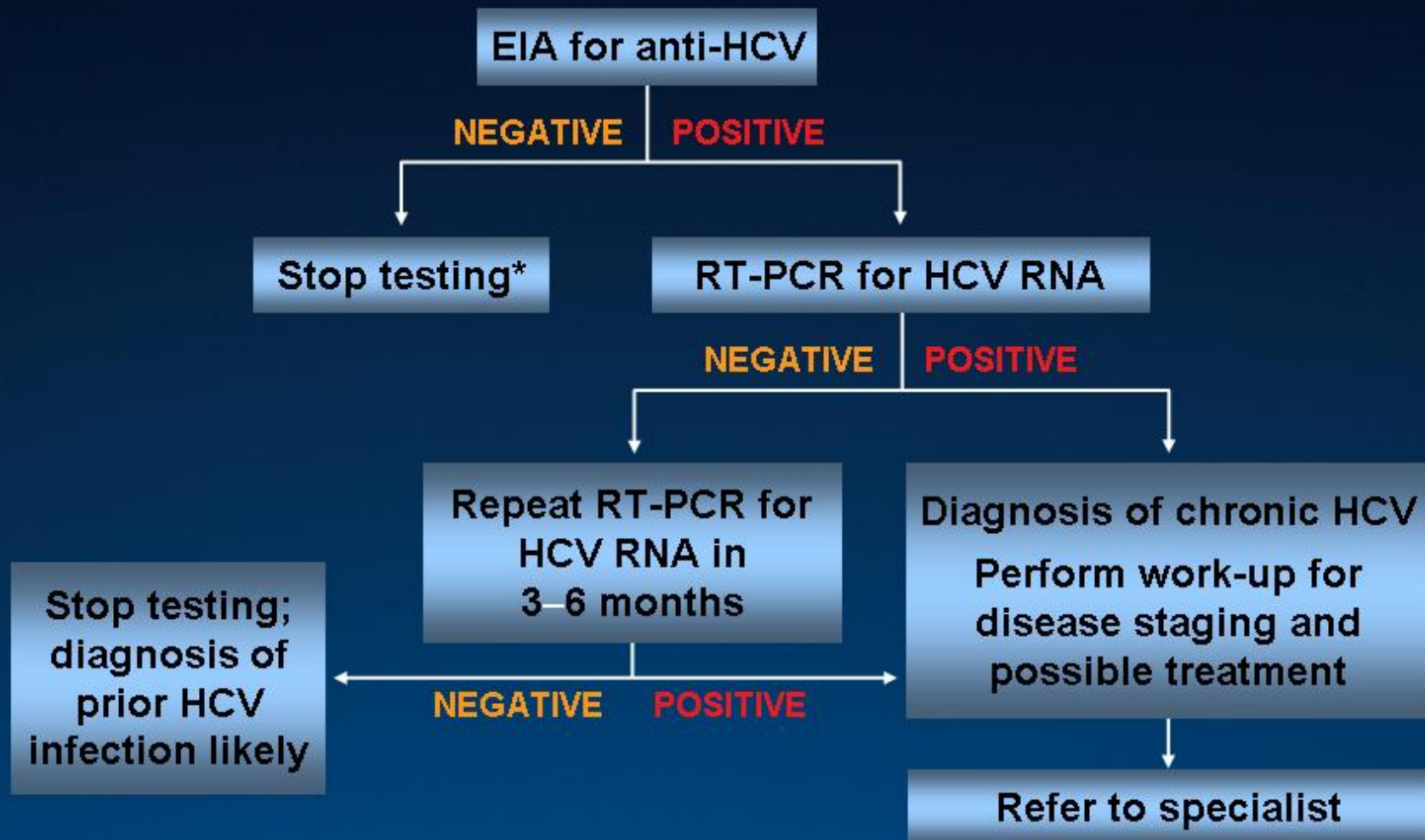
# Serologic Tests (continued)

- Hepatitis C genotype
  - There are 6 forms (genotypes) of HC.
  - Genotype 1 is the most common in the US.
  - With current therapies the response rates are similar regardless of genotype
    - Source- Flamm SL. *JAMA*. 2003; 289:2413-2417.

# Serologic Tests (continued)

- Liver biopsy
  - Allows staging of liver disease
  - Rules out autoimmune hepatitis

# HCV Screening Algorithm



\*False negatives may occur in immunosuppressed patients. HCV, hepatitis C virus; anti-HCV, antibody to hepatitis C virus; EIA, enzyme immunoassay; RT-PCR, reverse transcriptase polymerase chain reaction.

Kuritzky L, et al. *Family Practice Recertification*. 2006;28(2):41-57.

# Factors Causing Rapid Progression of Liver Disease in HC

- Alcohol use
- Obesity/fatty liver
- HIV infection
- Hepatitis B infection
- Male gender

— Source- Bialek SR, et al., *Clin Liv Dis.* 2006; 10:697-715.

# Factors Not Influencing Progression

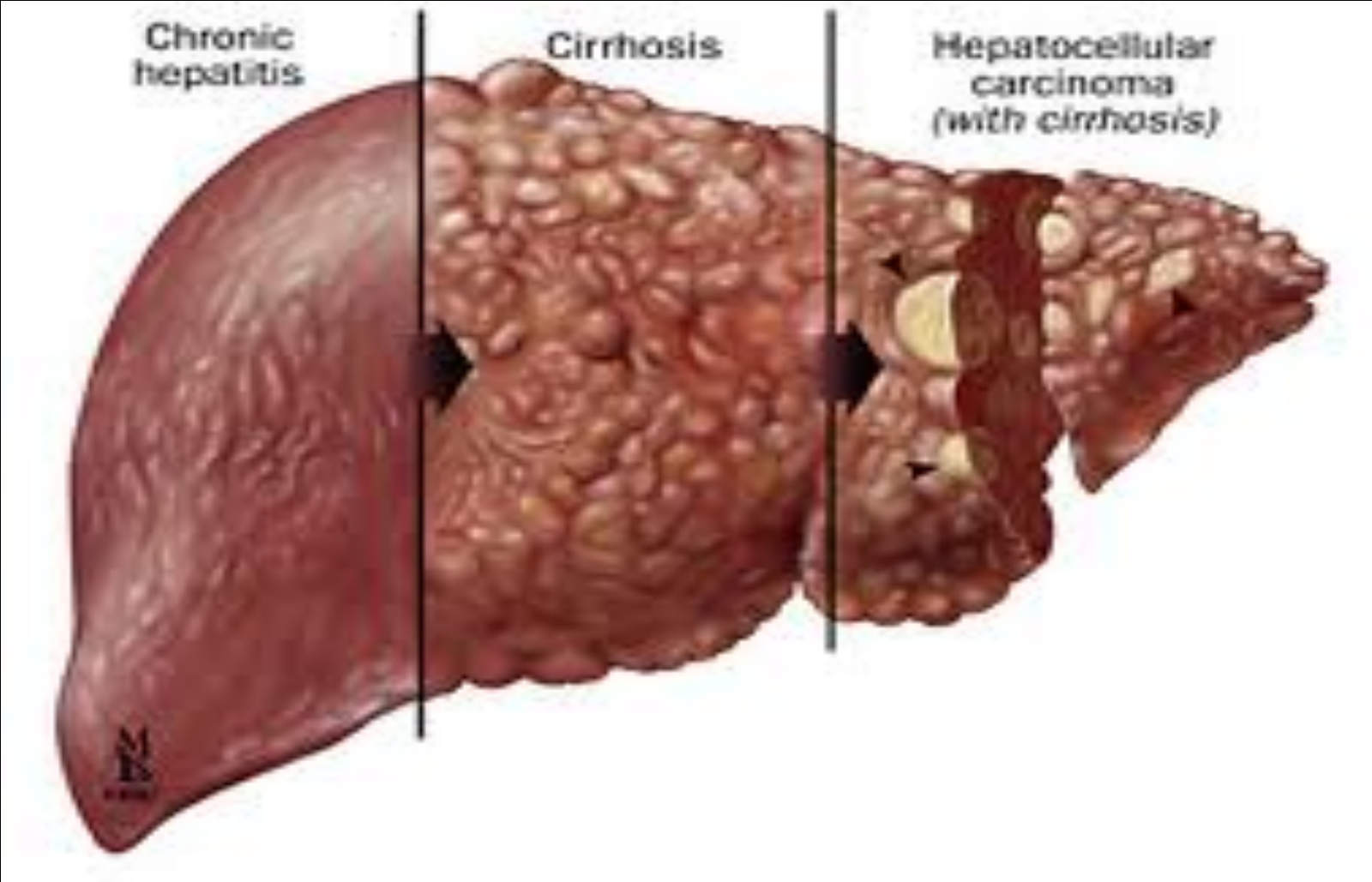
- Alanine aminotransferase level (ALT)
- Viral load
- Mode of transmission
- Genotype

— Source- NIH Consensus Development Conference Statement. 2002. Poynard et al. *Lancet*. 1997;349:825-832.

# Historical Management of Hepatitis C

# Goals of Antiviral Therapy

- Primary goal
  - Eradicate HCV infection (possible in 80% of cases)
- Secondary goals
  - Slow disease progression
  - Improve histology
  - Reduce risk of hepatocellular carcinoma
  - Improve health-related quality of life
    - Source- Ghany, M, et al., 2009. Diagnosis, Management and Treatment of Hepatitis C: An update. *Hepatology*. 49(4):1335-1374.



# Historic Management of HC

- Interferon
  - Innate immune chemical that has antiviral properties
  - “Boosts” the immune system and recruits other immune cells
    - Histamine, interleukins, bradykinins, etc.
  - <10% effective in eradicating HC
    - Source- McHutchison JG, et al., *N Engl J Med.* 1998;352:1485-1492.

# Historic Management of HC (continued)

- Ribavirin
  - 1998
  - Mechanism of action unknown
  - Ineffective as monotherapy
  - Close to 50% effective in eradicating HC when used in combination with interferon
    - Source- McHutchison JG, et al., *N Engl J Med.* 1998;352:1485-1492.

# Historic Management of HC (continued)

- Pegylated interferon
  - 2001
  - Used in combination with ribavirin
  - A molecule of polyethylene glycol was added to the interferon, prolonging its action.
  - <50% effective in eradicating genotype 1 HC and >70% effective at eradicating genotype 2/3
    - Source- Hadziyannis SJ, et al., *Ann Intern Med.* 2004;140:346-355.

# Historic Management of HC (continued)

- Direct acting antivirals
  - 2011
  - Boceprevir (Victrelis<sup>®</sup>), telaprevir (Incivek<sup>®</sup>)
  - Approved for genotype 1 virus only
  - Approved only in combination with pegylated interferon and ribavirin
  - Up to 80% cure rate in genotype 1 disease
    - Source- Ghany, M, et al., 2011. An Update on Treatment of Genotype 1 Chronic Hepatitis C Virus Infection: 2011 practice guideline by the American Association for the Study of Liver Diseases. *Hepatology*. 54 (4): 1433-1444.

## Additional Considerations with Direct Acting Antivirals

- Must be given with pegylated interferon and ribavirin
- Must avoid missing doses as resistance rapidly occurs
- Increased anemia
- Rash

## Case Study

- Mr. J is a 43 year-old who presents to you as a new patient for primary healthcare needs. As part of his health history, he reveals that he had a blood transfusion in 1983.
- What test should be drawn that would indicate exposure to hepatitis C?

## Hepatitis C antibody is positive.

- What is the percentage chance that he is currently infected?
- What test would indicate current infection with hepatitis C?

# Viral Load Testing Indicates Current Infection

- What test will determine duration of treatment and chance of responding?

# Additional Measures to Consider in the Management of Chronic Hepatitis C

- Hepatoma screening
  - Cirrhotic or chronic hepatitis **B**
    - Ultrasound and alpha-fetoprotein q 6 months
- Alcohol avoidance
- Weight reduction

# Vaccinate for Hepatitis A and B





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