ABC’S OF HEPATITIS

Disclosures

- Speaker for Abbvie
Learning Objectives

- Assess risk factors for Hepatitis A
- Navigate the risks of Hepatitis B reactivation
- Better understand the benefits of Hepatitis C eradication

Case Study

- 28 y/o Caucasian male with RUQ abdominal pain, myalgias, fever and chills
- +dark urine
- +tattoos, +IVDA (active)
- No new meds, No acetaminophen, No alcohol
- Recent travel to San Diego
- Girlfriend was recently diagnosed with acute Hepatitis
- PMHX-/PSHx-/FmHx-
VSS

- No scleral icterus or jaundice, exam essentially normal
- Hb 14.3, plts 152,000, Cr 1.0, PT 12.9/INR 1.2
- AST 1067, ALT 1222, alk phos 353, bili 2.4, alb 3.3
- US- unremarkable
- Hep C Ab-, Hep B S Ag -, Hep A IgM+

Pt was monitored for 2 days with slow, steady improvement in his transaminases

- On day 3, an uncapped syringe was found in the bathroom and on search, drug paraphernalia was found
- Police Dept was called
- Pt left AMA
Hepatitis A (HAV)

- Single stranded RNA virus
- Viral replication depends on uptake and synthesis in the hepatocyte
- Hepatocyte injury is due to host immunologic response
  - Lymphocytic infiltrate and necrosis
- Virus acquired almost exclusively via fecal-oral route, but parenteral transmission may occur
  - Resistant to environmental degradation
- Incubation period 14-45 days (avg 28)
- Period of greatest viral shedding is day 14-21
  - Highest transmission potential
- 90% of children and 25-50% of adults shed virus while asymptomatic
Presentation

- Fever, malaise, fatigue, anorexia, nausea, vomiting, RUQ pain and hepatosplenomegaly
- Jaundice, dark urine, clay colored stools follow later
- Tender enlarged liver
- Transaminases >500 U/L (typically in 1000’s)
- Bilirubin <10 mg/dL
- Rare extrahepatic manifestations

Atypical Presentations

- Prolonged Cholestasis
  - Jaundice >12 weeks
  - Pruritis, fatigue, loose stool, weight loss
  - Transaminases <500

- Relapsing Hepatitis
  - Infection followed by remission and subsequent relapse
  - Transaminases are normal during remission
  - Vasculitic skin rash
  - Nephritis
Most have no defined risk factors

High risk groups - personal contacts, institutionalization, day care workers
- Travelers to countries with high rates of HAV infection
- Men who have sexual activity with men
- Illicit drug users (both injection and non-injection)

Highest rate of infection is among young adults age 25-39

Treatment is supportive

Passive immunoprophylaxis with Immune Globulin
- Given within 2 weeks of exposure

Vaccination - 95% efficacy after 1st dose, near 100% after 2nd

Chronic carrier state does not exist

Fulminant HAV is rare
- Requires encephalopathy
HAV Outbreaks

- 2000: Carl’s Jr.- Spokane, WA
- 2003: Green onions- Chi-Chi’s in Monaca, PA
  - 565 cases, 128 hospitalizations, 3 deaths
- 2013: Townsend Berries frozen berries sold at Costco
  - 163 cases from 10 states, 23 in AZ
- 2016: Tropical Smoothie Café Strawberries
  - 143 cases from 9 states
- 2017: 727 cases in MI, 161 in Utah
  - Homeless, drug users and their contacts

CNN- California Combats Deadly Hepatitis A Outbreak
NPR- Hepatitis A Outbreak Hits California
LA Times- California Declares State of Emergency Over Deadly Hepatitis A Outbreak
Washington Post- Hepatitis A Outbreak Among Homeless a Byproduct of California’s Housing Crunch
USA Today- California Declared Emergency to Fight Hepatitis A Outbreak
California Outbreak

- Recent large scale outbreak in Southern California
  - Mostly San Diego
- Largest person to person outbreak in the US since availability of the HAV vaccine
- As of Feb 9 - 694 cases, 454 hospitalizations, 21 deaths
  - 231 cases in 2016
- Homelessness
- Person to person contact
- Fecally contaminated environment

California Outbreak

- State of Emergency declared
- Increased access to clean restrooms
- Increased washing of city streets
- Free vaccination clinics
- Temporary dwellings/tents
### Who should get HAV Vaccine?

- Homeless
- Incarcerated
- Injection and Non-injection drug users
- Those working with high risk populations
- Close contacts or caregivers of HAV affected individuals
- Those having sexual activity with someone with HAV
- Men having sex with men
- Travelers to countries with medium or high rates of HAV
- Clotting factor disorders
- **Anyone with chronic liver disease!**

### Hepatitis B (HBV)
Chronic Hepatitis B Is a Global Health Problem

An estimated 240 million people worldwide are living with chronic hepatitis B (CHB).

Map adapted from the CDC and Vijayadeva et al.


HBsAg prevalence
- ≥8% High
- 2%-7% Intermediate
- <2% Low

HBV=hepatitis B virus; HBsAg=hepatitis B surface antigen.

Virology of HBV Infection

- HBV is a partially double-stranded DNA virus which primarily infects liver cells.
  - Up to 10^{11} to 10^{13} virions/day may be produced in an infected person.
- Liver inflammation and fibrosis/cirrhosis are consequences of host’s immune response.
- The virus can evade the immune system during early phases of infection.
- Therefore, acute infections are primarily asymptomatic.
- The genomic template for active viral propagation, cccDNA, can persist in infected cells, even after clearance of infection marker.

Figure adapted from Toronto Centre for Liver Disease. Hepatitis B. www.torontoliver.ca/hepatitis-b/. cccDNA=covalently closed circular DNA.

Routes of HBV Transmission

**Horizontal transmission**
- Prolonged close contact (e.g., household)
- Injection/drug use
- Sexual contact
- Exposure to blood or body fluid
- Organ, blood, and semen donors
- Hemodialysis

**Vertical transmission via mother**
Up to 90% of infants born to HBeAg+ mothers develop CHB.

Approximately 25%-50% of acute infections in children aged 1-5 years and <5% in older children and adults progress to CHB.

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Progression and Complications of CHB

Acute Infection → Chronic Infection* → Cirrhosis
- 8%-38%1
- 10%-17%1
- 15%1
- 70%-85%1

Chronic Infection* → HCC → Liver Failure ( Decompensation) → Liver Transplantation → Death
- 0.1%-3%1
- 10%-17%1
- 15%1

HCC = hepatocellular carcinoma.

2. Percentages are 5-year cumulative incidence rates.
Serologic Markers of HBV Infection

- **HBsAg**
  - Hallmark of infection
  - Major tool for screening and diagnosis of CHB
  - In a person with successful immunization, only anti-HBs is detected

- **Anti-HBs**
  - Antibody to HBsAg
  - Marker of recovery and immunity from HBV infection
  - In a person with successful immunization, only anti-HBs is detected

- **Anti-HBc**
  - Antibody to HBV core antigen
  - Marker of prior exposure
  - IgM anti-HBc is a marker of recent or acute infection

- **HBV DNA**
  - Measure of viral load
  - Indicates ongoing viral replication
  - Marker of infectivity and risk of major liver disease

- **HBeAg**
  - HBsAg is a viral protein usually associated with active viral replication and may indicate higher infectivity

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**Interpretation of Hepatitis B Serology Test Results**

<table>
<thead>
<tr>
<th>HBsAg</th>
<th>HBV DNA</th>
<th>HBeAg (IgM)</th>
<th>HBeAg (IgG)</th>
<th>HbeAb</th>
<th>HBeAb</th>
<th>HBSAb</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Susceptible to HBV infection</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
<td>Acute HBV</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>-</td>
<td>✓</td>
<td>+/−</td>
<td>+/−</td>
<td>-</td>
<td>Chronic HBV (&gt; 6 months)</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>✓</td>
<td>+/−</td>
<td>-</td>
<td>✓</td>
<td>Immune to HBV (past infection)</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>✓</td>
<td>Immune to HBV (vaccinated)</td>
</tr>
</tbody>
</table>

The Natural History of Chronic Hepatitis B

CHB follows a variable clinical course; not all patients will go through each phase (including resolution).

Serologic Profiles of Progression from Acute Infection to CHB

Acute HBV

- Abdominal pain, fatigue, nausea, vomiting, arthralgias, myalgias, jaundice, scleral icterus, dark colored urine
- Elevated transaminases >500 U/L (typically >1000)
- Modest elevation in bilirubin (5-10mg/dL)
- Fulminant hepatic failure
  - Encephalopathy within 8 weeks of symptoms onset
  - <1% of cases

Chronic HBV

- Normal or mildly elevated ALT
- Risk of cirrhosis, HCC and death
  - Risk of HCC even without cirrhosis
- Consider Co-infection with HCV or HIV
- Consider infection with Hepatitis D
Extrahepatic Manifestations

HBV Vaccination Recommendations

- People born in regions with prevalence of HBV infection of ≥2%\(^1\)\(^-\)\(^3\)
- US-born people not vaccinated as infants whose parents were born in regions with prevalence of HBV infection of ≥8%\(^1\)\(^-\)\(^3\)
- Household and sexual contacts of persons with HBV infection\(^1\)\(^-\)\(^3\)
- All pregnant women\(^2\)\(^-\)\(^4\)
- Men who have sex with men\(^1\)\(^-\)\(^3\)
- Injection drug users\(^1\)\(^-\)\(^3\)
- Individuals infected with human immunodeficiency virus (HIV)\(^1\)\(^-\)\(^3\)
- People with certain medical conditions\(^2\)\(^,\)\(^3\)\(^,\)\(^5\)
  - Needing immunosuppressive therapy
  - Undergoing hemodialysis

AASLD=American Association for the Study of Liver Diseases.
CDC=Centers for Disease Control and Prevention.
USPSTF=United States Preventive Services Task Force.

For a complete list of screening recommendations, please see:
Passive Immunoprophylaxis

- Neonates born to HBsAg+ mothers
- After needle stick exposure
- After sexual exposure

Treatment

- Algorithm
- Consider HBsAg, HBeAg, HBeAb, ALT, HBV DNA, degree of fibrosis
- Also consider age, extrahepatic manifestations and family history of HBV, cirrhosis or HCC
- HepB.org
Hepatitis B Reactivation

- Characterized by a sudden increase in HBV DNA associated with a flare several weeks later
- Prior guidelines had recommended antiviral prophylaxis for those patients with HBsAg+ undergoing immune suppression or treated with chemotherapy
- What does immunity really mean?
Hepatitis B Reactivation

Perillo R, et al. Gastroenterology. 2015;148:221-244

Categories of Immunosuppressants

Risk level (High risk OR Moderate risk OR Low risk)?

High risk (Reactivation risk > 10%)

Moderate risk (Reactivation risk 1% to 10%)

Low risk (Reactivation risk < 1%)

HIGH RISK (REACTIVATION RISK >10%)

HBsAg-positive/anti-HBc-positive or HBsAg-negative/anti-HBc-positive

Patients taking B cell depleting agents (e.g., rituximab, olartumab)

Antiviral prophylaxis for at least 12 months after discontinuation of immunosuppressive therapy

HBsAg-positive/anti-HBc-positive

Patients taking anthracycline derivatives (e.g., doxorubicin, epirubicin)

Antiviral prophylaxis for at least 6 months after discontinuation of immunosuppressive therapy

Patients taking moderate dose (10-20 mg prednisone daily or equivalent) or high dose (> 20 mg prednisone daily or equivalent) corticosteroids daily for > 4 weeks
Patients who place a higher value on avoiding long term use of anti-viral therapy and cost associated with its use and a lower value on the small risk of reactivation (particularly in those who are HBV SAg-) may reasonably select no prophylaxis over antiviral prophylaxis.

**MODERATE RISK (REACTIVATION RISK 1–10%)**

<table>
<thead>
<tr>
<th>HBsAg-positive/anti-HBc-positive or HBsAg-negative/anti-HBc-positive</th>
<th>HBsAg-negative/anti-HBc-positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients taking TNF-α inhibitors (e.g., etanercept, adalimumab, certolizumab, infliximab)</td>
<td>Patients taking low-dose (&lt;10 mg prednisone daily or equivalent) corticosteroids daily for duration of ≥ 4 weeks</td>
</tr>
<tr>
<td>Patients taking other cytokine or integrin inhibitors (e.g., abatacept, ustekinumab, celecoxib, vedolizumab)</td>
<td>Patients taking moderate dose (10–20 mg prednisone daily or equivalent) or high dose (&gt;20 mg prednisone daily or equivalent) corticosteroids daily for ≥ 4 weeks. Patients taking antithymocyte derivatives (e.g., daclizumab, alemtuzumab)</td>
</tr>
</tbody>
</table>

*Suggest antiviral prophylaxis for at least 6 months after discontinuation of immunosuppressive therapy.*

**LOW RISK (REACTIVATION RISK < 1%)**

<table>
<thead>
<tr>
<th>HBsAg-positive/anti-HBc-positive or HBsAg-negative/anti-HBc-positive</th>
<th>HBsAg-negative/anti-HBc-positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients taking traditional immunosuppressive agents (e.g., azathioprine, 6-mercaptopurine, methotrexate)</td>
<td>Patients taking low-dose (&lt;10 mg prednisone or equivalent) corticosteroids for ≥ 4 weeks</td>
</tr>
<tr>
<td>Patients taking intra-articular corticosteroids. Patients taking any dose oral corticosteroids daily for duration of ≤ 1 week</td>
<td></td>
</tr>
</tbody>
</table>

*Suggest not to use routine antiviral prophylaxis in patients undergoing immunosuppressive drug therapy who are at low risk for HBV.*
Take Home Points

- Consider risk of reactivation of Hepatitis B in any patient who will receive chemotherapy or immune suppressants
- Screen for Hep B with HBsAg and HbcAb
  - Low risk patients do not need screening
  - HBsAb+ does not mean protected
- Presence of HbcAb is not protective as we once thought
- Gastro.org/hbvrdecisiontool

Hepatitis C (HCV)
Hepatitis C

- Most common blood borne infection in the US
- Viral infection leads to acute and chronic disease
  - Most patients with acute or chronic infection are asymptomatic
- 71 million infected globally with 400,000 deaths
- CDC estimates between 2.7-3.9 million people have chronic HCV in the US
  - 30,000 new cases annually
  - 8,000-10,000 deaths each year
    - In 2015, 19,629 death certificates had HCV recorded as an underlying or contributing cause of death

Primary Causes of Chronic Liver Disease*

- Hepatitis B Virus (11%)
- Hepatitis C Virus (23%)
- Alcohol (24%)
- Unknown (17%)
- Other (5%)

*Jefferson County, Alabama, USA
HCV History

- An RNA virus that used to be known as non-A, non-B hepatitis until it was discovered in 1988
- No vaccine available
- First therapy approved in 1991
- Before 2011, HCV treatment could last as long as a year, with cure (SVR) rates of 40%–50% for the most common genotype in the US
- Since that time, scientific advances have made HCV treatment shorter and more effective
- There are better tolerated, interferon-free treatment options available that have shown cure (SVR) rates of 90% and greater in clinical studies and real world cohorts


HCV Genotypes

- 6 HCV genotypes
- Genotypic prevalence varies by geography
- Genotype 1 is the most common in the US and accounts for approximately 79% of HCV infections

**Natural History of HCV Infection**

- **Acute infection** (first 6 months after exposure)
  - Clearance of HCV RNA: 15%-25%

- **Chronic infection**
  - 75%-85%
  - Potential extrahepatic manifestations

- **Cirrhosis** (within the first 20 years)
  - 10%-20%

- ** Decompensated cirrhosis**
  - Up to 30% at 10 years

- **Annual increase in risk of hepatocellular carcinoma (HCC) per year**
  - 1%-4%

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**Transmission of HCV**

- **Modes of Transmission**
  - IVDU or intranasal drug use
  - Clotting factors before 1987
  - Blood product/organ/tissue transplant before 1992
  - High-risk sexual activity
  - Mother-to-infant
  - Shared personal items with infected individuals
  - Nosocomial or occupational exposure
  - Tattoos, body piercing

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*RNA = ribonucleic acid

**All percentages are approximate.

*20%-30% of individuals are symptomatic.


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NEW HCV INFECTIONS ARE ON THE RISE

The incidence of new HCV infections in the United States climbed by 294% between 2010 and 2015.1-3

NEW HCV INFECTIONS DRIVEN BY PWID

The increase in new HCV infections is being driven in large part by the increase in injection drug use (notably, heroin) in young adults and adolescents in the United States.1

80% of new HCV infections are in PWID.2
The Incidence of HCV-related Liver Cancer and Death is Expected to Peak in the Coming Decades

- By treating more patients today, the peak 38,600 cases of end-stage liver disease; 3,200 referrals for transplant; 36,100 deaths may be tempered

HCV IMPACTS MORE THAN JUST THE LIVER

HCV may affect organs other than the liver, resulting in extrahepatic manifestations such as:
1. Mixed cryoglobulinaemia vasculitis
2. Lymphoproliferative disorders
3. Peripheral neuropathy
4. Membranoproliferative glomerulonephritis
5. Insulin resistance
6. Cutaneous manifestations (eg, lichen planus, paronychia, cutaneous tarsis, palpable purpura)

HCV may increase the risk for other diseases and conditions, including:
- Depression 2.30x
- Type 2 diabetes mellitus 1.38x
- Hypertension
- Fatigue
- Congestive heart failure

74% of HCV patients have at least one clinical extrahepatic manifestation

References:
What Defines HCV Cure?

- In some instances, HCV treatment does not result in cure, or SVR, because the virus does not reach undetectable levels or because it does not stay undetectable after therapy completion.
- In one study, of those patients who reached SVR, 99% had undetectable levels of HCV RNA more than 4 years after treatment end.
- These patients do not experience viral recurrence and may be considered to be cured.

Cure, also known as sustained virologic response (SVR), is defined as no detectable HCV in the blood at 12 or more weeks after therapy is complete.

Potential Benefits of SVR (Virologic Cure)

- Achieving SVR is associated with:
  - Reduced medical costs when compared with patients who do not achieve SVR.
  - Reductions in HCC, liver-related mortality or transplantation, and all-cause mortality.
  - Lowering the incidence of HCV-related comorbidities.
  - Improving relevant aspects of attentional and neurocognitive performance.
  - Certain improved quality-of-life measurements in a real-world cross-sectional study.
  - Regression of cirrhosis and fibrosis are frequently observed in patients with cirrhosis who achieve long-term SVR (median period of 61 months).


SVR was defined as lack of detection of HCV RNA at 24 weeks after the cessation of treatment.
SVR Associated With a Reduction in HCC, Liver-Related Mortality, Transplantation, and All-Cause Mortality

This was an international, multicenter, long-term follow-up study of 530 consecutive CHC patients with advanced hepatic fibrosis or cirrhosis (Ishak score 4-6), who started an IFN-based treatment regimen between 1990 and 2003, from 5 large tertiary care hospitals in Europe and Canada. Complete follow-up occurred between January 2010 and October 2011. Median follow-up duration was 8.4 years.

This study showed significant reduction of 10-year cumulative incidence of HCC, liver-related mortality or transplantation, and all-cause mortality in patients who achieved SVR.

SVR was defined as lack of detection of HCV RNA at 24 weeks after the cessation of treatment.


Improvements in HCV Therapy: Overall SVR Rates in the Pre-DAA and DAA Eras

<table>
<thead>
<tr>
<th>Era</th>
<th>Standard of Care</th>
<th>Overall SVR Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-2011 (Pre-DAA)</td>
<td>Peg-IFN + RBV</td>
<td>47%-54%1,2</td>
</tr>
<tr>
<td>2011-2013 (Early DAA)</td>
<td>DAA + Peg-IFN + RBV</td>
<td>67%-75%3,4</td>
</tr>
<tr>
<td>2013-present (all-oral DAA regimens)</td>
<td>DAA regimen ± RBV</td>
<td>≥90%5-9</td>
</tr>
</tbody>
</table>

Recent data suggests that patients with traditionally negative predictors of response, such as African Americans, achieve similar rates of SVR12 as the overall population.

The IFN-containing regimens were associated with higher rates of serious adverse events (eg, anemia and rash), longer treatment duration in some cases, high pill burden, numerous drug-drug interactions, more frequent dosing, and higher intensity of monitoring for safety or treatment response.

HCV IS UNDERDIAGNOSED AND UNDERTREATED

The problem of HCV is widespread, with as many as half of those with chronic HCV being unaware they are infected.¹

~3.5 MILLION Americans have chronic HCV infection¹

ONLY 9% HAVE BEEN SUCCESSFULLY TREATED¹²

Meta-analysis from articles published between January 2003 and July 2015

*aSuccessfully treated = achieved care


META-ANALYSIS FROM ARTICLES PUBLISHED BETWEEN JANUARY 2003 AND JULY 2015

CHALLENGES IN SCREENING AND DIAGNOSIS

• Low awareness among healthcare providers can lead to missed opportunities to provide recommended screenings to at-risk populations¹
• Low awareness among the public can delay diagnosis, which can lead to more severe outcomes and premature death¹
• Fear of stigmatization or discrimination may discourage patients from seeking follow-up care¹
• Risk-based screening recommendations have proven ineffective at identifying all HCV patients, many of whom have no known exposure risk²

OF THOSE WHO TESTED POSITIVE FOR HCV ANTIBODIES, 1/3 HAVE NOT HAD THEIR DIAGNOSIS CONFIRMED, CONTRIBUTING TO THE GAP IN HCV DIAGNOSIS AND TREATMENT³

LONG-STANDING BARRIERS EXIST TO FOLLOW-UP TREATMENT AND CURE

There are several common reasons patients defer follow-up care:

- Patients may not recognize the urgency of treating a disease with few symptoms
- Lack of insurance coverage
- Fear of social rejection and stigmatization
- Patients may also have misconceptions about available treatment options and their side effects

BETWEEN 25% AND 50% OF REFERRED PATIENTS MISS THEIR FIRST APPOINTMENTS WITH A TREATMENT PROVIDER


YOUR ROLE IN HCV

Liver damage is possible in the presence of low viral loads and normal ALT or AST levels

Approximately 30% of patients with chronic HCV infection have persistently normal ALT levels


ALT = alanine transaminase   AST = aspartate aminotransferase

SCREEN AT-RISK INDIVIDUALS REGARDLESS OF LIVER ENZYME LEVELS AND SYMPTOMS

- Screen at-risk individuals regardless of liver enzyme levels and symptoms

Your role in HCV
HCV Disease Progression in Patients With Normal ALT

Despite ‘persistently normal’ ALT levels, >75% have some degree of liver damage on biopsy, with 32% having portal and bridging fibrosis

References:

Who to Screen?

The CDC, USPSTF, and AASLD recommend screening all high-risk populations, including a one-time screening of all baby boomers.1-3
**Epidemiology and Disease Impact**

**Baby Boomers are at high risk for HCV**

- \(~75\%\) of patients infected with HCV are baby boomers (born 1945–1965)
- 60% don’t know they are infected

The CDC, USPSTF, and AASLD recommend a one-time screening of all baby boomers.

**References:**
3. CDC = Centers for Disease Control and Prevention
4. AASLD = American Association for the Study of Liver Diseases

**Your Role in HCV**

**How to Screen & Diagnose**

If patient falls within baby boomer age cohort (born 1945–1965) or risk factor is identified:

- **NONREACTIVE**
  - Screen with an HCV antibody test
  - **REACTION**
    - Confirm diagnosis with an HCV RNA test
      - **RNA NOT DETECTED**
        - NO CURRENT HCV INFECTION
        - NO FURTHER TESTING NEEDED
      - **RNA DETECTED**
        - CHRONIC HCV INFECTION
        - ADDITIONAL TESTING AS APPROPRIATE

Choose the lab’s ‘reflex-testing’ option at the screening step so an HCV RNA test will be run automatically if the antibody test is positive.

**References:**
Recommended Assessment Prior to Starting Antiviral Therapy

- Thorough history and physical
- Evaluation for advanced fibrosis/cirrhosis using liver biopsy, and/or noninvasive markers and imaging for HCC (US or consider high-resolution technique if high index of suspicion)
- Baseline laboratory testing: CBC, INR, hepatic function panel, GFR within 12 weeks prior to therapy initiation
- Genotype and viral load testing at any time prior to starting antiviral therapy
- Hepatitis B testing

Counseling Recommendations for HCV-Infected Individuals

To Prevent HCV Transmission
- Avoid sharing toothbrushes and dental or shaving equipment
- Prevent blood contact with others
- Stop using illicit drugs; those who continue to inject drugs should take precautions to avoid viral transmission
- Risk of sexual transmission is low, but practice “safe sex”

Additional Recommendations
- Avoid alcohol consumption
  - Excess alcohol may lead to progressive liver disease, increased HCV RNA replication, and reduced response to treatment
- Consider treatment for hepatitis C*
- Vaccinate for hepatitis A and B
- Get tested for HIV
- Encourage family members to get screened

SCREEN AND LINK TO CARE
ALL PATIENTS AT HIGH RISK FOR HCV

Your role in managing HCV has never been more important.

SCREEN
All baby boomers and other high-risk individuals should be screened, regardless of symptoms1-3

DIAGNOSE
Confirm a diagnosis with an HCV RNA test

REFER AND LINK TO CARE
Make a quality referral. Help make the appointment and follow up with patients before and after to ensure they saw a treatment provider

WHO TO REFER
Diagnosed patients should be referred to an HCV treatment provider for evaluation regardless of symptoms1,2

- Viral load is not an indicator of disease progression or severity1
- Liver function test results may be unreliable when evaluating disease progression1
- Liver damage is possible in the presence of low viral loads and normal ALT or AST levels1
Treatment has been shown to be more effective at early-stage disease:

- Earlier treatment significantly increased the mortality benefit of SVR (META VIR ≤ 2)
- Patients with advanced liver damage show a lower response to treatment
- Treatment delays can increase the morbidity and mortality risks of HCV

The AASLD-recommended goal of HCV therapy is to attain SVR early in the course of disease, before the development of severe liver disease and other serious complications.


Treatment Guidelines

- Joint guideline by AASLD and IDSA
- HCVGuidelines.org
- Updated regularly
- Last updated Sept 21, 2017
HCV IS **UNDERDIAGNOSED** AND **UNDERTREATED**

The problem of HCV is widespread, with as many as half of those with chronic HCV being unaware they are infected.\(^1\)

\[\begin{align*}
&= 3.5 \text{ MILLION} \\
&\text{Americans have chronic HCV infection}^1 \\
\end{align*}\]

Only 9% have been successfully treated\(^1\).

\[\text{Meta-analysis from articles published between January 2003 and July 2013.}\]

\(^1\)Successfully treated = achieved cure


**Summary**

- **Hepatitis A** is often associated with epidemics
  - Treatment is supportive
  - Vaccinate

- **Hepatitis B** reactivation is a serious concern
  - Test, vaccinate and use antiviral prophylaxis when appropriate

- **Hepatitis C** is curable
  - Screen, diagnose and treat