



Caring for People with Diabetes: Why Should You Be Concerned About Hepatitis C?

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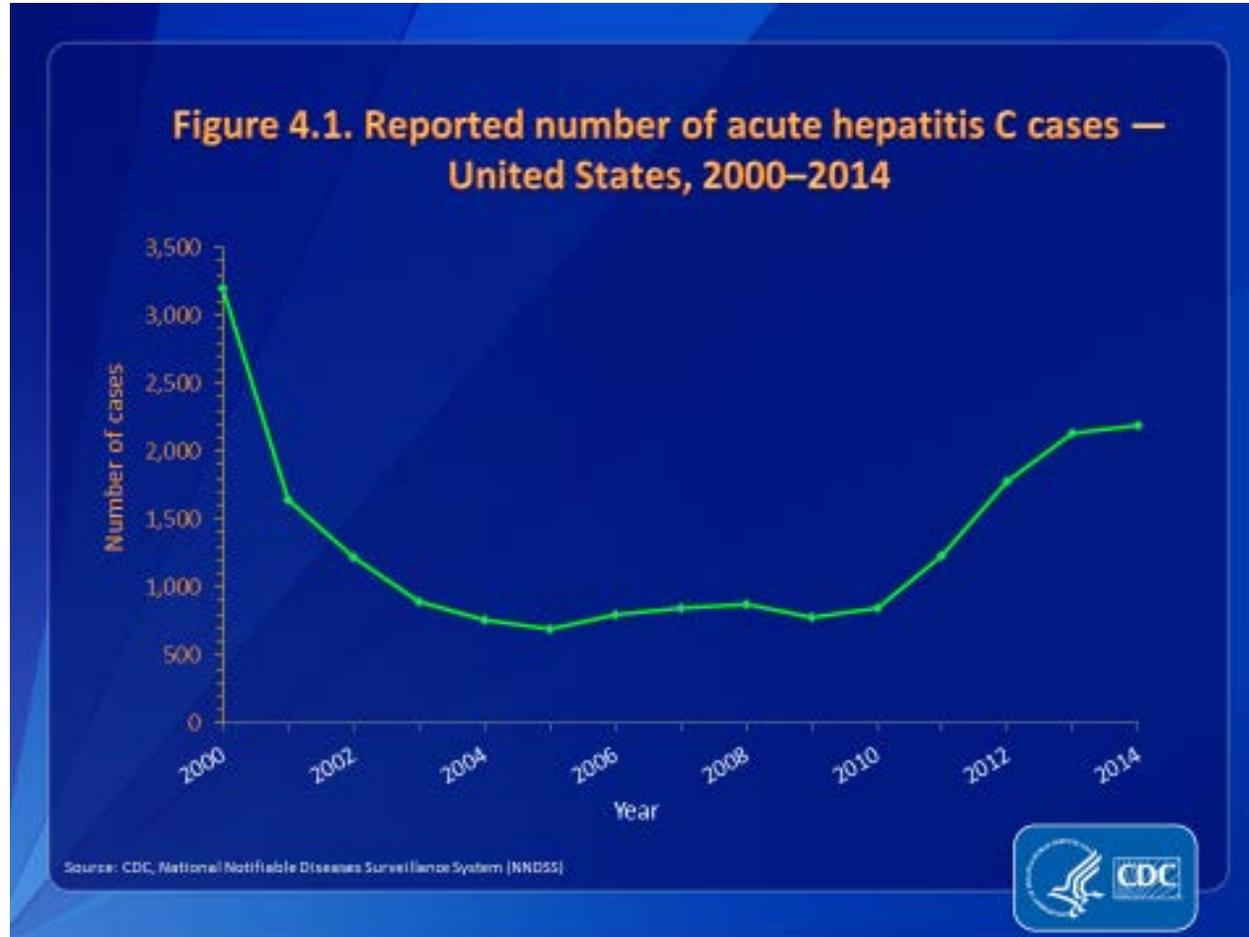
Objectives

- Examine the relationship between Hepatitis C and diabetes
- Utilize various clinical tools for Hepatitis C testing and testing strategies in the care of AI/AN
- Incorporate CDC clinical practice guidelines for managing patients with Hepatitis C in the clinic setting

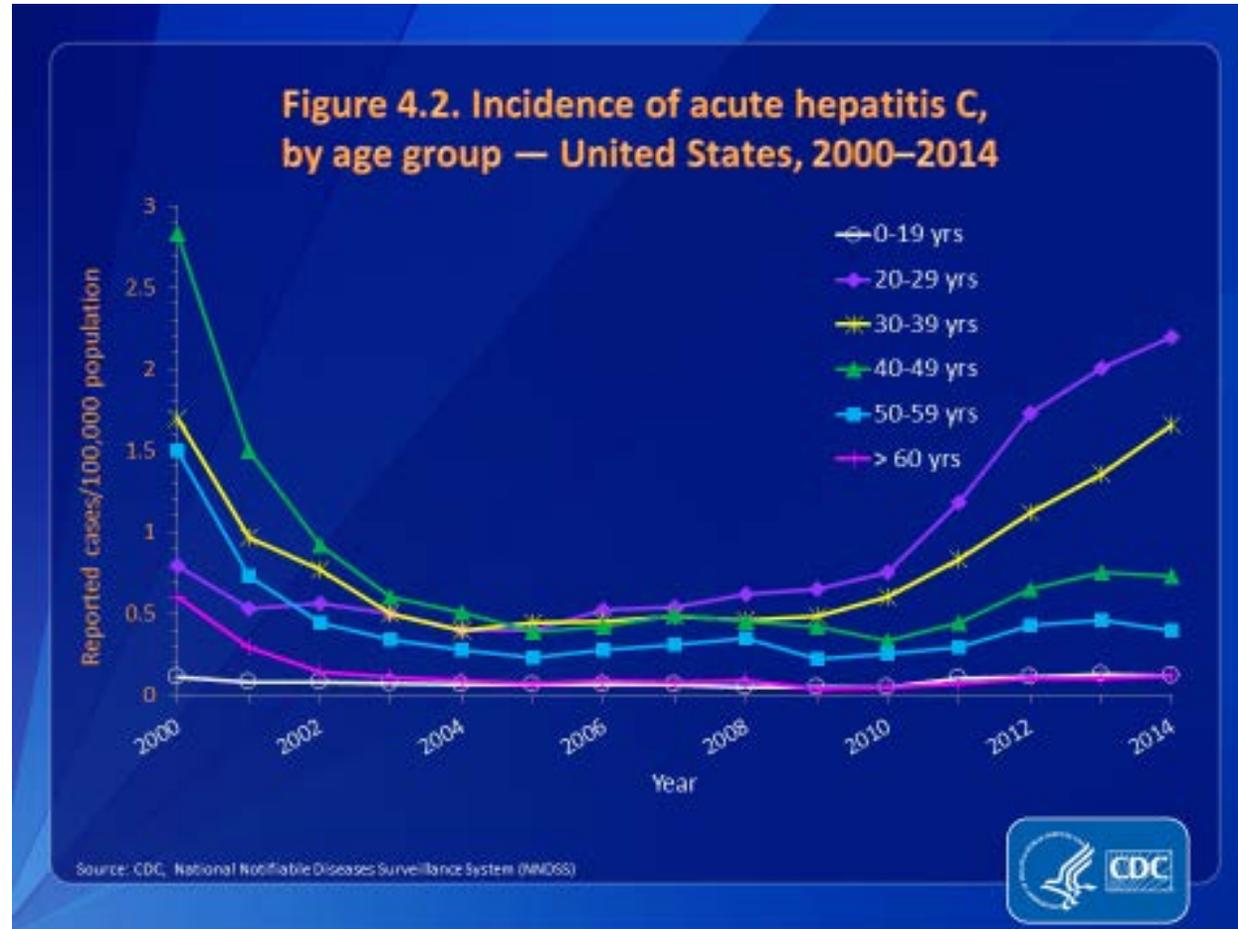
Statistics

- Estimated over 40,000 new US infections each year - and rising
- Over 3.5 million people have Hepatitis C in the US, over 70 million worldwide
- Hepatitis C disease and complications are estimated to account for over 15,000 US deaths annually
- Native Americans have higher rates of Hepatitis C infection than the general population

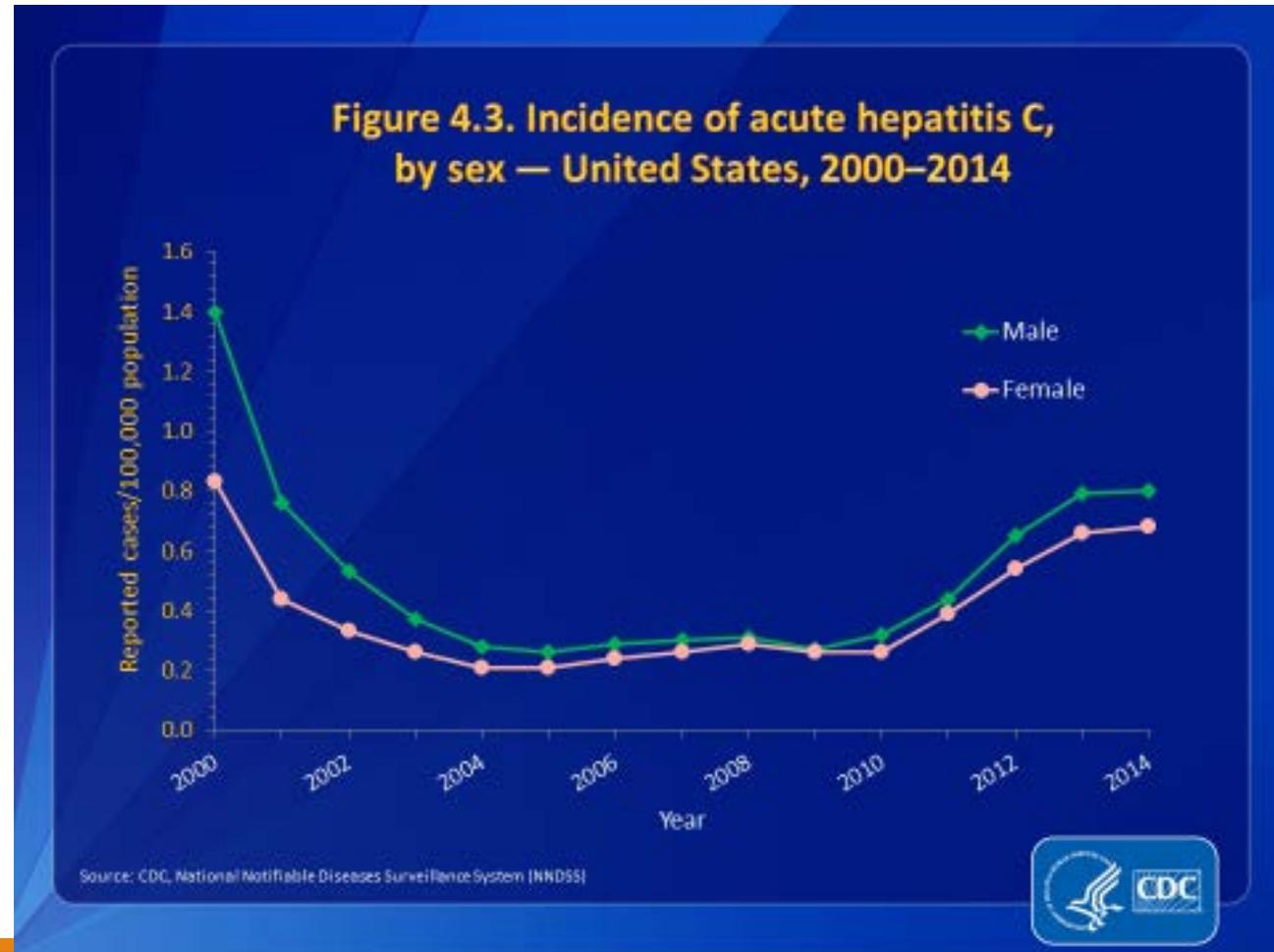
Reported Number of Acute Hepatitis C



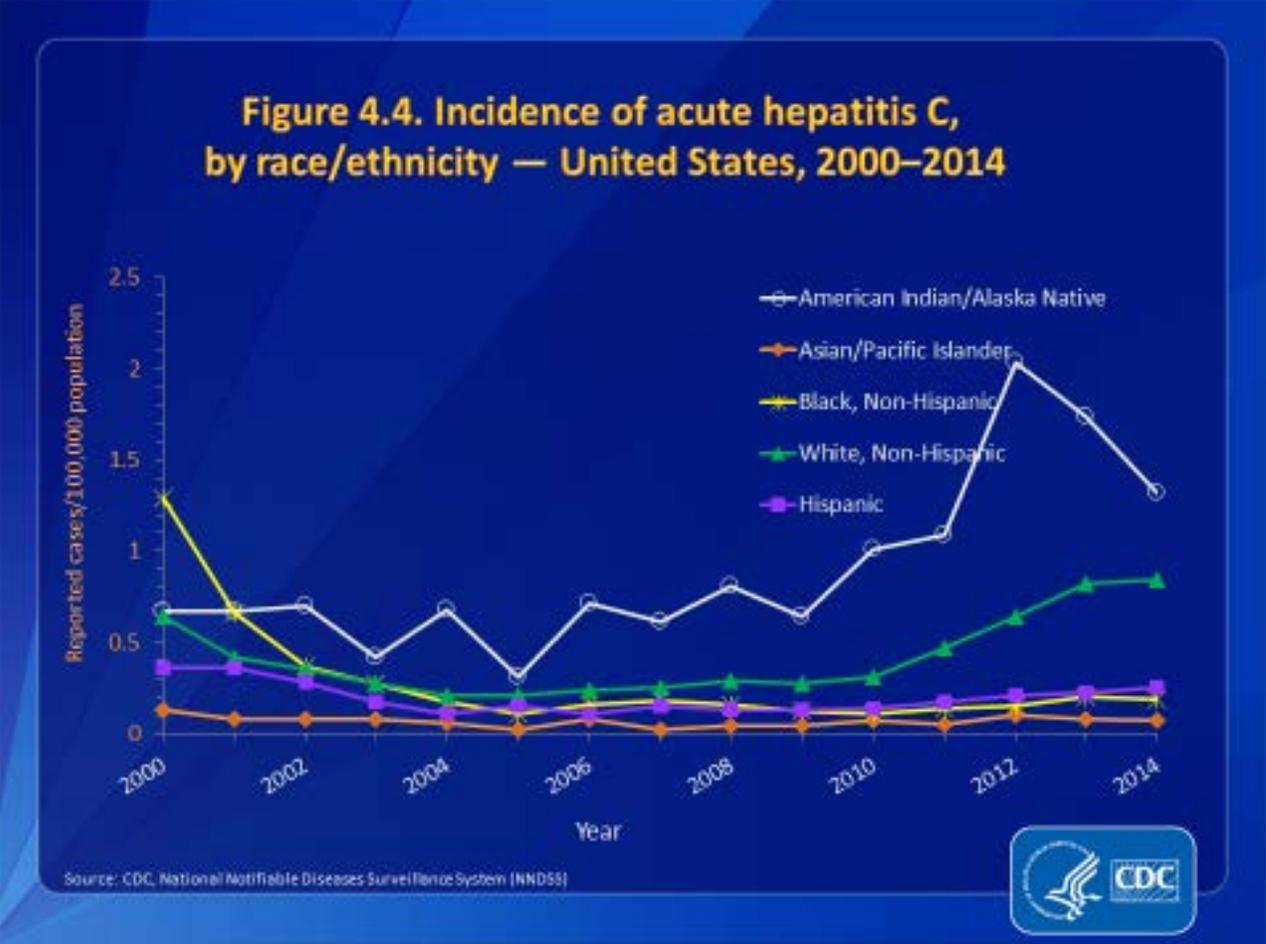
Incidence of Acute Hepatitis C By Age Group



Incidence of Acute Hepatitis C, by Sex



Incidence of Acute Hepatitis C, by Race/Ethnicity



Hepatitis C Virus

- Transmission
- Virology
- Clinical Syndromes
 - Hepatic
 - Extrahepatic

Hepatitis C Transmission

- Blood and Bloody Body Fluids
 - Dirty Needles
 - Injection Drug Use
 - Healthcare Workers (Needle sticks)
 - Contaminated Medical Equipment
 - Contaminated Blood Products, Contaminated Organ Transplants
 - Transfusions, Transplants pre 1993
 - Clotting Factors pre 1987
 - Chronic Hemodialysis
 - Perinatal Transmission
 - Sexual Transmission, Sharing Personal Hygiene Items, Unregulated Tattooing (Rare)

Hepatitis C Virology

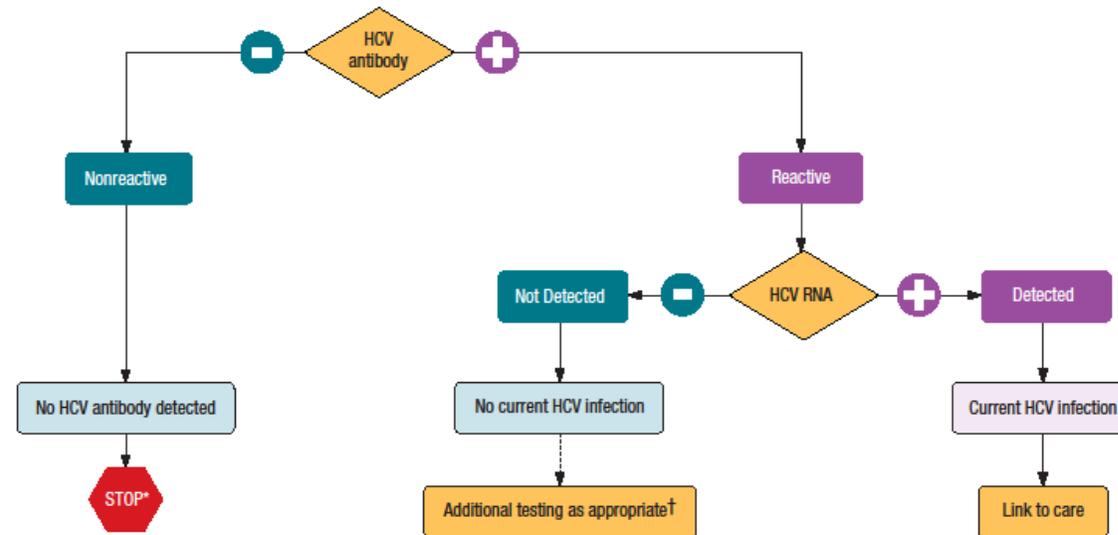
- Small RNA virus, six distinct genotypes
- Natural targets of infection
 - Liver cells (Hepatocytes)
 - Possibly B-cell lymphocytes, Islet cells
- Estimated 10 trillion circulating virions per day

Hepatitis C Infection

- Initial infection followed by an acute phase
- Incubation – average of 8 weeks following infection
- Symptoms largely absent, or mild and nonspecific
- Minority of patients will have more severe disease with jaundice, malaise, and nausea
- 15% - 25% will clear the virus spontaneously – associated with more severe acute illness
- 75% - 85% will develop chronic infection

Recommended Testing Sequence for Identifying Current Hepatitis C Virus (HCV) Infection

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* For persons who might have been exposed to HCV within the past 6 months, testing for HCV RNA or follow-up testing for HCV antibody is recommended. For persons who are immunocompromised, testing for HCV RNA can be considered.

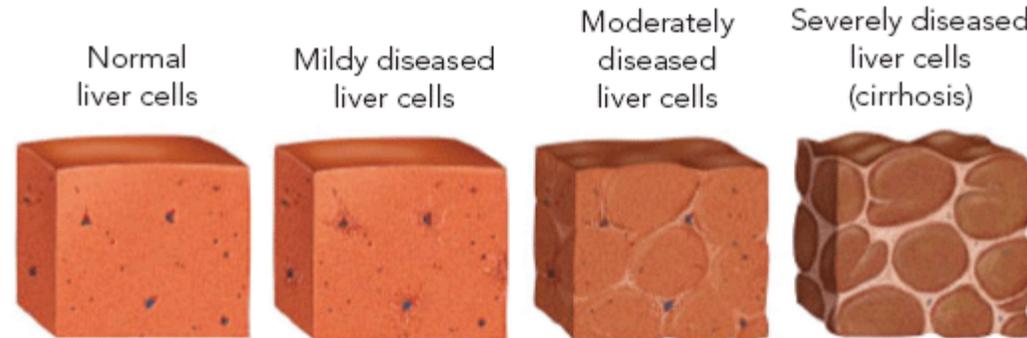
† To differentiate past, resolved HCV infection from biologic false positivity for HCV antibody, testing with another HCV antibody assay can be considered. Repeat HCV RNA testing if the person tested is suspected to have had HCV exposure within the past 6 months or has clinical evidence of HCV disease, or if there is concern regarding the handling or storage of the test specimen.

Source: CDC. Testing for HCV Infection: An update of guidance for clinicians and laboratorians. *MMWR* 2013;62(18).

Chronic Hepatitis C Infection

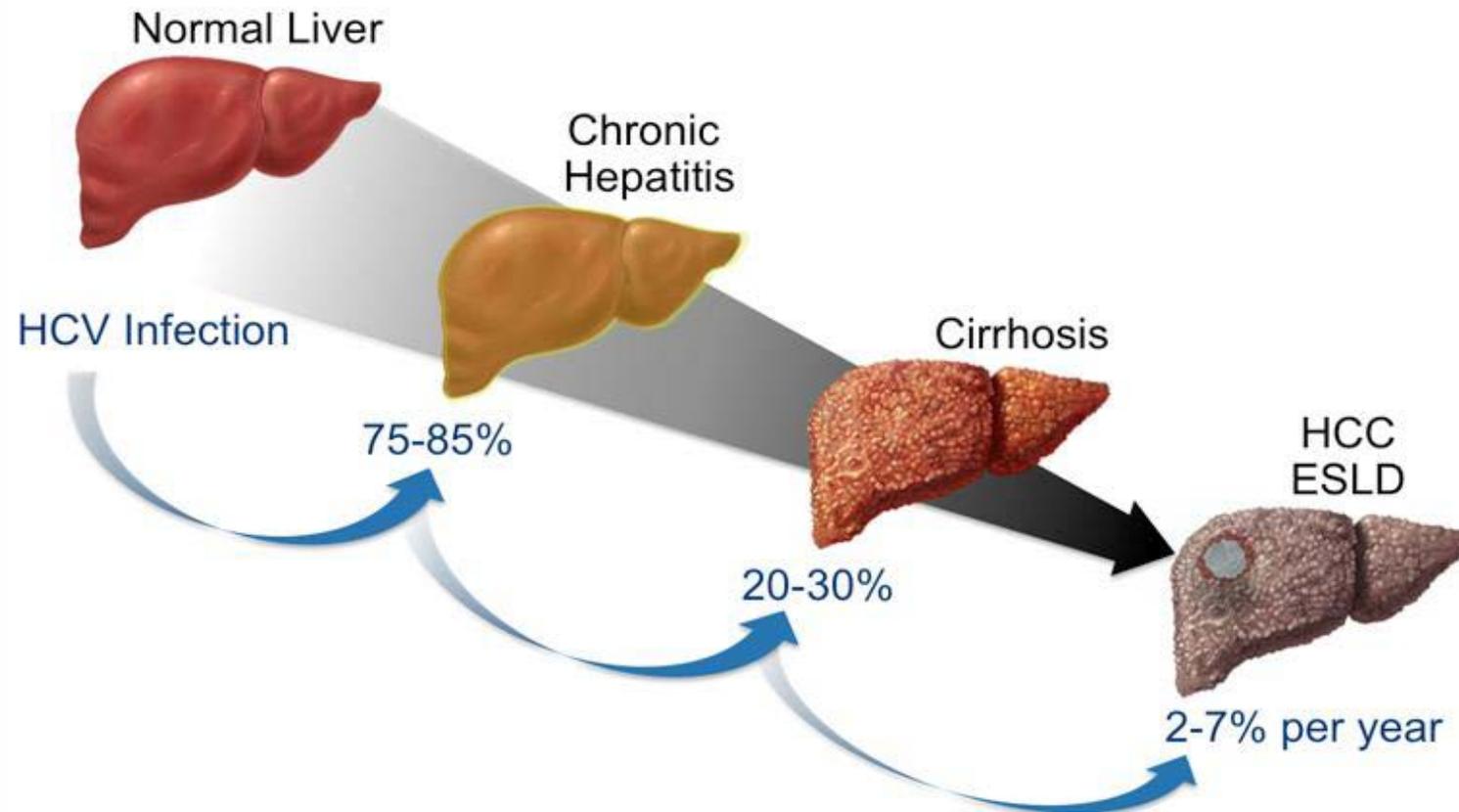
- 75% - 85% of all infected persons go on to have chronic viral replication
- The result is chronic hepatitis with liver damage and scarring
- Most chronically infected persons have minimal to no symptoms until liver damage is advanced
- 20% - 30% will go on to develop cirrhosis
- 2% - 10% will go on to develop hepatocellular carcinoma over 30 years

Up to 10% of Chronically Infected Patients with HCV Will Progress to Cirrhosis Within 20 Years; 20% Within 30 Years.



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Hepatitis C Infection: Consequences to the Liver



Chronic Hepatitis C Infection (cont.)

- More than 30% of people infected with Hepatitis C develop extrahepatic manifestations
 - Hematologic disorders – Cryoglobulinemia, Antigen-Antibody Complex Diseases, Lymphoma
 - Autoimmune disorders – Thyroiditis, Thrombocytopenia, Sjogrens Syndrome, Arthritis
 - Renal Disease
 - Dermatologic conditions – Porphyria Cutanea Tarda, Lichen Planus, Necrolytic Acral Erythema, Leucocytoclastic vasculitis

So, What Does This Have To Do With Diabetes?

Good Question!

The number one reason we want to worry about hepatitis C in diabetes is to save the liver.

Diabetes and Liver Disease

- Cirrhosis is more than twice as common in diabetics as in the general population
- Cirrhosis is the 4th leading cause of diabetes-related death (5-10%)
- Diabetes is the most common cause of liver disease and cryptogenic cirrhosis in the US

Hepatitis C and Kidney Disease

- Membranoproliferative Glomerulonephritis
 - Most cases due to Cryoglobulinemia and Antigen-Antibody Deposition
 - Improves with treatment of Hepatitis C infection
- Membranous Nephropathy

Keep Calm and Save Your Skin



Does Hepatitis C Cause Diabetes?

Hepatitis C and Diabetes

- Chronic Hepatitis C infection is linked to insulin resistance
 - Over and above the effects of chronic liver disease
 - Seen in patients that have not been diagnosed with Diabetes
- Type 2 Diabetics are almost 4 times as likely to have Hepatitis C
- Treatment of Hepatitis C leads to reduced insulin resistance and improvement in Type 2 Diabetes (Reduced A1c)
- Hepatitis C is also linked to the development of Type 1 Diabetes

Does Diabetes Make Hepatitis C Worse?

Diabetes and Hepatitis C

- Insulin Resistance is recognized as a risk factor for Hepatitis C induced cirrhosis
- Some studies have suggested a link between Diabetes and severity of cirrhosis due to chronic Hepatitis C
- Related to Nonalcoholic Fatty Liver Disease (NAFLD) and Nonalcoholic Steatohepatitis (NASH)?

Hepatitis C Treatment

- Ribavirin and pegylated alpha-IFN – becoming primarily of historical interest
- Direct acting antivirals
 - Taken in combination
 - Shorter courses of treatment (3-6 months)
 - High cure rates (>90%)
 - Limited side effects and medication interactions
 - Expensive

Direct Acting Antivirals

DNA-RNA Polymerase Inhibitors (NS5A/NS5B Inhibitors)

daclatasvir

ledipasvir

dasabuvir

sofosbuvir

prebentasvir

velpatasvir

velpatasvir

ombitasvir

elbasvir

Protease Inhibitors (NS3/4A protease complex)

telaprevir

simeprevir

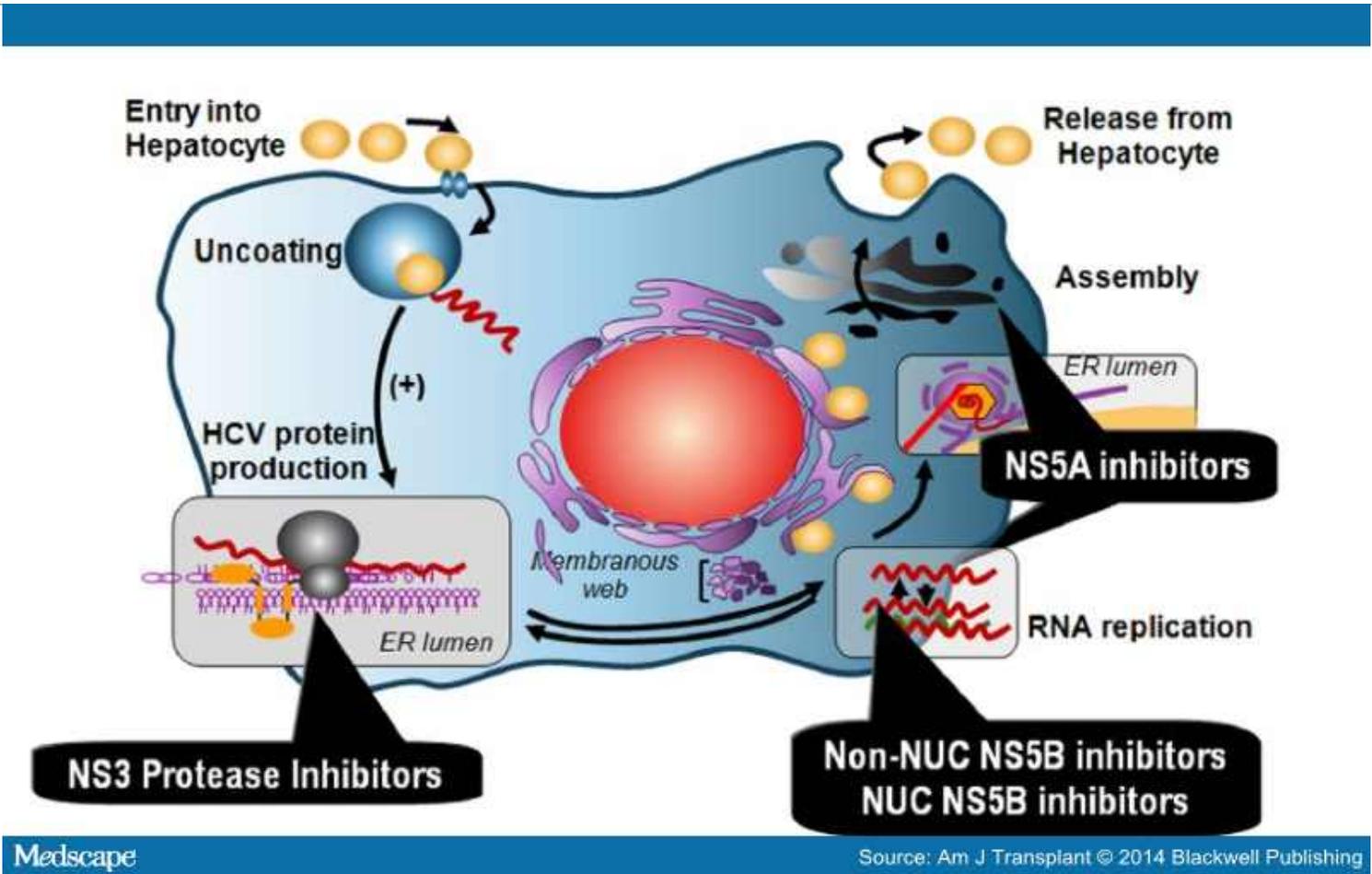
boceprevir

glecaprevir

paritaprevir

voxilaprevir

grazoprevir

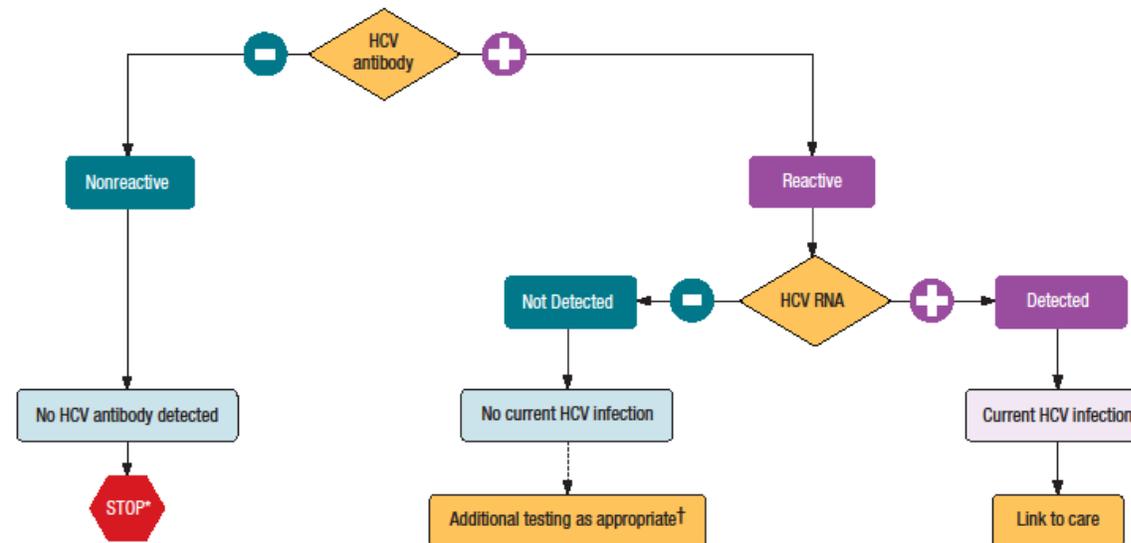


Recommended Testing Sequence for Identifying Current Hepatitis C Virus (HCV) Infection (cont.)

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U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention



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Screening for Hepatitis C

- Injection Drug Users (current and former)
- Everyone born between 1945 through 1965
- Clotting Factor recipients (from prior to 1987)
- Blood transfusion or solid organ transplant (from prior to July 1992)
- Chronic Hemodialysis
- Known exposures (HCWs, recipients of blood or organs from infected donors)
- Children born to infected mothers
- People with HIV
- Incarcerated persons
- Intranasal drug use
- Unregulated Tattoo recipient

Should All Diabetics be Screened for Hepatitis C?

- Increased incidence of Hepatitis C in AI/AN populations
- High incidence of Diabetes in AI/AN populations
- Mounting evidence of the link between Hepatitis C, insulin resistance, and Diabetes
- Evidence for worsened outcomes with Hepatitis C in Diabetics

Screening and Counseling

Keep Your Patients Informed

- Testing is to determine if they have been exposed to Hepatitis C and if they should be treated
- Treatment is available, effective, and has a high cure rate (>90%)
- Testing looks for exposure to Hepatitis C. If the test is positive, then more testing will be needed
 - To determine if the infection is active
 - To determine if treatment is needed