

# Alaska ID ECHO: HCV-HIV-PrEP-STIs



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NPAIHB

*Indian Leadership for Indian Health*

September 13, 2022

*This program is supported by a grant from the Northwest Portland Area Indian Health Board and funding is provided from the HHS Secretary's Minority HIV/AIDS Fund.*

# WELCOME

- The recording of the didactic presentation will be available at, [www.anthc.org/ak-id-echo](http://www.anthc.org/ak-id-echo) with the presentation slides.
- Questions will be saved until the end of the didactic presentation. Feel free to put your questions in the chat for the Q&A.

Thank you for participating!



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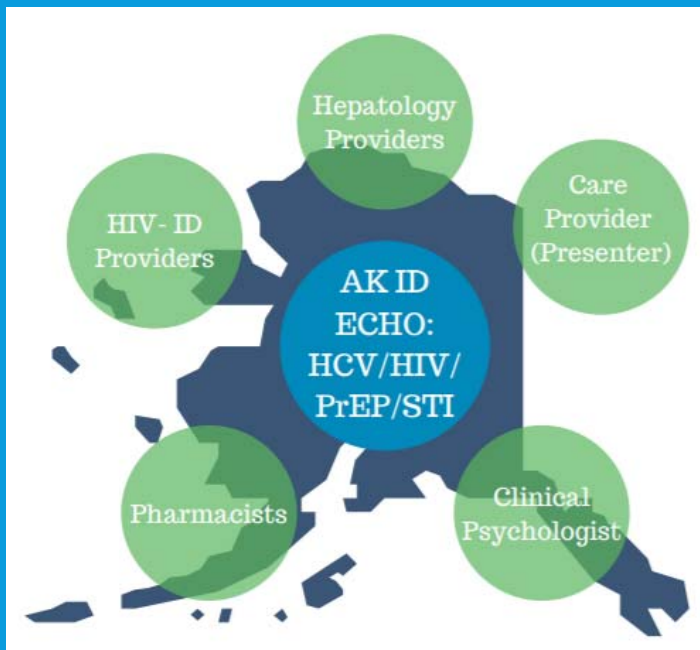
# WELCOME

- Please share in the chat:
  - Name
  - Where your joining from today
  - What would you like to learn during a future ECHO?



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# AK ID ECHO: CONSULTANT TEAM



- Youssef Barbour, MD Hepatologist
- Leah Besh, PA-C HIV/Hepatology Provider
- Terri Bramel, PA-C HIV/STI Provider
- Rod Gordon, R.Ph. AAHIVP Pharmacist
- Jacob Gray, MD Infectious Disease Provider
- Annette Hewitt, ANP Hepatology Provider
- Brian McMahon, MD Hepatologist
- Lisa Rea, RN HIV/STI Case Manager
- Lisa Townshend, ANP Hepatology Provider

# Welcome to Alaska Infectious Disease ECHO: HCV, HIV, PrEP, STIs

## Approved Provider Statements:



In support of improving patient care, Alaska Native Medical Center (ANMC) is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.

## Contact Hours:

ANMC designates this activity for a maximum of 12 contact hours, including 3 total pharmacotherapeutics contact hours, commensurate with participation.

## Financial Disclosures:

Youssef Barbour, MD & Lisa Townshend-Bulson, APRN / faculty for this educational event, are primary investigators in an ANTHC sponsored hepatitis C study funded in part by Gilead Sciences. All of the relevant financial relationships listed have been mitigated.

## Requirements for Successful Completion:

To receive CE credit please make sure you have actively engaged in the entire activity, your attendance is recorded by the facilitator, and complete the course evaluation form found here: <https://forms.gle/18t4EgvN2WdnM4P77>



For more information contact  
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# Hepatitis B Screening and Lab Interpretation

Brian J McMahon MD

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Alaska Native Tribal Health Consortium



## Quiz: Which of the Following Statements are True

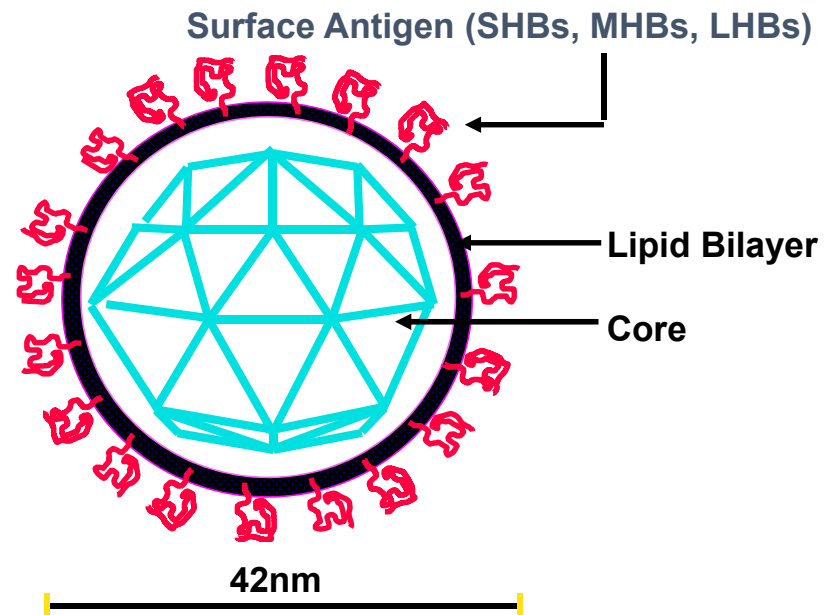
1. The CDC has recommended all adults should be screened for hepatitis B and those negative should be vaccinated
2. The CDC has recommended all adults should receive hepatitis B vaccine and will soon recommend that all adults be screened for hepatitis B Virus (HBV)
3. Only Injecting drug users and persons with a history of multiple sexual partners should be screened for hepatitis B
4. To Screen for hepatitis B, use HBsAg, antibody to HBsAg (anti-HBs) and antibody to HB core antigen (anti-HBc)
5. Numbers 2 and 4 are true

# Objectives and Goals

- Name the serology tests that should be ordered to screen a person for exposure to hepatitis B virus (HBV) to identify:
  - Those who are susceptible and need HBV vaccination
  - Those with chronic HBV
  - Those who previously acquired HBV but have recovered, though the virus is present but latent in their liver cells
- What other tests should be ordered if a person is found to be actively infected with HBV?
- When to order a test to measure presence and amount of HBV virus (HBV DNA level)?
- What other tests might be useful in a person infected with HBV?

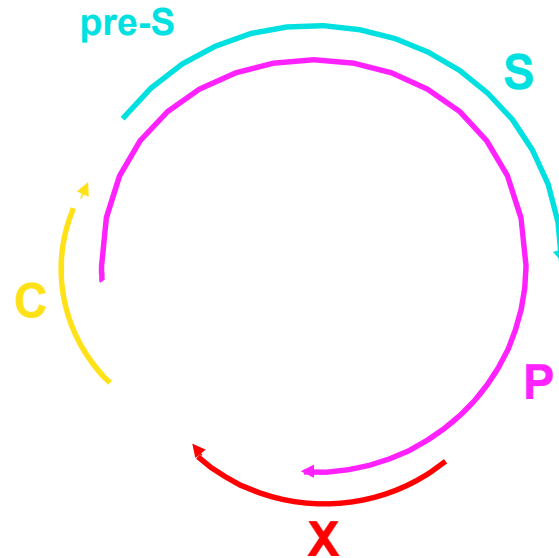


# Hepatitis B Virus



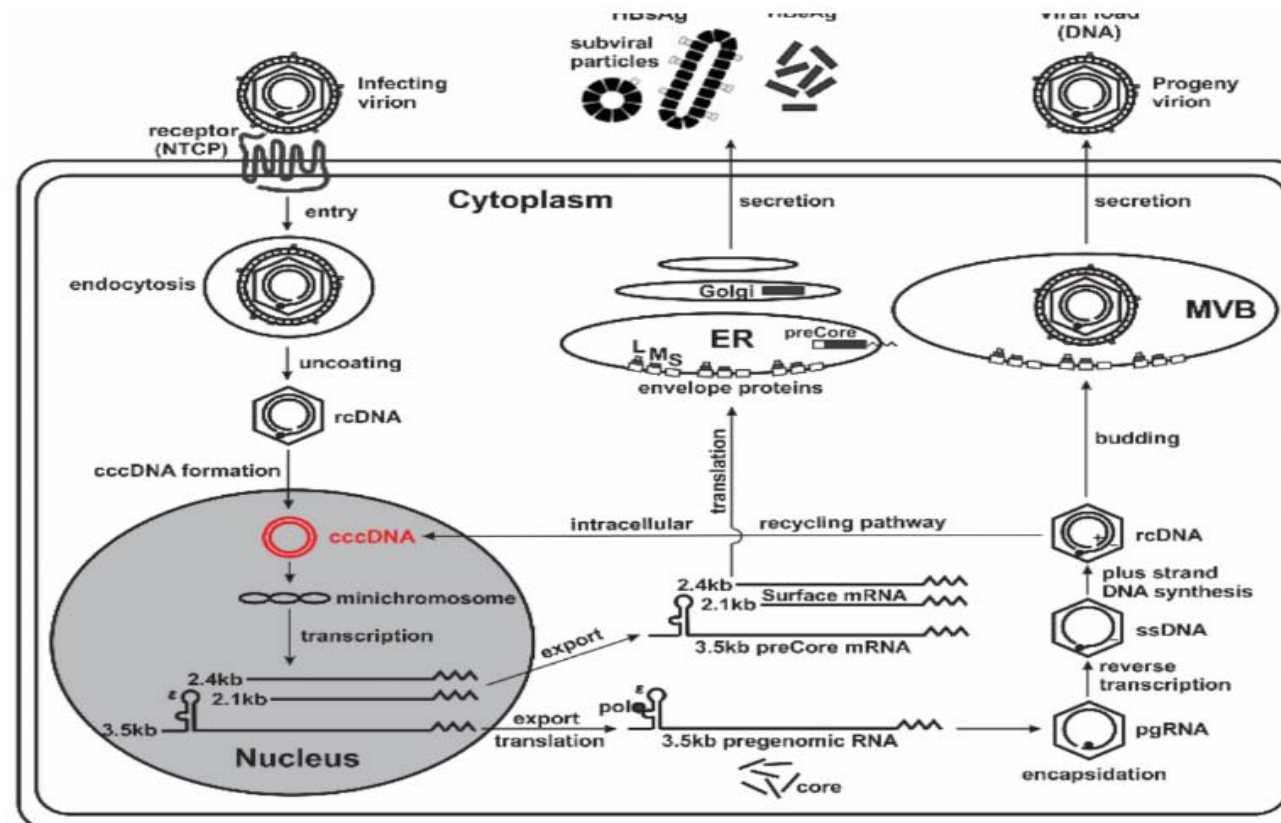
# HBV Genome and Gene Products

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- Partial double stranded DNA : long = negative Short=positive
- Four overlapping reading frames
  - Polymerase DNA polymerase, primase, RNAase, RT properties
  - Surface antigen surface glycoproteins, HBsAg, preS1, preS2
  - X transactivation - xprotein
  - Core nucleoproteins - HBcAg, HBeAg

# HBV Replication Cycle



# Hepatitis B nomenclature

HBsAg	<b>Hepatitis B surface antigen (in the virus envelope):</b> persistence beyond six months defines chronic infection
Anti-HBs	<b>Antibody to hepatitis B surface antigen:</b> defines <u>immunity</u> to reinfection
HBcAg	<b>Hepatitis B core antigen (in viral capsid):</b> “particulate form” is cell-associated; no soluble form present in plasma, so <u>don’t detect like HBsAg or HBeAg</u>
Anti-HBc	<b>Antibody to hepatitis B core antigen:</b> IgG defines any history of exposure to HBV; may be the <u>only marker of past infection</u> if anti-HBs declines; IgM defines acute HBV
HBeAg	<b>Hepatitis B E-antigen:</b> protein component of core; associated with <u>increased infectivity</u> ; soluble form released into plasma from infected hepatocytes
Anti-HBe	<b>Antibody to hepatitis B E-antigen:</b> signifies low-level of infectivity
HBV DNA	<b>HBV genome:</b> plasma level is prognostic of disease progression

# Interpretation of Hepatitis B Labs

Acute Hepatitis B Infection	Hepatitis B Carrier/ Chronic Infection	Previous Exposure with Immunity	Vaccination with Immunity
Anti-HBs -	Anti-HBs -	Anti-HBs +	Anti-HBs +
HBsAg +	HBsAg +	HBsAg -	HBsAg -
IgM anti-HBc +	Anti-HBc Total +	Anti-HBc Total +	Anti-HBc Total -

## Other Names for These Labs/Definitions

HBsAg = Surface Antigen. Positive = Infection

Anti-HBs = Surface Antibody. Positive = Immunity

Anti-HBc Total = Core Antibody. Infection memory. Positive at onset of hepatitis B infection (acute and chronic) and persists through life

# Screening the General Population for Hepatitis B Virus Infection

- CDC recommends that providers test for HBsAg, anti-HBs and anti-HBc

HBsAg = Surface Antigen. Positive = Infection: acute or chronic

Anti-HBs = Surface Antibody. Positive = Immunity

Anti-HBc Total = Core Antibody. Infection memory. Positive at onset of hepatitis B infection (acute and chronic) and persists through life

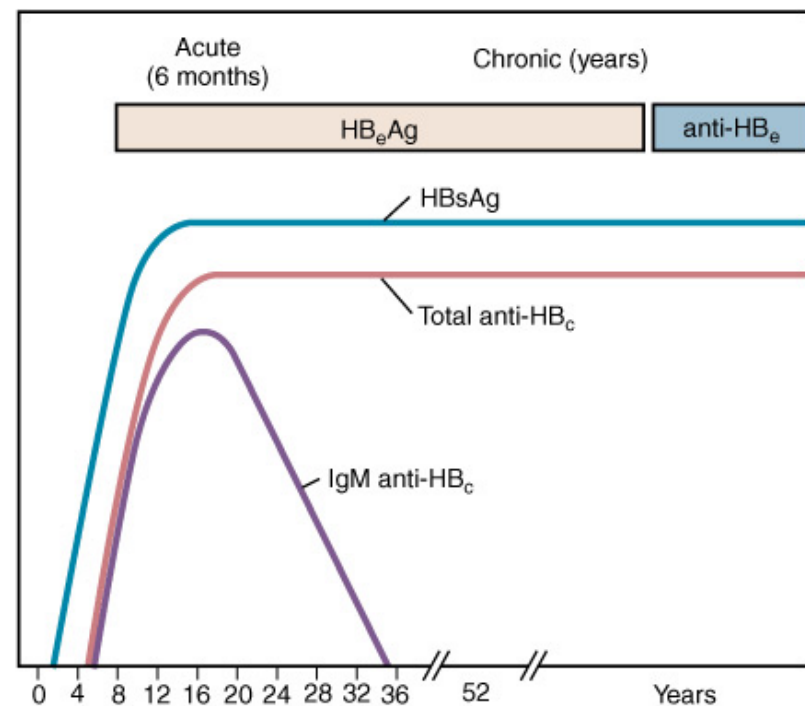
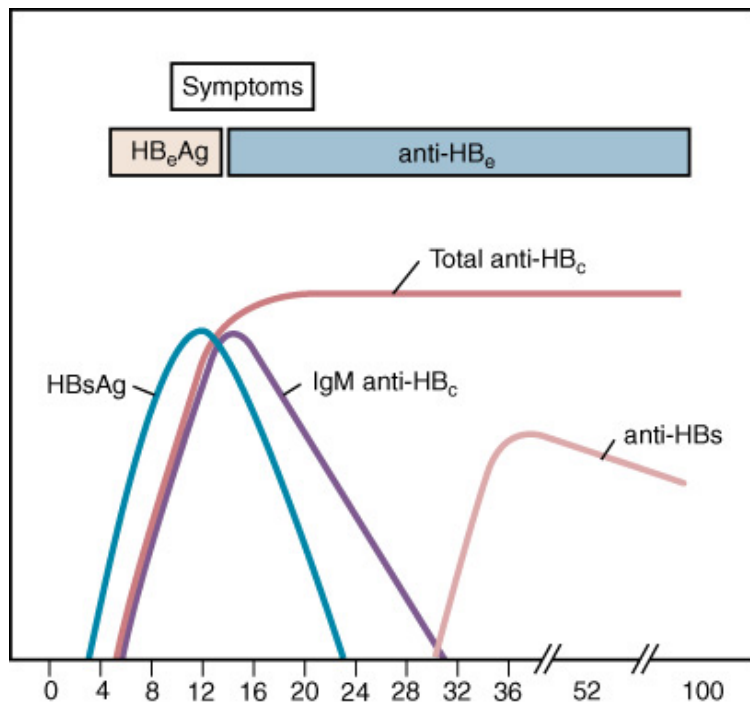
- For persons who are jaundice or symptomatic, test for anti-HBc IgM and HBsAg.

IgM anti-HBc = IgM Antibody. Only present during acute hepatitis B infection

# What Tests to Order in Persons Found to be HBsAg+

- HBV DNA
- Full panel LFTs
- Consider AFP
- Consider hepatitis B “e” antigen (HBeAg) and it’s antibody (anti-HBe)
- Consider HBV genotype
- For persons who are not of Alaska Native Origin, consider hepatitis Delta antibody

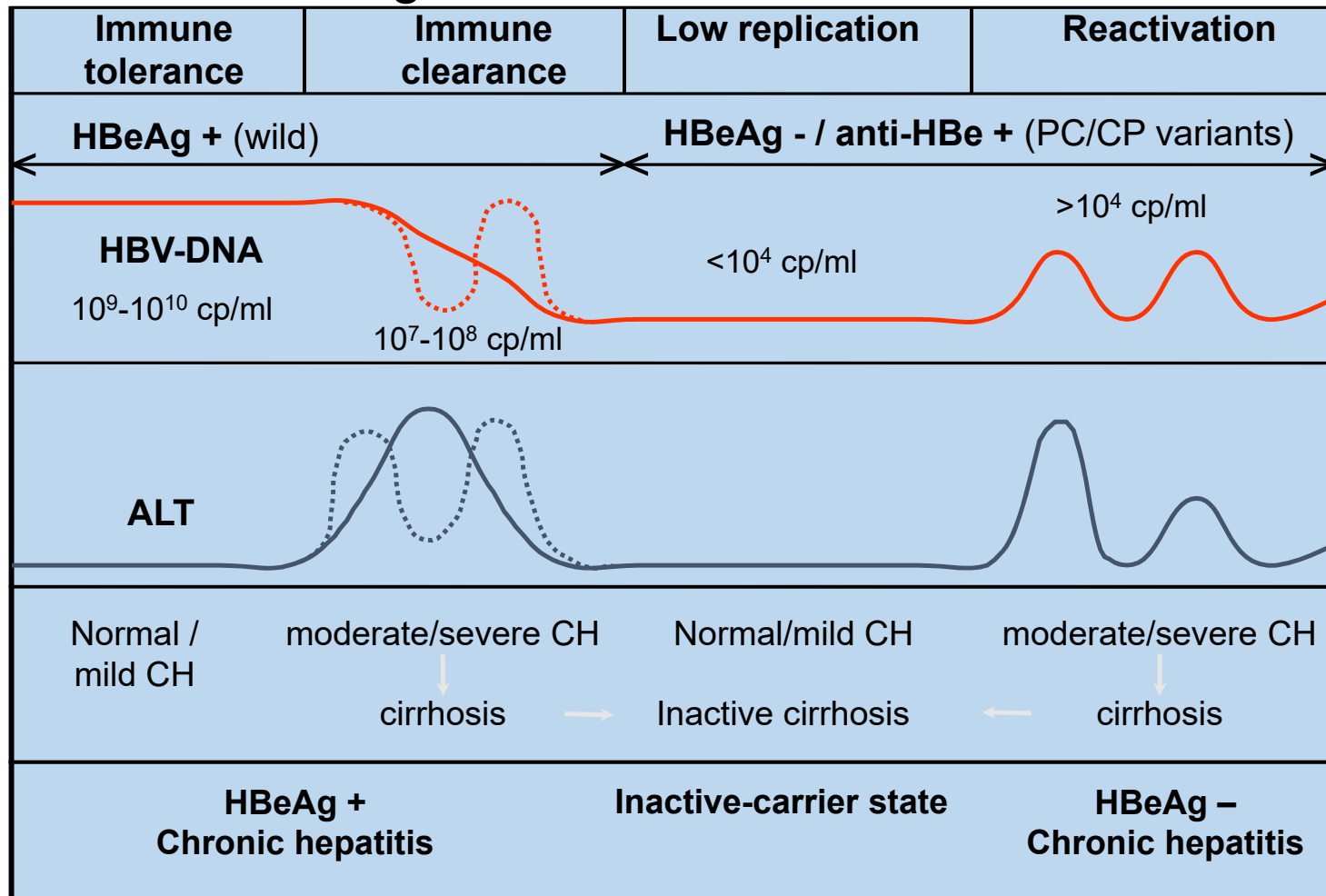
# Acute and Chronic HBV Infection



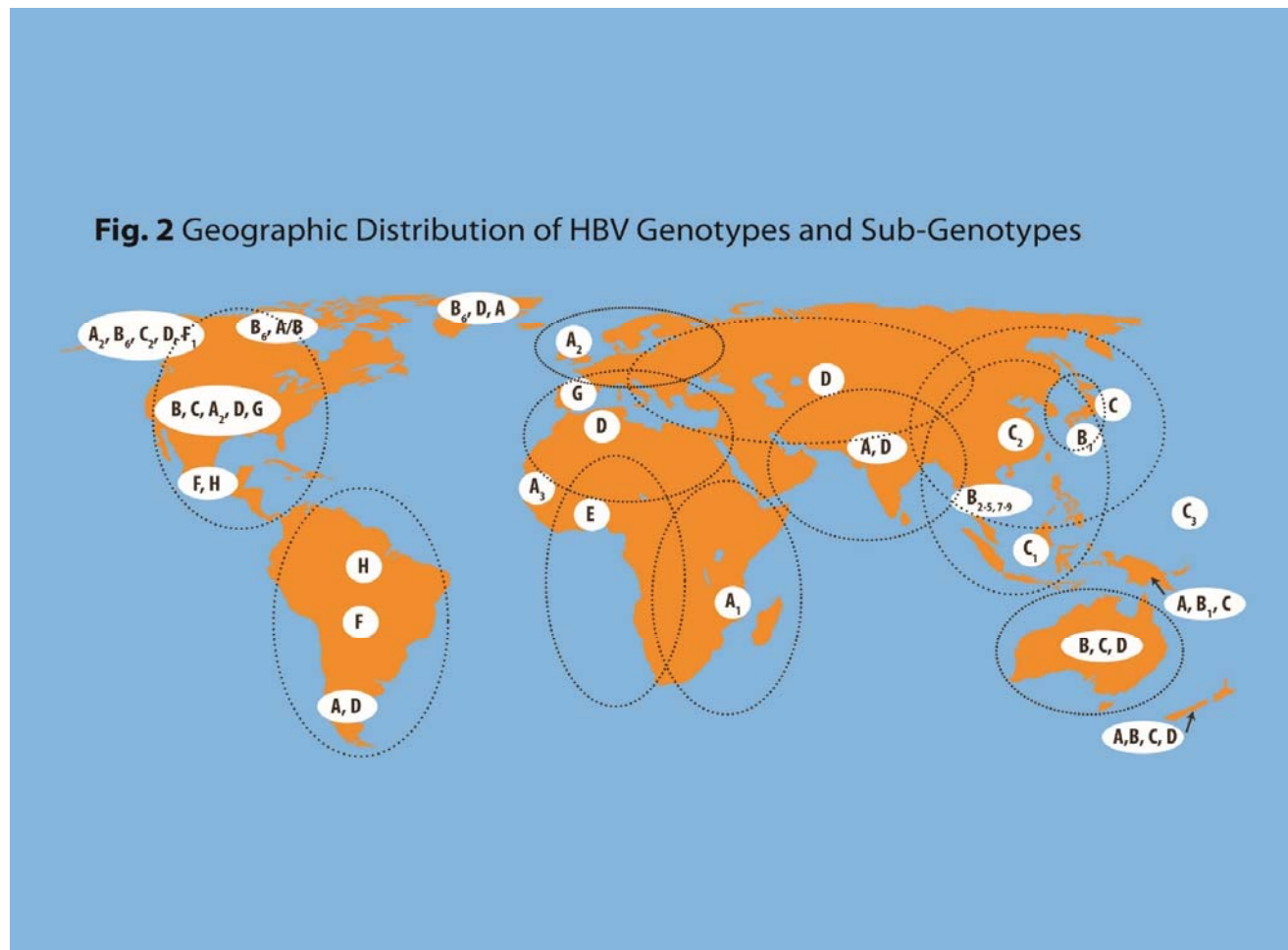
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## Fluctuating course of chronic HBV infection



# HBV Genotype Distribution Throughout The World



# HBV Genotype and its Influence on Natural History of Chronic HBV Infection

- Globally 8 HBV Genotypes
  - 5 HBV genotypes found in AN population
- Genotype testing is commercially available
- HBV Genotype HBV genotypes associated with
  - Clearance of HBeAg
  - Incidence of HCC
  - Likely risk of developing cirrhosis over lifetime

## Median Age of HBeAg Seroconversion by Genotype: Median 21 Years Follow-up\*

Genotype	No. HBeAg+	Age 50% lost HBeAg	Age 75% lost HBeAg
A <sub>2</sub>	34	19.8	32.1
B <sub>6</sub>	6	19.5	27.5
C <sub>2</sub>	36	47.8	58.1
D <sub>2,3</sub>	305	18.0	27.3
F <sub>1b</sub>	126	16.1	24.5

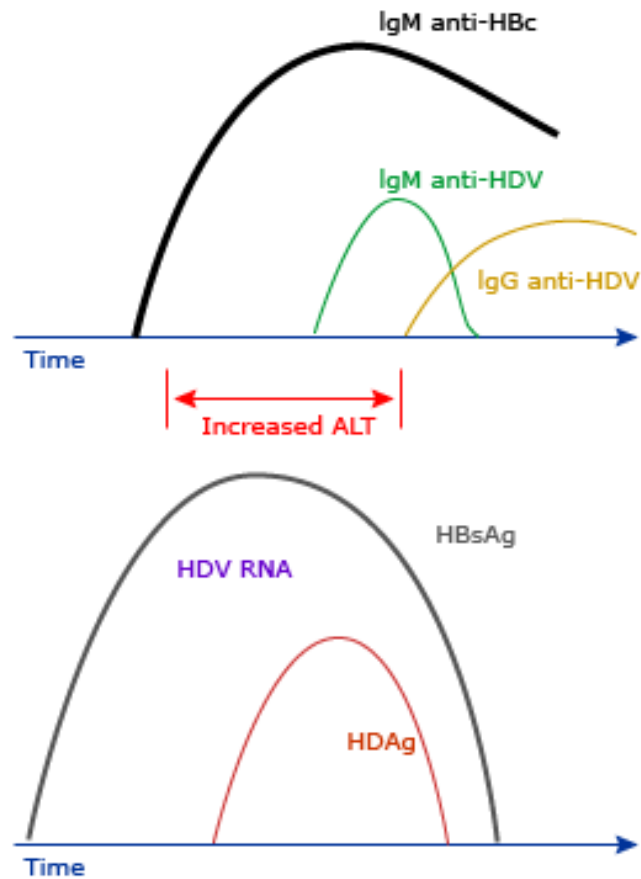
Livingston et al. Gastroenterology 2007;133:1452-57

# Hepatitis Delta Virus (HDV)

- RNA Virus that infects with HBV
- Requires HBsAg as it's coat and delta antigen as a protein which surrounds the nucleus of the virus
- Two outcomes after exposure to HDV
  - In person never infected with HBV, high risk of severe acute hepatitis but high probability of recovery from both viruses
  - In a person who already has chronic HBV, high risk of acute fulminant hepatitis and high risk of developing chronic HBV and HDV in those who recover with more rapid risk of developing liver failure
- Does not respond well to nucleoside or nucleotide analogues used to treat HBV
  - Usual treatment interferon plus nucleoside analogue
- Much more aggressive chronic hepatitis course with much higher risk of cirrhosis
- Is not found in the Alaska Native Population but other persons positive for HBsAg should be considered for testing for delta antibody

## Serum markers of acute, self-limiting HBV/HDV coinfection

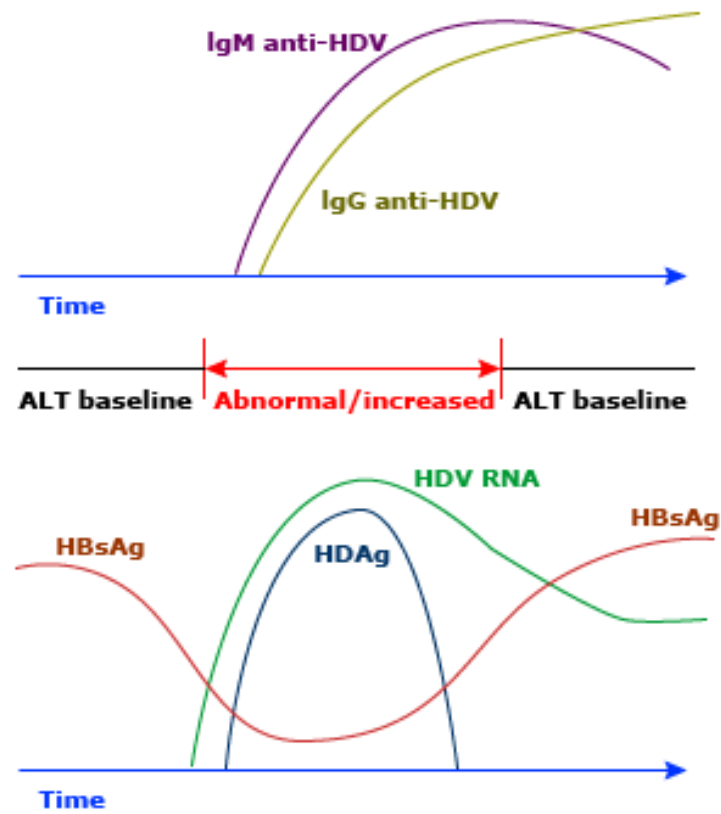
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From Up To Date

## Serum markers of an HDV superinfection of a chronic HBV carrier

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# New and Soon to be Recommendations for HBV Screening and Vaccination in the US

- In the US: Recent new initiatives
  1. In November 2021 the ACIP recommended universal hepatitis B vaccine for all adults
  2. CDC DVH has drafted a recommendation for universal screening of all adults for HBV seromarkers likely will be implemented before the end of this year or early next year



## Testing for HBV Seromarkers in Persons who are to Receive Immunosuppressive or anti-cancer Medications

- In persons who had acquired an acute HBV infection previously and made a full recovery and later are scheduled to receive a drug to treat cancer or an immunologic illness, they are at risk for a reactivation of HBV that even can be fatal
- All persons who receive chemo or immunotherapy should be tested for HBsAg, anti-HBs and anti-HBc
  - If HBsAg+, they need HBV antiviral medication probably indefinitely
  - If positive for anti-HBc but negative for HBsAg, they could reactivate on above medications and consultation regarding whether to put on prophylactic antiviral therapy should be sought
  - If negative for anti-HBc and HBsAg but positive for anti-HBs, it means that they were vaccinated for HBV and need no antiviral medication

## In Conclusion: Test persons for HBsAg, anti-HBs and anti-HBc

- All adults who have never been tested and have never received HBV vaccine and vaccinate those negative for all three markers
- All persons to be prescribed any immunosuppressive and chemotherapy
- All persons with acute hepatitis or who are found to have elevated LFTs on routine lab screening need testing for HBV seromarkers

## Quiz: Which of the Following Statements are True

1. The CDC has recommended all adults should be screened for hepatitis B and those negative should be vaccinated
2. The CDC has recommended all adults should receive hepatitis B vaccine and will soon recommend that all adults be screened for hepatitis B Virus (HBV)
3. Only Injecting drug users and persons with a history of multiple sexual partners should be screened for hepatitis B
4. To Screen for hepatitis B, use HBsAg, antibody to HBsAg (anti-HBs) and antibody to HB core antigen (anti-HBc)
5. Numbers 2 and 4 are true. **Correct Answer**



- **Postvaccine Antibody Testing:** Given the decreased response rate to hepatitis B vaccine among persons with HIV, postvaccine testing for antibody to hepatitis B surface antigen (anti-HBs) should be performed 1 to 2 months after completing the final dose of the vaccine series, with a titer of at least 10 mIU/mL considered protective; individuals who have a postvaccine anti-HB less than 10 mIU/mL are considered vaccine nonresponders.<sup>[6,31]</sup>

- **Repeat Immunization for Vaccine Nonresponders:** If a postvaccine anti-HBs concentration of at least 10 mIU/mL is not attained, the following are considered as options for these vaccine nonresponders:<sup>[2]</sup>
  - Administer a double-dose, 4-dose series with *Engerix-B* or *Recombivax-HB* given at 0, 1, 2, and 6 months (**BI**), or
  - Administer the *Heplisav-B* vaccine series (**CIII**).

# AK ID ECHO DIDACTIC TOPICS FOR 2022

- October 11: Drug Interaction Considerations with Gender Affirming Hormone Therapy
- November 8: STI EPI Update
- December 13: HIV Update



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# ADDITIONAL LEARNING OPPORTUNITIES

## **Alaska Liver Disease ECHO**

- Third Thursday of every month from 12:00-1:00 PM
- September 15: Trauma Informed Care and Liver Disease
- [www.anthc.org/project-echo/alaska-liver-disease-echo](http://www.anthc.org/project-echo/alaska-liver-disease-echo)

## **LiverConnect**

- Second Tuesday of every month 8:00-9:00 AM
  - October 11: TBA
- [www.anthc.org/hep/liverconnect](http://www.anthc.org/hep/liverconnect)



# ADDITIONAL LEARNING OPPORTUNITIES

## **Addiction Medicine ECHO**

- Second and fourth Thursday of every month from 12:00-1:00 PM
- September 22: Substance Use Disorder Policy in Alaska
- October 13: Population Health

[www.anthc.org/project-echo/addiction-medicine-echo](http://www.anthc.org/project-echo/addiction-medicine-echo)

## **Indian Country ECHO Programs**

- Harm Reduction, Infectious Disease, and more!

[www.indiancountryecho.org/teleecho-programs](http://www.indiancountryecho.org/teleecho-programs)



# AK ID ECHO Contacts

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ANTHC Liver Disease and Hepatitis Program: 907-729-1560

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- Jessica Leston: Clinical Programs Director: [jleston@npaihb.org](mailto:jleston@npaihb.org)



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