

Hepatitis B & HIV Coinfection

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Housekeeping Notes

Have a question for the presenter

- Type the question into the chat box and Meg will read them aloud to the presenter at the end

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- After the training, you will receive an e-mail with instructions, the course number, and the access code
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- Visit <https://empireliverfoundation.org/about-us/cme-accreditation/>

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- No Disclosures

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The Empire Liver Foundation is an association of NYS liver specialists dedicated to increasing community awareness of liver disease, providing education on liver disease to health care providers and patients and providing guidance to those who make policy decisions influencing the practice and science of liver disease.

- **CME Grand Rounds**
- **CME Clinical Training Series**
- **Live Preceptorship**
- **Mentoring**

www.empireliverfoundation.org



The New York City Health Department Viral Hepatitis Program conducts surveillance and develops and implements programs to build capacity to prevent, manage and treat hepatitis B and C in New York City.

- **Surveillance**
- **Community Coalitions**
- **Navigation Programs**
- **Clinical Practice Facilitation**
- **Training**

www.nyc.gov/health/hepatitis

Overarching Learning Objectives

By the end of this presentation, participants will be able to:

1. Describe the importance of interprofessional collaboration in effectively meeting the healthcare, educational, and psychosocial needs of patients living with hepatitis B or C infection.
2. Describe the epidemiology and natural history of hepatitis B and hepatitis C infection.
3. Use updated guidelines to identify patients at risk for hepatitis B and/or hepatitis C infection and provide screening according to these guidelines.
4. Select appropriate antiviral treatments for people living with hepatitis B or hepatitis C, including special populations such as people with advanced liver disease or HIV co-infection.
5. Explain the efficacy and safety of current and emerging therapies for hepatitis B and C, including use in special populations such as people who use drugs or alcohol or have substance use disorders.
6. Illustrate how to counsel patients diagnosed with hepatitis B or C regarding risks and benefits of therapies and involve them in shared treatment decisions.

Learning Objectives

By the end of this presentation, participants will be able to:

- Describe the epidemiology of hepatitis B (HBV) infection
- Understand the natural history of HBV infection
- Identify candidates for HBV vaccination
- Identify patients who should be screened for HBV and interpret HBV serology
- Educate patients on preventing HBV transmission
- Recall the role of the primary care provider (PCP) in HBV care

Clinical Case

- A 42-year-old man presents to establish care for HIV and HBV.
- Both were diagnosed on routine labs during a recent hospitalization for infective endocarditis. He is unsure if he was ever previously screened.
- Studies are as follows:
 - HIV 1,2 Ag/Ab+, CD4 640, HIV VL 89,000
 - HBsAg+, HBV DNA >100,000
 - HCV Ab-
 - CBC and BMP normal, ALT 45

Clinical Case

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Both were diagnosed on routine labs during a recent hospitalization for infective endocarditis. He is unsure if he was ever previously screened.

Studies are as follows:

- HIV 1,2 Ag/Ab+, CD4 640, HIV VL 89,000
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- HCV Ab-
- CBC and BMP normal, ALT 45

- *What risk factors might have predisposed this patient to HIV/HBV coinfection?*
- *How can we counsel him about his new diagnoses and risk of future complications?*
- *Which additional studies are indicated to characterize his condition?*
- *How should he be treated and monitored?*
- *Which referrals or services might be beneficial?*

Epidemiology

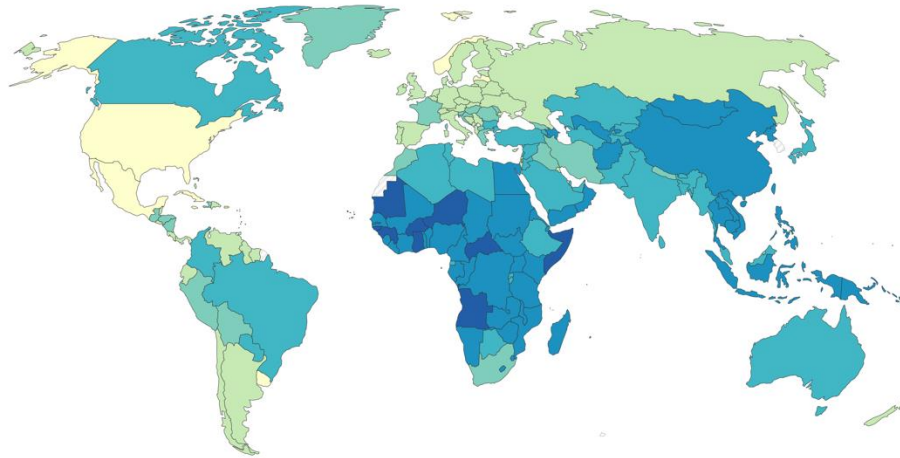
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HIV/HBV Global Prevalence

~296 million people globally with HBV
1% have HIV

Hepatitis B incidence rate, 2019

Incidence of hepatitis B, measured as the number of new cases of hepatitis B per 100,000 individuals in a given population. SDG Target 3.3 is to combat hepatitis by 2030.

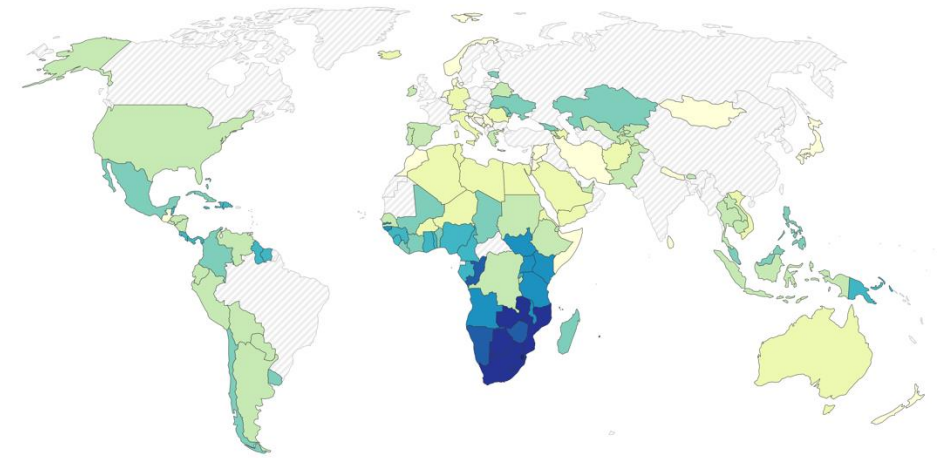


No data 0 100 250 500 1,000 2,500 5,000 10,000

~38 million people globally with HIV
7% have HBV

Incidence of HIV per 1,000 uninfected adults, 2020

Number of new HIV infections among uninfected populations ages 15-49 expressed per 1,000 uninfected population.



No data 0 0.05 0.1 0.25 0.5 1 2.5 5 10 25 50

~3 million people with
HIV/HBV coinfection

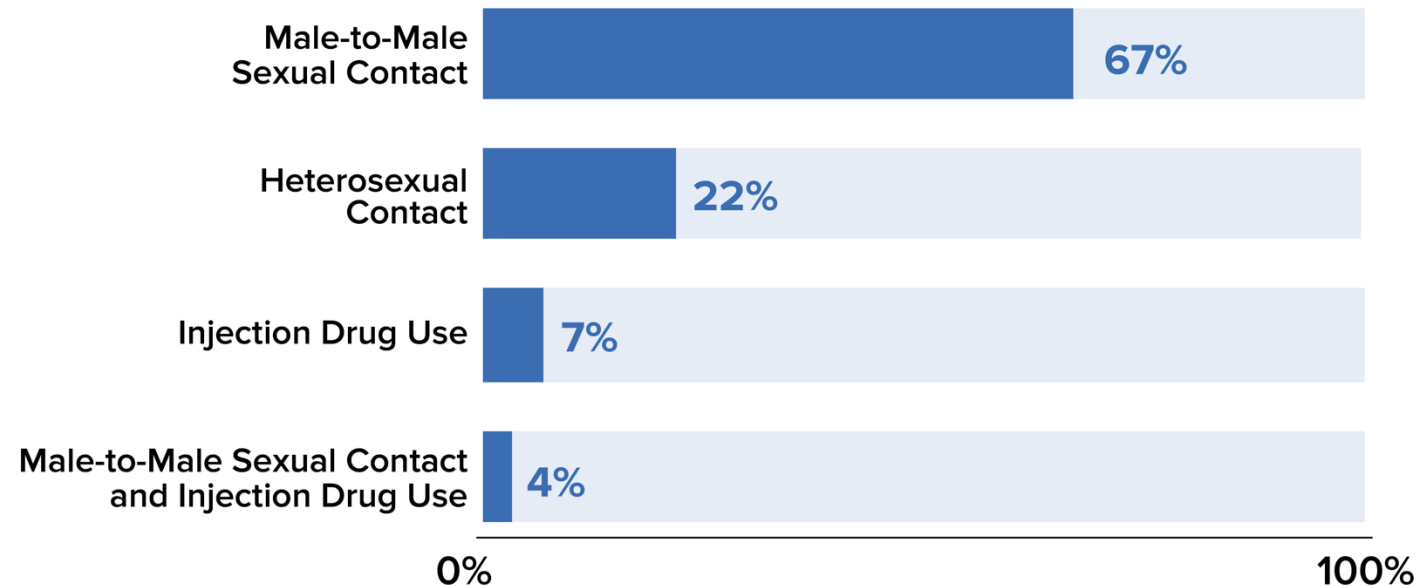
HIV/HBV Transmission

HIV and HBV have similar routes of transmission and populations impacted

New U.S. HBV diagnoses, 2020

Reported history or exposure	Number identified
Injection drug use	402
Multiple sexual partners	124
Surgery	91
Men who have sex with men	64

New U.S. HIV diagnoses, 2021



Disease Progression

The background features a light blue gradient. A large, dark blue, angular shape is positioned on the right side, pointing towards the bottom right. A thick, dark blue diagonal line runs from the top right towards the bottom right, intersecting the dark blue shape.

Impact of HIV/HBV Coinfection on Disease Progression

Impact of HIV on HBV natural history

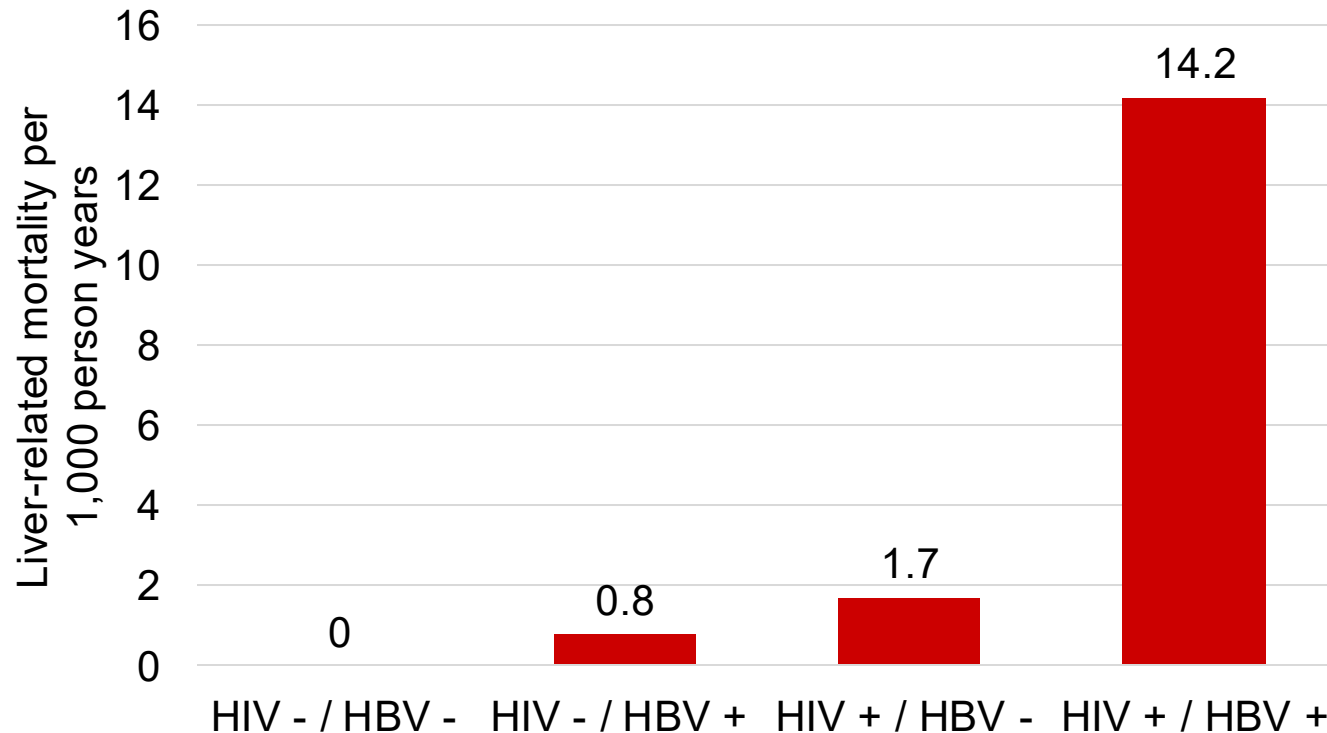
- Increases risk of
 - Cirrhosis
 - Hepatocellular carcinoma
 - End-stage liver disease
 - Mortality
- Lower rate of spontaneous HBeAg or HBsAg seroconversion
- Higher rate of HBV reactivation in those with HBcAb (“carriers”)

Impact of HBV on HIV natural history

- HBV infection does not
 - Influence HIV suppression or CD4 counts following initiation of HIV therapy
 - Substantially alter longterm HIV progression

Impact of HIV/HBV Coinfection on Liver-Related Mortality

Liver-related mortality in persons with HIV/HBV monoinfection versus coinfection



Multicenter, prospective cohort study of liver-related mortality with HIV and HBV infection among 5,622 men followed for a median of 10.5 years

Screening and Evaluation



Screening Guidelines

	HBV	IV
All adults at least once per lifetime	✓	✓ **Routinely in healthcare settings as part of general care (no separate written consent)
All pregnant women at least once per pregnancy	✓	✓
Persons at increased risk, periodically	✓	✓ (at least annually)
Initiation of HIV PrEP	✓	✓



persons diagnosed with HBV or HIV should be screened for coinfection on initial evaluation



History and Physical Examination

- History
 - Risk factors for viral hepatitis
 - Risk factors for HIV coinfection
 - Comorbid conditions
 - Family history of liver cancer
 - Social and substance use history
- Physical examination
 - Hepatosplenomegaly
 - Jaundice
 - Ascites
 - Cachexia
 - Thrush

Pretreatment Evaluation

HBV studies

- HBV sAg, sAb, cAb
- HBV DNA
- HBV eAg and eAb

HIV studies

- HIV Ag/Ab test
- CD4 absolute, %
- HIV viral load
- HIV genotype

Other viral hepatitides

- HAV IgG
(vaccination)
- HCV Ab
- HDV Ab
- HEV Ab
(acute hepatitis)

Additional labs

- CBC
- CMP: liver and renal function
- PT/INR
- Ultrasound

Assessing Liver Fibrosis

$$\text{APRI} = \frac{\frac{\text{AST Level (IU/L)}}{\text{AST (Upper Limit of Normal) (IU/L)}}}{\text{Platelet Count (10}^9\text{/L)}} \times 100 = \text{[]}$$

Transient elastography



$$\text{FIB-4} = \frac{\text{Age (years)} \times \text{AST Level (U/L)}}{\text{Platelet Count (10}^9\text{/L)} \times \sqrt{\text{ALT (U/L)}}} = \text{[]}$$

MR elastography



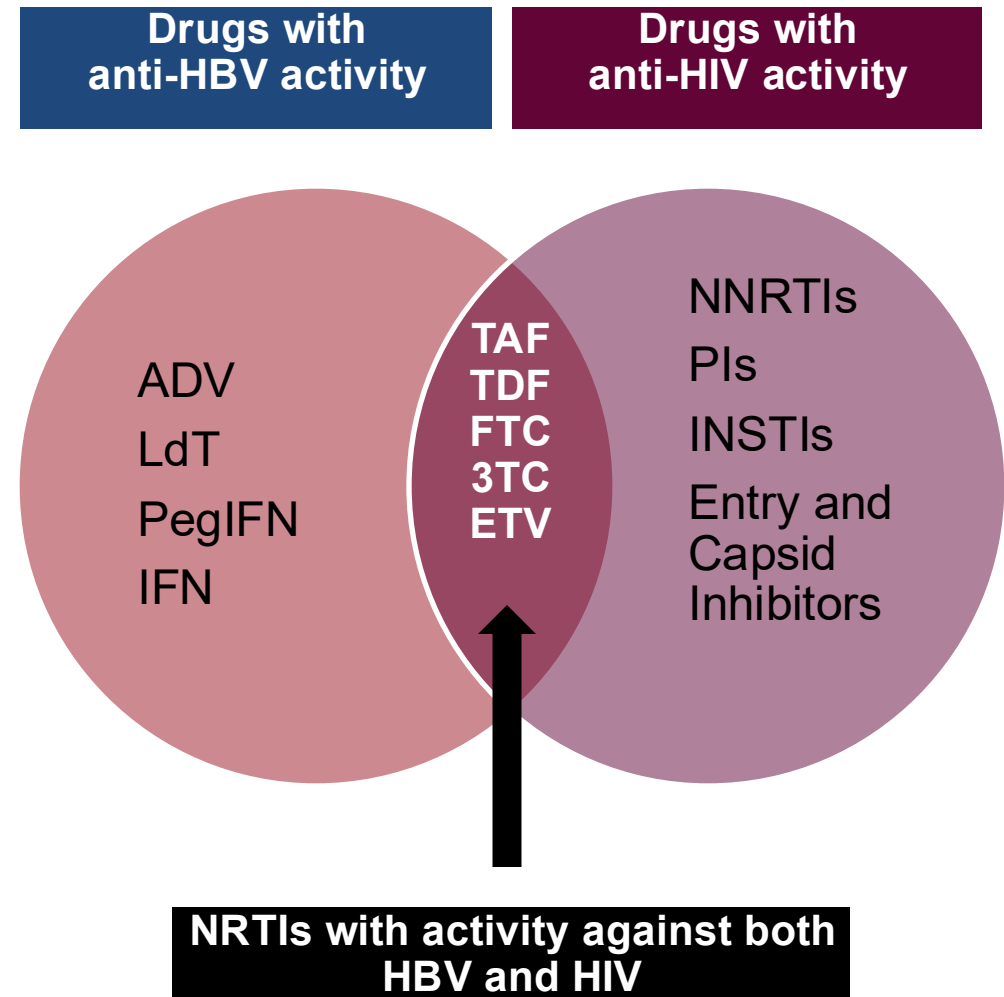
Treatment

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Recommendations for Universal Treatment

Summary of Guideline-Based Treatment Recommendations for HIV and HBV Coinfection

Guidelines	When to initiate	What to initiate
AASLD HBV update, 2018 ³⁵	All patients with HIV/ HBV, regardless of CD4+ cell count	2 HBV-active agents: tenofovir (TAF or TDF) with lamivudine or emtricitabine
DHHS antiretroviral guidelines, 2022 ³⁶	All patients with HIV/ HBV, regardless of CD4+ cell count	Tenofovir (TAF or TDF) with emtricitabine; chronic administration of lamivudine or emtricitabine as the only HBV-active agent as part of ART should be avoided.
EASL HBV guidelines, 2017 ³⁷	All patients with HIV/ HBV, regardless of CD4+ cell count	Tenofovir (TAF or TDF)—containing ART regimen
APASL HBV update, 2015 ³⁸	All patients with HIV/ HBV, "irrespective of immunologic, virologic, or histologic considerations"	2 HBV-active agents: tenofovir with lamivudine or emtricitabine

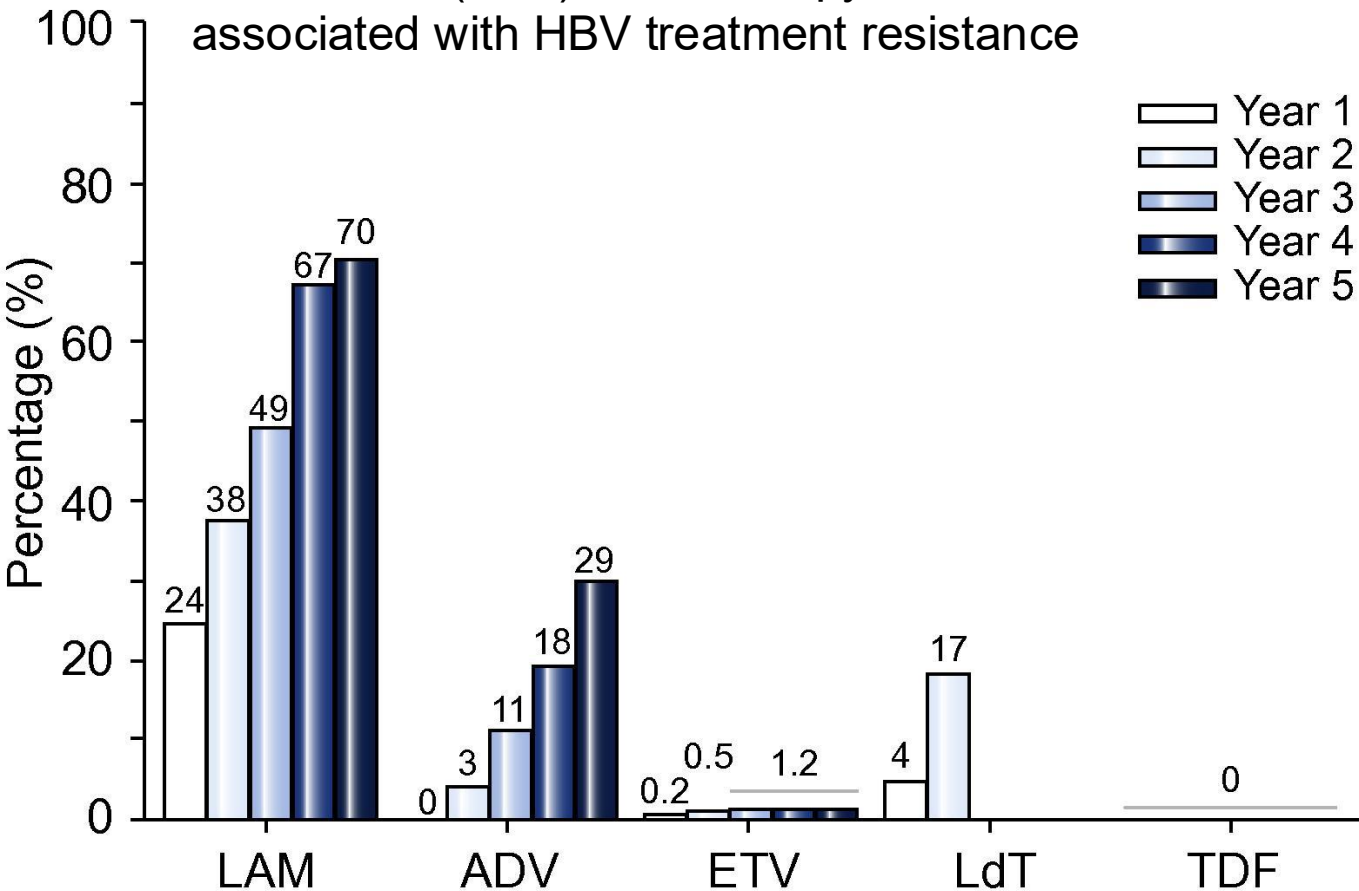


Treatment Recommendations for HIV/HBV Coinfection

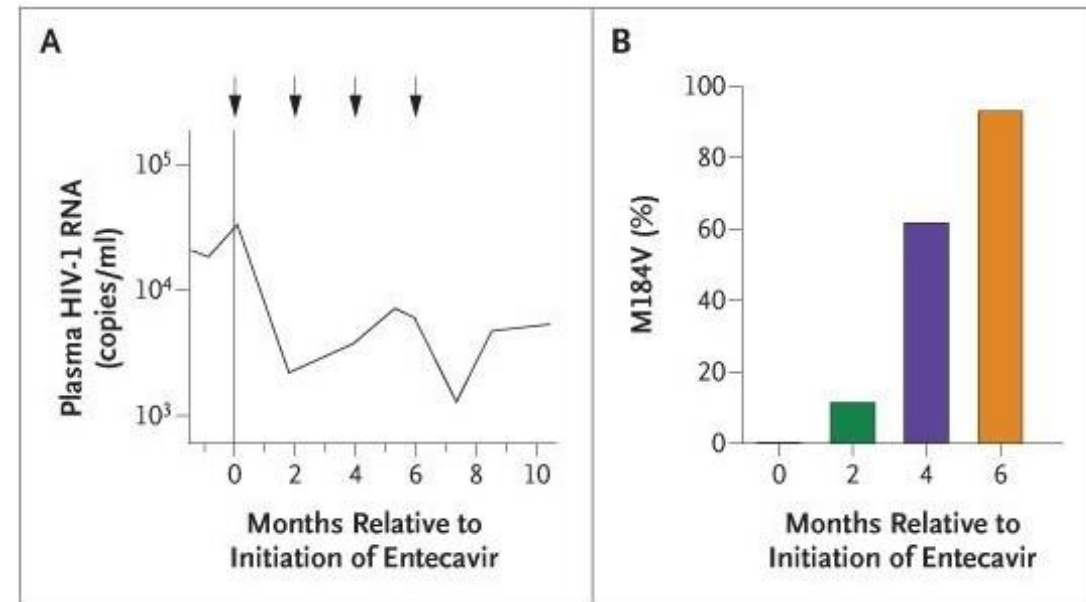
	AASLD 2018	DHHS 2022	EASL 2017	APASL 2016
Concurrent HIV and HBV therapy	ART should include: TAF or TDF + 3TC or FTC	TAF or TDF + 3TC FTC as part of fully suppressive ART <i>Alternatively, ETV in addition to fully suppressive ART</i>	TAF- or TDF-based ART	TDF + 3TC or FTC + 3 rd agent

Cautions with HIV/HBV Monotherapies

Lamivudine (3TC) monotherapy associated with HBV treatment resistance

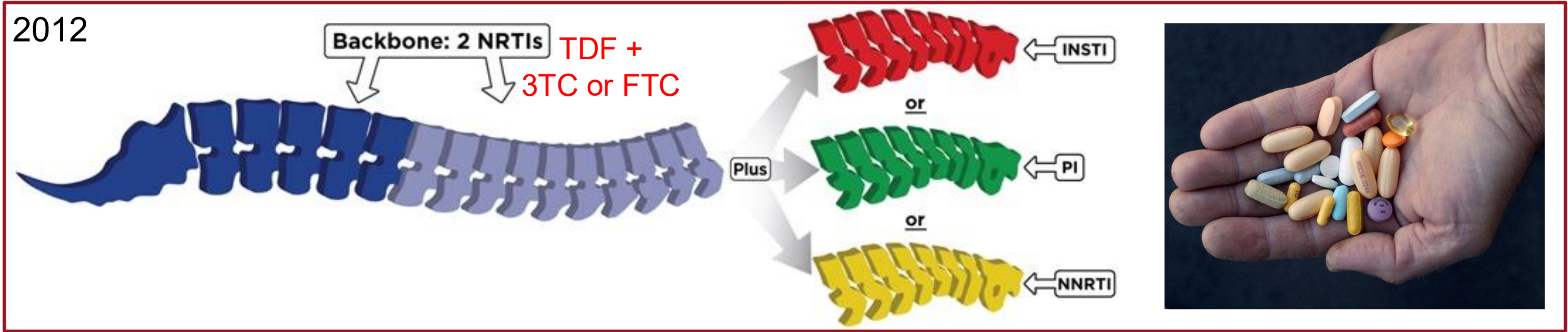


ETV monotherapy associated with HIV treatment resistance (M184V mutation)



McMahon, NEJM 2007

Cautions with HIV novel regimens



2017

Dolutegravir + Rilpivirine

A photograph of a single brown, oval-shaped pill with the embossed text 'SV J3T'.

2019

Dolutegravir + Lamivudine

A photograph of a single white, oval-shaped pill with the embossed text 'SV 137'.

2022

Cabotegravir + Rilpivirine

A photograph of a medical syringe and a vial, representing a long-acting injection regimen.

Some new HIV regimens lack HBV activity!

Attention needed to ensure HBV therapy added if switch to one of these

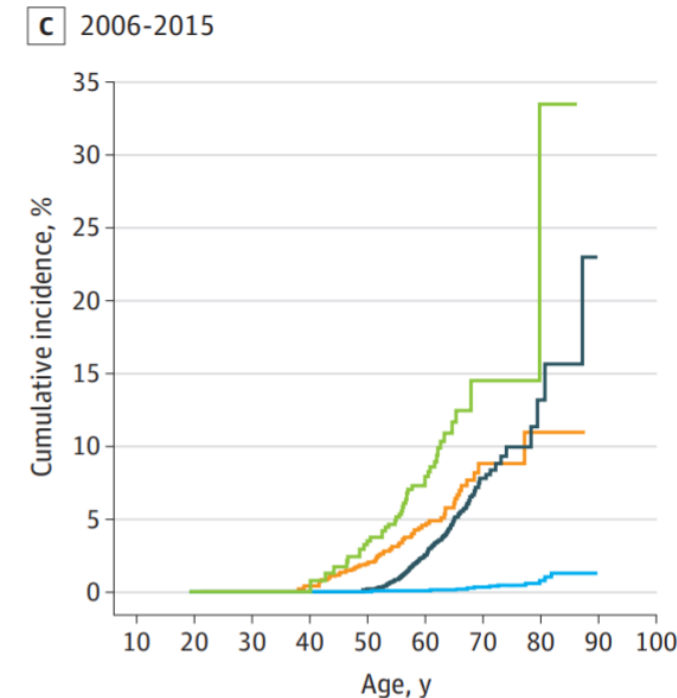
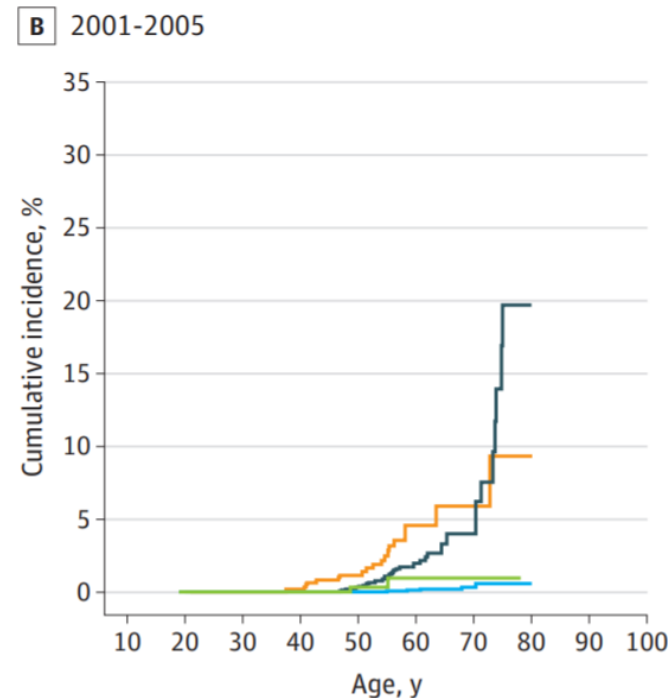
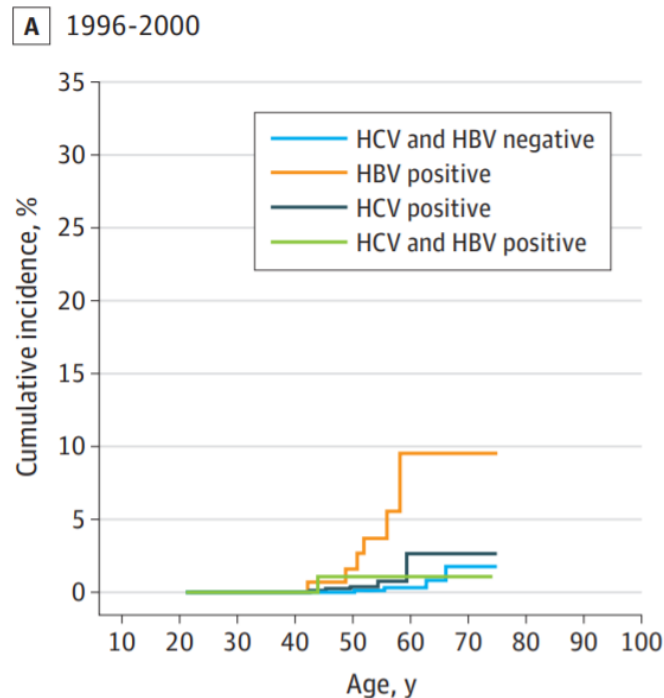
Hepatocellular Carcinoma

Risk of Liver Cancer

- 6x HCC incidence in persons with HIV (versus general population)
 - Associated with low CD4, high HIV VL
 - Only partially reduced by HBV-active ART (suggesting other factors in pathogenesis)
 - Increasing over time; marked impact of viral hepatitis coinfection

NA-ACCORD

Longitudinal study of
>100 thousand
persons with HIV in
US and Canada,
1996-2015



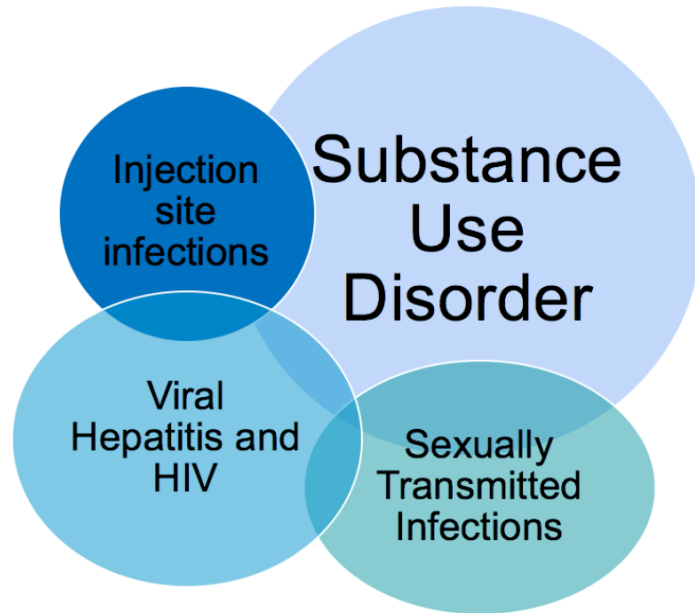
HCC Screening in HBV

- People with HBV at high risk for HCC, include:
 - Individuals with cirrhosis
 - Asian or Black men age >40 years and Asian women age >50 years
 - Family history of HCC (first-degree relative)
 - HDV infection
- Screen with ultrasound examination every 6 months (+/- MRI, AFP)



Care coordination and comorbid substance use

Substance use: An interrelated epidemic



“No-wrong-door” approach:
Connecting a person to services that meet their needs wherever they seek care (CDC, 2023)

Sexual networks



Comorbid substance use disorders



Homelessness



Needle sharing & lack of access to clean needles

Referrals and co-management

Co-localized / Referred services

Medication Assisted
Treatment

Mental health

Social work

Preventive health

Harm reduction

Indications for subspecialty evaluation

Cirrhosis

Liver mass

HCV or HDV coinfection

Pregnancy

Treatment failure or drug resistance (HIV, HBV)

Clinical Case, revisited

A 42-year-old man presents to establish care for HIV and HBV, both diagnosed on routine labs during a recent hospitalization for infective endocarditis.

- HIV 1,2 Ag/Ab+, CD4 640, HIV VL 89,000
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Clinical Case, revisited

A 42-year-old man presents to establish care for HIV and HBV, both diagnosed on routine labs during a recent hospitalization for infective endocarditis.

- HIV 1,2 Ag/Ab+, CD4 640, HIV VL 89,000
- HBsAg+, HBV VL >100,000
- Hep C Ab-
- CBC and BMP normal, ALT 45
- *Risk factors:*
 - *substance use? sexual history?*
- *Counseling:*
 - *chronic and treatable conditions*
 - *transmissible (HIV: U=U, HBV: partner vaccination)*
 - *↑ liver disease/cancer (alcohol)*
- *Studies:*
 - *HBeAg/Ab, anti-hepA/D, HIV genotype, ultrasound*
 - *fibrosis assessment (elastography vs lab-based)*
- *Treatment:*
 - *TAF + FTC + BIC or equivalent*
- *Referrals/services:*
 - *Vaccinations, STI screening, substance use treatments, syringe programs, housing...*

Summary

- HIV and HBV have shared transmission routes and may disproportionately impact certain populations
- HIV significantly affects natural history of HBV including risk of liver disease, liver cancer, and mortality
- All patients with HBV should have assessment for viral coinfections and liver fibrosis
- First-line treatment is tenofovir-based ART (LAM and ETV should be used in combination regimens only)
- Liver cancer screening is universally recommended
- Care coordination to address substance use and psychosocial risk factors is essential!

Hepatitis B Treatment Guidelines and Resources

- Treatment Guidelines - [AASLD](#)
- Drug-Drug Interactions - <https://www.hep-druginteractions.org/>

Hepatitis B Resources

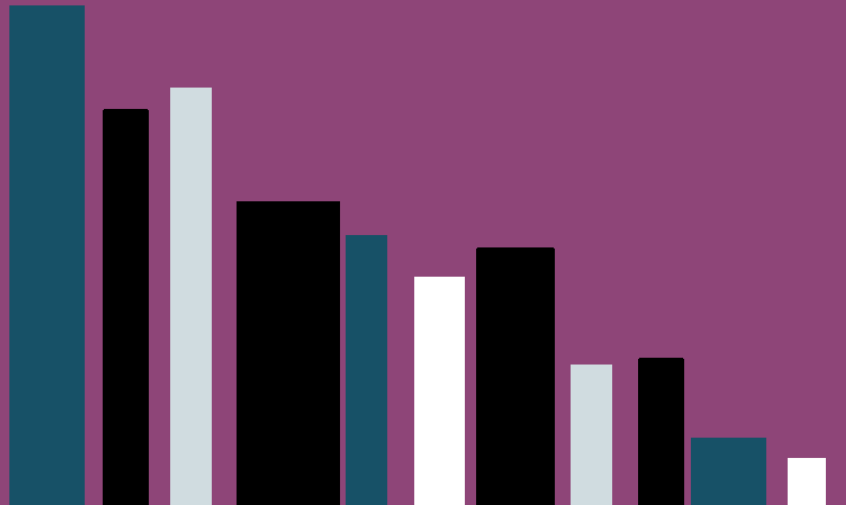
- www.HepFree.NYC
 - [Hep B Coalition](#)
 - [Clinical Resources](#)
 - [Capacity building tools](#)
 - [Advocacy Committee](#)
- Hepatitis B patient information page: www.nyc.gov/health/hepb
 - Free or low-cost testing and treatment

Elimination Plan and Annual Report

Plan to

Eliminate Viral Hepatitis

as a Major Public Health Threat
in New York City
by 2030




The bar chart consists of 11 vertical bars of varying heights and colors. From left to right, the bars are: a tall teal bar, a black bar, a light blue bar, a black bar, a teal bar, a white bar, a black bar, a light blue bar, a black bar, a teal bar, and a white bar. The heights of the bars vary, with the first bar being the tallest and the last bar being the shortest.

Working Toward a

Hep Free NYC

2023 Hepatitis A, B and C in NYC Report
Supplemental Appendices



The illustration shows a white line-art drawing of a suspension bridge tower and its cables. The tower is a tall, rectangular structure with a cross-like top. Numerous cables extend from the tower to the bridge deck. The background is a gradient of blue, transitioning from a lighter blue at the top to a darker blue at the bottom.

Contact Us

For CMEs or educational opportunities, contact:

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