



NASTAD's Prevention and Surveillance
Virtual Learning Collaborative

Chronic Hepatitis B

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Acute Hepatitis B

Acute Hepatitis B Overview

Transmission:

- Bloodborne
- Sexual transmission
- Vertical transmission from mother to child at birth

Presentation:

- Signs and symptoms indistinguishable from other forms of acute hepatitis
- Asymptomatic infection is common
- Adults and older children more likely to have symptoms than children <5 years old

Goals of case criteria:

- Differentiate from:
 - Other forms of acute hepatitis (viral and otherwise)
 - Chronic hepatitis B

Acute Hepatitis B Overview

Outcomes:

- Chronic infection in 2-6% of adults and 90% of infants
- Fulminant hepatitis, liver transplant, death are rare but can occur

Prevention:

- Vaccination starting at birth
- Standard precautions
- Use of condoms during sexual activity

Case Definition

Criteria Type	Criteria
Age	<ul style="list-style-type: none"> • >24 months of age, OR • ≤24 months of age and the mode of exposure was not perinatal
Clinical	<ul style="list-style-type: none"> • An acute illness with a discrete onset of any sign or symptom consistent with acute viral hepatitis (e.g., fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, and abdominal pain), AND • Jaundice OR serum alanine aminotransferase (ALT) >100 IU/L
Laboratory*	<ul style="list-style-type: none"> • Positive hepatitis B surface antigen (HBsAg), AND • Positive immunoglobulin M (IgM) antibody to hepatitis B core antigen (anti-HBc IgM) (if done)
HBsAg Test Conversion*	<ul style="list-style-type: none"> • Documented negative HBsAg test within 6 months prior to a positive test of either HBsAg, hepatitis B e antigen, or nucleic acid test (NAT) for HBV DNA (including qualitative, quantitative, or genotype)
Case Status	Classification
Confirmed Acute*	<ul style="list-style-type: none"> • >24 months of age OR ≤24 months of age and the mode of exposure was not perinatal, AND • Not known to have a history of acute or chronic hepatitis B, AND • Meets the clinical and laboratory criteria OR meets the HBsAg test conversion criterion

*Surveillance programs should provide prevention programs with information on people who have positive test outcomes for post-test counseling and referral to treatment and care, as appropriate.

Case 1:

- 57-year-old male presents with 7-day history of headache, nausea, and 1 day history of yellow eyes.
- Born in the US
- Has had 6 sexual partners in the last 6 months (2 male and 4 female)
- Uses marijuana occasionally
- Consumes 3-5 drinks daily
- History of “hepatitis vaccine” before his trip to Mexico last year

Case 1: questions

- Do we have enough information to classify this person as a case of acute hepatitis B?
- If not, what additional information do we need on this case to assess him for viral hepatitis?
- What risk factors that he reported are known to be associated with hepatitis B?

Case 1: lab results

- After lab testing:
 - Total anti-HAV +
 - IgM anti-HAV -
 - IgM anti-HBC +
 - HBsAg +
 - Anti-HBs -
 - HBV DNA detected
 - Anti-HCV -
 - ALT 3561 U/L
 - AST 1359 U/L
 - Total Bili 9.8 mg/dL

Case 1: questions

- Do we *now* have enough information to classify this person as a case of acute hepatitis B?
- If not, what additional information do we need on this case to assess him for viral hepatitis?
- If so, what key factors indicate that this person has acute hepatitis B and not chronic hepatitis B?
- If so, what key factors indicate that this person has acute hepatitis B and another type of acute viral hepatitis?

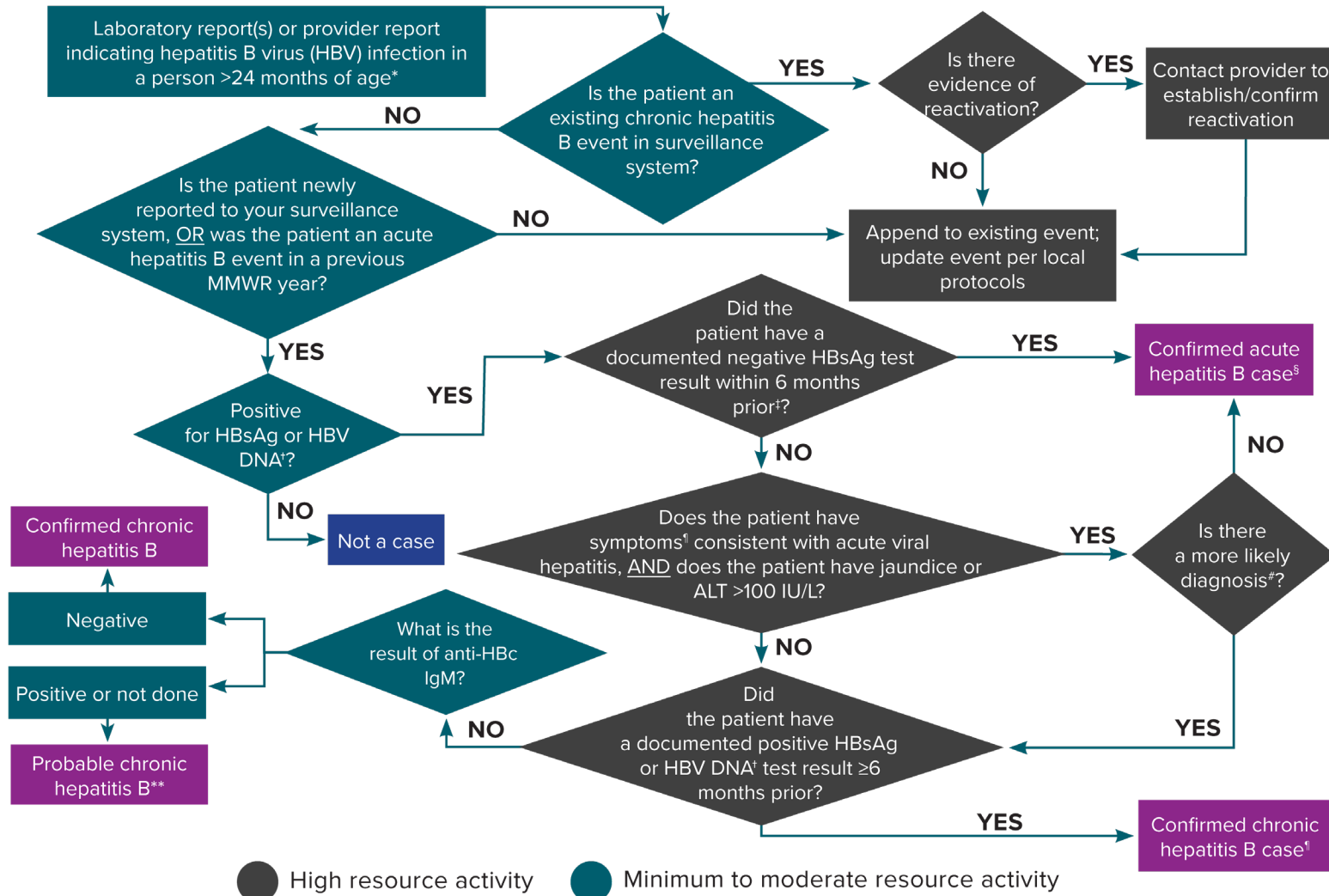
Case 1: provider assessment

- Provider diagnoses acute hepatitis B based on test results and clinical assessment
- Patient is counseled on his alcohol use and liver health

Case 1: questions

- Do we *now* have enough information to classify this person as a case of acute hepatitis B?
- If not, what additional information do we need on this case to assess him for viral hepatitis?
- If so, what key factors indicate that this person has acute hepatitis B and not chronic hepatitis B?
- If so, what key factors indicate that this person has acute hepatitis B and another type of acute viral hepatitis?

Figure 3-3. Process for acute and chronic hepatitis B case ascertainment and classification



- *A person ≤ 24 months of age whose mode of exposure is not perinatal (e.g., health care-acquired) should be classified under the 2012 acute or chronic hepatitis B case definitions. A person ≤ 24 months of age whose mode of exposure is perinatal should be classified under the 2017 perinatal hepatitis B case definition. Surveillance programs should provide prevention programs with information on people who have positive test outcomes for post-test counseling and referral to treatment and care, as appropriate.
- †Nucleic acid testing for HBV DNA, including qualitative, quantitative, and genotype testing. An isolated positive hepatitis B 'e' antigen (HBeAg) test result should prompt further investigation into the hepatitis B surface antigen (HBsAg) and/or HBV DNA results.
- ‡A documented negative HBsAg within 6 months prior to a positive test (either HBsAg, HBeAg, or HBV DNA) does not require acute clinical presentation to meet the acute hepatitis B case definition.
- §A new acute hepatitis B case is an incident case that has not been previously notified as an acute or chronic hepatitis B case.
- ¶Acute hepatitis B clinical symptoms include fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, and abdominal pain.
- #May include evidence of acute liver injury from infectious, autoimmune, metabolic, drug or toxin exposure, neoplastic, circulatory or thromboembolic, or idiopathic causes.
- **May re-classify as confirmed if additional information is later received before the Nationally Notifiable Diseases Surveillance System (NNDSS) close-out date for national notification purposes. Jurisdictions with a longitudinal system can update probable cases to confirmed within their system at any time regardless of the NNDSS close-out date.

Case 1: case definition

Criteria	Options	Assessment	Meets criteria
Age:	>24 months or ≤24 months non-perinatal	57-year-old	Yes
Clinical:	Discrete onset of symptoms	Discrete onset of several symptoms	Yes
Clinical (at least one of these must be true):	Jaundice	Yellowing of the eyes	Yes
	Elevated serum aminotransferase levels	ALT >100	Yes
Lab (at least one of these must be true):	IgM anti-HBc Positive	Positive	Yes
	HBsAg Positive	Positive	Yes
Lab (if done):	IgM anti-HAV negative	Negative	Yes

Case 2:

- 23-year-old female presents with a history of headache, nausea, and fatigue for the past 3-4 weeks
- She is 5 months pregnant, and this is her first prenatal visit
- HBsAg is positive on prenatal screening
- Born in the US
- Has one male sexual partner of 3 years
- Has a history of opioid use in her teens, but denies current use (denies ever injecting)
- Unsure of vaccine history, but thinks she got all her vaccines as a child

Case 2: lab results

- After further lab testing:
 - Total anti-HAV +
 - HBsAg +
 - Anti-HBs +
 - HBV DNA detected
 - Anti-HCV -
 - ALT 102 U/L
 - AST 52 U/L
 - Total Bili 0.7 mg/dL

Case 2: questions

- Do we have enough information to decide whether to classify this person as a case of acute hepatitis B?
- If not, what additional information do we need on this case to assess her for viral hepatitis?
- Is this a case of public health significance?

Case 2: further information and provider assessment

- Found immunization records from childhood and she was started her vaccination for hepatitis B starting at age 1 but only received one dose
- Her mother is from an area of high endemicity, but has no documented history of hepatitis B
- This is her first pregnancy, and she has never been tested for hepatitis B previously
- Provider diagnoses acute hepatitis B based on test results and clinical assessment

Case 2: questions

- Do we *now* have enough information to decide whether to classify this person as a case of acute hepatitis B?
- If not, what additional information do we need on this case to assess her for viral hepatitis?
- If so, what key factors indicate that this person has acute hepatitis B and not chronic hepatitis B?
- If so, what key factors indicate that this person has acute hepatitis B and another type of acute viral hepatitis?

Case 2: case definition

Criteria	Options	Assessment	Meets criteria
Age:	>24 months or ≤24 months non-perinatal	23-year-old	Yes
Clinical:	Discrete onset of symptoms	Discrete onset of headache, nausea, and fatigue.	Yes
Clinical (at least one of these must be true):	Jaundice	None reported	No
	Elevated serum aminotransferase levels	ALT >100	Yes
Lab (at least one of these must be true):	IgM anti-HBc Positive	Not done	No
	HBsAg Positive	Positive	Yes
Lab (if done):	IgM anti-HAV negative	Not done	Yes

Case 2: questions

- Do we *now* have enough information to decide whether to classify this person as a case of acute hepatitis B?
- If not, what additional information do we need on this case to assess her for viral hepatitis?
- If so, what key factors indicate that this person has acute hepatitis B and not chronic hepatitis B?
- If so, what key factors indicate that this person has acute hepatitis B and another type of acute viral hepatitis?

Chronic Hepatitis B

Chronic Hepatitis B Overview

Outcomes:

- Cirrhosis
- Liver cancer (with or without cirrhosis)
- Death

Goals of case criteria:

- Distinguish from other forms of chronic hepatitis
- Identify possible acute hepatitis B
- Confirm infection for perinatal hepatitis B prevention

Prevention:

- Prevention of acute infection using methods described earlier

Chronic Hepatitis B Core Surveillance

Ascertainment and Reporting

- Create or maintain an electronic system for collecting and storing hepatitis B lab and case data
- Establish or maintain a method to receive hepatitis B laboratory data and enter it into the hepatitis B surveillance system or registry
 - Preferably through an automated ELR system that can automatically enter the hepatitis B records into the surveillance system
- Implement a process to review and classify cases within the surveillance system or registry
- Extract data from the hepatitis B surveillance system or registry and transmit cases to CDC according to NNDSS procedures

Chronic Hepatitis B Core Surveillance

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Chronic Hepatitis B Core Surveillance

Investigations

- Document local procedures for investigations, including defining priority populations, or identifying priority reports for investigation.
- Conduct investigations for priority reports or populations.
- Establish a protocol for identifying and investigating health care-associated infections or coordinate with the department's health care-associated infections program.
- Establish a protocol for identifying and investigating other unique exposures.

Quality Assurance

- Identify and review potential duplicate reports
- Establish a process for cleaning, reviewing, and standardizing case data and test results
- Assess case reports and test results for completeness and accuracy

Chronic Hepatitis B Core Surveillance

Analyses

- Create an annual report, situational analysis, or other data product that can be widely shared with providers, advocates, and other public health professionals

Policy

- Research existing health code/policy related to hepatitis B reporting and the process for changing such policies
- Identify who should report hepatitis B cases – health care providers, health care facilities, and/or laboratories
- Determine what should be reportable (e.g., test types, pregnancy, ALT, and negative tests)
- Surveillance programs should provide prevention programs with information on people who have positive test outcomes for post-test counseling and referral to treatment and care, as appropriate

Other Data Sources

- Explore how to obtain access to additional sources of data (e.g., vital statistics person-level data)

Case Definition: Criteria

Criteria Type	Criteria
Age	<ul style="list-style-type: none">• >24 months of age, OR• ≤24 months of age and the mode of exposure was not perinatal
Clinical	<ul style="list-style-type: none">• No symptoms are required. People with chronic hepatitis B might have no evidence of liver disease or might have a spectrum of diseases ranging from chronic hepatitis to cirrhosis or liver cancer.
Diagnostic Laboratory *	<ul style="list-style-type: none">• Negative Immunoglobulin M (IgM) antibody to hepatitis B core antigen (anti-HBc IgM) AND a positive result on one of the following tests: HBsAg, nucleic acid test (NAT) for HBV DNA (including qualitative, quantitative, or genotype), or hepatitis B e antigen (HBeAg), OR• Positive for any combination of the following tests two times at least 6 months apart:<ul style="list-style-type: none">◦ Hepatitis B surface antigen (HBsAg)◦ NAT for HBV DNA (including qualitative, quantitative, or genotype testing)◦ HBeAg
Presumptive Laboratory*	<ul style="list-style-type: none">• Does not meet the case definition for acute hepatitis B AND• Has one positive HBsAg, NAT for HBV DNA (including qualitative, quantitative, or genotype testing), or HBeAg laboratory result

Case Definition: Classification

Case Status	Classification
Confirmed Chronic*	<ul style="list-style-type: none">• >24 months of age OR ≤24 months of age and the mode of exposure was not perinatal, AND• Has diagnostic laboratory evidence
Probable Chronic*	<ul style="list-style-type: none">• >24 months of age OR ≤24 months of age and the mode of exposure was not perinatal, AND• Has presumptive laboratory evidence, AND• Does not meet the clinical criteria of the acute hepatitis B case definition
Comments	<ul style="list-style-type: none">• Multiple laboratory tests indicative of chronic hepatitis B might be performed simultaneously on the same patient specimen as part of a “hepatitis panel.” Testing performed in this manner can lead to seemingly discordant results, e.g., HBsAg-negative AND HBV DNA-positive. For the purposes of this case definition, any positive result among the three laboratory tests mentioned above is acceptable, regardless of other testing results. Negative HBeAg results and HBV DNA levels below positive cutoff level do not confirm the absence of HBV infection.

*Surveillance programs should provide prevention programs with information on people who have positive test outcomes for post-test counseling and referral to treatment and care, as appropriate.

Case 1: Revisited

- 57-year-old male presents for follow-up of his acute hepatitis B infection at 9 months.
- Nine months ago:
 - 7-day history of headache, nausea, and 1 day history of yellow eyes.
 - Met acute hepatitis B case definition and provider diagnosed as acute hepatitis B.
- Now:
 - Ongoing abdominal pain and fatigue
 - No testing since initial diagnosis

Case 1: questions

- Do we have enough information to classify this person as a case of chronic hepatitis B?
- If not, what additional information do we need on this case to assess him for chronic hepatitis B?

Case 1: lab results

- After lab testing:
 - Total anti-HAV +
 - IgM anti-HAV -
 - IgM anti-HBC -
 - HBsAg +
 - Anti-HBs -
 - HBV DNA detected
 - Anti-HCV -
 - ALT 35 U/L
 - AST 19 U/L
 - Total Bili 0.8 mg/dL

Case 1: provider assessment

- Provider diagnoses chronic hepatitis B based on test results and clinical assessment

Case 1: questions

- Do we *now* have enough information to classify this person as a case of chronic hepatitis B?
- If not, what additional information do we need on this case to assess him for chronic hepatitis B?
- If so, what key factors indicate that this person has chronic hepatitis B?

Case 1: Case Criteria

Criteria	Options	Assessment	Meets criteria
Age:	>24 months or ≤24 months non-perinatal	23-year-old	Yes
Clinical:	May or may not have symptoms	Has abdominal pain	Yes
Diagnostic Lab (at least one of these must be true):	IgM anti-HBC negative and one of these positive: HBsAg, HBV DNA (including genotype), HBeAg	IgM anti-HBC negative, HBsAg positive, HBV DNA detected	Yes
	Any combination of two HBsAg, HBV DNA (including genotype), HBeAg positive at least 6 months apart	Two HBsAg nine months apart	Yes
Presumptive Lab (both must be true):	Does not meet the case definition for acute hepatitis B	Does not meet acute case definition with normal LFTs and a history of disease	Yes
	Has one positive HBsAg, NAT for HBV DNA, or HBeAg laboratory result	Has two positive tests >6 mo apart	No

Case 1: Case Status

Case Status	Options	Assessment	Meets criteria
Confirmed Chronic (must have both):	>24 months or ≤24 months non-perinatal	57-year-old	Yes
	Has diagnostic lab evidence	HBsAg twice 9 months apart	Yes
Probable Chronic (must have all):	>24 months or ≤24 months non-perinatal	57-year-old	Yes
	Has presumptive lab evidence (and NOT diagnostic lab evidence)	Has diagnostic lab evidence	No
	Does not meet the clinical criteria of the acute hepatitis B case definition	Does not meet acute case definition with normal LFTs and a history of disease	No

Case 2:

- 37-year-old female asylee presents to establish primary care
- No symptoms reported
- HBsAg positive
- Born in the Somalia and has lived in Kenya for several years
- Reports history of hepatitis B, but has no records
- No known history of hepatitis B vaccination
- Provider diagnoses chronic hepatitis B based on test results and clinical assessment

Case 2: questions

- Do we have enough information to classify this person as a case of chronic hepatitis B?
- If not, what additional information do we need on this case to assess her for viral hepatitis?

Case 2: full lab results

- All lab testing done at visit:
 - Total anti-HAV +
 - IgM anti-HAV -
 - HBsAg +
 - Anti-HBs -
 - HBeAg +
 - Anti-HBe -
 - HBV DNA detected
 - Anti-HCV -
 - ALT 32 U/L
 - AST 13 U/L
 - Total Bili 0.8 mg/dL

Case 2: questions

- Do we *now* have enough information to classify this person as a case of chronic hepatitis B?
- If not, what additional information do we need on this case to assess her for viral hepatitis?
- If so, what key factors indicate that this person has chronic hepatitis B and not acute hepatitis B?

Case 2: Case Criteria

Criteria	Options	Assessment	Meets criteria
Age:	>24 months or ≤24 months non-perinatal	37-year-old	Yes
Clinical:	May or may not have symptoms	No symptoms	Yes
Diagnostic Lab (at least one of these must be true):	IgM anti-HBC negative and one of these positive: HBsAg, HBV DNA (including genotype), HBeAg	IgM anti-HBC not done, HBsAg positive, HBV DNA detected	No
	Any combination of two HBsAg, HBV DNA (including genotype), HBeAg positive at least 6 months apart	Tests available from only one date	No
Presumptive Lab (both must be true):	Does not meet the case definition for acute hepatitis B	Does not meet acute case definition with normal LFTs and a history of disease	Yes
	Has one positive HBsAg, NAT for HBV DNA, or HBeAg laboratory result	HBsAg positive and HBV DNA detectable on single date	Yes

Case 2: Case Status

Case Status	Options	Assessment	Meets criteria
Confirmed Chronic (must have both):	>24 months or ≤24 months non-perinatal	37-year-old	Yes
	Has diagnostic lab evidence	Tests available from only one date	No
Probable Chronic (must have all):	>24 months or ≤24 months non-perinatal	37-year-old	Yes
	Has presumptive lab evidence (and NOT diagnostic lab evidence)	Single positive test date	Yes
	Does not meet the clinical criteria of the acute hepatitis B case definition	Does not meet acute case definition with normal LFTs	Yes

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Thank you!

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