



# ESP CASE DETECTION ALGORITHM

## HEPATITIS B

Acute Hepatitis B, Chronic Hepatitis B\*, Active Hepatitis B in Pregnancy\*

Document Version 2.13

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### Modification History

Version	Date	Modification	By
2.13	4/26/2018	Added language that chronic Hep B and Hep B in pregnancy have not yet been implemented in reporting	DPM
2.12	10/11/2017	Added ESP Logo and MDPH branding	DPM
2.11	7/5/2017	Transferred to updated template	DPM
2.1	5/23/2017	Removed hepatitis A and hepatitis C labs from data included in case reports to DPH.	DPH/DPM
2.0	3/6/2017	<ul style="list-style-type: none"><li>Updated algorithm format.</li><li>Added appropriate ICD-10-CM diagnosis codes.</li></ul>	DPM
1.0	7/21/2009	Original circulated version.	DPM

\* Reporting not yet implemented



**Section 1. Overview**

The purpose of this document is to describe the criteria used to identify new HEPATITIS B cases from electronic medical records (EMR) using ESP and report them to the Massachusetts Department of Public Health (MDPH).

**Section 2. Criteria used to identify cases using ESP data**

**I. CASE TYPES**

This document includes algorithms to identify acute hepatitis B, chronic hepatitis B, and active hepatitis B in pregnancy.

**II. TIME WINDOW**

There is no recurrence window for hepatitis B. A case is considered incident if it is the first time the criteria is met and it has not been previously reported.

**III. CASE CRITERIA**

**A. CASE COMPONENTS\***

1. Diagnosis code for jaundice, not of newborn
2. Alanine aminotransferase (ALT) >5x upper limit of normal
3. Aspartate aminotransferase (AST) >5x upper limit of normal
4. IgM antibody to Hepatitis B Core Antigen = "REACTIVE"
5. Hepatitis B Surface Antigen = "REACTIVE"
6. Hepatitis B "e" Antigen = "REACTIVE"
7. Hepatitis B Viral DNA
8. Diagnosis of Chronic Hepatitis B
9. Total bilirubin > 1.5
10. Calculated bilirubin = (direct bilirubin + indirect bilirubin) = value > 1.5

\*See [Section 4](#) for codes used to define each component.

**B. CRITERIA FOR ACUTE HEPATITIS B CASES**

Summary of Case Components					
1	Jaundice ICD9/10 Code	5	Hep B Surface Antigen	9	Total bilirubin >1.5
2	ALT >5x ULN	6	Hep B "e" Surface Antigen	10	Calculated bilirubin >1.5
3	AST >5x ULN	7	Hep B viral DNA		
4	IgM antibody to Hep B Core Antigen	8	Diagnosis for chronic Hep B		

Classify patient as having acute hepatitis B if any of the following conditions are true:

- a) (#1 or #2 or #3) and #4 within 14-day period
- b) (#1 or #2 or #3) and (#9 or #10) and #5 within 21-day period, and
  - a. No prior positive result for #5 or #7 ever, and
  - b. No code for #8 at this encounter or in the past
- c) (#1 or #2 or #3) and (#9 or #10) and #7 within 21-day period, and



- a. No prior positive result for #5 or #7 ever, *and*
- b. No code for #8 at this encounter or in the past
- d) #5 “reactive” with record of #5 “non-reactive” within the prior 12 months, *and*
  - a. No prior positive test for #5 or #7 ever, *and*
  - b. No code for #8 at this encounter or in the past.

Notes:

- For definition (b) and (c), cases should be reported immediately upon fulfilling criteria. However, if a diagnosis for #8 appears within 30 days following fulfillment of the conditions for the case, then case should be changed from acute hepatitis B to chronic hepatitis B.
- For definition (d), “date collected” (or if unavailable, then “date ordered”) should be used for comparison of dates.

**C. CRITERIA FOR CHRONIC HEPATITIS B CASES (reporting not yet implemented)**

Classify patient as having chronic hepatitis B if any of the following conditions are true:

- a) Any patient with (#5 or #6 or #7) who does not fulfill criteria for acute hepatitis B (above)
- b) Any patient with (#5 or #6 or #7) who fulfilled criteria for acute hepatitis B more than 12 months prior to the current positive test (#5 or #6 or #7)

**D. CRITERIA FOR ACTIVE HEPATITIS B IN PREGNANT CASES (reporting not yet implemented)**

Classify patient as having active hepatitis B in pregnancy if the following condition is true:

- a) Any patient with (#5 or #6 or #7) and pregnancy flag active at lab order encounter or in the 28 days following lab order date for (#5 or #6 or #7)

**Section 3. Specifications for reporting diseases/conditions to the Massachusetts Department of Public Health**

**I. INITIAL CASE REPORTING CRITERIA**

All cases should be immediately reported to MDPH upon initial detection.

**II. CASE REPORT UPDATE CRITERIA**

A repeat report should be sent to MDPH every time a patient has another positive/reactive test result for #5 or #6 or #7.

**III. DATA TO INCLUDE IN REPORTS TO MDPH**

**A. Demographic**

Name	Last, first, middle
Date of birth	yyyy/mm/dd
Age	
Social security number	
Gender	Male / Female
Race	American Indian / Asian / Black / White / Other / Unknown



Ethnicity	Hispanic / Non-Hispanic / Unknown
Marital Status	Single / Married / Other, Unknown
Address	Line 1, line 2, city, state, zip, country
Phone	xxx-xxx-xxxx
Language spoken	
Medical record number	
PCP	Name, office address, phone number, email

**B. Facility Information**

Facility name	
Facility address	Line 1, line 2, city, state, zip
Facility contact person	
Contact person email	
Contact person phone	xxx-xxx-xxxx
Facility phone	xxx-xxx-xxxx

**C. Encounter Data**

Lab test ordering clinician	Name, office address, phone number, email
Treating clinician	Name, office address, phone number, email

**D. Laboratory Results**

Most recent result within 14-day period of day on which case was established. See [Table 3](#) for LOINC.

Hep B Surface Antigen	
IgM to Hep B Core Antigen	
Hep B “e” antigen	
Hep B DNA	
ALT	
AST	
Hep E antibody	

**E. Pregnancy**

Pregnancy flag active	Yes or No
Expected Date of Delivery (EDD)	

**F. Symptoms**

If any of the following diagnosis codes (see [Table 2](#), below) or vital sign findings are present 14 days before or after case established then report the following symptoms:

Fever	Diagnosis code or measured temperature >100.4 degrees Fahrenheit
Jaundice	
Abdominal pain	
Nausea and Vomiting	
Diarrhea	



**IV. CRITERIA TO REVOKE A CASE**

For ACUTE hepatitis B cases identified using condition (b) or (c), the case should be changed to CHRONIC hepatitis B if a diagnosis code for chronic hepatitis B within the following 30 days.  
(Chronic Hep B reporting not yet implemented.)

**Section 4.** Codes, laboratory tests, and medications used to identify criteria listed in Section 2 and supplementary reporting information in Section 3.

**I. DIAGNOSIS CODES**

**Table 1. Diagnosis Codes Used to Identify Case Components**

Component Name	Code Type	Code	Description
Jaundice (#1)	ICD-9-CM	782.4	Jaundice, not of newborn
	ICD-10-CM	R17	Unspecified jaundice
Chronic Hepatitis B (#8)	ICD-9-CM	070.32	Chronic viral hepatitis B without mention of hepatic coma without mention of hepatitis delta
	ICD-10-CM	B18.0	Chronic viral hepatitis B with delta-agent
	ICD-10-CM	B18.1	Chronic viral hepatitis B without delta-agent

**Table 2. Diagnosis Codes Used to Identify Symptoms**

Symptom	Code Type	Code	Description
Fever	N/A	Temperature >100.4	Measured temperature if available, ELSE "fever".
	ICD-9-CM	780.60	Fever, unspecified
	ICD-10-CM	R50.9	Fever, unspecified
Jaundice	ICD-9-CM	782.4	Jaundice
	ICD-10-CM	R17	Unspecified jaundice
Abdominal pain	ICD-9-CM	789*	Abdominal pain
	ICD-10-CM	R10*	Abdominal and pelvic pain
Nausea & Vomiting	ICD-9-CM	787.0	Nausea and vomiting
	ICD-9-CM	787.01	Nausea with vomiting
	ICD-10-CM	R11.2	Nausea with vomiting, unspecified
	ICD-9-CM	787.02	Nausea alone
	ICD-10-CM	R11.0	Nausea
	ICD-9-CM	787.03	Vomiting alone
	ICD-10-CM	R11.10	Vomiting, unspecified
	ICD-10-CM	R11.11	Vomiting without nausea
Diarrhea	ICD-9-CM	787.91	Diarrhea
	ICD-10-CM	R19.7	Diarrhea, unspecified

**II. MEDICATIONS**

N/A

**III. LAB TESTS LOINCS**



**Table 3. Laboratory Test LOINC Mapping**

Component Name	LOINC	LOINC Name
ALANINE AMINOTRANSFERASE (ALT)	1742-6	ALT SerPl-cCnc
ASPARTATE AMINOTRANSFERASE (AST)	1920-8	AST SerPl-cCnc
IGM ANTIBODY TO HEPATITIS B CORE ANTIGEN	31204-1	Hepatitis B virus core Ab.IgM : ACnc : Pt : Ser : Ord :
HEPATITIS B SURFACE ANTIGEN	5195-3	Hepatitis B virus surface Ag : ACnc : Pt : Ser : Ord :
HEPATITIS B E ANTIGEN	13954-3	Hepatitis B virus little e Ag : ACnc : Pt : Ser : Ord : EIA
HEPATITIS B VIRAL DNA	<i>See Table 4</i>	<i>See Table 4</i>
HEPATITIS E ANTIBODY	14212-5	Hepatitis E virus Ab.IgM : ACnc : Pt : Ser : Ord :
TOTAL BILIRUBIN	33899-6	Bilirubin.glucuronidated+bilirubin.non-glucuronidated:SCnc:Pt:Ser/Plas:Qn
DIRECT BILIRUBIN	29760-6	Bilirubin.glucuronidated : SCnc:Pt:Ser/Plas:Qn
INDIRECT BILIRUBIN	14630-8	Bilirubin.non-glucuronidated:SCnc:Pt:Ser/Plas:Qn

**Table 4. Hepatitis B Viral DNA positivity and LOINC Mapping Criteria by Test**

Component Name	LOINC	LOINC Name	Positive result
HEP B DNA PCR (QL)	29610-3	Hepatitis B virus DNA : ACnc : Pt : Ser/Plas : Ord : Probe.Amp.Tar	“POSITIVE” or “DETECTED”
HEP B VIRAL DNA IU/ML	5009-6	Hepatitis B virus polymerase DNA : ACnc : Pt : Bld : Ord : Probe.Amp.Tar	>100
HEP B DNA COPIES/ML	5009-6	Hepatitis B virus DNA : ACnc : Pt : xxx : Ord : Probe.Amp.Tar	>160
HEPATITIS B DNA, QN, IU/COPIES	5009-6	Hepatitis B virus DNA : ACnc : Pt : xxx : Ord : Probe.Amp.Tar	>50 *
HEPATITIS B DNA IU/ML, QUANT	5009-6	Hepatitis B virus DNA : ACnc : Pt : xxx : Ord : Probe.Amp.Tar	>50
HEPATITIS B DNA LOG IU/ML, QUANT	16934-2	Hepatitis B virus polymerase DNA : ACnc : Pt : Bld : Ord : Probe.Amp.Tar	>1.7
HBV DNA QUANT INTERPRETATION	29610-3	Hepatitis B virus DNA : ACnc : Pt : Ser/Plas : Ord : Probe.Amp.Tar	“POSITIVE” or “DETECTED”
HEPATITIS B DNA QUANT COPIES/ML	5009-6	Hepatitis B virus DNA : ACnc : Pt : xxx : Ord : Probe.Amp.Tar	>40
HEPATITIS B DNA QUANT IU	5009-6	Hepatitis B virus DNA : ACnc : Pt : xxx : Ord : Probe.Amp.Tar	>200

\* Result field says “SEE BELOW”. Comment field has the result in the following format: “Result: 421 IU/ml (2.62 log IU/ml)” A positive result for us is >50 IU/ml.

#### IV. CODE MAINTENANCE STRATEGY

Continuously screen all incoming Lx\_Component\_Name fields for the text strings: “HEP” or “HBV” or “ALT” or “SGPT” or “AST” or “SGOT” or “AMINOTRANS” or “BILI” not “CAST” not “FASTING” not “YEAST” not “URINE” not “URO”