

Local Health Department Guidelines for the Epidemiological Investigation and Control of Hepatitis A

Maryland Department of Health and Mental Hygiene
Prevention and Health Promotion Administration
Infectious Disease Epidemiology and Outbreak Response Bureau (IDEORB)
Center for Immunization
May 2017 - Updated to Include Information About Activation and
Deactivation of Emergency Response Operations

Introduction

Hepatitis A is an acute self-limiting disease resulting from infection with the hepatitis A virus (HAV). Depending on conditions, HAV can be stable in the environment for months. The virus is relatively stable at low pH levels and moderate temperatures, but can be inactivated by high temperatures, (185°F [85°C] or higher), formalin, and chlorine.

In developing countries where infection is endemic, most people are infected during the first decade of life. Before the introduction of vaccine, hepatitis A was one of the most commonly reported vaccine-preventable diseases in the United States, but its incidence has declined in recent years. The most commonly identified risk factors for transmission include close personal contact with a person infected with HAV, household or personal contact with a childcare center, international travel, food and waterborne outbreaks, and injection drug use. While hepatitis A outbreaks are rare, they can occur, and for this reason, the immediate identification of a hepatitis A case is necessary so that proper control measures can be implemented.

This document was written to provide guidance on the investigation of hepatitis A cases and outbreaks. The recommendations in this document are intended to provide general guidance. Hepatitis A incidents should be evaluated on an individual basis, with the consultation of local and state infection control staff if needed, to determine the appropriate steps for prevention and control.

Questions regarding this document can be directed to:

Maryland Department of Health and Mental Hygiene
Center for Immunization
201 W. Preston St.
Baltimore, MD 21201
(410) 767-6679

Disease Description

Mode of Transmission: The virus is passed from person to person through the fecal-oral route (fecal matter to mouth) through the ingestion of food or other items that have been contaminated with the feces of an infected person. This is the primary means of HAV transmission in the United States, and most often occurs through close personal contact with an infected household member or sex partner. Illegal drug use, whether injected or not, can be associated with transmitting HAV. Exposures can also occur through contaminated food or water. This is more likely to occur in countries where Hepatitis A is common and in areas where there are poor sanitary conditions or poor personal hygiene. Uncooked or undercooked HAV-contaminated foods have been recognized as the source of outbreaks.

Incubation Period: The incubation period is approximately 28 days (range 15-50 days).

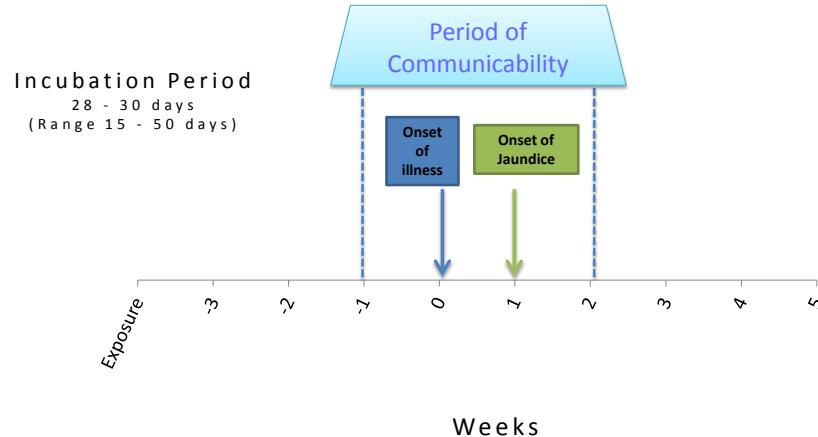
Clinical Characteristics: Symptoms of HAV infection include jaundice, nausea and/or vomiting, diarrhea or constipation, malaise, fever, dark urine (“cola colored”), and loss of appetite. Additional symptoms may include light-colored stools or stomach pain. Symptoms typically last less than 2 months, but can last as long as 6 months. There is no chronic form of HAV infection.

Persons with HAV infection may not exhibit any symptoms of the disease. This is often the case in children less than 6 years of age (approximately 70% will be asymptomatic). Infection is typically symptomatic among adults and older children with approximately 70% developing jaundice.

Communicability Period: Depending on symptom presentation, the communicability period of HAV is considered to be as follows:

- If jaundice is not present, the case is considered contagious from *one week before the onset of symptoms to two weeks after the onset of symptoms*.
 - If jaundice is present, the case is contagious from *two weeks before the onset of jaundice to one week after the onset of jaundice*.
 - If no symptoms are present, contact DHMH, but in general persons are considered communicable one week before specimen collection to two weeks after.
- Note: If jaundice is present, use jaundice onset date to calculate the communicability/infectious period.

Hepatitis A Disease Progression



Definitions and CDC Surveillance Case Classification

CDC/CSTE Surveillance Case Classification of HAV

1) Clinical Case Definition:

An acute illness with a discrete onset of any sign or symptom consistent with acute viral hepatitis (e.g., fever, malaise, anorexia, nausea, vomiting, diarrhea, or abdominal pain), and either a) jaundice, or b) elevated serum aminotransferase (AST or ALT) levels.

2) Laboratory criteria for diagnosis:

Immunoglobulin M (IgM) antibody to hepatitis A virus (anti-HAV) positive.

3) CDC/CSTE Surveillance Case Classification:

- **Confirmed:** a symptomatic case that meets the clinical case definition AND:
 - is laboratory confirmed, OR
 - occurs in a person who has an epidemiologic link with a person who has laboratory-confirmed hepatitis A (i.e., household or sexual contact with an infected person during the 15-50 days before the onset of symptoms)
- **Maryland Probable:** an asymptomatic case with IgM + and Epi linked to a confirmed case

Note: The most current CDC case definitions can be found at:

http://www.cdc.gov/osels/ph_surveillance/nndss/casedef/case_definitions.htm

4) Outbreak: An outbreak is defined as two or more cases of hepatitis A that are epidemiologically linked (identified common exposure occurring in a common setting). Cases acquired through household transmission might not be considered an outbreak, but contact DHMH for further guidance about such situations.

Testing/Laboratory Diagnosis

Serologic antibody tests for HAV-specific total and immunoglobulin (Ig) M antibody are available.

Collect a serum specimen in a red top tube or serum separator tube. The serum will be analyzed for IgM anti-HAV. Serum IgM is present at the onset of illness and usually disappears within four months but may persist for six months or longer. Presence of serum IgM generally indicates current or recent infection, although vaccine response and false-positive results can occur. Total anti-HAV is comprised of all Immunoglobulins including IgM and IgG. There is no readily available test for IgG alone. A positive total anti-HAV with the presence of a negative IgM indicates immunity from past infection or vaccination.

HAV IgM	Total HAV Antibody (IgM and IgG)	Results Indicate
Positive		Acute HAV infection
Negative	Positive	No active infection, but previous HAV exposure; has developed immunity to HAV
	Positive	Has been exposed to HAV but does not rule out acute infection
	Negative	No current or previous HAV infection; vaccine may be recommended if at risk

Treatment

There is no specific treatment for HAV infection. Treatment and management are supportive.

Prevention/Vaccination

Vaccination remains the most effective way to prevent HAV infection. All children should receive two doses of hepatitis A-containing vaccine at 12-24 months of age. Children who are not vaccinated by 2 years of age can be vaccinated at subsequent visits. Two doses of Hepatitis A vaccine are also recommended for persons at increased risk for hepatitis A or severe outcomes of infection. These include international travelers, susceptible close contacts of an international adoptee from a country of high or intermediate endemicity, men who have sex with men, persons who use illegal drugs, persons who have a clotting factor disorder, and persons with chronic liver disease including other viral hepatitides.

Case/Outbreak Investigation

Post-exposure Prophylaxis Recommendations:

Until 2007, an injection of immune globulin (IG) was the only recommended way to protect people after they have been exposed to Hepatitis A virus. In June 2007, U.S. guidelines were revised to allow for Hepatitis A vaccine to be used after exposure to prevent infection in healthy persons aged 12 months – 40 years.

Persons who have recently been exposed to HAV and who have not been vaccinated previously should be administered a single dose of single-antigen Hepatitis A vaccine or IG (0.02 mL/kg) as soon as possible, within 2 weeks after exposure. The guidelines vary by age and health status:

- For healthy persons aged 12 months–40 years, single-antigen Hepatitis A vaccine at the age-appropriate dose is preferred to IG because of vaccine's advantages, including long-term protection and ease of administration, as well as the equivalent efficacy of vaccine to IG.
- For persons aged >40 years, IG is preferred because of the absence of information regarding vaccine performance in this age group and because of more severe manifestations of Hepatitis A in older adults. Vaccine can be used if IG cannot be obtained. The magnitude of the risk of HAV transmission from the exposure should be considered in decisions to use vaccine or IG in this age group.
- For children aged <12 months, immunocompromised persons, persons with chronic liver disease, and persons who are allergic to the vaccine or a vaccine component, IG should be used.

Recommended case investigation procedures:

(Refer to *Special Settings* Section for additional guidance on case investigation procedures relevant to food service, jail/correctional, or childcare facilities.)

1) Confirm HAV diagnosis

Confirm the diagnosis of hepatitis A by collecting the following laboratory, clinical, and epidemiologic information:

1. Hepatitis A IgM result, AST and ALT result levels and other related tests, signs and symptoms and other clinical information of HAV.
2. Whether there is an epidemiologic link to a laboratory-confirmed hepatitis A case.

The DHMH Viral Hepatitis Case Report Form can be used to help guide this investigation.

2) Interview the case-patient and make recommendations for exclusion

Interview the case using the DHMH Viral Hepatitis Case Report Form. Educate the case about hepatitis A symptoms, modes of transmission, and prevention including vaccination. Emphasize that diligent and thorough hand washing is the most important preventive measure.

Determine if the case works in an occupation where he/she can easily transmit the virus to others (e.g. food service, healthcare, childcare). If so, the case should be excluded from work until no longer infectious. This should be determined on an individual case basis based upon the case's symptoms and occupational duties performed. See *Exclusion Guidance for Hepatitis A Cases and Contacts* at the end of this document.

3) Identify exposed and susceptible persons

Initiate a contact investigation to identify all close contacts that have been exposed to a confirmed case of hepatitis A. **Close contacts are defined as** all members of the household, sexual partners, persons who have shared illicit drugs, and anyone who spends a significant amount of time within the household (e.g. babysitters).

The following information should be collected from close contacts:

1. Demographics
2. Relationship to case
3. Occupation – exclusion of contacts that work in high risk occupations (e.g. food service, healthcare, childcare) should be evaluated on an individual case basis
4. Immunization history
5. If symptomatic – list of symptoms and onset date. All symptomatic contacts should be tested for HAV infection and followed as suspected cases. Educate contacts about hepatitis A symptoms, modes of transmission, and prevention.

4) Initiate HAV control measures

Cases in high risk occupations involving food handling, patient care, or care of young children or the elderly should be excluded for at least two weeks after the onset of early symptoms or one week after the onset of jaundice. Children in day care should be excluded for the same time periods. Susceptible close contacts should be identified promptly and evaluated for their need

to receive post-exposure prophylaxis. Post-exposure prophylaxis is most beneficial if administered within two weeks of exposure (see *Post-exposure Prophylaxis Recommendations* above). Any contacts who received the hepatitis A vaccine at least one month prior to exposure to the index case do not need to receive post-exposure prophylaxis.

5) Conduct surveillance

Active surveillance should be maintained for at least two incubation periods after the last reported confirmed case to ensure that all cases are identified.

Special Settings

In addition to following the recommended steps for case investigation described above, the following hepatitis A control measures should be conducted for cases and outbreaks occurring in settings where hepatitis A can be easily transmitted possibly resulting in an outbreak. In hepatitis A investigations, the setting/occupation of the index case plays a key role in determining the course of action. Of particular concern are hepatitis A cases in food service facilities, jails/correctional facilities, and childcare facilities. If more than one case of hepatitis A has been identified in any of these settings, notify the DHMH Division of Outbreak Investigation (410-767-6677) immediately.

1) Food Service Facilities

When investigating a hepatitis A case in a food service facility (FSF), it is important to involve both the Communicable Disease and Environmental Health divisions within the local health department.

- Confirm the diagnosis of hepatitis A.
- Interview the case using the DHMH Viral Hepatitis Case Report Form. Any food service worker (FSW) with diarrhea should be excluded from work immediately until considered no longer infectious. Additional exclusions can be made on a case by case basis depending on the duties that the case performs.
 - Determine the type of duties the food service worker performs, in particular
 - Preparation of foods and drinks, touching foods or drinks, and touching food-contact surfaces, wrapped or packaged foods. This may include wait staff, chefs, head cooks, cooks, bussers, bartenders, host/hostesses that handle food, beverage pourers (including alcoholic beverage pourers), and supervisory personnel, such as the general manager or managers).
 - Working in FSFs, but not touching food or food-contact surfaces might not be considered food handling.
 - Assess the case's hand-washing practices and hygiene. This information should be obtained by interviewing the manager about the case's practices, and looking for proxies for hand-washing/hygiene (i.e. soap, paper towels, sink accessibility, bathrooms equipped with soap and paper towels).
 - Identify the last day of work for the index case. Obtain the days and shifts (dates and times) that the case worked in the two weeks prior to onset of symptoms.

- If the case potentially worked at a FSF while infectious, the following actions should be implemented:
 - a) Interview all food service workers, including managers at the establishment.
 - b) Administer post-exposure prophylaxis as soon as possible to any susceptible food service workers considered to be exposed.
 - c) All symptomatic contacts should be tested for the presence of HAV infection.
 - d) If it is determined that the index case has direct hand contact with the food and/or drink preparation and either has poor personal hygiene or diarrhea, consider offering post-exposure prophylaxis to patrons. **Please contact staff at Maryland Department of Health & Mental Hygiene before making this decision. The decision to offer prophylaxis to patrons is a joint decision between DHMH and the local health department.**
- Destroy any food items prepared by any food service worker who has a positive IgM anti-HAV test and who potentially handled that food while infectious.
- Educate management and food service staff on hepatitis A symptoms, modes of transmission, and prevention. Emphasize diligent and thorough hand washing.

2) Jails/Correctional Facilities

- Confirm the diagnosis of hepatitis A.
- Interview the case using the DHMH Viral Hepatitis Case Report Form. If the case has food handling responsibilities, follow the above guidance for Food Service Facilities.
- Identify all close contacts. **Close contacts are defined as cell or dormitory mates, sex contacts, or anyone who shares toilet facilities.**
The following information should be collected from close contacts:
 - a) Demographics
 - b) Relationship to case
 - c) Occupation – if the contact has food handling responsibilities, exclusions should be made on a case by case basis.
 - d) Immunization history
 - e) If symptomatic – list of symptoms and onset date. All symptomatic contacts should be tested for HAV infection and followed as suspected cases.
- Isolate the case and any symptomatic contacts to their own cells (space permitting), the infirmary or other medical unit until considered no longer infectious.
- Administer post-exposure prophylaxis as soon as possible to susceptible close contacts.
- Educate the case and contacts about hepatitis A symptoms, modes of transmission, and prevention. Emphasize diligent and thorough hand washing and hygiene.
- Determine the source of infection.
- Continued surveillance for two incubation periods to identify additional HAV infections.

3) Childcare Facilities

- Confirm the diagnosis of hepatitis A.
- Interview the case or guardian using the DHMH Viral Hepatitis Case Report Form.

- Exclude the case until considered no longer infectious. If the index case prepares and handles food in the childcare facility, follow the guidance provided under Food Service Facilities.
- Identify all close contacts. **Close contacts are defined as staff and childcare attendees.** The following information should be collected from close contacts:
 - a) Demographics
 - b) Relationship to case
 - c) Occupation – if the contact has food handling responsibilities, exclusions should be made on a case by case basis after conducting a thorough risk assessment.
 - d) Immunization history
 - e) If symptomatic – list of symptoms and onset date. All symptomatic contacts should be tested for HAV infection and followed as suspected cases.
- Request that the childcare facility director inform all of the parents that a hepatitis A case has been identified in the childcare facility. A letter and fact sheet should be sent to each parent.
- Administer post-exposure prophylaxis as soon as possible to any exposed, susceptible staff and childcare attendees. Review immunization histories to determine susceptibility. CDC recommends that centers, which provide care only to children who do not wear diapers, administer prophylaxis only to the classroom contacts of an index case.
- Educate the case and contacts about hepatitis A symptoms, modes of transmission, and prevention. Specific recommendations should be made to limit fecal-oral spread:
 - Staff should wash hands with soap and water after changing any diapers or handling stool-soiled material from any person.
 - Staff should wash hands with soap and water after using the toilet.
 - All children should wash hands with soap and water after each trip to the bathroom and before eating. Staff should observe children washing their hands with soap and water.
 - Diaper changing surface areas should be cleaned after each diaper change with an appropriate disinfectant (1:10 dilution of bleach to water or $\frac{1}{2}$ cup of bleach per gallon of water).
 - Food handling/feeding duties should be kept separate from diaper changing and toilet cleaning responsibilities.
 - Toys should be disinfected with diluted bleach solution once a day.
- Determine the source of infection.
- Continued surveillance for two incubation periods to identify additional HAV infections.

Reporting/COMAR

The Code of Maryland Regulations (COMAR) 10.06.01.03 and 10.06.01.04 makes hepatitis A a reportable condition by healthcare providers, school and childcare facility personnel, masters of vessels or aircraft, medical laboratory personnel, and the owner/operator of a food establishment. HAV infections must be reported to the local health department immediately.

Exclusion guidance for food service, healthcare, and childcare workers are outlined in COMAR 10.06.01.10. Post-exposure prophylaxis guidance are outlined in COMAR 10.06.01.10.

Vaccine Adverse Events

Adverse events that occur after administration of the hepatitis A vaccine should be reported to the Vaccine Adverse Event Reporting System (VAERS), a passive reporting system used to monitor vaccine safety. Any clinically significant events, unexpected events following vaccination and/or events listed on the vaccine manufacturer's package insert, should be reported to VAERS. Adverse events may be reported by submitting a VAERS form online, by fax or by mail. Visit <http://vaers.hhs.gov> for detailed instructions on reporting.

Activation and Deactivation of Emergency Response Operations

The Infectious Disease Epidemiology and Outbreak Response Bureau (IDEORB), in consultation with the Director and Deputy Director of the Prevention and Health Promotion Administration, will activate emergency response operations when one or more of the following criteria are met:

- Existing staffing is inadequate to assign responsibilities to maintain critical operations for more than three operational periods
- Resources (financial or material or operational) required to mount and/or sustain an ongoing emergency response are needed from outside of the Bureau or Administration
- A non-infectious disease event substantially disrupts critical operations of the unit

IDEORB, in consultation with the Director and Deputy Director of the Prevention and Health Promotion, will deactivate emergency response operations when one or more of the following criteria are met:

- Public health problem is contained or resolved
- Emergency response is incorporated into normal operations and adequate resources are available to sustain all ongoing responses
- Non-infectious event is over and disruption impacting critical operations no longer exists

References

American Academy of Pediatrics. Hepatitis A. In: *Red Book: 2009 report of the committee on infectious diseases*. 27th Ed. Pickering LK, Baker CJ, Kimberlin DW, Long SS, eds. Elk Grove, IL; American Academy of Pediatrics; 2009:326-335.

Centers for Disease Control and Prevention. Hepatitis A. In: *Epidemiology and prevention of vaccine-preventable diseases*. 11th ed. Atkinson W, Wolfe S, Hamborsky J, McIntyre L, eds. Washington DC: Public Health Foundation, 2009.

Centers for Disease Control and Prevention. Prevention of hepatitis A through active or passive immunization: recommendations of the Advisory Committee on Immunization Practices (ACIP). Morbidity and Mortality Weekly Report , 2006;55(No. RR-7).

Centers for Disease Control and Prevention. Prevention and control of infections with hepatitis viruses in correctional settings. Morbidity and Mortality Weekly Report, 2003; 52(No. RR-1): 1-36.

Hepatitis A, acute Case Definition available at:

http://www.cdc.gov/osels/ph_surveillance/nndss/casedef/case_definitions.htm

Line Listing for Hepatitis A, Acute Case Contacts

Index Case Name: _____

Name	Age	Sex (Optional)	Relationship to Index Case	Occupation	Jaundice	Signs and Symptoms					Prophylaxis	Laboratory Testing (if applicable)		
					Date of Jaundice Onset (indicate N/A if not applicable)									
						Date of Onset (indicate N/A if not applicable)								
							Diarrhea							
								Date of Last Episode						
									Vomiting					
										Nausea				
										Fever (highest temp.)				
											Dark Urine			
												Abdominal Cramps		
												Recommended (Y/N)		
													Vaccine Admin. Date	
													IG Admin. Date	
													Serum Collect. Date	
													IgM anti-HAV Result	
													Stool Collect. Date	
													Stool Result	

Exclusion Guidance for Hepatitis A Cases and Contacts

Food Service Worker (FSW):

If a FSW is symptomatic (diarrhea) for hepatitis A and is HAV IgM confirmed, (s)he may not return to work for one week until after the onset of jaundice or two weeks after the onset of the illness, if not jaundiced. This is in accordance with COMAR 10.06.01.06 and 10.06.01.10

If the FSW is HAV IgM positive, but asymptomatic, he must be excluded from work or specific food-handling activities for two weeks after initial positive IgM anti-HAV blood was drawn. This individual must be monitored for symptoms consistent with HAV infections. If symptoms develop, continue exclusion as indicated above.

If a FSW is symptomatic, but lab tests are pending, the FSW must be excluded from food-handling activities, until HAV infection is ruled out.

Healthcare Worker (HCW):

If the HCW is HAV IgM positive, exclude from patient care for one week after onset of jaundice, for two weeks after symptom onset if not jaundiced, or for two weeks after the initial positive HAV IgM was drawn, if case was asymptomatic. This is in accordance with COMAR 10.06.01.06 and 10.06.01.10.

If the HCW is a contact of a hepatitis A case, then educate the individual on hepatitis A (symptoms, mode of transmission, prevention) and emphasize hygiene and proper hand washing. Administer prophylaxis per guidelines. If symptoms develop and HAV infection is detected, then treat as a case and exclude as indicated above.

Childcare Worker:

If a childcare worker or childcare attendee is HAV IgM positive, exclude from childcare for one week after onset of jaundice, for two weeks after symptom onset if not jaundiced, or for two weeks after the initial positive HAV IgM was drawn, if case was asymptomatic. This is in accordance with COMAR 10.06.01.06 and 10.06.01.10.

If the childcare worker is a contact of a hepatitis A case, then educate the individual on hepatitis A (symptoms, mode of transmission, prevention) and emphasize hygiene and proper hand washing. Administer prophylaxis per guidelines. If symptoms develop and HAV infection is detected, then treat as a case and exclude as indicated above.

Sample Food Service Worker Hepatitis A Questionnaire

Name: _____ Age: _____ Date of Birth: _____

Sex: Male Female

Address: _____ City: _____ County: _____

Phone: (H) _____

(W) _____

Employer: _____ Work Address: _____

Job Title: _____

Describe work duties: _____

List other jobs you have (job titles, employer name & address): _____

Have you had any of the following symptoms? (check all that apply)

Symptom	YES	NO	Date of Onset
Jaundice (yellow skin or eyes)			
Diarrhea			
Fever			
Abdominal pains			
Vomiting			
Nausea			
Dark urine			
Light-colored stool			
Headache			
Tiredness			
Other _____			

Did you go to a hospital because of your symptoms? YES NO

Date of visit: _____

Name of Hospital: _____

Name of Doctor: _____

Were you hospitalized? YES NO

Dates of hospitalization: _____

Did you have a blood test for hepatitis A (IgM anti-HAV)? YES NO

Date of blood draw: _____

Facility where blood draw occurred: _____

Did you have contact with a known hepatitis A case? YES NO

Name of case: _____

Relationship to case: _____

Phone # of case: _____

Does your occupation involve food service? YES NO

List date of last day of work: _____

List dates worked 2 weeks prior to onset of jaundice: _____

List dates worked 1 week prior to onset of other symptoms: _____

List types of food handled: _____

Comments:

Date of interview: _____

Interviewer: _____