

Hepatitis E

BASIC EPIDEMIOLOGY

Infectious Agent

Hepatitis E virus (HEV), is the only member of the genus *Hepevirus* in the family *Hepeviridae*. It is a spherical, nonenveloped, single-stranded RNA virus. There are four genotypes of HEV.

Transmission

Hepatitis E virus is usually spread by the fecal-oral route. The most common source of infection, particularly in developing countries, is fecally contaminated drinking water. Fecal-oral transmission probably can occur from person-to-person, though secondary household cases are not common during outbreaks. Unlike the other major hepatitis viruses, recent studies have suggested that hepatitis E is the only member of the group to have animal reservoirs and is likely a zoonotic infection transmitted from domestic pigs and other wild animal species. Sporadic outbreaks have occurred in developed countries in association with the consumption of raw/undercooked animal products, mainly pork and venison. Hepatitis E genetic material has been detected from the meat and organs of domestic pigs, wild boar, and deer. The consumption of contaminated shellfish has also been considered a risk for transmission.

Incubation Period

The range is 15-64 days; the mean incubation period has ranged from 26 to 42 days in various epidemics.

Communicability

Not known. Hepatitis E virus has previously been detected in stools 14 days after onset of jaundice and approximately 4 weeks after consuming contaminated food or water, persisting for about 2 weeks.

Clinical Illness

The signs and symptoms of Hepatitis E are similar to those of other types of acute viral hepatitis: fever, fatigue, jaundice (skin or whites of eyes turning yellow), loss of appetite, nausea, vomiting, abdominal pain, dark urine, joint pain, and clay colored stools. Children are usually asymptomatic or have mild disease. Pregnant women are at risk for severe outcomes, e.g., liver failure and death (mortality in this population in their third trimester is about 20%).

DEFINITIONS

Clinical Case Definition

Typical clinical signs and symptoms of acute hepatitis E virus (HEV) are similar to those of other types of acute viral hepatitis and include abdominal pain anorexia, dark urine, fever, hepatomegaly, jaundice, malaise, nausea, and vomiting. Other less common symptoms include arthralgia, diarrhea, pruritus, and urticarial rash. The period of infectivity following acute infection has not been determined but virus excretion in stools has been demonstrated up to 14 days after illness onset.

In most hepatitis E outbreaks, the highest rates of clinically evident disease have been in young to middle-aged adults; lower disease rates in younger age groups can be the result of anicteric and/or subclinical HEV infection.

No evidence of chronic infection has been detected in long-term follow-up of patients with hepatitis

E. The case fatality rate is low except in pregnant women where it can reach 20% among those infected during the third trimester of pregnancy.

Laboratory Confirmation

- IgM anti-HEV from CDC laboratory or PCR positive from reference laboratory

Note: No FDA approved tests to diagnose HEV infection are available in the United States.

Case Classifications

- **Confirmed:** A case that meets the clinical case description and is laboratory confirmed
- **Probable:**
 - A case that meets the clinical case description with supportive laboratory evidence (positive IgM antibody from labs other than CDC), **OR**
 - Negative tests for other acute hepatitis markers and an epidemiological link to other confirmed cases or travel history to an endemic area during exposure period

SURVEILLANCE AND CASE INVESTIGATION

Local and regional health departments should promptly investigate all reports of Hepatitis E. Investigations should include an interview of the case or a surrogate to get a detailed exposure history. Please use DSHS Viral Hepatitis Case Track form available on the DSHS website: <http://www.dshs.state.tx.us/idcu/investigation/>

Case Investigation Checklist

- Confirm laboratory results meet the case definition.
- Review medical records or speak to an infection preventionist or healthcare provider to verify case definition, identify possible risk factors and describe course of illness.
- Interview the case to identify potential sources of infection.
 - Use the **DSHS Viral Hepatitis Case Track** to record information from the interview.
- Fax completed forms to DSHS EAIDU at **512-776-7616** or email securely to an EAIDU foodborne epidemiologist FOODBORNETEXAS@dshs.texas.gov.
 - For lost to follow-up (LTF) cases, please complete as much information obtained from medical/laboratory records (e.g., demographics, symptomology, onset date, etc.) on investigation form and fax/email securely to DSHS EAIDU noting case is LTF.
- Identify whether there is a public health concern: persons should not work as food handlers, child-care or health care workers, or attend child-care if they have diarrhea. See Exclusions.
- If case is part of an outbreak or cluster, see Managing Special Situations section.
- All confirmed and probable case investigations must be entered and submitted for notification in the NEDSS Base System (NBS). Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

Prevention and Control Measures

- Prevention of Hepatitis E relies primarily on good sanitation and the availability of clean drinking water.
- When traveling internationally to areas with poor sanitary conditions:
 - Drink bottled water or water that has been boiled for at least 1 minute.

- o Don't drink fountain drinks or drinks with ice.
- o Don't eat fruits or vegetables that you don't peel yourself.
- o Avoid uncooked foods.
- Routine hand washing with soap and warm water, especially:
 - o Before preparing, handling or eating any food.
 - o After going to the bathroom.
 - o After changing a diaper.
 - o After caring for someone with diarrhea.

Exclusions

School/child-care: No exclusions are specified for hepatitis E but the standard exclusion for diarrhea or fever applies:

- Children with diarrhea should be excluded from school/child-care until they are free from diarrhea for 24 hours without the use of diarrhea suppressing medications.
- Children with a fever from any infection should be excluded from school/child-care for at least 24 hours after fever has subsided without the use of fever suppressing medications.

Food Employee: No exclusions are specified for hepatitis E but the standard exclusion for vomiting or diarrhea applies:

- Food employees are to be excluded if symptomatic with vomiting or diarrhea until:
 - o Asymptomatic for at least 24 hours without the use of diarrhea suppressing medications OR
 - o Medical documentation is provided stating that symptoms are from a noninfectious condition.

Please see Guide to Excluding and Restricting Food Employees in Appendix A.

MANAGING SPECIAL SITUATIONS

Outbreaks

Outbreaks of Hepatitis E in the United States are rare and are usually associated with contaminated water supply in countries with poor sanitation.

If an outbreak is suspected, notify the appropriate regional DSHS office or DSHS EAIDU at **(512) 776-7676**.

The local/regional health department should:

- Interview all cases suspected as being part of the outbreak or cluster.
- Request medical records for any case in your jurisdiction that died, was too ill to be interviewed, or for whom there are no appropriate surrogates to interview.
- Prepare a line list of cases in your jurisdiction. Minimal information needed for the line list might include patient name or other identifier, DSHS or laboratory specimen identification number, specimen source, date of specimen collection, date of birth, county of residence, date of onset (if known), symptoms, underlying conditions, treatments and outcome of case, and risky foods eaten, foods eaten leading up to illness, or other risky exposures, such as animal contact and travel, reported by the case or surrogate.

Line list example:

ID	Name	Age	Sex	Ethnicity	Onset	Symptoms	Food	Animal	Notes
1	NT	34	F	W/N	2/4/16	Bl. D, F	Chicken, eggs	Dog	Dog food
2	PR	2	M	U/U	1/30/16	V,D,F	Chicken, spinach	None	Brother ill

- If the outbreak was reported in association with an apparent common local event (e.g., party, conference, rodeo), a restaurant/caterer/home, or other possible local exposure (e.g., pet store, camp), contact hospitals in your jurisdiction to alert them to the possibility of additional cases.
- Work with any implicated facilities to ensure staff, students, residents, and volunteers receive hand hygiene education, and review hygiene and sanitary practices currently in place including:
 - Policies on and adherence to hand hygiene.
 - Storage and preparation of food.
 - Procedures for changing diapers and toilet training.
 - Procedures for environmental cleaning.
- Recommend that anyone displaying symptoms seeks medical attention from a healthcare provider.
- Restrict individuals from handling food, engaging in child-care, healthcare work, or attending child-care, as long as they are symptomatic. See Exclusions in Case Investigation section.
- Enter outbreak into NORS at the conclusion of the outbreak investigation. See Reporting and Data Entry Requirements section.

REPORTING AND DATA ENTRY REQUIREMENTS

Provider, School, Child-Care Facility, and General Public Reporting Requirements

Confirmed, probable, and clinically suspected cases are required to be reported **within 1 week** to the local or regional health department or DSHS EAIDU at **[(512) 776-7676]**.

Local and Regional Reporting and Follow-up Responsibilities

Local and regional health departments should:

- Enter the case into NBS and submit an NBS notification on all **confirmed and probable** cases.
 - Please refer to the *NBS Data Entry Guidelines* for disease-specific entry rules.
 - A notification can be sent as soon as the case criteria have been met. Additional information from the investigation may be entered upon completing the investigation.
- Fax completed forms to DSHS EAIDU at **512-776-7616** or email securely to an EAIDU foodborne epidemiologist at FOODBORNETEXAS@dshs.texas.gov.

When an outbreak is being investigated, local and regional health departments should:

- Report outbreaks within 24 hours of identification to the regional DSHS office or to EAIDU at **512-776-7676**
- Enter outbreak information into the **National Outbreak Reporting System (NORS)** at the conclusion of the outbreak investigation.

- o For NORS reporting, the definition of an outbreak is two or more cases of similar illness associated with a common exposure.
- o The following should be reported to NORS:
 - Foodborne disease, waterborne disease, and enteric illness outbreaks with person-to-person, animal contact, environmental contact, or an indeterminate route of transmission.
 - Outbreaks as indicated above with patients in the same household.
- o Enter outbreaks into NORS online reporting system at <https://wwwn.cdc.gov/nors/login.aspx>
- o Forms, training materials, and other resources are available at <http://www.cdc.gov/nors/>
- To request a NORS account, please email FoodborneTexas@dshs.state.tx.us
 - o Please put in Subject Line: NORS User Account Request
 - o Information needed from requestor: name, email address, and agency name
 - o After an account has been created a reply email will be sent with username, password, and instructions for logging in.

LABORATORY PROCEDURES

- Hepatitis E testing is not available at the DSHS State Laboratory.
- Testing for hepatitis E is widely available at most private laboratories.
- Testing is also available at the CDC laboratory:
<http://www.cdc.gov/hepatitis/HEV/LabTestingRequests.htm>

REVISION HISTORY

March 2021

- Minor updates