

Meningitis, Viral

("Aseptic")

Note: This chapter focuses only on meningitis caused by viruses. For information about other kinds of meningitis, refer to the chapters entitled "Meningitis, General (Multiple Etiologies)," "Meningococcal Infection (Invasive)," and "Streptococcus pneumoniae (Invasive)."



Section 1:

ABOUT THE DISEASE

A. Etiologic Agent

Viral meningitis can be caused by many different viruses. Coxsackievirus and echovirus, both members of the enterovirus group, are responsible for the majority of identified viral meningitis cases in the U.S. Adenovirus, mumps, measles, herpes simplex, varicella, and arboviruses can also cause meningitis.

Note: This chapter is devoted to the viral meningitis caused by agents that have not been allocated individual chapters. Depending on the type of meningitis, you may need to refer to the chapters pertaining to those agents, such as West Nile virus (WNV) or eastern equine encephalitis virus (EEE).

B. Clinical Description

Meningitis is an inflammation of the membranes covering the brain and the spinal cord. Due to the many causes of viral meningitis, the clinical description of disease can vary, but illness is generally characterized by fever, stiff neck, headache, nausea and vomiting, and (variably) rash. Meningitis caused by enteroviruses is relatively common. Illness typically resolves within ten days, and most individuals have a complete recovery.

C. Vectors and Reservoirs

Humans are the reservoir for enteroviruses, mumps, measles, herpes simplex, and varicella viruses. Humans are incidentally infected by arboviruses, with mosquitoes serving as vectors. Natural reservoirs for many arboviruses remain unknown, but they include birds, rodents, reptiles, amphibians, or other animals.

D. Modes of Transmission

The viruses that cause meningitis are transmitted primarily from person to person, and in the case of arboviruses, from arthropod vectors to humans. Person-to-person transmission varies, depending on the particular virus, and may include fecal-oral (enteroviruses), true airborne (measles, varicella), respiratory droplet (enteroviruses, mumps), and direct contact (mumps, measles, herpes simplex, varicella). Arboviruses are transmitted to humans by arthropod vectors (including mosquitoes, ticks, sand flies, and midges).

E. Incubation Period

The incubation period for viral meningitis is variable. For most enteroviruses, it is 3–6 days. For most arboviruses, it is 2–15 days.

F. Period of Communicability or Infectious Period

Enteroviruses can be shed in feces for several days to many weeks after symptoms have resolved. Enteroviruses may also be shed in respiratory secretions, usually for no longer than one week following onset of symptoms. Arboviruses are generally not communicable from person to person.

G. Epidemiology

Viral meningitis occurs worldwide, as epidemics and as sporadic cases. In the U.S., increases in cases of viral meningitis caused by enteroviruses are typically observed in the late summer and fall. Enteroviral meningitis is most common in young children. The incidence of arboviral meningitis reflects the seasonal patterns of the vectors responsible for transmission.

H. Bioterrorist Potential

The viral pathogens discussed in this chapter are not considered to be of risk for use in bioterrorism.



Section 2:

REPORTING CRITERIA AND LABORATORY TESTING

A. What to Report to the Massachusetts Department of Public Health (MDPH)

Report clinically-compatible cases diagnosed by a health care provider as viral (aseptic) meningitis, which are accompanied by:

- ◆ Laboratory results that indicate no evidence of bacterial or fungal meningitis (e.g., cultures are negative); or
- ◆ Laboratory results that indicate a specific viral cause (e.g., enterovirus).

Note: See Section 3C for information on how to report a case.

B. Laboratory Testing Services Available

The MDPH State Laboratory Institute (SLI) may provide arbovirus or enterovirus testing during outbreaks of aseptic meningitis or in particular seasons of the year.

For additional information on testing and specimen submission, contact the SLI Virus Isolation Laboratory at (617) 983-6382.



Section 3:

REPORTING RESPONSIBILITIES AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- ◆ To track increases over expected numbers of cases, thus facilitating control and prevention initiatives.
- ◆ To focus educational and prevention efforts.

B. Laboratory and Health Care Provider Reporting Requirements

Viral meningitis is reportable to the local board of health (LBOH). The MDPH requests that health care providers immediately report to the LBOH in the community where the case is diagnosed, all confirmed or suspect cases of viral meningitis, as defined by the reporting criteria in Section 2A.

Laboratories performing examinations on any specimens derived from Massachusetts residents that yield evidence of arbovirus, enterovirus, herpes simplex virus, measles virus, mumps virus, or varicella virus infection shall report such evidence of infection directly to the MDPH within 24 hours.

C. Local Board of Health (LBOH) Reporting and Follow-Up Responsibilities

Reporting Requirements

MDPH regulations (*105 CMR 300.000*) stipulate that viral meningitis is reportable to the LBOH and that each LBOH must report any case of viral meningitis or suspect case of viral meningitis, as defined by the reporting criteria in Section 2A. Cases should be reported to the MDPH Bureau of Communicable Disease Control, Office of Integrated Surveillance and Informatics Services (ISIS) using the appropriate MDPH case report form. If the etiologic agent is known, use the case report form specific for that agent (found at the end of the chapter for that agent). If there is no specific case report form for the identified etiologic agent or there is no etiologic agent identified, use a *MDPH Generic Confidential Case Report Form* (found at the end of this chapter). Refer to the *Local Board of Health Timeline* at the end of this manual's *Introduction* section for information on prioritization and timeliness requirements of reporting and case investigation.

Case Investigation

1. It is the responsibility of the LBOH to complete a *MDPH Generic Confidential Case Report Form* (found at the end of this chapter) by interviewing the case and others who may be able to provide pertinent information. Much of the information required on the form can be obtained from the health care provider or from the medical record.
2. Use the following guidelines to assist in completing the form:
 - a. Accurately record the demographic information.
 - b. Accurately record clinical information, including “viral meningitis” as the disease being investigated, date of symptom onset, symptoms, whether hospitalized, and hospital and clinician contact information.
 - c. Include all available diagnostic laboratory test information.
 - d. Indicate that culture results were negative for bacteria and fungi. If applicable, indicate the type of virus identified and the type of specimen from which it was identified. This information can be recorded in the “Comments” section at the bottom of the page.

- e. Include any additional comments regarding the case in the “Comments” section at the bottom of the page.
 - f. If you have made several attempts to obtain case information but have been unsuccessful (e.g., the case or health care provider does not return your calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please fill out the form with as much information as you have gathered. Please note on the form the reason(s) why it could not be filled out completely.
3. After completing the form, attach laboratory report(s) and fax or mail (in an envelope marked “Confidential”) to ISIS. The confidential fax number is (617) 983-6813. Call ISIS at (617) 983-6801 to confirm receipt of your fax. The mailing address is:

MDPH, Office of Integrated Surveillance and Informatics Services (ISIS)
305 South Street, 5th Floor
Jamaica Plain, MA 02130
Fax: (617) 983-6813

4. Institution of disease control measures is an integral part of case investigation. It is the responsibility of the LBOH to understand, and if necessary, institute the control guidelines listed in Section 4.



Section 4:

CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements (*105 CMR 300.200*)

None.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

Daycare or School

Any case of meningitis in a daycare or school often causes panic in staff members, parents, and the community. A *Meningitis Public Health Fact Sheet* is available from the MDPH Division of Epidemiology and Immunization; the fact sheet explains meningitis and its various causes. A “Sample Letter to Parents” about viral meningitis is also available and can be obtained by contacting the MDPH Division of Epidemiology and Immunization at (617) 983-6800 or (888) 658-2850. There is no need for any medical treatment for people who have been in contact with a case of viral meningitis. The most effective way to prevent the spread of these viruses is through proper hand washing and good general hygiene, and this should be communicated to the school or daycare facility. It should be noted that most people with enteroviral infections do not develop meningitis but may have a variety of other symptoms (e.g., gastrointestinal or respiratory).

Cluster of Cases Observed/Outbreak Suspected

If the number of reported cases in your city/town is higher than usual or if you suspect an outbreak, investigate to determine the source of infection and the mode of transmission. Identification of common risk factors, such as age,

school, or workplace, may lead to the implementation of effective prevention and control measures. Consult with the epidemiologist on-call at the MDPH Division of Epidemiology and Immunization at (617) 983-6800 or (888) 658-2850. The Division can help determine a course of action to prevent further cases and can perform surveillance for cases across town lines, which would otherwise be difficult to identify at the local level.

D. Preventive Measures

Personal Preventive Measures/Education

Since most forms of viral meningitis are caused by enteroviruses, which are shed in feces, individuals should be advised to practice good hygiene, especially frequent and thorough hand washing.

Advise individuals to:

- ◆ Always wash their hands thoroughly with soap and water before eating or preparing food, after using the toilet, and after changing diapers.
- ◆ After changing diapers, wash the child's hands as well as their own hands, and dispose of feces in a sanitary manner.
- ◆ Wash their hands thoroughly and frequently when ill with diarrhea or when caring for someone with diarrhea. Hands should be scrubbed for at least 15–20 seconds after cleaning the bathroom; after using the toilet or helping someone use the toilet; after changing diapers, soiled clothing or soiled sheets; before handling food; and before eating.

A Viral Meningitis Public Health Fact Sheet is available from the MDPH Division of Epidemiology and Immunization or on the MDPH website at www.mass.gov/dph. Click on the “Publications and Statistics” link, and select the “Public Health Fact Sheets” section under “Communicable Disease Control.”



ADDITIONAL INFORMATION

The following is the formal Centers for Disease Control and Prevention (CDC) case definition for aseptic meningitis. It is provided for your information only, and should not affect the investigation and reporting of a case that fulfills the criteria in Section 2A of this chapter. (The CDC and the MDPH use the CDC case definitions to maintain uniform standards for national reporting.) For reporting to the MDPH, always use the criteria outlined in Section 2A.

Note: The most up-to-date CDC case definitions are available on the CDC website at www.cdc.gov/epo/dphsi/casedef/case_definitions.htm.

Clinical Description

A syndrome characterized by acute onset of meningeal symptoms, fever, and cerebrospinal fluid (CSF) pleocytosis, with bacteriologically sterile cultures.

Laboratory Criteria for Diagnosis

No evidence of bacterial or fungal meningitis.

Case Classification

Confirmed

A clinically-compatible case diagnosed by a physician as aseptic meningitis, with no laboratory evidence of bacterial or fungal meningitis.

Comment

Aseptic meningitis is a syndrome of multiple etiologies, but many cases are caused by a viral agent.



REFERENCES

American Academy of Pediatrics. In: Pickering L.K., ed. *Red Book: 2003 Report of the Committee on Infectious Diseases, 26th Edition*. Elk Grove Village, IL, American Academy of Pediatrics; 2003.

CDC. Case Definitions for Infectious Conditions Under Public Health Surveillance. *MMWR*. May 2, 1997; 46(RR-10).

Heymann, D., ed. *Control of Communicable Diseases Manual, 18th Edition*. Washington, DC, American Public Health Association, 2004.

MDPH. *Regulation 105 CMR 300.000: Reportable Diseases, Surveillance, and Isolation and Quarantine Requirements*. MDPH, Promulgated November 4, 2005.

“Viral (Aseptic) Meningitis.” Centers for Disease Control and Prevention. January 21, 2005.
<www.cdc.gov/ncidod/dvrd/revb/enterovirus/viral_meningitis.htm>.



FORMS & WORKSHEETS

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LBOH Action Steps

This form does not need to be submitted to the MDPH with the case report form. It is for LBOH use and is meant as a quick-reference guide to viral meningitis case investigation activities.

LBOH staff should follow these steps when viral meningitis is suspected or confirmed in the community. For more detailed information, including disease epidemiology, reporting, case investigation, and follow-up, refer to the preceding chapter.

- ☐ Notify the MDPH Division of Epidemiology and Immunization, at (617) 983-6800 or (888) 658-2850, to report any confirmed or suspect case(s) of viral meningitis.
- ☐ Obtain laboratory confirmation.
- ☐ Fill out the case report form (attach laboratory results).
- ☐ Send the completed case report form (with laboratory results) to the MDPH Bureau of Communicable Disease Control, Office of Integrated Surveillance and Informatics Services (ISIS).