MENINGITIS, VIRAL

(Aseptic meningitis, nonbacterial meningitis, serous meningitis, lymphocytic meningitis)

1. **Agent**: Various viruses, many associated with other specific diseases, can cause meningitis. A third or more of cases have no demonstrable agent identified. In the US, most cases are caused by enteroviruses; other agents include arboviruses (especially WNV), measles, herpes simplex types I and II, varicella, mumps, and lymphocytic choriomeningitis (LCM) virus.

2. **Identification**:

   a. **Symptoms**: A clinical syndrome characterized by acute onset of febrile illness with signs and symptoms of meningeal inflammation, including headache, stiff neck and back, and photophobia. In young children, fever, irritability, and lethargy are common. CSF reveals pleocytosis, usually mononuclear (polymorphonuclear in very early stages), mildly elevated protein, normal or slightly low glucose, and absence of bacteria by Gram stain and culture. Illness seldom exceeds 10 days. Recovery from enteroviral and most other viral meningitides is usually complete but weakness, muscle spasm, insomnia and personality changes lasting less than a year are occasionally reported.

   b. **Differential Diagnosis**: Partially treated bacterial meningitis; poliomyelitis; leptospirosis; tuberculosis; fungal, amebic, or chemical meningitis; cerebrovascular syphilis; viral (including vector-borne) encephalitis. Among the enteroviruses, certain Coxsackie and ECHO viruses may produce a rubella-like rash.

   c. **Diagnosis**: Rule out bacterial causes. Isolation of virus from throat, stool, or CSF; 4-fold rise in specific viral antibody titer in acute and convalescent sera. PCR-based diagnostics are also available for enteroviruses and herpes viruses.

3. **Incubation**: Varies with the specific infectious agents. One to thirty days.

4. **Reservoir**: Varies with the specific infectious agents.

5. **Source**: Varies with the specific infectious agents.

6. **Transmission**: Varies with the specific infectious agents.

7. **Communicability**: Varies with the specific infectious agents.

8. **Specific Treatment**: Varies with the specific infectious agents.

9. **Immunity**: Varies with the specific infectious agents.

REPORTING PROCEDURES

1. **Reportable**. All cases of meningitis are reportable within one working day under *California Code of Regulations,* Section 2500.

2. Outbreaks of meningitis are investigated by district nursing. An outbreak of viral meningitis is defined as at least two cases outside of the immediate family from a suspected common source.

   Report Form: **CASE REPORT OF SUSPECTED VIRAL DISEASES OF THE CENTRAL NERVOUS SYSTEM (SDH 262-401, 2/70)**.

3. **Epidemiologic Data**:

   a. Clinical history and pertinent laboratory information.

   b. Recent illness: other viral diseases.

   c. Similar illness in household or community.

   d. Immunizations for poliomyelitis, influenza, or other viral diseases within past 30 days.

   e. History of travel away from home within past month, or contact with visitors.

   f. History of mosquito bites.

CONTROL OF CASE, CONTACTS & CARRIERS

Individual cases do not require investigation. Investigate within 3 days when clustering occurs.

CASE:

Precautions: Specific diagnosis depends upon laboratory data that is not usually available until recovery has occurred. Therefore, isolate all patients during febrile period. Enteric and respiratory secretion (standard) precautions recommended while hospitalized.

CONTACTS:

No restrictions; except as applicable for specific preceding viral disease. If etiology is unknown, restrict only if symptomatic, and then as for case.

CARRIER: Not applicable.

PREVENTION-EDUCATION

1. See section on specific disease.
2. Stress hand washing and personal hygiene to limit fecal-oral transmission of enterovirus.
3. Disinfect utensils and fomites soiled by secretions and excretions of patient.
4. Alert family and contacts to possible secondary cases.

DIAGNOSTIC PROCEDURES

Clinical and epidemiological history is required to aid the laboratory in test selections.

1. **Serology**: Paired sera required.

   Container: Serum separator tube (SST, a red/gray top Vacutainer tube).

   Laboratory Form: **Test Requisition and Report Form H-3021 or online request if electronically linked to the Public Health Laboratory**.

   Examination Requested: Viral (aseptic) meningitis.

   Material: Whole clotted blood.

   Amount: 8-10 ml.

   Storage: Refrigerate.

   Remarks: Collect first blood specimen as early as possible (acute) and second about 2 weeks after the first (convalescent). Send each as it is collected to the Public Health Laboratory.

2. **Culture**: Enterovirus diagnosis dependent on recovery of virus from stool, throat or CSF.

   Container: Sterile, 30 ml wide-mouth, screw-capped bottle; viral culturette; sterile test tube.

   Laboratory Form: **Test Requisition and Report Form H-3021 or online request if electronically linked to the Public Health Laboratory**.

   Examination Requested: Viral (aseptic) meningitis.

   Material: 2-3 g stool (no preservatives) required; throat swab and CSF (no preservatives) recommended.

   Storage: Keep chilled and deliver to the virology laboratory as soon as possible. If unable to deliver within 48 hours, freeze immediately after collection at -70^{o}C and keep frozen until delivered to the virology laboratory.

   Remarks: Specimens for isolation attempts must be collected as soon after onset as possible. Consult the Public Health Laboratory, Virology Division.