

1. What causes Creutzfeldt-Jakob Disease (CJD)?

- a. bacteria
- b. virus
- c. **prion**
- d. Fungi

Explanation: Prions are infectious proteins that cause progressive neurodegenerative disease in both humans and animals. They are not generally considered organisms, but are transmissible between hosts.

2. Which of the following is NOT a known mode of transmission for CJD?

- a. Inherited
- b. ingesting contaminated meat products
- c. **blood transfusion**
- d. iatrogenic

Explanation: Blood transfusions are thought to be a potential source of transmission, but unlike the other options, there is no established link. Iatrogenic transmission refers to infection via contaminated surgical and other equipment.

3. Which of the following is not helpful in diagnosing CJD?

- a. Brain biopsy or tissue exam
- b. **cerebrospinal fluid PCR test**
- c. CT and MRI imaging
- d. cerebrospinal fluid Western blot protein assay

Explanation: The only way to conclusively diagnose CJD is by directly examining brain tissue. However, CSF sampling and imaging are far less invasive and when combined with clinical presentation to form a diagnosis.

4. Which of the following are characteristics of CJD? (choose all that apply)

- a. **Long incubation period**
- b. **Condition is always fatal**
- c. Gradual, insidious dementia and neuromuscular progression
- d. Average onset is in young adulthood

Explanation: Progression is generally rapid with death usually occurring within 7-9 months of symptom onset. Onset generally occurs after age 50, but earlier onset can occur with certain strains.

5. Which of the following are not considered high risk tissue from a CJD-infected patient?

- a. Brain tissue
- b. Eyes
- c. cerebrospinal fluid**
- d. Spinal cord

Explanation: Cerebrospinal fluid (CSF) can carry CJD prions, but in lower concentrations. It is categorized as a low risk tissue/fluid.

6. What is an alternative to high heat sterilization of equipment after high-risk tissue prion contamination?

- a. Equipment must be discarded**
- b. use of 1:10 sodium hypochlorite (bleach) or sodium hydroxide solution
- c. sterilization with ethylene oxide gas
- d. Any of the above

Explanation: Bleach is an appropriate disinfectant against CJD, but sterilization must be performed with high heat (autoclave or steam sterilization). Gas sterilization and flash sterilization do not sufficiently deactivate prions.

7. What is the most common organism responsible for meningitis in kids and teens?

- a. Haemophilus influenzae
- b. Streptococcus pneumoniae
- c. Neisseria meningitidis**
- d. Streptococcus aureus

Explanation: Most cases appear in spring/winter and are spread by droplets between infected persons. This is the organism responsible for the majority of school-related and college dormitory outbreaks.

8. Which finding in cerebrospinal fluid is not suggestive of bacterial meningitis?

- a. **increased lymphocytes**
- b. Cloudy appearance
- c. Decreased glucose
- d. Increased protein

Explanation: Neutrophils are the type of WBC produced to fight a new bacterial infection. Because the lab reports WBC differentiation as percentages, the relative percent of lymphocytes and other WBCs will actually be lower than normal due to the large proportion of immature neutrophils. Elevated lymphocytes are more commonly seen in viral infections or in the later/chronic stages of bacterial infection.

9. Transmission based precautions for meningitis patients with suspected or confirmed *N. meningitidis* include:

- a. **Droplet precautions until 24 hrs after starting antibiotics**
- b. Airborne precautions until 24 hrs after fever resolution
- c. Contact precautions until 24 hrs after symptom resolution
- d. Contact precautions until 24 hrs of antibiotic completion

Explanation: Patients with bacterial meningitis, particularly *N. meningitidis* or *H. influenzae* should be placed on droplet isolation until completing at least 24 hrs of antibiotics. Close contacts with high risk exposure, including HCP who were not wearing protective PPE should be placed on antibiotics prophylactically.

10. Quadrivalent meningococcal vaccination (MCV4) is routinely recommended for which ages?

- a. **At age 11-12 with a booster at age 16**
- b. At age 2 months, 4 months, 6 months, and 1 year
- c. At age 65, or 19-64 with risk factors
- d. All of the above

Explanation: This is a recent change to vaccination recommendations. If recommended doses are missed, a single dose is recommended prior to starting college.

11. True or false: College dorm outbreaks account for roughly half of all meningitis cases in the United States.

False

Explanation: College dorms account for a large proportion of meningitis outbreaks. However outbreaks only account for 2% of meningitis cases. The other 98% are sporadic.

12. Which pathogens are associated with viral encephalitis?

- a. Varicella-zoster
- b. West Nile Virus
- c. Herpes Simplex-1
- d. All of the above**

Explanation: A number of viruses can cause encephalitis. CSF studies and PCR testing can be helpful in determining pathogen type. Special attention should be given to evaluation for Herpes Simplex (HSV) as treatment with acyclovir favorably improves outcomes.

13. A patient presents with sudden, intense lower back pain and progressive leg weakness. He had an L4/L5 surgery 2 weeks ago and his incision is red/inflamed.

Which do you suspect?

- a. Epidural abscess**
- b. Sepsis
- c. Meningitis
- d. Cerebrovascular accident (CVA)

Explanation: Epidural spinal abscesses are an uncommon complication, but are most likely to occur in the lumbar region of the spine. Surgical and other soft tissue infections are the most common source. Symptom progression is rapid and requires immediate surgical intervention to prevent paralysis and/or death.

14. A two-year-old has been diagnosed with aseptic, viral meningitis. Which is most appropriate (check all):

- a. Implement droplet precautions
- b. Implement standard precautions**
- c. Prophylactic therapy for close contacts
- d. Reassure parents that risk for serious outcome is rare**

Explanation: Most meningitis cases are viral and are rarely serious except in neonates or immunocompromised persons. Most cases self-resolve and are not directly transmissible. Transmission-based precautions or prophylactic therapy of close contacts are not warranted.

15. This used to be the most common cause of bacterial meningitis, but now occurs infrequently in the US due to routine vaccination

- a. **Haemophilus influenzae**
- b. Klebsiella pneumonia
- c. Escherichia coli
- d. Treponema pallidum

Explanation: Since Hib was added to the childhood vaccination schedule in 1987, cases, particularly in young children have become much less common. N. meningitidis is now much more common in children and adolescents.