

# Bacterial Meningitis

1. Which organism is encapsulated and causes acute purulent meningitis?
  - a) *Listeria monocytogenes*
  - b) *Neisseria meningitidis*
  - c) *Candida albicans*
  - d) Herpes simplex virus
  
2. The polysaccharide capsule of *N. meningitidis* is critical because it:
  - a) Enhances phagocytosis
  - b) Resists complement-mediated killing
  - c) Degrades IgA
  - d) Promotes iron acquisition
  
3. Which age group is most susceptible to Group B Streptococcal meningitis?
  - a) Teens
  - b) Older adults
  - c) Neonates
  - d) Immunocompromised adults
  
4. *Listeria monocytogenes* is transmitted via:
  - a) Mosquito bites
  - b) Contaminated refrigerated food
  - c) Respiratory droplets
  - d) Sexual contact

5. Which medium is used to culture *N. meningitidis*?

- a) MacConkey agar
- b) Sabouraud's dextrose agar
- c) Chocolate agar
- d) Blood agar

6. A CSF sample with turbidity, high protein, and low glucose suggests:

- a) Viral meningitis
- b) Bacterial meningitis
- c) Fungal encephalitis
- d) Tuberculous meningitis

7. Which virulence factor of *N. meningitidis* cleaves IgA?

- a) Pili
- b) Capsule
- c) IgA protease
- d) Endotoxin

8. Chemoprophylaxis for meningococcal contacts includes:

- a) Acyclovir
- b) Rifampicin
- c) Amphotericin B
- d) Ganciclovir

9. *H. influenzae* type b is a:

- a) Gram-positive coccus
- b) Gram-negative coccobacillus
- c) Acid-fast bacillus
- d) Spore-forming rod

10. Which serogroup of *N. meningitidis* causes epidemics in sub-Saharan Africa?

- a) Serogroup B
- b) Serogroup A
- c) Serogroup Y
- d) Serogroup W-135

11. *Listeria monocytogenes* demonstrates motility at:

- a) 37°C only
- b) 22°C only
- c) Both 22°C and 37°C
- d) No motility

12. The drug of choice for empiric bacterial meningitis treatment is:

- a) Penicillin
- b) Ceftriaxone
- c) Acyclovir
- d) Fluconazole

13. Which organism is oxidase-positive and ferments maltose?

- a) Streptococcus pneumoniae
- b) Neisseria meningitidis
- c) Listeria monocytogenes
- d) Escherichia coli

14. Neonatal meningitis caused by E. coli is often due to:

- a) Vertical transmission
- b) Inhalation of spores
- c) Contaminated water
- d) Insect vectors

15. Which test confirms N. meningitidis in CSF?

- a) Ziehl-Neelsen stain
- b) Gram-negative diplococci on microscopy
- c) India ink preparation
- d) Germ tube test

16. S. pneumoniae appears microscopically as:

- a) Gram-negative rods
- b) Gram-positive diplococci
- c) Acid-fast bacilli
- d) Pseudohyphae

17. Which vaccine prevents H. influenzae type b meningitis?

- a) MMR
- b) Hib conjugate
- c) Varicella
- d) BCG

18. Chronic meningitis is most likely caused by:

- a) Mycobacterium tuberculosis
- b) Neisseria meningitidis
- c) Enteroviruses
- d) Candida albicans

19. Listeria monocytogenes escapes phagosomes using:

- a) Capsule
- b) Listeriolysin O
- c) Pili
- d) Endotoxin

20. Which organism causes meningitis in immunocompromised and elderly patients?

- a) HSV-1
- b) Listeria monocytogenes
- c) Plasmodium falciparum
- d) Aspergillus fumigatus

21. The Thayer-Martin medium contains:
- a) Vancomycin, colistin, nystatin
  - b) Amphotericin B, penicillin, streptomycin
  - c) Cycloheximide, chloramphenicol, erythromycin
  - d) Ciprofloxacin, rifampicin, gentamicin
22. *N. meningitidis* serogroup B is problematic because:
- a) It resists all antibiotics
  - b) Its capsule mimics human brain antigens
  - c) It grows only at 22°C
  - d) It lacks pili
23. Which CSF finding is atypical in bacterial meningitis?
- a) Neutrophilic pleocytosis
  - b) Low glucose
  - c) High protein
  - d) Lymphocytic predominance
24. *S. pneumoniae* meningitis is common in:
- a) Infants and older adults
  - b) Exclusive to neonates
  - c) Only immunocompromised hosts
  - d) Teens with HIV

25. Which of the following is NOT a route of CNS infection?
- a) Direct spread
  - b) Blood-borne
  - c) Mosquito bite
  - d) Vertical transmission
26. *Listeria monocytogenes* is distinguished by:
- a) Spore formation
  - b)  $\beta$ -hemolysis on blood agar
  - c) Acid-fast staining
  - d) Germ tube positivity
27. The rapid diagnostic test for *N. meningitidis* uses:
- a) PCR
  - b) Latex agglutination for capsular antigen
  - c) Western blot
  - d) ELISA for IgM
28. Which organism causes meningitis with "bullet-shaped" morphology?
- a) Rabies virus
  - b) *N. meningitidis*
  - c) *L. monocytogenes*
  - d) *H. influenzae*

29. *H. influenzae* requires which growth factor?

- a) X and V factors
- b) Heme
- c) Siderophores
- d) Cysteine

30. Which population is at highest risk for *L. monocytogenes* meningitis?

- a) Pregnant women
- b) Adolescents
- c) Healthy adults
- d) Preterm infants

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## Viral Meningitis/Encephalitis

31. Aseptic meningitis is most commonly caused by:

- a) Cryptococcus neoformans
- b) Enteroviruses
- c) Mycobacterium tuberculosis
- d) Streptococcus agalactiae

32. HSV-1 establishes latency in:

- a) Sacral ganglia
- b) Trigeminal ganglia
- c) B lymphocytes
- d) Monocytes

33. Which virus causes a vesicular rash in successive waves?

- a) Measles virus
- b) Varicella-zoster virus
- c) West Nile virus
- d) Mumps virus

34. Neonatal herpes is most often acquired via:

- a) Transplacental transmission
- b) Birth canal exposure
- c) Breast milk
- d) Respiratory droplets

35. The "owl's eye" inclusion body is seen in infections caused by:

- a) CMV
- b) EBV
- c) HSV-1
- d) VZV

36. Which arbovirus belongs to the Flaviviridae family?

- a) Eastern equine encephalitis virus
- b) La Crosse virus
- c) West Nile virus
- d) Rabies virus

37. Subacute sclerosing panencephalitis is a complication of:

- a) Measles
- b) Mumps
- c) Rubella
- d) HSV-1

38. The heterophile antibody test is used to diagnose:

- a) CMV mononucleosis
- b) EBV infection
- c) HIV
- d) Rabies

39. Which herpesvirus is associated with Kaposi's sarcoma?

- a) HSV-2
- b) EBV
- c) HHV-8
- d) VZV

40. Mumps virus primarily targets:

- a) Salivary glands
- b) Liver
- c) Kidneys
- d) Heart muscle

41. The MMR vaccine protects against all EXCEPT:

- a) Measles
- b) Mumps
- c) Rubella
- d) Varicella

42. Rabies virus enters the CNS via:

- a) Hematogenous spread
- b) Axonal transport
- c) Lymphatic drainage
- d) Direct inoculation

43. Negri bodies are diagnostic of:

- a) Rabies
- b) HSV encephalitis
- c) Polio
- d) CMV retinitis

44. Which virus causes "cold sores"?

- a) HSV-1
- b) HSV-2
- c) VZV
- d) EBV

45. Congenital CMV infection may result in:

- a) Microcephaly
- b) Osteomyelitis
- c) Pancreatitis
- d) Myocarditis

46. The Tzanck smear detects:

- a) HSV/VZV multinucleated giant cells
- b) Candida pseudohyphae
- c) Cryptococcus capsule
- d) Mycobacterium acid-fast bacilli

47. Which virus is transmitted via saliva ("kissing disease")?

- a) HIV
- b) EBV
- c) HBV
- d) HPV

48. Postherpetic neuralgia follows reactivation of:

- a) HSV-1
- b) VZV
- c) EBV
- d) CMV

49. The St. Louis encephalitis virus is transmitted by:

- a) Ticks
- b) Mosquitoes
- c) Rodents
- d) Contaminated water

50. Which test detects HSV DNA in CSF?

- a) Gram stain
- b) PCR
- c) Latex agglutination
- d) India ink

51. Koplik's spots are pathognomonic for:

- a) Rubella
- b) Measles
- c) Mumps
- d) Roseola

52. Ganciclovir is used to treat:

- a) HSV-1 encephalitis
- b) CMV retinitis
- c) EBV infection
- d) VZV reactivation

53. Which virus causes "hydrophobia"?

- a) Rabies virus
- b) Poliovirus
- c) Norovirus
- d) Rotavirus

54. The most common cause of viral encephalitis in the U.S. is:

- a) HSV-1
- b) West Nile virus
- c) Enterovirus 71
- d) Japanese encephalitis virus

55. HSV-2 is typically associated with:

- a) Genital lesions
- b) Encephalitis in neonates
- c) Both a and b
- d) Neither

56. The live attenuated VZV vaccine prevents:

- a) Chickenpox only
- b) Shingles only
- c) Both chickenpox and shingles
- d) Neither

57. Which virus causes unilateral vesicular rash along a dermatome?

- a) HSV-1
- b) VZV
- c) Coxsackievirus
- d) Parvovirus B19

58. The primary reservoir for West Nile virus is:

- a) Bats
- b) Birds
- c) Rodents
- d) Mosquitoes

59. Which herpesvirus infects and transforms B cells?

- a) HSV-1
- b) EBV
- c) CMV
- d) HHV-6

60. A patient with fever, pharyngitis, and atypical lymphocytes likely has:

- a) EBV infection
- b) Streptococcal pharyngitis
- c) Influenza
- d) Tuberculosis

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## Fungal CNS Infections

61. *Cryptococcus neoformans* is diagnosed in CSF using:

- a) Gram stain
- b) India ink
- c) Ziehl-Neelsen stain
- d) KOH mount

62. The major virulence factor of *C. neoformans* is:

- a) Pseudohyphae
- b) Polysaccharide capsule
- c) Germ tubes
- d) Endotoxin

63. Rhinocerebral mucormycosis is seen in:

- a) Diabetic ketoacidosis
- b) HIV patients
- c) Neonates
- d) Healthy adults

64. *Aspergillus* hyphae are:

- a) Non-septate
- b) Septate and branching
- c) Spiral-shaped
- d) Acid-fast

65. *Candida albicans* is identified by:

- a) Germ tube formation
- b) Capsule production
- c) Motility at 22°C
- d) Spore formation

66. Which fungus grows as "cottony" colonies on SDA?

- a) *Cryptococcus neoformans*
- b) *Aspergillus fumigatus*
- c) *Mucor* spp.
- d) *Histoplasma capsulatum*

67. *C. neoformans* is transmitted via:

- a) Inhalation of bird droppings
- b) Contaminated food
- c) Sexual contact
- d) Mosquito bites

68. The Wood's lamp is used to diagnose:

- a) Candidiasis
- b) Dermatophyte infections
- c) Mucormycosis
- d) Aspergillosis

69. *Mucor* spp. hyphae are:

- a) Septate and pigmented
- b) Non-septate and wide
- c) Branching and gram-positive
- d) Acid-fast

70. Angioinvasion is a hallmark of:

- a) Candidemia
- b) Mucormycosis
- c) Cryptococcosis
- d) Histoplasmosis

71. *Candida* pseudohyphae are seen in:

- a) Blood cultures
- b) Vaginal discharge
- c) CSF
- d) Sputum

72. The "black mold" refers to:

- a) *Aspergillus niger*
- b) *Mucor* spp.
- c) *Cryptococcus neoformans*
- d) *Candida albicans*

73. *Histoplasma capsulatum* is endemic in:

- a) Ohio River Valley
- b) Sub-Saharan Africa
- c) Southeast Asia
- d) Northern Europe

74. *Blastomyces dermatitidis* causes:

- a) Pulmonary and disseminated disease
- b) Meningitis only
- c) Cutaneous lesions only
- d) Osteomyelitis

75. *Coccidioides immitis* is found in:

- a) Desert soils of the Southwest U.S.
- b) Tropical rainforests
- c) Arctic regions
- d) Urban water systems

76. *Aspergillus* produces:

- a) Aflatoxins
- b) Ergot alkaloids
- c) Anthrax toxin
- d) Botulinum toxin

77. The "fruiting head" is seen in:

- a) Candida
- b) Aspergillus
- c) Cryptococcus
- d) Mucor

78. *C. neoformans* replicates in:

- a) Macrophages
- b) Neutrophils
- c) Red blood cells
- d) Epithelial cells

79. Mucormycosis treatment includes:

- a) Amphotericin B
- b) Acyclovir
- c) Penicillin
- d) Rifampicin

80. *Candida* thrives in:

- a) Acidic pH
- b) Alkaline pH
- c) High salt environments
- d) Anaerobic conditions

81. Cryptococcus is stained with:

- a) Lactophenol cotton blue
- b) India ink
- c) Gram stain
- d) Both a and b

82. Aspergilloma is a fungal ball in:

- a) Old TB cavities
- b) CSF
- c) Blood vessels
- d) Bone marrow

83. Mucor invades blood vessels due to:

- a) Iron acquisition
- b) Capsule production
- c) IgA protease
- d) Endotoxin

84. Candida germ tubes form in:

- a) Saline
- b) Human serum
- c) KOH
- d) India ink

85. Histoplasma is detected via:

- a) Urine antigen
- b) Blood cultures
- c) CSF PCR
- d) Skin biopsy

86. C. neoformans colonies are:

- a) White and mucoid
- b) Green and powdery
- c) Black and cottony
- d) Red and pigmented

87. Mucor reproduces via:

- a) Sporangia
- b) Conidia
- c) Blastospores
- d) Chlamydospores

88. Candida is part of normal flora in:

- a) Gut
- b) Skin
- c) Vagina
- d) All of the above

89. Aspergillus causes allergic:

- a) Asthma
- b) Rhinitis
- c) Both
- d) Neither

90. Cryptococcus is differentiated from Candida by:

- a) Pseudohyphae
- b) Capsule
- c) Germ tubes
- d) Spores

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## Model Answers

1. b
2. b
3. c
4. b
5. c
6. b
7. c
8. b
9. b
10. b
11. b
12. b
13. b
14. a
15. b
16. b
17. b
18. a
19. b
20. b
21. a
22. b
23. d
24. a
25. c

- 26. b
- 27. b
- 28. a
- 29. a
- 30. a
- 31. b
- 32. b
- 33. b
- 34. b
- 35. a
- 36. c
- 37. a
- 38. b
- 39. c
- 40. a
- 41. d
- 42. b
- 43. a
- 44. a
- 45. a
- 46. a
- 47. b
- 48. b
- 49. b
- 50. b
- 51. b
- 52. b
- 53. a

- 54. b
- 55. c
- 56. a
- 57. b
- 58. b
- 59. b
- 60. a
- 61. b
- 62. b
- 63. a
- 64. b
- 65. a
- 66. c
- 67. a
- 68. b
- 69. b
- 70. b
- 71. b
- 72. a
- 73. a
- 74. a
- 75. a
- 76. a
- 77. b
- 78. a
- 79. a
- 80. a
- 81. d

82. a

83. a

84. b

85. a

86. a

87. a

88. d

89. c

90. b

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