

Q & A: Meningitis

1. What is meningitis?

Meningitis is a serious infection that causes inflammation of the lining surrounding the brain and spinal cord.¹

2. What are the clinical symptoms of meningitis?

High fever, headache and stiff neck are common symptoms of meningitis in anyone over the age of 2 years. Other symptoms include nausea, vomiting, discomfort looking into bright lights, sleepiness, confusion or seizures. In infants, the classic symptoms of headache and stiff neck are difficult to detect and the infant may only appear lethargic, sleepy, irritable, have a tense, bulging fontanelle or poor feeding.²



3. What causes meningitis?

Meningitis is usually caused by a virus or a bacteria. Viral meningitis is generally less severe and does not require specific treatment. Bacterial meningitis is a severe illness that may result in brain damage, hearing loss or death if not treated promptly.³ The main bacteria causing meningitis are *Neisseria meningitidis* (meningococcus), *Streptococcus pneumoniae* (pneumococcus) and *Haemophilus influenzae type b* (Hib).

4. Who is most at risk for getting meningitis?

Persons who have been in close contact with someone who has meningitis are at increased risk as some types of bacteria such as meningococcus are spread by oral secretions. Persons who have compromised immune systems as a result of such conditions as undernutrition or AIDS are at greater risk for acquiring meningitis. Infants are also at greater risk for meningitis because their immune response to some types of bacteria is immature.^{4 5}

5. How is meningitis diagnosed?

Early diagnosis and prompt treatment is extremely important if a person has a bacterial meningitis. In many areas of the world, clinical symptoms alone are the basis for making a diagnosis of meningitis. However, whenever possible, a spinal tap should be done to make the diagnosis and identify what type of bacteria, if present, is causing the meningitis. A spinal tap is performed by inserting a needle in the lower back and taking a sample of the cerebrospinal fluid that surrounds the

¹ Meningitis Research Foundation. Accessed at <http://www.meningitis.org/disease-info/what-are-meningitis-septicaemia> on 2/12/08.

² CDC. Meningococcal Disease. Accessed at http://www.cdc.gov/ncidod/dbmd/diseaseinfo/meningococcal_g.htm#What%20is%20meningitis on 2/12/08.

³ CDC. Meningococcal Disease.

⁴ Sigauque B, Roca A, et al. Acta Tropica 2008; 105: 21-27.

⁵ Johnson AP, Waight P, et al. J Infection 2007; 55: 394-99.

spinal cord. Correctly identifying the bacterial cause of a meningitis can ensure the selection of an effective [antibiotic](#) for treatment.⁶

6. How is meningitis treated?

Prompt, effective antibiotic treatment is crucial for the best outcome when a person has a bacterial meningitis. The choice of antibiotic depends on the age of the patient, the particular bacteria causing the meningitis and local patterns of [antimicrobial resistance](#) where the patient lives. According to the WHO, chloramphenicol and ampicillin or benzylpenicillin are the first-line drugs for meningitis in children between the ages of 2 months and 5 years. However, because of high levels of antibiotic resistance in many parts of the world, a third generation cephalosporin is often the effective drug of choice. These antibiotics need to be given intravenously or as an intramuscular injection.⁷ Treatment options differ for infants under 2 months.

7. How common is pneumococcal meningitis? Pneumococcus is a major cause of bacterial meningitis and the leading cause of non-epidemic meningitis in Africa.⁸

Studies have shown that about half of acute bacterial meningitis cases in children are due to pneumococcus.^{9 10 11 12} While

meningococcus is usually considered the primary bacteria causing epidemics (seasonal increases in meningitis cases in the African Meningitis Belt.), there is some evidence that pneumococcus also contributes to epidemic increases of meningitis in Africa. A recent study from Burkina Faso found pneumococcal meningitis rates increased 3-fold among children under 5 years during the epidemic season.¹³



8. How serious is pneumococcal meningitis?

Pneumococcal meningitis has a higher case fatality rate than other causes of bacterial meningitis. In developing countries about 45% of people with pneumococcal meningitis die, compared to 29% with Hib meningitis and 8% with meningococcal meningitis.¹⁴ Pneumococcal meningitis also has a higher rate of long-term disability compared to other causes of bacterial meningitis. Lifetime complications--such as deafness, seizures, mental retardation and movement problems--occurred in 64% of Gambian children who survived pneumococcal meningitis.¹⁵

9. How can meningitis be prevented?

[Vaccines](#) can help prevent some types of serious bacterial meningitis. There are effective vaccines against Hib, pneumococcus and meningococcus. [Pneumococcal conjugate vaccine](#) can be used in infants who are at relatively higher risk for serious [pneumococcal disease](#) including pneumococcal meningitis.

⁶ CDC. Meningococcal Disease.

⁷ WHO. Pocket Book of Hospital Care for Children 2005.

⁸ Peltola H. Clin Inf Dis 2001; 32: 64-75.

⁹ Sigauque B, Roca A, et al. Acta Tropica 2008; 105: 21-27.

¹⁰ Ciana G, Parmar N, et al. J Trop Pediatr 1995; 41: 164-8.

¹¹ Tram TT, Thinh LQ, et al. Ped Inf Dis J 1998; 17(9 Suppl): S192-S194.

¹² du Chatelet IP, Traore Y, et al. Clin Inf Dis 2005; 40: 17-25.

¹³ Yaro S, Lourd M, et al. Comm Inf Dis 2006; 43: 693-700

¹⁴ Peltola H. Clin Inf Dis 2001; 32: 64-75.

¹⁵ Goetghebuer T, West TE, et al. Trop Med Int Health 2000; 5(3): 207-213.