

## Fact Sheet: Meningitis

**Meningitis is a serious infection that can be caused by a bacteria or virus.**

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



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.<sup>2</sup>

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.<sup>3</sup> The main bacteria causing meningitis are *Neisseria meningitidis* (meningococcus), *Streptococcus pneumoniae* (pneumococcus) and *Haemophilus influenzae type b* (Hib).

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 under nutrition or AIDS are at greater risk for acquiring meningitis. Infants are also at greater risk for meningitis because their immune response against some types of bacteria is immature.<sup>4 5</sup>

**Pneumococcus is a major cause of bacterial meningitis and the leading cause of non-epidemic meningitis in Africa.**<sup>6</sup> Studies have shown that about half of acute bacterial meningitis cases in children are due to pneumococcus.<sup>7 8 9 10</sup> While meningococcus is usually considered the primary bacteria causing epidemics

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

<sup>2</sup> CDC. Meningococcal Disease. Accessed at [http://www.cdc.gov/ncidod/dbmd/diseaseinfo/meningococcal\\_g.htm#What%20is%20meningitis](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/meningococcal_g.htm#What%20is%20meningitis) on 2/12/08.

<sup>3</sup> CDC. Meningococcal Disease.

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

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

<sup>6</sup> Peltola H. Clin Inf Dis 2001; 32: 64-75.

<sup>7</sup> Sigauque B, Roca A, et al. Acta Tropica 2008; 105: 21-27.

<sup>8</sup> Ciana G, Parmar N, et al. J Trop Pediatr 1995; 41: 164-8.

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

<sup>10</sup> du Chatelet IP, Traore Y, et al. Clin Inf Dis 2005; 40: 17-25.

(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.<sup>11</sup>



**Pneumococcal meningitis is more likely to result in death or lifelong disability.** 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.<sup>12</sup> 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.<sup>13</sup>

**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. However, whenever possible, a spinal tap should be done to make the diagnosis of meningitis 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 spinal cord. Correctly identifying the bacterial cause of a meningitis can ensure the selection of an effective [antibiotic](#) for treatment.<sup>14</sup>

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.<sup>15</sup> Treatment options differ for infants under 2 months.

**Vaccines can help reduce the burden of death and disability due to meningitis.** 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.

<sup>11</sup> Yaro S, Lourd M, et al. *Comm Inf Dis* 2006; 43: 693-700

<sup>12</sup> Peltola H. *Clin Inf D* 2001; 32: 64-75.

<sup>13</sup> Goetghebuer T, West TE, et al. *Trop Med Int Health* 2000; 5(3): 207-213.

<sup>14</sup> CDC. *Meningococcal Disease*.

<sup>15</sup> WHO. *Pocket Book of Hospital Care for Children* 2005.