

An 18-month-old child is brought to the emergency department by his mother with fever, vomiting, and lethargy. He developed a fever during the day that initially responded to treatment with acetaminophen. Throughout the day, he became increasingly lethargic and developed a rash on his lower extremities that has acutely worsened during the past few hours. The child's immunizations are up to date and he is otherwise healthy. On examination he is drowsy and lethargic. He flexes his hips when his neck is flexed. He also has an erythematous, nonblanching pinpoint rash on his trunk and bilateral lower extremities. What is the most likely organism causing this patient's symptoms?

- ☐ A. *Borrelia burgdorferi*
- ☐ B. *Cytomegalovirus*
- ☐ C. Group B *Streptococcus*
- ☐ D. *Haemophilus influenzae*
- ☐ E. Herpes simplex virus
- ☐ F. *Listeria monocytogenes*
- ☐ G. *Neisseria meningitides*

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- ☐ A. *Borrelia burgdorferi* [1%]
- ☐ B. *Cytomegalovirus* [1%]
- ☐ C. Group B *Streptococcus* [10%]
- ☐ D. *Haemophilus influenzae* [3%]
- ☐ E. Herpes simplex virus [1%]
- ☐ F. *Listeria monocytogenes* [6%]
- ☒ G. *Neisseria meningitides* [78%]

[Proceed to Next Item](#)**Explanation:**

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This patient with signs of meningitis and a petechial rash most likely has *Neisseria meningitides*. *Neisseria meningitides* is the most common cause of bacterial meningitis in children and young adults in the United States. The mortality rate of meningococcal meningitis is extremely high, approaching nearly 15%. Children age < 2 are at greatest risk for contracting this illness, with rates 10 times higher than those of the general population. Seventy-five percent of patients with Meningococcus meningitis present with a petechial rash that is prominent on the axilla, wrists, flanks and ankles. It appears within 24 hours of the infection.

Prompt identification and treatment are critical given that the disease progresses rapidly over the course of a few hours and carries a very high morbidity and mortality rate even with appropriate treatment.

(Choice A) *Borrelia burgdorferi* causes Lyme disease. It is usually acquired in the late summer months after an *Ixodes sp.* tick bite. Lyme disease typically presents with a rash (ie, erythema chronicum migrans), headaches, fevers, chills, and malaise. The skin rash is very characteristic and is large, annular, and erythematous, occasionally with central

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(Choice B) *Cytomegalovirus* can cause infectious mononucleosis like illness, which presents with high fevers, fatigue, malaise, splenomegaly, and pharyngitis. It usually does not cause meningitis or present with a rash.

(Choice C) Group B *Streptococcus* is the most common cause of meningitis in infants. It is usually acquired from the mother during childbirth. It is not associated with a rash and is quite unlikely in an 18-month-old.

(Choice D) *Haemophilus influenzae* may cause meningitis but typically does not present with a rash. It may also cause rhinorrhea, fever, epiglottitis, and ear infections. The rate of *H influenzae* infections has decreased dramatically since the vaccine was introduced.

(Choice E) Herpes simplex virus generally causes temporal lobe encephalitis in neonates and infants and typically presents with seizures. It would be less likely in an 18-month-old child.

(Choice F) *Listeria monocytogenes*, which is transmitted vaginally, is 1 of the 3 most common causes of meningitis in newborns but does not present with a rash. Another mode of transmission is ingestion of unpasteurized milk or cheese from infected cows. It would be less likely to occur in an 18-month-old child.

Educational objective:

Meningococcal meningitis is the most common cause of bacterial meningitis in children and young adults. It typically presents with fever, headache, neck stiffness, altered mental status, and a **petechial or purpuric rash**. Prompt diagnosis and treatment are critical given that it has a high morbidity and mortality rate even with appropriate treatment.

References:

1. [Multicenter surveillance of invasive meningococcal infections in children.](#)
2. [Clinical recognition of meningococcal disease in children and adolescents.](#)

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