

Typhoid and Paratyphoid Fever: Information for Healthcare Professionals



Typhoid and paratyphoid fever are systemic, life-threatening illnesses caused by *Salmonella* serotypes Typhi and Paratyphi, respectively. Symptoms of typhoid and paratyphoid fever include high fever, weakness, stomach pain, headache, diarrhea or constipation, cough, and loss of appetite. Typhoid and paratyphoid fever are transmitted commonly through consumption of contaminated food or water. Following safe food and water practices is the best way to help prevent typhoid and paratyphoid fever; vaccination can also help prevent typhoid fever.

How common are typhoid and paratyphoid fever?

An estimated 11–21 million cases of typhoid fever and 5 million cases of paratyphoid fever occur worldwide each year, causing an estimated 215,000 deaths.

About 425 cases of typhoid fever and 125 cases of paratyphoid fever are diagnosed in the United States annually, mostly among international travelers to places where the diseases are endemic.

Who's at higher risk?

Travelers to eastern and southern Asia (especially Pakistan, India, and Bangladesh), Africa, the Caribbean, Central and South America, and the Middle East are at increased risk for typhoid and paratyphoid fever.

Travelers visiting friends and relatives are at additional risk, because they may not seek health consultation or typhoid vaccination before travel and may be less careful with food and water during travel.

Although the risk of illness with typhoid or paratyphoid fever increases with the duration of stay, travelers have acquired typhoid fever even during visits of less than a week to countries where the disease is endemic (such as Pakistan, India, and Bangladesh).



Typhoid fever and antimicrobial resistance

Antimicrobial resistance in typhoid fever has been increasing.

The first known outbreak of a strain of extensively drug-resistant (XDR) typhoid fever in Pakistan resulted in over 10,000 cases from 2016–2019, including 30 cases in the United States.

This XDR strain is resistant to most antibiotics used to treat typhoid fever, including ciprofloxacin and ceftriaxone. The strain remains susceptible to azithromycin and carbapenems.

As treatment options become more limited, counseling patients on prevention measures becomes increasingly important. These measures include receiving pre-travel vaccination, washing hands frequently, and taking food and water precautions during travel.



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Diagnosis

Blood culture is the mainstay of diagnosis. Early suspicion can ensure that cultures are sent to the laboratory for diagnosis and resistance testing, and that appropriate antimicrobial treatment is started quickly.

If you suspect your patient has typhoid or paratyphoid fever:

- Obtain a complete travel history.
- Collect stool and blood cultures, and request antimicrobial susceptibility testing.
- Consider getting an infectious diseases consultation.

Report all cases of confirmed typhoid or paratyphoid fever to the appropriate local or state health departments.

Treatment

Carefully consider empiric treatment options. Most typhoid and paratyphoid fever infections diagnosed in the United States, especially among patients who traveled to South Asia, are caused by strains not susceptible to fluoroquinolones. Therefore, fluoroquinolones should not be used for empiric treatment. Azithromycin is recommended for suspected uncomplicated disease and third-generation cephalosporins for severe or complicated disease. Patients who traveled to Pakistan should initially be treated with azithromycin for suspected uncomplicated typhoid fever and carbapenems for severe or complicated typhoid fever. Treatment regimens should be adjusted when culture and sensitivity results are available.

Prevention

Vaccination can help prevent typhoid fever. CDC recommends vaccination for people traveling to places where typhoid fever is endemic, such as South Asia, especially Pakistan, India, or Bangladesh.

Two typhoid fever vaccines are available in the United States:



- Oral vaccine — can be given to people at least 6 years old. It consists of four pills taken every other day and should be finished at least 1 week before travel.
- Injectable vaccine — can be given to people at least 2 years old and should be given at least 2 weeks before travel.

Both vaccines protect 50%–80% of those vaccinated. The injectable vaccine requires a booster every 2 years, and the oral vaccine requires a booster every 5 years. **There is not a vaccine for paratyphoid fever.**

Advise your patients to select food and water carefully while traveling internationally.

Drinking water should be bottled, boiled, or treated (e.g., using chlorine) to remove germs. Travelers should avoid consuming salads; uncooked vegetables; raw, unpeeled fruits; and unpasteurized fruit juices. Foods should be fully cooked and consumed hot.

Tell your patients to seek medical care, even while abroad, if they have a fever and feel very ill.

Learn more at www.cdc.gov/typhoid-fever and www.cdc.gov/travel.