Typhoid and paratyphoid fever are systemic illnesses caused by *Salmonella Typhi* and *Paratyphi*. 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 commonly transmitted through consumption of contaminated food or water. Safe food and water practices are 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 to 21 million cases of typhoid fever and 5 million cases of paratyphoid fever occur worldwide each year, causing 215,000 deaths.

About 350 cases of typhoid fever and 90 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 Africa, the Caribbean, Central and South America, East Asia and especially South Asia are at increased risk for typhoid and paratyphoid fever. Visitors to South Asia are at the highest risk.

Travelers to those places visiting friends and relatives are at additional risk, because they may be less careful with food and water while abroad and may not seek pre-travel health consultation or typhoid vaccination.

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 India, Pakistan, or Bangladesh).

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**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 5,000 cases from 2016–2018, including 5 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, prevention measures such as pre-travel vaccination and counseling regarding food and water precautions are crucial to...
Diagnosis

Blood culture is the mainstay of diagnosis. Early clinical 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 for suspected uncomplicated disease and third-generation cephalosporins for severe or complicated disease are recommended. Patients who have traveled to Pakistan should be treated with azithromycin for suspected uncomplicated typhoid fever and carbapenems for severe or complicated typhoid fever, with treatment regimens 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 common, including countries in Africa, the Caribbean, Central and South America, East Asia, and South Asia, especially India, Pakistan, 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 is a total 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 are moderately effective, protecting 50 to 80% of those vaccinated, but lose effectiveness after several years. The injectable vaccine requires a booster every 2 years, and the oral vaccine requires a booster every 5 years. There are no vaccines for paratyphoid fever.

In addition to vaccination, be sure to advise your patients to select food and water carefully while traveling internationally. Drinking water should be bottled, boiled, or treated to remove germs (e.g., using chlorine). 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 symptoms consistent with typhoid or paratyphoid fever.

Learn more: [https://www.cdc.gov/typhoid-fever/index.html](https://www.cdc.gov/typhoid-fever/index.html)