

spirochetes between febrile episodes. PCR is the preferred procedure for direct detection of *B. miyamotoi* in blood or CSF.

Culture of blood or CSF in Barbour-Stoenner-Kelly broth medium or equivalent is an option for isolation of *Borrelia* species. However, few laboratories offer this service. An alternative for tick-borne *Borrelia* species, but not *B. recurrentis*, is inoculation of blood or CSF into severe combined immunodeficient mice and examination of the animal's blood after a few days.

Options for serologic confirmation of infection are limited, and results may be misleading. Whole cell-based assays, such as enzyme-linked immunosorbent assay (ELISA) and immunoblot, and the C6-peptide ELISA for Lyme disease may be positive in relapsing fever or *B. miyamotoi* disease through antigenic cross-reactivities among these spirochetes. A commercially available assay based on GlpQ, a protein antigen of all relapsing fever *Borrelia* species (including *B. miyamotoi*) but not of any Lyme disease species, has better specificity, but commonly is negative at a time when a blood smear or PCR assay would be positive. The results of current GlpQ-based assays cannot be used to differentiate between different *Borrelia* species as to etiology.

■ DIFFERENTIAL DIAGNOSIS

Depending on the patient's history of residential, occupational, travel, and recreational exposures, the differential diagnosis of relapsing fever includes one or more of the following infections that feature either periodicity in the fever pattern or an extended single febrile period with nonspecific constitutional symptoms: Colorado tick fever, Rocky Mountain spotted fever and other rickettsioses, ehrlichiosis, anaplasmosis, tick-borne viral infection, rat bite fever, and babesiosis in North America, Europe, Russia, and northeastern Asia. Elsewhere in the Americas and Asia and in most of Africa, malaria, typhoid fever, typhus and other rickettsioses, dengue, and leptospirosis may also be considered. There may be co-infections of malaria, typhus, or typhoid with TBRF or LBRF. *B. miyamotoi* infection may coexist with Lyme disease, anaplasmosis, or babesiosis in North America.

TREATMENT