Finally, the third stage and the most serious stage of the disease, is characterized by systemic involvement of neurologic, cardiac, and musculoskeletal systems that appears 2 to 12 months after inoculation. Lyme arthritis is the most common manifestation with pain, swelling, and effusion. In children, the arthritis is characterized by intermittently painful swollen joints (primarily the knees), with spontaneous remissions and exacerbations. Rare neurologic features of pediatric Lyme disease may include chronic demyelinating encephalitis, polyneuritis, and memory problems (Kest and Pineda, 2008).

Cardiac complications, which may appear in a small percentage of persons 4 to 5 weeks after erythema chronicum migrans, are commonly carditis and acute atrioventricular conduction abnormalities and may result in severe heart block (Costello, Alexander, Greco, et al, 2009). Patients may be asymptomatic but can develop syncope, palpitations, dyspnea, chest pain, and severe bradycardia.

Diagnostic Evaluation

The diagnosis is based primarily on the history, observation of the lesion, and clinical manifestations. Serologic testing for Lyme disease at the time of a recognized tick bite is not recommended because antibodies are not detectable in most persons (American Academy of Pediatrics, 2015). Laboratory diagnosis can be established in later stages with a two-step approach that includes the screening test EIA or immunofluorescent immunoassay (IFA) and, if the results are equivocal or positive, with Western immunoblot testing, as outlined by the Centers for Disease Control and Prevention (2011a, 2011b) and adopted by the American Academy of Pediatrics (2015).

Therapeutic Management

At the time the rash appears or shortly thereafter, children older than 8 years old should be treated with oral doxycycline, and children younger than 8 years old are given amoxicillin or cefuroxime. For patients who are allergic to penicillin, an alternative drug is cefuroxime (American Academy of Pediatrics, 2015).