

Infectious Endocarditis in Dogs

What is infectious endocarditis?

Infectious endocarditis (IE), also called *infective* or *bacterial* endocarditis, is a life-threatening infection of the inner surface of the heart. The infection most frequently involves one of the four valves in the heart (usually the aortic or mitral valve), each of which is meant to ensure that bloodflow through the heart occurs only in the forward direction. The term *vegetative* endocarditis refers to severe cases in which visible clumps (“vegetations”) can be seen at the site of infection, which contain bacteria, inflammatory cells, and clotted blood.

A prerequisite to the development of IE is the entry of bacteria into the bloodstream. Possible sources include the gastrointestinal tract, the urinary tract, and teeth in dogs with significant dental disease. Bacteria can also spread to the heart from other infected organ systems, such as the nervous system or joints in the limbs or spinal column. Once bacteria enter the bloodstream, they can become lodged in the heart where they multiply and lead to IE. Likewise, once IE develops, infection can spread from the heart to other organs.

The most life-threatening consequences of IE are the result of damage to the heart, itself. In cases where significant damage to the affected valve occurs, severe backflow of blood through the valve can result in congestive heart failure, a devastating consequence of this disease. In addition, destruction of nearby and important components of the heart’s electrical conduction system can result in a variety of life-threatening arrhythmias.

How is IE diagnosed?

Dogs with IE typically have a **history** of feeling poorly, evidenced by symptoms such as decreased appetite and activity level. Recent onset of limb pain and associated lameness may have been noted, sometimes including shifting of the pain from one leg to another. **Physical examination** often reveals a fever. Joint pain may also be noted at this time. In addition, a heart *murmur* (an abnormal “whooshing” sound associated with the normally crisp heart sounds) is almost always present in dogs with IE. This may be a new finding, or it may have been detected and even evaluated in the past. Other physical abnormalities may be noted depending on the presence of congestive heart failure or arrhythmias, as well as the involvement of other organ systems.

In dogs diagnosed with IE, evaluation of other more common causes of fever often occurs prior to specific cardiac testing. Screening **bloodwork**, **urine analysis**, and **urine culture** are performed in order to assess organ function (particularly that of the liver and kidneys) and to try to isolate the responsible bacterial organism. Additional bloodwork may include blood cultures and titers for certain infectious organisms. **X-rays** of the chest and abdominal cavities and the spine, as well as **abdominal ultrasound** examination, may reveal a source of infection in one of these sites.

An **echocardiogram** (ultrasound examination of the heart) is also performed in search of a cause for an unexplained fever, and it is here that the lesions characteristic of IE are seen in dogs with this condition. Mild changes may include subtle thickening of one of the valves in the heart, which may be indistinguishable from common age-related valvular degeneration. In more severe cases, vegetations may be seen as described above. Affected valves allow backflow of blood, which is visible during the echocardiogram and called valvular *insufficiency* or *regurgitation*. It is this insufficiency that is responsible for development of congestive heart failure in some dogs with IE. Chest x-rays, if not already obtained, are important to evaluate for the presence of heart failure and to monitor its therapy. An **electrocardiogram** is performed to identify and characterize arrhythmias that may be present, and to guide antiarrhythmic therapy if necessary.

How is IE treated?

Treatment of IE includes prolonged antibiotic therapy. Intravenously administered broad-spectrum antibiotic agents are used during initial hospitalization. If blood cultures reveal a specific causative bacterium, then therapy can be tailored to that organism. Repeat cultures are performed approximately two weeks after treatment is begun, at which time an absence of bacterial growth serves as an early indicator of appropriate antibiotic selection. Treatment is typically continued for up to three months, with a final blood culture performed one to two weeks after the last antibiotic dose.

In addition to antibiotics, some dogs require therapy for congestive heart failure. In such cases, although resolution of the infection allows discontinuation of antibiotics, the permanent damage to the affected heart valves may necessitate lifelong treatment for heart failure. Periodic monitoring may include bloodwork, chest x-rays, electrocardiograms, and echocardiograms depending on response to therapy and medications utilized.

What is the prognosis? What should I watch for?

The prognosis for dogs with IE depends on factors including the duration of antibiotic therapy, the severity of damage to the affected valve, the presence or development of congestive heart failure, and the degree of involvement of other organ systems. Dogs that have relatively mild infections and do not develop congestive heart failure may live normal lives provided that antibiotics are diligently administered. The prognosis is, unfortunately, poor for those dogs that have severe valvular damage and heart failure.

Both during and after antibiotic therapy, it is important to watch for signs of continued or recurrent infection such as **loss of appetite, lethargy, and weakness or limping**. Signs of congestive heart failure may also include lethargy and weakness, as well as **intolerance to activity or exercise, coughing, and rapid or labored breathing**. If any of these symptoms are noted, or if you have any questions or concerns, please call your veterinarian or the Cardiology Service at Veterinary Specialty Services to discuss an appropriate plan. If you feel that the problem should not wait and requires immediate attention, then an emergency visit is warranted.