

Dirofilariosis

Heartworm disease is caused by the nematode *Dirofilaria immitis* and is transmitted by mosquitoes of many species. Heartworm disease is common in Southern Europe, USA, Canada, Australia and Southeastern and Eastern Asia, including Japan. In Europe, it is prevalent in Portugal, Spain, Southern France, Italy, Greece and other peri-Mediterranean countries.

The dog is the primary host for *Dirofilaria immitis*. The microscopic larval parasites are transmitted by mosquitoes into the skin and from there they migrate slowly through the body to the right pulmonary artery. Here they may reach adult size (up to 30 cms). The onset of disease is usually slow (months to years) unless a dog has been exposed to a large number of infected mosquitoes at the same time.

Clinical signs include exercise intolerance, coughing, weight loss, and occasionally death. Diagnosis is by demonstrating worms in the pulmonary artery using ultrasound, characteristic heart and lung changes on radiography and use of serological testing. Treatment of heartworm infection in dogs is complex and potentially dangerous. As they are killed, the worms are washed into the pulmonary vasculature where they can cause thromboembolism.

Heartworm can affect humans but it is extremely rare and usually only occurs in areas of extremely high prevalence.

Subcutaneous Dirofilariosis

Subcutaneous dirofilariosis is caused by the nematode *Dirofilaria repens*, and, similar to *D. immitis*, is transmitted by mosquitoes of many species. The disease is restricted to Europe, the Middle East, Asia and Africa. In Europe, subcutaneous dirofilariosis has been reported in France, Spain, Italy, Czech Republic, Slovakia, Switzerland, Greece, Bulgaria and the Balkan States. In Italy, *Dirofilaria repens* is reported with increasing prevalence from northern to southern regions, often clustering in coastal regions.

The dog is the primary host, but also cats and foxes are reservoirs of the nematode. Mosquitoes are infected when they ingest microfilariae of *D. repens* as they feed on the dog. Within the mosquito, the nematode develops to a larval parasite which infects a new host as the mosquito feeds.

Dirofilaria repens is considered to be of less pathogenicity than *D. immitis*. Clinical signs include a small, subcutaneous nodule caused by the presence of an adult worm. The location of the swelling may vary over time as the worms can move through subcutaneous tissue. In addition, they may be found in connective tissues between muscles during surgery.

Although infection cannot occur directly from dog to man, *D. repens* is considered to be an important and emergent zoonosis. In Italy, more than 100 human cases have been reported, with the majority from Piedmont, but also from Emilia-Romagna, Sardinia, Sicily, Tuscany, Apulia, Lombardy and the Central Region. Infection in man usually results in a subcutaneous nodule, with worms occasionally reaching deeper locations into the lungs. Both subcutaneous and pulmonary lesions must be differentiated from neoplasia. When the nodule's location is ocular, the worms are situated in the conjunctiva.