

One can of worms you don't want to open!

Seasons Vet Clinic

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Giant Kidney Worm - What is it?

Diocotophyma renale (AKA the giant kidney worm) looks like something out of a Steven King novel. These creepy crawlers are most commonly found in South America; however they are found in nearly every country worldwide¹. These worms are some of the largest known parasitic nematodes, with female worms reaching 20 to 100cm in length and 4 to 12mm in diameter². Males are slightly smaller in size, measuring 14 to 45cm in length and 4 to 6mm in diameter. Their brilliant red colour is due to a protein within the worm called nemoglobin, which is similar to human hemoglobin in that it functions to bring oxygen to tissues¹.

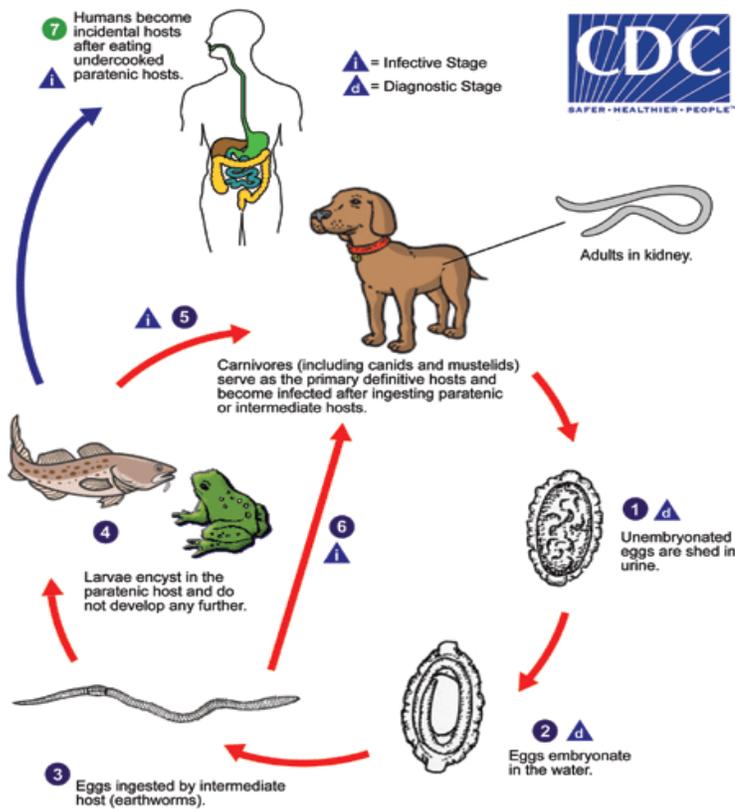
These worms get their nick name from their monstrous size and because of their organ of choice to infect; the kidney.



Two giant kidney worms removed by Dr. Leigh Chisholm from the abdomen of a dog in Winnipeg, MB. Photo taken by Dr. Chisholm.

Life cycle

The giant kidney worm life cycle can take up to 2 years to complete, and typically requires 2-3 hosts². The final host passes the eggs to the external environment in its urine, where they can remain for up to 5 years before they are consumed by the first host in this lifecycle; earthworms. The eggs hatch within the earthworms and the larvae undergo the first 2 molts in their lifecycle.⁴ The last 2 molts can either take place within the earthworm as well, or within a frog or fish that consumes the infected earthworm. Dogs and other carnivorous mammals become infected when they consume the earthworm, fish, or frog harboring the infective 3rd or 4th stage larvae. After entering the digestive system of the dog, the larvae burrow through the stomach wall and migrate to the kidney, where they develop into adults and produce eggs.



Dioctophymiasis [*Dioctophyma renale*] life cycle. (Center for Disease Control, 2017)

Nematode fun fact: Nematodes are one of the most abundant and diverse animals on Earth.⁴ One handful of dirt can contain over one thousand nematodes!

Symptoms, Diagnosis, and Treatment

For unknown reasons, giant kidney worms seem to favour the right kidney of their hosts.¹ The worms feed on and destroy the parenchyma tissue of the kidney, causing irreversible damage to the nephrons required for blood filtration.⁵ Symptoms of infection are often delayed, as the uninfected kidney tends to compensate for the infected kidney. Typical symptoms of a giant kidney worm infection include frequent urination with blood present in the urine, pain in the

abdomen or renal area, and weight loss. Kidney failure can occur in cases of severe infection where both kidneys are harboring a worm.

The best treatment method for a giant kidney infection is removal of the worms from the infected kidney or the abdominal cavity.⁵ In severe cases, removal of the entire kidney is necessary, however this option is successful only if the other kidney is not damaged or infected.



Giant kidney worms within the right kidney of a German Shepherd.⁶ All of the parenchyma tissue has been eaten away, with only the capsule remaining.

Should you be concerned?

Giant kidney worm infections, although uncommon, are very serious and potentially life threatening. In recent years, the incidence of giant kidney worms has been on the rise in Manitoba. This worm is most often seen in dogs from Northern Manitoba that regularly consume fish.

The key to protecting your dog from catching this parasite is prevention. This worm is transmitted to your dog when they consume infected raw frogs or fish, or through the consumption of infected earthworms.⁴ Careful monitoring of your dog's activity in environments where they may have access to these sources is the best way to prevent infection. If you do suspect your dog is infected with this worm, do not hesitate to ask your vet; it's better to be safe than sorry, especially with this monster worm!

References

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