

Using Antech KeyScreen™ GI Parasite PCR to Diagnose Drug-Resistant Hookworms

THE PRODUCT

KeyScreen™ GI Parasite PCR is a molecular diagnostic test that uses polymerase chain reaction (PCR) technology to identify DNA in stool samples for 20 of the most common gastrointestinal parasites affecting dogs and cats, including nematodes, cestodes and protozoa.

KeyScreen PCR testing is different from other fecal diagnostics, such as fecal flotation and antigen testing, which rely on detecting ova, cysts or proteins in stool samples. KeyScreen identifies parasites by their genetic material, an approach that enables rapid and accurate detection. KeyScreen is able to detect the common protozoa *Giardia*, and contains a marker that determines *Giardia* assemblages with zoonotic

potential, allowing for informed, and most often reassuring, conversations on human risk.

Another critical innovation is the test's ability to detect markers for hookworm (*Ancylostoma caninum*) benzimidazole (e.g., fenbendazole, febantel) drug resistance, which allows for appropriate antimicrobial use and targeted treatment. As antiparasitic resistance spreads, this information is vital for guiding therapy and improving patient outcomes.

PRESENTATION AND RELEVANT HISTORY

Otis, a 4-month-old intact male bullmastiff from Ontario, Canada, first presented to his veterinarian in early 2023 with loose stools and concerns about poor weight gain

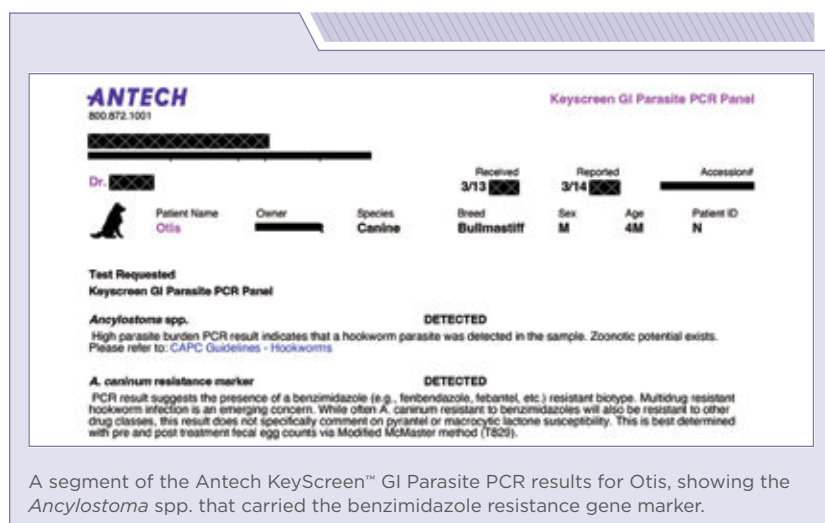
compared to his littermates. Otis had no travel history to the United States, no exposure to other dogs through boarding or dog parks and no contact with environments typically associated with resistant parasite strains.

An initial physical examination revealed a thin body condition but was otherwise unremarkable. An in-house fecal flotation performed during this visit identified hookworm eggs (*Ancylostoma* spp.). Otis was prescribed a standard benzimidazole dewormer (e.g., fenbendazole) dose, and the owners were instructed to administer a second course three weeks later, as per typical treatment protocols.

DIAGNOSTIC PICTURE

Despite following the outlined deworming protocol, Otis's clinical signs did not improve. One month after the initial visit, he returned for reevaluation. He had persistent soft stools and continued poor body condition. A repeat in-house fecal flotation showed hookworm eggs, and Otis was treated again with the same benzimidazole protocol. Two weeks later, Otis was still doing poorly, and his fecal flotation revealed an ongoing hookworm infection.

After six weeks of persistent infection despite multiple deworming attempts, Otis's veterinarian submitted a fecal sample for a KeyScreen GI Parasite



A segment of the Antech KeyScreen™ GI Parasite PCR results for Otis, showing the *Ancylostoma* spp. that carried the benzimidazole resistance gene marker.

PCR. Results indicated detection of *Ancylostoma* spp. that carried the benzimidazole resistance gene marker.

TREATMENT

Unfamiliar with treatment-resistant hookworms, which were previously rare in their area, Otis's veterinary team consulted with Antech's consultation services to develop a new treatment strategy. Otis began a "triple therapy" regimen, which uses multiple anthelmintics with different mechanisms of action concurrently to improve response.

The Companion Animal Parasite Council–suggested triple therapy typically includes:

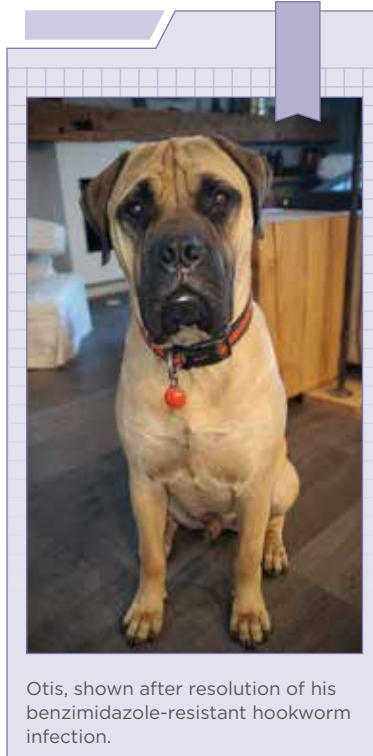
- A macrocyclic lactone (e.g., moxidectin)
- Pyrantel pamoate
- Fenbendazole

Two days after starting treatment, Otis's diarrhea had fully resolved, and his appetite and demeanor dramatically improved.

PATIENT RESPONSE AND FOLLOW-UP

Three weeks after beginning triple therapy, Otis returned for a follow-up KeyScreen test, which showed no detectable *Ancylostoma* spp. DNA. He continued to thrive in the months following treatment with no recurrence of clinical signs.

Given the aggressive nature of hookworm infections and the possibility of reinfection or larval leak (reactivation of arrested larvae in tissues), Otis's veterinarian performed recheck fecal screenings according to the KeyScreen hookworm algorithm (see [RESOURCE](#)).



Otis, shown after resolution of his benzimidazole-resistant hookworm infection.

CONCLUSION

Otis's case contributed to a larger epidemiological finding of benzimidazole-resistant hookworms presumably moving from the U.S. into Canada. In a recent AVMA publication on emerging hookworms, Otis was one of the 11 dogs detected with benzimidazole drug-resistant hookworms in Canada between May 2022 and April 2023.

Since its initial discovery in a Florida population of greyhounds, resistance is now documented more broadly, with implications for

veterinary practices across North America and now globally (e.g., Australia, Brazil and others). Drug-resistant parasites can impact not only individual pets but also the broader human and environmental health ecosystems.

When conventional testing and treatments failed to resolve Otis's infection, Antech's KeyScreen GI Parasite PCR provided critical missing information. Diagnosing treatment-resistant hookworms allowed the veterinary team to intervene appropriately, giving Otis a chance to grow and thrive like his littermates. Additionally, KeyScreen results prevented the veterinary team from administering additional, unnecessary antimicrobials.

As antimicrobial resistance and stewardship become more critical to human and animal health, veterinary teams must have access to diagnostic tools that provide the information needed to make prudent treatment decisions. KeyScreen GI Parasite PCR sets a new standard for parasite management by combining broad-spectrum parasite identification with resistance monitoring, empowering veterinarians to deliver more effective care.



RESOURCE

Scan to access Antech's hookworm clinical decision-making algorithm.

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