



# 7 MUST-KNOWS ABOUT INTESTINAL PARASITES

- |    |   |   |
|----|---|---|
| 1. | <b>Perform Routine Fecal Exams</b>        | <ul style="list-style-type: none"><li>• Perform routine fecal exams by centrifuge for dogs &amp; cats.<sup>1</sup></li></ul>  |
| 2. | <b>Roundworms in Puppies</b>              | <ul style="list-style-type: none"><li>• Roundworms infect over 90% of puppies under 3 months of age.<sup>2</sup></li></ul>  |
| 3. | <b>Most Common Parasites</b>              | <ul style="list-style-type: none"><li>• Hookworms &amp; roundworms are the most common intestinal nematode parasites in dogs.<sup>3</sup></li></ul>   |
| 4. | <b>Hookworms &amp; Roundworms</b>         | <ul style="list-style-type: none"><li>• Hookworms &amp; roundworms are zoonotic, posing high risk to children and dog owners.<sup>4,5</sup></li></ul>                                       |
| 5. | <b>Whipworm Eggs</b>                      | <ul style="list-style-type: none"><li>• Whipworm eggs can take up to a month to become infective.<sup>6</sup> Good sanitation is critical for effective control of this parasite.</li></ul> |
| 6. | <b>Tapeworm Transmission</b>              | <ul style="list-style-type: none"><li>• Tapeworm transmission is through ingestion of an intermediate host with encysted cysticercoid.<sup>7,8</sup></li></ul>                              |
| 7. | <b>Year-Round, Lifelong Anthelmintics</b> | <ul style="list-style-type: none"><li>• Year-round, lifelong anthelmintics that act against parasites with zoonotic potential is recommended.<sup>9</sup></li></ul>                         |

1. Fecal Exam Procedures. Companion Animal Parasite Council, 2020, [www.capcvet.org/articles/fecal-exam-procedures](http://www.capcvet.org/articles/fecal-exam-procedures). Accessed 28 Oct. 2020. 2. Schantz PM. Zoonotic ascarids and hookworms: the role for veterinarians in preventing human disease. In: Emerging Vector-Borne and Zoonotic Diseases, *The Compendium Suppl* 2002;24(1):47-52. 3. Little, Susan E., et al. Prevalence of intestinal parasites in pet dogs in the United States. *Vet. Parasitol.*, vol. 166, no. 1-2, Dec. 2009, pp. 144-152, 10.1016/j.vetpar.2009.07.044. 4. CDC – Parasites – Zoonotic Hookworm. CDC Centers for Disease Control and Prevention, 2020. <https://www.cdc.gov/parasites/zoonotichookworm/index.html>. Accessed 14 Mar 2022. 5. CDC – DPDx – Toxocariasis, Parasite Biology tab. CDC Centers for Disease Control and Prevention, 2019, [www.cdc.gov/dpdx/toxocariasis/index.html#tabs-1](http://www.cdc.gov/dpdx/toxocariasis/index.html#tabs-1). Accessed 27 Jan. 2022. 6. Companion Animal Parasite Council, CAPC. *Trichuris vulpis*, 28 July 2020. <https://capcvet.org/guidelines/trichuris-vulpis/>. Accessed 29 Mar. 2022. 7. Companion Animal Parasite Council, CAPC. *Dipylidium caninum*, 1 Nov. 2016. <https://capcvet.org/guidelines/Dipylidium-caninum>. Accessed 27 Jan. 2022. 8. Companion Animal Parasite Council, CAPC. *Taenia*, 1 Nov. 2016. <https://capcvet.org/guidelines/taenia/>. Accessed 27 Jan. 2022. 9. General Guidelines for Dogs and Cats. Companion Animal Parasite Council, 2020, [www.capcvet.org/guidelines/general-guidelines](http://www.capcvet.org/guidelines/general-guidelines). Accessed 27 Jan. 2022. 10. Data on file at Boehringer Ingelheim.



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## Trusted and Proven Heartworm Disease Prevention

**HEARTGARD® Plus (ivermectin/pyrantel)**  
is the only heartworm preventive made with  
real beef. Its savory taste makes it the #1  
dog-preferred chew, and that makes protecting  
dogs year-round easy and enjoyable month  
after month.<sup>10</sup>



For more information on pet owner education, reach out  
to your Boehringer Ingelheim Sales Representative or scan  
the QR code to visit [www.HEARTGARDClinic.com](http://www.HEARTGARDClinic.com).

**Heartgard®**  
(ivermectin/pyrantel) **Plus**

### CHEWABLES

**CAUTION:** Federal (U.S.A.) law restricts this drug to use by or on the order of a licensed veterinarian.

**INDICATIONS:** For use in dogs to prevent canine heartworm disease by eliminating the tissue stage of heartworm larvae (*Dirofilaria immitis*) for a month (30 days) after infection and for the treatment and control of ascarids (*Toxocara canis*, *Toxascaris leonina*) and hookworms (*Ancylostoma caninum*, *Uncinaria stenocephala*, *Ancylostoma braziliense*).

**DOSAGE:** HEARTGARD® Plus (ivermectin/pyrantel) should be administered orally at monthly intervals at the recommended minimum dose level of 6 mcg of ivermectin per kilogram (2.72 mcg/lb) and 5 mg of pyrantel (as pamoate salt) per kg (2.27 mg/lb) of body weight. The recommended dosing schedule for prevention of canine heartworm disease and for the treatment and control of ascarids and hookworms is as follows:

Dog Weight	Chewables Per Month	Ivermectin Content	Pyrantel Content	Color Coding On Foil Backing and Carton
Up to 25 lb	1	68 mcg	57 mg	Blue
26 to 50 lb	1	136 mcg	114 mg	Green
51 to 100 lb	1	272 mcg	227 mg	Brown

HEARTGARD Plus is recommended for dogs 6 weeks of age and older. For dogs over 100 lb use the appropriate combination of these chewables.

**ADMINISTRATION:** Remove only one chewable at a time from the foil-backed blister card. Return the card with the remaining chewables to its box to protect the product from light. Because most dogs find HEARTGARD Plus palatable, the product can be offered to the dog by hand. Alternatively, it may be added intact to a small amount of dog food. The chewable should be administered in a manner that encourages the dog to chew, rather than to swallow without chewing. Chewables may be broken into pieces and fed to dogs that normally swallow treats whole.

Care should be taken that the dog consumes the complete dose, and treated animals should be observed for a few minutes after administration to ensure that part of the dose is not lost or rejected. If it is suspected that any of the dose has been lost, redosing is recommended.

HEARTGARD Plus should be given at monthly intervals during the period of the year when mosquitoes (vectors), potentially carrying infective heartworm larvae, are active. The initial dose must be given within a month (30 days) after the dog's first exposure to mosquitoes. The final dose must be given within a month (30 days) after the dog's last exposure to mosquitoes.

When replacing another heartworm preventive product in a heartworm disease preventive program, the first dose of HEARTGARD Plus must be given within a month (30 days) of the last dose of the former medication.

If the interval between doses exceeds a month (30 days), the efficacy of ivermectin can be reduced. Therefore, for optimal performance, the chewable must be given once a month on or about the same day of the month. If treatment is delayed, whether by a few days or many, immediate treatment with HEARTGARD Plus and resumption of the recommended dosing regimen will minimize the opportunity for the development of adult heartworms.

Monthly treatment with HEARTGARD Plus also provides effective treatment and control of ascarids (*T. canis*, *T. leonina*) and hookworms (*A. caninum*, *U. stenocephala*, *A. braziliense*). Clients should be advised of measures to be taken to prevent reinfection with intestinal parasites.

**EFFICACY:** HEARTGARD Plus Chewables, given orally using the recommended dose and regimen, are effective against the tissue larval stage of *D. immitis* for a month (30 days) after infection and, as a result, prevent the development of the adult stage. HEARTGARD Plus Chewables are also effective against canine ascarids (*T. canis*, *T. leonina*) and hookworms (*A. caninum*, *U. stenocephala*, *A. braziliense*).

**ACCEPTABILITY:** In acceptability and field trials, HEARTGARD Plus was shown to be an acceptable oral dosage form that was consumed at first offering by the majority of dogs.

**PRECAUTIONS:** All dogs should be tested for existing heartworm infection before starting treatment with HEARTGARD Plus which is not effective against adult *D. immitis*. Infected dogs must be treated to remove adult heartworms and microfilariae before initiating a program with HEARTGARD Plus.

While some microfilariae may be killed by the ivermectin in HEARTGARD Plus at the recommended dose level, HEARTGARD Plus is not effective for microfilariae clearance. A mild hypersensitivity-type reaction, presumably due to dead or dying microfilariae and particularly involving a transient diarrhea, has been observed in clinical trials with ivermectin alone after treatment of some dogs that have circulating microfilariae.

### Keep this and all drugs out of the reach of children.

In case of ingestion by humans, clients should be advised to contact a physician immediately. Physicians may contact a Poison Control Center for advice concerning cases of ingestion by humans. Store between 68°F - 77°F (20°C - 25°C). Excursions between 59°F - 86°F (15°C - 30°C) are permitted. Protect product from light.

**ADVERSE REACTIONS:** In clinical field trials with HEARTGARD Plus, vomiting or diarrhea within 24 hours of dosing was rarely observed (1.1% of administered doses). The following adverse reactions have been reported following the use of HEARTGARD: Depression/lethargy, vomiting, anorexia, diarrhea, mydriasis, ataxia, staggering, convulsions and hypersalivation.

To report suspected adverse drug events, for technical assistance, or to obtain a copy of the Safety Data Sheet (SDS), contact Boehringer Ingelheim Animal Health USA Inc. at 1-888-637-4251. For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS, or online at <http://www.fda.gov/AnimalVeterinary/SafetyHealth>.

**SAFETY:** HEARTGARD Plus has been shown to be bioequivalent to HEARTGARD, with respect to the bioavailability of ivermectin. The dose regimens of HEARTGARD Plus and HEARTGARD are the same with regard to ivermectin (6 mcg/kg). Studies with ivermectin indicate that certain dogs of the Collie breed are more sensitive to the effects of ivermectin administered at elevated dose levels (more than 16 times the target use level) than dogs of other breeds. At elevated doses, sensitive dogs showed adverse reactions which included mydriasis, depression, ataxia, tremors, drooling, paresis, recumbency, excitability, stupor, coma and death. HEARTGARD demonstrated no signs of toxicity at 10 times the recommended dose (60 mcg/kg) in sensitive Collies. Results of these trials and bioequivalency studies, support the safety of HEARTGARD products in dogs, including Collies, when used as recommended.

HEARTGARD Plus has shown a wide margin of safety at the recommended dose level in dogs, including pregnant or breeding bitches, stud dogs and puppies aged 6 or more weeks. In clinical trials, many commonly used flea collars, dips, shampoos, anthelmintics, antibiotics, vaccines and steroid preparations have been administered with HEARTGARD Plus in a heartworm disease prevention program.

In one trial, where some pups had parvovirus, there was a marginal reduction in efficacy against intestinal nematodes, possibly due to a change in intestinal transit time.

**HOW SUPPLIED:** HEARTGARD Plus is available in three dosage strengths (see DOSAGE section) for dogs of different weights. Each strength comes in convenient cartons of 6 and 12 chewables.

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Boehringer Ingelheim Animal Health USA Inc.  
Duluth, GA 30096

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Rev. 08-2018

1050-1999-04.

US-PET-0199-2020.







# ***7 MUST-KNOWS*** **ABOUT INTESTINAL PARASITES**



# 1

## ***Poop Is Important***

### **Common Fecal Exam Techniques<sup>1</sup>**

- Centrifuge Fecal Float – routine fecal exam
- Passive Float – technique with commercial fecal collection kits
- Direct Smear – trophozoites and nematode larvae
- Stained Direct – protozoal giardiasis, trichomoniasis
- Fecal Antigen Test<sup>2</sup>

### **CAPC Recommendations for Dogs & Cats:**

- Centrifuge fecal float 4 times in first year of life, then at least 2 times a year for adults

### **Common Mistakes:**

- Fecal sample size
- Type of fecal solutions
- Timing and rpm of centrifuge



# 2

## Roundworms in Pets

### Symptoms:

- Diarrhea
- Weight loss
- Worms in feces
- Swollen abdomen
- Vomiting
- Malnutrition
- Weakness
- Lack of appetite

### Species:

- *Toxocara canis*
- *Toxocara cati*
- *Toxascaris leonine*
- *Baylisascaris procyonis*

### Transmission:

- In utero transmission
- Ingestion of paratenic host
- Ingestion of larvated eggs
  - Eggs remain in the environment for years
- Nursing
  - Varies depending on species



Roundworms infect over 90% of puppies under 3 months of age<sup>3</sup>

# 3

## ***Roundworms in People***

### **Zoonotic Concerns:**

- Ocular larva migrans<sup>4</sup>
- Visceral larval migrans<sup>4</sup>

### **Transmission:**

- Ingestion of soil contaminated with larvated eggs
- Hand-to-mouth contact

### **Symptoms:**

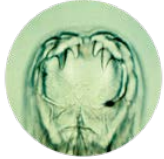
- Stomach problems
- Rashes
- Pneumonia
- Blindness



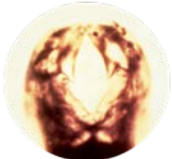
**Young children and owners of dogs are at a higher risk of exposure<sup>5</sup>**

# 4

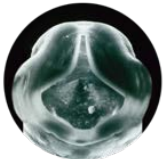
## Hookworms in Pets



*Ancylostoma caninum* (dog)  
*Ancylostoma tubaeforme* (cat)



*Ancylostoma braziliense*  
(dog and cat)



*Uncinaria stenocephala* (dog)

### Transmission:

- Ingesting contaminated matter
- Skin penetration
- Nursing
- Ingesting paratenic host

### Symptoms:

- Weakness
- Weight loss
- Diarrhea
- Pale gums
- Vomiting
- Can be fatal in puppies

**Hookworms are the most common intestinal nematode parasite in dogs<sup>6</sup>**

**A single female hookworm in an infected dog can lay up to 20,000 eggs per day<sup>7</sup>**



Images property of Boehringer Ingelheim



# 5

## *Hookworms in People*

### Transmission:

- Hand to mouth
- Larvae penetrate the skin

### Reduce Your Risk:

- Wash hands<sup>8,9</sup>
- 4 P's: Pick Up Pet Poop Promptly<sup>9</sup>
- Cover sandboxes<sup>8</sup>
- Avoid skin contact with soil and sand<sup>9</sup>

Cutaneous larva migrans: progression over one week.

Photos courtesy of Florida Department of Health, Duval County Epidemiology<sup>10</sup>



July 4

July 6

July 8

July 9

July 10

July 10

July 11



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# 6

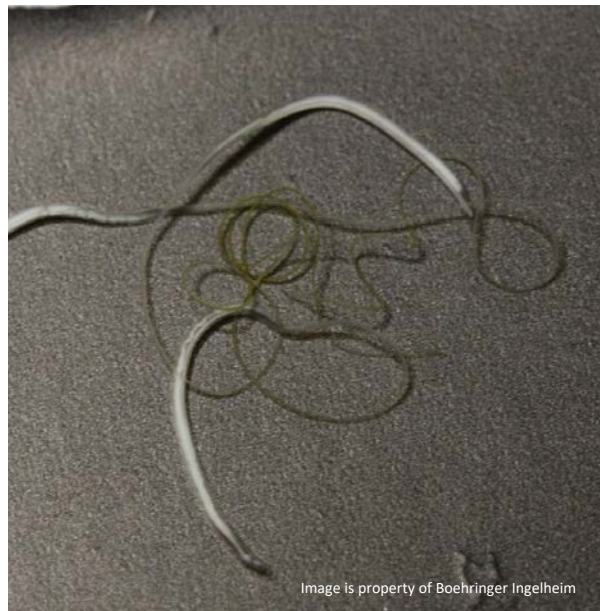
## ***Whipworm—Trichuris vulpis***

### **Transmission:**

- Ingestion of embryonated egg from environment
- Eggs can remain viable in the environment for many years<sup>11</sup>

### **Clinical Signs:**

- Bloody diarrhea
- Weight loss
- Dehydration



**Good sanitation is the key to effective control of this parasite**

# 6

## Tapeworms

### *Diphylidium caninum:*

- Intermediate host: Flea

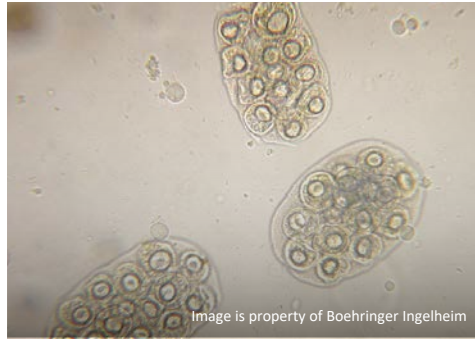
### Transmission:

- Ingestion of intermediate host with encysted cysticeroid



### *Taenia spp.:*

- Intermediate hosts:
  - Rodents
  - Pigs
  - Sheep
  - Rabbits




### Control Exposure:

- Monthly flea control<sup>12</sup>
- Prevent hunting<sup>13</sup>



# 7 ***7 Intestinal Parasite Infections Are Common, But Can Be Controlled***

- Start anthelmintic at 2 weeks of age repeating every 2 weeks until regular parasite control begins<sup>8</sup>
- Treat year-round with an anthelmintic that acts against parasites with zoonotic potential<sup>8</sup>
- There are several products available for intestinal parasite control
  - Most are administered once every 30 days
  - All have some intestinal parasite coverage; species coverage differs
  - All are also highly effective at preventing heartworm disease, and all are safe
  - All require a prescription, and some must be administered by a veterinarian

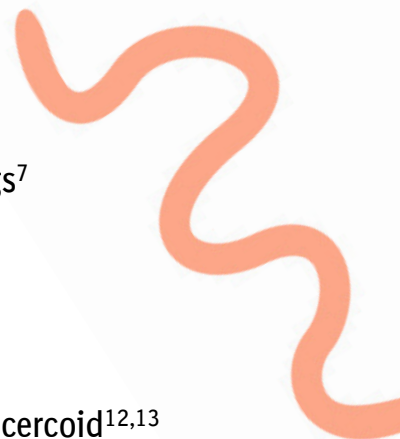


**The MOST PREVALENT  
intestinal nematode parasites  
of dogs in the United States are  
HOOKWORMS & ROUNDWORMS<sup>5</sup>**



# ***7 Must-Knows About Intestinal Parasites***

- 1.** Perform routine fecal exams by centrifuge for dogs & cats<sup>1</sup>
- 2.** Roundworms infect over 90% of puppies under 3 months of age<sup>3</sup>
- 3.** Hookworms & roundworms are the most common intestinal nematode parasites in dogs<sup>7</sup>
- 4.** Hookworms & roundworms are zoonotic, posing high risk to children and dog owners<sup>5</sup>
- 5.** Whipworm eggs can remain viable in the environment for many years<sup>11</sup>
- 6.** Tapeworm transmission is through ingestion of an intermediate host with encysted cysticercoid<sup>12,13</sup>
- 7.** Year-round, lifelong anthelmintics that act against parasites with zoonotic potential is recommended<sup>8</sup>



# Trusted and Proven Heartworm Disease Prevention



- Year-round use of HEARTGARD® Plus (ivermectin/pyrantel) is a highly palatable, easy solution.
- HEARTGARD Plus is the ONLY monthly preventive made with REAL beef. Owners find it easy to administer, and dogs prefer it over other products.<sup>14</sup>
- After 35 years and 2 billion doses prescribed, HEARTGARD Plus is the **#1 heartworm disease preventive** in the United States.<sup>15</sup>
- With proper purchases and testing history, owners are eligible for the HEARTGARD Plus Satisfaction Guarantee.<sup>16</sup>
- HEARTGARD Plus is safe for puppies as young as 6 weeks, with no minimum weight requirement.

**IMPORTANT SAFETY INFORMATION:** HEARTGARD Plus is well tolerated. All dogs should be tested for heartworm infection before starting a preventive program. Following the use of HEARTGARD Plus, digestive and neurological side effects have rarely been reported. For more information or for the full prescribing information, visit [www.heartgard.com](http://www.heartgard.com) or call 888-637-4251. US-PET-0218-2022-B



**THANKS**





# References

1. Fecal Exam Procedures. Companion Animal Parasite Council, 2020, [www.capcvet.org/articles/fecal-exam-procedures](http://www.capcvet.org/articles/fecal-exam-procedures). Accessed February 23, 2022.
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11. Companion Animal Parasite Council, CAPC. *Trichuris vulpis*, July 28, 2020. Accessed January 27, 2022.
12. Companion Animal Parasite Council, CAPC. *Dipylidium caninum*, 1 Nov. 2016. <https://capcvet.org/guidelines/Dipylidium-caninum>. Accessed February 23, 2022.
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14. Data on file at Boehringer Ingelheim.
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(ivermectin/pyrantel)

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**ADVERSE REACTIONS:** In clinical field trials with HEARTGARD Plus, vomiting or diarrhea within 24 hours of dosing was rarely observed (1.1% of administered doses). The following adverse reactions have been reported following the use of HEARTGARD: Depression/lethargy, vomiting, anorexia, diarrhea, mydriasis, ataxia, staggering, convulsions and hypersalivation.

To report suspected adverse drug events, for technical assistance, or to obtain a copy of the Safety Data Sheet (SDS), contact Boehringer Ingelheim Animal Health USA Inc. at 1-888-637-4251. For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS, or online at <http://www.fda.gov/AnimalVeterinary/SafetyHealth>.

**SAFETY:** HEARTGARD Plus has been shown to be bioequivalent to HEARTGARD, with respect to the bioavailability of ivermectin. The dose regimens of HEARTGARD Plus and HEARTGARD are the same with regard to ivermectin (6 mcg/kg). Studies with ivermectin indicate that certain dogs of the Collie breed are more sensitive to the effects of ivermectin administered at elevated dose levels (more than 16 times the target use level) than dogs of other breeds. At elevated doses, sensitive dogs showed adverse reactions which included mydriasis, depression, ataxia, tremors, drooling, paresis, recumbency, excitability, stupor, coma and death. HEARTGARD demonstrated no signs of toxicity at 10 times the recommended dose (60 mcg/kg) in sensitive Collies. Results of these trials and bioequivalency studies, support the safety of HEARTGARD products in dogs, including Collies, when used as recommended.

HEARTGARD Plus has shown a wide margin of safety at the recommended dose level in dogs, including pregnant or breeding bitches, stud dogs and puppies aged 6 or more weeks. In clinical trials, many commonly used flea collars, dips, shampoos, anthelmintics, antibiotics, vaccines and steroid preparations have been administered with HEARTGARD Plus in a heartworm disease prevention program.

In one trial, where some pups had parvovirus, there was a marginal reduction in efficacy against intestinal nematodes, possibly due to a change in intestinal transit time.

**HOW SUPPLIED:** HEARTGARD Plus is available in three dosage strengths (See DOSAGE section) for dogs of different weights. Each strength comes in convenient cartons of 6 and 12 chewables.

Marketed by  
Boehringer Ingelheim Animal Health USA Inc.  
Duluth, GA 30096

Made in U.S.A.

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Rev. 08-2018

1050-1999-04.

