**MODULE 3: PARASITES**

**Lesson 1: Intestinal Parasites**

[Note to Trainer: Using accessory materials with pictures in this module may be useful for reviewing important facts about parasites; however, the main goal of this section is to train team members to be able to clearly answer common questions about parasites. The importance of zoonotic disease can be highlighted. Appropriate resources may include the Companion Animal Parasite Council (CAPC) and Guidelines for Veterinarians: Prevention of Zoonotic Transmission of Ascarids and Hookworms in Dogs and Cats developed by the Division of Parasitic Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, in cooperation with the American Association of Veterinary Parasitologists (AAVP).]

1) Name five intestinal parasites. What do they look like and what are some clinical signs associated with these parasites?

**Answer:**

2) What percentage of puppies is born with intestinal parasites?

**Answer: Eighty percent to 100% of puppies are born with *Toxocara canis* (roundworm) infections. Many are coinfected with other intestinal parasites (Little 2004).**

3) How do puppies and kittens become infected with roundworms?

**Answer: Puppies and kittens can be infected through the placenta and via the milk during pregnancy and nursing, respectively. They can also become infected with roundworms by ingesting roundworm eggs excreted in their mother’s feces after birth (Kazacos 2004).**

4) How do adult dogs and cats become infected with intestinal parasites?

**Answer: Intestinal parasites can be transmitted by the fecal-oral route, through the skin (hookworms), water (Giardia, coccidia), intermediate or paratenic hosts, and vectors (e.g., tapeworm infections caused by ingesting fleas). Approximately one-third of dogs admitted to animal shelters are diagnosed with one or more intestinal parasites (Blagburn et al. 1996).**

5) Which intestinal parasites are zoonotic? What diseases can they cause?

[Note to Trainer: In 1985, researchers analyzed serum collected from children with gastrointestinal illnesses between 1971 and 1973 showed that 50% of the children were infected with *Toxocara* spp. Up to 30% of children one to eleven years of age were infected. It is currently estimated that one to three million people, mostly children, are infected with *Toxocara* spp. annually (Hermann et al. 1985).]

**Answer: Examples of zoonotic parasites are roundworms (visceral larval migrans), hookworms (cutaneous larval migrans), Giardia (gastrointestinal disease), and toxoplasmosis (fetal damage during pregnancy).**

6) Will a stool sample always test positive if a pet is infected with one or more internal parasites?

[Note to Trainer: It is important for the trainees to know that just because a fecal test is negative it does not mean the pet is free of intestinal parasites. Schantz et al. (1994) reported that 80% of puppies studied were infected with *Toxocara* *canis* but only 20% were diagnosed based on the results of a fecal examination. Further, it takes an average of three fecal tests to diagnose a whipworm infection because whipworms only shed eggs intermittently. AAHA recommends recording negative fecal test results as “NOS” (no ova seen) or “NPS” (no parasites seen) to avoid making the claim to owners that the tested pet is free from parasites. Remember that we are calling a single stool sample negative, not the pet itself.]

**Answer: No!**

7) What ingredient in heartworm preventative medication is used to prevent the development of intestinal parasites?

**Answer: Pyrantel is included in some heartworm preventative medications to prevent the development of roundworm and hookworm infections.**

8) What additional parasite protection does milbemycin provide?

**Answer: Whipworm infections**

9) Name five different deworming products and which parasites they kill. What are the dosing schedules for these products?

[Note to Trainer: Deworming products are changing and every hospital stocks and recommends certain products. What are your hospital’s preferred drugs and deworming protocols? Do you use dosing charts or product labels to determine how much to administer?]

**Answer:**

10) In addition to intestinal parasite control, what do you need to think about when an animal is diagnosed with a tapeworm infection?

**Answer: Flea control**

11) If one cat in the household has roundworms should all the cats be dewormed? Is the answer the same if the cat is diagnosed with a tapeworm infection?

[Note to Trainer: What is your protocol for multi-cat households, especially if you can only obtain a “**composite**” fecal sample?]

**Answer:**

12) What should the owner do to prevent recurrence of internal parasites?

[Note to Trainer: This question is designed to make trainees aware of simple advice to give to clients.]

**Answer: Deworm as directed, clean up stools in the yard/litter box, and limit access to contaminated areas.**

13) How often should an outdoor cat be dewormed and what products are recommended?

**Answer:**

14) When should a stool sample be rechecked after deworming?

[Note to Trainer: Does your CCR enter a note into the computer to call back these clients to remind them to recheck the stool samples?]

*Sample Response: For roundworm and hookworm infections, stool samples should be rechecked approximately one month after administering the last dose of dewormer. For Giardia, a fecal centrifugation should be performed two or more weeks after the last dose of dewormer is administered. For coccidia, recheck the stool sample before finishing the prescription (approximately day ten of treatment). For whipworm infections, three doses of dewormer are administered at zero, three, and 12 weeks. A stool test should be checked after the second dewormer and again after the third.*

15) How often should stool samples be checked in adult cats and dogs?

[Note to Trainer: Does it depend on the lifestyle or exposure of the pet?]

**Answer:**

16) What should the CCR always ask a client to bring with them for the first puppy or kitten visit, for an annual vaccine visit, or for an annual heartworm visit?

*Sample Response: A stool sample*

17) How do you ask the client for this sample?

[Note to Trainer: Does the average client know the words fecal, feces, or stools? What, exactly, do you want them to say?]

**Answer:**

18) Is it acceptable to have kitty litter or other foreign materials included with the sample? Does the sample have to be fresh?

[Note to Trainer: What instructions would you like the CCR to give to clients when requesting stool samples?]

**Answer: The sample should be as fresh as possible. Owners do not need to concern themselves with kitty litter or other materials. They generally do not interfere with the test.**

19) How long will it take to have the results from a stool sample?

[Note to Trainer: Are the fecal samples analyzed in batches once daily or sent out to the laboratory? If the pet is ill, being examined because the owner suspects internal parasites, or the patient is a new puppy or kitten, is the fecal sample analyzed while the client waits? If so, how long does this take, generally?]

**Answer:**

20) What is the difference between fecal **flotation** and fecal **centrifugation**?

[Note to Trainer: Centrifugation is part of a high quality of care. Many hospitals elect to outsource the stool testing rather than performing fecal flotations in-house because centrifugation is messier and requires a special centrifuge. What testing method does your hospital use? You may wish to refer to the article by Blagburn (2008), “Why fecal centrifugation is better.” (See References.)]

**Answer:**

21) Who notifies the client with the results of the fecal analysis? Does a team member call all clients or only those with positive results requiring medication?

**Answer:**

22) How and where are the results of fecal examinations recorded?

**Answer:**

23) If the owner saw worms but the fecal test is negative, how is this recorded?

**Answer:**

24) Are tapeworms or Giardia commonly identified by fecal flotation?

**Answer: No**

25) Who prepares the deworming medications for the client when a sample tests positive?

**Answer:**

26) How and when does our practice test for Giardia?

*Sample Response: Giardia SNAP testing along with fecal centrifugation and a fecal direct is recommended because none of these tests is 100% accurate. Many parasitologists recommend only testing animals with clinical disease, because after infection the Giardia can become part of the gastrointestinal tract and it only needs to be eradicated in homes with immunocompormised humans. Diagnosing Giardia is important, in part because it’s a zoonotic disease. All puppies and kittens should be tested, but your hospital will need to decide what test methodology you will use and whether to test all adult pets or only those with clinical signs of infection.*

27) How is Giardiatreated?

[Note to Trainer: Does your practice only treat animals with a positive diagnosis or are some animals treated if they have clinical signs of disease regardless of the test results?]

**Answer:**

28) How and when is a patient retested after treatment for Giardia?

*Sample Response: A fecal centrifugation test may be repeated at least two weeks after finishing the medication.*

29) What are the current Centers for Disease Control and Prevention (CDCP) recommendations for deworming pets?

[Note to Trainer: Visit the Companion Animal Parasite Council’s (CAPC) website for current recommendations.]

**Answer:**

30) Does our practice follow those recommendations?

**Answer:**

31) If a particular patient is at a higher risk of becoming infected with intestinal parasites, are their stool samples examined more often?

[Note to Trainer: Are dogs who hunt, dogs that visit dog parks, dogs in agility or training classes, or farm dogs tested more than once a year? Does your practice use a parasite pamphlet or handout for client education?]

**Answer:**

32) What types of people are more at-risk for becoming infected with zoonotic parasites?

[Note to Trainer: Do you have a way of noting in the patient record if a client is at higher risk or there are small children in the family?]

**Answer: A person’s age and health status can affect how likely it is that she or he can become infected with a zoonotic disease. At-risk groups include infants and children less than five years old, the elderly, pregnant women, and immunocompromised individuals (e.g., people undergoing chemotherapy, taking immunosuppressant drugs for organ transplants, people with HIV/AIDS).**

33) To prevent illness due to animal contact, what does the Centers for Disease Control and Prevention (CDCP) recommend?

[Note to Trainer: Visit cdc.gov/healthypets.com to print out their brochure, “What Every Pet Owner Should Know about Roundworms & Hookworms.” See also www.capcvet.org, the Companion Animal Parasite Council website.]

**Answer: The CDCP recommends, “Always wash your hands thoroughly with soap and running water after contact with animals and their feces. Wear gloves to clean soiled litter boxes. If you are pregnant it is best not to clean them at all. Keep sandboxes covered to prevent them being used as litter boxes by stray cats. Deworm puppies and kittens according to CDCP recommendations. Keep puppies and dogs on year round heartworm preventatives, which help prevent roundworm and hookworm transmission to people. Have puppies, kittens, and new pets to the household tested for Giardia. Keep your pets, even indoor ones, vaccinated for Rabies. Have pets with diarrhea diagnosed and treated promptly.”**

34) What is our hospital’s hand washing protocol at the fecal station?

[Note to Trainer: Are gloves available to wear when setting the samples up? Are fecal containers washed and reused?]

*Sample Response: The Centers for Disease Control and Prevention states that the recommended hand-washing technique involves wetting hands in warm water, lathering hands with soap or detergent, vigorously rubbing together all surfaces of hands for at least thirty seconds, and rinsing thoroughly. You should then use the paper towel to turn off the faucet and open the door.*

**MODULE 3: PARASITES**

**Lesson 2: Heartworm**

[Note to Trainer: Using additional resources such as a DVD about heartworms, a heartworm heart model, or preserved specimens may be useful for this section.]

1) What are heartworms?

**Answer: *Dirofilaria immitus* is the common heartworm species infecting dogs. Left untreated, it is routinely fatal yet almost 100% preventable. Adult heartworms live in the heart and adjacent blood vessels where they cause significant damage to the heart and lungs.**

2) How are heartworms spread?

[Note to Trainer: Review the life cycle with your trainees.]

**Answer:**

3) What species can become infected with *Dirofilaria immitus*?

**Answer: Dogs and other canids (e.g., cats, sea lions, ferrets). Wolves, coyotes, foxes, and other animals can serve as a reservoir to infect household pets (Morgan 1997).**

4) How do we test for heartworms?

[Note to Trainer: Do you do the testing in house or send the blood out? If performed in-house, who does the testing?]

**Answer:**

5) What kind of blood tube is used to collect the sample for heartworm testing?

**Answer:**

6) Does the heartworm test also test for other diseases?

**Answer:**

7) If the blood samples are sent to an external laboratory, how long does it take to get heartworm test results back?

[Note to Trainer: If testing is performed in-house, is each test done right away or are the samples stored in the fridge and analyzed once or twice daily?]

**Answer:**

8) Are all owners notified with the results or only those with a positive result? Who contacts the owners?

**Answer:**

9) What is the length of the heartworm season where our practice is located? What month do owners begin and finish administering heartworm preventative medications?

**Answer:**

10) What heartworm preventative medications does our practice carry? If more than one product is available, what are the advantages of each product?

**Answer:**

11) What are some medications that our practice does not carry? Why are these products not used?

[Note to Trainer: How should team members explain to clients who transfer their records to your hospital why you use a different product than their former veterinary hospital?]

**Answer:**

12) What breed of dog is susceptible to drug reactions caused by ivermectin?

[Note to Trainer: Not every collie will have an adverse reaction, but some will. Genetic testing for ivermectin sensitivity is offered by Washington State University’s Veterinary Clinical Pharmacology Laboratory.]

**Answer: Collies and related breeds**

13) How do heartworm preventative medications work?

[Note to Trainer: The goal of this question is for your team to be able to explain to a client when to administer the preventative medication (i.e., at least one month after a hard freeze or year-round in southern climates).]

**Answer: Most kill any parasites that have accumulated over the previous month. With the exception of selamectin, they do not stay in the body for a month; they work backwards by killing the previous month’s worth of larval parasites. They only affect certain larval stages, and if monthly doses are given too far apart some of the worms will have grown past the stage where the preventative will kill them. Giving the medication faithfully and on time every month is important.**

14) How would we answer the following client question? “We live in the Northern part of the United States (in Detroit). Our puppy was born in November of last year. Does he need a heartworm test this April?”

*Sample Response: Puppies under six months of age are not generally tested because it takes at least six months after being bitten by an infected mosquito for the test to be positive.*

15) Are cats at-risk for heartworm disease?

**Answer: Yes, though they are at less risk than dogs**

16) Are indoor cats at risk for heartworm disease?

[Note to Trainer: About one-third of infected cats live indoors.]

**Answer: Yes**

17) Do cats require annual blood testing for heartworm?

[Note to Trainer: Heartworm testing is not as accurate in cats as it is in dogs. Many clinics in the northern United States do not regularly test cats, but many southern practices do. What is your hospital’s protocol?]

**Answer:**

18) What are the clinical signs of heartworm disease in dogs?

**Answer:**

19) What are the clinical signs of heartworm disease in cats? How are these different than in dogs?

**Answer: Heartworm disease can cause sudden death in cats, as well as a syndrome called HARD—heartworm associated respiratory disease. Cats have fewer cardiac signs than dogs, but more coughing, dyspnea, and vomiting. HARD should be a rule-out that is considered for cats with chronic vomiting or coughing.**

20) How long does a heartworm live inside an untreated pet?

**Answer: According to the American Heartworm Society, cats typically have fewer and smaller worms than dogs and the life span of worms is shorter, approximately two to three years, compared to five to seven years in dogs. In experimental infections of heartworm** [**larvae**](http://www.heartwormsociety.org/article.asp?id=27#larvae) **in cats, the percentage of worms developing into the adult stage is low (0% to 25%) compared to dogs (40% to 90%).**

21) How are dogs treated for heartworm?

[Note to Trainer: With the recent discovery of *Wolbachia sp.* and their importance in the pathology of heartworm disease, treatment recommendations are changing to include use of doxycycline. What is your current protocol?]

**Answer:**

22) If a client misses a dose of heartworm preventative, what should they do?

*Sample Response: The client should give the preventative as soon as they remember and then resume their once a month schedule.*

23) How many clients forget to administer the heartworm medication to their pets?

[Note to Trainer: About two-thirds of pet owners forget to give at least one dose per season. A little over 50% of oral heartworm preventatives sold are administered as directed. When the pet owner does forget a dose, the average time before the medication is remembered and subsequently administered is 30 days. Thirty-three percent of pet owners miss several doses of preventative per season and about 20% owners forget the preventative so frequently that they stop administering the product mid-season (statistics from Fort Dodge and Merial, data on file).]

**Answer:**

24) What heartworm preventative product do we recommend for puppies?

**Answer:**

25) What heartworm preventative product do we recommend for kittens?

**Answer:**

26) What heartworm preventative product do we recommend for ferrets?

**Answer:**

27) How does our practice remind clients to bring their pet in for heartworm testing?

**Answer:**

28) What does our practice do for clients that do not purchase enough heartworm preventative medication to last the entire season?

[Note to Trainer: Does a team member send a reminder by mail or e-mail? Does someone phone the client?]

**Answer:**

**MODULE 3: PARASITES**

**Lesson 3: Fleas**

1) What do fleas look like?

**Answer:**

2) Describe the life cycle of the flea.

**Answer:**

3) Which flea preventative medications does our hospital stock and recommend?

[Note to Trainer: The doctors in the practice generally decide which products to carry but it is everyone’s responsibility to know which products are recommended and why veterinary approved products are recommended instead of the over-the-counter products. Flea products generate a significant amount of income for most practices so it is important for every team member to be knowledgeable about these products. For example, Sentinel™ contains a growth inhibitor but does not kill adult fleas. In contrast, Frontline™ kills both the adults and larvae.]

**Answer:**

4) How are topical flea products applied?

**Answer:**

5) How long do topical products last?

**Answer:**

6) How much do topical products cost?

[Note to Trainer: Is a price list available for team members to make looking prices up quicker and easier? The goal of this question is to give new team members a rough idea of what a good quality product costs.]

**Answer:**

7) Why are over-the-counter flea collars not recommended?

*Sample Response: Flea collars have been linked to squamous cell carcinoma (mouth cancer) in cats. In addition, flea collars are not very effective, especially when the owner forgets to put a new one on every few months. Older pyrethrin chemicals used in flea collars (which are toxic to cats) since the 1970s are much less effective than newer, safer drugs currently available*

8) When (if ever) would we recommend using a flea spray? What products does our practice recommend and why?

**Answer:**

9) How soon after applying a topical flea medication can a client bathe his or her dog?

**Answer:**

10) If the client just gave the dog a bath, how long should she or he wait before applying a topical flea preventative?

**Answer:**

11) When (if ever) is a flea dip or flea bath recommended?

**Answer:**

12) What products does our practice recommend if the animal already has fleas?

**Answer:**

13) Which flea products are safe for puppies, kittens, or nursing mothers?

**Answer:**

14) What intestinal parasite do fleas cause?

[Note to Trainer: New team members may not remember to talk about flea control when an animal is diagnosed with tapeworm infections (or vice versa).]

**Answer: Tapeworm infection**

15) What are potential problems or concerns associated with clients purchasing flea or heartworm preventative over the Internet or from a catalog?

**Answer:**

16) What flea products does our practice recommend for pets with flea allergy dermatitis?

**Answer:**

17) How does parasite control differ in various geographic regions of the country?

[Note to Trainer: If a client is traveling or moving to an area of the country with different parasites or warmer winters, what do you recommend?]

**Answer:**

18) Does our practice have client handouts or brochures regarding flea control?

**Answer:**

19) Which team member discusses treatment of the home when a pet is diagnosed with fleas?

**Answer:**

20) If a client has fleas in their house, what do they need to know about vacuuming?

**Answer: It used to be thought that in order to prevent fleas from hatching inside the vacuum cleaner, the client needed to throw away the sweeper bag. A recent study showed that vacuuming kills 96% of adult and 100% of larval fleas and is a relatively effective method of flea control.**

21) Should a client vacuum the house before or after fogging?

[Note to Trainer: Do your trainees know what fogging is?]

**Answer: Before fogging. Limit vacuuming afterwards so the insecticide is not removed. It needs to remain in the environment to kill new fleas when they hatch from the eggs.**

22) How many foggers will a client need? Why?

[Note to Trainer: Draw a picture of spray going up and falling down; discuss the protocol for home treatment as you would present it to the client. Should team members ask the client to draw a floor plan of their house so you can sell them the correct number of foggers?]

**Answer: One fogger per room is recommended. Foggers do not distribute insecticide around corners or under furniture.**

23) Is an area spray still required in conjunction with fogging?

**Answer: Yes. The area spray is required for under the furniture, in the closets, hallways, and bathrooms. The spray should be applied before setting off foggers and vacating the home.**

24) Do the clients need to treat the yard as well as the inside of the home?

**Answer:**

25) When does our practice recommend flea preventatives for cats?

[Note to Trainer: Outdoor or indoor-outdoor cats only? All cats? Homes with both dogs and cats?]

**Answer:**

**MODULE 3: PARASITES**

**Lesson 4: Ticks**

1) Describe the life cycle of a tick.

[Note to Trainer: Does your practice have brochures or pamphlets on tick prevention? Do you have any tick specimens to show your trainees? What times of year are ticks a problem in your area?]

**Answer:**

2) What do ticks look like?

[Note to Trainer: Clients often mistake a tick for a skin tumor. Make sure your new team members know a tick when they see one and can advise clients about what to do if they find one on their pet or even themselves.]

**Answer:**

3) What ticks do we see in our area?

[Note to Trainer: At least two major tick species have expanded their ranges and even their density within those ranges over the last 15 to 20 years. This is mainly thought to be due to an increase in the deer population over the past 100 years. Many practices are seeing more ticks and also more species of ticks in their areas.]

**Answer:**

4) How are ticks removed once they have begun feeding on the pet?

*Sample Response: Grasp the tick as close to the dog’s skin as possible and pull firmly and steadily until the tick comes out. Caution should be employed to avoid detaching the body from the head and leaving the head embedded in the dog’s skin. If possible, it may be useful to spray some insecticide on the tick first.*

5) What are a dog’s body are ticks most commonly found?

**Answer: The head or legs**

6) What tick preventative products does our hospital stock and recommend? When in the course of a client visit are these products recommended and under what circumstances?

**Answer:**

7) How are deer ticks different from other ticks?

**Answer: Deer ticks are very small, making them difficult to detect.**

8) What diseases do ticks carry?

**Answer: Ticks carry *Anaplasma*, *Bartonella*, and *Ehrlichia,* hepatozoonosis, Lyme disease (caused by *Borellia burgdorferi*) and Rocky Mountain Spotted Fever (RMSF) (caused by *Ricketsia rickettsii)*.**

9) How is a pet tested for tick-borne diseases?

*Sample Response: Tests include the Idexx SNAP 4X, titer tests, and* ***PCR testing****.*

10) What other problems do tick bites cause?

**Answer: Tick bites may cause local infection at the site of the bite and, with a heavy infestation, anemia.**

11) How do ticks get onto their host?

**Answer: Some ticks jump onto a host from the grass as the animal walks by while others drop down from trees.**

12) How can clients protect themselves from ticks?

**Answer: Owners may wish to wear long sleeved shirts, tuck their pants into socks and wear light colored clothing. If the pet has ticks, the owner is likely at-risk also.**

13) Are cats in our geographical area at-risk for tick bites?

**Answer:**

14) What areas of the United States have the most Lyme disease?

**Answer: The northeast, the upper Midwest, and the west coast have the most Lyme disease.**

15) What areas of the United States have the most RMSF?

**Answer: The southeast (not in the Rocky Mountains) has the most cases.**

16) What areas of the United States have the most *Ehrlichia*?

[Note to Trainer: There are several different species found in various locations throughout the country.]

**Answer:**

17) What tick-borne diseases does our practice most commonly see?

**Answer:**

18) Is it recommended to treat animals that test positive for tick-borne diseases even if the dog is asymptomatic?

**Answer:**

**MODULE 3: PARASITES**

**Lesson 5: Other Parasites**

[Note to Trainer: Suggested reference for this lesson is *A Color Handbook of Skin Diseases of the Dog and Cat* (McKeever and Harvey 1998).]

1) What do **lice** look like?

**Answer:**

2) How are lice diagnosed and treated?

**Answer:**

3) If a child in the family has head lice could it have come from their cat or dog?

**Answer: No, lice are species-specific.**

4) What is **sarcoptic mange**?

[Note to Trainer: The trainees will remember this better if they draw pictures of the mites instead of simply writing the names of the mites.]

**Answer:**

5) What are the clinical signs of *Sarcoptes scabei*?

**Answer:**

6) How is sarcoptic mange diagnosed and treated?

[Note to Trainer: Only about 20% of cases can be diagnosed on skin scrapes and it may take multiple scrapings to finally find a mite. Do your doctors typically attempt skin scrapings or are they more likely to treat the animal?]

**Answer:**

7) What is **demodectic mange**?

**Answer:**

8) What are the clinical signs of demodectic mange?

**Answer:**

9) How is demodectic mange diagnosed and treated?

10) Which of the above three parasites are contagious to humans (zoonotic)?

**Answer: Sarcoptic mange is zoonotic. People in contact with a dogs infected with *Sarcoptes scabei* may develop a pruritic, papular rash on the arms, chest, or abdomen. Human lesions are usually transient and resolve spontaneously once the dog is treated.**

11) What do ear mites look like?

**Answer:**

12) What are the clinical signs of ear mites?

**Answer: Scratching and headshaking**

13) How are ear mites diagnosed?

**Answer:**

14) Are ear mites contagious to other pets? Humans?

**Answer: No**

15) What pets are most commonly infected with ear mites?

**Answer: Puppies and kittens**

16) How are ear mites treated?

**Answer:**

17) Do mosquitoes bother dogs and cats? What are other problems associated with mosquitoes?

[Note to Trainer: While some flea products are labeled as mosquito repellants, this effect generally only lasts a few hours. What products does your practice recommend? Is DEET recommended? ]

**Answer: Cats can develop severe facial skin lesions from mosquito bite allergies and outdoor dogs may be very bothered by their biting. Heartworm and West Nile virus can also be transmitted by biting mosquitoes.**

18) What is **fly strike**?

[Note to Trainer: Does your practice stock and recommend fly repellants?]

**Answer:**

19) What are **maggots**?

**Answer:**

20) How are maggots treated?

**Answer:**

21) What are **bots**?

**Answer:**

22) How are bots treated?

**Answer:**

23) What is **cheyletiellosis**?

**Answer:**

24) What clinical signs do *Cheyletiella* cause?

**Answer:**

25) How is cheyletiellosis diagnosed and treated?

**Answer:**

26) What are nasal mites? Are nasal mites a commonly diagnosed condition in your practice?

[Note to Trainer: Practices in the southeastern United States probably see these more often than northern practices.]

**Answer:**

**Module 3 Suggested Reading**

American Animal Hospital Association. 2007. *Laboratory Standards. AAHA Standards*. Lakewood, CO: AAHA.

American Animal Hospital Association. 2007. *Patient Care Standards.* *AAHA Standards*. Lakewood, CO: AAHA

Know Heartworms.

http://www.knowheartworms.org/forvets.asp