



The Hazards of Puppies & Kittens with Diarrhea

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The Case

Check-In

Princess, a 12-week-old golden retriever puppy, was administered her first series of vaccines at a local veterinary practice approximately 4 weeks ago. She was scheduled to receive the next series in 2 days, but her owner, Mrs. Smith, called the practice and rescheduled the appointment for today.

Mrs. Smith and Princess arrive at the practice. Princess receives a lot of attention, including petting and hugging, from several team members and other clients. Most team members and clients do not wash their hands or use hand sanitizer after handling her in the reception area.

Without warning, Princess has explosive, bloody diarrhea across one of the reception area benches and the floor. Mrs. Smith then mentions that Princess has not quite been herself for the past few days and has had diarrhea “a couple of times.”

Disposal of Contaminated Items

- **Disposable items** and those that cannot be effectively disinfected should be placed directly in the garbage, double-bagged, and removed from the examination room.
- **Reusable items** should be cleaned in the examination room and disinfected before being removed.
- **Laundry** should be handled as contaminated:
 - Remove gross contamination.
 - Take bagged laundry directly to the washer.
 - Wash in hot water with added bleach.
 - Dry with hot air.

What Next?

Every team member has different roles and responsibilities. Here is what each team member should and should not do to help control the spread of infection when handling such a case.

Client Service Representatives, Veterinary Nurses & Nursing Assistants

- **DO:** Immediately move Princess to an examination or isolation room, if possible. Containing any potential pathogens is top priority. Use a blanket or disposable puppy pad to pick Princess up and carry her to the room.
- **DO NOT:** Encourage Mrs. Smith to take Princess outdoors to finish defecating. At this point, the cause of the diarrhea is unknown, and if an infectious agent is involved, the areas commonly used by other dogs will be contaminated, increasing the risk for transmission.

Veterinarians, Veterinary Nurses & Nursing Assistants

- **DO:** Minimize movement in and out of the examination room. Ask a “clean” team member to stay outside the room and retrieve needed supplies.
- **DO:** Ask a “clean” team member to escort the clients out of the practice once all the paperwork and permission forms are complete. Clients should not be taken to the reception/waiting area because their clothing and hands are possibly contaminated.
- **DO:** Perform any procedures (eg, sample collection, catheter placement) in Princess’ examination room. When all procedures are complete, wrap Princess in a clean blanket or puppy pad. Leave all contaminated materials in the “dirty” room to deal with later. (See **Disposal of Contaminated Items**.)
- **DO:** Carry the puppy directly to an isolation kennel or a kennel that is separated as much as

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possible from other animals and high-traffic areas. An isolation kennel is ideal but requires more effort to monitor because it should be physically separated from other parts of the practice. In both cases, follow procedural isolation techniques, which require excellent communication between team members (eg, signs to ensure only designated team members handle Princess) and compliance with practice protocols.

- **DO NOT:** Repeatedly enter and exit the room to retrieve treatment and diagnostic testing supplies while wearing potentially contaminated clothing and without handwashing.
- **DO NOT:** Carry Princess to the main treatment room to perform diagnostic testing and then to an easily accessible kennel for monitoring. Moving Princess and any potentially contaminated materials through the practice can spread infectious pathogens into a high-traffic area.

TABLE
1 | Potential Control Points & Actions for this Case

Control Point	Action
Scheduling the appointment	<ul style="list-style-type: none"> • When confirming an appointment, particularly for high-risk animals (eg, puppies, kittens), ask the client about any additional concerns (eg, recent diarrhea episodes, coughing, sneezing).
Arrival at the practice	<ul style="list-style-type: none"> • Knowing Princess has diarrhea, the appropriate team member takes the client and the patient directly to an examination or isolation room. • If the patient has diarrhea in the practice, as Princess did, clean and disinfect the affected areas using the 2-step process outlined on page 30. • Have hand sanitizer in the reception area, and make sure clients are aware it is available for their use and protection.
Patient examination	<ul style="list-style-type: none"> • Team members must wear appropriate attire (eg, gown or laboratory coat, gloves) that can be changed and laundered. • Team members must also exercise proper hand hygiene (ie, hand sanitizer, soap and water hand-washing) immediately after handling any animal.
Movement through the practice	<ul style="list-style-type: none"> • Minimize movement to prevent direct contact with other patients and limit environmental contamination.
After client and patient departure	<ul style="list-style-type: none"> • Immediately clean and disinfect potentially contaminated reusable items (eg, stethoscopes) and dispose of potentially contaminated consumable items. • Clean and disinfect contaminated surfaces (eg, examination tables, floors, reception-area benches or chairs).

*Client Service Representatives,
Veterinary Nurses & Nursing Assistants*

- **DO:** Follow a 2-step process to clean and disinfect the soiled areas. Commonly used disinfectants (eg, quaternary ammonium compounds, bleach) have decreased activity in organic material such as diarrhea, so contaminated surfaces must be cleaned thoroughly before disinfection. Once the area is visibly contamination-free, apply enough disinfectant to keep the surface wet for the time recommended on the product label—usually 10 to 15 minutes—and then wipe dry. If disinfection is performed properly, the affected area should be ready for use as soon as the surface is dry.^{1,2}
- **DO:** Perform a second round of careful disinfection, if concerns remain. This will be more effective than simply closing the soiled area for a period of time. Most practices have a disinfectant for routine daily use, but an enhanced protocol that uses another product (eg, bleach) that is effective against a wider range of pathogens (eg, nonenveloped viruses [parvovirus]) should also be in place. Use a 1:25 to 1:50 solution of household bleach (4% to 5.25%).² Absorbent fabric items (eg, reception-area bench cushions) often cannot be effectively cleaned and disinfected and may need to be replaced.
- **DO NOT:** Spray or pour disinfectant on the diarrhea, let the diarrhea sit for 5 minutes, wipe or mop it up, spray again, wipe up residual contamination, and close the area to team members, clients, and patients for 24 to 48 hours. This is not an effective means of cleaning and disinfecting the area.

All Team Members

- **DO:** Wear an additional layer of clothing (eg, laboratory coat, smock) that can be removed easily,

or change into clean scrubs and place contaminated clothing directly in the laundry.

- **DO:** Perform good hand hygiene, which in these scenarios is essential but should also be part of the practice's daily infection-control procedures. Hand sanitizer is quick and easy to use and can be effective, but certain viruses (eg, parvovirus) are resistant to alcohol, so wash hands with soap and water whenever possible.
- **DO NOT:** Overlook the importance of hand hygiene and changing contaminated clothing. Hands and clothing can easily transmit pathogens to patients, clients, food, and beverages.

Examination

The veterinarian determines Princess is mildly dehydrated and admits her for fluid therapy and diagnostic testing, including blood work and fecal analysis. The veterinary nurse collects samples and places the IV catheter in the examination room before taking Princess directly to the isolation kennel for IV fluid therapy.

Discharge

At the end of the day, Princess is bright and responsive. Fecal test results are pending, but blood test results show only mild abnormalities, so the veterinarian decides to send Princess home.

Before discharge, team members discuss at-home infection-control precautions with the client. Precautions include isolating Princess from other dogs and high-risk individuals (eg, young children, the elderly, immunocompromised persons), properly cleaning and disinfecting areas in the home contaminated by feces, and practicing good hand hygiene.

Everyone loves puppies and kittens ... however, they can be fuzzy little biohazards.

Discussion

Noninfectious “events” and infectious organisms can cause diarrhea in puppies and kittens. Noninfectious causes (eg, dietary changes or indiscretion, stress, toxin ingestion) are not transmissible. Infectious diarrhea is caused by nonzoonotic organisms (eg, parvovirus, distemper, coronavirus), zoonotic pathogens (eg, bacteria [primarily *Salmonella* spp]), some parasites (eg, *Ancylostoma* spp). In fact, in one study, more than 77% of both diarrheic and nondiarrheic puppies were found to be shedding one or more enteropathogens.³

Veterinary practices should have an infection-control protocol in place to ensure all team members are familiar with the actions required when animals present with diarrhea. (See **Table 1**, page 29.)

Conclusion

Everyone loves puppies and kittens, and most clients enjoy other people taking delight in their pets. In the end, however, puppies and kittens can be fuzzy little biohazards. ■

References

1. Canadian Committee on Antibiotic Resistance. Infection prevention and control best practices for small animal veterinary clinics. <https://www.wormsandgermsblog.com/files/2008/04/CCAR-Guidelines-Final2.pdf>. Published August 2008. Accessed January 2018.
2. Traverse M, Aceto H. Environmental cleaning and disinfection. *Vet Clin North Am Small Anim Pract*. 2015;45(2):299-330.
3. Duijvestijn M, Mughini-Gras L, Schuurman N, Schijf W, Wagenaar JA, Egberink H. Enteropathogen infections in canine puppies: (co-)occurrence, clinical relevance, and risk factors. *Vet Microbiol*. 2016;195:115-122.



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FUN FACT: In her off time, Maureen has been a long-time member of 2 local community choirs.

Interceptor™ Plus (milbemycin oxime/praziquantel)

Caution

Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

Before using INTERCEPTOR PLUS, please consult the product insert, a summary of which follows:

Indications

INTERCEPTOR PLUS is indicated for the prevention of heartworm disease caused by *Dirofilaria immitis*, and for the treatment and control of adult roundworm (*Toxocara canis*, *Toxascaris leonina*), adult hookworm (*Ancylostoma caninum*), adult whipworm (*Trichuris vulpis*), and adult tapeworm (*Taenia pisiformis*, *Echinococcus multilocularis*, *Echinococcus granulosus*, and *Dipylidium caninum*) infections in dogs and puppies two pounds of body weight or greater and six weeks of age and older.

Dosage and Administration

INTERCEPTOR PLUS should be administered orally, once every month, at the minimum dosage of 0.23 mg/lb (0.5 mg/kg) milbemycin oxime, and 2.28 mg/lb (5 mg/kg) praziquantel. For heartworm prevention, give once monthly for at least 6 months after exposure to mosquitoes (see **EFFECTIVENESS**).

See product insert for complete dosing and administration information.

Contraindications

There are no known contraindications to the use of INTERCEPTOR PLUS.

Warnings

Not for use in humans. Keep this and all drugs out of the reach of children.

Precautions

Treatment with fewer than 6 monthly doses after the last exposure to mosquitoes may not provide complete heartworm prevention (see **EFFECTIVENESS**).

Prior to administration of INTERCEPTOR PLUS, dogs should be tested for existing heartworm infections. At the discretion of the veterinarian, infected dogs should be treated to remove adult heartworms. INTERCEPTOR PLUS is not effective against adult *D. immitis*.

Mild, transient hypersensitivity reactions, such as labored breathing, vomiting, hypersalivation, and lethargy, have been noted in some dogs treated with milbemycin oxime carrying a high number of circulating microfilariae. These reactions are presumably caused by release of protein from dead or dying microfilariae.

Do not use in puppies less than six weeks of age.

Do not use in dogs or puppies less than two pounds of body weight.

The safety of INTERCEPTOR PLUS has not been evaluated in dogs used for breeding or in lactating females. Studies have been performed with milbemycin oxime alone (see **ANIMAL SAFETY**).

Adverse Reactions

The following adverse reactions have been reported in dogs after administration of milbemycin oxime or praziquantel: vomiting, diarrhea, depression/lethargy, ataxia, anorexia, convulsions, weakness, and salivation.

To report suspected adverse drug events, contact Elanco US Inc. at 1-888-545-5973 or the FDA at 1-888-FDA-VETS.

For technical assistance call Elanco US Inc. at 1-888-545-5973.

Information for Owner or Person Treating Animal:

Echinococcus multilocularis and *Echinococcus granulosus* are tapeworms found in wild canids and domestic dogs. *E. multilocularis* and *E. granulosus* can infect humans and cause serious disease (alveolar hydatid disease and hydatid disease, respectively). Owners of dogs living in areas where *E. multilocularis* or *E. granulosus* are endemic should be instructed on how to minimize their risk of exposure to these parasites, as well as their dog's risk of exposure. Although INTERCEPTOR PLUS was 100% effective in laboratory studies in dogs against *E. multilocularis* and *E. granulosus*, no studies have been conducted to show that the use of this product will decrease the incidence of alveolar hydatid disease or hydatid disease in humans. Because the prepatent period for *E. multilocularis* may be as short as 26 days, dogs treated at the labeled monthly intervals may become reinfected and shed eggs between treatments.

Effectiveness

Heartworm Prevention:

In a well-controlled laboratory study, INTERCEPTOR PLUS was 100% effective against induced heartworm infections when administered once monthly for 6 consecutive months. In well-controlled laboratory studies, neither one dose nor two consecutive doses of INTERCEPTOR PLUS provided 100% effectiveness against induced heartworm infections.

Intestinal Nematodes and Cestodes Treatment and Control:

Elimination of the adult stage of hookworm (*Ancylostoma caninum*), roundworm (*Toxocara canis*, *Toxascaris leonina*), whipworm (*Trichuris vulpis*) and tapeworm (*Echinococcus multilocularis*, *Echinococcus granulosus*, *Taenia pisiformis* and *Dipylidium caninum*) infections in dogs was demonstrated in well-controlled laboratory studies.

Palatability

In a field study of 115 dogs offered INTERCEPTOR PLUS, 108 dogs (94.0%) accepted the product when offered from the hand as if a treat, 1 dog (0.9%) accepted it from the bowl with food, 2 dogs (1.7%) accepted it when it was placed in the dog's mouth, and 4 dogs (3.5%) refused it.

Storage Information

Store at room temperature, between 59° and 77°F (15-25°C).

How Supplied

INTERCEPTOR PLUS is available in four strengths, formulated according to the weight of the dog. Each strength is available in color-coded packages of six chewable tablets each. The tablets containing 2.3 mg milbemycin oxime/22.8 mg praziquantel or 5.75 mg milbemycin oxime/57 mg praziquantel are also available in color coded packages of one chewable tablet each.

Manufactured for:

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