

Clostridium difficile in Sandboxes

J. Scott Weese, DVM, DVSc, DACVIM
University of Guelph

In the Literature

Orden C, Neila C, Blanco JL, et al. Recreational sandboxes for children and dogs can be a source of epidemic ribotypes of *Clostridium difficile* [published online July 7, 2017]. *Zoonoses Public Health*. doi: 10.1111/zph.12374

FROM THE PAGE ...

Clostridium difficile is an anaerobic bacterium and an important cause of disease in humans and some animal species. *C difficile* can produce hardy spores that can survive for years in the environment—and as more environments are studied, it becomes more clear how widely this bacterium is distributed.

In this study, researchers visited public playgrounds in Madrid, Spain, and collected sand samples from 20 pairs of sandboxes for children and for dogs. *C difficile* was isolated from 52.5% of samples—from 12 of 20 (60%) samples from sandboxes for dogs and from 9 of 20 (45%) of samples from sandboxes for children. Of the *C difficile* isolates tested, 40% were strains that carry toxin genes and can thus cause disease; most of those were types commonly found in humans and animals.

Although the results were not surprising, this study provided evidence that *C difficile* is a ubiquitous organism that is present in food,^{1,2} water,³⁻⁵ and many animal species.⁶⁻⁹ How *C difficile* got into the sand is hard to determine because it could have come from humans, dogs, or other animals.^{10,11} This study highlighted the fact that any fecal-origin bug can be widely disseminated in places where multiple individuals of any species congregate.

CHOOSE THE CHEW WITH
MORE PROTECTION
THAN HEARTGARD® PLUS
(ivermectin/pyrantel)*



Heartworm disease



Hookworm (*A. caninum*)



Roundworm

INDICATIONS

Interceptor® Plus (milbemycin oxime/praziquantel) 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*) in dogs and puppies 6 weeks of age and older and 2 pounds of body weight or greater.

Heartgard is a registered trademark of Merial.

Interceptor®, Elanco™ and the Diagonal Bar™ are trademarks owned or licensed by Eli Lilly and Company, its subsidiaries or affiliates.
© 2017 Eli Lilly and Company, its subsidiaries or affiliates. USCACINP00189

From a patient-care perspective, this does not mean dogs should not be taken to parks. Exposure to myriad micro-organisms is unavoidable. Further, the role of *C difficile* in canine diarrhea is unclear.

Human health risks are similarly unclear and likely quite low. Sandboxes have been implicated in outbreaks of various diseases,¹²⁻¹⁴ and *C difficile* is probably low on the list of important sandbox-associated pathogens. However, this study provided another reason to follow basic practices (eg, hand hygiene), to prevent children from putting sand or sandy objects in their mouths, and to cover sandboxes that are not in use to keep animals out.

... TO YOUR PATIENTS

Key pearls to put into practice:

- 1** *C difficile* is a ubiquitous organism with an unclear role in canine diarrhea.
- 2** Organisms of fecal origin may be widely disseminated in places where animals congregate; however, this does not mean that dogs owners should avoid taking their pets to parks.
- 3** There are a number of important sandbox-associated pathogens. Basic hygiene is important.

References

1. Metcalf DS, Costa MC, Dew WM, Weese JS. *Clostridium difficile* in vegetables, Canada. *Lett Appl Microbiol*. 2010;51(5):600-602.
2. Weese JS, Avery BP, Rousseau J, Reid-Smith RJ. Detection and enumeration of *Clostridium difficile* in retail beef and pork. *Appl Environ Microbiol*. 2009;75(15):5009-5011.
3. al Saif N, Brazier JS. The distribution of *Clostridium difficile* in the environment of South Wales. *J Med Microbiol*. 1996;45(2):133-137.
4. Xu C, Weese JS, Flemming C, Odumero J, Warriner K. Fate of *Clostridium difficile* during wastewater treatment and incidence in Southern Ontario watersheds. *J Appl Microbiol*. 2014;117(3):891-904.
5. Zidaric V, Beigot S, Lapajne S, Rupnik M. The occurrence and high diversity of *Clostridium difficile* genotypes in rivers. *Anaerobe*. 2010;16(4):371-375.
6. Alvarez-Perez S, Blanco JL, Bouza E, et al. Prevalence of *Clostridium difficile* in diarrhoeic and non-diarrhoeic piglets. *Vet Microbiol*. 2009;137(3-4):302-305.
7. Clooten J, Kruth S, Arroyo L, Weese JS. Prevalence and risk factors for *Clostridium difficile* colonization in dogs and cats hospitalized in an intensive care unit. *Vet Microbiol*. 2008;129(1-2):209-214.
8. Keessen EC, van den Berkt AJ, Haasjes NH, Hermanus C, Kuijper EJ, Lipman LJ. The relation between farm specific factors and prevalence of *Clostridium difficile* in slaughter pigs. *Vet Microbiol*. 2011;154(1-2):130-134.
9. Knight DR, Riley TV. Prevalence of gastrointestinal *Clostridium difficile* carriage in Australian sheep and lambs. *Appl Environ Microbiol*. 2013;79(18):5689-5692.
10. Bondo KJ, Weese JS, Rousseau J, Jardine CM. Longitudinal study of *Clostridium difficile* shedding in raccoons on swine farms and conservation areas in Ontario, Canada. *BMC Vet Res*. 2015;11:254.
11. Jardine CM, Reid-Smith RJ, Rousseau J, Weese JS. Detection of *Clostridium difficile* in small and medium-sized wild mammals in Southern Ontario, Canada. *J Wildl Dis*. 2013;49(2):418-421.
12. Centers for Disease Control and Prevention (CDC). Outbreak of cutaneous larva migrans at a children's camp—Miami, Florida, 2006. *MMWR Morb Mortal Wkly Rep*. 2007;56(49):1285-1287.
13. Fukushima H, Gomyoda M, Ishikura S, et al. Cat-contaminated environmental substances lead to *Yersinia pseudotuberculosis* infection in children. *J Clin Microbiol*. 1989;27(12):2706-2709.
14. Orden C, Neila C, Blanco JL, et al. Recreational sandboxes for children and dogs can be a source of epidemic ribotypes of *Clostridium difficile* [published online July 7, 2017]. *Zoonoses Public Health*. doi: 10.1111/zph.12374



Whipworm



Tapeworm**

INTERCEPTOR[®]
PLUS
(milbemycin oxime/praziquantel)

Recommend a monthly chew that protects against more dangerous parasites **including whipworm and tapeworm** — Interceptor Plus. Talk to your Elanco sales representative today.

IMPORTANT SAFETY INFORMATION

Treatment with fewer than 6 monthly doses after the last exposure to mosquitoes may not provide complete heartworm prevention. Prior to administration of Interceptor Plus, dogs should be tested for existing heartworm infections. The safety of Interceptor Plus has not been evaluated in dogs used for breeding or in lactating females. 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. Please see full product information on page 57.

*Heartgard Plus hookworm species: *Ancylostoma caninum*, *Uncinaria stenocephala*, *Ancylostoma braziliense*.
***Taenia pisiformis*, *Echinococcus multilocularis* and *Echinococcus granulosus*.

Elanco