Clostridium difficile

For Horse Owners

EquIDblog
Equine Infectious Diseases

What Is *Clostridium difficile*?

- *Clostridium difficile* is a species of bacteria that can be found in the intestinal tract of humans and many animal species, including horses, pets, farm animals and wildlife.
- *Clostridium difficile* is an important cause of disease in people and animals.
- *Clostridium difficile* has two very important characteristics:
  - Some strains contain genes that allow them to produce toxins. It is the toxins, not the bacteria themselves, that make a person or an animal sick.
  - They can form spores, which can survive for years in the environment, and are resistant to many disinfectants. If ingested, the spores germinate and the bacteria begin to grow when they reach the intestine.
- In people, *C. difficile* is most common in the elderly, hospital inpatients and individuals being treated with antibiotics. It usually causes diarrhea, which may be mild or very severe.
- The strains of *C. difficile* that infect horses are often the same as those that infect people, but it remains unclear if horses can transmit *C. difficile* to humans or if people can transmit *C. difficile* to horses.

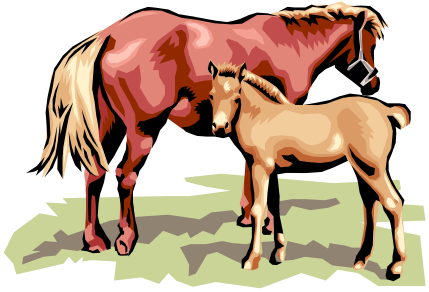
How Common Is *Clostridium difficile*?

Humans

- In developed countries, *C. difficile* is the leading cause of infectious hospital-associated diarrhea in adults, and it causes 15-25% of cases of antibiotic-associated diarrhea. Cases are becoming more common and severe.
- The most important risk factor for *C. difficile* infection (CDI) is treatment with antibiotics. The antibiotics affect the normal "good" bacteria in the intestine, which sometimes allows the *C. difficile* to take over and grow faster.
- Old age, certain cancer treatments, long hospitalization, some acid-suppressants used to treat stomach ulcers, intestinal surgery and some other procedures also increase the likelihood of CDI.
- A hypervirulent *C. difficile* strain (ribotype 027/NAP1) has emerged in North America, Europe and Japan, and has been responsible for epidemics of severe illness. This strain can also be found in some animals.
- Recently, severe illness due to CDI has been reported in some healthy, non-hospitalized people as well.

Horses

- A small percentage of healthy horses (up to 10%) carry *C. difficile* in their intestine. Carriage rates are higher in young foals and horses that are treated with antibiotics. In these groups, carriage rates of up to 45% have been reported.



- ***Usually,* C. difficile *never causes any illness in these animals.***
- Despite the fact that it can be carried by a large number of healthy horses, *C. difficile* is a very important cause of colitis and diarrhea in horses.
  - Signs of illness can range from mild to rapidly fatal.
  - In some areas, *C. difficile* infection (CDI) is the most commonly diagnosed cause of diarrhea in horses.
  - Unlike the situation in people, the majority of CDI cases in horses develop on farms, not in hospitals.
- Risk factors for CDI in horses have not been identified in any studies. Nonetheless, use of antibiotics is likely an important risk factor. Use of certain classes of antibiotics in horses is more likely to cause diarrhea than others, although the higher-risk drug groups seems to vary geographically. For example, in Sweden it was reported that exposure of mares to very low doses of erythromycin (e.g. when their foals were being treated for *Rhodococcus equi*) was associated with severe fatal colitis. This is not widely reported in other areas.
- Outbreaks of CDI in horses are uncommon, but they have been reported, particularly in foals on breeding farms. In some of these outbreaks, the majority of foals on the farms may be affected.

How Do Horses & People Become Infected With *C. difficile*?

- *Clostridium difficile* lives in the intestine of people and animals. When the bacteria are passed in stool, they form spores which can survive in the environment for a long time.
- The bacteria are transmitted when the spores are ingested. This typically happens when there is stool contamination on something a person touches, and then the person touches their nose or mouth. Contamination of food and water could potentially also occur.

- Most horses probably become infected by ingesting *C. difficile* spores from the environment.
- It is unclear if *C. difficile* can be transmitted from horses to people. The types of *C. difficile* found in horses are often the same as those found in people. So it makes sense that *C. difficile* could *potentially* be transmitted between people and animals, but there is still no conclusive proof.
- For now, it is best to err on the side of caution and consider *C. difficile* transmissible between horses and people until proven otherwise.

What Happens If A Person Or Animal Gets *Clostridium difficile* Infection (CDI)?

Humans: In people, CDI may cause no illness at all, or anywhere from very mild to very severe diarrhea. Additional complications can also occur, particularly in people who are already sick for another reason. In some cases the disease can be fatal.

Horses: The vast majority of horses that carry *C. difficile* in their intestine do not become ill. However, disease can occur and it can be very severe. One study reported a mortality rate of 42% of horses with CDI, but later studies reported lower mortality rates. It is unclear whether horses with CDI are more likely to die compared to horses with diarrhea due to other causes, such as *Salmonella*. Regardless, aggressive therapy is usually needed, treatment can be very expensive, and complications such as laminitis may occur.

How is *Clostridium difficile* Infection Diagnosed?

In horses and people, CDI is diagnosed by testing the stool for the toxins that are produced by the bacteria. Just finding *C. difficile* (by culturing the stool, for example) does not mean that it is causing a problem, because not all strains are able to produce toxins and some horses carry *C. difficile* without any problems. Detecting the toxins themselves is the key. ***Testing animals that do not have diarrhea for* C. difficile *is not recommended.*** Molecular tests (PCR) for detection of toxin producing strains of *C. difficile* are available in some areas, but these have not been validated for use in horses. Considering that up to 10% of healthy horses can carry *C. difficile* strains capable of producing toxins, it is unclear if this type of testing is useful. It is not recommended at this time.

How is *Clostridium difficile* Infection Treated?

- **In humans**, many cases of CDI are caused by treatment with antibiotics for some other infection. In mild cases, the diarrhea may resolve with no additional specific treatment. In severe cases, specific antibiotics may be needed to control the *C. difficile*. Probiotics are not considered effective for treatment of CDI in humans.
- Some mild cases of CDI **in horses** resolve without additional antibiotics. However, in more severe cases, aggressive treatment may be required, which may include large volumes of intravenous fluids, anti-inflammatory medications and even plasma transfusions. Referral to an equine hospital may be required. Some horses with CDI deteriorate so rapidly that they may die within 24 hours of the first signs of illness.
- There is no vaccine available for *C. difficile* for any species.
- ***If your horse develops diarrhea while being treated with antibiotics, tell your veterinarian right away. However, it is very important that you only stop or change the medication you are giving to your horse if you are told to do so by your veterinarian.*** Otherwise the infection for which the antibiotics were originally prescribed may get worse.

What Do I Do If My Horse Is Diagnosed With *Clostridium difficile* infection?

Intestinal CDI in horses is only diagnosed in animals that have diarrhea. The following recommendations apply to **any horse with diarrhea**, whether the cause is CDI, Salmonella, another pathogen or unknown.

- **Wash Your Hands!!!**: Wash your hands with soap and running water after handling your horse, and especially before handling food or touching things in the kitchen.
    - Alcohol-based hand sanitizers are unlikely to kill *C. difficile* spores, so ideally you should wash with soap and water instead.
- **Isolate the Affected Horse**: Keep the horse in a low-traffic area and as far away as possible from other horses. Do not allow other animals to come in contact with the horse (directly or indirectly), or to use the same pastures or paddocks.

- **Cover Up**: When handling the affected horse or entering its stall for any reason, wear designated clothing (e.g. coveralls or a long coat, as well as designated footwear or disposable overboots) to prevent contamination of your regular barn clothes and shoes. The designated clothing must be taken off immediately upon exiting the stall and left at the stall entrance (or discarded if disposable). Boots should be disinfected after each use.
- **Follow Instructions**: It is important to follow all treatment instructions given by your veterinarian, particularly regarding any medications. If you have questions or are having trouble with the treatment, call your veterinary clinic to let them know.
- **Steer Clear of Manure**: Avoid contact with your horse's manure as much as possible. Wash your hands thoroughly after mucking or handling manure or contaminated bedding in any way.
    - Manure from horses with CDI should not be spread on pastures because the spores can survive for long periods of time. It is unclear whether heat from composting will effective kill the spores, because they are very heat-tolerant.
- **Disinfect stalls**: This can be difficult to do, but should be done after the horse has recovered. All bedding and debris must be removed from the stall, and all the surfaces in the stall (e.g. floors, walls, feed troughs) must be **scrubbed thoroughly** to remove any adherent debris and organic matter. *Clostridium difficile* spores are resistant to many disinfectants, but a 1:10 dilution of household bleach (1 part bleach to 9 parts water) can kill *C. difficile* spores if as much manure, dirt and other debris is removed first.

If I Have *Clostridium difficile*, Should I Test My Horse?

- ***NO.*** Even if your horse was found to be shedding *C. difficile* in its manure, you still would not know if it was the same strain you were carrying. This type of specialized testing is not readily available and is not indicated in most situations.
- If you have *C. difficile*, you should be very thorough about washing your hands after using the washroom.

Additional Information

- Public Health Agency of Canada (PHAC). *Clostridium difficile* information page. Available at: http://www.phac-aspc.gc.ca/id-mi/cdiff-eng.php
- Centers for Disease Control and Prevention (CDC). *Clostridium difficile* frequently asked questions. Available at: http://www.cdc.gov/ncidod/dhqp/id_CdiffFAQ_general.html