

Botulism

A. Courtenay Freeman, DVM
Marc Kent, DVM, DACVIM (Small Animal and Neurology)
Scott J. Schatzberg, DVM, PhD, DACVIM (Neurology)

BASIC INFORMATION

Description

Botulism is a rare disease that causes generalized weakness involving many of the nerves that activate the muscles of the body. Information travels down nerves to stimulate muscles to move (contract). This activation of muscles is mediated through a chemical called *acetylcholine*. Botulism blocks the release of acetylcholine from the nerve endings, which results in neurologic dysfunction and weakness.

Causes

Animals acquire botulism by ingesting the botulinum toxin, which is produced by a bacterial organism called *Clostridium botulinum*. This organism may be present in spoiled or rotting foods, garbage, and carrion.

Clinical Signs

After the animal eats spoiled, contaminated material, vomiting and diarrhea may occur prior to the onset of neurologic signs, which typically occurs 2-4 days after ingestion of the botulinum toxin. Affected animals usually develop hind leg weakness that is rapidly followed by front leg weakness. The animal has difficulty standing and walking. It may stand crouched and have a short-strided gait. Severely affected animals may not be able to stand, lift their heads up, or even move their legs. They may not be able to eat or drink because of weakness of the jaw and tongue muscles. Affected animals may not be able to bark or vocalize as a result of weakness of the muscles of the larynx. They may not be able to blink their eyes.

As a consequence of weakness of the muscles of the esophagus, it may become weakened and dilated (*megaesophagus*). Food and water may be regurgitated and can be inhaled (aspirated) into the lungs, leading to pneumonia. Signs of aspiration pneumonia include a cough, fever, and difficulty breathing. In severely affected animals, muscles involved in breathing, such as the diaphragm, may become weak, leading to respiratory failure and death.

Diagnostic Tests

A history of eating spoiled foods, garbage, or carrion and the presence of compatible clinical signs may cause an initial suspicion

of botulism. Blood and feces can be tested for botulinum toxin; however, the toxin may not be detectable at the time clinical signs are occurring. Laboratory and other tests are needed to rule out diseases that cause similar signs. Chest x-rays may be recommended to look for pneumonia.

Specialized electrophysiologic procedures, such as electromyography and nerve stimulation testing, help to identify nerve dysfunction that supports the diagnosis. Sometimes the diagnosis can be made only after other diseases that cause similar clinical signs have been excluded.

TREATMENT AND FOLLOW-UP

Treatment Options

There is no specific treatment for botulism. Affected animals usually require hospitalization and intensive supportive care, such as intravenous fluids, during recovery. Medications may be given to stop vomiting and help the diarrhea. Affected animals require clean, dry, padded bedding and frequent changes in their position to prevent bedsores and pneumonia. Assistance is needed with urination and defecation and keeping the animal clean. If the muscles of the diaphragm are involved, the animal may be placed on a mechanical ventilator.

Animals that are able to eat and swallow can be fed with the head held up to prevent aspiration. Animals unable to eat may require insertion of a feeding tube and supplemental nutrition. The eyes may require lubrication if the animal cannot blink. Physical therapy exercises can be performed to prevent muscle wasting and encourage improved muscle tone. Any secondary problems that arise because of this disease also require specific treatment.

Follow-up Care

Recovery may be rapid in mild cases, but it can take weeks. After discharge from the hospital, continued nursing care is commonly needed at home. Recheck visits are often used to monitor the animal's progress and recovery.

Prognosis

Clinical signs usually improve gradually over 3-4 weeks. Most mildly affected animals return to normal. Prognosis is very poor (guarded) for animals with paralysis of the breathing muscles and aspiration pneumonia.