

# Gastric Dilatation-Volvulus Syndrome “Bloat”

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The name Gastric Dilatation-Volvulus Syndrome (GDV) succinctly describes the condition. The stomach has become both dilated (bloat) and twisted (volvulus). It is not clear which comes first. Regardless of the order of events, this can quickly turn into a life-threatening situation. A dog’s survival is dependent on early recognition and prompt emergency treatment.

## Commonalities

There is no one factor that precludes GDV in dogs, but rather a series of similar factors. Most likely GDV occurs due to a combination of these. The risk of a dog getting GDV has been shown to increase with the following circumstances:

- § Large and giant-breed dogs (pure bred and mixed)
- § 1<sup>st</sup> degree relative with a history of GDV
- § Dogs with a deep chest
- § Underweight dogs
- § Increasing age
- § After having a splenectomy
- § Laxity of gastric ligaments
- § Rapid eating/gulping that promotes air swallowing
- § Eating from a raised food dish
- § Large volume of food intake
- § Exercise after a meal (controversial)
- § Once daily feedings
- § Type of food (more plant proteins, soybean meal)
- § Dry food with fat among the first 4 ingredients
- § Dry food with citric acid that was moistened before feeding
- § Sudden change in diet
- § Stress
- § Fearful, nervous, or aggressive dogs



Please note that although these factors are common among GDV patients, GDV has been reported in smaller dogs and younger dogs. There are also cases of bloating without the twist, which may be relieved with burping or vomiting. Occasionally twisting of the stomach occurs without the bloat, but will untwist before serious signs occur. All cases should be immediately evaluated and treated appropriately.

## Clinical Signs

No matter how many predisposing factors are avoided, it may still happen. The earlier a possible GDV is recognized, the better chance for the dog's survival. It is an absolute emergency situation. Get to a veterinary hospital ASAP. The clinical signs are as follows:

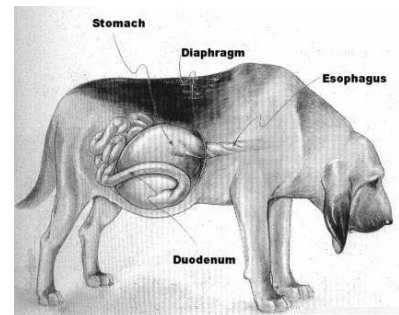
- \$ Sudden, non-productive retching
- \$ Excessive salivation
- \$ Abdominal distention and discomfort (they may look at or bite at their abdomen)
- \$ Restlessness or depression
- \$ Fast breathing (tachypnea) or difficulty breathing (dyspnea)
- \$ Weakness or collapse

**Sudden, non-productive retching** occurs as a dog is trying to get rid of food and gas that has over-distended the stomach. It is non-productive because the entrance to the stomach (as well as the exit from the stomach) has been twisted. Gas continues to build up unless relief is provided. This is best achieved by passing a stomach tube from the mouth past the twist. If the tube cannot be passed, relief is with a large bore needle into the bloated stomach. In the worse case scenario the stomach will finally rupture within the abdomen.

**Excessive salivation** is a common sign of upper digestive system pain and a prelude to retching or vomiting. They drool because they have difficulty swallowing.

**Abdominal distention** occurs as the gas builds up within the stomach lumen. It enlarges enough to become evident just by looking at the dogs abdomen, especially just behind the ribs. As you can imagine, this can be very uncomfortable.

**Restlessness** is an early sign of the discomfort. This may progress to **depression** as the metabolic events taking place within the body continue to cause more and more problems, and the dog's cardiovascular system deteriorates.



**Tachypnea** (rapid breathing) may occur from both physical and metabolic causes. For the physical aspect, stomach distension puts pressure on the diaphragm. This in turn decreases the chest volume for the lungs to expand. Rapid breathing is an attempt to make up for the lack of oxygen. Also, it can be an indication of pain. For the metabolic aspect, breathing efforts attempt to correct the changes that circulation compromise exerts.

**Dyspnea** occurs when there is significant pain, and pressure on the diaphragm is advanced.

**Weakness or collapse** is indicative of an advanced stage of the GDV syndrome. Both physical and metabolic states are severe, and shock may be evident. Their mucous membrane color is muddy, if you press on the gums the color does not return within 2-3 seconds, their heart rate is fast, their pulses are weak.

## What Else Could It Be?

Other possibilities with similar signs include gastric dilatation alone, splenic torsion, intestinal volvulus, diaphragmatic hernia, and peritonitis.

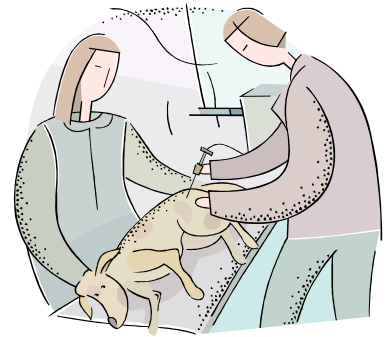
## What to Expect at the Veterinary Hospital

Initial management begins with **aggressive fluid therapy**. Catheters are placed in one or both of the forelimbs. Back legs are avoided because fluids placed here cannot get past the pressure placed on the caudal vena cava. Blood samples can be taken at the time the catheter(s) are placed. Tests of most importance include RBC count, protein count, electrolytes (sodium, potassium, chloride), kidney values (BUN, creatinine), blood gas for metabolic status, and clotting tests if possible (activated clotting time, etc.).

**Gastric decompression** is next on the agenda. It may precede fluid therapy if the animal is in respiratory distress so as to relieve the more life-threatening situation. Some dogs are down enough that no additional sedation is needed; others may need a touch of something (opiate, valium) to allow non-stressful passage of a stomach tube.

- § The tube must be a relatively large diameter to accommodate not just the gas but some thick food, therefore it is passed through the mouth and not the nose.
- § If a tube cannot be passed, a large bore needle may be placed into an air-bubble to take enough pressure off the entrance into the stomach so a tube can be passed.
- § In severely unstable patients that these cannot be performed, a temporary gastrotomy may be chosen. A small incision is made on the abdomen and into the stomach where the stomach lies against the abdominal wall. The stomach is then sutured to the outer wall to allow decompression until the dog is stable enough for surgery.

**Drug therapy** depends on the results of blood tests and monitoring of heart, lungs, and hydration status. These dictate the use of fluid type and amount, acid-base altering drugs, glucose, and electrolytes. Oxygen may be given to offset impaired ventilation. Antibiotics are routine to counter the effects of bacteria that can now traverse the digestive system barriers, and steroids are sometimes given after fluid resuscitation to help treat shock and counter the effects of radical toxins that are released during GDV. The use of these emergency steroids remains controversial. Analgesics, usually an opiate, are always given to alleviate pain. All aspects of a patient's care are improved when judicious use of pain relievers is administered.



**Radiographs** are used to confirm the diagnosis. The timing of these depends upon the status of the patient and the discretion of the attending veterinarian. Generally x-rays are delayed until after medical stabilization. Sometimes the stomach repositions after decompression. Sometimes x-rays are unnecessary and may cause added stress to the patient. All of the other possible diagnoses are surgical, so some believe x-rays to be unnecessary. Others prefer to confirm the diagnosis to better prepare the owner, as well as check for certain complications. For example, free gas in the abdomen may indicate stomach rupture.

**Surgery** is the definitive treatment of choice. Rarely, decompression results in normal stomach positioning and the dog can be managed medically, but the incidence of recurrence of GDV remains high. Surgical intervention is recommended as soon as the dog is stabilized. Complications seem to increase the longer surgery is delayed, but longer periods of stabilization may be necessary for patients with severe metabolic imbalances and/or cardiac abnormalities. Stomach rupture is suspected if blood comes through the tube during decompression or free gas on an x-ray is seen. Immediate surgery is then indicated.

## Surgical Procedure

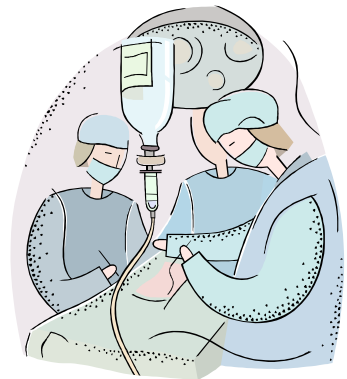
There are 3 main goals with surgical intervention:

- § Anatomic repositioning of the stomach (and spleen along with it)
- § Assessment and treatment of the stomach and splenic tissues
- § Gastropexy to prevent recurrence

Once the abdomen is opened, the surgeon must **reestablish normal stomach positioning**. This is performed gently but steadily. The stomach may be twisted from 90 to 360 degrees. The tissues are compromised and must be handled with care. Further decompression aids in the derotation. After this is accomplished the rest of the abdominal organs should be checked for any abnormalities. Then particular attention is paid to the stomach and spleen, which gets involved due to its anatomic association with the stomach.

The **tissues of the spleen and stomach are assessed** for viability. If the spleen is compromised (no blood supply leading to death of the tissue), the dead portion is removed or the entire spleen may be removed. Dogs live quite well without this organ. If a portion of the stomach is similarly compromised, that portion may be removed as well or alternatively inverted if the viability is questionable.

**Gastropexy** describes the surgical procedure of creating an adhesion of the outer stomach wall to the opposite inner abdominal wall. By fixing the stomach in place it will be prevented from twisting. It does not stop dilatation. The stomach can be fixed to the abdominal wall in several ways and is usually at the discretion of the surgeon. These include belt-loop, incisional, circumcostal, incorporating, and much less commonly the tube gastropexy techniques.



## Postoperative Care

After surgery the patient receives continued supportive care.

- § Antibiotics, analgesia, and fluid therapy are the mainstays of treatment.
- § Basic body parameters are closely monitored (heart, lungs, pulse, temperature, color, blood pressure, vomiting, diarrhea, urination)
- § Gastric acid inhibitors and stomach wall coating drugs are often added to aid in the healing of the inner stomach wall.
- § Heart arrhythmias are not uncommon with GDV. EKG monitoring should continue for 36 hours after surgery. The severity of these arrhythmias is assessed and drug therapy instituted based on the most current knowledge.
- § Blood values are monitored and treated as abnormalities arise
- § Food and water are withheld for 12-24 hours, then a low residue highly digestible diet is slowly introduced.

## Home Care

There are usually medications to continue at home for a few days. A recheck is usually scheduled for suture removal 10-14 days after surgery. If all is well then medications can be stopped.

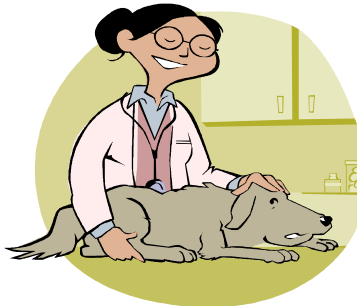
There are a few things do to in order to decrease the chance of bloating again. Even though the stomach is now prevented from twisting, it can still dilate and cause discomfort. These same measures can be used before a GDV occurs in an effort to decrease the chance of occurrence.

- § Feed multiple small meals per day (2-3) rather than one large meal
- § Limit exercise for 30-60 minutes after eating
- § Limit the drinking of large amounts of water after a dry meal or vigorous activity
- § Avoid foods that are known to incite dilation of the stomach

## Prophylactic Gastropexy

In dog breeds with a high incidence of acute gastric dilatation-volvulus syndrome one may wish to consider a prophylactic gastropexy procedure. It may be performed at any time, but is often recommended at spay or neutering. For females, the traditional spay incision can be extended and the gastropexy performed. For males, a separate abdominal incision would be performed. Alternatively, laparoscopy is becoming more common in the veterinary world. The gastropexy is performed through 2 or 3 small porthole incisions.

There are several factors to consider, and one should weigh the potential benefits as well as risks. The most obvious benefit is avoiding a potentially life-threatening situation. The risks of anesthesia, surgery, and postoperative complication must also be weighed against the risk of GDV. Accidental entrance into the stomach or poorly placed sutures may cause severe infection or chronic vomiting. Dogs with a gastropexy have a slightly higher risk of twisting their small intestines. The animal's age, health status, and history should be taken into account. There is no way to know if an animal will develop GDV, and the decision to perform this procedure is an individual one. Whatever the choice it should be made given all the known information to date about this syndrome.



## References

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