

Equine Colic

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The term “colic” can cause fear in many horse owners. For the novice horse owner, colic is often a term that is poorly understood. Colic can be caused by many things but is often a clinical condition that can be controlled and/or prevented with good management strategies. This bulletin is designed to address the common causes and preventative measures of colic that originates exclusively from the gastrointestinal tract (GI) (Figure 1) as well as give a brief overview of treatment options. However, it should by no means serve as a replacement for veterinary attention required to treat an ongoing case of colic.

What is colic?

The term “colic” is defined as a general manifestation of abdominal discomfort in the horse, regardless of the cause. While most cases of colic are associated with gastrointestinal disturbances, the nature of some abdominal discomfort may be non-gastrointestinal in origin, such as those resulting from other abdominal organs (including but not limited to the liver, spleen, ovaries, or kidneys). This discomfort can be anything from mild belly pain, causing the horse to paw, bite, and kick at its sides or seem restless, to excruciating pain that causes the horse to flail and thrash around.

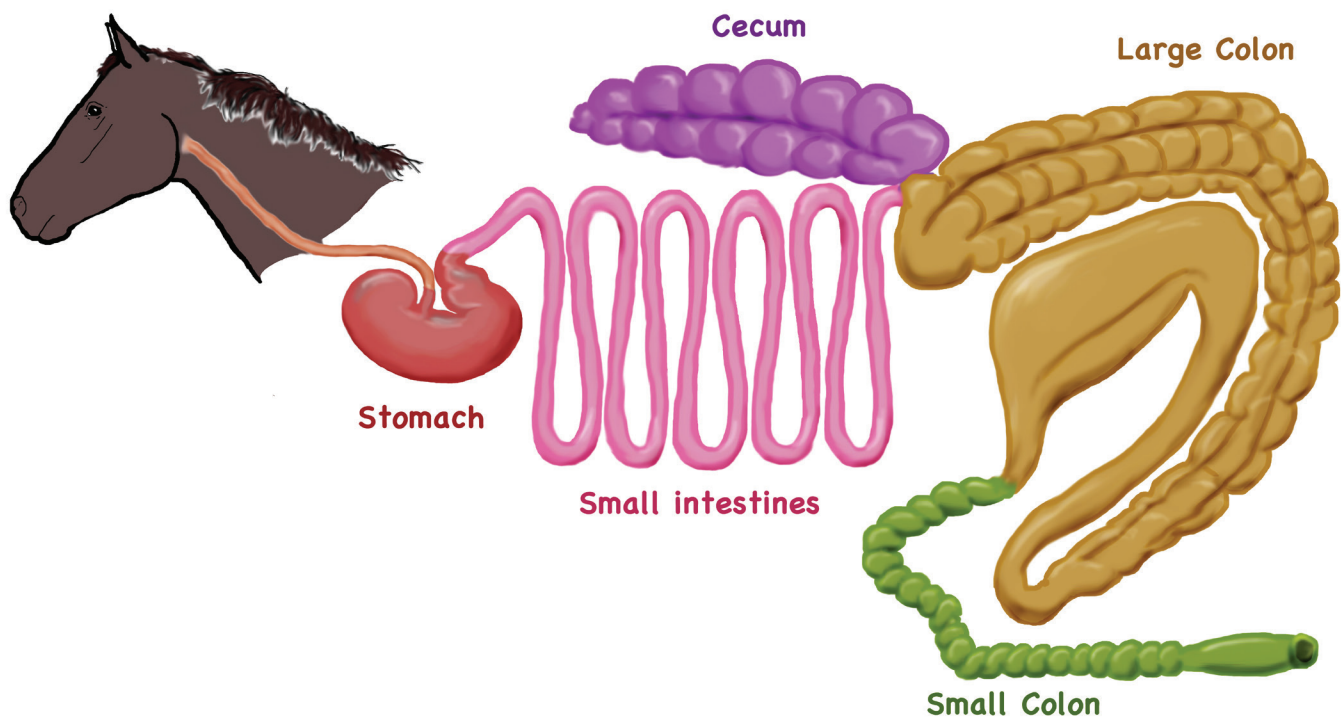


Figure 1. Illustration of the various components that encompasses the equine gastrointestinal tract.

Why do horses colic?

Diet and the horse's unique GI system

To understand why horses colic, it is important to understand the horse's digestive system. What is most critical and most overlooked by horse owners is that the horse is an animal that is adapted to eating forage, such as grass and hay. The horse's digestive system is designed to subsist on this type of roughage, as horses do in the wild. The horse has a relatively small stomach and a more extensive large intestine that includes a cecum filled with microbes to ferment and digest roughage (Figure 2).

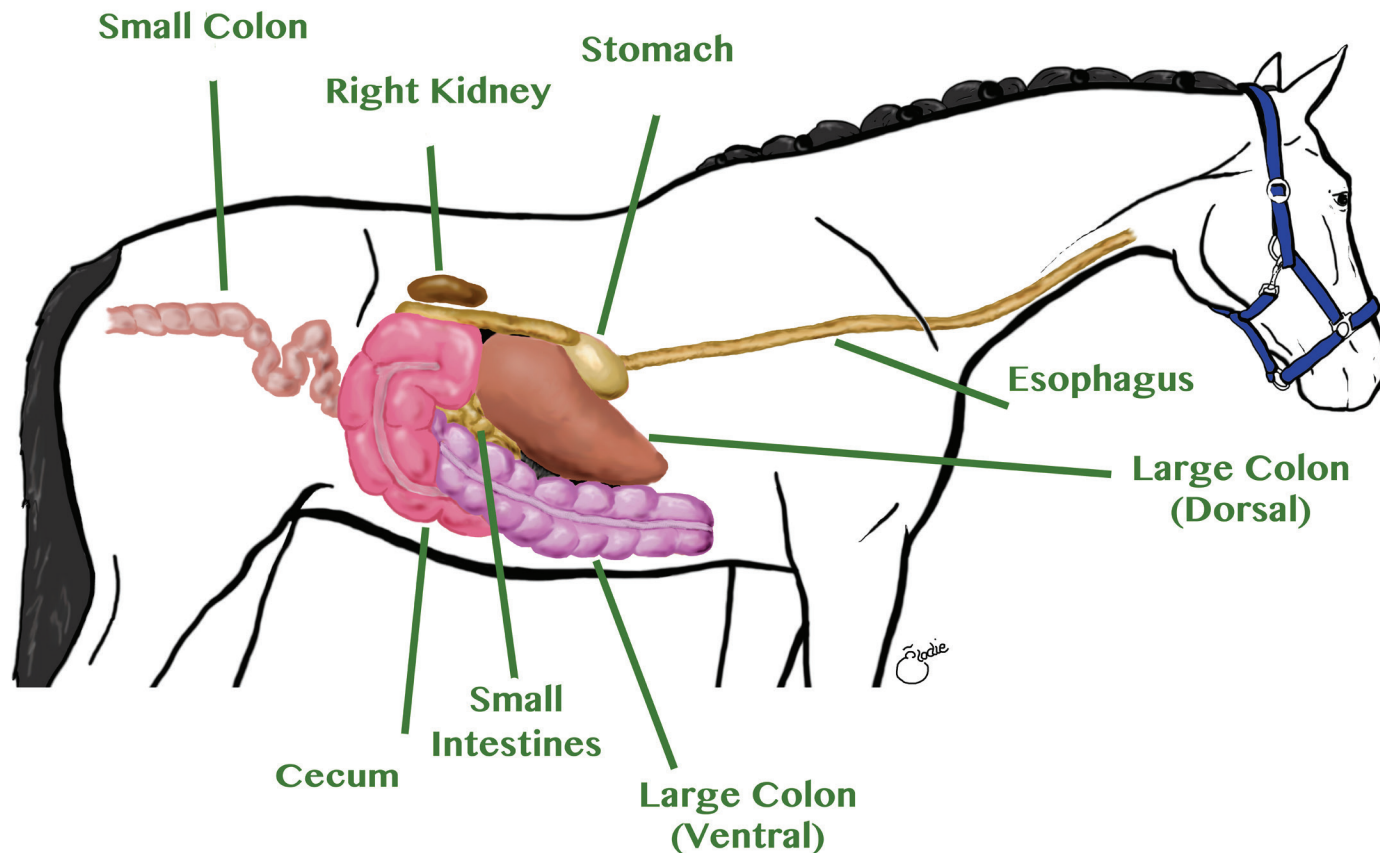


Figure 2. Positional anatomy of the equine gastrointestinal system.

The most common mistake horse owners make, as we will discuss later, is overfeeding high starch/sugar grain-based concentrates (such as textured grain, pellets, or extruded feed) while not ensuring that the horse has adequate forage intake. The horse is designed to eat continuously throughout the day. If allowed access to pasture all day, horses typically graze from 9-19 hours.¹ Issues associated with limited forage intake, but high grain diets, include ulcer formation, irritation in the large intestine, and the potential for laminitis.

As mentioned above, the horse is designed to be a continuous eater, and as a result, has a continual release of acid in the stomach. This acid is normally buffered by saliva produced from chewing and swallowing. However, in confinement situations where horses are not given adequate forage, acid in the stomach is not neutralized during the day and ulcer formation occurs.

Additionally, sugars and starches (found in large quantities in traditional grains) need to be primarily digested in the stomach and small intestine of the horse through enzymatic digestion. If they move undigested into the

cecum (which happens when the horse consumes a large quantity of concentrate), microbes will ferment the sugar and starch and produce an excess of lactic acid. Over-production of lactic acid can cause a sharp drop in pH, leading to death of the microbial population in the cecum that prefer a higher pH (primarily the fiber digesting cellulolytic bacteria) and proliferation of bacteria that prefer a lower pH (including some pathogenic bacteria). The natural flora of the horse's hindgut is disrupted, and the many of cellulolytic bacteria die and are degraded. Breakdown of these bacteria result in production of endotoxins, which enter the horse's circulatory system due to increased permeability of the intestinal membrane caused by the drop in pH. Large quantities of endotoxins in circulation create problems for the horse including laminitis. Even if fermentation of sugars or starches is not enough to cause endotoxin release and laminitis, there is still irritation of the intestinal lining.

The more concentrate a horse eats at a time (for example: the horse got into the feed bin and drastically over-ate), the more likely it is that concentrate will end up in the large intestine for fermentation. Typically, the rule of thumb is to feed **no more than 0.5%** of the horse's body weight in concentrate at a time to avoid this type of acidosis. For example, a 1,200-pound horse should receive no more than 6 pounds of concentrate per meal. Additionally, research shows that processing of grain may also have an impact on the digestion and rate of passage in the gastrointestinal tract. For instance, grains that are cracked, rolled, ground, or even pelleted are more readily digested in the stomach and small intestine and less likely to reach the cecum to be fermented.² While utilizing processed grains will help maximize digestibility and further reduce the risk of grain overload, they are still better if fed at no more than 0.5% of the horse's body at a time. It is important to note that not all grains are created equal and their nutritional value should be taken into consideration.

Another important consideration is to make changes to concentrate and forage slowly. The microbial population in the cecum becomes adapted to the diet the horse routinely eats. Very quick changes in type or amount of either forage or grain can disrupt the natural flora (for instance, different microbes are better adapted to fermenting grain vs. forage). Many horse owners recognize that changing grain sources should be done slowly, over a period of a week to two weeks, depending on the amount the horse is eating. It is usually recommended to replace 25% of the current concentrate with the new grain every other day until fully transitioned.

However, horse owners may not recognize that it is equally, if not more, important to make changes to roughage sources slowly as well—in order to allow the microbial population in the hindgut to slowly adapt. Hay may also be transitioned in 25% increments over a one to two week period, but no data is published providing guidelines on the matter. Feeding hay and grain by weight allows more accurate measurements of feeding rations, due to the weight per volume differences brought upon by different ingredients and processing methods. Any quantity changes are usually best if done in half-pound increments on a daily basis. Additionally, a horse's grazing time should be limited for several days when initially turned out on lush pasture to prevent GI disturbances. The amount of turnout can be increased by one to two hours daily, and a grazing muzzle may be advised for horses needing limited grass intake.

The fiber content and management of hay may also be linked to greater risks of colic. Long stem forage, such as hay and pasture, is necessary to stimulate the intestinal wall to contract and aid in moving digesta through the gastrointestinal tract. Horses should be fed a minimum of 1-1.5% of their body weight in forage. Hydration is important to aid in digestive transit by lubricating the ingesta. Dehydration may dry up the feed particles and cause the feed bolus to lodge in the lumen of the intestinal tract. Greater incidences of impactions are often seen during the winter months when horses are less inclined to remain hydrated.³

Quality of hay is also an important consideration to help prevent colic. As grasses mature, the content of indigestible fiber increases, making hay cut at later stages of growth a lower quality as compared to hay cut at early stages of growth. Lower quality hay is associated with increased risk of colic.

Bermudagrass hay is one of the most commonly grown hays in the Southeast and often comes with the stigma of having an increased risk of impaction colic. At least one study has shown an increased incidence of ileal impactions in horses consuming bermudagrass hay; however, whether this was causative or was a result of

higher numbers of horses in the Southeast consuming bermudagrass hay was not established. Additionally, hay quality was not assessed and may have influenced the outcome of the research.⁴ Bermudagrass hay (as well as other types of hay) can provide a good source of nutrients and does not need to be avoided if managed correctly.

Examining all hay, regardless of what type it is, for appropriate maturity is important. If hay was cut when overly mature (often resulting in coarser stems), it is significantly less digestible to the horse and can cause gas and impaction colic. (Side note: It is important to know what the hay species you are feeding should look like; some types of hay naturally have coarser stems than others.) When purchasing hay, ask for a forage test whenever possible. Forage analysis can be performed by your local Cooperative Extension agent for a minimal fee and is the only way to accurately predict digestibility. Acid Detergent Fiber (ADF) and Neutral Detergent Fiber (NDF) values represent the fiber levels in the hay. As these levels go up, digestibility and intake go down. Hays with ADF values of less than 31% and NDF values of less than 40% are excellent horse hays, while hays with ADF values over 45% and NDF values over 65% should be avoided.⁵

Additionally, impactions have often been blamed on feeding hay in the form of free choice round bales, and horse owners have been cautioned against such management practice. A study in Texas did document an increased risk of impaction colic on horses fed round bales.⁶ Again, whether this is causative or a result of the commonality of this practice in this area was not established. Many horses across the country are fed hay in such form, and good management techniques can make it a safer habit. Firstly, quality is again a foremost consideration; select round bales that have been harvested at an early stage of maturity and have been baled and stored properly (for example, stored under cover, out of the weather). The ADF and NDF guidelines mentioned above apply to hay stored as round bales as well. If the selected horse herd is not large enough to readily consume the bale, square bales should be used instead to avoid hay molding due to prolonged weather exposure. However, commercial products are available on the market to maintain round bales out of the elements, such as hay huts or sheds. Bales can also be opened but stored under cover and fed in small amounts at a time.

Impaction colic may occur in horses that are abruptly given large amounts of hay to consume, particularly if forage intake has previously been limited. A common situation would be the example of the horse out on a pasture eating grass until the grass suddenly seems very sparse (often this coincides with early frosts and initial cold weather in the fall/winter). The horse owner will put a round bale out, and the horses will initially indulge, often concurrently not drinking as much water with suboptimal temperatures. This dramatic increase in intake of dry matter forage (as opposed to grass, which has a much higher water content) coupled with reduction in water intake from decreased drinking makes the horse very prone to impaction colic. This is compounded if the hay is of poor quality.

A few better management practices can greatly reduce this problem. First, hay should be put out for horses to eat well in advance of the grass becoming sparse. If horses still have adequate grass to eat, they typically will self-limit their time spent eating hay and will avoid the initial gorging seen when round bales are put out after the grass has disappeared. By the time the grass is no longer providing a good source of nutrients, they will have gradually adjusted to eating hay. If it is not possible to put round bales out before the pasture has deteriorated, it is recommended to initially limit the time spent eating off a round bale (starting at 30 minutes or so at a time and working up to free access over a period of a few weeks). This can be done by physically keeping horses away from the round bale, by feeding square bales in increasing amounts prior to putting a round bale in the pasture, or by cutting open a round bale and feeding it in smaller sections at a time, initially.

Finally, another management practice that will help prevent impaction colic in these circumstances is encouraging horses to drink adequately during cold months. Keeping water warmed to ambient temperatures by using a commercial warmer, providing water a few times a day from a source of warmer water, and adding an ounce or two of salt to the horse's grain to encourage drinking are all ways to help ensure the horse will get enough to drink. Practicing these good management practices during cooler months of the year will go a long way to help prevent impaction colic.

Parasites

Parasites are recognized to inhabit the gastrointestinal tract without essentially causing disease. As horse owners, it is important to prevent excessive parasitization, which can damage the intestinal parenchyma and cause disease. Before the introduction of dewormers, large strongyles were commonly associated with colic; however, the parasite is now rarely present among our horse population. More prevalent is the presence of small strongyles. Fecal egg counts are a useful method at quantifying the amount of eggs shed by a horse to give a rough estimate of the worm load present.

While most horses infected with small strongyles are asymptomatic, heavily parasitized animals may show severe weight loss, abdominal distension, and diarrhea. The parasite encysts in the intestinal wall as larva and erupts causing clinical signs. Roundworms in 3-to-6-month-old foals may also cause ileal impaction following anthelmintic (drugs that expel parasitic worms) administration if heavily infected. However, the occurrence is very rare. The live parasite has a negligible impact on the foal's life. Heavy infections may cause general unthriftiness, such as a lack of weight gain and a poor hair coat. Lastly, tapeworms have been associated with ileocecal intussusception, a condition in which a portion of the bowel slides into the next and causes impaction. The validity of current research remains questionable; however, it is advised to target tapeworms as well when implementing a deworming schedule.

A targeted, selective treatment approach is recommended to prevent parasites from becoming resistant to the few dewormers available on the market. A veterinarian should perform a fecal egg count with a small manure sample twice a year to identify horses that need treatment. In Georgia, it is often too hot for larvae to develop and persist on pasture from the month of June to August. Optimal conditions for development and survival of strongyle are present in September, October, November, March, and April. It is therefore important to treat and prevent egg shedding at that time. Two treatments per year in the fall and spring with a praziquantel and ivermectin/moxidectin product are recommended for low egg shedders. Additional treatments may be recommended by a veterinarian for horses who are moderate to high shedders. Parasite control can also be influenced with management practices. The number of deworming treatment may be reduced by picking up feces and harrowing pastures to break up fecal pellets and expose the developing larva to conditions incompatible with their survival strategies. Rotating pastures and hay supplementation may also be advised to prevent overgrazing.

Sand ingestion

Impaction from sand can also be common in parts of Georgia with sandy soil, typically caused by sand accumulation in the large colon. Good management practices are the best way to prevent this problem. Avoid feeding horses directly on the ground or over bare sandy areas where they will drop feed and then eat it off the ground. Keeping low stocking numbers in pastures to avoid deterioration of pasture into large sandy areas is also important. The dietary supplement psyllium has been recommended to help move sand out of the intestine. It is an insoluble fiber that when mixed with water turns into a gel. This gel is thought to coat the intestinal wall and facilitate the movement of sand out of the digestive tract. Research on the effectiveness of psyllium has been inconclusive. More severe cases of sand impaction may require surgical intervention to manually lavage (wash out) the colon.

Toxic plants

Toxic plants can cause colic in horses, as well as a variety of other health issues. Routinely inspecting pastures for toxic weeds, trees, and shrubs is important for horse health. Information on plants that may be toxic can be found at this USDA website: <http://www.ars.usda.gov/Main/docs.htm?docid=10086>. Additional information on toxic plants in your area may be obtained from your local Cooperative Extension office.

It is also important to note that horses that are limited on forage consumption (for example, if grass is not

adequate or if hay is not supplemented) are much more likely to consume available toxic plants in higher amounts, whether out of hunger or boredom. Most toxic plants are not palatable to horses, and most horses will avoid toxic plants in favor of quality forage if it is available. A good defense against toxic plant consumption is to ensure that your horse has access to a high quality forage program.

Post-foaling complications

Mares are predisposed to certain types of colic after foaling. The space created after the foal exits the abdominal cavity and the shrinkage of the uterus may cause the large colon to shift in an abnormal position and get displaced. In more severe cases, the large colon can twist and create torsion. As a result, the blood supply to the gastrointestinal tract gets compromised, and the prognosis is usually guarded. However, chances of survival increase if diagnosed early.

Additionally, tears to the reproductive tract and nearby rectum during foaling can result in contamination of the abdominal cavity. The ensuing peritonitis (inflammation of the lining) should be addressed with aggressive antibiotic therapy, and the tear requires surgical intervention. A post-foaling examination of the reproductive tract by a veterinarian is always advised. Post-partum mares that are also lactating may not drink an adequate amount of water to meet their physiologic need. If they become dehydrated, they are predisposed to impactions.

What can I do to prevent colic?

Management

Horses are animals of habit. To reduce stress, particularly in confined horses, horses should be kept in a routine feeding and work schedule. In addition, the introduction of new forage and concentrate should be done in a gradual manner to avoid gastrointestinal upsets. If introducing a horse to a new pasture with more abundant grass, it is best if done slowly by limiting the horse's initial exposure to the new feed source. It is important to remember that horses are grazers and grasses should be the primary component of a horse's diet. Horses should have access to fresh, clean water 24/7, and administration of any medication should be avoided without first consulting a veterinarian. Some common drugs, such as phenylbutazone (bute) or flunixin meglumine (banamine), have been proven to cause gastrointestinal upset if improperly given. It is important to be familiar with your horse's normal behavior and recognize any changes. Horses with previous colic episodes should be monitored closely.

Routine parasite control and dental care

Routine lifelong parasite and dental control are recommended to prevent colic in horses. Parasites can do permanent damage to the intestinal tract of the horse, making them more susceptible to colic as they age. Additionally, large parasite loads can cause impaction colic in horses of all ages. It is recommended that all horse owners consult with a veterinarian to get specific recommendations on parasite control for their area. Parasite resistance to dewormers is becoming a problem, so current recommendations are to do fecal egg counts before and after the administration of a dewormer to determine effectiveness of an anthelmintic. Consistent monitoring is also essential to tailor a deworming schedule to each individual horse. Good pasture management along with composting manure from stalls and paddocks can also go a long way in reducing parasite load.

Proper dental care is also of key importance in the lifelong health of the animal. Good dental management from a young age will improve the dental health of the horse later in life. Horses' teeth should be inspected and floated annually to remove sharp points, problematic teeth, etc. Inability to chew food properly due to pain or mechanical impairments greatly hinders digestion of foodstuffs, be it forage or concentrate. Teeth are important for breaking the seed coat of grains and reducing particle size of hay; if the horse cannot do this, larger quantities of grain and hay will move through the digestive tract undigested, potentially increasing the risk for gas colic and impactions.

Special diets to help prevent colic

Highly digestible forages: Since colic is often a management disorder relating to dietary intake, it is to be expected that certain nutritional practices and commercial feeds have been developed to help prevent colic. Since providing adequate good quality forage is one of the biggest steps to preventing colic, commercial feeds have been developed to address the unique aspects of the horse's GI tract. The primary basis for many upper-end commercial horse feeds is to provide a feed that is lower in starch and sugar and higher in fat and digestible fiber. Commercial feeds contain 2-14% fat. The horse digests fat well, and fat is a source of concentrated energy, so providing energy in the form of fat rather than sugar and starch may help alleviate problems mentioned earlier associated with feeding horses that require large amounts of grain to maintain their weight. Fat addition to diets often reduces the amount of grain required to provide the same calories, reducing the risk of grain overload.

Additionally, utilizing ingredients that provide a source of highly digestible fiber are also beneficial to the horse's gastrointestinal tract. One such common ingredient is beet pulp. Beet pulp is a fiber and is therefore digested in the hind gut of the horse to produce volatile fatty acids that the horse absorbs for energy. It is more digestible than many other forage sources, meaning that the horse will glean more energy from this form of fiber. Because of these reasons, it is becoming an increasingly popular ingredient in horse feed industries trying to meet the needs of the unique GI system of the horse. Other fiber sources with higher digestibility that are often included in commercial feeds include wheat middlings, alfalfa meal, and soybean hulls.

Feeds that are designed for horses that require large amounts of energy or horses that are prone to laminitis or repeated colic will often provide a majority of the energy requirements from fat sources and digestible fiber sources while containing less of high starch ingredients like corn. A good solution for the horse that has the opposite problem and is an easy keeper is to reduce grain intake rather than drastically limiting forage intake. Horses can be fed forage plus a ration balancer rather than a traditional commercial grain. Ration balancers are designed to be fed in a small quantity (approximately 0.5-1.0 pound per day) and provide the necessary vitamins, minerals, and protein without the caloric content of typical commercial feeds.

Bran mashes: One management practice that should be addressed in this bulletin is the use of bran mashes to help prevent colic. It is thought that bran mashes have a laxative effect and therefore help to regulate the horse's GI tract. Some people will feed them daily, others may feed them weekly or monthly, while others may not at all. In a bran mash, bran is typically fed along with a lesser amount of commercial feed and then wet substantially before giving to the horse. It is thought that this creates an increase in moisture and fiber, which has both laxative and hydrating effects on the horse.

Bran, however, actually has a lower fiber content than many other fiber sources (10-12% fiber). Additionally, the small amount of water added to the mash has a negligible and short lasting effect on overall hydration. Providing good quality hay and access to clean water at an ambient temperature will go much further in addressing fiber and water needs as compared to the occasional bran mash. Additionally, the potential effect of a bran mash of creating a watery stool (often attributed to its laxative or hydrating properties) is quite possibly instead caused by slight digestive upset created by the sudden change in diet.

The biggest problem associated with bran mashes, particularly when used frequently, is that they have an inverse calcium to phosphorus ratio (they are higher in phosphorus than calcium due to the very high phosphorus content in bran). This can cause problems with the bone structure of the horse, causing the horse to mobilize calcium from his bones to keep his blood calcium to phosphorus ratio normal.

When used infrequently, bran mashes may cause digestive upset for reasons previously mentioned of allowing the microflora of the GI tract of the horse time to adjust to dietary changes. For these reasons, many nutritionists will advise against the use of repeated bran mashes for control or prevention of colic in most horses.

How is colic treated?

The majority of this publication is aimed at explaining causes of colic and prevention. If a horse owner gets to the point where the horse is actually showing signs of colic, it is important to consult with a licensed veterinarian to establish appropriate treatment. Some colic cases are mild and will quickly resolve with little treatment or administration of a pain killer and anti-inflammatory. However, some cases can become severe very quickly and ultimately require surgery. The earlier colic is recognized and treated, the better the outcome for the horse. All symptoms of colic should be considered serious and a potential emergency situation.

Recognizing colic symptoms

It is important to understand that horses do lie down without experiencing signs of colic. An average horse requires two to three hours of rapid eye movement (REM) sleep daily. Simply lying down resting is not a sign of colic. Below is a list of the most common symptoms of colic; however, it is important to note that not all horses will show the same level of pain tolerance and signs will vary depending on the source of discomfort. Indications that the horse may have abdominal discomfort:

- Repeatedly getting up and lying down
- Rolling on the back beyond a normal short roll back and forth a few times
- Continuously getting up and then lying down to roll in a short period of time
- Biting at the sides or flanks
- Stretching out
- Pawing
- Inappetence (lack of appetite)
- Lack of bowel movement
- Mentation (depressed)
- Elevated temperature, pulse, or respiration
- Reduced or absent gut sounds
- Excessive sweating from pyremia (fever) and pain
- Grinding of the teeth
- Bright pink or pale white mucus membranes
- Other signs of discomfort

If you recognize that your horse is exhibiting signs of colic, it is important to take action but also assess the situation carefully. Many horses react to colic by showing mild signs of discomfort. However, some may react with violent thrashing. It is important to handle the horse carefully so as not to be injured by a rolling or a violently distressed horse.

Initial steps when horse is showing signs of colic

A horse that has a case of very mild colic, but is agitated and rolling, can often be helped simply by moving the horse to another area to promote increased movement. Hand walking can alleviate gas build up and prevent further complication by the horse repeatedly laying down and rolling. However, this should not be overdone done, and it should even be avoided in horses with reduced water consumption.

The important thing to note about colic is that the more agitated the horse gets, the more likely it is to do further damage (such as torsions to the intestinal tract) by thrashing and rolling. Therefore, keeping the horse comfortable until gas or an impaction can pass is critical for preventing the development of more serious colic cases. If simply increasing the movement of the horse does not adequately relieve pain, anti-inflammatory drugs such as flunixin meglumine (banamine) or mild tranquilizers can be given to temporarily alleviate symptoms (these must either be administered by or purchased from a licensed veterinarian and administered appropriately, i.e., not in the muscles). Cases that do not clear up after a dose of this type of medication often will require further treatment.

In addition, it is best to remove all food from the horse to avoid any complications, but continue to allow access to water, and get the horse in an area at close proximity for monitoring. Horse owners may also obtain their horse's vital signs by taking their horse's temperature, pulse, and respiration, and record the color and moistness of the gums. A horse's normal temperature should be within 98-101.5 degrees F. The heart rate can be heard with a stethoscope by positioning it behind the elbow, on the left side of the horse and along the girth line. An adequate heart rate should be between 28-44 beats per minute. A normal adult horse at rest should take 12-30 breaths per minute. Healthy horses have pink mucous membranes that are moist to the touch. The mucous membranes can be assessed by looking at the gums. Have this information ready when your vet arrives. In addition, be prepared to report any dietary changes, medical history, behavior changes, etc.

Further treatment of colic

Any further treatment of colic must be performed by a licensed veterinarian and will depend on the type of colic the horse is experiencing. If the horse is showing signs of pain, a veterinarian may decide to sedate the patient, start administering a bolus (dose) of IV fluids and perform a rectal palpation to assess for any palpable abnormality. A basic colic evaluation will usually involve passing a nasogastric tube to check for reflux and potentially pump mineral oil into the horse's gastrointestinal tract to encourage passage of possible obstructing material. If the patient is not responding to medical treatment, further diagnostics may need to be performed in a clinical setting that has the resources to perform blood tests, a belly tap, an ultrasound exam, etc. Horse owners should also inform their veterinarian about financial limitations, the option of doing surgery if the need arises, and whether the patient has insurance coverage.

What to expect?

Colic that originates from the GI tract can be classified based on its occurrence: non-strangulating obstruction, strangulating obstruction, enteritis/colitis, and peritonitis. While there are many other causes of colic, we will focus on these four broad types for the purpose of this document. A brief explanation of each is as follows:

Non-strangulating obstruction

Non-strangulating obstructions are defined as a blockage in some part of the horse's intestinal tract without hindrance of the general blood supply. It can affect any part of the horse's digestive tract. Many causes of non-strangulating obstructions have been suggested, but there is little evidence to confirm it. Horses will usually present varying signs of pain depending on the severity of the obstruction.

Impactions of the stomach, small intestine, large colon, and small colon are more commonly caused by feeding dry and finely stemmed roughage with possible concurrent dehydration. Additionally, horses pastured on sandy soil can also have impactions in the small intestines from sand ingestion. The treatment involves rehydration, flushing the GI tract, and administration of laxatives, while managing pain. Surgery may be indicated in more severe cases. Impactions of the small intestine (Figure 3), large colon, and small colon generally have a good prognosis; however, stomach and cecal impactions tend to have a poorer outcome. Additionally, some horses on alfalfa hay may develop enteroliths (a stone-like mass formed from digested material) in the colon causing a partial or complete obstruction. Surgery is usually required to remove the structure and the prognosis is typically excellent. Last, but not least, horses can commonly have increased gas production, which can distend the bowels and prohibit passage of food through the intestine. While potentially painful, gas colic typically resolves well with medical treatment, such as pain management following veterinary examination, or may resolve on its own in some horses.

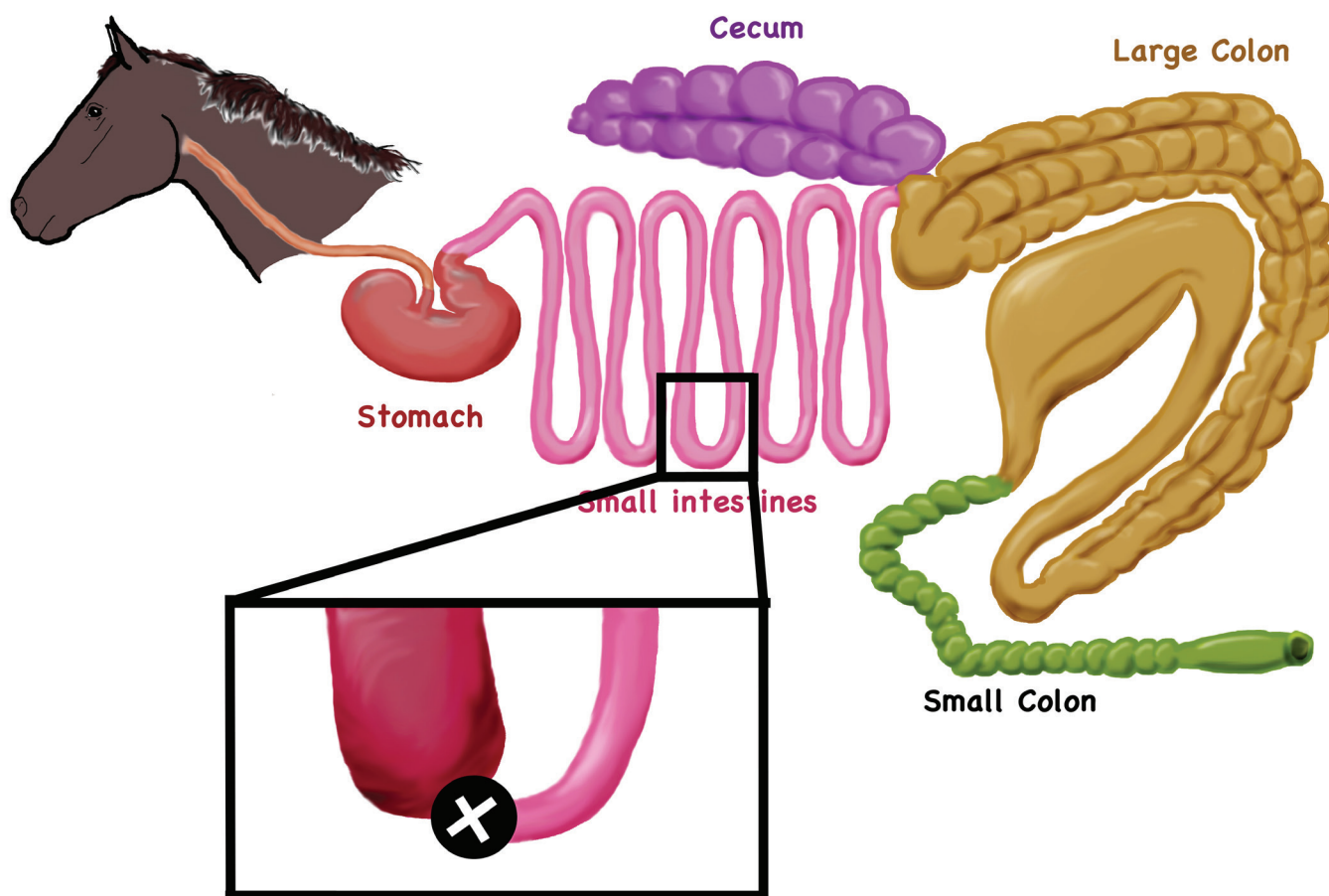


Figure 3. Small intestine impaction. The magnified box depicts distension of the small intestines, as food cannot move forward due to an obstruction.

Displacement of the large colon may be secondary to an impaction or gas build up in the colon. Medical management (primarily pain control) is usually advised and sufficient. However, some unresolving cases may require surgical intervention. The prognosis for both forms of displacement is very good.

Strangulating obstruction

This refers to a condition where a portion of the intestine is twisted or entrapped within the other organs of the horse, effectively blocking movement of the ingesta through the digestive tract and compromising blood flow through part of the digestive tract causing extreme pain.

Volvulus: This can be described as a condition in which the intestine twists upon itself. Volvulus most commonly affects the small intestine or large colon. Horses will show some of the more severe signs of discomfort and require immediate intervention (typically surgery) to increase prognosis of a full recovery.

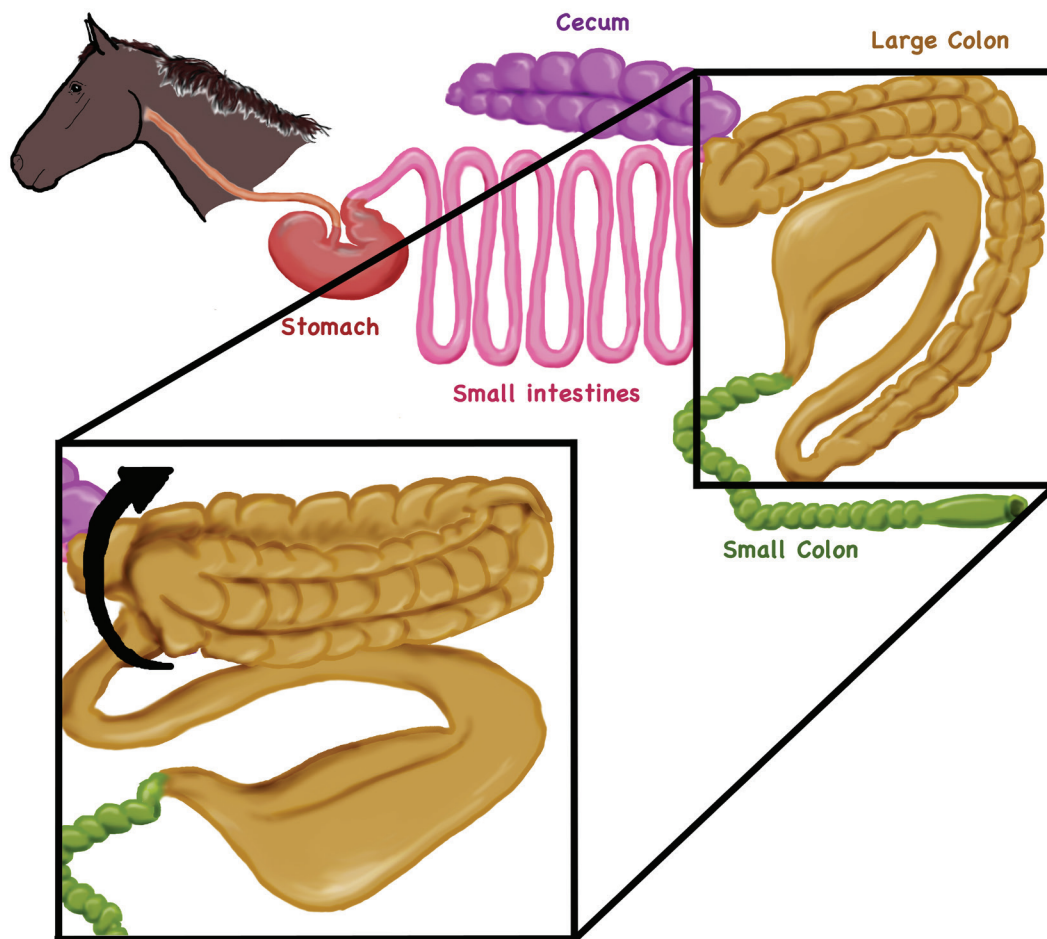


Figure 4. Large colon volvulus. The magnified box depicts a twist in the large colon.

Entrapment: Sections of the small intestine have a lot of mobility compared to other portions of the GI tract. Therefore, a section of intestines can lodge itself in small opening in the abdominal cavity or become wrapped within a pedunculated lipoma (a benign fatty tumor more common in older horses).

Enteritis/colitis

Enteritis and colitis refers to inflammation of the small intestines and large intestines respectively. Both are often characterized by showing signs of fever, lethargy, and possibly extreme pain. Enteritis often presents with a large amount of reflux, whereas colitis may have the classic sign of diarrhea. It can be caused by a wide variety of factors, such as bacterial, fungal, and viral infections, though the exact cause is often unknown. Studies have shown greater incidence in horses on high grain diets, and the inflammation associated with these types of colic predisposes horses to laminitis. Veterinary care should be prompted immediately to void reflux from the stomach of the horse and manage the pain. Additional supportive therapy may be necessary. Antibiotic administration is controversial as the killing of bacteria may cause the release of their toxin; however, anti-endotoxin therapy is often given to prevent laminitis and decrease inflammation. Prognosis is fairly good with supportive care.

Peritonitis

This is defined as inflammation of the lining of the abdominal cavity. It can be secondary to intestinal disease, such as enteritis, colitis, parasites, surgery, etc. Trauma or tearing of the intestinal tract can be primary causes of peritonitis. Horses often present a fever and may be in too much pain to move. Examination by a veterinarian will include a rectal exam and analysis of the abdominal fluid with an abdominal tap. Supportive therapy and antibiotic administration is warranted. The prognosis is variable based on the cause. For instance, complete rectal tears carry a poor prognosis.

Conclusion

Colic is one of the most common health issues that horse owners must face and can range from mild self-limiting colic cases to life threatening situations. Employing good management practices can be extremely effective in preventing the occurrence of colic, and the aim of this publication is to educate readers on practices that may be beneficial to implement or avoid in their horse care regimes. Pasture management strategies and forage testing can be done through local Cooperative Extension offices and can be very useful in helping to reduce risks of colic. Additionally, it is important to work closely with your veterinarian to establish parasite control and dental programs for your horse. Finally, horse owners should understand the options for colic treatment and have a good working relationship with their veterinarian in the event an emergency situation arises.

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