



EQUINE ROUNDS

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COLIC : WHAT YOU CAN DO BEFORE THE VETERINARIAN ARRIVES

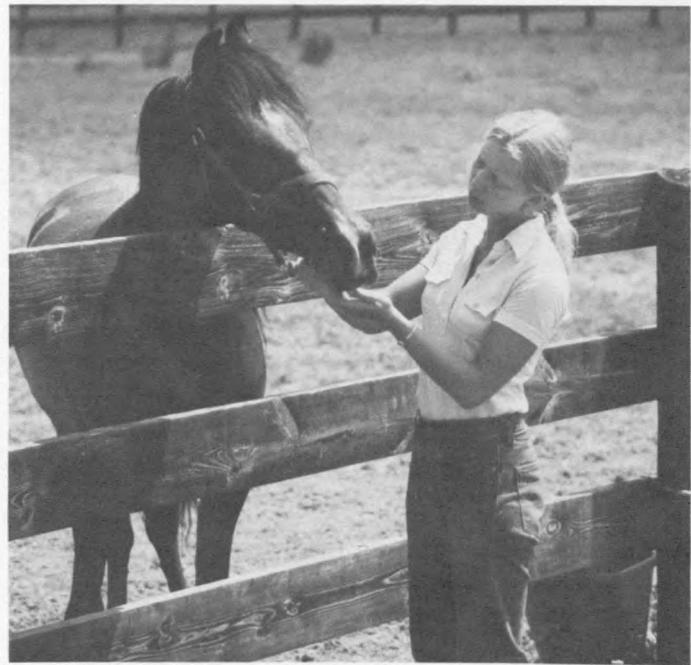
By Luba Drouin '87
With Thanks to Dr. Patricia Tithof

Colic is one of the most frustrating situations that a horseowner faces. But if the owner can recognize colic before it becomes too severe and acts promptly, he or she improves the chances of a successful recovery. The horse owner should know how to approach and assess the situation, and what to do when it occurs.

What is colic? In its broadest sense it is a catch all term for abdominal pain regardless of its cause. Colic is usually associated with stasis or obstruction to the flow of blood through the intestine.

How should you approach the colic situation? Be concerned, but do not panic! Learn to recognize the signs before the colic becomes too severe. There are many different causes of colic, and depending on the cause, the signs may develop gradually or suddenly. Some of the commonly occurring signs include: 1) looking at the flank, 2) pawing the ground, 3) restlessness, 4) getting up and down, 5) refusing to eat, 6) passing manure of abnormal quantity (usually less), as well as abnormal quality (hard, mucous covered, soft, smelly, or loose). Horses with severe colics may : 1) roll and thrash violently, 2) sweat profusely, 3) have an increased pulse, 4) congested mucous membranes, and 6) distention of the abdomen.

What should you do when a colic does occur? First, call your veterinarian. With prompt and proper treatment most horses with abdominal pain resolve the problem. Until the veterinarian arrives, assess the situation in



order to provide the veterinarian with the most accurate information. Keep a close watch on the horse. The changes of symptoms that may occur with time are of vital importance to the veterinarian in order to successfully diagnose the colic. To help you assess the situation you can take the horse's pulse and evaluate the mucous membrane color.

Mucous membrane color indicates the blood flow through the vessels and capillary refill time. The normal color is pink. If the color is "muddy", dark red, or congested this is an indication of shock and a decreased circulating blood volume. To restore this volume the animal's circulatory system responds by closing precapillary sphincters to peripheral tissues. Capillary refill time can be examined by applying light pressure for 1-2 seconds with your thumb on the gums of the upper incisors. Normal color should return in less than 2 seconds. Prolonged refill time is also indicates a decreased circulating blood volume.



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The heart rate is an important parameter to evaluate. Elevations in heart rate may be caused by pain, dehydration, and shock. The easiest place to take the horse's pulse is at the facial artery which runs under the cheekbone. By placing three fingers lightly over the vessel as it runs along the bottom of the cheekbone, you should be able to feel the throb of the artery. The normal resting pulse of the horse is 36-48 beats per minute. A resting pulse of over 50 is cause for concern. In some colics the pulse may be in excess of 90. If you regularly take your horse's pulse, it will be much easier to do in an emergency situation.

You can determine the progress of the colic by observing the commonly occurring signs that indicate degree of pain. A horse that initially presents with mild intermittent pain will show signs of uneasiness, constantly shifting weight, and getting up and down. This condition may remain unchanged or it may deteriorate over time to violent rolling and thrashing. It is extremely important to observe the progression of signs, especially in a situation where the veterinarian is not immediately available. The veterinarian will rely on your account of the sequence of events preceding his/her arrival to help evaluate the horse's status.

You can also provide minimal supportive therapy, such as walking the horse for 15-20 minute intervals. A horse in severe pain may sweat profusely. If it is cold out it is a good idea to place a blanket over the horse to preserve his body heat. Wrap the horse's legs to prevent him from injuring himself. A painful horse is not very responsive to his environment, so be careful that you don't get hurt.

If the horse is uncontrollably painful he may damage himself in a confined space, such as a stall, by casting or getting his legs caught between stall boards. In such a situation it may be wise to move him outside to a grassy surface where he can't injure himself.



In many colic situations painkillers are helpful, but their use should be left to the discretion of the veterinarian. Administering painkillers can lull you into a false sense of security by eliminating the signs of pain but not the cause. The horse's condition may actually be deteriorating without showing any signs. Many colics take hours to resolve or show any improvement even after treatment by the veterinarian. So you should be prepared to watch these horses.

Some horses have recurring bouts of colic. A regular deworming program and proper management practices might help forestall these bouts. If the horse has been treated surgically, adhesions that form during the healing process may contribute to the recurrence of colic.

Colic can certainly be a dilemma, but the majority of the colics treated have successful outcomes. You, the owner, are a vital link in that successful outcome.

Luba Drouin '87 is interested in equine practice after graduation. She will be working at the Irish National Stud Farm this summer.



VERMINOUS COLIC

THE MIGRATIONS OF S. VULGARIS LARVAE

By Andrew Pepper, '87

An internal parasite problem can cause a horse to appear unthrifty and show poor growth. Of more concern to every horse owner is the severe and often fatal colic caused by the migrations of Strongylus vulgaris larvae. This nematode worm, as an adult, lives in the horse's cecum and ventral colon. In these sites the adult worm does little damage to its equine host. It is as a migrating traveler through the horses' tissues that S. vulgaris earns its lethal reputation.

S. vulgaris has 5 larval stages and one adult stage. Larval stage 1 and 2 live in the cecum and colon. The roundabout trip taken by S. vulgaris larvae begins when a 3rd stage larval form invades the wall of the cecum or colon. After developing into a 4th stage form the larvae penetrates a small artery lying outside the cecum or colon. The larvae rapidly travels up the smaller arteries and lodges in the main artery to the gut, the cranial mesenteric artery. A quickly moving larvae can reach this vessel within 11-21 days after infection.

The presence of these worms in blood vessels initiates the formation of thrombi. These thrombi will block the blood flow to the gut and may cause serious consequences. Infarction and necrosis will occur if a piece of intestine is cut off from its nutrient and oxygen supply even for a short period of time. Moreover, this abnormality in intestinal blood flow will cause changes in intestinal tone and motility and may be the primary cause for many intestinal displacements and intussusceptions that result in surgical colics. This phenomenon known as verminous arteritis is a direct result of the migration of S. vulgaris larvae.

In the past it was virtually impossible to protect a horse against the larval forms of S. vulgaris. Many chemical agents destroy the adult worm in the cecum and colon, but few could guarantee lethal action against all ages of larvae. Ivermectin is a new agent that is effective against all larval forms of S. vulgaris as well as the adults. Killing the larvae can hope to prevent the blockage of the blood supply to the lower intestinal tract and the severe colic that often follows. It has been shown that removal of the larvae from the mesenteric vessels by chemical treatment will allow for the resolution of vascular changes and a return to normal blood perfusion.

A horse owner can thus treat verminous colic in their animals by establishing a regular deworming program early in the animal's life. A worming compound effective against both larval and adult forms of S. vulgaris must be used in animals with suspected verminous colic. Ivermectin is such a compound and can help to provide protection against a colic caused by internal parasite infestation. Any chemical prophylaxis program must accompany proper management practices concerning the disposal of manure, pasture rotation, and proper timing of worming treatments. Horse owners should consult their veterinarian when setting up an effective worming program to prevent verminous colic.

Additional Reading:

Georgi, Jay DVM Parasitology for Veterinarians 4th Edition W.B. Saunders Comp. 1985

Olsen, O. Animal Parasites 3rd Edition University Park Press 1974.

Andrew Pepper, '87 is interested in equine reproductive management and hopes to work in this area when he graduates.



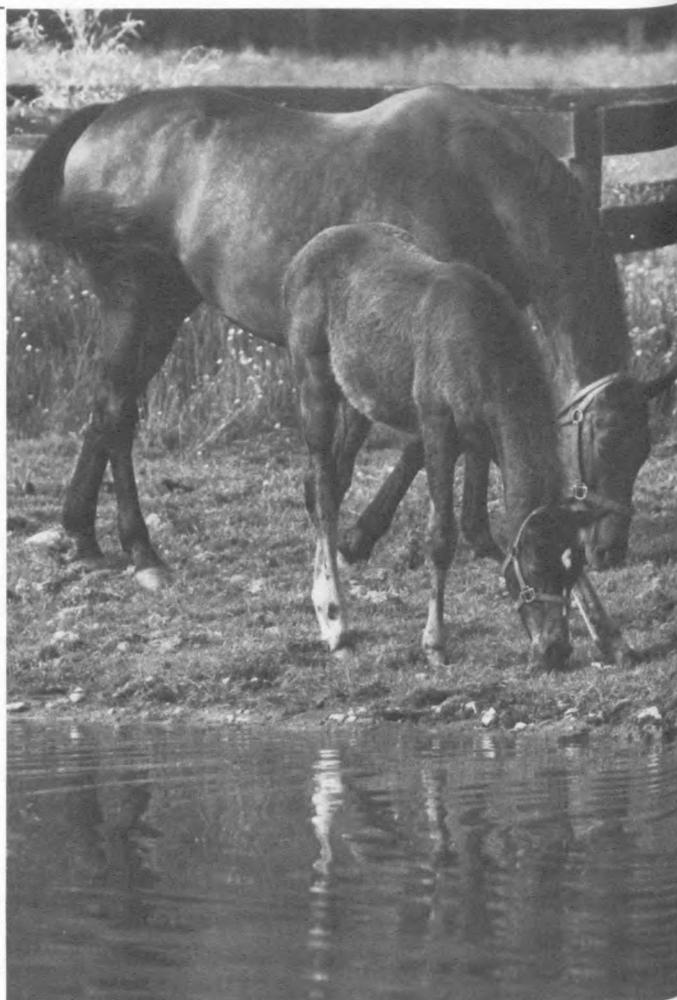
HEY DOC, MY FOAL IS SICK!

By Pamela Livesay-Wilkins '86
With Special Thanks to Dr. Patricia Tithof

"Hey Doc! My foal has colic, could you come right over?" Many horse owners are unaware of the thoughts that run through their veterinarian's mind when these words are heard over the telephone, usually at rather odd hours of the day or night. Your veterinarian is generating a "Differential Diagnosis", a list of the many etiologies (causes) of colic in young horses. Colic is not just one disease. It is abdominal pain that can arise from a seemingly endless list of separate disease entities.

Colic in foals can be a diagnostic dilemma and your veterinarian will need your help to determine the most probable etiology and institute appropriate therapy as rapidly as possible. Many colics can be traced to problems related to parasites, management or anatomic predisposition, so the largest contribution you can make is to provide your veterinarian with a history that is as accurate as possible. The history you give can rapidly shrink the differential to a reasonable size.

One of the most important factors to consider is the age of the foal and its breed. If the foal was born normal and begins to show signs of colic within 24 hours to several days after birth, your veterinarian will consider diseases such as: a ruptured urinary bladder (especially in male foals), meconium impaction, congenital malformations, functional problems, or an infectious enteritis such as salmonellosis or *Corynebacterium equi* enteritis resulting from a failure of passive immunity transfer due to inadequate colostrum intake. If the colic develops in the foal at weaning, pyloric stenosis or duodenal stricture either congenital or secondary to gastroduodenal ulceration will be on the differential, as these narrowings of the intestine prevent or inhibit passage of the now solid ingesta through the foal. Young horses



are also more susceptible to intestinal accidents such as small intestinal volvulus, jejuno-jejunal intussusception and ileo-cecal intussusception than are older horses, so these entities (which require surgical intervention) will also be considered.

Your veterinarian will want to know the following : how long the foal has been sick, how the illness has progressed, if the foal received adequate colostrum, if the birth was normal, what kind of parasite control program you have, if the foal has been wormed recently, how and what you feed the foal, if the foal or any other horse at the same stable has had colic recently, what the foal's bowel and urinary habits are and if they have changed. This history should be as accurate and as honest as possible; if it is not, diagnosis and treatment can be delayed or inappropriate for the foal's actual condition. For example, foal colics that



begin suddenly and worsen rapidly are more likely to require surgery than those that develop slowly and are more mild. Mild, chronic, recurrent colic in foals is often due to parasites such as Strongylus vulgaris, Parascaris equorum and the Anaplocephala species. Although more severe colic such as thromboembolic colic due to Strongylus vulgaris or impaction colic due to Parascaris equorum following worming can also occur.

The veterinarian will want to physically examine the foal before any medications are administered, so if you have treated the foal with anything, it is important to inform your veterinarian. Treatment with potent analgesics (ie. Banamine) will alter physical findings and mislead your veterinarian if he or she is unaware of the treatment.

The rectal examination, to determine if any portion of the intestinal tract is distended or not in its normal place, cannot be performed in foals. They are simply too small. Instead your veterinarian will want to know if the abdomen is distended more than what is normal for that foal. He or she will listen to the abdomen to determine if intestinal motility is normal. Simultaneous auscultation with a stethoscope and percussion will aid in determining if there is excess gas or fluid in the abdomen. A nasogastric tube will be passed to relieve any distention of the stomach due to gas or fluid. If the colic is severe, your veterinarian may perform an abdominal tap, which involves tapping the abdomen with a needle or cannula to withdraw fluid. Changes in this abdominal fluid from normal can be a great diagnostic aid and help your veterinarian determine if the colic requires surgical correction. The foal will be examined for hernias that can trap sections of intestine and create an obstruction. Once the physical exam is complete, the veterinarian has, hopefully, sufficient information to begin to classify the colic. He or she is aware of any abnormality in the foal's vital signs, hydration status, intestinal motility, and cardiovascular system;

the veterinarian has an accurate history and the differential has been narrowed considerably since your initial phone call.

Colics are classified as functional, simple obstruction, or strangulation obstruction colics. The functional colics are generally managed medically, at least initially, and most colics are functional. These colics include spasmodic, impaction, and flatulent colic, in addition to diseases such as peritonitis and enteritis. While these entities usually respond quite well to medical management, the foal needs to be watched closely as impaction and flatulent colics may have to be relieved surgically if they are very prolonged.

Simple intestinal obstruction can be life-threatening due to metabolic problems such as dehydration and shock. This can be especially frightening in a young foal and requires immediate attention, frequently involving surgical removal of the obstruction. In strangulation obstruction the blood supply to a portion of the intestine is abolished. These foals are sick, and require careful surgical and medical management.

This should illustrate the problems your veterinarian faces in diagnosing and treating foals with abdominal pain. The next time you call in a foal colic to your veterinarian, keep in mind the important part you can play in getting your foal the most rapid and the best veterinary attention it can have! Give an accurate and complete description of the problem to your veterinarian. Remember, colic is not just one disease!

Pamela Livesay-Wilkins, '86 is a third year DVM student interested in equine pediatrics. She is spending her summer researching uterine physiology and writing her senior seminar on premature foals.



EQUINE ROUNDS

SURGERY & YOUR "COLICKY" HORSE

By Susan Coggins '87

With Special Thanks to Dr. Susan Fubini

Almost every horse owner sooner or later will be faced with the problem of a "colicky" horse. It is important to remember that "colic" is a sign - not a specific disease condition. There are many diseases which can cause signs of abdominal pain. Fortunately most of these resolve with conservative medical treatment, but a horse should be reexamined if the abdominal pain fails to respond promptly to medical treatment. In some cases, abdominal surgery may be necessary to correct the problem.

Transporting a horse with a possible surgical colic to appropriate facilities often means a long distance trip. There are some precautions which, if followed, can help the horse arrive at his destination in the best possible condition. It goes without saying that the horse should be transported as quickly and safely as possible. Prior to loading, your veterinarian may give the horse a painkiller and provide you with extra filled syringes to be administered en route should the horse again become painful. It is recommended that the horse be shipped with a nasogastric tube in place to provide an outlet for excessive fluids and prevent possible distention and fatal rupture of the stomach. Legs should be well wrapped to prevent the horse from cutting his own legs with his hooves if he goes down in the trailer. A horse in great pain may sweat profusely and every effort should be made to keep him as dry as possible. Use extra blankets, towels, or an anti-sweat sheet between the horse and his blanket. Be sure to call ahead to inform the clinic of your estimated time of arrival. If you're traveling a long distance, it is also advisable to call the clinic again ½ hour before arrival. Last but by no means least, someone traveling with the horse should be prepared to give a thorough history. This includes the duration and progression of the current illness, all



medications and treatments prescribed, and the horse's response to them. Additionally, information on previous episodes of colic, deworming history, and diet are helpful.

When a colic case arrives at the Large Animal Clinic of the New York State College of Veterinary Medicine, a team consisting of 2-3 veterinarians, senior students and nurse technicians begin working on the animal. While a history is obtained and the paper work begun, an assessment of the horse's pain and immediate needs is made. Intravenous fluid therapy is started to maintain hydration and counteract shock. Analgesics are given as needed to control pain while blood and abdominal fluid are submitted to the clinical pathology laboratory. If not already in place, a stomach tube will be passed to check for accumulation of fluid in the stomach. Large amounts of fluid in the stomach may indicate an obstruction in the pylorus or small intestine. Blood laboratory values will be continually monitored for signs of shock and metabolic disturbances, meanwhile tests on abdominal fluid will show if there is an inflammatory process in the abdomen due to a gastrointestinal disorder. Based on the judgment of the attending veterinarians and laboratory results, antibiotic treatment is started.

When the horse is quiet and adequately restrained, a rectal examination is done. Amount and characteristics of feces in the



rectum are noted. The abdominal organs are palpated carefully for any distended bowel, abnormal masses, tight mesentery, and intestinal displacements.

The horse's vital signs and hydration status are monitored continuously as are mucous membrane color, capillary refill time, and peripheral pulse quality. The horse's abdomen is listened to with a stethoscope to determine whether gastrointestinal sounds are abnormal or absent. When the horse has been examined and stabilized as well as possible, a decision regarding treatment must be made. Signs which indicate that surgery may be necessary include:

- 1) Unrelenting pain which does not respond to analgesics
- 2) A heart rate which is over 60 and continuing to rise
- 3) Gastric distention as evidenced by spontaneous reflux of fluid through the nostrils or a nasogastric tube
- 4) Abnormal rectal examination findings giving evidence of obstruction or space occupying lesions in the small or large intestine
- 5) Serosanguinous or amber-colored abdominal fluid

The decision is not always easy or clear cut, but if findings indicate that surgery is the treatment of choice, it is important that surgery be done as soon as the animal is stabilized to increase the likelihood of a successful outcome. Survival rate is directly related to the time span between onset of signs and surgical intervention.

Colics in which surgery is indicated include those caused by strangulation obstruction of the gut, those due to simple obstruction with progressive deterioration of the patient, and functional colics which do not respond within a reasonable length of time to conservative therapy. Colics with an acute onset and rapid course are more likely to require surgery than those with slow onset and progression.

AFTER COLIC SURGERY

The period immediately following surgery is critical and the medical management is intensive. The horse will be maintained on intravenous fluid therapy for as long as necessary. Food and water will be withheld in most instances until the gastrointestinal tract regains some motility. When started on feed the patient's diet will consist of laxative feeds such as green grass, alfalfa hay, and bran mashes. Antibiotics may be given to combat infection, and analgesics and anti-inflammatory drugs will be administered as necessary. Stall rest with handwalking for the first 4 post-operative weeks is advised and strenuous exercise should not be resumed for at least 3 months.

Even under the best possible circumstances, complications following abdominal surgery in the horse are not uncommon. The possibility of wound infection or peritonitis exists. Temporary loss of intestinal motility (ileus) often occurs in horses following abdominal surgery and may be persistent and severe. Ileus must be handled with aggressive medical treatment. As healing progresses, adhesions between the gut and the abdominal wall may form. These can be painful and may cause future episodes of colic.

The overall survival rate for colic surgery is approximately 60%, the rate being significantly lower for strangulation obstruction and much more favorable (80%) for simple obstruction. It must be remembered that many horses presented for surgery are already in shock and suffering from severe metabolic abnormalities which necessitate a poor prognosis. Nevertheless, with modern medical, surgical and anesthetic techniques, many of these horses can be saved.

Susan Coggins, '87 has a special interest in horses and is considering equine practice after graduation.



EQUINE ROUNDS

A Newsletter for Horsepeople

New York State College of Veterinary Medicine
Cornell University
Ithaca, NY 14853

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Large animal soft tissue surgery, in particular abdominal surgery, is Dr. Fubini's special interest. With Dr. John Cummings and Dr. Rory Todhunter, she is conducting research on the prevention of postneurectomy neuromas. This summer she plans to begin a study, in cooperation with surgery resident Dr. Jill Parker on the use of heparin in the prevention of intra-abdominal adhesions.

OUR GUEST EDITOR: Equine Rounds is pleased to have **Susan Fubini, DVM**, as this issue's guest editor. Dr. Susan Fubini is a 1980 graduate of the University of Georgia College of Veterinary Medicine. After receiving her DVM degree, she accepted an internship in large animal medicine and surgery at the New York State College of Veterinary Medicine, followed by a residency in large animal surgery. She is currently Instructor for large animal surgery at the College.

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