

COLIC

PRIME TIME

Four common scenarios that increase your horse's colic risk

LUCILE VIGOUROUX, MSC

Colic. It's a dreaded word in the equine community. This broad term used to describe abdominal pain is the No. 1 killer of horses of all ages. It's also the top reason for an emergency vet call, note researchers on one study (Bowden et al., 2017). With the rapid decline it can cause and potentially fatal consequences, colic is not something veterinarians take lightly.

In this article we've partnered with two colic researchers to help you identify and navigate four situations that increase your horse's colic risk. Sarah Freeman, BVetMed, PhD, is a professor of veterinary surgery at the University of Nottingham's School of Veterinary Medicine and Science, in England. Her areas of interest include equine surgery and colic. Louise Southwood, BVSc, Dipl. ACVS, ACVECC, PhD, serves as a professor of large animal emergency and critical care at the University of Pennsylvania School of Veterinary Medicine, in Kennett Square. Her expertise lies in equine colic, the gut microbiome, and critical care. Let's dive in.

Scenario 1: Management Changes

For a long time we had little scientific insight behind the reasons horses colic. It

wasn't until 2019 that Freeman and her team published the first-ever systematic review quantifying risk factors for colic in adult horses—a massive undertaking that involved reviewing 52 publications and identifying the Top 22 risk factors for colic (see table on page 20).

To many seasoned horse owners it might not come as a surprise that the risk factor Freeman's team identified most frequently was change in management. Whether that involves their feed, caretaker, or stabling arrangement, horses' digestive tracts seem to respond poorly to change.

"We need to keep everything as consistent as possible and in a natural environment," says Freeman. "Five or six days of relatively intense exercise followed by one or two days of complete rest in a stall is a significant variation in routine. We



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can reduce that change by providing free turnout on the days the horses are not exercised and offering similar amounts of pasture access on days when in exercise compared to days of rest."

In a different study Freeman and her team looked at the physical and social impact of moving pastured horses into a stable. She says they found changes in



Equine researchers have shown that colic is the top reason for an emergency veterinary visit.

living conditions came with:

- Reduced gut motility.
- Fewer and drier feces.
- Reduced water intake.
- Reduced movement.
- Lack of social interaction.

“These findings revealed how big of an impact common management changes

can have on equine health, especially digestive health,” she notes.

Regarding the lesser-known and unexpected colic risk factors identified in her study, Freeman takes the data with a grain of salt. In some of the studies evaluated, for instance, researchers found correlations between feeding a whole-grain

diet and an increased risk of colic, while others found the opposite: a decreased colic risk.

“Risk factors associated with management changes are often difficult to interpret, as there are multiple factors involved,” explains Freeman. For example, she isn’t convinced that exercising

a horse more than once a week is truly a significant risk factor for colic. “We only have data from one study, so the evidence is relatively weak. We need more studies showing similar findings before making assumptions.”

What does prevail across the board is the value of keeping things consistent and natural. Of course, some changes are unavoidable. Life happens, horses get sold, move to new barns, and must adapt. When change is necessary, the key is to use transition periods to introduce new elements gradually, mixing them with the old whenever possible. This is particularly important when introducing a new feed.

Scenario 2: Dehydration

Horse owners are well-known for worrying about their horses’ drinking habits when temperatures drop and water troughs freeze—a justified concern, given proper water intake is necessary to ease the passage of grass, hay, and feed through the gut. If your horse does not have access to a fresh water source or does not drink enough water voluntarily, he could end up with an intestinal blockage and impaction colic.

Colic cases very often arrive at the hospital dehydrated, requiring intravenous (IV) fluids. It begs the question: Does

Does the Weather Cause Colic?

“Temps are dropping 20 degrees tonight, let’s feed them a mash,” is a phrase commonly heard at horse farms. Anecdotally, equestrians have long believed drastic weather changes can make their horses colic. So far, science has failed to confirm this. While work in this domain remains limited, researchers have not found significant correlations between weather parameters and colic.

For example, in their 2021 study looking at more than 3,000 equine “medical events,” Cianci et al. found no correlation between barometric pressure and colic incidence. They did, however, identify a seasonal influence, with horses being more likely to colic in the spring, summer, and fall. In a 2019 study Ferriola et al. tracked 100 horses over one year and found no increased risk of colic with temperature, humidity, and barometric pressure changes. The researchers did find that colic occurs significantly more frequently during the waxing gibbous and full moon phases of the lunar cycle.

More research is needed to fully understand potential effects of climatic and atmospheric factors on equine colic. In the meantime, it’s never a bad idea to encourage proper hydration at all times, especially during extreme weather changes.—*Lucile Vigouroux, MSc*

the dehydration cause the colic, or does the colic cause the dehydration? Is it a vicious cycle?

“It depends,” says Freeman. “Horses with colic caused by intestinal strangulations and those related to diarrhea develop dehydration as a result of fluid loss through the gastrointestinal tract. Intestinal twists, for example, can rapidly develop severe fluid imbalances due to damaged or dying intestine.”

Other times, the narrative is reversed. “Impactions may have dehydration as

an underlying cause, but the impaction will suppress drinking and cause further fluid imbalance, both of which worsen the dehydration,” Freeman continues. “Food blockages also disturb the normal fluid secretion and reabsorption in the intestines. These cases, therefore, do turn into a vicious cycle of colic and dehydration.”

Scenario 3: Gut Microbiome Disturbance

The horse’s intestines—just like ours—are populated with trillions of beneficial bacteria, viruses, and fungi, collectively known as the gut microbiome. Changes in diet and stress (from travel, competition, etc.) seem to throw the gut microbiome out of whack. This again points to the larger change-in-management risk factor that increases colic risk. When the delicate balance of the gut microbiome is disturbed, all sorts of health issues—including colic—can ensue.

“It takes time for the horse’s gut physiology and microbiota to adapt to new forage and the microbiomes it contains,” says Freeman. “Our research suggests that the gut physiology needs at least two weeks to adapt to a change in diet. This all goes back to management, and the focus should be on a gradual feed transition.”

Southwood adds that the exact pathophysiological link between gut microbiome disturbances and colic is something she and other scientists are still trying to understand. New studies on the topic are constantly emerging.

Table 1: Risk factors for acute colic in the adult horse (adapted and simplified from Curtis et al., 2019)

Variable	Risk Factor
Concentrates	Concentrate intake of 2.5-5 (5.5-11 lbs) or > 5 kg/day ¹ ; more than one change in concentrate amount, type, or frequency of feeding within one year; change of concentrates within the past two weeks.
Hay	More than one change of hay within one year; change of hay within the past two weeks; feeding hay from round bales.
Caretaker	Having more than one caretaker.
Exercise	Being exercised more than once a week.
Pasture	Having access to four different pastures (versus a single pasture).
Water	Not having access to water; decreased water intake.
Housing	Change of housing within the past one to two weeks; increased duration of stabling; crib-biting or windsucking.

¹ Different studies have found different quantities associated with an increased risk of colic.

Scenario 4: Postpartum

Eleven percent of all mares that deliver a foal experience colic shortly after (Salem et al., 2019). Scientists have long suspected postpartum colic episodes are tied to

gut microbiome changes that occur naturally during and shortly after the birthing process. But they have not confirmed this theory. In recent studies, including one in which researchers examined fecal samples

of broodmares from the last three weeks of pregnancy until seven weeks postpartum, they concluded that fecal microbiota remains relatively stable and functional throughout the periparturient (around the time of foaling) period. Any variations were deemed to be associated with individual mare flora. What causes mares to colic after foaling, then?

There are likely several reasons. Large colon volvulus (twisting) is a common presentation, accounting for 36% of all postpartum colic cases (Salem et al., 2019). Broodmares are 13 times more likely than other horses to develop the condition (Suthers et al., 2012). Vets believe the high prevalence is associated with the many management changes that usually accompany the postpartum period—notably, diet changes as the mare switches from gestating to lactating overnight, with caretakers meeting her all-time-high energy demands largely with concentrates. Changes in diet and large amounts of concentrates are known risk factors for gut microbiome disturbance and colic. Therefore, our sources say an indirect correlation between the postpartum period and colic in broodmares likely exists, with the direct link being changes in management and diet.

Reducing Colic Risk Through Management

Given our management practices’ potential to increase or reduce colic risk, Southwood has come up with a list of



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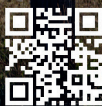
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top husbandry recommendations to keep a horse's gut happy and healthy:

- Increase pasture time, and reduce time spent in a stall.
- Avoid access to sand and gravel, which the horse can inadvertently consume, causing accumulation the gut and leading to large colon impaction colic or problems with recurrent colic.
- Feed good-quality hay.
- Minimize feeding concentrates when possible. Forage should make up the bulk of the diet. If your horse doesn't need the extra calories from concentrates, you should instead feed

a fortified ration balancer to meet his vitamin and mineral needs.

- Provide ad libitum access to clean water that does not freeze in winter.
- Design a parasite management plan in consultation with your veterinarian to include strategic anthelmintic administration. Heavy internal parasite burdens can cause many health problems, including colic.
- Provide regular dental care by a qualified equine dentist. Inadequate chewing can allow large food boluses to make their way into the intestines, resulting in a blockage.

Final Thoughts

Sometimes when a horse suffers from colic, it's due to factors entirely beyond our control. In many other cases we can prevent colic episodes by adopting management practices known to promote digestive health. Review your horse's living conditions, diet, and routine, and ask yourself, "Am I doing everything in my power to keep his gut healthy?" If you see room for improvement, have a conversation with your barn manager and veterinarian. You could save yourself heartache and financial strain down the road. 🐾

Altren® (altrenogest)

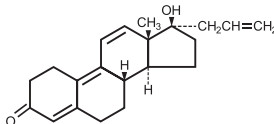
SOLUTION 0.22% (2.2 mg/mL)

CAUTION:

Federal law restricts this drug to use by or on the order of a licensed veterinarian.

DESCRIPTION:

Altren® (altrenogest) Solution 0.22% contains the active synthetic progestin, altrenogest. The chemical name is 17 α -allyl-17 β -hydroxyestra-4,9,11-trien-3-one. The CAS Registry Number is 850-52-2. The chemical structure is:



Each mL of Altren® (altrenogest) Solution 0.22% contains 2.2 mg of altrenogest in an oil solution.

ACTIONS:

Altren® (altrenogest) Solution 0.22% produces a progestational effect in mares.

INDICATIONS:

Altren® (altrenogest) Solution 0.22% is indicated to suppress estrus in mares. Suppression of estrus allows for a predictable occurrence of estrus following drug withdrawal. This facilitates the attainment of regular cyclicity during the transition from winter anestrus to the physiological breeding season. Suppression of estrus will also facilitate management of prolonged estrus conditions. Suppression of estrus may be used to facilitate scheduled breeding during the physiological breeding season.

CONTRAINDICATIONS:

Altren® (altrenogest) Solution 0.22% is contraindicated for use in mares having a previous or current history of uterine inflammation (i.e., acute, subacute, or chronic endometritis). Natural or synthetic gestagen therapy may exacerbate existing low-grade or "smoldering" uterine inflammation into a fulminating uterine infection in some instances.

PRECAUTIONS:

Various synthetic progestins, including altrenogest, when administered to rats during the embryogenic stage of pregnancy at doses manifold greater than the recommended equine dose caused fetal anomalies, specifically masculinization of the female genitalia.

DOSAGE AND DIRECTIONS:

While wearing protective gloves, remove shipping cap and seal; replace with enclosed plastic dispensing cap. Remove cover from bottle dispensing tip and connect luer lock syringe (without needle). Draw out appropriate volume of Altren® solution. (Note: Do not remove syringe while bottle is inverted as spillage may result.) Detach syringe and administer solution orally at the rate of 1 mL per 110 pounds of body weight (0.044 mg/kg) once daily for 15 consecutive days. Administer solution directly on the base of the mare's tongue or on the mare's usual grain ration. Replace cover on bottle dispensing tip to prevent leakage. Excessive use of a syringe may cause the syringe to stick; therefore, replace syringe as necessary.

DOSAGE CHART:

Approximate Weight in Pounds	Dose in mL
770	7
880	8
990	9
1100	10
1210	11
1320	12

WHICH MARES WILL RESPOND TO ALTREN® (altrenogest) SOLUTION 0.22%:

Extensive clinical trials have demonstrated that estrus will be suppressed in approximately 95% of the mares within three days; however, the post-treatment response depended on the level of ovarian activity when treatment was initiated. Estrus in mares exhibiting regular estrus cycles during the breeding season will be suppressed during treatment; these mares return to estrus four to five days following treatment and continue to cycle normally. Mares in winter anestrus with small follicles continued in anestrus and failed to exhibit normal estrus following withdrawal.

Response in mares in the transition phase between winter anestrus and the summer breeding season depended on the degree of follicular activity. Mares with inactive ovaries and small follicles failed to respond with normal cycles post-treatment, whereas a higher proportion of mares with ovarian follicles 20 mm or greater in diameter exhibited normal estrus cycles post-treatment. Altrenogest Solution 0.22% was very effective for suppressing the prolonged estrus behavior frequently observed in mares during the transition period (February, March and April). In addition, a high proportion of these mares responded with regular estrus cycles post-treatment.

SPECIFIC USES FOR ALTREN® (altrenogest) SOLUTION 0.22%:

SUPPRESSION OF ESTRUS TO:

- Facilitate attainment of regular cycles during the transition period from winter anestrus to the physiological breeding season. To facilitate attainment of regular cycles during the transition phase, mares should be examined to determine the degree of ovarian activity. Estrus in mares with inactive ovaries (no follicles greater than 20 mm in diameter) will be suppressed but these mares may not begin regular cycles following treatment. However, mares with active ovaries (follicles greater than 20 mm in diameter) frequently respond with regular post-treatment estrus cycles.
- Facilitate management of the mare exhibiting prolonged estrus during the transition period. Estrus will be suppressed in mares exhibiting prolonged behavioral estrus either early or late during the transition period. Again, the post-treatment response depends on the level of ovarian activity. The mares with greater ovarian activity initiate regular cycles and conceive sooner than the inactive mares. Altren® (altrenogest) Solution 0.22% may be administered early in the transition period to suppress estrus in mares with inactive ovaries to aid in the management of these mares or to mares later in the transition period with active ovaries to prepare and schedule the mare for breeding.
- Permit scheduled breeding of mares during the physiological breeding season. To permit scheduled breeding, mares which are regularly cycling or which have active ovarian function should be given Altren® (altrenogest) Solution 0.22% daily for 15 consecutive days beginning 20 days before the date of the planned estrus. Ovulation will occur 5 to 7 days following the onset of estrus as expected for non-treated mares. Breeding should follow usual procedures for mares in estrus. Mares may be regulated and scheduled either individually or in groups.

ADDITIONAL INFORMATION:

A 3-year well controlled reproductive safety study was conducted in 27 pregnant mares, and compared with 24 untreated control mares. Treated mares received 2 mL altrenogest solution 0.22%/110 lb body weight (2x dosage recommended for estrus suppression) from day 20 to day 325 of gestation. This study provided the following data:

- In filly offspring (all ages) of treated mares, clitoral size was increased.
- Filly offspring from treated mares had shorter interval from Feb. 1 to first ovulation than fillies from their untreated mare counterparts.
- There were no significant differences in reproductive performance between treated and untreated animals (mares & their respective offspring) measuring the following parameters:
 - interval from Feb. 1 to first ovulation, in mares only.
 - mean interovulatory interval from first to second cycle and second to third cycle, mares only.
 - follicle size, mares only.
 - at 50 days gestation, pregnancy rate in treated mares was 81.8% (9/11) and untreated mares was 100% (4/4).
 - after 3 cycles, 11/12 treated mares were pregnant (91.7%) and 4/4 untreated mares were pregnant (100%).
 - colt offspring of treated and control mares reached puberty at approximately the same age (82 & 84 weeks respectively).
 - stallion offspring from treated and control mares showed no differences in seminal volume, spermatozoal concentration, spermatozoal motility, and total sperm per ejaculate.
 - stallion offspring from treated and control mares showed no difference in sexual behavior.
 - testicular characteristics (scrotal width, testis weight, parenchymal weight, epididymal weight and height, testicular height, width & length) were the same between stallion offspring of treated and control mares.

REFERENCES:

Shoemaker, C.F., E.L. Squires, and R.K. Shideler, 1989. Safety of Altrenogest in Pregnant Mares and on Health and Development of Offspring. Eq. Vet. Sci. (9); No. 2: 69-72.
Squires, E.L., R.K. Shideler, and A.O. McKinnon, 1989. Reproductive Performance of Offspring from Mares Administered Altrenogest During Gestation. Eq. Vet. Sci. (9); No. 2: 73-76.

WARNING:

For oral use in horses only. Keep this and all other medications out of the reach of children. Do not use in horses intended for human consumption.

HUMAN WARNINGS:

Skin contact must be avoided as Altren® (altrenogest) Solution 0.22% is readily absorbed through unbroken skin. Protective gloves must be worn by all persons handling this product. Pregnant women or women who suspect they are pregnant should not handle Altren® (altrenogest) Solution 0.22%. Women of child bearing age should exercise extreme caution when handling this product. Accidental absorption could lead to a disruption of the menstrual cycle or prolongation of pregnancy. Direct contact with the skin should therefore be avoided. Accidental spillage on the skin should be washed off immediately with soap and water.

INFORMATION FOR HANDLERS:

WARNING: Altren® (altrenogest) Solution 0.22% is readily absorbed by the skin. Skin contact must be avoided; protective gloves must be worn when handling this product.

Effects of Overexposure

There has been no human use of this specific product. The information contained in this section is extrapolated from data available on other products of the same pharmacological class that have been used in humans. Effects anticipated are due to the progestational activity of altrenogest.

Acute effects after a single exposure are possible; however, continued daily exposure has the potential for more untoward effects such as disruption of the menstrual cycle, uterine or abdominal cramping, increased or decreased uterine bleeding, prolongation of pregnancy and headaches. The oil base may also cause complications if swallowed.

In addition, the list of people who should not handle this product (see below) is based upon the known effects of progestins used in humans on a chronic basis.

PEOPLE WHO SHOULD NOT HANDLE THIS PRODUCT:

- Women who are or suspect they are pregnant.
- Anyone with thrombophlebitis or thromboembolic disorders or with a history of these events.
- Anyone with cerebral-vascular or coronary-artery disease.
- Women with known or suspected carcinoma of the breast.
- People with known or suspected estrogen-dependent neoplasia.
- Women with undiagnosed vaginal bleeding.
- People with benign or malignant tumors which developed during the use of oral contraceptives or other estrogen-containing products.
- Anyone with liver dysfunction or disease.

Accidental Exposure

Altrenogest is readily absorbed from contact with the skin. In addition, this oil based product can penetrate porous gloves. Altrenogest should not penetrate intact rubber or impervious gloves; however, if there is leakage (i.e., pinhole, spillage, etc.), the contaminated area covered by such occlusive materials may have increased absorption. The following measures are recommended in case of accidental exposure.

Skin Exposure: Wash immediately with soap and water.
Eye Exposure: Immediately flush with plenty of water for 15 minutes. Get medical attention.

If Swallowed: Do not induce vomiting. Altren® (altrenogest) Solution 0.22% contains an oil. Call a physician. Vomiting should be supervised by a physician because of possible pulmonary damage via aspiration of the oil base. If possible, bring the container and labeling to the physician.

Store upright at or below 25° C (77° F). Reclose tightly.

HOW SUPPLIED:

Altren® (altrenogest) Solution 0.22% (2.2 mg/mL). Each mL contains 2.2 mg altrenogest in an oil solution. Available in 150 mL and 1000 mL plastic bottles.

Manufactured by:
Aurora Pharmaceutical, Inc.
Northfield, Minnesota 55057

Approved by FDA
under ANADA # 200-620



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