The foaling season is upon us and, with it, all the anxieties that culminate after waiting 11 months for the mare to foal. A significant amount of time, effort, money and emotion goes into the decisions around breeding the mare and after the initial pregnancy confirmations, we are often just left crossing our fingers that all will go well as the fetus grows, and then enters the world, and then continues to grow and develop as a young, promising new horse. Happily, most of the time, things go as planned. But sometimes they do not, and when they go wrong, they can go horribly wrong. This article will discuss some of the problems that can happen to the mare towards the end of gestation, or following shortly after the foaling event.

**Prevention**

Even though complications are not common, because problems in late gestation or following foaling are often serious when they do occur, it is wise and prudent to monitor broodmares carefully in order to catch warning signs that can allow us to intervene before the situation becomes too dire. As the owner of broodmares, you can do some relatively simple things to screen for impending problems.

1. Visually check your mare’s mammary glands daily, starting around eight months gestation. It takes about 30 seconds to take a peek at the mare’s udder and confirm that nothing is changing prematurely. An early warning sign of impending abortion in the mare is the premature development of the mammary glands—she starts to “bag up” before you would expect. Normally mares will not develop significant mammary tissue until about a week before they are ready to foal, and that normally is after about 330 days of gestation, at the earliest. If you notice that your mare’s udder seems to be enlarging, and especially if there is any discharge or whitish, waxy substance on the teats (Figure 1), you should call your veterinarian immediately to come out and evaluate the pregnancy.

2. Visually check your mare’s vulva daily, again starting around eight months gestation. One of the most common reasons for a broodmare to abort her pregnancy in late gestation is an infection of the placenta (“placentitis”). Most of these infections occur as a result of bacteria ascending from the outside environment, through the vagina and cervix. These infections will result in a discharge of pus through the cervix that will be seen exiting the vulva. You may notice this as either active pus, or dried on the area surrounding the vulva. Be a little bit careful about this because urine in horses contains a large amount of minerals (especially calcium) that can also result in a whitish, dried, powder-like substance around the vulva and flanks of some mares. How would you tell the difference? Smell it. Rub a little off with your fingers and smell it. If it is dried urine, it will smell like, well … horse urine. Dried pus will smell worse. If you’re still not sure, it’s worth asking your veterinarian to have a look. Better safe than sorry. Placentitis, if caught early enough, can often be successfully treated (more on that later).

3. Do your best to be there to witness the foaling. Even though most mares foal normally without help, if there is a problem, it will be imperative to the life of the foal and health of the mare that intervention happens quickly. The trick, since most mares will foil in the middle of the night, is knowing when to be there. Once the mare does start developing her mammary tissue, assuming she is appropriately close to her due date (usually within ten days), start monitoring the mineral content of her mammary secretions (the “milk”—early secretions—are actually not milk at all, and will not become true milk until a day or two after foaling). As

"Figure 1. Usually anywhere from a week to a day before foaling, a broodmare will develop mammary tissue (start to “bag up”) and may start developing a waxy secretion on the teats."
the mare gets close to foaling, the composition of her mammary secretions changes. One of the significant changes is that calcium in those secretions increases tremendously. There are a number of commercial kits you can purchase to measure the calcium concentrations in the mammary secretions. Some are essentially hard water test strips. As calcium increases, the number of squares that change color in the test increase. The Predict-A-Foal test (by Animal Healthcare) is a popular example of this kind of test. Depending on the number of squares that turn color, it gives you a likelihood that the mare will foal that night. Another option is the FoalWatch test (by ChemMetrics) that actually measures the calcium directly in the mammary secretions and gives you an actual, quantitative numerical measurement (it tells you the parts per million of calcium). As with the earlier test, a likelihood that the mare will foal that night is assigned to different numerical values. Both of these tests are fairly reliable for predicting when the mare will NOT foal. In other words, if the number of squares, or the numerical value, is very low, chances are very high that tonight is a safe night for you to sleep and not worry about the mare foaling. Once the numbers, or squares, rise above a certain point, then you had better have a method of checking the mare every 30 minutes, or have a Foal-Alert™ system in place to wake you up if the mare starts foaling. But it could be that night, or the next, or the next ... In any case, being there to observe is important. Most of the time it will all go well and you will still be glad to be there, because it's a miracle to witness, every time.

4. Make sure that during and after foaling a few important milestones happen:

a. First you should see one hoof, followed right after by a second hoof, and then the nose of the foal right after that. These may be covered in a whitish membrane (the amnion). If that is not what you see, you should call your veterinarian immediately. The foal should be born relatively quickly, usually within 20 to 30 minutes from start to finish.
b. The umbilical cord will break on its own. Do not cut it!
c. Remember the 1-2-3 guideline: The foal should stand within one hour, nurse within two hours, and the placenta should pass within three hours.
   i. Make sure that the foal is truly nursing, latching on and sucking.
   ii. Set the placenta aside in a bag or bucket for your veterinarian to examine the next day.
   iii. Have your veterinarian come out to conduct a new-foal exam and post-foaling exam on the mare.

Following these preventative guidelines should help you get your veterinarian involved as soon as possible in cases when pregnancy or foaling are not progressing as they normally should. The following conditions are some of the problems sometimes encountered in broodmares in late gestation or shortly after foaling:

**Placentitis**

Placentitis is inflammation of the placenta and is the most common reason for pregnancy losses in mares. Usually, placentitis is due to bacterial infection, though sometimes, it may be caused by a fungal infection. Early warning signs, discussed above, usually include premature mammary development and sometimes a pus-like discharge from the vulva. If caught early enough, treatment with antibiotics, anti-inflammatory drugs, and progestagens (such as Regumate®) can often allow the mare to maintain her pregnancy long enough to deliver a viable foal. Even if the mare does not keep the pregnancy

Figure 2. Late gestational aborted twins. Live twins are very rare in horses and, when they occur, are usually unthrifty and small. Twin pregnancies can be easily avoided by having the veterinarian evaluate all broodmares two weeks after ovulation.

**Figure 3.** Hydrops mare. The abnormally large abdomen, even for a late-term pregnant broodmare, is caused by an abnormally large accumulation of fluid within the uterus. These mares need veterinary attention as they will be uncomfortable and will go into shock when they foal, due to excessive fluid loss.
until what we would normally consider full-term, some placentitis foals (in a strangely fortuitous twist of nature) are able to survive without intensive care even though they are born, technically, premature. Without treatment, mares usually abort the pregnancy.

**Twins**

Another relatively common reason for late-term pregnancy loss is abortion due to twins (Figure 2), which also often presents first as premature mammary development. This is a particularly frustrating condition, because with ultrasound technology available to every equine veterinarian today, twinning in mares is completely and easily avoidable. Having your mare evaluated for pregnancy within 14 days after she has ovulated will allow your veterinarian to detect a twin pregnancy and efficiently reduce one of the twins while sparing the other one. This technique results in a single, healthy foal being born more than 90% of the time (the other 10%, both twins are lost and the breeding must be repeated).

**Hydrops**

Very rarely in horses, an abnormally large amount of fluid will accumulate within the uterus during late gestation. The abdomen of these mares will visibly become much larger than normal, even for late-term pregnant mares (Figure 3). It is possible for a normal foal to be born from a hydrops mare, although some foals in this condition are deformed or just not able to survive once they are born. Hydrops is usually a very uncomfortable situation for the mare, and can become dangerous. At the very least, the mare will be uncomfortable moving around with the increased weight. She is at a higher risk of rupturing her abdominal muscles. When she foals, whether naturally or induced, she will almost assuredly go into shock due to the immense loss of fluids. For all of these reasons, you must consult your veterinarian and the mare will need to have immediate IV fluids to compensate for the fluid loss when she foals, or she will go into shock and likely not survive. Treatment prior to foaling includes pain control, anti-inflammatory drugs, abdominal support and confinement. This condition is uncommon enough that we do not know how likely this is to repeat if a hydrops mare were to be bred again.

**Twisted Uterus**

If a mare shows signs of colic between seven and ten months of gestation, a twisted uterus should be a suspected cause. These mares are usually in great pain and will act very colicky. If the uterus is untwisted within a couple hours of the occurrence, the pregnancy may be saved. Surgical untwisting is often the best option for treatment. Mares may also be rolled under anesthesia, but this does not always work, and sometimes further complicates the situation, so it should only be used when surgery is not an option.

**Uterine Artery Rupture**

Blood vessels feeding the uterus are understandably very big during late gestation. During difficult births, sometimes one of these blood vessels is damaged and ruptures. If the vessel breaks open into the abdomen, it will bleed freely, faster than the mare’s ability to clot, and the mare will collapse and die very quickly and without much warning. If the bleeding is contained within the tissue of the ligaments around the reproductive tract, then the mare will not bleed to death, but will instead develop a very large and painful internal bruise (or “hematoma”). As long as the blood clot within the hematoma is contained within the ligament, the mare will likely survive. This is a painful condition and an affected mare will often show signs of colic. The mare’s reaction to the pain—incessantly rolling, etc.—may disrupt the clot and lead to sudden death. If the veterinarian finds the hematoma, the best recommendation will be to keep the mare quiet and confined for a couple of weeks while she heals. Blood counts should be monitored and sometimes blood transfusions are needed. If the ligament breaks open and the bleeding is allowed access to the much larger abdominal cavity, then the mare will continue on next page
collapse and die very quickly from blood loss. There is no good treatment for this condition except quiet confinement and pain control.

**Uterine Rupture**

Uterine rupture occurs when the foal sticks a foot through the uterus and into the abdomen during foaling. These mares usually show signs of colic within one to three days following foaling. The pain they experience is due to infection of the abdomen through the tear in the uterus. These tears are difficult to see with ultrasound and are usually diagnosed by directly feeling them inside the uterus or by tapping the mare's abdomen and finding signs of inflammation in the abdominal fluid. Treatment involves antibiotic and anti-inflammatory treatment, sometimes coupled with lavage (washing) of the abdomen, which is a surgical procedure. The tear in the uterus may need to be repaired if it is more than just a little one. The prognosis for the mare depends on the degree of infection she has in her abdomen, but with larger tears, the prognosis is poor.

**Uterine Prolapse**

Sometimes following a very difficult birth, the mare will continue to push after the foal is delivered due to residual pain and irritation. In these cases, the mare can push her uterus inside out (Figure 4). If a veterinarian is brought in very quickly to treat the mare, the prognosis can be very good. Treatment involves very patiently, and very carefully, massaging the uterus back inside the anesthetized mare. The veterinarian must take care not to push a finger through the uterus and it can take a long time before it seems that progress is being made. But with careful, calm persistence, the uterus can be put back in place and these mares can do very well and even remain fertile. This situation becomes very dangerous if a veterinarian is not able to quickly respond, because the uterine tissue will usually become damaged as it hangs outside the mare due to exposure to the outside environment and from being kicked and stepped on by the mare. While waiting for the veterinarian to arrive, it is helpful to try to keep the mare calm and, if safely possible, keep the prolapsed uterus moist and covered. Be cautious, however, because the mare may be distressed, sometimes kicking and abruptly lying down.

**Rectal Prolapse**

On rare occasions after a difficult foaling a mare may continue to strain and can push her rectum inside out. If only an inch or two prolapses, this may be replaced and the mare may recover. If more than a few inches

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**Figure 4.** Prolapsed uterus. This uterus is still fairly fresh, red, and clean, and therefore carries a good prognosis once it is replaced. The longer the uterus remains prolapsed without veterinary attention, the worse the prognosis.

**Figure 5.** Prolapsed rectum. This damage to the intestinal tract of this mare, with this degree of a prolapse, was too much for the mare to recover from and she was euthanized.

**Figure 6.** Rectovaginal tear. This occurs when a foal pushes a hoof through the ceiling of the vagina and through the floor of the rectum and then rips an opening as the foaling progresses. As ugly as it looks, prognosis for future fertility is good, after surgical repair.

**Figure 7.** Retained placenta. The fetal membranes remained attached in this mare after foaling. They should usually be shed by three hours post-foaling. If they are still in place six hours after foaling, it is considered an emergency and the veterinarian should be involved.
of rectum are pushed out (Figure 5), the damage to the intestinal tract is usually too severe for the mare to recover and euthanasia is usually the best option.

Perineal Lacerations
As the foal passes through the birth canal, it can push a hoof up through the roof of the vagina and into the rectum. These tears that cause the rectum and vagina to communicate can be very ugly and seem like they would destroy a mare’s future potential as a broodmare (Figure 6), but they actually can heal very well and usually do not affect the mare’s fertility. They should be surgically repaired, but not immediately following foaling when the tissues will be swollen and not likely to heal well if sutured together. It is usually recommended that the mare be brought to the veterinarian about a month or two after foaling for surgical reconstruction.

Retained Placenta
The placenta should pass from the mare within three hours of foaling. If this does not happen, your veterinarian should be contacted immediately (Figure 7). If the placenta remains attached more than six hours after foaling, your veterinarian should begin treating your mare. Treatments for retained placenta vary, but usually include antibiotics, anti-inflammatory agents, oxytocins and uterine lavage. The risk is that toxins from bacterial contamination, exacerbated by the abnormal uterine environment and the retained placenta, travel in the blood and cause inflammation of the lamina in the hooves (laminitis), and cause the mare to founder. If a light-breed mare is started on appropriate treatment around six hours post-foaling, or shortly thereafter, she usually has a good prognosis of recovery. Draft mares, unfortunately, are different. Draft mares are likely at higher risk simply because of the increased weight on their feet, compared to light-breed mares.

It is important for someone who is knowledgeable about equine placentas to evaluate every set of fetal membranes shed from a broodmare after foaling. Your veterinarian certainly can fill this role, or can train someone on your farm how to appropriately evaluate them. It is important to thoroughly evaluate every set of fetal membranes for completeness, because often just a piece of the placenta is retained. In these cases, you will notice the bulk of the placenta has come out, and may assume it is complete (without having actually examined them). But if a piece remains inside the mare’s uterus, she will become just as sick as if the entire placenta remained attached.

Being involved in horse breeding is lots of fun, and there’s nothing more rewarding or wondrous than a perfect, uncomplicated foaling. It may be a cliché, but it truly is a miracle to behold every time it happens. Happily, most of the time everything goes as planned. But when it doesn’t go as planned, it can go very badly, very fast. Hopefully the explanations in this article will help you be prepared to notice the warning signs and get your veterinarian involved as early as possible to give your mare, and the foal, the best chance of recovery and survival.