

The Care of Newborn Foals

By Dr Traci Hill Hulse, DVM

It is that wonderful time of year again. Spring. New life is here. Many owners spend lots of sleepless nights, with coffee, anticipating the arrival of a newborn foal. There are things you, the owner, should know to prepare for your foal's arrival and determine what is normal and what is not. I will outline what is normal, what you can do as an owner, and when to get a vet involved. Specifically, we'll cover normal pregnancy and foaling parameters, newborn foal exam, the importance of colostrum, risk factors associated with the mare and newborn foal, and common newborn foal diseases.

Pregnancy and Foaling

First, let's discuss pregnancy. Normal gestation length is 342 days. Typically, pregnancy less than 300 days results in a nonviable foal due to immaturity of the foal's organs, especially the lungs. A pregnancy less than 320 days is considered a premature foal. Signs of prematurity may include a silky coat, weak tendons, and a domed head. Some pregnancies can last 12 months or more. This can be normal. It is a good idea to keep a journal of your mare's history to know what is "normal" for her. As a rule, the more premature a foal is, the more at risk it is for getting sick and needing special attention. Typical foaling takes 20-30 minutes after the mare has "broken her water". If the birth is not progressing along within 20-30 minutes, a veterinarian should be called. The newborn should try to right itself (sternally) within five minutes of birth and respond to nasal stimulation (i.e. with a piece of straw in the nose) by coughing or sneezing. A suckle reflex should be present within 20 minutes of birth. This can be tested by placing a finger in the foal's mouth. The foal should attempt to stand within 30 minutes, and stand unassisted in one to two hours after birth. The foal should nurse within three hours. These parameters are considered "average" and slight variations may be considered acceptable, but major deviations are abnormal. When the foal is born, the owner should dip the navel with a dilute chlorohexidine dip (one part chlorohexidine to four parts water) or a 1-2% > >>iodine solution. This treatment should be repeated two to four times per day over the first three days of life. Do not use 7% iodine. This is contraindicated. It can scald the navel (and abdomen) causing the foal pain and may result in a patent umbilicus -- the exact opposite effect you are trying to achieve. For example, I have seen a 7% iodine treatment irritate the foal so much it became colicky and stopped urinating.

Normal Foaling Parameters

- Normal gestation 320-365 days
- Normal birth within 30 min. with no manipulation
- Sitting sternal within 5 minutes
- Suckle reflex within 20 minutes
- Standing within 2 hours
- Nursing within 3 hours
- Placenta normal

Newborn Exam

When examining the newborn foal it should be remembered that what is "normal" for a foal is very different from an adult. By definition, a newborn foal is no more than one-week-old. Normal temperature in a newborn foal is 99.5-102, higher than an adult horse. Foals do not regulate their body temperature very well for the first few days of life; therefore, it is important to provide them with proper protection against the weather depending on the outside weather conditions and environment.

A foal is considered hypothermic if its temperature is less than 99. Hypothermic foals will expend a lot of energy trying to keep themselves warm and can become weak very quickly. Moreover, intestinal motility will reduce markedly if the foal is cold. This can rapidly spiral the foal into a poor situation. The foal is cold. Its body is working hard, using lots of energy and calories, trying to keep its core temperature up. The foal becomes weak and stops nursing as much. The intestinal motility slows down even more; therefore, the foal isn't digesting milk and absorbing energy and calories. The foal becomes even colder, weaker and dehydrated, and rapidly deteriorates. This can happen in just a few short hours. Foals can become cold if they get wet or don't dry well after birth. An example is a foal born outside in the rain or in moist/cold conditions. Most newborns do not shiver due to their body's inability to respond properly to the outside temperature at this early time. Keeping the foal dry and warm is very important.

In a hot environment (i.e. Phoenix in the summer) a foal can rapidly become hyperthermic with a body temperature greater than 103. A foal can rapidly become heat stressed if it does not have shade. It will start hyperventilating to blow off extra heat. Again, because the newborn does not regulate its temperature well, they do not sweat in response to hot outside temperatures. Hyperventilating also expends a lot of energy and the foal can quickly become dehydrated. If the foal becomes extremely hyperthermic (temperature greater than 104) repeated cool water baths and shade should be implemented immediately. Do not confuse hyperthermia with a fever due to septicemia. Hyperthermia is a high body temperature associated with a high outside temperature. The foal is usually hyperventilating, but appears normal otherwise. A septic foal may have a fever, but its temperature usually is not as high as a hyperthermic foal. Septic foals will have other signs of illness, which may include diarrhea, weakness, decreased appetite, depression, and swollen joints or navel.

Normal heartrate (HR) for a foal is greater than 60 beats per minute (bpm). In Arizona, I typically see heartrates ranging from 80-120 bpm during the first day. An increased or decreased heartrate can indicate septicemia, stress, or dehydration. Normal respiration rate (RR) is greater than 30 breaths per minute, with the average RR about 60 breaths per minute. A foal should start passing its first feces (meconium) within three hours. The foal will pass multiple small piles of meconium. All of the meconium should be passed within 24 hours. The meconium is dark brown, firm fecal balls. If the foal is straining a lot, the owner can give a Fleet enema to help assist the foal. I typically will give a newborn foal an enema prophylactically to reduce straining and stress. After all of the meconium has passed, the foal will start to defecate a thick, pasty, orange colored feces. This is a good sign indicating that milk has made its way through the entire digestive tract.

Lax tendons are commonly found with newborn foals. This is when the muscle/tendon unit is weak resulting in low fetlocks and pasterns. This condition typically does not need veterinary attention. A day or two of confinement in a stall allows the foal's muscles to strengthen and "pulls" the tendons and associated fetlocks and pasterns up. Do not use bandages or splints for weak tendons as this will make the condition worse. On the other hand, contracted tendons may need veterinary attention depending on how severe it is. This is when the pasterns, fetlocks, and/or knees are extremely upright or buckled forward. The cause is usually due to malpositioning in the uterus. If the foal is mildly contracted, a few days of exercise and stretching in a small paddock will usually correct the problem. However, if it is severe, or if the foal cannot straighten its legs, a veterinarian should be contacted. Treatment may include standing bandages (which relax the tendons), and / or Oxytetracycline treatment. The drug Tetracycline binds calcium causing secondary relaxation of the muscle/tendon unit. If contraction is severe, this treatment may be repeated daily up to three days.

Colostrum

During the first 24 hours after giving birth, the mare produces a thick milk called colostrum. Colostrum is very important because it is rich in antibodies, protein and calories. The mare transfers her antibodies to the foal primarily through the colostrum, rather than through the placenta (like humans). These antibodies protect the foal against environmental diseases. These proteins are also called immunoglobulins or "IgG". They are very large in size. The foal's small intestine will only absorb these large proteins during the first 12-24 hours after birth. Consequently, after 24 hours, the only way a foal can absorb more immunoglobulins is by a plasma (intravenous) transfusion. It is recommended that a veterinarian check the foal's IgG levels within the first 12-16 hours after birth. Why is this important? These antibodies protect the foal against disease. Typically, a "good" IgG level is equal or greater than 800mg/deciliter (dl). An IgG level 400-800mg/dl is considered less than optimal. If this is determined at less than 24 hours of age, I recommend orally supplementing the foal with more colostrum (from the mare or saved frozen colostrum) or a commercial oral IgG (ex. Seramune or Lymphomune). This test is administered by a veterinarian and involves a blood sample. There are two variations of the test available. The first is sometimes called "Gamma-Check-E" just gives a general "high or low" reading but the results are available quickly, in about 5 minutes. The second method provides a specific IgG level but it takes over 12 hours to obtain those results. Frozen colostrum can be saved up to 1 year. It should be thawed in a hot water bath not a microwave.

If the IgG is checked after 24 hours old, then only a plasma transfusion can be given to increase the immunoglobulin levels. If IgG is less than 400 mg/dl, this is considered failure of passive transfer. I recommend giving a transfusion because the foal is at a higher risk for contracting an environmental disease. If IgG is 400-800mg/dl, this is partial failure of passive transfer. The decision to supplement the foal with plasma depends on farm management, finances, and whether there are any foal or mare risk factors (to be discussed next). If there are risk factors present, then I do recommend a plasma transfusion. If there is good farm management and no risk factors, then a transfusion is optional. If IgG is equal or greater than 800mg/dl, no treatment is needed.

Mare Risk Factors

The following are considered risk factors in the mare that may lead to problems in the newborn foal that may need veterinary attention:

- Mare has a history of foaling problems (septic foals, dystocia - difficult birth)
- Poor mammary gland development (i.e. from certain fescue grasses) oragalactia (no milk production)
- Poor colostrum quality or the mare leaks milk days before foaling
- Dystocia (difficult birth- the foal's eyes, body or placenta may be stained with meconium indicating a stressful birth)
- Red Bag (premature placental separation)
- Unhealthy placenta
- The mare had fever, sickness, or colic prior to foaling
- Purulent vaginal discharge prior to foaling
- Malnutrition
- Cesarean section

Foal risk factors

The following are considered risk factors in the foal that may lead to problems and need veterinary attention.

- Foal doesn't stand or nurse within normal time period
- Lack of suckle or poor affinity for mare --Neonatal Maladjustment Syndrome (NMS)
- Colic
- Diarrhea (don't confuse with foal heat diarrhea at 7-10 days of age)-foals should NOT have diarrhea the first few days of life!
- Abnormal temperature, HR, RR
- Swollen joints or navel (sign of septicemia)
- Navel doesn't dry up/stays moist
- Twins
- Any kind of congenital abnormality

Foals at Moderate Risk for Post- foaling Problems = One foal or mare risk factor present

Foal at High risk for Post-foaling Problems = Two or more mare or foal risk factors present

Common Newborn Foal Problems- How to Identify and Treat Them

The following problems occur commonly in newborn foals. As you read about these diseases, you will notice many problems have similar and overlapping signs. This can be a challenge to you and your veterinarian to diagnose. To add to confusion, some foals can have multiple problems occurring at once. For example, it is not unusual for NMS foals to be septicemic as well.

I examine approximately 100 newborn foals a year. The most common problem I deal with in newborns is partial or complete failure of passive transfer. I treat about 2 dozen foals a year for this. Only a few of these have complete failure of passive transfer (IgG < 400mg/dl). Septicemia is also a common newborn problem. I typically treat 5-10 foals per year for this disorder. Neonatal Maladjustment Syndrome (NMS) foals are less common. I usually only see 1-2 per year. Neonatal Isoerythrolysis (NIE) and ruptured bladders are also less common than the other problems. I have only seen 1 case of each in 7 years.

Septicemia

Septicemia (infection in the blood stream) is a common cause of newborn illness and is very serious and life threatening. Aggressive treatment is vital for the foal's survival. If unnoticed and untreated, a foal can quickly weaken and die. Signs of septicemia include lethargy, diarrhea, cessation of suckle reflex ("milk face"--foal bumps the mare's bag but doesn't suckle and milk squirts all over the foal's face), hypothermia --more prominent -- or fever and weakness. Septicemia can be contracted through the umbilicus, placenta, and respiratory or digestive tract. The most common causative agents include E. coli, Actinobacillus, Klebsiella, and Streptococcus. Foals at higher risk for septicemia include preemies, foals with failure of passive transfer, foals with NMS, twins, and foals born from high-risk mares.

A vet diagnoses septicemia by physical exam, blood work (very high or low white blood cell count and high fibrinogen), IgG levels < 400 mg/dl, and a positive blood culture (note: a negative blood culture could still be a septic foal). Treatment commonly includes broad-spectrum antibiotics and fluids. Broad-spectrum antibiotics are a combination of different types of antibiotics used together to treat a wide range of bacterial diseases. Since a gram-negative type of bacteria commonly causes foal diseases, the antibiotics should be more specific for this type. For example, I routinely use amikacin or gentamicin with penicillin concurrently. Using penicillin alone will have minimal effect. Therapy may also include a plasma transfusion, oxygen therapy, anti-diarrheals, food supplements, and keeping the foal warm, dry, and clean.

If the foal is sick enough to require supplemental feeding to support it, the first choice is obviously the mare's own milk. Other good choices include Foal Lac and Mare's Match. These are good supplements, but may cause diarrhea. Nutrifoal is a very good milk replacer with less digestive upset, but it is very expensive. Goat's milk and cow's milk (with 1-tsp. corn syrup added to every 8 oz.) may also be used. Constipation is a common side effect with goat's milk. Foals typically need to be fed 10% of their body weight per day and should gain one to three pounds per day. For example, a 100# foal needs about 12 oz. every two hours. If the foal needs special nutritional support, it may be necessary to provide food through an indwelling nasogastric tube. If the foal needs to be fed intravenously, Total Parenteral Nutrition (TPN) is an exceptional product. It can be cost prohibitive with prices ranging \$300-500/day, and must be done at a referral clinic.

Neonatal Maladjustment Syndrome (NMS)

Foals with NMS are commonly referred to as a "dummy" foals, wanderers or barkers. It is a temporary or permanent condition caused by a lack of oxygen to the brain. This usually occurs secondary to dystocia, but may also be associated with septicemia or a brain disorder. Signs of NMS include lack of the suckle reflex, lack of affinity to the mare, disorientation, and irritability (grinding teeth, sneezing, wandering). If it is severe the foal may seizure or become comatose. Treatment may include nasal oxygen, mannitol, 400-800IU of daily vitamin E, naloxone, DMSO, antibiotics, and nutritional support. The foal is often treated concurrently for septicemia. The window of opportunity of treatment and potential recovery is typically 5-7 days.

Neonatal Isoerythrolysis (NIE)

NIE is an immune mediated hemolytic condition inherited from the stallion. The mare produces antibodies against the foal's red blood cells, which are concentrated in the mare's first milk, the colostrum. The foal is normal at birth. But after ingesting the antibodies in the colostrum, these antibodies attach and destroy its red blood cells. The foal typically shows signs of weakness, jaundice, and anemia within 12-24 hours. Treatment includes a whole blood transfusion if it is diagnosed early enough. Prevention is key. If the mare has a history of NIE foals, the mare can be tested 2-3 weeks prior to the foaling date. If the fetus is considered at risk, prevention is vital. The foaling should be attended. The newborn foal should be muzzled the first 24 hours and fed an alternative source of colostrum. The mare's milk should be stripped (milked) out the first day. This condition is rarely seen in maiden mares, and is more commonly seen in foals when the mare is bred back to the same stallion carrier.

Ruptured Bladder

A ruptured bladder typically occurs during the foaling process. As the foal is pushed through the birth canal, the bladder may tear internally inside the foal. This condition is most common in colts (90%). The foal typically appears normal at birth. Depending on the size of the tear, the foal will show signs of uroperitoneum (urine in the abdomen) between days 1 and 7. Signs include colic, depression, abdominal distension, and urine dribbling. The foal may or may not be able to urinate. Some foals can urinate, but tend to strain and don't have a steady stream. Diagnosis is based on physical exam, abdominocentesis (belly tap to take a fluid sample from the abdomen), blood work, and ultrasound or radiographs. Treatment is surgery in conjunction with fluids and antibiotics.

Failure of Passive Transfer (FPT)

Failure of passive transfer is the failure of the transfer of immunoglobulins (IgG). This means the foal's IgG levels are less than 400 mg/dl. IgG levels between 400-800 mg/dl are considered partial failure of passive transfer. Poor colostrum quality, failure to ingest enough colostrum, poor mammary gland development, or the mare leaking the colostrum before foaling can cause this. If the foal's IgG <400 mg/dl, the foal has a 25% chance that it will contract a disease if exposed. If the foal's IgG < 200 mg/dl, the foal has a 75% chance it will contract an environmental disease if exposed.

The Key is Prevention

Prevention is vital. It includes properly vaccinating and deworming your pregnant mare. Properly preparing for the newborn's arrival includes having adequate protection against adverse weather conditions, a clean area for the mare to foal, and knowing your mare's foaling history. It is especially important to be present during the foaling process, so that if any problems arise they can be addressed immediately. I recommend observing the foal to be sure that the foal stands, nurses, and behaves normally. Foals are wonderful and unique. But unlike adults, their status can change very quickly. Being aware of your foal's health is the best preventative measure you can take to ensure a healthy foal (and lower vet bills)!

Dr. Hulse graduated from Purdue University and has served for the past 8 years as an associate at the Durango Equine Veterinary Clinic in Buckeye, Arizona. The clinic serves as a specialized equine breeding operation using fresh, cooled and frozen semen from around the country and internationally. Dr.Hulse's specialty and focus are the foals produced at this clinic and the surrounding rural area.

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