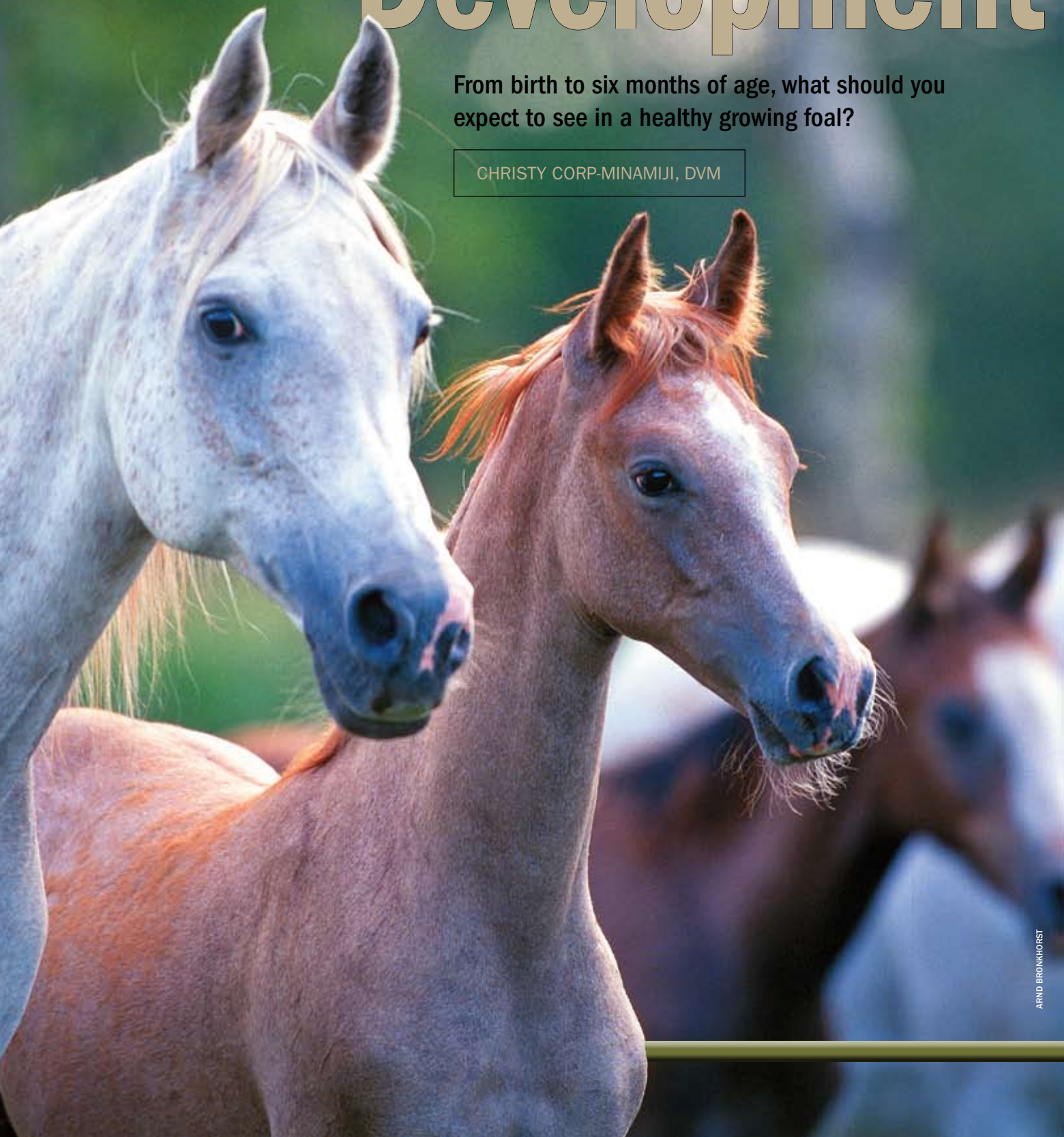


Young Horse Development

From birth to six months of age, what should you expect to see in a healthy growing foal?

CHRISTY CORP-MINAMIJI, DVM





The stall smells warm, sweet, and metallic. The straw rustles as the mare turns to lick the damp, lanky creature curled in the corner. Overwhelmed with euphoria—and in need of coffee—you speed-dial your horsey friends. As the phone rings you wonder, how will this spindly thing transform into the athlete of your dreams? What can or should you do to ensure he develops into a healthy young horse?

Setting the Stage

Development begins before conception; the blueprint for the foal—what genetic disorders and developmental problems he might be prone to—lies in his DNA. According to Gary Magdesian, DVM, Dipl. ACVIM, ACVECC, ACVCP, associate professor at the University of California, Davis, School of Veterinary Medicine, owners sometimes overlook genetics, tending to “select one desired trait and to focus on that and not on the bigger picture.” While the recent sequencing of the equine genome will continue to impact breeding selection, “at present it is important that people realize genetics do play a very big role in growth and development,” he says.

Tom Yarbrough, DVM, PhD, an equine veterinary surgeon from Northern California, concurs, noting that clinically he sees higher concentrations of certain deformities within particular breeds and bloodlines, pointing to a genetic component.

Magdesian suggests scrutinizing the histories of the dam and sire before breeding: “Have the parents had developmental orthopedic disease (DOD)? ... If horses were retired into breeding early, why were they not used (in performance)? Do the foals have a high rate of OCD (osteochondritis dissecans), flexural deformities, and so on?”

Post-conception, however, we can only influence environment. Magdesian

stresses broodmare care and recommends a balanced diet, paying particularly close attention to macro- and micromineral balance, iodine levels, exercise, vaccination, and deworming. For instance, excessive iodine intake in the mare, sometimes caused by overfeeding seaweed supplements, can cause goiter (enlargement of the thyroid gland) in the foal. Proper care of the mare, including optimal nutritional support and core vaccinations and deworming in the months leading up to foaling, can set the stage for skeletal development early on.

Born Ready

Prior to birth, the equine fetus is coddled—buoyant, fed, and protected in the mare’s uterus. Bones, muscles, and connective tissue focus on growth rather than on weight bearing or coordinated motion. Materno-fetal circulation (the circulatory system that transfers nutrients from the mare to the foal) bypasses the functions of lungs and digestive tract. Sensory organs receive little input.

But birth transforms the foal into an animal prepared to survive a harsh world. As he fills his lungs for the first time with oxygen, shunts that bypassed the fetal lungs

close. Sensory organs absorb a flood of information. The digestive tract prepares for colostrum, the antibody-rich first milk. The foal attempts coordinated movement even before the hind legs exit the birth canal. This precocious newborn will stand and nurse within hours, an instinct essential to survival as a large prey animal. But first let’s discuss the birth itself.

The Big Event

Though mares foal rapidly and with inconvenient timing, an observed foaling is best, says Magdesian, since the highest mortality rates occur early in the parturition process. Monitoring delivery allows immediate correction of conditions that impair the foal’s oxygen supply. *The Horse* reviewed difficult births in Dystocia Advancements (www.TheHorse.com/17498), so for brevity let us assume an uneventful delivery: You have a live foal—now what?

If the foal is breathing and alert, step back. The first few hours cement the bond between dam and foal. Sue McDonnell, PhD, Cert. AAB, head of the equine behavior program at the University of Pennsylvania School of Veterinary Medicine, says that she has great respect for the early

View the Video

Young Horse Development: Birth to Six Months



the **HORSE**.com

period of bonding with the dam and does not see it as a critical period for learning to interact with humans. Instead, she recommends formulating a plan that accustoms the foal to human handling during the early weeks, but without ending up with a foal that “follows like a puppy.”

Within his first days of life, the foal undergoes a period of adaptation as his body regulates respiration, circulation, and digestion and acclimates to fluctuations in light, temperature, and sound. The first gasping breaths, shivering, and efforts to stand and nurse are all part of this adaptation. The foal should stand within one to two hours and nurse within two hours after standing. In addition, McDonnell likes to see a foal circle the dam, increasing his speed and diameter and breaking into a canter by Day 2 or 3.

Although the pair should be left to bond as much as possible during the first day, some early tasks are necessary. Because the foal is born with minimal immunity, Magdesian says the veterinarian, foaling manager, or horse owner should dip the umbilical stump in chlorhexidine (at a 1:4 ratio) and pat it dry with a clean cloth to prevent bacterial infection. The foal acquires immunity through the mare’s colostrum.

For the first 12-24 hours, the intestinal lining allows passage of large molecules, permitting absorption of antibody (IgG) molecules into the foal’s bloodstream. After the first day, the gut “closes” to large molecules. This narrow window makes early and vigorous nursing essential. To confirm adequate colostrum consumption a blood IgG level should be checked after 12-24 hours. A veterinarian can perform this during the post-foaling exam. (At this time the veterinarian should also check the mare for adequate milk production, complete passage of the placenta, normal appetite, and perineal tearing of the vulva, the anal area, and the tissues between.)

Even apparently healthy foals should be checked for conditions such as palate and pharyngeal dysfunction, cardiac dysfunction, limb deformities, hernias, ophthalmic (eye) conditions, and signs of dysmaturity. Many of these conditions require prompt veterinary attention.

Yarbrough notes that veterinarians should correct abnormalities that hinder



PAULA DA SILVA

Common markers of foal growth are body weight and height at the withers (shown).

swallowing and breathing as soon as possible, since aspiration of milk can lead to chronic lung infections, causing delayed development and/or severe illness. Magdesian states that the first month is probably the most important time for addressing musculoskeletal development because “as the growth rates slow, our ability to correct problems slows.”

During early handling, remember that the foal takes most of his cues from the dam. So positive interaction with the mare means the foal will likely respond to humans in positive ways. One study (Henry et al., 2005) analyzed the impact of human interactions with the mare on the later responses of the foal to humans. Mares in the study’s experimental group received positive human contact within the first five days after foaling, while mares in the control group were ignored. The researchers found that foals of mares in the experimental group better tolerated

handling than the foals of mares in the control group. Interestingly, even within the experimental group, foals of protective mares remained further away from the handlers than did the foals of mares that weren’t as protective.

Growing Up

While the most dramatic physical changes and the greatest risks to a foal’s well-being occur in his first 48 hours, this period of rapid growth and adaptation extends over a period of weeks.

Common growth markers are body weight and wither height. A neonatal foal should gain between one and three pounds per day. Magdesian also recommends measuring body condition score (on a scale of 1-9, with 1 being extremely emaciated) with veterinary guidance for an accurate assessment of muscle and fat development, along with serial close monitoring of the limbs for overly rapid or uneven growth.



We're for foals.

See healthcare milestones at www.FoalCare.com.

We're for more care that starts before conception and foal care that leads to a lifetime of good health. At www.FoalCare.com you'll find a comprehensive guide to healthcare from prebreeding through the foal's first birthday. And, you'll find an easy way to remember it all. Use our interactive scheduling calendar and automated e-mail reminder system to keep track of important healthcare dates.

Because most of all, we're for providing your foal with the best start possible.

We're for the horse.

And for helping the unwanted horse. Visit www.uhvr.org

Intervet/Schering-Plough Animal Health • 556 Morris Avenue • Summit, NJ 07901 • intervetusa.com • 800-521-5767

Intervet Foal Care Program is the property of Intervet International B.V. or affiliated companies or licensors and is protected by copyrights, trademark and other intellectual property laws. Copyright © 2010 Intervet International B.V. All rights reserved. Photo © Melanie Snowwhite EQ-BIO-1115 AD 35966-FoalCareHO-6/10-





The foal takes most of his social cues from the dam. How you handle her will impact his response to humans.

CYNDIE PLANCK



PAULA DA SILVA

Foals housed in a herd with other mares and foals will display a more normal range of social behaviors and should show increasing confidence.

In extreme climates it is important to recognize that a foal is less able to regulate body temperature than an adult and, therefore, might require shelter from the elements until he's older. The ratio of surface area to body mass is larger in a juveniles than in an adult, so proportionately more of the foal is exposed to the elements. As the foal grows, this disparity decreases.

While you should pay attention to shelter and safety, realize that a domestic foal's environment should mimic nature. The natural environment consists of open range, a large, social herd, and a diet of mare's milk and mixed grasses. Stall confinement, isolation of mare/foal pairs from other horses, and feeding of concentrates are human constructs and might impair the growing foal's development.

According to McDonnell, foals housed in a herd will display a more normal range of social behaviors. The foal's circling of the dam will expand to circling of the band by Day 2 or 3, as foals distinguish their dam's social group from others in the pasture. Foals housed in a band also will begin to display meaningful social interactions with animals other than the dam, and by Week 1 should "show increasing confidence with distance from the dam," she explains.

For diet and exercise, Magdesian states that "the more we mimic Mother Nature, the healthier and better off (the foals) are. Unnatural movement (i.e., longeing, hard ground, small paddocks) is not optimal." Furthermore, withholding of exercise from a rapidly growing foal (i.e., stall rest) can impair musculoskeletal development and bone density.

Foals will begin to pick at the mare's feed by Days 10-14, so it is important to plan for nutrition. In addition to the mares' milk, Magdesian provides his own foals a mixture of grass hay with 20-30% alfalfa to meet the higher amino acid requirement for foals. For weanlings he provides a small amount of concentrate containing a vitamin/mineral supplement and/or protein supplement. While companies tout faster growth as a benefit of high-concentrate diets, Magdesian doesn't believe this is the best feeding practice in the long run. And though researchers have not definitively established a correlation

“As the growth rates slow, our ability to correct problems slows.”

DR. GARY MAGDESIAN

between faster growth rates and DOD (which encompasses all musculoskeletal problems in growing horses), there are links between feeding excessive dietary energy and DOD.

In regards to limb deformities, which foals require surgical intervention? When should an owner worry? “If we had the ability to see every foal born with angular limb deformity, probably 90% autocorrect, 5-7% require minor alterations—trim, glue-on extensions—and 3-5% actually require surgery,” says Yarbrough. “A lot of surgeries get done for angular deviation that, if left alone, the foal would come around and be left with less of a blemish.”

For mild deviations he recommends conservative treatment for an extensive period, as long as the foal makes progress and does not deteriorate. However, severe deviations impairing locomotion or showing deterioration should be corrected

immediately. Yarbrough cites tarsal valgus (cow hocks) and ligamentous laxity (looseness) as the most challenging deformities, as both can cause serious joint damage and can be difficult to correct.

Have your farrier and/or veterinarian evaluate your foal's feet and limb conformation for abnormalities when he's around 1 month old. Regular hoof trimming, however, typically is not required until the foal is 6 to 8 months old.

Also consult your veterinarian for vaccination and deworming recommendations for your area. Parasite control for a foal should typically begin 45-60 days after birth, but it might vary according to your farm's parasite load, as indicated by a fecal egg count. A foal usually requires his core vaccinations when he's 4 to 6 months old but, again, this varies according to the mare's vaccination status and the diseases prevalent in your geographic area (see the

American Association of Equine Practitioners' core and at-risk vaccine lists at www.aaep.org/vaccination_guidelines.htm).

Flying the Nest

Weaning times vary with breed and discipline; however, Magdesian says, “I like following Mother Nature's lead, so I tend to wean older—about 6 months.” McDonnell notes that when the foal is between 2 ½ and 6 or 7 months old he will begin to show strong signs of independence from the dam, indicating readiness for weaning.

Weaning increases stress on the foal. Magdesian notes that conditions that had been previously subclinical (not apparent) might erupt at weaning, and he suggests avoiding other stressful procedures or surgeries such as castration around this time.

The Six-Month Mark

Congratulations! Proper nutrition, exercise, monitoring, and hoof care have contributed to the even growth of your weanling. Frequent fecal egg counts and establishment of a good deworming program in light of these results maximize his intestinal health and overall condition. His maternal antibodies have waned, so you have begun vaccination under the guidance of your veterinarian. Socialization and careful, consistent handling have created a sensible animal, ready to meet new situations with curiosity rather than fear. Enjoy your coffee as you watch your weanling gallop across the pasture in the morning light.

Check back for Part II of the three-part Young Horse Development series in June, as we continue to follow the foal's stages of growth and maturity through a year and a half of age. 🐾



PAULA DA SILVA

When the foal is between 2 ½ and 6 or 7 months old he will begin to show strong signs of independence, indicating readiness for weaning.

ABOUT THE AUTHOR

Christy Corp-Minamiji, DVM, is an equine practitioner in private practice and freelance writer living in Northern California, with particular interests in equine wound management and geriatric equine care. She and her husband have three children, and she writes fiction and creative nonfiction and blogs in her spare time.