



HEALTH ZONE

Foal Health

Foal Eyes

BY DR. NANCY LOVING

The newborn foal opens his eyes for the first time, and those soft, expressive orbs framed by tiny eyelashes begin to take in his surroundings. This brand-new set of eyes has never encountered environmental pathogens, sharp objects, or trauma. But it's important to realize that while all might appear normal now, these peepers could be primed for developing particular conditions—genetic or otherwise—in the coming days or further down the road.

Recognizing any of an array of foal problems early sometimes can mean the chance to treat and preserve vision. But before we get into what can go wrong, let's cover what's normal.

Vision recognition is a learned response

Dr. Steve Roberts, of the Animal Eye Center in Loveland, Colo., notes that newborn foals must “learn” to see.

“Since vision recognition is a learned response, newborn foals may not seem to recognize objects, movements, or sit-

uations within their environment,” he explained. “Although the eye correctly detects visual information, a foal's brain may not properly understand what that information means. Programming of the brain to interpret visual information

might take several days, initially making it difficult for a horse owner to determine the foal's actual visual function.”

Signs and Timing of Problems

Typical clinical signs of an eye problem requiring veterinary intervention include swelling or partial or complete eyelid closure.

“Both eyes should function symmetrically, so monitor for differences between them,” Roberts said. “Any irritation to eyelid tissues often results in increased discharge that serves to protect the eye and remove debris. Discharge may begin as liquid tears, but within a few hours may change to a thicker, mucous consistency, varying from clear to slightly gray. Significant inflammation or an infection



ANNE M. EBERHARDT PHOTOS

A horse's environment can increase the risks of bacterial or fungal infections in a foal's eyes

may turn the discharge white to yellow due to entry of inflammatory cells (neutrophils) into the tear film.”

Roberts also prompts owners to watch for subtler clinical signs such as increased blinking or eyelid movement, often with eyelids moving out of sync with one another.

“Because the upper eyelid typically has the greatest range of motion, it would be abnormal to see the lower eyelid moving more than the upper lid,” he said.

Dr. Dennis Brooks, of the University of Florida’s College of Veterinary Medicine, advised, “Watch the position of the upper eyelid lashes—if lashes droop, the eye is painful.”

Always have a painful eye checked for corneal ulcers using fluorescein dye staining, he said.

Some eye injuries occur during birth, the most common of which, according to Roberts, is hemorrhage resulting from incidental birth trauma or from excessive pressure applied to the head or neck during delivery.

“Usually, this resolves within seven to 10 days and rarely is associated with actual damage to the interior of the eye,” he said.

“Once a foal is on the ground,” observed Roberts, “environmental irritants (straw, bedding material, soil, or feces) may cause conjunctivitis. Traumatic corneal ulcers are another potential problem. Although most eye ulcers in foals are initially sterile, the barnyard environment increases the risk of bac-



Newborn foals must ‘learn’ to see, a process that might take several days

“Some heritable congenital disorders occur but congenital disorders are not necessarily heritable,” Roberts said.

An example of a congenital but not heritable problem is atresia (absence) of the nasolacrimal (tear drainage) system. An affected foal born without an opening in the eyelid or inside the nostril for tears to flow might show clinical signs of increased ocular discharge or no nasal discharge, but the owner might not notice the condition until the foal is several months to a year old.

Roberts describes potentially heri-

table congenital conditions:

Congenital cataracts “are the most frequent, significant ocular problem of foals,” he said. “A cataract appears as a distinctly cloudy or whitish region that involves either a portion of the lens or the entire lens. Evaluation for cataracts is best accomplished in dim lighting, preferably with the pupil dilated.”

Roberts reported an 80% success rate surgically managing foals younger than six months old with cataract-impaired vision.

Microphthalmos describes a smaller-

For potential eye problems, Dr. Steve Roberts prompts owners to watch for subtler clinical signs such as increased blinking or eyelid movement

terial or fungal infections. A superficial corneal ulcer that doesn’t rapidly resolve in 24-48 hours should receive immediate, professional evaluation.”

Congenital and Heritable Conditions

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DR. NANCY LOVING PHOTOS

Environmental irritants such as bedding and manure can cause conjunctivitis

than-normal eyeball(s).

“Since Thoroughbreds seem to be prone to this, there is a possible genetic propensity,” Roberts said.

Strabismus is a deviation in the eyeball’s positioning, with the affected eye(s) rotated inward, outward, upward, or downward. Roberts noted that shortly after birth, many foals have uncoordinated eye movements.

“But,” he said, “this asymmetrical movement should self-correct within the first few hours or days. Congenital

strabismus with upward and/or upward and inward eye rotation is often noted in Appaloosa foals with equine congenital stationary night blindness (a lack of night vision). Congenital cataracts also cause abnormal alignment of one or both eyes, creating a cross-eyed appearance; this is seen in Saddlebreds.”

Iris hypoplasia (underdevelopment of iris tissue) is more common in breeds that are color-dilute (lacking dense tissue color saturation; e.g., dun). Affected foals are unable to regulate light enter-

ing the eye and might squint severely in bright light.

“A completely absent iris (aniridia) is a very rare condition,” said Roberts. “The pupil may appear completely dilated but, in fact, iris tissue is missing. This problem is more prevalent in Thoroughbreds, but it is also seen in Belgians and Quarter Horses, neither of which has cataracts associated with the problem.”

Persistent pupillary membranes are remnants of the iris that don’t properly regress during latter stages of embryonic ocular development.

“While rarely genetic, these membranelike strands of tissue near the pupil regress over the first 3-12 months of life,” Roberts reported.

Dermoids (normal tissue in an abnormal location) usually involve the third eyelid, cornea, or conjunctiva.

“This congenital condition is due to improper separation of various ocular surface tissues during embryological

Any toxin or infection that causes illness in the mare can cross the placenta to cause problems in the fetus

BREED PREDISPOSITIONS

Some breeds might be predisposed to develop specific eye problems—some as foals and others as adults—including the following listed by Dr. Steve Roberts of the Animal Eye Center in Loveland, Colo.

- Ocular squamous cell carcinoma in breeds lacking complete pigment along the margin of the third eyelid or corneal perimeter, such as draft horses, Paints, and Appaloosas.
- Cataracts in Belgians and Thoroughbreds; Morgans can develop a mild, non-vision-threatening cataract involving the center of the lens. Cataracts can also cause abnormal alignment of one or both eyes in Saddlebreds.
- Equine recurrent uveitis and glaucoma in Appaloosas.
- Congenital stationary night blindness in Appaloosas, Thoroughbreds, Paso Finos, and Saddlebreds.
- Anterior segment dysgenesis or multiple congenital ocular anomalies syndrome in horses with the silver dapple gene (chocolate hair coat color with flaxen mane), such as the Rocky Mountain Horse, Kentucky Mountain Saddle Horse, Miniature horse, Shetland Pony, Mountain Pleasure Horse, Belgian draft, and Morgan. These horses might experience concurrent congenital cataracts.
- Progressive retinal atrophy in Thoroughbreds.

By Dr. Nancy Loving

development,” Roberts explained. “It is seen in Quarter Horses that are also affected with iris hypoplasia and cataracts, implying a genetic linkage.”

Researchers continue to make progress identifying genetic eye problems.

“We now understand the genetics of some hereditary eye problems in horses with blue eyes and also in silver dapple horses (chocolate with flaxen mane and tail) related to the Rocky Mountain Horse—this syndrome is called multiple congenital ocular anomalies (a group of nonpainful and nonprogressive developmental abnormalities of the cornea, iris, lens, and ciliary body),” Brooks said. “We are also beginning to uncover the genetics behind equine recurrent uveitis (an autoimmune disease that causes inflammation within the eye).”

Systemic Disease

Roberts explained that virtually any

toxin or infection that causes illness in the mare can cross the placenta to cause problems in the fetus. Crucial antibodies in the vaccinated mare also cross the placenta. He recommends having a veterinarian examine the foal shortly after birth to identify systemic disease and assess immune status.

“If there is failure of passive transfer of antibodies through the mare’s colostrum milk, then a newborn foal is highly susceptible to bacterial or viral infection,” he said, from pathogens in the environment. He also advises the veterinarian to inspect the neonatal umbilicus, which becomes a significant entry portal for infection.

Most infectious diseases have the potential to cause inflammation of the iris.

“Pathogens such as *Salmonella*, *Streptococcus equi*, *Borrelia burgdorferi*, and *Rhodococcus equi* are especially problematic,” Roberts said. “Also, any Gram-negative bacterial infection can affect the interior of the eye while equine herpesvirus can cause uveitis in foals.

“The pupil tissues...are highly supplied with blood vessels—vasculitis (blood vessel inflammation) permits a breach in the otherwise fairly resistant blood-eye barrier,” he continued. “Not only can bacteria and viruses then enter eye tissues, but nonspecific inflammation may also target iris and ciliary body tissues. In addition, the immune system may attack internal ocular tissues where protein markers (antigens) reside. These antigens, typically not exposed to the immune system, can be a source of ongoing, immune-driven inflammation.”

A foal that is recumbent (unable to rise) might develop slow-healing corneal ulcers. These usually cause minimal discomfort and are not infectious.

While uncommon, a foal affected by dehydration or malnourishment might develop entropion; loss of body fluid or orbital fat due to profound emaciation can cause the globes to sink deeper within the eye socket and the eyelid margins to invert. This results in eyelid hairs rubbing against the cornea.

“More commonly, entropion develops from irritation of the ocular surface that causes spasm of the eye to retract (the globe) more deeply into the bony orbit,” said Roberts. “This is relatively simple to manage by eliminating the reason for the ocular irritation while also applying lubricants (antibiotic or artificial tear ointment) and/or surgically everting the eyelid margins (turning them outward) temporarily with sutures or skin staples.”

Lastly, any foal is susceptible to eye trauma, such as penetrating wounds or blunt trauma.

Take-Home Message

Monitor foals for any signs of trouble, such as increased eyelid blinking, tear spillage down the face, increased mucous discharge, clouding of the cornea, an irregularly shaped pupil, or haziness within the pupil; and have these youngsters examined immediately. “An accurate diagnosis and appropriate therapy go a long way toward reducing the severity of



Always check a foal’s painful eye for corneal ulcers by staining with fluorescein dye

the problem and minimizing the overall impact upon vision function,” Brooks concluded. **BH**

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