

## **Clinical Equine Behavior**

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### *Clinical Relevance:*

Behavior is often on the minds of those who work with horses, especially in the context of context of therapeutic riding where the behavior of an individual horse can be a major factor in its suitability for work. Identifying where behaviors intersect with clinical problems, or can be addressed in a problem-oriented approach with inputs from the veterinarian and trainer, can help make sure the needs of both horses and humans are met.

The behavior of horses is a reported contributor to cases of neglect, cruelty, and abandonment alongside the condition of the horse, abandonment, or owner hardship<sup>1</sup>. In a 2012 survey of 1326 horses in the United Kingdom 91% of owners reported behavior problems occurring each week, including rearing(7%), bolting(3%), stopping at jumps(13%), refusing to slow when asked(31%), or jogging when asked to walk(32%)<sup>2</sup>. While some may consider the last two to be relatively minor these can be the difference between a horse that is suitable for a Therapeutic Riding Program and one that is wholly inappropriate. And, as will be discussed later, even some normal equine behaviors, when expressed at the wrong time with humans, can be dangerous!

From the point of view of the horse behavior is a major component of welfare. The five freedoms of animal welfare include<sup>3</sup>:

- Freedom from thirst, hunger, and malnutrition
- Freedom to express normal behavior for the species
- Freedom from pain, injury, and disease
- Freedom from discomfort due to the environment
- Freedom from fear and distress

Not only is expression of normal behavior one of these pillars of animal welfare, but there are intersections with the others. How a horse interacts with humans, other horses, and the environment are important for their ability to eat and drink, feel comfortable and fear-free, and to find safety and protection from weather and environmental hazards. Additionally, behaviors associated with pain help us identify when medical intervention may be needed to provide relief.

There are a number of “pain points” that have been identified as sources of concern for equine welfare which relate to behavior. One welfare system highlights behaviors which may be relevant to therapeutic riding programs, including<sup>4</sup>:

- Confusion, conflict, frustration, distress, stress, fear, and even pain due to human-horse interactions during work
- Inappropriate training methods due to misunderstanding of (equine) learning theory
- Stabling 24/7 resulting in inability to express normal behaviors as well as being kept in a monoculture (emotionally “boring”) pasture

- Conflicts between horses resulting in competition for feed or other resources
- Social isolation when kept in areas where they cannot see or interact with other horses
- Negative affective states including anxiety or fear, pain from chronic disease (including arthritis), or depression (especially for horses who are separated from their previous herds or who lose a herd member)

From the human side there has long been an interest among horse owners and trainers in equine behavior. This can be a complicated issue as in many cases there is limited evidence-based support for some techniques. While the majority of horse owners use traditional methods, other methods including natural horsemanship, Parelli, clicker training, and Tellington Touches have all been used by horse trainers<sup>2</sup>. The success of these methods can be variable and it is likely that some techniques work better for individual horses, trainers, or horse-human teams.

Some methods which are attributed to mimicking “natural” horse behaviors may not always be so. For example head lowering is sometimes described as a method to calm horses in training; however, when studied in a more rigorous manner head lowering did not seem to reliably induce a calming effect<sup>5</sup>. Round-yard training horses has been described as a way of improving teaching by mimicking the interaction of a young horse with an older horse, with the trainer as a stand-in. However, when old and young horses are placed in a pen together they fail to exhibit the types of behaviors advocated by that training method<sup>6</sup>. This is not to say that these interactions may not work well or be useful, but we should be cautious about attributing a degree of “natural-ness” as the sole reason for the incredible learning ability of horses.

And from a true medical point of view behavior is important! Stall vices and aggressive behaviors are challenges which can make appropriate medical treatment challenging at home or in the hospital. Sleep deprivation and alterations in sleep behavior are commonly seen in hospitalized horses<sup>7</sup>. There is also a suspected connection between stress and the formation of gastric ulcerations.

For all of these reasons equine behavior is important. Understanding how horses think and why they do what they do can help us make sure their welfare needs are met while also making sure they are good partners for our uses, especially in therapeutic riding programs.

### *Cognitive Abilities of the Horse:*

Anyone who has spent sufficient time with horses knows that they are intelligent animals. It is part of what makes them such excellent partners and companions. However, we also know that how they think is a bit different than we do. Perhaps the simplest way to summarize this difference is that horses learn quickly but unlearn slowly.

Horses are capable of quickly learning spatial or discrimination learning tasks or behavior, including the ability to differentiate different 3-dimensional objects, photographs of objects, and even the ability to sort objects by shape and size<sup>8,9</sup>. They have been able to retain these abilities for over 10 years in some cases! Additionally they have been shown to be able to remember

humans for months to years and can distinguish between individual humans, even twins. However, their cognitive pathways for unlearning behaviors is relatively poor. Learning a behavior that may be picked up in a few hours or days may take weeks or months of effort to unlearn. They are capable of anticipation behaviors and appear to recognize unfairness (for example: missing a meal due to a diet when the other horses in the barn are being fed).

This means that we need to be very careful when introducing and reinforcing behaviors to horses and be aware of the surrounding environment as learning can also include making connections between things. A horse that associates walking through a particular barn door with an incident when a bird swooped overhead or a fire alarm went off may be hesitant to use that door for a long period of time.

Positive reinforcement has been shown to improve learning ability and duration of retention of behaviors. Horses also learn better from humans with whom they have positive associations. Negative emotional states inhibit learning<sup>8,9</sup>. Additionally, horses who are turned out in pasture with other horses and have normal social relationships appear to learn better.

From a practical point of view this means that taking the time to build positive relationships with horses in your program can pay dividends. It also means that if a horse is having a bad day or reacting poorly in a training session that is not the best setting to try to train or teach a new positive behavior. Positive reinforcement does not need to be a “high-calorie” activity, either. A study comparing positive reinforcement methods found that for many horses scratches behind the withers or ears were close to a handful of feed<sup>10</sup>!

Interestingly horses appear to have “lateralized emotion” meaning that the eye or eyes they use to look at option correlates with their emotional state. They tend to look at positive stimuli with both eyes, neutral stimuli with the right eye, and negative stimuli with the left eye. Interestingly they also appear to look at many humans with the left eye in some studies, regardless of the side they were first trained on. Perhaps there is some science behind the “stink-eye!”

### ***Equine Behavior and Ethogram:***

*Note: unless otherwise noted the descriptions in this section are sourced from Sue McDonnell’s “A Practical Guide to Horse Behavior<sup>11</sup>” which summarizes several decades of published and previously unpublished observations of horses, zebras, and donkeys*

Covering *all* of equine behavior in an hour, or even a day, would be a challenging task. Instead, we will focus on some of the major common behaviors. It is also worth noting that there is some emerging evidence that horses from different herds may have significant differences. Equine behavior is well-described compared to most species, but still come from a subset of sources including behavioral research herds, Bureau of Land Management feral horse surveys, observation of feral horse or wild equid species across the globe, and observations of patients seen by veterinarians for health issues.

In natural settings horses form herds consisting of stable adult harems within the context of a larger herd. These family groups include a stallion, several mares, and their young offspring typically up to 3-5 years old. Young males and females will also form relatively unstable “bachelor” bands when they are still too young to have settled down – think roaming teenagers. Within the context of these herds individuals have strong social bonds and may have complex relationships.

One of the most apparent components of equine behavior is facial expressions and vocalizations. Relaxed horses will stand with their head at the level of their withers with their ears in a neutral position. Horses which are alert will have their head raised and their ears forward. Fearful horses may have their ears back and their head high, but this should be differentiated from true *threatening* behavior where the ears are back but the head is low and forward with nostrils flaring and teeth showing. A fearful horse may respond well to calming behavior and need reassurance, whereas a threatening horse should be given space due to risk to the handler.

Vocalizations can also give good information about how a horse is feeling. A whinny is a 1-3s prolonged call generally associated with alert behaviors and approaching other horses (especially ones they know), typically followed by a friendly or playful interaction. A squeal, on the other hand, is a high-pitched short (around 1s) vocalization associated with posturing, biting, nipping, and either real or play fighting. A scream is a more prolonged squeal and is usually followed by aggressive behavior. A nicker is a low-pitched, pulsed vocalization which is generally positive and intimate. A snort, which is a quick exhalation, is often followed by investigation, posturing, or even fighting behaviors, but a blow, which is a stronger, shorter exhalation, seems to be a warning behavior for herdmates. Groaning, a monotone hum-like sound, lasting up to 2s generally occurs during pain or discomfort, but may be normal in horses when they are lying down. Sighs, much like us, seem to indicate dissatisfaction.

Eating and drinking are major parts of a normal day for a horse. If allowed to graze they will spend most of their time eating or investigating forage. Drinking is relatively intermittent; some horses may drink most of their water for the day in one or two “drinks” and in our experience many horses seem to do this at night when they may feel safer. If regular water sources are not available horses may drink from hoof impressions, dig holes, or use communal rolling pits to collect rainwater. Most normal horses will eat standing, although foals and debilitated adults will sometimes eat in recumbency. Pica (eating dirt or other minerals) and coprophagy (eating manure) can be normal behaviors, especially in younger horses.

Pawing to remove overgrowth, snow, or ice is a normal behavior. When stalled this may be interpreted as a stall vice, but may be an appropriate response as they are seeking food within the stall and exhibiting a normal behavior in an “abnormal” situation. When we feed a horse after pawing we are reinforcing this behavior of “if I paw, I get food” so waiting until they stop or providing a distraction to break the cycle of the behavior prior to feeding may be helpful to avoid learning an unwanted behavior.

Elimination, including urination and defecation, are also important behaviors. Stallions often have elaborate behaviors around these, including making piles of manure and urinating on them, especially around important areas in their pasture or where they roam. Mares and geldings typically defecate more freely and do so every 2-12 hours depending on environmental conditions. Males generally should partially or completely drop their penis to urinate. In (especially older) horses failure to drop may indicate medical conditions which bear investigation by a veterinarian, including some forms of cancer and infection by parasites.

Another major component of normal behavior is movement and rest. If allowed to roam horses will travel miles per day. It is normal for horses with access to water to wade or swim. Horses will rest and sleep daily if possible, but can go days without lying down or sleeping. A typical horse will sleep around 4 hours per day with 1.5-2 hours of rapid eye movement (REM) sleep. In order to get REM sleep, needed for rest, they must be able to rest their head on something solid. During this phase individuals lose voluntary muscle control and may exhibit involuntary muscle movement (similar to a dog running in their sleep). Many horses do not sleep well if kept by themselves; when kept with at least one other horse they will sleep in shifts and keep watch for each other.

There are several retreating and avoidance behaviors commonly seen in horses. The first is a submissive retreat where an animal has its head low, pins its ears, and trots (typically) away from another animal or person. They may kick out if pursued. This is important to note because it may look like aggression, but is more of an expression of submission or fear. Giving these animals space and then working with them to reduce sources of anxiety can be productive. While aggression generally makes a horse unsuitable for use in a therapeutic riding program a horse that exhibits fear in certain situations may be able to be used with appropriate training and handling.

There is also an infant-like submissive posture seen in young animals where the animal snaps its jaw, lowers its head and extends it (nursing posture) and bends the front knees. Young males will sometimes do this to older males to demonstrate that they are not a threat (essentially acting like a foal instead of a competing stallion). Some natural horsemanship practitioners recommend bowing to horses when approaching horses; in this context this may be read as this type of submissive "I'm-not-a-threat" posture.

Horses will shy away from negative stimuli, often by rear or lateral movement. Horses can struggle to differentiate dark surfaces (like drains or dark floors) from pits and may exhibit normal shying behavior around these. Especially for young horses this should be anticipated when handling. Walking with the horse over the area or encouraging them slowly and patiently can help. When designing facilities flooring with strong dark-light transitions in areas where horses will be walking should be avoided.

The most common *abnormal* behaviors in horses are so-called "stall vices" and pain behaviors. Most frequently these are observed by the owner or trainer at home and then brought to the

attention of the veterinarian. They can be the first sign something is amiss that requires medical or behavioral intervention.

Stall vices generally refer to behaviors in the stall which can be dangerous or are simply irritating. These are generally stereotyped, meaning they the horse repeats them over and over in a consistent manner. They may or may not be triggered by obvious stimuli in the barn. Some behaviors have been associated with medical conditions – for example, cribbing has been associated with a type of colic called an “epiploic foramen entrapment” where part of the small intestine becomes trapped and strangulated.

Cribbing involves grasping an object or part of the stall door, fence, or rarely another horse and gulping in air and expelling it. This is very loud and annoying and may last for several minutes or up to an hour. This seems to be a compensation mechanism for anxiety. There are special collars and even several described surgeries to treat cribbing; however, these are not curative in all horses. Often management and limiting time spent stalled are the best options if possible. A similar behavior most frequently seen in young animals is tongue sucking where the horse rolls their tongue and sucks on it; this is similar to how a foal nurse and is thought to be equivalent to a human sucking their thumb.

Some repetitive behaviors seem to be a way for horses to channel their anxiety. Fencewalking, where a horse walks back and forth along a section of the fence in a stereotyped manner, is sometimes seen in horses separated from other horses. A similar behavior is weaving, where instead of walking back and forth the horse shifts weight back and forth between their front feet and moves their head. In some cases this may be an anticipation behavior, such as when they expect to be fed.

Headbobbing or headshaking where the horse moves their head in repetitive small motions is a more complex issue. In some horses this is a stereotyped behavior. However, there are some medical conditions which can result in headshaking. These include ear mites or ear ticks, trigeminal neuralgia, infections of the guttural pouch, temporohyoid osteoarthropathy, dental disease, and other less common conditions. A veterinarian can help attempt to identify causes of headshaking and appropriate treatment, although not all cases have a true medical cause.

Self-mutilation is fortunately rare. This includes biting or kicking at any part of the body in a stereotyped manner. Self-mutilation can be acute or chronic and may represent anxiety, a maladaptive response to environmental conditions, or is a sign of true pain, especially in acute situations.

Identifying pain is one of the most important skills for a horse owner or trainer. A painful horse should be seen by a veterinarian as soon as possible; abdominal pain can represent a medical emergency. Subtle indicators of pain can include changes in facial expression, such as a grimace. Flankwatching, where the horse turns their head back and looks at their abdomen repeatedly. Frequently they will turn and look at one side; likely this is the location of the pain. Horses may also kick at their abdomen or kick out violently when they are in pain. In addition to being a

sign of abdominal pain this can also be a sign of urogenital pain or discomfort in stallions and geldings. Recumbency for prolonged periods of time can be a sign of discomfort. Some horses will kick or thrash when they are recumbent (“down”), but some may express pain by staying down. Horses do lie down to sleep normally; however, most horses will stand up when approached by humans unless they are unusually comfortable with them. Even those horses should stand with minimal stimulation and unwillingness to stand should be considered a sign of pain or discomfort. Teethgrinding is not a reliable sign of pain in adult horses; however, it is a good indicator of abdominal pain in foals.

Another behavioral sign of pain outside the abdomen is maintenance of an abnormal stance. Horses with limb pain or laminitis will stand in a way which offloads weight from the area that is painful. Horses with laminitis in multiple feet may exhibit frequent shifting or prolonged recumbency to take weight off their feet. This will also limit expression of normal behaviors including decreased locomotion and sometimes eating and drinking if they have to walk to those. Lastly, some horses in pain exhibit “hyperesthesia” a condition where they exhibit an exaggerated response to a normal touch stimulus. This occurs due to increased excitation of the nerves to that area. All of these are indications to have the horse evaluated by a veterinarian.

### ***Summary:***

Behavior is an important part of the relationship between horses and humans. Understanding its role in welfare, how horses think, and contextualizing normal and abnormal behaviors are all valuable for making sure that the horses used in therapeutic riding programs are able to do their jobs safely and in a way that is a good fit for the human and horse elements. Key takeaways are

- Expression of normal behaviors in abnormal situations can be a source of friction for humans and horses
- Horses learn quickly, but unlearn slowly
- Clinical signs of pain are generally consistent across horses and are always a reason to contact your veterinarian
- Learning to differentiate anxiety versus aggression can be valuable in helping identify horses that just need some work versus those that are inappropriate for your program
- Facility design, pastures, and turnout should be designed to reduce anxiety in horses and allow expression of normal behaviors and to reduce boredom

Please feel free to reach out with questions or more information! Even if I cannot answer a specific question hopefully I can point you in the right direction. I can currently be reached by email at [evan.crisman@okstate.edu](mailto:evan.crisman@okstate.edu)

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