

Pain Management in Horses

Horses experience acute and chronic pain, and managing pain is critical to minimizing secondary problems

Overview

The term “pain” stems from the Latin word *peona*—a penalty. For those of us who have actually experienced real pain, this is obviously a gross understatement. In veterinary medicine “pain” is defined as an unpleasant sensation or awareness of a noxious stimulus due to actual or perceived tissue damage.

Pain is mediated by specific nerves and is ultimately perceived by the central nervous system when pain receptors—specialized nerve endings located throughout the body—are stimulated. These specialized nerves transmit pain signals to the spinal cord and brain, where pain is consciously appreciated.¹ Pain is caused by one or more stimuli such as extreme heat or cold, tearing, crushing, penetration, or chemicals/toxins.

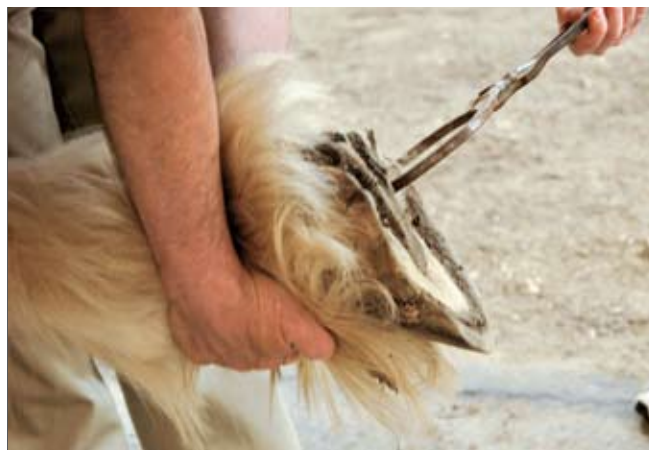
Albeit unpleasant, pain is important for bodily defense as it triggers a reflexive action to retract from the painful stimulus and modifies the animal's behavior to avoid that particular painful situation again.

Types of Pain

The two main “types” of pain are nociceptive and neuropathic (neurogenic). Neuropathic pain is caused by damage to the peripheral nerves, brain, brainstem, or spinal cord, whereas nociceptive pain is a result of tissue damage due to chemical, thermal, or mechanical events.

Nociceptive pain is often divided into different subclasses: superficial; deep; and, visceral pain.² Superficial somatic (cutaneous) pain is due to injury to the skin or superficial tissues. This type of pain is typically caused by minor cuts or first degree burns and results in a sharp, well-defined, and localized pain of short duration.

Deep somatic pain originates from



Hoof testers are used to try and localize the source of pain in a horse's foot in order to find a treatment that addresses the cause of lameness.

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ligaments, tendons, bones, muscles, connective tissues, or blood vessels. Sprains and fractures are injuries resulting in deep somatic pain, which is characterized by a dull, aching, poorly localized pain of longer duration than superficial somatic pain.

Finally, visceral pain is pain caused by damage to internal organs (e.g. colic pain). Visceral pain typically results in a dull, cramping pain that can either be well-localized or difficult to localize. Damage to internal organs can result in “referred” pain, in which the site of pain is completely unrelated to the affected organ(s).

Causes of Pain

Horses can suffer a range of painful stimuli, from mild irritations to severe injuries. Some examples are (from mild to severe):³

- Minor cuts or scrapes, fly bites, osteochondrosis dissecans (OCD) lesions, minor medical procedures (e.g., endoscopic-guided biopsy, castration, arthroscopy), and minor musculoskeletal injuries such as a soft tissue strain or bowed tendon.
- Corneal (eye) ulcers, cellulitis (skin infection), joint infections, abdominal surgery, and fractures.

- Peritonitis (infection of the abdominal cavity), exertional rhabdomyolysis (tying-up), and laminitis/founder with rotation and sinking of the coffin bone.

It is important to note that the amount of pain a horse experiences can vary over time. Horses with osteoarthritis often suffer only mild bouts of musculoskeletal pain, but can intermittently experience moderate to severe episodes. This example highlights the importance of monitoring pain status in horses with ongoing diseases.

Signs of Pain in Horses

When in pain, the exact signs a horse displays will vary depending on the cause of the pain, the horse's normal demeanor, the degree of pain, and the overall health of the horse.³ For example, horses with musculoskeletal pain can show a reluctance to move, hold one or more limbs in an abnormal/unusual position, exhibit an abnormal movement during locomotion (e.g., head nod, hip hike), have decreased eating and drinking, and spend an increased amount of time lying down. Alternatively, horses experiencing abdominal pain often kick, bite, or stare at their abdomen, frequently change positions from lying down to standing up, sweat profusely, roll, groan, grind their teeth, or call to their herdmates.

Horses experiencing chronic pain due to longstanding conditions such as laminitis or severe osteoarthritis often have weight loss, changes in eating and drinking patterns, alterations in time spent sleeping or recumbent, modified social behaviors, and a decreased responsiveness to external stimuli. These signs are much different than those described for horses experiencing acute pain, characterized by restlessness, an anxious appearance, dilated

pupils and glassy eyes, flared nostrils, muscle tremors, profuse sweating, and increased respiratory and heart rates.³

Managing Pain

The pharmaceutical management of pain is likely the most well-known pain management strategy. Multiple drug classes that impact the transmission of pain at various points along the pain pathways can be selected and used either solely or in various combinations. These include:

- Non-steroidal anti-inflammatory drugs (e.g., phenylbutazone);
- Steroids (e.g., dexamethasone);
- Local anesthetics (e.g., lidocaine);
- Opiates or narcotics (e.g., morphine, butorphanol);
- Alpha-2 agonists (e.g., xylazine);
- Dissociative anesthetics (e.g., ketamine).

Other pain management strategies include providing appropriate nursing/supportive care by creating a quiet, comfortable environment (e.g., deep bedding), applying heat or ice, hydrotherapy, bandaging or splinting, physical therapy, extracorporeal shock wave therapy (ESWT),

surgical management, surgically desensitizing an anatomic region via neurectomy (partial or total excision or resection of a nerve), and the use of complementary therapies such as acupuncture, chiropractic, and nutritional supplements.

Drugs are often combined in what's termed a balanced or multimodal approach in order to gain the benefits of multiple methods of action with lower doses and, ideally, fewer side effects.

There are many ways to give pain medications to a horse, including:


- Intravenously (IV);
- Intramuscularly (IM);
- Subcutaneously (SQ/SC);
- Orally (PO);
- Via epidural injection (into the spinal canal but outside the spinal cord);
- Transdermally (through the skin); and
- Through continuous rate infusion (CRI, which is an IV at a low, constant dose).

De-Bunking the Myths about Pain

Pain management in horses has, and continues to be, a neglected subject.⁴ While

some argue that a horse will overuse an injured body part (such as a limb or hoof) if he does not hurt, pain management is important and humane to ensure no horse experiences excessive pain unnecessarily.

Experts attest that avoiding wind-up—the progressive increase in pain sensation resulting in hyperalgesia (increased pain sense)—is one of the most important reasons to institute adequate pain management strategies in horses early in the course of treatment.

Controlling pain also can decrease the risk for problems such as gastric ulceration, colitis, and depression. 

KEY REFERENCES

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