

## Introduction to Equine Pain Management

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The perception of pain is one of the most important sensory experiences. When you were a child and touched a hot plate, the pain receptors in your fingertips sent sensory information to your spinal cord where a reflex was triggered to pull your hand away from the plate. At the same time, the sensory information traveled up your spinal cord to your brain where the pain sensation was perceived so that you could make a mind/body connection between touching the hot plate and the sensation that you experienced from doing so. After perceiving this information, your brain formed memories of the experience so that you began to associate touching a hot plate with pain. This in turn would hopefully prevent you from touching a hot plate again and causing tissue damage to your fingertips. Although pain is unpleasant, it is necessary for survival as it allows the body to protect itself against tissue damage in the present and in the future. On the contrary, even though pain is necessary, it can become harmful to the body when it is left untreated and consequently, there is never an appropriate excuse to leave pain untreated.

Horses are a challenge when it comes to pain detection and management. As many of you know, horses are very stoic animals and do not often show outward signs of pain unless their pain is very severe. Because of this, equine pain is often overlooked and consequently not being treated. A second challenge that arises in equine pain management is that due to equine physiology, there are not a huge variety of options to choose from when treating equine pain. In this article, I am going to review common drugs used to treat equine pain and describe complementary therapies that can be used to treat pain in a multi-modal approach.

### Pharmaceuticals:

**Banamine (Flunixin Meglumine):** This a drug that most horse owners have at least heard of and many have used. Banamine is an NSAID (nonsteroidal anti-inflammatory drug) that works to decrease inflammation and prevents the release of pain-inducing substances, and in doing so, provides an analgesic (pain-relieving) effect. Banamine is most often used for visceral pain associated with colic as well as pain that originates in soft tissue. Banamine can be given orally and intravenously. It is labeled for intramuscular use, but this route should be avoided as it can lead to infection and other complications.

**Bute (Phenylbutazone):** Like banamine, bute is also an NSAID drug and works to provide analgesia by reducing inflammation and preventing the release of pain-inducing substances in the body. Bute is recommended over banamine when pain is originating from the musculoskeletal system. Bute can be given orally and IV but caution should be taken when administering IV as bute is very irritating to tissue if it gets outside of the vein.

Bute and Banamine are non-selective COX enzyme inhibitors, meaning that they block COX-1 and COX-2, (the COX-2 enzyme plays a major role in the inflammatory cascade, while COX-1 is important for maintaining GI and renal health) and can inhibit the production of protective compounds in the body that are necessary to maintain kidney and GI health. Excessive doses or long-term use of bute and

banamine can potentially lead to gastric ulcers, hind gut ulcers, and renal damage, therefore, we want to use these drugs judiciously.

**Equioxx (Firocoxib):** Equioxx is also an NSAID, but unlike bute and banamine, it is more selective for the COX-2 enzyme that is part of the inflammatory cascade. Therefore, it is generally considered safer to use as it may have a decreased risk of side effects. Equioxx does not provide as potent an anti-inflammatory and analgesic effect as bute and banamine, so therefore it is not recommended in the acute injury phase and is instead used for milder or more chronic issues. Equioxx is most often administered orally but an intravenous formulation also exists.

**Surpass (Diclofenac):** Surpass is a topical NSAID that can be applied directly to the painful area of the body. Surpass is generally safe but excessive amounts of it can lead to GI and renal issues.

**Gabapentin:** Gabapentin is a drug that helps to decrease excitatory neurotransmitter release and consequently prevent pain transmission at the level of the spinal cord. Gabapentin is not useful to treat acute pain because it does not provide analgesia but rather it is useful in treating chronic and neuropathic pain. Gabapentin is relatively safe, has few side effects, and is given orally.

#### **Complimentary treatments:**

**Acupuncture:** Many people are familiar with acupuncture which is a modality that originating in China and is the practice of inserting very fine needles into the skin at set points that are in close relation to nerves, motor points of muscles, and myofascial trigger points. Acupuncture directly impacts the nervous system and can help to relieve musculoskeletal and visceral pain by tricking the nervous system into focusing on the acute pain caused by the needle stick and in turn blocking pain transmission from a separate set of neurons that are responsible for eliciting more chronic and visceral pain. Acupuncture is very safe but should be only performed by a certified practitioner.

**TENS:** This acronym stands for transcutaneous electrical nerve stimulation. A TENS unit consists of a small machine that produces electrical currents that are transmitted to electrodes that are placed on the skin. The electrical current then stimulates the underlying nerves. TENS can be used for acute and chronic pain. Acute pain settings consist of high frequency and short pulse duration currents while chronic pain settings consist of low frequency and long pulse duration currents. The acute pain setting works through the gate control theory to block pain while the chronic pain setting causes an endogenous opioid release within the spinal cord to relieve pain. The electrodes should be placed near the painful part of the body and/or the spinal cord segment that innervates the painful part of the body. TENS is extremely safe and has no know side effects.

**Cryotherapy:** Cold therapy is ideally used in the acute phases of injury and the initial inflammatory phase as it helps to decrease nerve transmission to prevent pain perception and to slow the tissue metabolic rate to prevent inflammation and tissue damage. Fifteen to twenty minutes of cold therapy where the deep tissue temperature is reduced to temperatures between 59 and 66 degrees F helps to control pain for one to two hours. Cold water immersion is most successful to achieve these internal temperatures as ice packs do not reduce deep temperatures appropriately. Cold hosing, though not as effective is a

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common means to provide cold therapy. Game Ready is a cryotherapy system that acts to cool the tissue and provide compression to relieve swelling.

Heat: Heat therapy is best used in chronic pain states and should not be used with acute injury as it can be counter-productive in the acute phase. Heat therapy can decrease pain, improve range of motion by increase tissue extensibility and decreasing muscle hypertonicity, accelerate tissue healing, and improve circulation to the injured part of the body. Topical hot packs, warm water compresses, and heating pads only heat the superficial tissue and do not reach deeper tissue therefore, they are not recommended unless the injury is very superficial or on a thin part of the body such as the distal leg. Therapeutic ultrasound is an ideal heat producing modality as it produces heat than penetrates deeply into tissue for maximum effect and can be used to heat thicker parts of the body such as the back and pelvic regions.

As mentioned earlier, a multi-modal approach to pain management is ideal and can be achieved by combining the methods discussed above. If you have any questions or want to learn more, please contact me at [intern@newenglandequine.com](mailto:intern@newenglandequine.com).

Sources:

Information taken from lectures given by Dr. Melissa King and Dr. Rob Landry at Colorado State University.