

## Neck and Back Anatomy and Pain in Performance Horses

Neck and back pain is widely acknowledged to have negative effects on equine performance. However, neck and back issues are often undiagnosed and go untreated. There are many causes for pain associated with the spinal column and most can be treated once they have been properly identified.

Several different anatomical structures must be considered when trying to diagnose neck and back pain. The vertebrae, the bones that make up the spinal column and protect the spinal cord, are divided into five groups. The seven cervical vertebrae are located from the back of the skull to just in front of the first rib. The eighteen thoracic vertebrae, which also articulate with the ribs, extend from about the level of the point of the shoulder and through about 2/3 of the back. The six lumbar vertebrae make up the last 1/3 of the back. The dorsal spinous processes of the thoracic and lumbar vertebrae extend from the main body of the vertebrae (which houses the spinal cord) up to just under the skin. These are the structures that make the shape of the withers. The five sacral vertebrae are located behind the lumbar vertebrae and are fused together to make the sacrum. The sacrum is attached to the pelvis at the sacroiliac joints. The caudal vertebrae vary in number and make up the spinal column in the tail. Intervertebral discs are located between the vertebrae. Many ligaments extend between individual vertebrae and keep the spinal column in alignment. The nuchal ligament (which extends from the back of the skull to the withers) and the supraspinous ligament (which extends from the withers to the sacrum) are located on top of the vertebral column and act as a "spring" when the horse rounds its neck and back. Finally, the epaxial muscles run along either side of the vertebral column and enable a horse to bend from side to side.

Although many problems can occur with such complex anatomy, there are a few issues that are most commonly seen in the neck and back of the performance horse. In the neck, the joints between the cervical vertebrae (called cervical facet joints) can develop osteoarthritis. This is usually a degenerative process that occurs over time and is more common as horses get older. Narrowing of the facet joint spaces can be seen on radiographs. Proliferation of bone at the joint spaces can also be seen on ultrasound. Signs of cervical facet joint osteoarthritis may include decreased range of motion in the neck, especially from side to side, reluctance to bend laterally under saddle and resistance to the bit when bending. The facet joints can be medicated under ultrasound guidance with steroids, which decrease inflammation in the area and will often make the horse more comfortable for 6 months to a year. In conjunction with joint injections, horses will often benefit from neck stretching exercises ("carrot stretches") and non-steroidal anti-inflammatory drugs (such as phenylbutazone).

Another common condition is overlapping or overcrowding of the thoracic and lumbar dorsal spinous processes, also known as "kissing spines". This occurs when the spaces between the dorsal spinous processes decrease, causing inflammation and bony changes. This can occur secondary to trauma but is probably more commonly associated with exercise and spinal conformation. It is particularly common in hunters and jumpers and horses may refuse to jump. Kissing spines can

be particularly painful because they often occur where the saddle sits on the back. Horses may resent the saddle and palpation of the back and may move quite stiffly. Diagnosis of kissing spines may include deep palpation of the back, radiographs, ultrasound or nuclear scintigraphy (bone scan). Once accurately identified, the narrowed spaces between the dorsal spinal processes can be medicated with steroids. The muscles surrounding the affected bones may also be quite tight and will add to the pain associated with kissing spines. Steroid injections into the surrounding muscles and mesotherapy (intra-dermal injections to decrease pain conduction) will help break the pain cycle and allow horses to continue exercising and building back muscles.

It is important to remember that back pain can be caused by compensation for lameness in either the front or hind limbs. When diagnosing a horse with back pain, the entire clinical picture must be taken into account. However, with more awareness for neck and back diseases, horse with decreased performance due to neck and back pain are being diagnosed and treated more appropriately.

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