Approach to Diagnosis and Therapy of Neck and Back Pain
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Introduction
While some of the most common complaints related to athletic performance of the sport horse, the
diagnosis of the sources of neck and back pain can be complex. The signs are easy enough to recognize,
however the underlying cause may be perplexing. The rider or trainer may perceive that a horse has neck or
back pain from a number of clinical signs. These may include sensitivity to grooming and saddling,
resistance to rider weight, stiffness, pain on manual palpation of the neck or back, lack of engagement, and
poor jumping performance. Many of these symptoms may arise as secondary issues to other lameness
problems, particularly of the hind limb, and the difficult issue is determining the origin of the problem.
Back pain may be due to secondary muscle strain related to hind limb lameness producing an altered gait,
primary muscle strain related to athletic effort or a fall, impingement of dorsal spinous processes, strain of
the sacroiliac ligament, poor saddle fit, inflammation of the supraspinous ligament, trauma to spinous
processes, and facet joint arthritis to name a few. Neck pain may be related to a “forced” head position in
training, injury from an accident of fall, muscle soreness, or osteoarthritis of synovial facet joints. A
thorough physical examination, coupled with a complete therapeutic approach can most often identify and
effectively relieve symptoms of neck and back pain.

Physical examination
The examiner should first attempt to rule out lower limb problems as a cause for the presence of neck
and back pain. Lower limb pain may affect how the horse carries itself and may result in muscle soreness in
the back, neck and shoulders. Hind limb lameness such as distal tarsitis, chronic proximal suspensory
desmitis, and gonitis may contribute to significant muscle soreness in the low back because of an altered
leg swing related to a resistance to flex the lower limb or bear weight. Chronic forelimb soreness,
particularly foot soreness, may contribute to back pain in the jumper because of an inverted way of going
that attempts to protect the forelimbs on landing after a jump. Something as simple as an ill-fitting saddle
can be the source of significant pain and should be considered. Bad teeth that cause mouth pain and an
inverted way of going may lead to back pain. The horse’s neck should be carefully evaluated for painful
responses as well. Evaluating neck flexion with “carrot stretches” that asks the horse to bend and flex for a
treat can be very useful in evaluating range of motion. The examiner needs to develop confidence in his or
her palpation technique and trust the observations made. It may take considerable time to develop a
cautious and smooth palpation technique that elicits true pain responses but doesn’t startle the horse. A
complete physical examination should include palpation, passive and active flexion tests, jogging, lunging
and riding the horse, and imaging as indicated by the physical examination. Radiography and ultrasound
are very valuable tools in the evaluation of neck and back pain. Modern digital radiography makes
diagnostic radiographs of the neck and back possible with portable x-ray machines, and ultrasound
examination may reveal joint and soft tissue abnormalities of the neck and back.

Neck
The neck may frequently be the source of poor performance and apparent “mouth problems.” Many
jumpers and dressage horses with neck pain do not “engage” the bit and are constantly resisting work by
being “behind the bit.” One should consider dental issues as a source of pain and rule them out. The
temporomandibular joints (TMJ) may also be a source of discomfort. Local palpation of the TMJ and
manipulation of the mandible may strongly suggest TMJ pain. Intra-articular therapy of the TMJ and
modification of the bit and bridle may provide significant relief.

Stiffness in the neck can dramatically affect the horse’s way of going. This may affect turning on tight
jumper courses and produce poor head and neck carriage in the dressage horse. Evaluation of flexion may
give the examiner a lot of information, and palpation may reveal local areas of soreness.

Acute nuchal ligament and neck muscle strain may be very painful resulting in the horse being
unwilling to raise or lower its head from a desired fixed position. In the author’s experience this type of
pain has been most often observed subsequent to a fall or getting cast in a stall. Osteoarthritis and other
bony proliferative problems may actually produce front limb lameness that eludes the investigator using the
usual flexion tests and regional nerve blocks. It is interesting to note however, that some horses with front limb lameness related to neck issues may actually demonstrate a worsening of lameness when asked to trot away from a lateral neck flexion test. Digital radiographic equipment coupled with high frequency x-ray generators has made field radiography of the neck a fairly simple technique to demonstrate lesions of the synovial facets and vertebral bodies. Diagnostic ultrasound is very sensitive to subtle changes of the facet joints and can also be employed for therapeutic injections when appropriate.

Treatment of neck pain can be accomplished through a variety of modalities. Non-steroidal anti-inflammatory drugs (NSAIDS)\textsuperscript{a} may provide immediate relief that may be complete in the case of simple acute strain or very mild arthritis. Newer NSAIDS\textsuperscript{b} that work through COX2 enzyme inhibition may be safer for long term use in horses with a history of gastric or colonic ulcers or in older horses requiring extended therapy. Muscle relaxants such as methocarbamol\textsuperscript{c} may provide additional relief in acute onset pain where there may be muscle splinting. In the case of synovial facet arthritis, intra-articular injection with corticosteroids and other preparations can be very effective in improving mobility and relieving signs that are secondary to osteoarthritis. Mesotherapy has further reduced local discomfort and improved range of motion in many cases of chronic neck pain. These two techniques will be discussed later in this paper.

Acupuncture has been of significant benefit in the author’s opinion as adjuvant therapy for neck pain. Additionally therapeutic ultrasound has proven beneficial in improving apparent comfort and range of motion.

Withers

Pain in the withers region may produce very poor jumping performance. Discomfort in this region may affect the horse’s ability to “round his back” over a jump thus affecting the shape of the jump. Poorly fitting saddles, strain from jumping and direct trauma from falls may all lead to development of pain in the withers. In the case of poor saddle fit, the solution is obvious, however the very fact that the saddle doesn’t fit may elude even the most experienced horseman. Many horsemen try to force the saddle forward on the shoulders and withers rather than allowing the saddle to settle in behind the withers at the shoulders. This practice may produce some local soreness. Proper saddle fit may solve the issue in some cases. Horses with sore withers may demonstrate sensitivity to pressure on the sternum. Local injection of corticosteroids\textsuperscript{d} (with or without local pain relieving agents\textsuperscript{e}) between spinous processes can provide profound relief of local soreness. This technique will require the use of 3-6 inch needles (7.5 to 15 cm). Chiropractic manipulation and acupuncture may aid in relieving discomfort. Severe trauma and fractures as sometimes seen from following over backward require long-term lay-off (6-12 months) for recovery.

\textsuperscript{a} Banamine (flunixin meglumine), Schering-Plough Animal Health Corp., Union, NJ USA 07083 and Buta-Paste (phenylbutazone), Butler Animal Health Supply, Dublin, OH USA 43017
\textsuperscript{b} Equioxx, Merial Limited, Duluth, GA, USA 30096-4640
\textsuperscript{c} Methocarbamol tablets, USP, 750 mg, Qualitest Pharmaceuticals, Huntsville, AL USA 35811
\textsuperscript{d} Depo Medrol and Predef 2X, Pharmacia & Upjohn Company, Division of Pfizer, Inc., N.Y., N.Y., USA 10017
\textsuperscript{e} Sarapin, High Chemical Company, Levittown, PA, USA 19056
**Thoraco-lumbar region**

The thoracolumbar area is the most often found locally painful region of the back. Pain to palpation along the longissimus muscles concurrently with sensitivity to palpation over the superficial and middle gluteal muscles is often an indicator of problems in the lower hind limb. The examiner should evaluate the hind limbs in such cases to rule out commonly encountered lower limb issues such as distal tarsitis, chronic proximal suspensory desmitis or gonitis.

Pain along the dorsum of the back may be a sign of inflammation of the supraspinous ligament or impingement of dorsal spinous processes. The horse may be noted, when exercised on the lunge line, to move with a very flat and rigid back. Under saddle, the horse may move with a shortened stride behind and the back may appear to be “hollowed out” (lordosis). The horse may resent the weight of the rider sitting in the tack evidenced by tail wringing and a raised head carriage. It has been claimed by some practitioners that local anesthesia (10-20 cc mepivicaine) of a palpably painful area frequently changes the horse’s way of going and confirms the source of pain. This technique may not really identify the locus of pain in many cases. The anesthetic removes some local pain and proprioception and thereby changes function. This may just change how the horse uses it back and perceives various stimuli. Therefore, this technique may not be all that useful in actually localizing the source of pain but is an indication of dysfunction nonetheless.1

Spinous process impingement may demonstrate significant radiographic lesions presenting as narrowed spaces with proliferation, sclerosis, and lysis of vertebral spines. Scintigraphy may demonstrate increased uptake in the affected region but the investigator needs to be aware of summation from deeper structures on dorsal views. Ultrasound examination of the dorsal spinous processes and associated tissues with a 5-8 MHz linear probe may reveal thickening and/or edema of the supraspinous ligament as well as osteophytes of the dorsal spines. Both of these conditions may be effectively handled by local injection of corticosteroids, with or without pain relieving agents such as Sarapin®, between the spinous processes of the painful area using two to three and one half inch needles (5 to 7.5 cm). If significant bony lysis is present between the spinous processes, tiludronate given in an intravenous bolus (500 mg) in one liter of saline over 30 minutes may be helpful in reducing pain related to bone lysis.

Soreness of the lumbar musculature may result from primary strain due to extreme jumping effort or an accident such as a refusal or a twisting fall. Facet joint arthritis of the lumbar vertebrae may produce significant spasm and pain. Again, the horse may be noted to work with a very flat and rigid back and show more discomfort when under saddle. Ultrasound examination of the lumbar facet joints is performed using a 4-6 MHz curvilinear or sector probe, and identification of arthritic joints is possible. Symptomatic relief may be achieved in many cases with NSAIDS such as flunixin meglumine, ketoprofen, or naproxen. The addition of methocarbamol at 7.5-10 grams BID may be of benefit. Acute strain may be accompanied by considerable spasm that will be evident as very firm, painful musculature. icing these areas in the acute situation will increase comfort. Later hot packs and therapeutic ultrasound will reduce pain and inflammation. Accurate injection of facet joints using ultrasound guidance may be performed; however the author has seen benefit from injection of corticosteroids locally without being certain medication was actually in the joint. According to Denoix2 this is due to the fact that the heavy fascia associated with the multifidus muscles retains the medication in the region providing more of a local effect rather than just being absorbed into the general circulation. Mesotherapy, in the author’s experience, has been very useful in the treatment of back pain. This technique involves the intra-dermal injection of soluble corticosteroids and local anesthetic that effectively break the local pain reflex arc and reduce muscle spasm and local discomfort. The effect may last for several weeks. Estrone sulfate has been anecdotally reported to be of benefit in treating chronic back pain. It may be most beneficial in older geldings for improving muscle tone. This medication is generally given as a 25 mg total dose once or twice weekly for two to three months.

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1 Carbocaine-V, Pharmacia & Upjohn Company, Division of Pfizer, Inc., N.Y., N.Y., USA 10017
2 Tildren, Ceva Sante Animale, 33500 Libourne, France
3 Ketofen, 100 mg/ml, Fort Dodge Animal Health, Fort Dodge, Iowa, USA 50501
4 Naproxen Tablets, 500mg, West-ward Pharmaceutical Corp., Eatontown, NJ, USA 07724
5 Flucort (flumethasone), Fort Dodge Animal Health, Fort Dodge, Iowa, USA 50501
6 Lidocaine HCL 2%, American Regent, Inc., Shirley, NY USA 11967
7 Estrone, 5 mg/ml Injectable, Wickliffe Veterinary Pharmacy, Lexington, KY USA
Acupuncture is a very useful adjuvant to previously mentioned therapies for lumbar pain. Repeat therapies are most likely to be of the greatest benefit on a long-term basis. Chiropractic manipulation may be of some benefit in relieving pain and muscle spasm in the low back but most information on this is anecdotal. Pulsating magnetic field therapy is often used on a long-term basis for the treatment of low back pain and in relieving symptoms of muscle spasm. Ultrasound therapy may prove very useful for the treatment of more superficial muscle soreness.

Extracorporeal Shock Wave Therapy (ESWT) has been shown to be effective in the treatment of back pain. The application of this technique would appear at the least to be effective in pain management, but further evaluation of this technique is needed to determine if there is any curative or disease modifying effect.

**Lumbosacral/Sacroiliac region**

Lumbosacral and sacroiliac strain is common in the jumping horse. There is far more motion in the lumbosacral joint than in the sacroiliac, and the pain may be coming from this joint instead of the sacroiliac. The sacroiliac, however, has multiple ligamentous attachments to the axial skeleton that may be subject to stress and strain. Many horses are mildly affected on a chronic basis and continue to perform, although soreness in the region is evident. In more severe cases, jumping performance is usually significantly compromised and the horse is distinctly lame, usually more obviously on one leg. Horses that were good performers suddenly don’t want to jump. The horse often stands with a stretched out posture and may rest one hind limb. Palpation over the lumbosacral area produces a painful response. More pain may be perceived by exerting more pressure on one tuber sacrale. There may be considerable resistance on the part of the horse to have one of the hind legs picked up and flexed high. Rocking the pelvis may cause the horse to grunt. In cases of sacroiliac pain, lameness may be apparent in the opposite hind limb following an upper limb flexion test. The horse may be observed to have one more prominent tuber sacrale when viewed from behind, but this is not a certain indicator of recent injury. The appearance of a “jumper’s bump” has been associated with sacroiliac strain; however this may be more of a conformational matter than a sign of pathology. Some veterinarians report being able to reduce lameness or temporarily alter the horse’s way of going with local anesthetic infiltrated deeply over the sacroiliac, but this can be tricky with a misplaced injection causing difficulty for the horse to stand. Caution should be taken when performing this technique. Nuclear scintigraphy can be useful in assessing if significant inflammation is present in the area. Rectal ultrasound can be employed to visualize bony lesions of the lower lumbar vertebral body articulations and the sacroiliac joints. Abnormalities of the lumbosacral joint should be carefully noted. Additionally, the foramina for the last lumbar and sacral nerve roots may be imaged. Thickening of nerve roots that contribute to the sciatic nerve may be visualized.

Rest and time are the two most significant factors in treating serious injuries of the sacroiliac. In the case of severe strain, which is likely to be accompanied by sudden onset lameness, healing of the injured tissue will likely require six months or longer. The horse should be stall rested for thirty days followed by two to three months controlled paddock rest (tranquilized at first, if necessary). Following this, light exercise on flat surfaces with a gradual increase in the amount of work over the next three months will allow time for healing and regaining strength in the affected area. Deep injection of the sacroiliac joint region may be of benefit and will be described later. Acupuncture therapy for local pain and muscle spasm has been useful during convalescence in the authors’ experience. ESWT can have a pain relieving effect as well as stimulating a healing response.

Horses with less severe injuries of the lumbosacral and sacroiliac joints may continue in work and receive local therapy for soreness. Injection of corticosteroids with/without Sarapin® over the sacroiliac may significantly reduce pain. There are two commonly used techniques for injection of the lumbosacral and sacroiliac joints. The first, requiring less technical instrumentation, involves using a six to ten inch needle that is placed along the cranial edge of one tuber sacrale and directed obliquely across the midline to the medial aspect of the opposite tuber sacrale. The needle is then directed along the medial surface of the ilium toward the sacrum as deeply as possible. This may require slightly bending the needle to accommodate placement. The area is then infiltrated with a corticosteroid (and Sarapin® solution according some practitioners). Ultrasound guidance may be useful but is not necessary for this technique. In the second technique preferred by the author, ultrasound is used to visualize the needle passing deep to the wing of the ilium in a direction parallel to the spinal column and directed obliquely to reach the lumbosacral joint and the cranial aspect of the sacroiliac. The caudal aspect of the sacroiliac is then visualized from a spot caudal to the tuber sacrale with the probe placed transversely to visualize the wing of
the sacrum. A six inch needle is directed ventrally to the sacral wing at the caudal margin of the sacroiliac joint. Approximately 5 ml of corticosteroid solution is deposited at each site. The author’s preference is Predef 2X® (10-20 mg) with or without Depo Medrol® (100 mg) as a total dose and diluted with saline or Sarapin®. Infiltration of acupuncture points (BL 25, 26, 27) parallel to the sacrum with the same solution can also be performed at this time. This technique has proven effective for the author in relieving pain from minor to moderate strains and chronic arthritis. Local mesotherapy may be of similar benefit. Some veterinarians advocate the use of irritant agents such as iodine solutions to stimulate healing of the sacroiliac ligament. This carries risk for serious side effects (cellulitis and abscesses) when placed over the dorsal aspect of the back and has not been employed by the author. Refractory cases have been reported to respond to injection of the sacroiliac (cranially and caudally) with bone marrow-blood, stem cells, and other tissue stimulating factors.

Chiropractic manipulation is often attempted in cases of sacroiliac injury. While chiropractic is very useful in identifying the nature of the problem in some cases and may be helpful in mild cases of strain, manipulation in more severe cases will not replace the need for rest, healing time and medical therapy.

A regular schedule of acupuncture can be of benefit in relieving sacroiliac and lumbosacral discomfort. Pulsating magnetic field therapy is often used on a long-term basis for sacroiliac injury and appears to be of some benefit for pain relief. Therapeutic ultrasound is helpful for pain and spasm when used over the adjacent musculature.

**Conclusion**

The neck and back are frequently the source of performance problems for the sport horse. Problems may range from acute trauma to chronic osteoarthritis. A thorough physical examination and careful observation of the horse in motion can enable the practitioner to accurately assess the horse and address the problems in an effective manner. A variety of techniques are available for managing neck and back pain in the sport horse.

**References:**

1. Denoix JM, International Society of Equine Locomotor Pathology (ISELP) module # 3, Neck and Back 22-24 Aug. 2008, Menlo Park, CA USA,
2. Denoix JM, personal communication