

## ADAPTED DURAL MOBILIZATION TECHNIQUES FOR THE CANINE PATIENT

The Central Nervous System, Peripheral Nervous System and Autonomic Nervous System are adjoined, continuous and constantly under some degree of tension.

The connective tissue attachment and continuity of the neural structures, as well as the inherent resting tension means that movement of one body part will have an effect on the nervous system elsewhere in the body and can also restrict movement when too tight. These tissues however have the ability to adapt and a normal nervous system will allow full flexibility.

### ADVERSE NEURAL TENSION TESTING TECHNIQUES:

#### HIND LIMB:

Straight Leg Raise / Slump test: For the Canine patient this is most easily carried out in side lying. Round the spine, straighten the stifle and flex from the hip as far as tolerated. Movements to incorporate with this test include:

- Hock flexion (dorsiflexion) will stress the sciatic nerve, tibial nerve and sural nerve (if some inversion (inward bend and rotation) is added to the dorsiflexion)
- Hock extension with inversion (inward bend and rotation) will stress the sciatic nerve and common peroneal nerve
- Hip Adduction stresses the lumbosacral plexus
- Medial rotation of the hind limb stresses the sacral plexus and common peroneal nerve
- With Cervical flexion or extension: Flexion may increase the symptoms and extension may decrease the symptoms

Prone Knee Bending: For the Canine patient again assume the side lying / lateral recumbency position.

- Straighten or Round the spine (try one and if you don't get the tension you expect, then try the other) and...
- a) first bend the stifle – holding this position, then extend the leg at the hip (keeping a bent knee).
- b) Extend the hip and then bend the stifle
- Adding cervical flexion or extension may increase the symptoms (tension)

Passive Neck Flexion: This may test the spinal dura in general.

**NOTE:** For these test, we are unable to ask when, if or where they may experience a deep stretch sensation along the line of the nerve. Instead we must watch for a reaction of discomfort from the dog and also pay close attention to the amount of movement and end feel present in the end ranges of each movement in order to determine if an adverse neural tension is present OR to determine the end range for your mobilization of the dura.

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## FRONT LIMB TENSION TESTS

The Brachial Tension Test was first described by Elvey in 1979.

- To test the Median Nerve (C8 – T2), put the shoulder into slight Abduction, depress the shoulder girdle (pull the shoulder blade down and away from the neck) and externally rotate at the shoulder. Straighten the elbow and extend the carpus.
- To test the Radial Nerve (C7 – T1), put the shoulder girdle into depression (pull the shoulder blade down and away from the neck), and internal rotation of the shoulder. Straighten the elbow and flex the carpus.
- To test the Ulnar Nerve (C8 – T2), put the shoulder into Abduction and elbow flexion (ie putting the paw (hand) behind the head, and extend the wrist.
- To test the Musculocutaneous Nerve (C7 – C8), put the shoulder into Abduction, Internal Rotation and Elbow extension.

## MOBILIZATIONS

The Mobilizations of the dura or nerve / nerve root, utilize the same techniques as listed above, but incorporate the movement of getting into the end range position and are graded just like the Maitland Mobilization scale: Utilizing inner range Grade 1 or 2 mobs for acute injuries or flares and Grade 3 – 4 for subacute or chronic neural dysfunctions. Grade 5 mobilizations should not be used with Nerves.

Grade 1: small amplitude movement with no tension

Grade 2: large amplitude of movement with no tension

Grade 3: large amplitude of movement up to point of resistance

Grade 4: small amplitude of movement with tension

Grade 3 mobs are most commonly used clinically as this grad is not as likely to compromise neural blood supply and has the mechanical effect of changing fluid gradients and preventing fibrosis

Grade 4 mobs create more tension in the nervous tissues which can compromise microcirculation but may be helpful in restoring connective tissue elasticity.

**Effects of Treatment:**

1. Mechanical
  - Increases blood supply and axoplasmic flow
  - Mechanical dispersion of intraneural edema
  - Decreases connective tissue entrapment
  - Normalizes pressure gradients
  - Increases cerebral spinal fluid circulation
  
2. Pain Modulation
  - Peripheral
    - Accommodation: meaning they adapt to continual stimuli
  - Central & Spinal
    - Release of neurotransmitters (serotonin system and noradrenaline systems)

**INDICATION THEORIES for Dural Mobilization Techniques:**

- ◆ LMNL subacute or chronic
- ◆ Chronic musculoskeletal injuries (near or involving nerves) in the subacute or chronic phase
- ◆ Compulsive licking or chewing of an extremity
- ◆ Nerve root compressions / signs / inflammation
- ◆ Loss of Range of Motion along the line of a nerve
- ◆ Recurrent spinal joint dysfunctions at Dural Tension Points (C6, T6 & L4 in the human)

**CONTRAINDICATIONS:**

- ◆ Spinal cord signs and symptoms
- ◆ Recent increase in neural signs
- ◆ Acute radiculopathies

**Suggested treatments for selected nerve states:**

Irritable state:

- Grade 2 – 3 movement
- Slow rhythmical oscillations x 20 reps
- Reassess
- Repeat in 2 – 3 minutes
- Do not provoke pain

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Non-Irritable state:

- Grade 3 mobs
- Method as above
- Grade 4 mobs – hold in tensed position
- Slow rhythmical movement of DISTAL joint

Progression of Treatment

- Increase number of oscillations
- Increase amplitude
- Move into resistance
- Tense system elsewhere
- Move closer to affected area
- Tense affected area first

Owner education

- This is not a technique to send home with every owner. Screen your owners carefully
- Stress mobility not stretching
- Not like any other exercise
- Never provoke pain
- More is not better