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ABNORMALITIES OF POSTURE AND APPEARANCE
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Animals with neurologic disease may have numerous postural, behavioral, involuntary, and seizure disorders that result in them having abnormal appearances and actions. Animals may have abnormalities of voluntary movement, and those will be covered in the session on dogs and cats that can’t walk.

Abnormalities of Head Posture

A head tilt is an abnormal posture wherein one ear is deviated more ventrally than the opposite. For reference, when the animal is viewed from the front, an imaginary line can be drawn from one side of the head to the other along the horizon. A second imaginary line can be drawn perpendicular to this horizontal line that transects through the philtrum of the nose. In normal animals, these imaginary lines will form a 90° angle. In animals with a head tilt, the imaginary line drawn through the philtrum will form an acute angle less than 90°. When severe, the animal may be rolled on the dorsal aspect of its body. In some cases, the animal may continually fall and roll.

Head tilting is most often associated with disease of the vestibular or cerebellar systems. The head tilt is usually directed toward the side of the lesion in the nervous system especially if the lesion involves the peripheral vestibular apparatus. Occasionally, with lesions involving the caudal cerebellar peduncle between the brain stem and cerebellum or flocculonodular lobe of the cerebellum, the head tilt is directed away from the side of the lesion, the so-called paradoxical vestibular syndrome.

A head turn is where the nose remains parallel to the horizon, however, the nose is directed toward the flank or caudal aspect of the body. This has sometimes been referred to as a "yaw". This posture may be a component of the adhesive syndrome, which consists of a head turn (sagittal axis of head perpendicular to the ground) and circling. The animal may also intermittently orient the head laterally or toward the caudal aspect of the body.

A head turn occurs most often with supratentorial lesions. The head turn and circling are usually toward the side of the lesion. A similar abnormality, termed "hemi-inattention" or "hemi-neglect," may be seen wherein the animal will only eat from one side of its food bowl. In some situations of lesions of the (caudal) brain stem or cervical region, the head may be turned to be positioned tightly against the neck or trunk.

Abnormalities of Limb Posture

Animals with neurologic dysfunction may stand with their limbs more laterally positioned than normal. This is often referred to as a wide-based stance. This appearance is most often associated with an abnormality of proprioceptive...
function. Lesions of the nervous system commonly associated with a wide-based stance include the vestibular system, cerebellum, and spinal cord. This posture may be an attempt by the animal to prevent itself from falling to one side. Conversely, animals that stand with the limbs very close together and directly under the trunk may have abnormalities of muscle strength, such as with disease of the peripheral nerves, neuromuscular junction, or muscles themselves.

**Spasticity** is increased tone of the muscles of the limbs. Opisthotonus is a body posture where the neck is held in extension with the top of the head directed toward the mid-back region. In a recumbent animal, spasticity and/or opisthotonus can be seen in numerous situations. These include decerebrate rigidity, decerebellate rigidity, and Schiff-Sherrington syndrome.

**Decerebrate rigidity** is characterized by opisthotonus and extension of all limbs. Usually the animal is stuporous or comatose. This is due to loss of descending input (from the supratentorial structures) to the brain stem structure responsible for flexion and extension of the limbs.

Lesions of the cerebellum may result in a similar posture. **Decerebellate rigidity**, is characterized by opisthotonus with thoracic limb extension, flexion of the pelvic limbs up under the body due to contraction of the sublumbar muscles. If the lesion involves the ventral aspects of the cerebellum, extensor rigidity of all limbs is seen. Importantly, as the lesion associated with this posture does not affect consciousness, the animal with decerebellate rigidity has normal mental awareness and consciousness. This clinical feature serves to differentiate decerebellate from decerebrate rigidity.

Affected animals can assume decerebellate posture episodically resulting in some referring to this as a "cerebellar seizure." This is not a true seizure disorder but rather an episodic postural abnormality.

**Schiff-Sherrington posture** is characterized by thoracic limb extension and inability to move the pelvic limbs normally. Spinal reflexes in the pelvic limb are usually normal. This results from a lesion in the thoracolumbar spinal segments that interrupts the ascending inhibitory impulses originating in the lumbar grey matter and terminating on cells responsible for extension of the thoracic limbs. Border cells located in the dorsal aspect of the ventral grey matter in the lumbar spinal segments between (L1 and L7 concentrated between L1 and L4) send ascending, cranial projections to terminate on the extensor muscles of the thoracic limbs. This influence is normally inhibitory to these extensor muscles. Spinal lesions that interrupt this ascending inhibitory influence result in unopposed function of the thoracic limb extensor muscles and the rigidly extended appearance. The thoracic limbs, except for the rigid extension, are otherwise neurologically normal. Schiff-Sherrington posture is usually associated with severe spinal cord injuries, but this posture alone does not indicate that the spinal lesion is irreversible as has been suggested.

Severe extensor rigidity of the limbs and other muscles is characteristic of **tetanus**. Classically, the rigid extension of the limbs results in a "sawhorse"
appearance when the animal is standing. Facial muscle contraction may result in an abnormal facial expression termed risus sardonicus. Often the lips are contracted causing the commissures of the lips to be directed more caudally. The ears may be contracted caudally as well. In animals with erect ears, the ears may be positioned closer together on the dorsal aspect of the head. In other instances, there is prolapse of the nictitating membranes and possibly miotic pupils. Affected animals may also salivate, possibly due to contraction of the pharyngeal muscles and ineffective swallowing.

While tetanus usually affects the entire body, localized tetanus involving one limb is occasionally noted. Episodic extensor rigidity of the limbs may be associated with a variety of abnormalities of the central or peripheral nervous systems and muscles. Episodic muscle contraction resulting in a stiff appearance, albeit intermittently, can result in disorders such as myotonia (failure of muscle relaxation), reflex myoclonus, seizure, and metabolic abnormalities such as hypoglycemia, electrolyte abnormalities, and muscle cramping syndromes ("Scotty cramp").

In some instances of chronic lower motor neuron disease with muscle atrophy and fibrosis, one or both pelvic limbs may be held in chronic rigid extension. This posture is often seen with toxoplasmosis or neosporosis infection in young dogs. Spasticity can be seen at rest or at gait and is usually associated with upper motor neuron (UMN) disease.

A consistent flexion of a limb may be associated with soft tissue injury of the limb, muscle fibrosis, and skeletal and joint abnormalities. When walking, this is commonly referred to as a (non-weight bearing) lameness. If the limb is not anatomically fused in this position, this posture most often is the result of pain somewhere or around the limb. If the pain originates from a spinal or peripheral nerve abnormality, this is termed a nerve root signature. Nerve root signature may involve either the thoracic or pelvic limbs.

**Abnormalities of Body Trunk Posture**

*Scoliosis* is an abnormal lateral deviation of the vertebral column. This may be due to a problem of the vertebrae, ribs, or associated muscles and ligaments. Abnormal muscle support due to denervation of the paraspinal musculature contributing to asymmetric lateral muscle tension and subsequent vertebral deviation. In dogs, scoliosis often occurs secondary to intramedullary spinal cord lesions such as syringomyelia or hydromyelia. Associated damage to spinal cord LMN cells that are responsible for paraspinal muscle innervation may result in abnormal paraspinal muscle function.

*Kyphosis*, an abnormal flexion primarily of the thoracolumbar spine, may be a postural abnormality associated with pain, or may result from abnormalities of the vertebrae, ligaments, ribs, paraspinal muscles, and spinal and other peripheral nerves. Often, a kyphotic posture is the result of pain originating in the cervical area, thoracolumbar spine, or abdomen. Dogs with cervical pain also will often keep their neck muscles rigid with their heads held in the same horizontal plane as their spine, or lower to the ground. Doberman pinschers
with cervical vertebral malformation/malarticulation will often keep their cervical area straight in relation to their thoracolumbar area presumably as a result of pain or possibly to relieve some of the associated spinal compression. Lack of muscle tone dorsally may allow for overpulling of the ventral spinal muscles.

*Lordosis* is a ventral deviation of the spine and is uncommon in small animals. This may be a reflection of weakness or impairment of the paraspinal muscles. Occasionally, animals with thoracic vertebral or thoracic cavity disease will tend to flex the thoracic spine ventrally compared to the cervical and lumbar regions. In some instances, the neck and head may secondarily be positioned in a more extended position.

*Ventral flexion of the neck* (ventral neck flexion) is mostly commonly seen in cats and immature dogs. The animal's head will be directed ventrally toward the ground and usually caudally toward the ventral thoracic region. While this posture may result from cervical pain, it is more often a reflection of weakness of the cervical muscles. Animals with paralysis of the cervical muscles may also have a head and neck that appear to "flop" in a dependent (compared to gravity) direction.