

## Muscles of the Neck and Thoracic Limb

<b><u>Structure</u></b>	<b><u>Origin</u></b>	<b><u>Insertion</u></b>	<b><u>Action(s)</u></b>	<b><u>Stretch</u></b>
<b><u>Nuchal Ligament</u></b>	First 3 Thoracic Spinous Processes	Dorsal Spinous Process of C2	Support the head and prevent excessive ventroflexion Proprioception for head/neck placement	N/A
<b><u>Supraspinatus</u></b> N: Suprascapular (C6-C7)	Supraspinous Fossa	Greater Tubercle, anterior to Infraspinatus	Shoulder extension Stabilize the shoulder joint Proprioception in tendon	Shoulder flexion
<b><u>Infraspinatus</u></b> N: Suprascapular (C6-C7)	Infraspinous Fossa	Lateral Greater Tubercle, between the Supraspinatus and Teres Minor tendons	Shoulder extension and flexion Abduction of the humerus Lateral rotation of the humerus stabilizes the shoulder joint	Shoulder flexion or extension Internal rotation of the humerus Adduction of the humerus
<b><u>Teres Minor</u></b> N: Axillary (C7-C8)	Distal 1/3 of caudal border of scapula	Greater Tubercle, caudal to Infraspinatus tendon	Shoulder flexion External rotation of the humerus	Shoulder extension Internal rotation of the humerus
<b><u>Deltoideus</u></b> Spinous Head (S) Acromial Head (A) N: Axillary (C7-C8)	S: Spine of Scapula A: Acromion	Deltoid Tuberosity of Humerus (both heads)	Both Heads: Shoulder flexion Both Heads: Abduction of the humerus	Both Heads: Shoulder extension Both Heads: Adduction of the humerus
<b><u>Teres Major</u></b> N: Axillary (C7-C8)	Caudal angle and border of Scapula	Teres Major tuberosity of Humerus	Shoulder flexion Adduction of the humerus Internal rotation of the humerus	Shoulder extension Abduction of the humerus (scapula should be stabilized) External rotation of the humerus

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<b><u>Subscapularis</u></b> N: Subscapular (C6-C7)	Subscapular Fossa on the medial aspect of the scapula	Lesser Tubercle of the humerus via thick, short, strong tendon  This tendon unites intimately with the joint capsule of the shoulder	Shoulder extension Adduction of the humerus Internal rotation of the humerus The tendon functions as a medial collateral ligament of the shoulder joint Stabilizes the shoulder joint while in flexion	Shoulder flexion (and elbow flexion to allow for stretch)  External rotation of the humerus Abduction of the humerus
<b><u>Anconeus</u></b> N: Radial (C7-T1)	Caudal aspect of the humerus (from medial to lateral epicondyles)	Lateral surface of the proximal ulna	Elbow extension Resists elbow flexion during quiet standing	Elbow Flexion
<b><u>Triceps Brachii</u></b> Medial Head (M) Accessory (A) Lateral Head (La) Long Head (Lo) N: Radial (C7-T1)	M: Medial surface of the humerus A: Neck of the humerus La: Proximal lateral humerus Lo: Caudal border of scapula	All heads insert on the Olecranon	M: Elbow extension A: Elbow extension La: Elbow extension Lo: Elbow extension and shoulder flexion	Shoulder extension Elbow flexion
<b><u>Biceps Brachii</u></b> N: Musculocutaneous (C6-C8)	Supraglenoid tubercle of the scapula	Medial ulna and radius, just distal to the elbow joint	Shoulder extension Elbow flexion Stabilizes the shoulder	Shoulder flexion Elbow extension
<b><u>Extensor Carpi Radialis</u></b> N: Radial (C7-T1)	Lateral condylar crest of the humerus	Bases (proximal end) of MC 2 & 3 on the dorsal surface	Elbow flexion (weak) Carpal extension	Elbow extension Carpal flexion
<b><u>Common Digital Extensor</u></b> N: Radial (C7-T1)	Lateral epicondyle of the humerus	Extensor process of the distal phalanx (P3) of digits II-V	Carpal extension Digits of the carpus (II-V) extension	Elbow extension Carpal flexion

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<b><u>Deep Digital Flexor</u></b> Humeral Head (H) Ulnar Head (U) Radial Head (R) N: Median (C8-T1) and Ulnar (C8-T1)	H: Medial epicondyle of the humerus U: Proximal 3/4 of caudal border of ulna R: Middle 1/3 of the medial border of radius	Palmar surface of the base (proximal end) of the distal phalanx (P3) of each digit (I-V)	All Heads: Carpal flexion All Heads: Digit flexion	Elbow flexion Carpal extension Digit extension (at P3)
<b><u>Flexor Carpi Ulnaris</u></b> Humeral Head (H) Ulnar Head (U) N: Ulnar (C8-T1)	H: Medial epicondyle of the humerus U: Caudal border and medial surface of Olecranon	Accessory carpal bone	Both Heads: Carpal flexion Both Heads: Abduction of the paw	Elbow flexion Carpal extension
<b><u>Superficial Digital Flexor</u></b> N: Median (C8-T1)	Medial epicondyle of the humerus	medial and lateral surfaces of the middle phalanx (P2) of digits II-V	Carpal flexion Digit flexion to the level of P2 of digits II-V	Elbow flexion Carpal extension Digit extension (at P2)

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<p><b><u>Transversospinalis System</u></b></p> <p>Short (Sh)</p> <p>Long Rotator (L)</p> <p>Multifidus (M)</p> <p>Semispinalis (Se)</p> <p>N: Medial branches of Dorsal rami of spinal nerves</p>	<p>Mamillary, transverse, articular process</p>	<p>Sh: Spinous process 1 vertebrae cranial to origin</p> <p>L: Spinous process 2 vertebrae cranial to origin</p> <p>M: Spinous process 3 vertebrae cranial to origin</p> <p>Se: Spinous process 5 vertebrae cranial to origin</p>	<p>Sh: Rotate vertebrae only in the thoracic region (T1-T10) and fix the spine when fires bilaterally</p> <p>L: Rotate vertebrae only in the thoracic region (T3-T10) and fix the spine when fires bilaterally</p> <p>M: Rotate vertebrae (C2-Sacrum) and fix the spine when fires bilaterally</p> <p>Se: Rotate vertebrae &amp; lateral flexion - only in cervical and thoracic</p>	<p>Cookie stretches (side to side, extension, &amp; flexion) of the cervical, thoracic and lumbar spinal regions</p>
<p><b><u>Longissimus Thoracis et Lumborum</u></b></p> <p>N: Dorsal branch of Thoracic and Lumbar spinal nerves</p>	<p>Crest and the medial surface of the wing of the ilium</p> <p>Supraspinous ligament</p> <p>Spines of the lumbar and thoracic vertebrae</p>	<p>Spinous, mamillary, and transverse process of the lumbar, thoracic vertebrae and ribs</p>	<p>Rotation, extension, and lateral flexion of the thoracic and lumbar spine</p>	<p>Cookie stretches (side to side, extension, &amp; flexion) of the thoracic and lumbar spinal regions</p>
<p><b><u>Iliocostalis Lumborum</u></b></p> <p>N: Dorsal branch of Thoracic and Lumbar spinal nerves</p>	<p>Wing of the ilium (along w/ Longissimus)</p> <p>Transverse processes of lumbar vertebrae</p>	<p>Transverse processes of the lumbar vertebrae and last 4 to 5 ribs</p>	<p>Lateral flexion of the lumbar and thoracolumbar spine</p> <p>Fixation of the vertebral column</p>	<p>Cookie stretches (side to side) of the thoracic and lumbar spinal regions</p>
<p><b><u>Deep Pectoral</u></b></p> <p>N: Caudal Pectoral (C8-T1)</p>	<p>Ventral sternum &amp; Xiphoid</p> <p>First to last sternbrae</p>	<p>Lesser Tubercle</p> <p>Greater Tubercle</p> <p>Crest of the humerus</p>	<p>Limb weight bearing and advanced: Draw the trunk cranial and FLEX shoulder</p> <p>Non-weight bearing: Draw the limb caudally and FLEX shoulder</p> <p>End of stance phase: EXTENDS shoulder</p>	<p>Shoulder extension</p> <p>Abduction of the humerus</p>
<p><b><u>Superficial Pectoral</u></b></p> <p>N: Cranial Pectoral (C6-C8)</p>	<p>First 2-3 sternbrae, ventral medial raphe</p>	<p>Crest of the greater tubercle</p>	<p>When weight bearing - prevents abduction</p> <p>When non-weight bearing - adduction</p>	<p>Shoulder neutral</p> <p>Abduction of the humerus</p>
<p><b><u>Serratus Ventralis</u></b></p> <p>N: Ventral branches of cervical nerves &amp; long thoracic (C7) thoracic region</p>	<p>Dorso-medial 1/3 of the scapula</p>	<p>Transverse processes of the last 5 cervical vertebrae</p> <p>First 7-8 ribs, ventral to middle</p>	<p>Supports the trunk and depresses the scapula</p> <p>Protract (cervical part) or retract (thoracic part) the limb</p>	<p>Cervical Part: Stabilize the scapula and draw the neck away from the scapula</p> <p>Thoracic Part: Cranial glide of the scapula</p>

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<p><b><u>Omotransversarius</u></b></p> <p>N: Accessory (CN XI)</p>	Distal scapular spine	Caudal border of the wing of the atlas (C1)	<p>Draw the limb cranially</p> <p>Lateral flexion of the neck</p>	Stabilize the scapula and draw the neck away from the scapula
<p><b><u>Brachiocephalicus</u></b></p> <p>N: Accessory (CN XI) &amp; ventral branches of cervical nerves</p>	Clavicular tendon	<p>Distal Part: Distal end of anterior humerus</p> <p>Cervical Part: Cranial 1/2 of the dorsal median raphe</p> <p>Mastoid Part: The mastoid part of the temporal bone</p>	<p>Advance the limb</p> <p>Extend the shoulder</p> <p>Draw the head and neck to the side</p>	<p>Shoulder flexion</p> <p>Draw head and neck away from shoulder being flexed</p>
<p><b><u>Latissimus Dorsi</u></b></p> <p>N: Dorsal Thoracic (C6-C8) &amp; Caudal Pectoral (C8-T1)</p>	Thoracolumbar fascia from the spinous processes of the lumbar and last 7-8 thoracic vertebrae	Proximo-medial humerus along with the Teres Major at the Teres Major tuberosity	<p>Draw the forelimb caudally and flex the shoulder</p> <p>Draw the trunk cranially over a fixed limb</p> <p>Draws the limb against the trunk</p>	<p>Shoulder extension</p> <p>External rotation of the humerus</p> <p>Abduction</p> <p>*Do not need to stabilize the scapula*</p>
<p><b><u>Rhomboideus</u></b></p> <p>N: Dorsal rami of cervical/thoracic nerves (C2-T4)</p>	<p>3 parts:</p> <p>Capital: Nuchal Crest</p> <p>Cervical: Median Raphe</p> <p>Thoracic: Spinous process of first 7 thoracic vertebrae</p>	Dorsal border and adjacent surfaces of the scapula	Elevate the limb and draw the scapula against the chest	<p>Flexion of cervical and upper thoracic spine</p> <p>Ventral scapular glide</p>
<p><b><u>Trapezius</u></b></p> <p>Cervical Part (C)</p> <p>Thoracic Part(T)</p> <p>N: Accessory (CN XI) dorsal branch</p>	<p>C: Median Raphe of the neck</p> <p>T: supraspinous ligament T3-T9</p>	<p>C: Spine of Scapula</p> <p>T: Distal part of the spine remains free for omotransversarius</p>	<p>Elevate the limb and draw it cranially</p> <p>Abduct the forelimb</p> <p>Rotate the Scapula</p>	Ventral, cranial, and caudal scapular glides

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<p><b><u>Iliopsoas</u></b></p> <p>Iliacus (I)</p> <p>Psoas Major (P)</p> <p>N: Femoral (L4-L6)</p>	<p>I: Cranioventral ilium</p> <p>P: Ventral bodies &amp; transverse processes of all lumbar and last 3-4 thoracic vertebrae</p>	<p>Lesser trochanter of the femur</p>	<p>Both: Hip &amp; lumbar flexion</p> <p>Both: External rotation of the femur</p>	<p>Hip extension</p> <p>Lumbar spine extension</p> <p>Internal rotation of the femur</p>
<p><b><u>Deep Gluteal</u></b></p> <p>N: Cranial Gluteal (L6-S1)</p>	<p>Body of ilium and ischial spine</p>	<p>Cranial aspect of the greater trochanter</p>	<p>Hip extension</p> <p>Abduction of the femur</p> <p>Internal rotation of the femur</p>	<p>Hip flexion</p> <p>Adduction of the femur</p> <p>External rotation of the femur</p>
<p><b><u>Piriformis</u></b></p> <p>N: Caudal Gluteal (L7)</p>	<p>Lateral surface of S3 and Cd1</p>	<p>Dorsal greater trochanter (with middle gluteal)</p>	<p>Hip extension</p>	<p>Hip flexion</p>
<p><b><u>Middle Gluteal</u></b></p> <p>N: Cranial Gluteal (L6-S1)</p>	<p>Crest and gluteal surface of the ilium</p>	<p>Dorsal greater trochanter (with piriformis)</p>	<p>Hip extension</p> <p>Internal rotation of the femur</p>	<p>Hip flexion</p> <p>External rotation of the femur</p>
<p><b><u>Adductor</u></b></p> <p>N: Obturator (L5-L6)</p>	<p>Entire pelvic symphysis, ventral pubis and ischium, symphyseal tendon of the pelvic symphysis</p>	<p>Caudolateral edge of the femur and the lateral lip of the caudal rough surface of the distal femur</p>	<p>Adduction of the limb</p> <p>Hip extension</p>	<p>Abduction of the limb</p> <p>Hip flexion</p>
<p><b><u>Pectineus</u></b></p> <p>N: Obturator (L5-L6)</p>	<p>Body of the pubis from the iliopubic eminence to pubic tubercle</p>	<p>Medial lip of the caudal rough surface of the distal femur</p>	<p>Adduction of the limb</p>	<p>Abduction of the limb</p>
<p><b><u>Sacrospinous Ligament</u></b></p>	<p>Transverse process of S3-Cd1</p>	<p>Lateral angle of the ischiatic tuberosity</p>	<p>No action - Ligament</p>	<p>N/A</p>
<p><b><u>Superficial Gluteal</u></b></p> <p>N: Caudal Gluteal (L7)</p>	<p>Lateral border of sacrum and Cd1 and proximal 1/2 of sacrotuberous ligament</p>	<p>Third trochanter</p>	<p>Hip extension</p> <p>Abduction of the limb</p>	<p>Hip flexion</p> <p>Adduction of the limb</p>

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<p><b><u>Quadriceps (Femoral Heads)</u></b></p> <p>Vastus Medialis (VM)</p> <p>Vastus Intermedius (VI)</p> <p>Vastus Lateralis (VL)</p> <p>N: Femoral (L4-L6)</p>	<p>VM: Proximal end of the cranio-medial femur</p> <p>VI: Lateral part of proximal 1/4 of the femur</p> <p>VL: Proximal lateral femur</p>	<p>Come together as a tendon to the patella, then as a ligament to the distal end of the tibial tuberosity</p>	<p>Stifle extension</p>	<p>Stifle flexion</p>
<p><b><u>Rectus Femoris (Iliac Head)</u></b></p> <p>N: Femoral (L4-L6)</p>	<p>Ilium, cranial to the acetabulum</p>	<p>Joins the other three heads by a common tendon to the patella, then on to the Tibial Tuberosity</p>	<p>Stifle extension</p> <p>Hip flexion</p>	<p>Stifle flexion</p> <p>Hip extension</p>
<p><b><u>Semimembranosus</u></b></p> <p>N: Tibial (L6-S1)</p>	<p>Cranial and Caudal Heads' origin is the same for both:</p> <p>Ventral surface of the Ischiatic Tuberosity (medial and caudal to Semitendinosus)</p>	<p>2 Insertions:</p> <p>Cranial Head: Distal medial femur blends in with the aponeurosis of the medial head of the gastrocs</p> <p>Caudal Head: The proximal end of the tibia (broad membranous attachment)</p>	<p>Both Heads: Hip extension</p> <p>Caudal Head: Stifle flexion</p>	<p>Both Heads: Hip flexion</p> <p>Caudal Head: Stifle extension</p> <p>External rotation to provide extra stretch</p>
<p><b><u>Semitendinosus</u></b></p> <p>N: Tibial (L6-S1)</p>	<p>Lateral and Ventral Ischiatic Tuberosity</p>	<p>Medial surface of the body of the tibia via a prominent tendon and tuber calcanei via the crural fascia</p>	<p>Hip extension</p> <p>Stifle flexion during non-weight bearing</p> <p>Tarsal extension</p>	<p>Hip flexion</p> <p>Stifle extension</p> <p>Tarsal flexion</p> <p>Adduction of the limb for extra stretch</p>
<p><b><u>Gracilis</u></b></p> <p>N: Obturator (L5-L6)</p>	<p>Pubic Symphysis</p>	<p>Cranial border of the tibia, and with the semitendinosus, the tuber calcaneus</p>	<p>Hip extension</p> <p>Stifle flexion</p> <p>Tarsal extension</p> <p>Adduction of the limb</p>	<p>Hip flexion (slight)</p> <p>Stifle extension</p> <p>Tarsal flexion</p> <p>Abduction of the limb</p>

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<p><b><u>Tensor Fascia Latae</u></b></p> <p>N: Cranial Gluteal (L6-S1)</p>	Tuber Coxae and adjacent ilium	Lateral Femoral Fascia	<p>Tense the femoral fascia</p> <p>Hip flexion</p> <p>Stifle extension</p> <p>Abduction of the limb</p>	<p>Hip extension</p> <p>Stifle flexion</p> <p>Adduction of the limb</p>
<p><b><u>Sartorius</u></b></p> <p>N: Saphenous (L4-L6)</p>	<p>Cranial Head: Iliac Crest and cranial ventral Iliac Spine</p> <p>Caudal Head: Tuber Coxae</p>	<p>Cranial Head: The patella with the Quadriceps</p> <p>Caudal Head: Cranial border of the Tibia</p>	<p>Both Heads: Hip flexion</p> <p>Cranial Head: Extends the stifle</p> <p>Caudal Head: Flexes the stifle</p>	<p>Both Heads: Hip extension</p> <p>Cranial Head: Stifle flexion</p> <p>Caudal Head: Stifle extension</p>
<p><b><u>Biceps Femoris</u></b></p> <p>N: Sciatic (L6-S1)</p>	Sacroteruberous ligament and ischiatic tuberosity	By the tensor fascia to the patella, paterllar ligament, and cranial tibia; via crural fascia to the tuber calcaneus	<p>Hip extension</p> <p>Stifle flexion and extension</p> <p>Tarsal extension</p>	<p>Hip flexion</p> <p>Stifle extension</p> <p>Tarsal flexion</p> <p>Adduction of the limb for extra stretch</p>
<p><b><u>Long Digital Extensor</u></b></p> <p>N: Fibular (L6-S1)</p>	Extensor fossa of the distolateral femur	Extensor process of the distal phalanges of digits II-V	<p>Tarsal flexion</p> <p>Digit extension (at P3)</p>	<p>Tarsal extension</p> <p>Digit flexion (at P3)</p>
<p><b><u>Fibularis (Peroneus) Longus</u></b></p> <p>N: Fibular (L6-S1)</p>	Lateral condyle of the tibia and the proximal end of the fibula	4th tarsal bone, plantar aspect of the base of the II-V MT	<p>Tarsal flexion</p> <p>Rotate the dorsum of the paw medially (eversion/pronation)</p>	<p>Tarsal extension</p> <p>Rotate the dorsum of the paw laterally</p>
<p><b><u>Cranial Tibial</u></b></p> <p>N: Tibial (L6-S1)</p>	Lateral edge of Cranial Tibial border	Plantar surface of the base of MTs I and II meets up with Fibularis longus	<p>Tarsal flexion</p> <p>Rotation of the paw laterally (inversion/supination)</p>	<p>Tarsal extension</p> <p>Rotate the dorsum of the paw medially</p>
<p><b><u>Deep Digital Flexor</u></b></p> <p>N: Tibial (L6-S1)</p>	Caudal aspect of proximal 2/3 of the tibia and proximal 1/2 of the fibular	Plantar surface of the base of each of the distal phalanx (P3)	<p>Tarsal extension</p> <p>Digit flexion to P3</p>	<p>Tarsal flexion</p> <p>Digit extension to P3</p>



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<p><b><u>Superficial Digital Flexor</u></b></p> <p>N: Tibial (L6-S1)</p>	Distal Caudal Femur (in common with the lateral head of the gastroc)	Tuber Calcaneus (with the calcaneal tendon) and base of the middle phalanx of digits II-V	<p>Stifle flexion</p> <p>Tarsal extension and fixation</p> <p>Digit flexion at P2</p>	<p>Stifle extension</p> <p>Tarsal flexion</p> <p>Digit extension at P2</p>
<p><b><u>Gastrocnemius</u></b></p> <p>N: Tibial (L6-S1)</p>	Medial and lateral supracondylar tuberosity of femur (over sesamoid bones)	Dorsoproximal surgance of Tuber Calcaneus	<p>Stifle flexion (slight)</p> <p>Tarsal extension</p>	<p>Stifle extension</p> <p>Tarsal flexion</p>

**N = Muscle Innervation**

**Resources:**

- Miller's Anatomy of the Dog, 5th edition (Hermanson, de Lahunta, Evans) 2020
- Veterinary Neuroanatomy and Clinical Neurology, 4th edition (de Lahuna, Glass, Kent) 2015