

## Muscles of the Neck and Thoracic Limb

<u>Structure</u>	<u>Origin</u>	<u>Insertion</u>	<u>Action(s)</u>	<u>Stretch</u>
<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)

## Muscles of the Trunk and Pelvis

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

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

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

## Muscles of the Pelvic Limb

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

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



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

**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