Muscles of the Neck and Thoracic Limb

Structure	Origin	Insertion	Action(s)	Stretch
Nuchal Ligament	First 3 Thoracic Spinous Processes	Dorsal Spinous Process of C2	Support the head and prevent excessive ventroflexion Proprioception for head/neck placement	N/A
Supraspinatus N: Suprascapular (C6-C7)	Supraspinous Fossa	Greater Tubercle, anterior to Infraspinatus	Shoulder extension Stabilize the shoulder joint Proprioception in tendon	Shoulder flexion
Infraspinatus 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
Teres Minor N: Axillary (C7-C8)	Distal 1/3 of caudal border of scapula	Greater Tubercle, caudal to Infraspinatus tendon	Shoulder flextion External rotation of the humerus	Shoulder extension Internal rotation of the humerus
Deltoideus 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
Teres Major 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

Muscles of the Neck and Thoracic Limb

Structure	Origin	Insertion	Action(s)	Stretch
Subscapularis N: Subscapular (C6-C7)	Subscapular Fossa on the medial aspect of the scapula	Lesser Tubercle of the humerus via think, short, strong tendon This tendon unites intimately with the joint capdule 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
Anconeus N: Radial (C7-T1)	Caudal aspect of the humerus (from medial to lateral epicondyles)	Lateral surface of the proximal ulna	Elbow extension Resists elbow felxion during quiet standing	Elbow Flexion
Triceps Brachii 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
Biceps Brachii N: Musculocutaneous (C6-C8)	Supraglenoid tubercle of the scapula	Medial ulna and radisu, just distal to the elbow joint	Shoulder extension Elbow flexion Stabilizes the shoulder	Shoulder flexin Elbow extension
Extensor Carpi Radialis 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
Common Digital Extensor 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

Muscles of the Neck and Thoracic Limb

Structure	Origin	Insertion	Action(s)	Stretch
Deep Digital Flexor 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)
Flexor Carpi Ulnaris 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
Superficial Digital Flexor 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

Structure	Origin	Insertion	Action(s)	Stretch
Transversospinalis System Short (Sh) Long Rotator (L) Multifidus (M) Semispinalis (Se) N: Medial branches of Dorsal rami of spinal nerves	Mammillary, 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, & felxion) of the cervical, thoracic and lumbar spinal regions
Lonissimus Thoracis et Lumborum 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, & felxion) of the thoracic and lumbar spinal regions
Iliocostalis Lumborum 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
Deep Pectoral N: Caudal Pectoral (C8-T1)	Ventral sternum & Xiphoid First to last sternebrae	Lesser Tubercle Greater Tubercle Crest of the humerus	Limb weight bering and advanced: Draw the trunk cranial and FLEX shoulder Non-weight bering: Draw the limb caudally and FLEX shoulder End of stance phase: EXTENDS shoulder	Shoulder extension Abduction of the humerus
Superficial Pectoral N: Cranial Pectoral (C6-C8)	First 2-3 sternebrae, ventral medial raphe	Crest of the greater tubercle	When weight bearing - prevents abduction When non-weight bearing - adduction	Shoulder neutral Abduction of the humerus
Serratus Ventralis N: Ventral branches of cervical nerves & long thoracic (C7) thoracic region	Dorso-medial 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

Muscles of the Trunk and Pelvis

Structure	Origin	Insertion	Action(s)	Stretch
Omotransversarius 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
Brachiocephalicus 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
Latissimus Dorsi 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 agaisnst the trunk	Shoulder extension External rotation of the humerus Abduction *Do not need to stabilize the scapula*
Rhomboideus 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
Trapezius 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

Muscles of the Trunk and Pelvis

Structure	Origin	Insertion	Action(s)	Stretch
Iliopsoas 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
Deep Gluteal 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
Piriformis N: Caudal Gluteal (L7)	Lateral surgace of S3 and Cd1	Dorsal greater trochanter (with middle gluteal)	Hip extension	Hip flexion
Middle Gluteal 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
Adductor 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 surgace of the distal femur	Adduction of the limb Hip extension	Abduction of the limb Hip flexion
Pectineus 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
Sacrotuberous Ligament	Transverse process of S3-Cd1	Lateral angle of the ischiatic tuberosity	No action - Ligament	N/A
Superficial Gluteal 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

Structure	Origin	Insertion	Action(s)	Stretch
Quadriceps (Femoral Heads) 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 pateral, then as a ligament to the distal end of the tibial tuberosity	Stifle extension	Stifle flexion
Rectus Femoris (Ilial Head) 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
Semimembranosus 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
Semitendinosus N: Tibial (L6-S1)	Lateral and Ventral Ischiatic Tuberosity	Medial surgace 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
Gracilis 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

Muscles of the Pelvic Limb

Structure	Origin	Insertion	Action(s)	Stretch
Tensor Fascia Latae 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
Sartorius 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
Biceps Femoris N: Sciatic (L6-S1)	Sacrotuberous ligament and ischiatic tuberosity	By the tensor fascia to the patella, paterllar 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
Long Digital Extensor 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)
Fibularis (Peroneus) Longus 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
Cranial Tibial 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
Deep Digital Flexor N: Tibail (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

Muscles of the Pelvic Limb

Structure	Origin	Insertion	Action(s)	Stretch
Superficial Digital Flexor N: Tibial (L6-S1)	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	Stifle flexion Tarsal extension and fixation Digit flexion at P2	Stifle extension Tarsal flexion Digit extension at P2
Gastrocnemius N: Tibial (L6-S1)	Medial and lateral supracondylar tuberosity of femur (over sesamoid bones)	Dorsoproximal surgace 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