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DOG MUSCLE ANATOMY

Dog Muscle Anatomy: Origins & Insertions (PDF)

Origins & insertions — the origin, insertion, action and nerve of every muscle a vet student needs, from the thoracic girdle to the hindpaw, with labelled bone attachment maps. Companion to the article at vet-ebooks.com.

Contents

The 17 sections of this guide, in order.

IN SHORT

Dog muscle anatomy is far easier to hold in your head once you stop memorising lists and start reading **attachment maps**. This guide walks the whole **canine muscular system** — the thoracic girdle, shoulder, arm, forelimb and paw, the muscles of mastication, the epaxial and abdominal muscles, and the hip, thigh and crus of the hindlimb — giving the **origin, insertion, action and nerve** of every muscle a student is expected to know, alongside **labelled diagrams** of the bones showing exactly where each muscle attaches. There are 15 self-test questions at the end and a free **illustrated PDF** you can print for the dissection room.

KEY POINTS

1. By convention the **origin** is the more fixed (usually proximal) attachment and the **insertion** the more mobile one — but the roles reverse whenever the distal limb is planted on the ground.
2. A muscle's **action follows from the joints it crosses** and the side it crosses them on. Work that out and you never have to memorise an action again.
3. The dog has **no functional clavicle**: the forelimb is attached to the trunk only by muscle — the **synsarcosis**, with **serratus ventralis** as the main sling.
4. Two-joint muscles are the ones that catch people out — the **long head of triceps**, **rectus femoris**, **gastrocnemius** and the **long digital extensor** (which starts on the femur).
5. **Infraspinatus and subscapularis act as the collateral ligaments** of the shoulder, a joint with no true collateral ligaments of its own.
6. Learn muscles by **nerve group** as well as by region: the radial nerve supplies every extensor of elbow, carpus and digits, which is why a radial nerve injury produces the classic knuckling dog.

About the images

The labelled diagrams and dissection plates are reproduced for educational reference from *Anatomy of the Dog* (Budras KD, McCarthy PH, Fricke W, Richter R, 5th ed.) and *Miller and Evans' Anatomy of the Dog* (Evans HE, de Lahunta A, 5th ed.). Each figure is credited beneath it; copyright remains with the original authors and publishers.

01 How to read dog muscle anatomy: origins & insertions

Most students meet **dog muscle anatomy** as a vocabulary test and give up somewhere around the deep digital flexor. It becomes far more manageable if you treat it as a small set of rules rather than a list.

First, the definitions. The **origin** is conventionally the more *fixed* attachment — usually the proximal one — and the **insertion** is the more *mobile* attachment that gets pulled toward it. That convention is useful but not sacred: as soon as the paw is planted on the ground, the distal end becomes the fixed point and the muscle moves the body over the limb instead. This is exactly why the same muscle can appear to have opposite effects in a standing and a swinging limb.

Second, and far more powerful: **a muscle's action is dictated by the joints it crosses and which side of each joint it passes.** A muscle crossing the cranial aspect of the stifle must extend it; one crossing the caudal aspect of the hock must extend the hock. Once you can see the line of pull on an attachment map, you can derive the action rather than remember it — and you will get the two-joint muscles right, which is where most exam marks are lost.

Third, learn the **nerve alongside the muscle**. Muscles are grouped by innervation for good reason: the radial nerve supplies every extensor of the elbow, carpus and digits, so a single lesion produces a predictable, recognisable dog. Grouping by nerve turns a memory task into a clinical one.

02 The extrinsic muscles: how the forelimb attaches to the trunk

The dog has **no functional clavicle** — only a small clavicular tendon within the brachiocephalicus. The forelimb therefore has *no bony articulation with the trunk at all*. It is slung in a muscular cradle called the **synsarcosis**, and the muscles that form it are the extrinsic (girdle) muscles. This arrangement absorbs concussion, lengthens the stride and lets the scapula glide over the thorax — and it is why the canine shoulder blade moves so freely compared with our own.

MUSCLE	ORIGIN	INSERTION	ACTION & NERVE
Trapezius (cervical & thoracic)	Median raphe of the neck and the supraspinous ligament, roughly C3–T9	Spine of the scapula	Elevates the limb and draws it **cranially**; rotates the scapula. **Accessory n. (XI)**
Omotransversarius	Distal part of the scapular spine, as far as the acromion	Caudal border of the **wing of the atlas**	Draws the limb cranially; with the limb fixed, assists lateral flexion of the neck. **Accessory n.** (Budras gives the ventral branch of C4)
Rhomboideus (capitis, cervicis, thoracis)	Nuchal crest and spinous processes of the cervical and cranial thoracic vertebrae (thoracic part: spines of T4–T6/7)	Medial and dorsal border of the scapula	Elevates the limb and draws the scapula cranially. **Dorsal branches of cervical & thoracic nn.** — unusual for a limb muscle, and a favourite exam point.
Latissimus dorsi	Thoracolumbar fascia — spinous processes of the lumbar and last seven or eight thoracic vertebrae — and muscularly from the last two or three ribs	Teres major tuberosity, with the deep pectoral onto the crest of the greater tubercle	Draws the limb caudally; flexes the shoulder. **Thoracodorsal n. & caudal pectoral nn.**
Serratus ventralis (cervicis & thoracis)	Transverse processes of the last five cervical vertebrae and the first seven or eight ribs(Miller 5e describes this muscle in reverse, from the scapula outward; the direction given here is the conventional one used in most courses.)	**Facies serrata** on the medial scapula	The main **thoracic sling** — suspends the trunk between the forelimbs. **Long thoracic n.** (thoracic part) and **ventral branches of the cervical nn.** (cervical part)

MUSCLE	ORIGIN	INSERTION	ACTION & NERVE
Pectorals (superficial & deep)	Sternum and the first costal cartilages; the deep pectoral also from the abdominal fascia	Superficial pectorals to the **crest of the greater tubercle**; deep pectoral mainly to the **lesser tubercle**, with an aponeurosis over the biceps to the greater tubercle	Adduct the limb; with the limb advanced and planted, the deep pectoral draws the trunk cranially over it. **Cranial & caudal pectoral nn.**
Brachiocephalicus (cleidocephalicus + cleidobrachialis)	Cleidobrachialis from the distal cranial surface of the humerus; cleidocephalicus from the **mastoid process** and the median fibrous raphe of the neck, meeting at the **clavicular intersection**	Continuous across the vestigial clavicle	Advances the limb and extends the shoulder; with the limb fixed, flexes the neck laterally. **Accessory n. & ventral cervical branches**

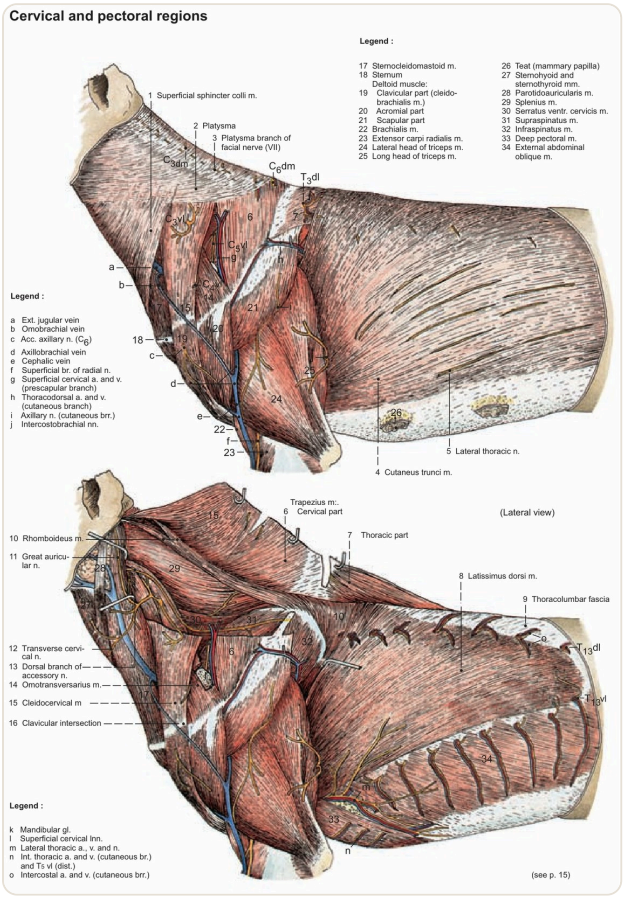

Fig 1 — The cervical and pectoral regions. The superficial layer — platysma, cleidocephalicus and cleidobrachialis, trapezius, omotransversarius and the pectorals — and beneath it the rhomboideus, latissimus dorsi and thoracolumbar fascia.

Image — Budras KD, McCarthy PH, Fricke W, Richter R. Anatomy of the Dog , 5th ed. — plate: Cervical and pectoral regions. Reproduced for educational reference.

03 Where do muscles attach on the dog scapula?

Rather than learning scapular muscles one by one, learn the bone. Almost every muscle of the shoulder region attaches to a named feature of the scapula, and once the map is in your head the origins come free. Laterally, the **supraspinous and infraspinous fossae** are filled by the two muscles named after them, the **spine** carries trapezius and the scapular part of deltoideus, the **acromion** gives rise to the acromial deltoid, and the **caudal border** supplies teres major, teres minor and the long head of triceps. Medially, the **subscapular fossa** is filled by subscapularis and the **facies serrata** receives serratus ventralis — the sling itself. Note too the **supraglenoid tubercle**, the origin of biceps brachii.

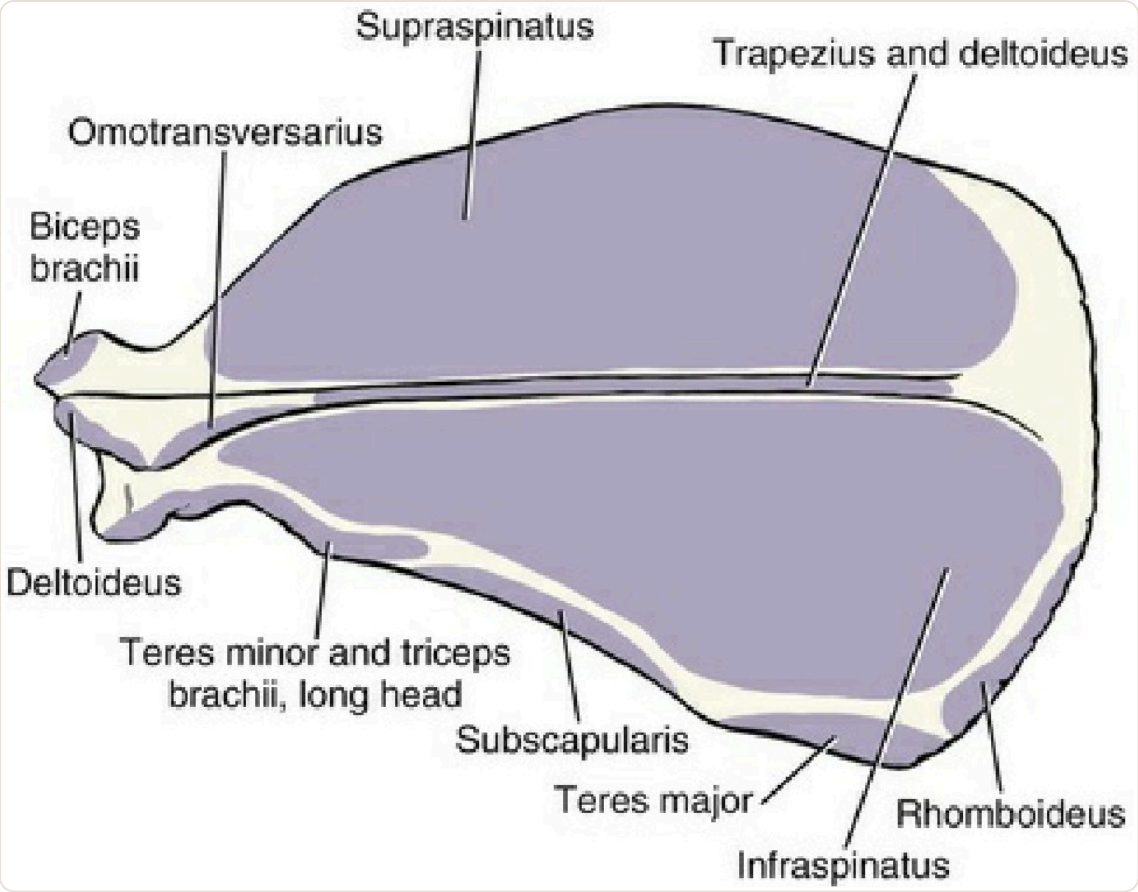

Fig 2 — The scapula, lateral aspect. Attachment areas shaded and named: supraspinatus and infraspinatus in their fossae, trapezius and deltoideus on the spine, omotransversarius distally, and teres major, teres minor and the long head of triceps along the caudal border.

Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog , 5th ed. — Fig. 6.46, left scapula, areas of muscle attachment, lateral. Reproduced for educational reference.

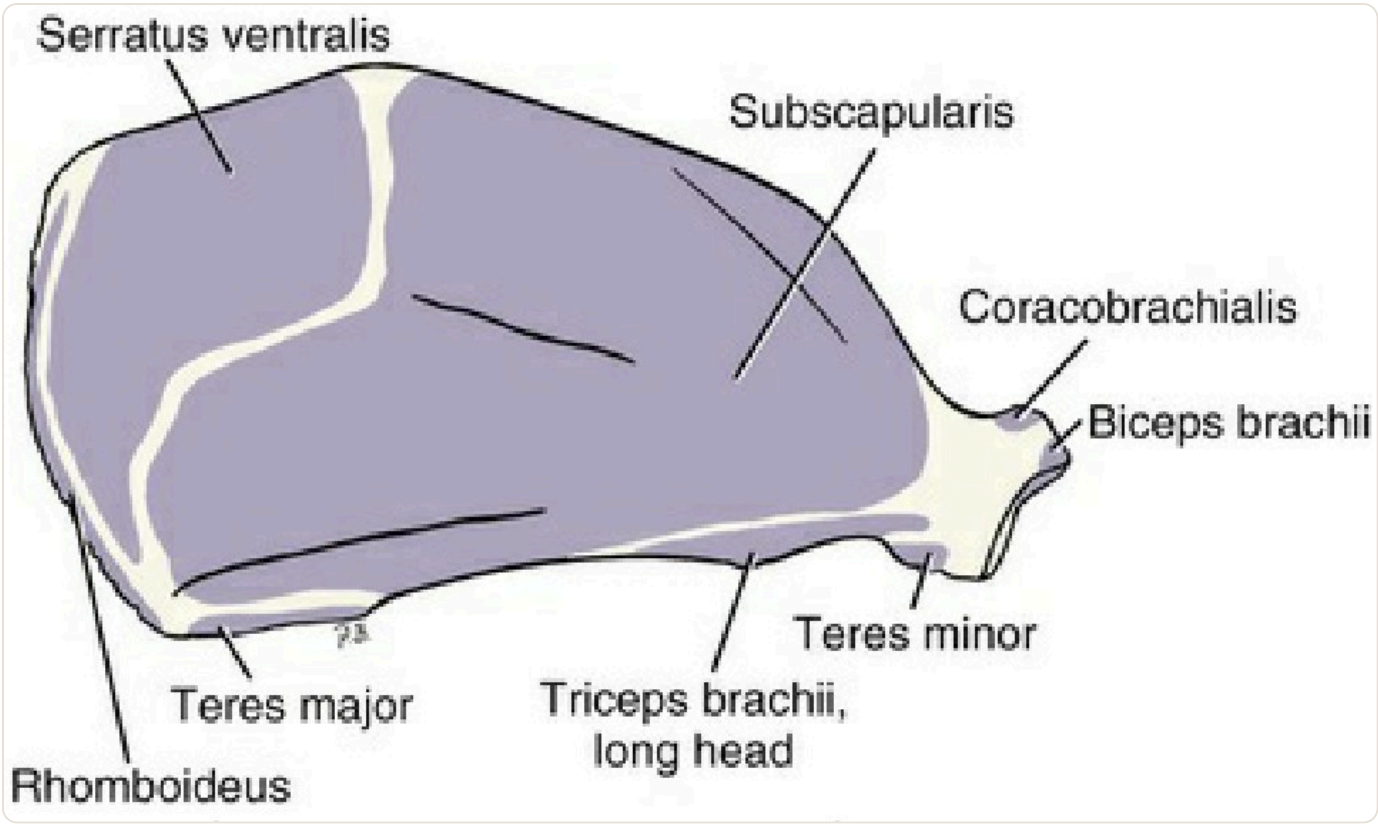

Fig 3 — The scapula, medial aspect. The subscapular fossa filled by subscapularis, the facies serrata receiving serratus ventralis, with rhomboideus on the dorsal border and coracobrachialis and biceps brachii at the supraglenoid tubercle.

Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog , 5th ed. — Fig. 6.47, left scapula, areas of muscle attachment, medial. Reproduced for educational reference.

04 Muscles of the shoulder: origins, insertions & nerves

The canine shoulder is a ball-and-socket joint with **no true collateral ligaments** — only medial and lateral *glenohumeral* thickenings of the joint capsule. Stability is muscular: **infraspinatus acts as the lateral collateral and subscapularis as the medial collateral**. That single fact explains a great deal of shoulder pathology, and it is worth more than any list of actions.

MUSCLE	ORIGIN	INSERTION	ACTION & NERVE
Supraspinatus	Entire supraspinous fossa, the scapular spine and the edge of the scapular neck	Free edge of the **greater tubercle** of the humerus	Extends and stabilises the shoulder. **Suprascapular n.**
Infraspinatus	Infraspinous fossa, scapular spine and caudal border of the scapula	Smooth area distal to the **greater tubercle** (crossing its caudal part)	Abducts and rotates the shoulder; acts as the lateral collateral ligament. **Suprascapular n.**
Deltoideus (scapular & acromial parts)	Scapular part from the scapular spine aponeurosis; acromial part from the **acromion**	**Deltoid tuberosity** of the humerus	Flexes the shoulder; abducts the arm. **Axillary n.**
Teres major	Caudal angle and caudal border of the scapula	**Teres major tuberosity** of the humerus	Flexes the shoulder; draws the limb caudally and rotates the arm medially. **Axillary n.**
Teres minor	Distal third of the caudal border of the scapula	**Teres minor tuberosity**, just proximal to the deltoid tuberosity	Flexes the shoulder. **Axillary n.**
Subscapularis	Subscapular fossa, especially the muscular lines of the caudal scapular border	**Lesser tubercle** of the humerus	Adducts and stabilises the shoulder — its tendon functions as the **medial collateral ligament**. **Subscapular & axillary nn.**

05 Where do muscles attach on the dog humerus?

The humerus is where the shoulder muscles end and the antebrachial muscles begin, so it carries two families of attachment. Proximally the **greater tubercle** takes supraspinatus and infraspinatus, the **lesser tubercle** takes subscapularis, and the **teres major tuberosity** on the medial surface receives teres major with latissimus dorsi. Mid-shaft, the **deltoid tuberosity** and **tricipital line** anchor deltoideus and the lateral head of triceps, while **brachialis** arises from the proximal caudal surface and spirals laterally through the brachial groove. Distally the two epicondyles are the key to the forearm: the **lateral epicondyle** is the extensor origin and the **medial epicondyle** the flexor origin — a rule that holds for the whole antebrachium.

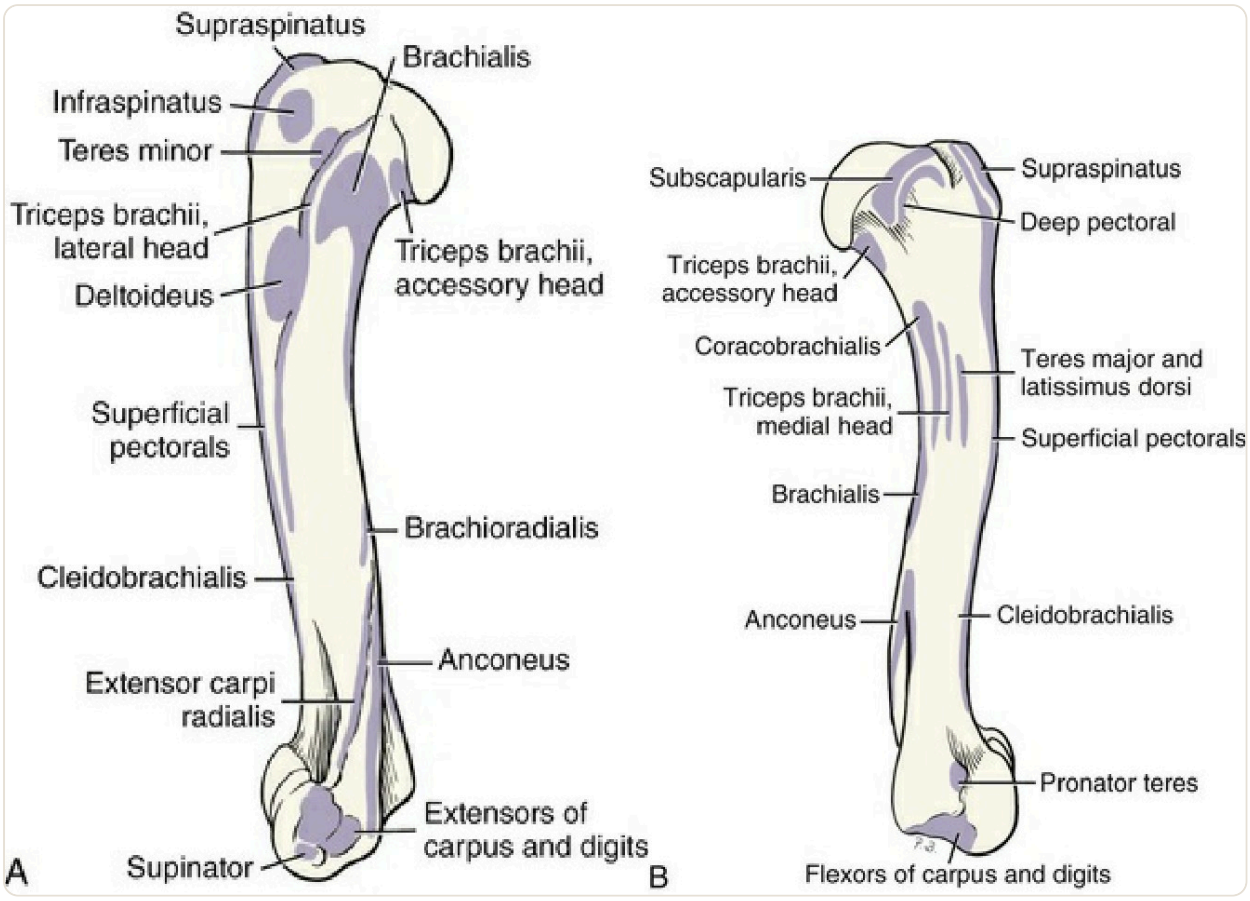

Fig 4 — The humerus, lateral (A) and medial (B) aspects. Supraspinatus, infraspinatus and teres minor proximally; deltoideus, brachialis and the triceps heads on the shaft; and the epicondyles giving origin to the extensors (lateral) and flexors (medial) of the carpus and digits.

Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog , 5th ed. — Fig. 6.49, left humerus, areas of muscle attachment. Reproduced for educational reference.

06 Muscles of the arm (brachium)

The arm divides cleanly into a small cranial flexor compartment and a large caudal extensor compartment. Cranially, **biceps brachii** and **brachialis** flex the elbow; caudally the four heads of **triceps brachii** extend it. The one to watch is the **long head of triceps**, which arises from the *scapula* rather than the humerus and therefore crosses two joints: it extends the elbow *and* flexes the shoulder.

MUSCLE	ORIGIN	INSERTION	ACTION & NERVE
Biceps brachii	**Supraglenoid tubercle** of the scapula (tendon runs in the intertubercular groove)	Ulnar tuberosity and radial tuberosity	Flexes the elbow, extends the shoulder. **Musculocutaneous n.**
Brachialis	**Proximal part of the caudal surface of the humerus**, then winds laterally through the spiral brachial groove	Ulnar and radial tuberosities, with the biceps	Flexes the elbow (pure flexor). **Musculocutaneous n.**
Triceps brachii — long head	Caudal border of the scapula	**Olecranon**	Extends the elbow *and* flexes the shoulder (two-joint). **Radial n.**

MUSCLE	ORIGIN	INSERTION	ACTION & NERVE
Triceps — lateral head	Tricipital line of the humerus	Olecranon	Extends the elbow. **Radial n.**
Triceps — medial & accessory heads	Crest of the lesser tubercle (medial head); humeral neck (accessory)	Olecranon	Extend the elbow. **Radial n.**
Anconeus	Lateral epicondyle and the margins of the olecranon fossa	Lateral surface of the olecranon	Extends the elbow; helps tense the antebrachial fascia and joint capsule. **Radial n.**
Tensor fasciae antebrachii	Epimysium on the lateral surface of the **latissimus dorsi**, above the axillary arch	Olecranon and the antebrachial fascia	Extends the elbow; tenses the fascia. **Radial n.**

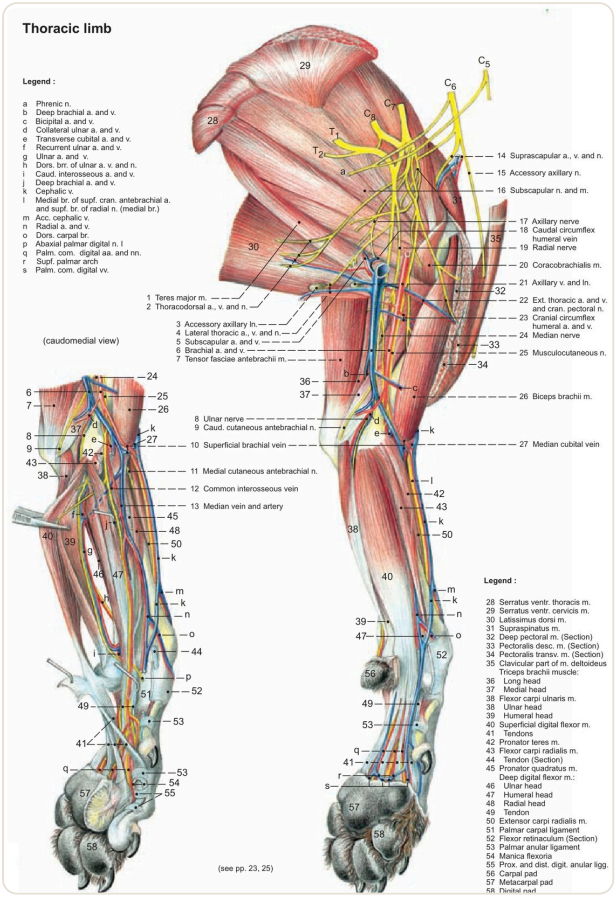

Fig 5 — The thoracic limb, caudomedial view. The arm and forearm muscles in situ with the brachial plexus and its named branches — the anatomical basis for localising a forelimb nerve injury.

Image — Budras KD, McCarthy PH, Fricke W, Richter R. Anatomy of the Dog , 5th ed. — plate: Thoracic limb. Reproduced for educational reference.

07 Forearm & forepaw muscles of the canine forelimb

The antebrachial muscles obey one simple rule: **extensors arise from the lateral epicondyle, flexors from the medial epicondyle**. Craniolaterally sit the extensors of carpus and digits, all supplied by the **radial nerve**; caudomedially sit the flexors, supplied by the **median and ulnar nerves**. There is one classic trap: **ulnaris lateralis** lies in the extensor group and is radial-innervated, but it actually *flexes* the carpus.

MUSCLE	ORIGIN	INSERTION	ACTION & NERVE
Extensor carpi radialis	**Lateral epicondylar crest** of the humerus	Dorsal bases of **metacarpals II and III** (longus to MC II, brevis to MC III)	Extends the carpus — the main carpal extensor. **Radial n.**
Common digital extensor	**Lateral epicondyle** of the humerus	Extensor processes of the distal phalanges, digits II–V	Extends the digits and carpus. **Radial n.**
Lateral digital extensor	Lateral epicondyle / lateral collateral ligament	Digits III–V (joins the common extensor tendons)	Extends the lateral digits. **Radial n.**

MUSCLE	ORIGIN	INSERTION	ACTION & NERVE
Ulnaris lateralis (m. extensor carpi ulnaris in Miller 5e)	Lateral epicondyle of the humerus	Base of **metacarpal V**, with a connection to the accessory carpal bone	Action is genuinely **equivocal**: it abducts and laterally rotates the carpus, flexes the flexed carpus but extends the extended one. It keeps the **extensor (radial) nerve** supply.
Flexor carpi radialis	**Medial epicondyle** of the humerus	Palmar bases of metacarpals II and III	Flexes the carpus. **Median n.**
Flexor carpi ulnaris	Medial epicondyle (humeral head) and the olecranon (ulnar head)	Accessory carpal bone	Flexes the carpus. **Ulnar n.**
Superficial digital flexor	Medial epicondyle of the humerus	Palmar base of the **middle** phalanges, digits II–V	Flexes the metacarpophalangeal and proximal interphalangeal joints — and so the whole forepaw. **Median n.**
Deep digital flexor	Medial epicondyle, plus the radius and ulna (three heads)	Palmar base of the **distal** phalanges, digits I–V	Flexes the digits — the deep flexor of the paw. **Median & ulnar nn.**
Pronator teres	Medial epicondyle of the humerus	Medial border of the radius	Pronates the paw; weak elbow flexor. **Median n.**

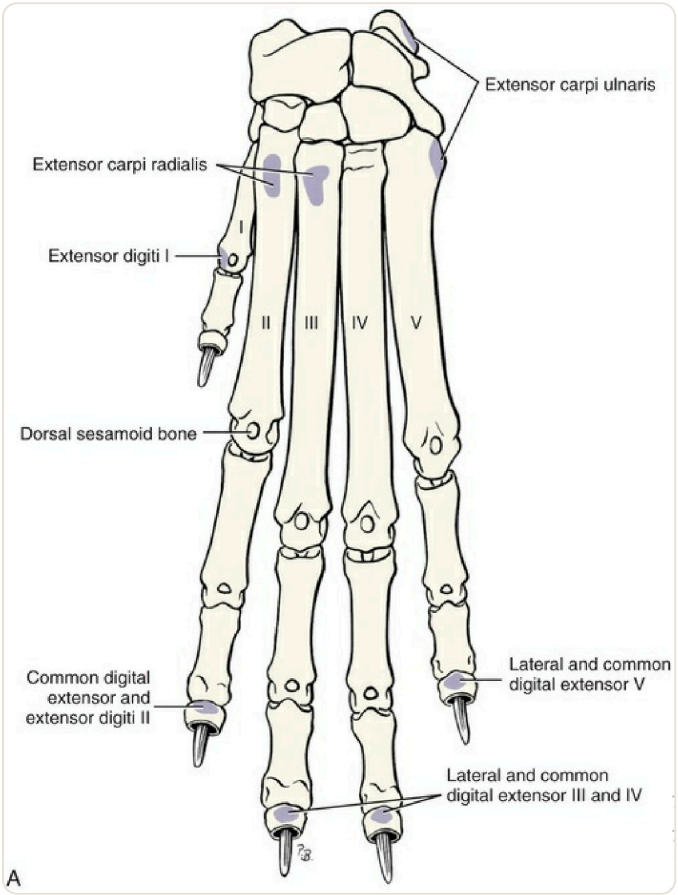

Fig 6 — The forepaw and its muscle attachments. Where the long tendons finally land: the common and lateral digital extensors on the dorsal extensor processes, and the flexor tendons on the palmar surfaces of the middle and distal phalanges.

Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog , 5th ed. — Fig. 6.65, left forepaw with muscle attachments. Reproduced for educational reference.

08 Epaxial muscles of the back

Everything dorsal to the transverse processes is **epaxial** and is supplied by the **dorsal branches** of the spinal nerves — with the **serratus dorsalis** as the notable exception, which keeps a ventral-branch (intercostal) supply. Functionally they are the extensors and lateral flexors of the vertebral column, arranged in three longitudinal columns from lateral to medial: **iliocostalis**, **longissimus** and the **transversospinalis** system (spinalis et semispinalis, multifidus). The thoracolumbar longissimus is the largest muscle of the canine *trunk* and forms the palpable topline either side of the spinous processes.

MUSCLE	ORIGIN	INSERTION	ACTION & NERVE
Splenius	Nuchal ligament, the median dorsal raphe, and the spinous process of the **first (sometimes also the second)** thoracic vertebra	Nuchal crest and the **mastoid part of the temporal bone**	Extends and elevates the head and neck; acting alone, turns them. **Dorsal branches of cervical nn.**
Iliocostalis (lumborum & thoracis)	Ilium and the cranial borders of the ribs	Ribs and transverse processes, several segments cranial	Extends the spine; lateral flexion. **Dorsal branches**
Longissimus (lumborum, thoracis, cervicis, capitis)	Iliac crest and medial surface of the ilium, the sacrum, and the spinous processes and supraspinous ligament	**Accessory** and transverse processes several segments cranially; longissimus capitis to the **mastoid process**	The main spinal extensor — carries the "topline". **Dorsal branches**
Spinalis et semispinalis	**Mamillary** processes of the thoracic vertebrae and the spinous processes of the thoracic and cervical region	Spinous processes further cranial, and the occipital bone	Extends the neck and back. **Medial division of the dorsal branches**

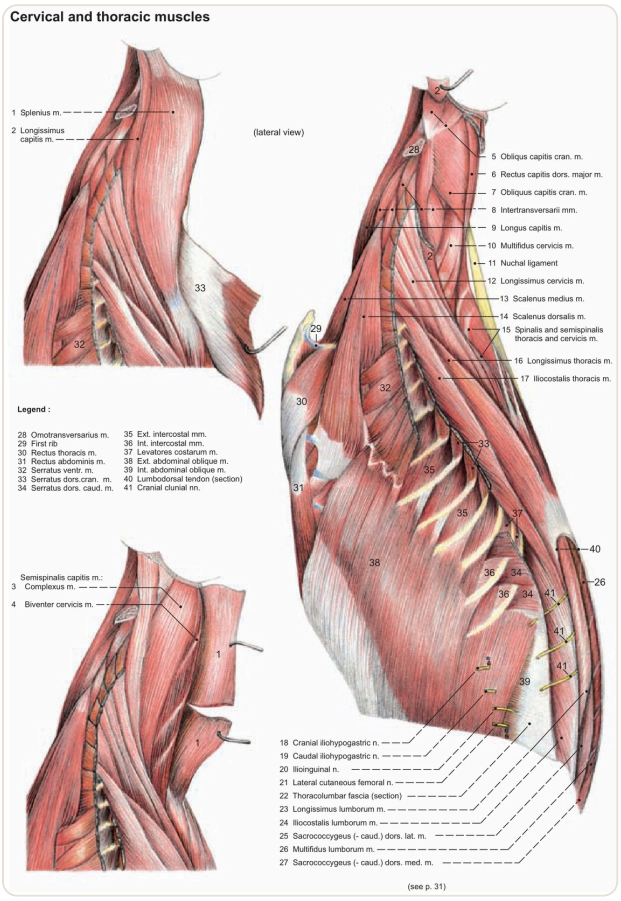

Fig 7 — The cervical and thoracic (epaxial) muscles. Splenius over the neck, and beneath it the three epaxial columns — iliocostalis laterally, longissimus in the middle and spinalis et semispinalis medially — that extend and stabilise the spine.

Image — Budras KD, McCarthy PH, Fricke W, Richter R. Anatomy of the Dog , 5th ed. — plate: Cervical and thoracic muscles. Reproduced for educational reference.

09 Thoracic & abdominal wall muscles

The abdominal wall is four sheets whose fibres (fibers) run in different directions — a plywood arrangement that gives strength in every plane and forms the **linea alba** where the aponeuroses meet in the midline. From superficial to deep: **external abdominal oblique** (fibres caudoventral), **internal abdominal oblique** (cranioventral), **transversus abdominis** (transverse), with the **rectus abdominis** running longitudinally either side of the midline. Together they support the viscera, flex the trunk, and provide the abdominal press for expiration, defecation and parturition. The **diaphragm** completes the thorax and is the principal muscle of inspiration.

MUSCLE	ORIGIN	INSERTION	ACTION & NERVE
External abdominal oblique	Lateral surfaces of ribs 4/5–13 and the thoracolumbar fascia	**Abdominal tendon** to the linea alba; **pelvic tendon** to the iliopsoas fascia and the pubic brim (prepubic tendon)	Fibres run **caudoventrally**. Compresses the abdomen; flexes the trunk. **Costoabdominal, iliohypogastric & ilioinguinal nn.**

MUSCLE	ORIGIN	INSERTION	ACTION & NERVE
Internal abdominal oblique	**Tuber coxae** and the thoracolumbar fascia	Linea alba and the last rib and costal cartilage	Fibres run **cranioventrally** — at roughly right angles to the external oblique. Same actions. **Costoabdominal, iliohypogastric & ilioinguinal nn.**
Transversus abdominis	Transverse processes of the lumbar vertebrae and the medial costal arch	Linea alba	Fibres run **transversely**; the deepest sheet — compresses the abdomen. **Costoabdominal, iliohypogastric & ilioinguinal nn.**
Rectus abdominis	Costal cartilages and the sternum	**Pecten ossis pubis**, via the prepubic tendon	A longitudinal strap crossed by tendinous inscriptions; flexes the trunk and supports the viscera. **Ventral branches of the caudal thoracic & lumbar nn.**
Diaphragm	Lumbar crura (L3–L4), the costal arch and the sternum	**Central tendon**	The principal inspiratory muscle. **Phrenic n. (C5–C7)**

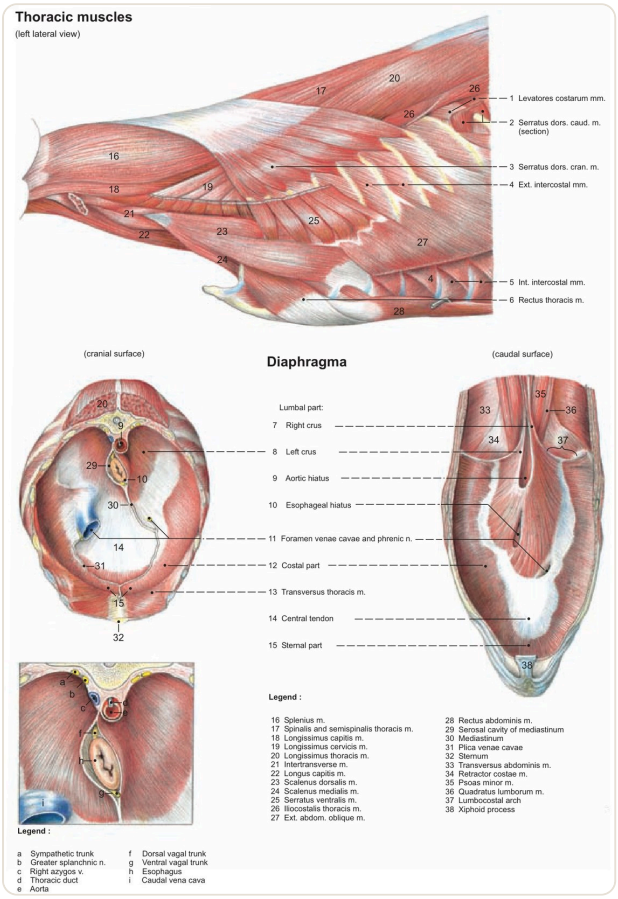

Fig 8 — The thoracic muscles and diaphragm. The intercostal muscles and the diaphragm seen from its cranial and caudal surfaces, with the crura, central tendon and the three hiatuses — aortic, oesophageal and caval.

Image — Budras KD, McCarthy PH, Fricke W, Richter R. Anatomy of the Dog , 5th ed. — plate: Thoracic muscles and diaphragm. Reproduced for educational reference.

10 Muscles of mastication & facial expression

The head is the one region where **canine muscle anatomy** is organised by *cranial nerve* rather than by limb segment, and it is the region students most often skip. The rule is short and worth memorising outright: **every muscle that closes the jaw is supplied by the mandibular branch of the trigeminal nerve (CN V_3), and every muscle of facial expression is supplied by the facial nerve (CN VII).**

Four muscles close the jaw — **masseter**, **temporalis** and the two **pterygoids** — and only one, the **digastricus**, opens it. In the dog the temporalis is the largest of them, filling the temporal fossa and running to the coronoid process; this is why **temporal muscle wasting is the first thing an owner notices in masticatory muscle myositis**, and why a dog with bilateral trigeminal neuropathy presents with a dropped jaw it cannot close. Facial nerve paralysis looks quite different: a drooping lip and a lost blink, with the jaw working normally.

MUSCLE	ORIGIN	INSERTION	ACTION & NERVE
Masseter (superficial, middle & deep parts)	**Zygomatic arch** and the masseteric fascia	**Masseteric fossa** of the mandible, and the ventral and caudal mandibular border	Closes the jaw — the most powerful of the closers. **Mandibular n. (CN V_3)**

MUSCLE	ORIGIN	INSERTION	ACTION & NERVE
Temporalis	**Temporal fossa** of the skull, filling it and reaching the nuchal crest and the sagittal and temporal lines	**Coronoid process** of the mandible, on both surfaces	Closes the jaw; the largest masticatory muscle in the dog. **Mandibular n. (CN V_3)**
Pterygoideus medialis	Pterygoid, palatine and sphenoid bones of the pterygopalatine fossa	Medial surface and ventral border of the **angular process** of the mandible	Closes the jaw; draws the mandible medially. **Mandibular n. (CN V_3)**
Pterygoideus lateralis	Sphenoid bone, rostral to the medial pterygoid origin	Pterygoid fovea on the **medial condylar neck** of the mandible	Closes the jaw; protracts and swings it to the opposite side. **Mandibular n. (CN V_3)**
Digastricus (rostral & caudal bellies)	**Jugular (paracondylar) process** of the occipital bone	Ventral border of the mandible, along the caudal two-thirds	**Opens the jaw** — the only true jaw opener. Caudal belly **facial n. (CN VII)**, rostral belly **mandibular n. (CN V_3)**
Mylohyoideus	Mylohyoid line on the medial mandible	Median raphe and the basihyoid	Forms the floor of the mouth; raises the tongue and larynx. **Mandibular n. (CN V_3)**
Platysma & facial muscles (orbicularis oris, levator nasolabialis, buccinator, caninus)	Superficial fascia of the neck and face; buccinator from the maxilla and mandible	Skin of the lip, cheek, eyelid and ear; buccinator into the orbicularis oris	**Facial expression**, moving the lips and cheek and returning food to the teeth. All **facial n. (CN VII)**

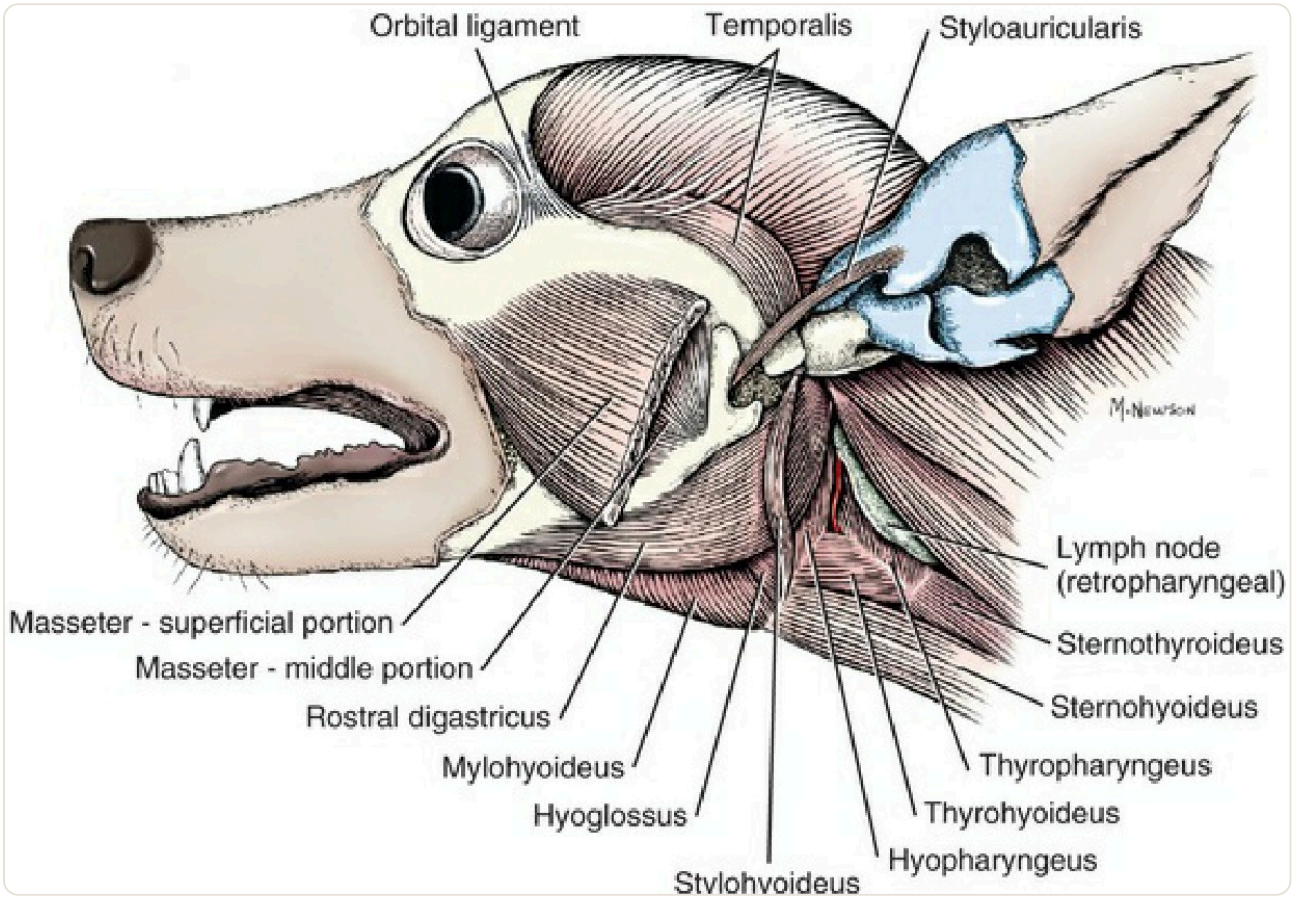

Fig 9 — Superficial muscles of the head, lateral aspect. The masticatory group in place — temporalis filling the temporal fossa, the superficial and middle parts of masseter over the mandible, and the rostral digastricus below — together with the hyoid and pharyngeal muscles of the throat.

Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog , 5th ed. — Fig. 6.9, muscles of mastication, lateral aspect. Reproduced for educational reference.

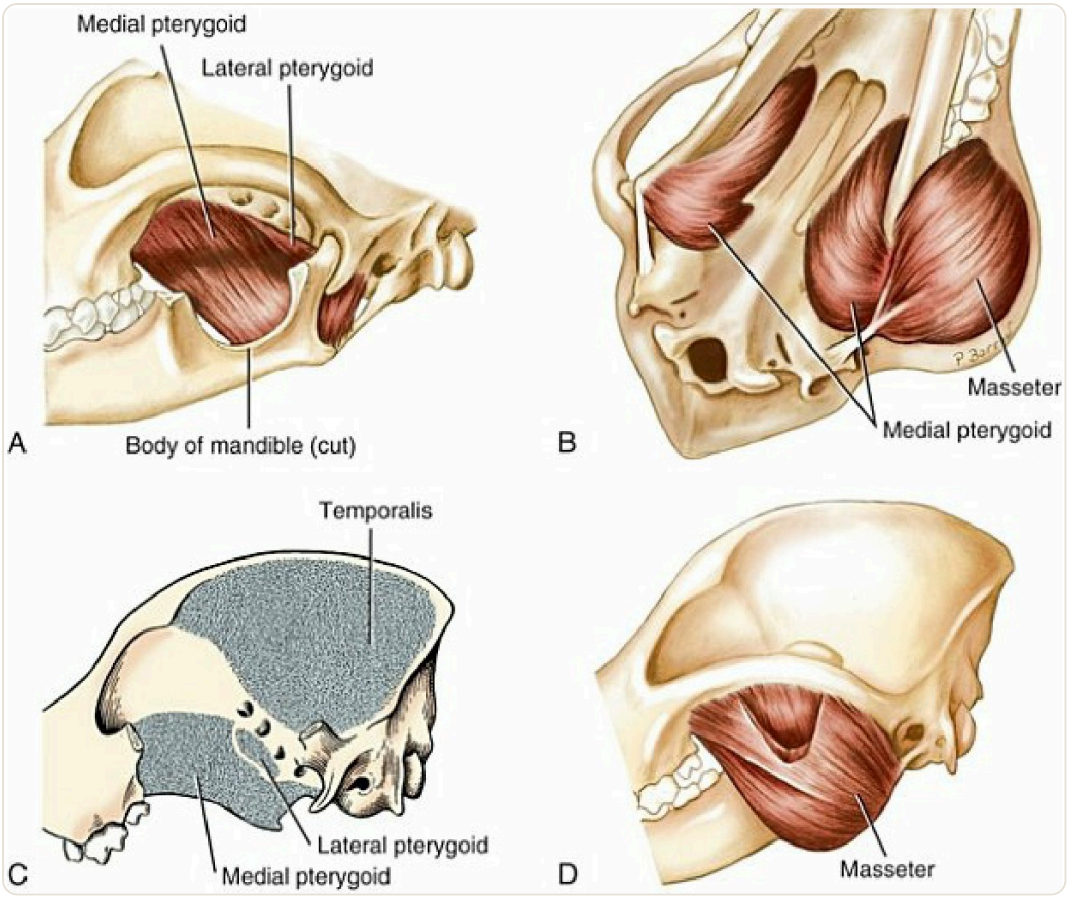

Fig 10 — The deep masticatory muscles and their attachment areas. (A) The medial and lateral pterygoids on the medial surface of the mandible; (B) the same seen from below with masseter; (C) the **attachment areas** of temporalis and the pterygoids shaded on the skull; (D) masseter filling the masseteric fossa.

Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog , 5th ed. — Fig. 6.11, muscles of mastication. Reproduced for educational reference.

11 Where do muscles attach on the dog pelvis (os coxae)?

The hindlimb girdle, unlike the forelimb, *is* bony — the sacroiliac joint transmits propulsion directly to the spine. The os coxae is correspondingly crowded with attachments. Laterally, the **gluteal surface of the ilium** carries the middle and deep gluteals, the **tuber coxae** gives origin to tensor fasciae latae and sartorius, and the **ischiatic tuberosity** is the origin of the entire hamstring group. Medially the **iliac surface** takes iliacus and the sublumbar muscles, and the **pelvic symphysis** gives rise to gracilis and the adductors.

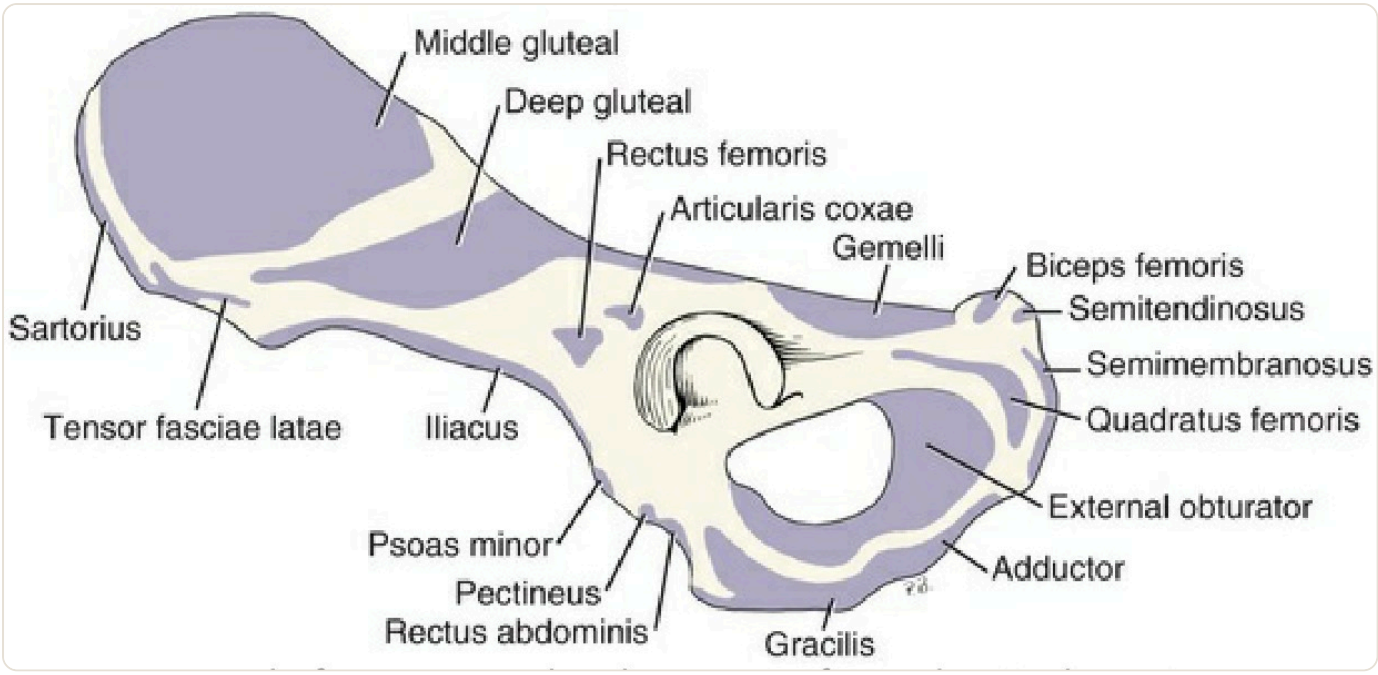

Fig 11 — The os coxae, lateral aspect. The gluteal surface for the middle and deep gluteals, tuber coxae for tensor fasciae latae and sartorius, and the ischiatic tuberosity giving origin to biceps femoris, semitendinosus and semimembranosus.

Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog , 5th ed. — Fig. 6.69, left os coxae, areas of muscle attachment, lateral. Reproduced for educational reference.

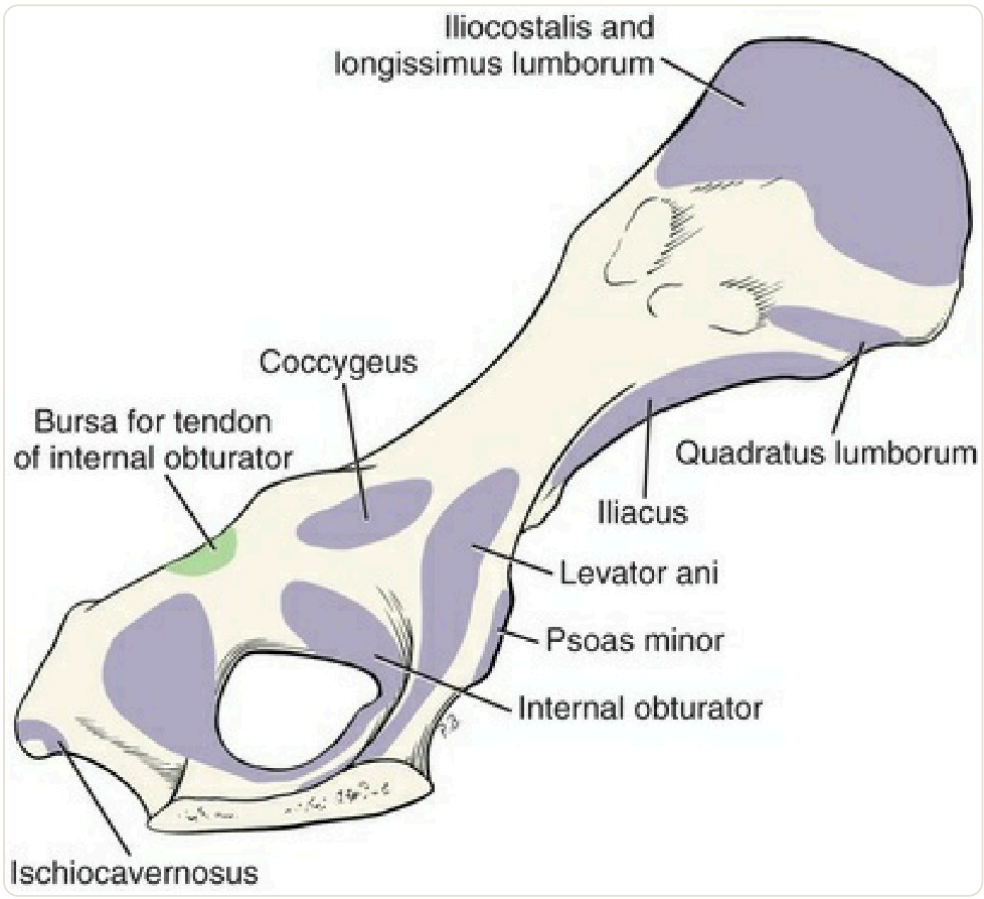

Fig 12 — The os coxae, medial aspect. Iliacus and quadratus lumborum on the iliac surface, psoas minor at the arcuate line, and internal obturator over the pelvic floor — with coccygeus and levator ani forming the pelvic diaphragm.

Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog , 5th ed. — Fig. 6.70, left os coxae, areas of muscle attachment, medial. Reproduced for educational reference.

12 Gluteal & hip muscles of the hindlimb

The gluteal group extends the hip and provides propulsion; the deep group beneath it rotates the femur. A practical point worth carrying into clinics: the **sciatic nerve runs caudomedial to the hip joint** and down the caudal thigh, so the caudal thigh muscles are **avoided** for intramuscular injection. The **lumbar epaxial muscles** and the **quadriceps** are the preferred sites in the dog.

MUSCLE	ORIGIN	INSERTION	ACTION & NERVE
Superficial gluteal	Lateral sacrum, first caudal vertebra, gluteal fascia and the sacrotuberous ligament	**Third trochanter** of the femur	Extends the hip. **Caudal gluteal n.**
Middle gluteal	Gluteal surface of the ilium, between the iliac crest and the dorsal border	Free end of the **greater trochanter**	Extends the hip and rotates the limb medially — the main propulsive muscle. **Cranial gluteal n.**
Deep gluteal	Body of the ilium and the ischiatic spine	Cranial aspect of the greater trochanter	Extends the hip; rotates the limb medially. **Cranial gluteal n.**
Tensor fasciae latae	**Tuber coxae** and the adjacent ilium	Fascia lata, and through it the patella and tibia	Flexes the hip and extends the stifle. **Cranial gluteal n.**
Piriformis	Lateral surface of the third sacral and first caudal vertebrae	Greater trochanter, with the middle gluteal	Extends the hip. **Caudal gluteal n.**
Internal & external obturator, gemelli	Internal obturator from the pelvic symphysis and dorsal ischium; external obturator from the ventral pelvic floor around the obturator foramen; gemelli from the ischiatic spine	**Trochanteric fossa** of the femur	The deep **lateral rotators** of the hip. Internal obturator and gemelli **sciatic n. branches**; external obturator **obturator n.**
Quadratus femoris	Ventral surface of the ischium, caudal to the obturator foramen	**Intertrochanteric crest**, just proximal to the third trochanter — *not* the trochanteric fossa	Extends the hip and rotates the femur laterally. **Sciatic n. branch**
Iliopsoas (psoas major + iliacus)	Psoas major from the bodies and transverse processes of L2–L7; iliacus from the ventral ilium	**Lesser trochanter** of the femur	Draws the limb cranially by flexing the hip. **Ventral branches of the lumbar nn. (femoral n. to iliacus)**

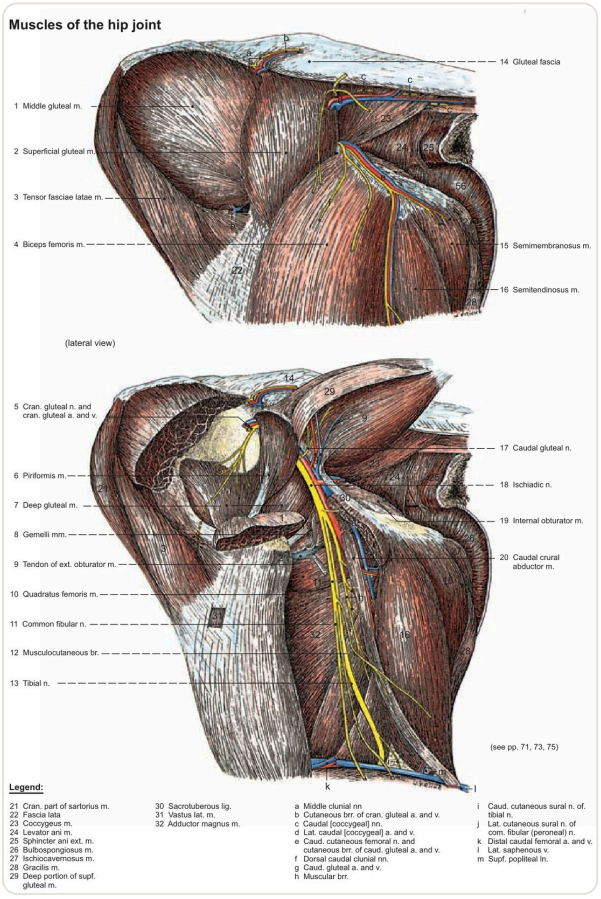

Fig 13 — Muscles of the hip joint. The superficial and middle gluteals removed in stages to show the deep gluteal, piriformis, the gemelli, internal and external obturator and quadratus femoris — the deep lateral rotators — with the sciatic nerve crossing them.

Image — Budras KD, McCarthy PH, Fricke W, Richter R. Anatomy of the Dog , 5th ed. — plate: Muscles of the hip joint. Reproduced for educational reference.

13 Where do muscles attach on the dog femur?

The femur ties the hip to the stifle and carries three groups. Proximally the **greater trochanter** receives the middle and deep gluteals, the **third trochanter** the superficial gluteal, the **trochanteric fossa** the deep rotators, and the **lesser trochanter** iliopsoas. Along the shaft the adductors and pectineus attach caudally and the vasti arise from the cranial and lateral surfaces. Distally, the supracondylar tuberosities give origin to **gastrocnemius** and the **superficial digital flexor**, and the **extensor fossa** to the **long digital extensor** — muscles of the crus and paw that start on the thigh bone.

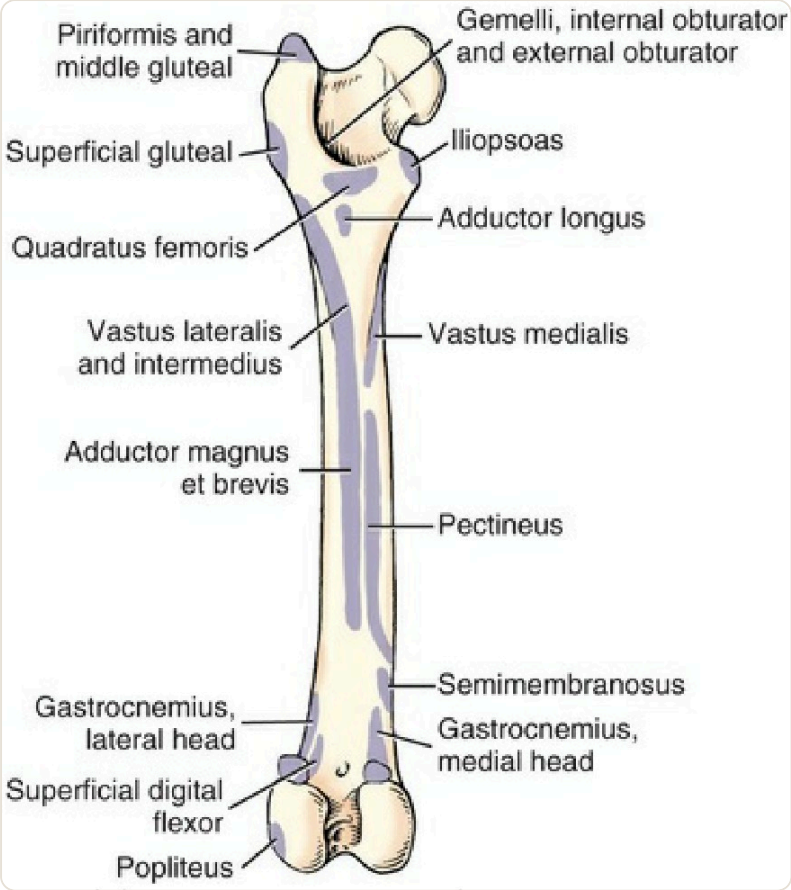

Fig 14 — The femur, caudal aspect. Gluteal insertions on the trochanters, iliopsoas on the lesser trochanter, the adductors and pectineus along the shaft, and the gastrocnemius heads, superficial digital flexor and popliteus distally.

Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog , 5th ed. — Fig. 6.72, left femur, areas of muscle attachment, caudal. Reproduced for educational reference.

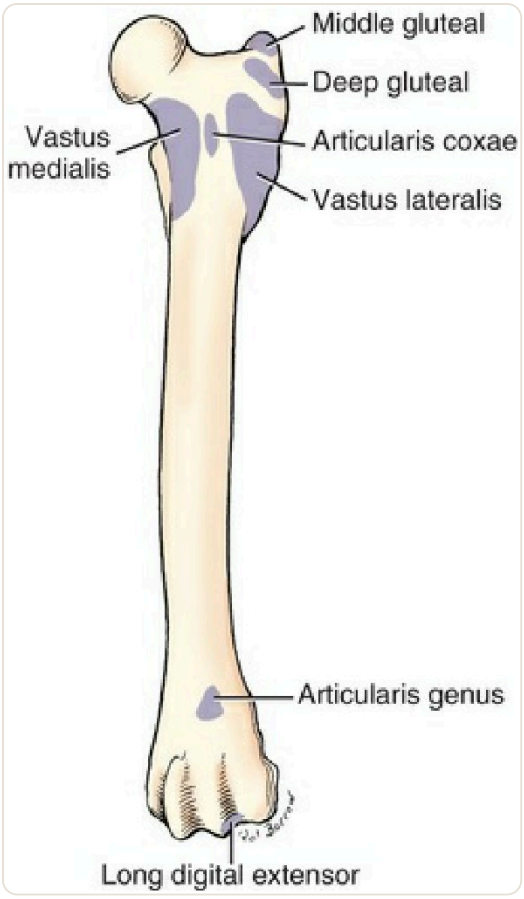

Fig 15 — The femur, lateral and cranial aspects. The gluteal insertions and articularis coxae proximally, the vastus lateralis and medialis over the shaft, and the long digital extensor arising from the extensor fossa at the distal end.

Image — Evans HE, de Lahunta A. Miller and Evans' Anatomy of the Dog , 5th ed. — Fig. 6.73/6.74, left femur, areas of muscle attachment. Reproduced for educational reference.

14 Muscles of the thigh

The thigh divides into three groups. **Cranial:** the **quadriceps femoris**, the great stifle extensor — and remember that only **rectus femoris** crosses the hip. **Caudal:** the hamstrings — biceps femoris, semitendinosus and semimembranosus — which extend the hip and act across the stifle and hock. **Medial:** gracilis, pectineus and the adductors, all supplied by the **obturator nerve**.

MUSCLE	ORIGIN	INSERTION	ACTION & NERVE
Quadriceps — rectus femoris	Body of the ilium, cranioventral to the acetabulum	Tibial tuberosity, via the patella and patellar ligament	The only head crossing the hip: flexes the hip *and* extends the stifle. **Femoral n.**
Quadriceps — vastus lateralis, medialis & intermedius	Proximal femur (lateral, medial and cranial surfaces below the trochanters)	Tibial tuberosity, via the patella and patellar ligament	Extend the stifle. **Femoral n.**
Biceps femoris	**Ischiatic tuberosity** and the sacrotuberous ligament	Patella, patellar ligament, tibial crest and (via the crural fascia) the calcaneus	Extends hip, stifle and hock; the caudal part flexes the stifle. **Sciatic n.**
Semitendinosus	Caudal and ventrolateral part of the ischiatic tuberosity	Tibial crest and medial tibia; a strand joins the **common calcanean tendon**	Extends the hip, flexes the stifle, extends the hock. **Sciatic n.**
Semimembranosus	Ischiatic tuberosity and the ischiatic table	Cranial head to the **distal medial femur**; caudal head to the **medial condyle of the tibia**	Extends the hip. The cranial head extends the stifle in the weight-bearing limb; the **caudal head is two-joint and flexes it**. **Sciatic n.**
Sartorius (cranial & caudal parts)	Iliac crest and the tuber coxae	Cranial part to the patella; caudal part to the medial tibia	Flexes the hip; cranial part extends the stifle. **Femoral n.**
Gracilis	Pelvic symphysis, via the **symphysial tendon**	The **entire cranial border of the tibia** and, through the crural fascia, the calcaneus	Adducts the limb; extends the hip and hock; flexes the stifle. **Obturator n.**

MUSCLE	ORIGIN	INSERTION	ACTION & NERVE
Pectineus	Iliopubic eminence and the prepubic tendon	Distal medial femur	Adducts the limb. Implicated in hip dysplasia — the muscle shows **myopathic, hypotrophic** change (reduced myofibre size), and was historically the target of pectineal myectomy. **Obturator n.**
Adductor magnus et brevis	Along the **entire pelvic symphysis**, the ischiatic arch and mainly the symphysial tendon	Lateral and caudal surface of the femur	Adducts the limb; extends the hip. **Obturator n.**

15 Crus & hindpaw muscles of the canine hindlimb

The crus repeats the forearm pattern with the polarity reversed: **craniolateral muscles flex the hock and extend the digits** (fibular/peroneal nerve), while **caudal muscles extend the hock and flex the digits** (tibial nerve). The caudal group converges on the **common calcanean (Achilles) tendon**, formed mainly by gastrocnemius and the superficial digital flexor with contributions from biceps femoris, semitendinosus and gracilis.

MUSCLE	ORIGIN	INSERTION	ACTION & NERVE
Gastrocnemius (lateral & medial heads)	Supracondylar tuberosities on the caudal distal femur (a sesamoid in each head)	**Tuber calcanei**, via the common calcanean tendon	Extends the hock; flexes the stifle. **Tibial n.**
Superficial digital flexor	Lateral supracondylar tuberosity of the femur	Middle phalanges of digits II–V; its cap covers the tuber calcanei	Flexes the digits and stifle; extends the hock. **Tibial n.**
Deep digital flexor (lateral & medial heads)	Caudal surfaces of the tibia and fibula (two heads)	**Flexor tubercles** of the distal phalanges, digits II–V	Flexes the digits; because its tendon passes over the sustentaculum tali it also supports and extends the hock. **Tibial n.**
Cranial tibial	Lateral condyle of the tibia, lateral to the extensor sulcus, and the cranial tibial border	Plantar base of metatarsals I and II	Flexes the hock; rotates the paw laterally. **Fibular (peroneal) n.**
Long digital extensor	**Extensor fossa of the femur** (it crosses the stifle)	Extensor processes of the distal phalanges, digits II–V	Extends the digits; flexes the hock. **Fibular n.**
Popliteus	Caudal aspect of the lateral condyle of the femur, by a long tendon containing a **sesamoid**	Medial border of the **proximal third of the tibia**	**Medially rotates the crus** on the femur; the traditional "stifle flexor" role is disputed in Miller 5e. **Tibial n.**

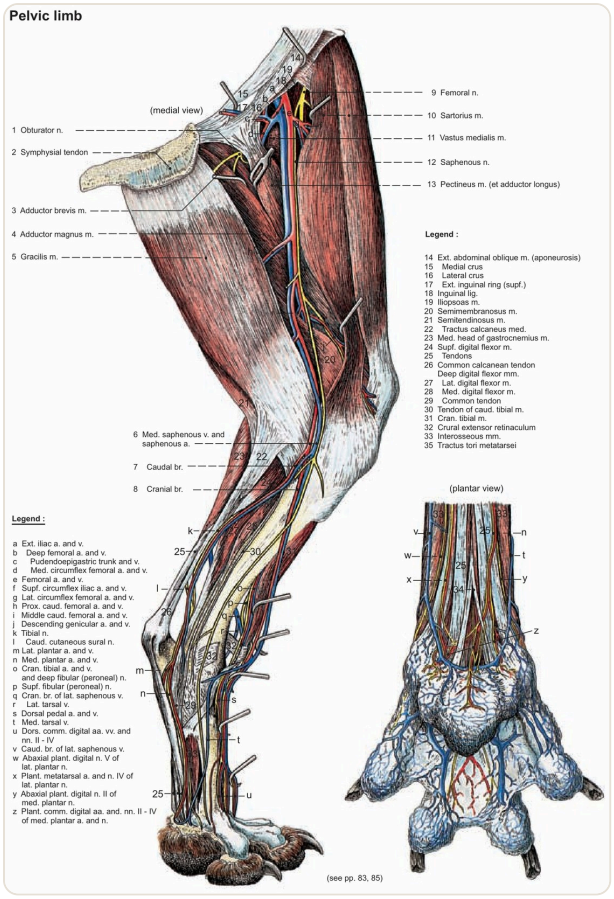

Fig 16 — The pelvic limb, medial view, with the crus and hindpaw. The medial thigh muscles — gracilis, adductors, pectineus and sartorius — give way distally to the crural group: gastrocnemius and the superficial digital flexor forming the common calcanean tendon, with the deep digital flexors and cranial tibial. The plantar view shows where the flexor tendons finally land.

Image — Budras KD, McCarthy PH, Fricke W, Richter R. Anatomy of the Dog , 5th ed. — plate: Pelvic limb, medial view and plantar aspect of the paw. Reproduced for educational reference.

16 How dog muscle anatomy compares with the horse and ox

Because the same muscle names recur across species with different jobs, a quick comparison fixes the dog's plan in place. The dog is built for **acceleration and manoeuvring**; the horse for **economical, sustained locomotion**; the ox for **carrying a heavy fermenting gut**. Almost every difference in the chart below follows from those three facts.

FEATURE	DOG	HORSE	OX (CATTLE)
Clavicle	Absent — only a clavicular tendon in the brachiocephalicus	Absent	Absent
Forelimb attachment	Muscular sling (synsarcosis); **serratus ventralis** is the main suspender	Same synsarcosis, but a far stronger fibrous serratus for standing	Same plan; heavy trunk, very stout serratus
Digits	Five in front, four behind — separate long flexor and extensor tendons to each	One weight-bearing digit; no independent digital movement	Two functional digits, paired tendons
Stay apparatus	**None** — the dog must use muscle to stand, so it lies down to rest	Well developed — passive stay lets the horse sleep standing	Partial; cattle lie down for much of the day
Masticatory pattern	Vertical scissor bite; **temporalis** dominant	Lateral grinding; **pterygoids and masseter** dominant	Lateral grinding; masseter very large
Cutaneous trunci	Extensive — the panniculus reflex is a routine neurological test	Present, used to dislodge flies	Present

The single most useful contrast for a clinician is the **stay apparatus**. A horse can lock its limbs and sleep standing; a dog cannot, so it lies down to rest, and a dog that will not lie down — or will not get up — is telling you something. For the full regional picture in each species see our Dog Anatomy, Cat Anatomy, Horse Anatomy and Cattle Anatomy visual guides.

17 Why muscle anatomy matters clinically

Origins and insertions are not an academic exercise. In every case below the clinical picture is simply the anatomy read backwards — which is why learning the attachment maps pays off long after the exam.

Nerve injuries you can predict from the tables

Radial nerve injury paralyses every extensor of elbow, carpus and digits, producing the dog that knuckles onto the dorsum of the paw and cannot bear weight. **Sciatic** injury — from a pelvic fracture or a badly placed caudal-thigh injection — abolishes stifle flexion and everything below it. **Obturator** injury after a difficult whelping leaves a dog unable to adduct, splaying on smooth floors. Bilateral **trigeminal (CN V_3)** neuropathy drops the jaw; **facial (CN VII)** paralysis drops the lip and the blink instead.

Contracture and myopathy

The **infraspinatus and subscapularis** tendons are the shoulder's only collateral support, so infraspinatus contracture produces the characteristic outwardly rotated paw with a flipping gait. Because the **rectus femoris** is the one quadriceps head that crosses the hip, quadriceps contracture after a femoral fracture locks the stifle in rigid extension. **Temporalis and masseter** wasting is the visible sign of masticatory muscle myositis. *(These are clinical-orthopaedic entities — see the BSAVA musculoskeletal manual below rather than the anatomy texts.)*

Muscle atrophy: the pattern localises the problem

Wasting is one of the most useful things you can find with your hands, because *how* a muscle has wasted narrows the cause before any imaging.

Disuse atrophy develops over weeks, is diffuse across a limb, and follows chronic lameness. The classic is **quadriceps atrophy** in long-standing **cranial cruciate ligament** disease — often more obvious to a hand run down both thighs than anything seen on the walk. **Neurogenic atrophy** is quite different: it is fast, appearing within one to two weeks, and it is confined to the muscles of a single nerve. Wasting of **supraspinatus and infraspinatus** that leaves the spine of the scapula standing out like a ridge is suprascapular nerve injury, and the tables above tell you that before you reach for anything else. **Symmetrical wasting of temporalis and masseter** points at chronic masticatory muscle myositis or trigeminal neuropathy rather than at a limb problem at all, and generalised loss across every group suggests cachexia, endocrine disease or a myopathy.

Soft-tissue lameness: the muscles and tendons that actually go wrong

Not every lameness is a joint. **Iliopsoas strain** is common in working and agility dogs and is missed easily, because the dog looks like a hip case: the giveaway is pain on extending the hip while internally rotating it, with a normal hip radiograph. **Supraspinatus tendinopathy** and **biceps tenosynovitis** produce a forelimb lameness that localises to the shoulder, with discomfort on flexing the shoulder while the elbow is extended. **Fibrotic myopathy of gracilis and semitendinosus** is largely a German shepherd problem and is unmistakable once seen — a shortened stride with a rapid, snapping inward rotation of the paw as the limb advances. And rupture of the **common calcaneal (Achilles) tendon** drops the hock into a plantigrade stance, the whole hindpaw flat on the ground.

Where to put a needle

Avoid the caudal thigh: the **sciatic nerve** runs caudomedial to the hip joint and down behind the femur. Use the **lumbar epaxial muscles** or the **quadriceps** instead.

18 Dog muscle anatomy quiz: 15 self-test questions

Cover the answers and work down the list. These 15 questions cover the points most often examined in **canine muscle anatomy** spot tests and vivas — attachment sites, two-joint muscles and nerve supply.

SELF-TEST1. Which muscle inserts on the greater tubercle of the humerus and extends the shoulder?**Answer: Supraspinatus** — from the supraspinous fossa to the free edge of the greater tubercle.2. Name the two muscles that act as the collateral ligaments of the canine shoulder.**Answer: Infraspinatus** (lateral) and **subscapularis** (medial).3. Which head of the triceps crosses two joints, and what does it do? **Answer:** The **long head** — from the caudal scapular border to the olecranon; it extends the elbow and flexes the shoulder.4. Where does biceps brachii originate?**Answer:** The **supraglenoid tubercle** of the scapula; its tendon runs in the intertubercular groove.5. Which muscle suspends the trunk between the forelimbs?**Answer: Serratus ventralis** — the thoracic sling, since the dog has no functional clavicle.6. Which quadriceps head crosses the hip, and why does that matter?**Answer: Rectus femoris** — it flexes the hip as well as extending the stifle, so it is the head implicated in quadriceps contracture.7. Give the origin and insertion of the superficial gluteal.**Answer:** Sacrum, first caudal vertebra and sacrotuberous ligament → **third trochanter**.8. Which muscle inserts on the lesser trochanter, and what is its action?**Answer: Iliopsoas** — the main hip flexor.9. What forms the common calcanean (Achilles) tendon?**Answer:** Mainly the **gastrocnemius** and **superficial digital flexor**, with contributions from biceps femoris, semitendinosus and gracilis.10. Which muscle originates on the *femur* yet extends the *digits*? **Answer:** The **long digital extensor**, from the extensor fossa of the femur.11. A dog knuckles over and cannot extend the carpus or digits.

Which nerve?**Answer:** The **radial nerve** — it supplies every extensor of the elbow, carpus and digits.12. Which nerve supplies the adductor group of the medial thigh?**Answer:** The **obturator nerve** — gracilis, pectineus and the adductors; injury causes splaying on a slippery floor. Note that **sartorius** also lies medially but is supplied by the **femoral (saphenous) nerve**.13. Which is the only muscle that *opens* the dog's jaw? **Answer:** The **digastricus**, from the jugular process of the occipital bone to the ventral mandible. Every other masticatory muscle closes the jaw.14. A dog cannot close its mouth and the jaw hangs open. Which nerve?**Answer:** The **mandibular branch of the trigeminal nerve (CN V_3)**, bilaterally — it supplies masseter, temporalis and both pterygoids. Facial nerve (VII) paralysis causes a drooping lip and lost blink, *not* a dropped jaw.15. Which muscle fills the temporal fossa, and where does it insert?**Answer: Temporalis** — it fills the fossa and inserts on the **coronoid process** of the mandible. Its wasting is the first visible sign in masticatory myositis.

19 Dog muscle anatomy — frequently asked questions

What is the difference between an origin and an insertion?

The **origin** is the more fixed attachment (usually proximal) and the **insertion** the more mobile one that is pulled toward it. The distinction is a convention rather than a law — when the paw is planted, the distal attachment becomes fixed and the muscle moves the body over the limb instead.

How many muscles does a dog have?

Several hundred, depending on how paired and subdivided muscles are counted — there is no single agreed figure, and variation between individuals and breeds is genuinely common. For study purposes, what matters is the region-by-region groups in the tables above rather than a total.

Why does the dog have no clavicle?

The clavicle is reduced to a small **clavicular rudiment** — a real bone, ossified in about 86% of dogs, but not articulated with the rest of the skeleton — embedded in the clavicular intersection of the brachiocephalicus. Without a bony strut the forelimb is slung to the trunk by muscle alone — the **synsarcosis** — which absorbs concussion and lengthens the stride in a running animal.

Which muscles form the Achilles tendon in a dog?

The **common calcanean tendon** is formed mainly by the **gastrocnemius** and the **superficial digital flexor**, with contributions from biceps femoris, semitendinosus and gracilis. All of it attaches to the tuber calcanei.

Which nerve makes a dog knuckle over?

The **radial nerve**. It supplies every extensor of the elbow, carpus and digits, so a lesion leaves the dog unable to extend the carpus and standing on the dorsum of the paw.

Where should you give an intramuscular injection in a dog?

The **lumbar epaxial muscles** or the **quadriceps** are preferred. The caudal thigh is avoided because the **sciatic nerve** runs caudal to the hip joint and down the caudal thigh, where a misplaced injection can damage it.

How do you remember origins and insertions?

Learn the **bone**, not the muscle list. Every attachment map in this guide shades the areas on the scapula, humerus, os coxae and femur where muscles land; once you can picture the shaded bone, the origins come free and you only have to remember the direction of pull. Then group by **nerve** rather than by region, so one lesion predicts a whole set of deficits. The printable **PDF chart** above is laid out for exactly this kind of revision.

Which muscle is the strongest in a dog?

It depends what you mean. By cross-sectional area the **thoracolumbar longissimus** is the largest muscle of the trunk, and the **middle gluteal** and **quadriceps** generate the most propulsive force. For bite force, the **temporalis** is the biggest masticatory muscle in the dog.

What are the muscles of mastication in the dog?

Four close the jaw — **masseter**, **temporalis**, **pterygoideus medialis** and **pterygoideus lateralis**, all supplied by the mandibular branch of the trigeminal nerve (CN V_3) — and one opens it, the **digastricus**. See the masticatory muscle section above for the full table and diagrams.

Is dog muscle anatomy the same as in other species?

The plan is broadly shared, but the details differ with function. The horse has a comparable forelimb sling but a single digit and a passive stay apparatus; cattle share the ruminant body plan. See the comparison chart above, and our Dog Anatomy, Cat Anatomy, Horse Anatomy and Cattle Anatomy visual guides.

When to refer

- **The knuckling forelimb** — radial nerve: every extensor of elbow, carpus and digits is out.
- **The dog that splays on a smooth floor after whelping** — obturator nerve: gracilis, pectineus and the adductors.
- **The outwardly rotated forepaw with a flipping gait** — infraspinatus contracture.
- **The rigidly extended stifle after femoral fracture repair** — quadriceps contracture, because rectus femoris crosses the hip.
- **The intramuscular injection** — use the lumbar epaxials or quadriceps; avoid the caudal thigh and the sciatic nerve.

Sources

1. Evans HE, de Lahunta A. *Miller and Evans' Anatomy of the Dog*. 5th ed. Elsevier — primary source for origins, insertions and the muscle-attachment plates.
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