

Lab 4 Notes

The Muscular System

From here on, we will be closely following the lab manual. That being said, helpful information will continue to be included in the class notes. Remember to read the material ahead of time whenever possible, so that you can work more efficiently in the lab. Along with identifying specific muscles, you will also be responsible for the **actions and functions** of those particular muscles. You will not be tested on the insertions or origins of the various, but it will greatly facilitate your ability to determine a muscle's function if you have a rough idea of what particular structures are attached to it. This has the potential to be a very long lab if you do not use your time wisely, so try to work as efficiently as you can.

Starting this week, you will need dissecting kits, which are available at the UTA bookstore (~\$25).

Shark (pp. 121-126; 141-151)

Read pp. 121-126 (omit integumentary system), and be able to identify the following external structures and their functions: **placoid scales, rostrum, subterminal mouth, incurrent aperture, nasal flap, excurrent aperture, pectoral fin, pelvic fin, anterior dorsal fin, posterior dorsal fin, caudal fin, ampullae of Lorenzini, eye, spiracle, gill slits, clasper (males), cloaca, urogenital papilla (males), urinary papilla (females), abdominal pores.**

Read chapter 17 (pp. 141-151) completely. Be able to identify the following structures and their functions:

Axial muscles:

epaxial muscle	myomere
horizontal septum	myoseptum
hypaxial muscle	linea alba

Appendicular muscles:

Pectoral extensor/abductor	pectoral flexor/adductor
pelvic extensor/abductor	pelvic flexor/adductor
dorsal fin muscle	

Branchiomic muscles:

levator palatoquadrati	spiracularis
adductor mandibulae	preorbitalis
intermandibularis	second dorsal constrictor
interhyoideus	cucullaris
dorsal interarcual	lateral interarcual
dorsal and ventral constrictors	

Hypobranchial muscles:

coracomandibularis	coracoarcual
coracohyoid	

Cat (pp. 309-342)

This week we will examine only the superficial muscles, so read those sections in chapter 35 (starting on pg. 309). We will examine the deep muscles next week. Below is a list of all of the muscles that you will need to know in the cat (includes both weeks).

I have also attached a figure illustrating the various muscle actions. This should compliment the lab manual, and will hopefully help in understanding the actions. Additional illustrations covering deep muscles will follow in next week's notes.

Significant Muscles of *Felis*

Note: Categories and/or structures marked with * are to be examined during lab 5.

Cutaneous Muscles (pp. 309-310)

Cutaneous maximus

Platysma

Superficial Thoracic Muscles (pp. 310-312)

Pectoantebrachialis

Pectoralis major

Pectoralis minor

Xiphohumeralis

Abdominal muscles (pp. 312-313)

External oblique

Internal oblique

Transversus abdominis

Rectus abdominis

Superficial Back Muscles (pp. 313-314)

Clavotrapezius

Clavobrachialis

Acromiotrapezius

Spinotrapezius

Latissimus dorsi

Deep Thoracic Muscles* (pp. 315-317)

Scalenus medius

Intercostalis externus

Deep Lumbar and Thoracic Muscles* (pp. 317-318)

Multifidus spinae

Longissimus dorsi

Spinalis dorsi

Iliocostalis

Superficial Neck Muscles (pp. 318-320)

Sternomastoid

Sternohyoid

Mylohyoid

Deep Neck and Back Muscles* (pp. 320-322)

Rhomboideus capitis
Rhomboideus cervicis

Splenius
Rhomboideus thoracis

Head Muscles (pp. 322-324)

Masseter
Digastric

Temporalis

Shoulder Muscles (pp. 324-325)

Supraspinatus*
Infraspinatus*
Teres major*
Subscapularis*

Acromiodeltoid
Spinodeltoid
Levator scapulae ventralis

Forelimb Muscles (pp. 325-330)

Brachialis
Biceps brachii*

Epitrochlearis
Triceps brachii

Hindlimb Muscles (pp. 331-335)

Sartorius
Biceps femoris
Caudofemoralis
Semimembranosus
Tensor fascia latae*
Quadriceps complex*
Rectus femoris*

Gracilis
Gastrocnemius
Semitendinosus
Adductor femoris*
Vastus medialis*
Vastus lateralis*

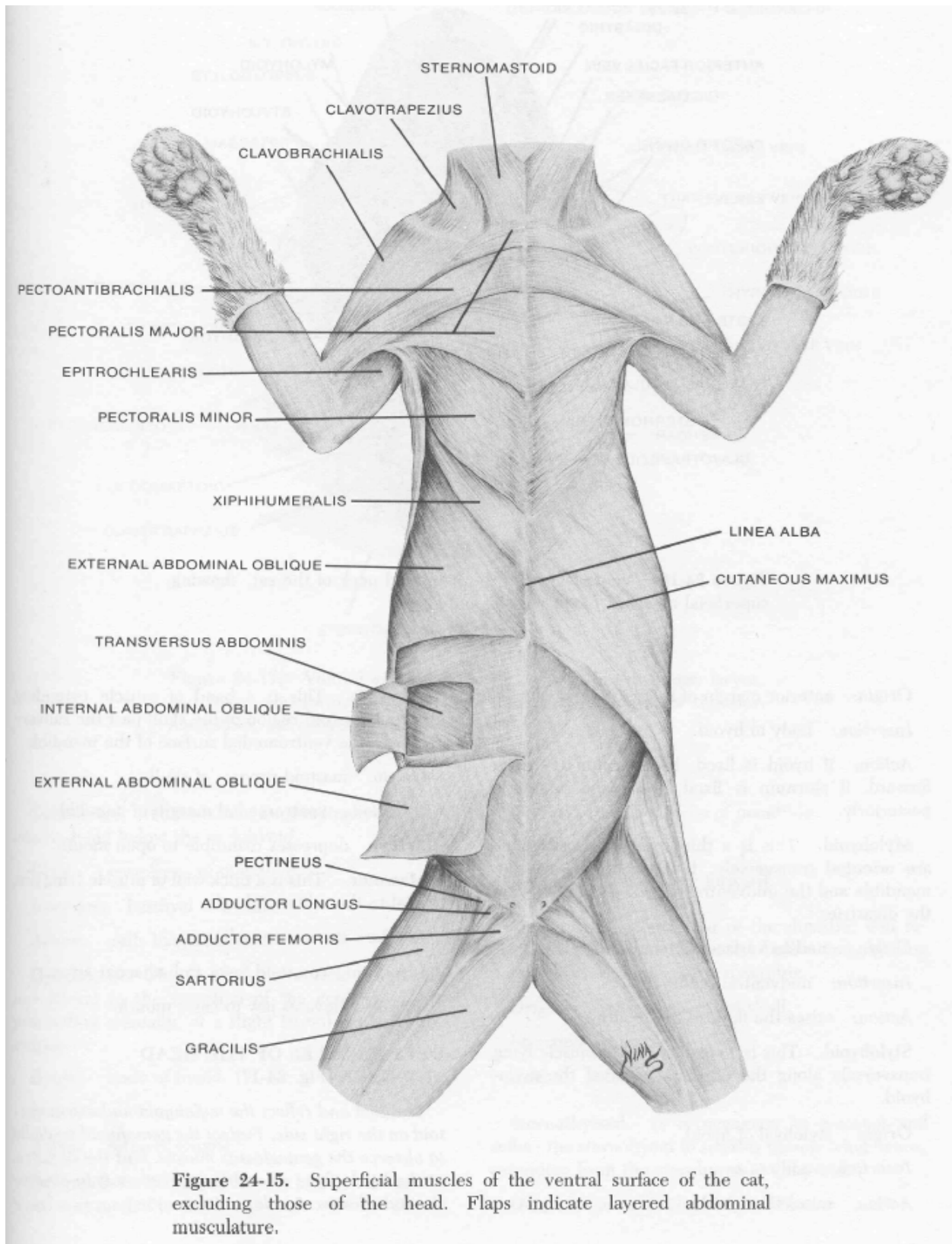


Figure 24-15. Superficial muscles of the ventral surface of the cat, excluding those of the head. Flaps indicate layered abdominal musculature.

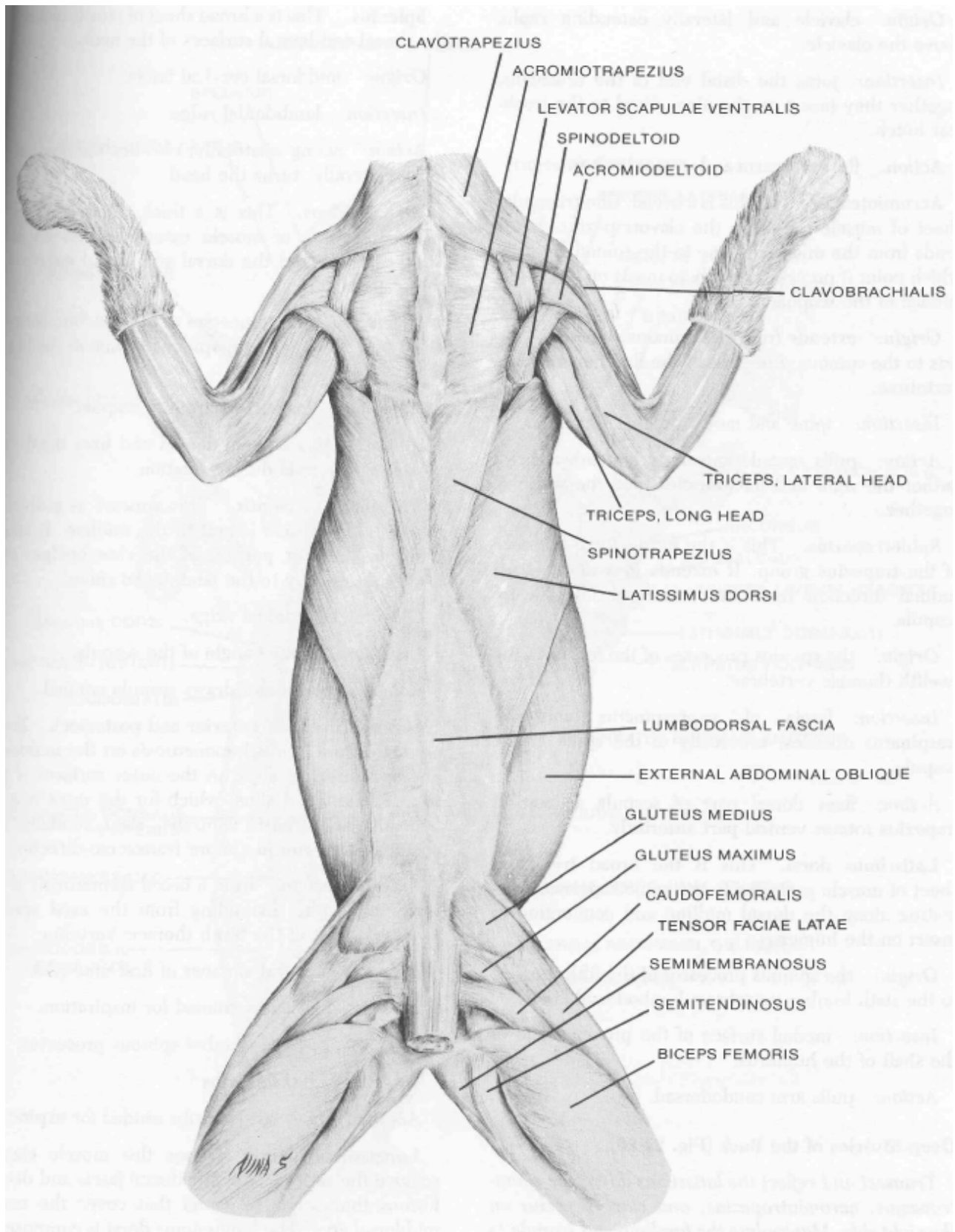


Figure 24-19. Superficial muscles of the dorsal surface of the cat, excluding those of the head.

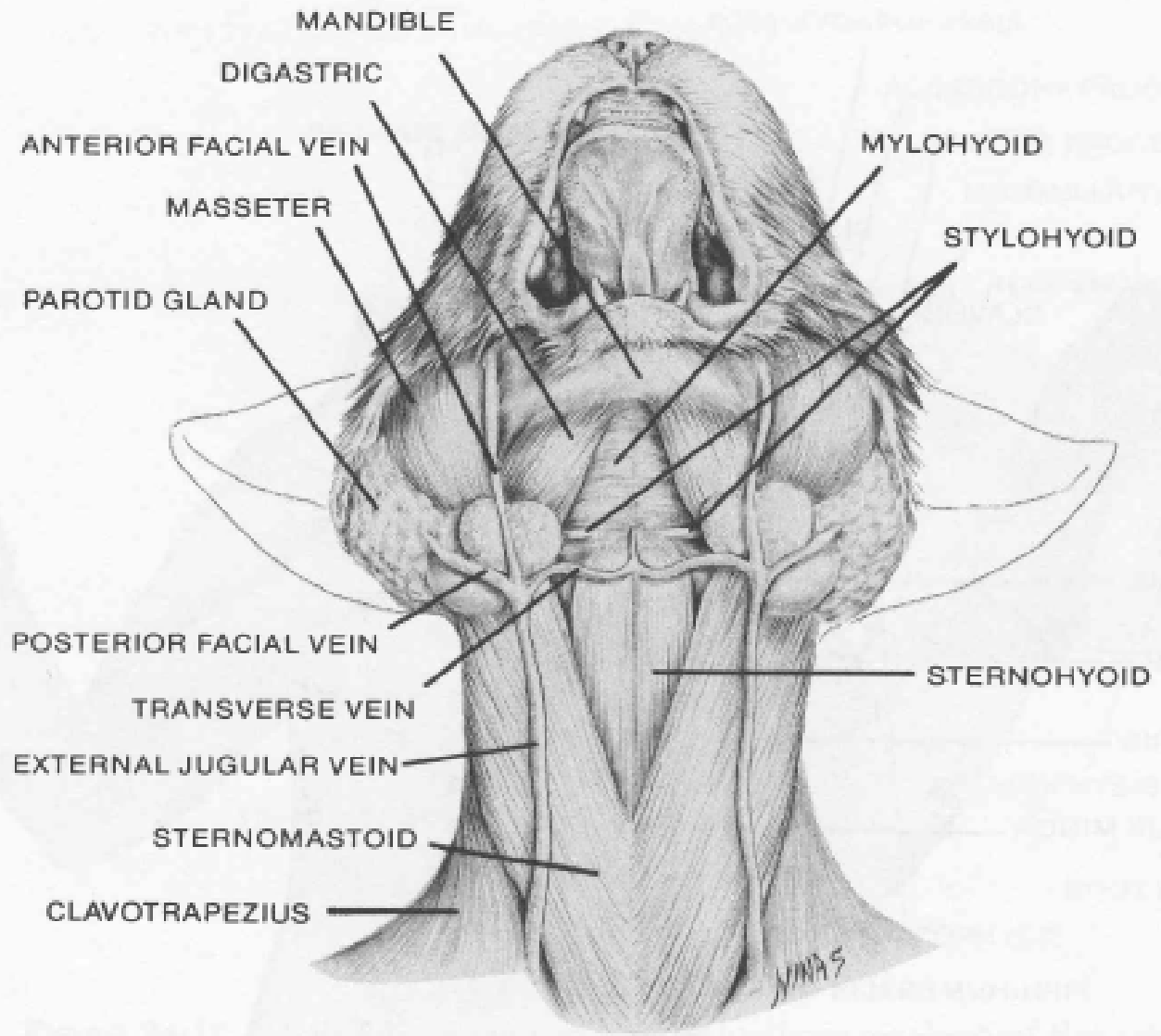


Figure 24-16. Ventral view of the head and neck of the cat, showing superficial muscles, blood vessels, and glands.

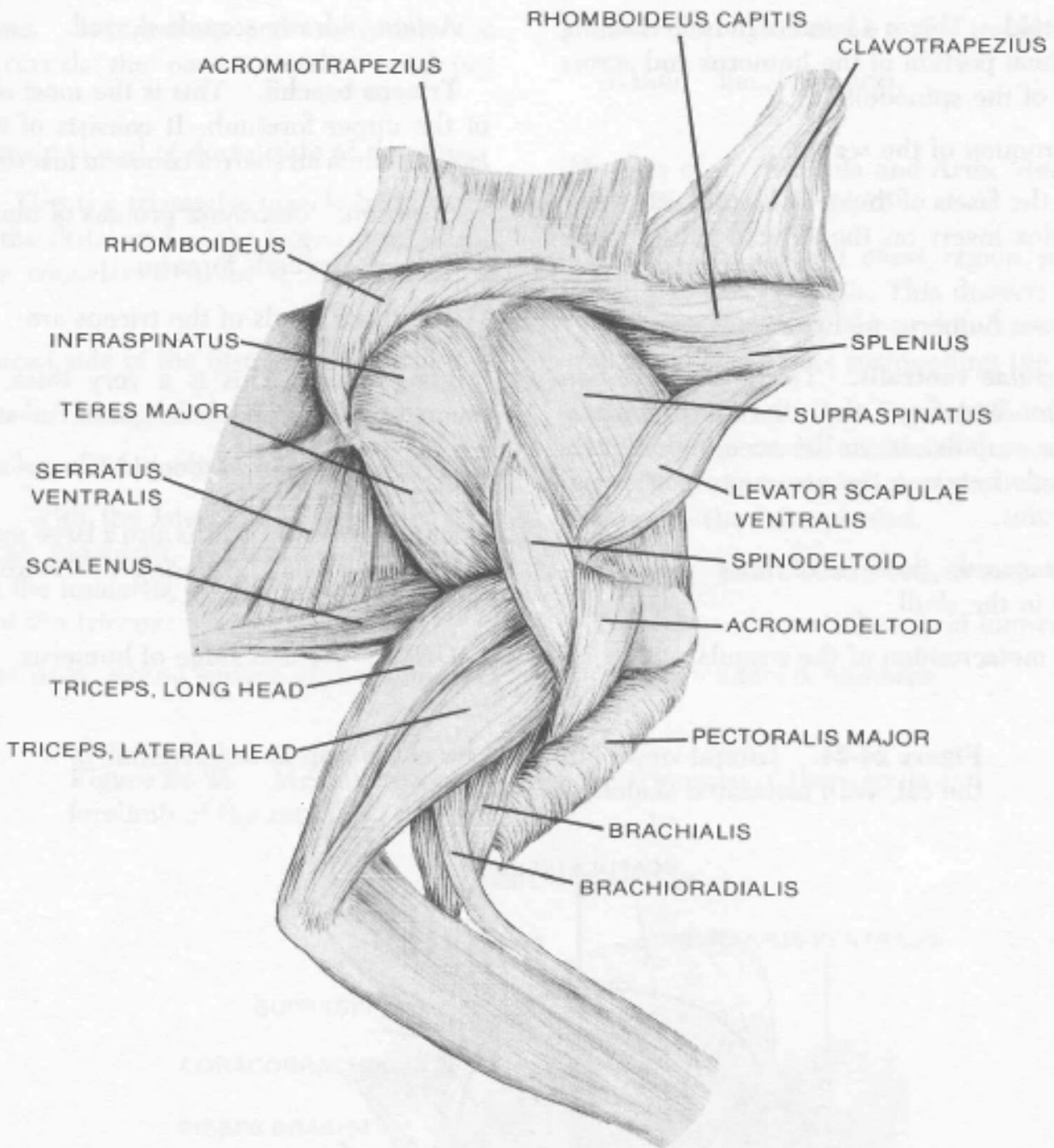
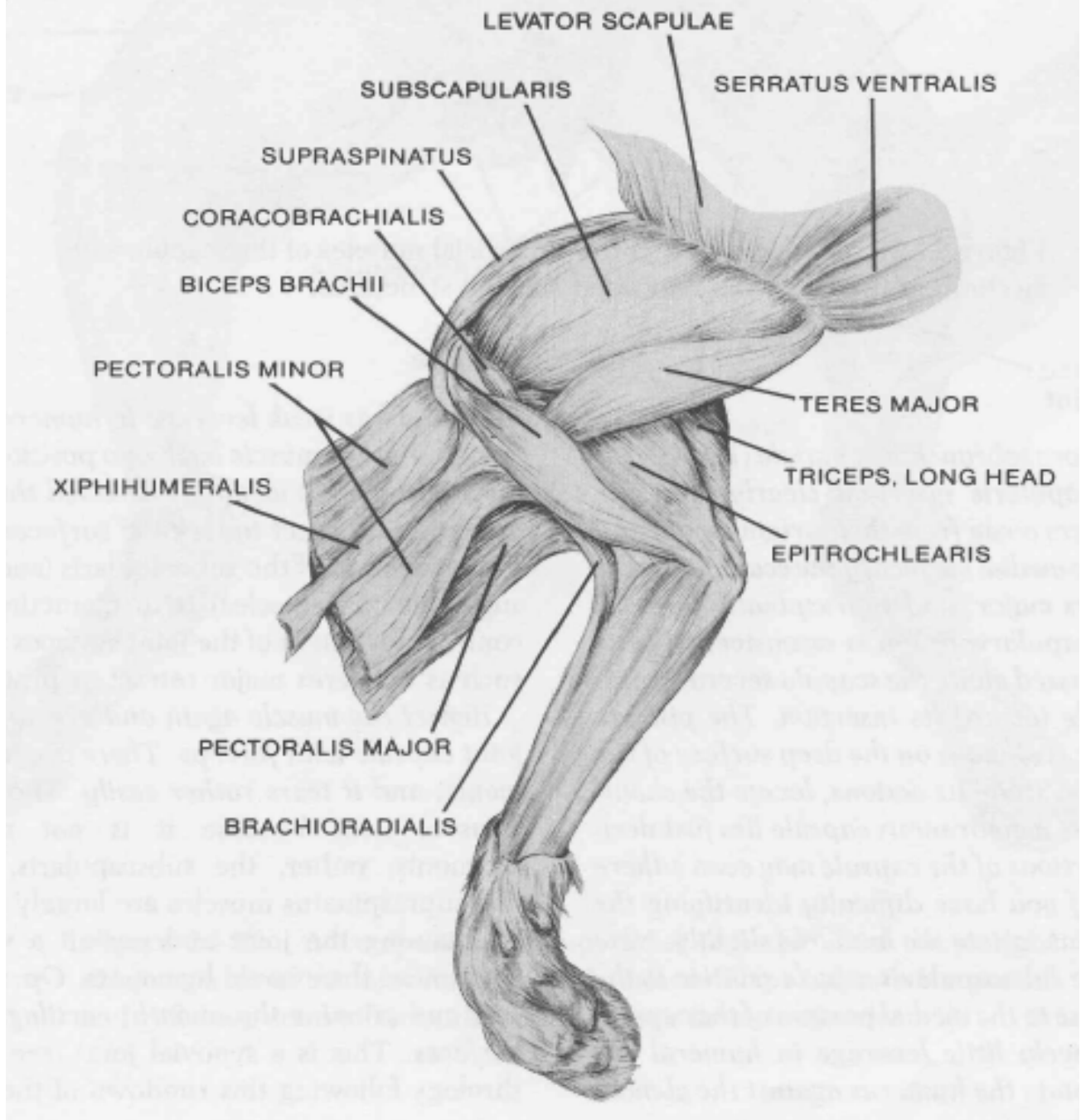


Figure 24-23. Lateral view of the muscles of the scapula and forelimb of the cat.

Figure 24-25. Medial view of the superficial muscles of the scapula and forelimb of the cat.



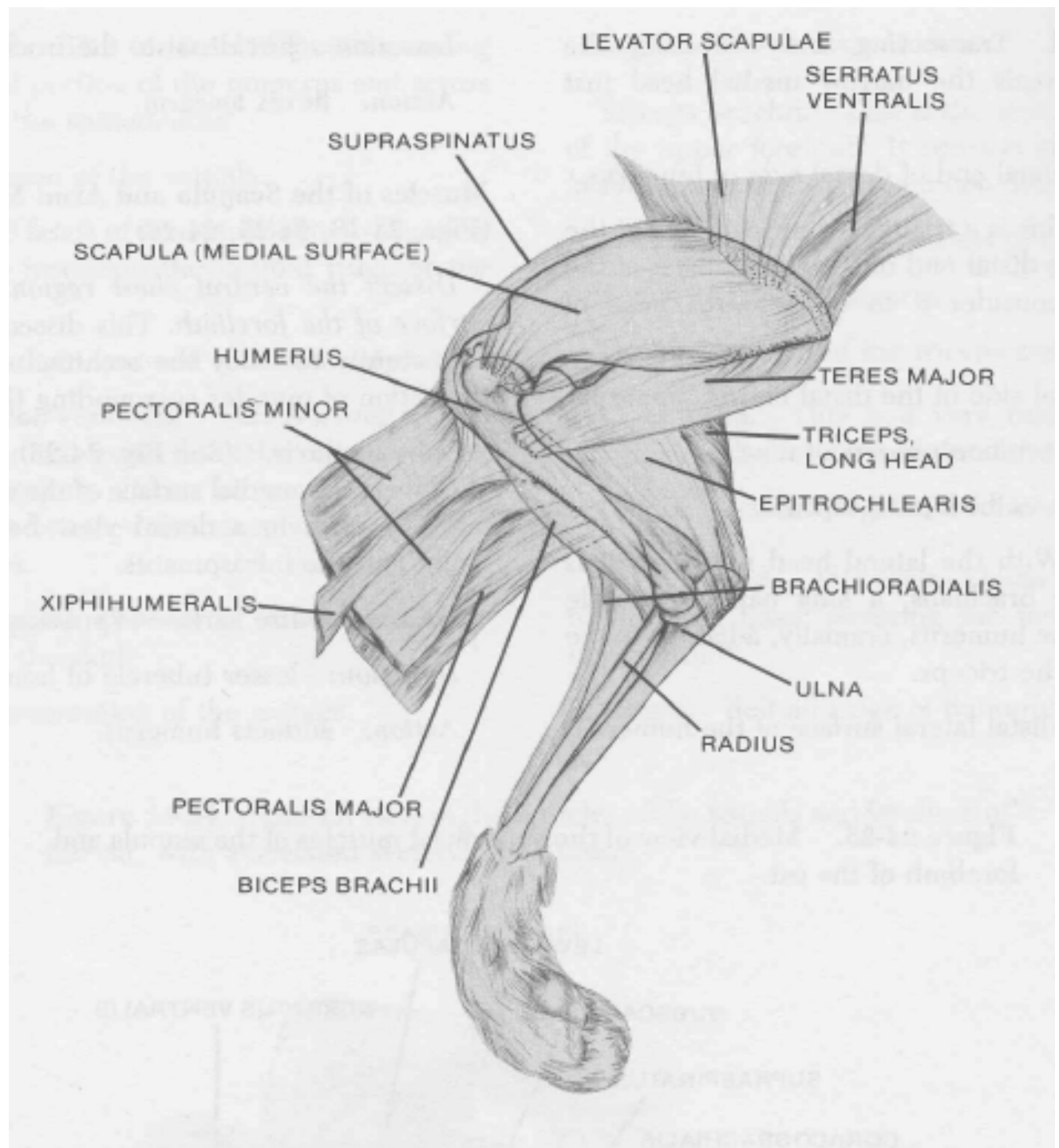


Figure 24-26. Ventral view of the superficial muscles of the scapula and forelimb of the cat, with associated skeletal structures.

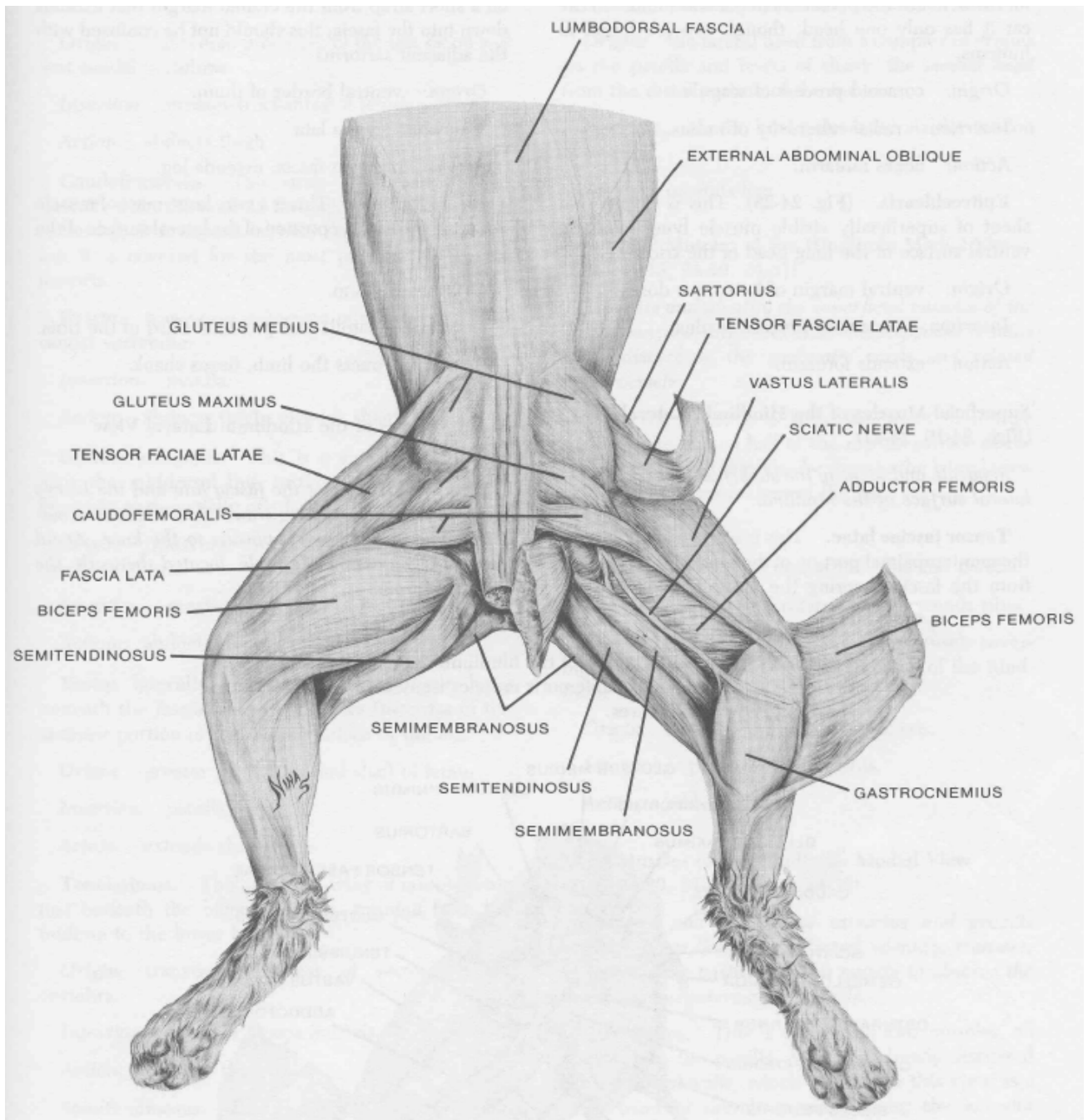


Figure 24-27. A comparison of superficial (left side) and deep (right side) muscles of the hindlimb's lateral surface. Flaps indicate transected and reflected tensor fasciae latae and biceps femoris muscles.

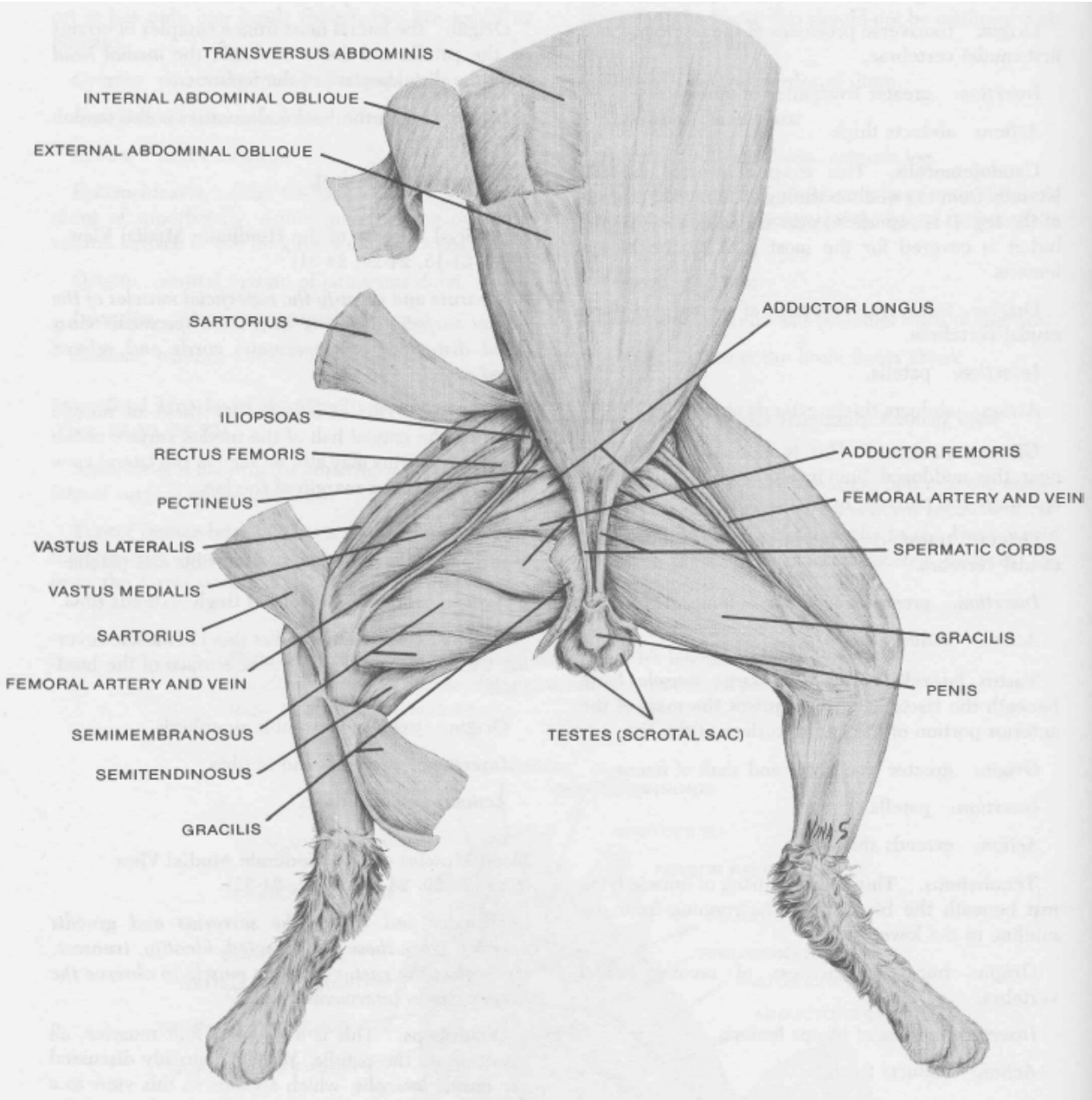


Figure 24-29. A comparison of superficial (right side) and deep (left side) muscles of the hindlimb's medial surface. Flaps indicate transected and reflected sartorius and gracilis muscles.

Table 24-1. Summary of major muscles of the cat and their action.

<i>Muscle</i>	<i>Action</i>
<i>Abdominal Muscles</i>	
External oblique	Compresses abdomen
Internal oblique	Compresses abdomen
Transversus abdominis	Compresses abdomen
Rectus abdominis	Compresses abdomen, draws ribs & sternum caudad
<i>Thoracic Muscles</i>	
Superficial:	
Pectoantibrachialis	Adducts forelimb
Pectoralis major	Adducts and retracts forelimb
Pectoralis minor	Adducts and retracts forelimb
Xiphohumeralis	Adducts forelimb
Deep:	
Scalenus	Bends head to one side; pulls rib cage forward
Transversus costarum	Draws sternum craniad
Levator scapulae	Draws scapula cranioventrad
Serratus ventralis	Draws scapula to thorax, supports trunk
External intercostal	Pulls ribs forward
Internal intercostal	Pulls ribs backward
<i>Muscles of the Back</i>	
Superficial:	
Clavotrapezius	Draws scapula craniodorsad
Clavobrachialis	Flexes forearm
Acromiotrapezius	Draws scapula dorsad
Spinotrapezius	Draws scapula caudodorsad
Latissimus dorsi	Pulls arm caudodorsad
Deep:	
Splenius	Turns and elevates head
Rhomboideus	Draws scapula dorsad
Rhomboideus capitis	Draws scapula craniad
Serratus dorsalis	Draws last four ribs caudad
Longissimus dorsi	Extends vertebral column
Multifidus spinae	Extends or bends vertebral column
Spinalis dorsi	Extends vertebral column
Iliocostalis	Draws ribs together
<i>Muscles of the Head and Neck</i>	
Superficial:	
Sternomastoid	Turns head
Cleidomastoid	Pulls head down or clavicle forward
Sternohyoid	Draws hyoid posteriorly or sternum forward
Mylohyoid	Raises floor of mouth
Stylohyoid	Raises hyoid
Digastric	Lowers mandible
Masseter	Elevates mandible

<i>Muscle</i>	<i>Action</i>
Deep:	
Geniohyoid	Pulls hyoid cranial
Hyoglossus	Retracts tongue
Styloglossus	Retracts tongue
Genioglossus	Draws tongue forward
Sternothyroid	Draws larynx caudad
Thyrohyoid	Raises larynx
Cricothyroid	Tenses vocal cords

Muscles of the Scapula and Proximal Forelimb

Lateral:	
Supraspinatus	Extends shoulder
Infraspinatus	Rotates humerus outward
Teres major	Flexes and rotates humerus
Teres minor	Rotates humerus
Acromiodeltoid	Flexes and rotates humerus
Spinodeltoid	Flexes and rotates humerus
Levator scapulae ventralis	Draws scapula dorsad
Triceps brachii	Extends forearm
Brachialis	Flexes forearm
Anconeus	Tenses elbow joint capsule
Medial:	
Subscapularis	Adducts humerus
Biceps brachii	Flexes forearm
Epitrochlearis	Extends forearm

Muscles of the Proximal Hindlimb

Lateral:	
Tensor fasciae latae	Pulls on fascia latae, extends shank
Biceps femoris	Retracts leg
Gluteus medius	Abducts thigh
Caudofemoralis	Abducts thigh & extends leg
Gluteus maximus	Abducts thigh
Vastus lateralis	Extends shank
Tenuissimus	Abducts thigh
Semitendinosus	Flexes shank
Medial:	
Sartorius	Adducts and rotates thigh
Gracilis	Adducts thigh
Rectus femoris	Flexes hip and extends knee
Vastus medialis	Extends leg
Vastus intermedius	Extends leg
Iliopsoas	Rotates and flexes thigh
Adductor femoris	Adducts and extends thigh
Adductor longus	Adducts and extends thigh
Pectineus	Adducts thigh
Semimembranosus	Extends thigh

Actions of muscles:

- (a) Flexion. (b) Extension.
- (c) Abduction. (d) Adduction.
- (e) Plantar flexion. (f) Dorsiflexion.
- (g) Supination. (h) Pronation.
- (i) Eversion. (j) Inversion.
- (k) Elevation. (l) Depression.
- (m) Protrusion/Protraction.
- (n) Retraction. (o) Dilation.
- (p) Constriction. (q) Rotation.

