**Generic Vertebral Parts**

- **Axis C2**
  - Nuchal ligament
  - Spinal process
  - Lateral vertebral foramen
  - Transverse process

- **Atlas C1**
  - Spinal process
  - Lateral vertebral foramen
  - Apical ligament of the dens
  - Transverse ligament of the atlas

**Intervertebral Disks**

- **Nucleus Pulposus**
  - Type I collagen
- **Anulus Fibrosis**
  - Concentric layers of dense fibrous tissue

**Dogs and Cats**

- Dogs and cats: C7, T13, L7, S3

**Whole Spine**

- Supraspinous ligament
  - Continuation of the nuchal ligament
  - Heavy collagenous band atop spines of T1-C3
  - Prevents abnormal separation of spines during flexion
  - Cats also don't have an organized supraspinous ligament

**WHOLE SPINE**

- Dogs have Cd 6-23
- Cats have Cd 22-23

**Sacrum**

- Dorsal view
  - Cranial sacral foramen
  - Lateral sacral foramen

- Ventral view
  - Sacral canal
  - Presacral canal

**Vertebral Artery**

- Passes through lateral vertebral foramen

**Intervertebral Foramen**

- First cervical spinal nerve and vertebral artery pass out through lateral vertebral foramen
- Vertebral artery/vein and vertebral nerve pass into transverse foramen

**Vertebral Spinal Artery**

- Passes through transverse foramen

**Dorsal Root**

- Contains sensory fibers for pain, temperature, and touch

**Venomous Vertebral Artery**

- Expanded transverse process

**Tails**

- Dogs have Cd 6-23
- Cats have Cd 22-23

**@DayDVM**
Rest of the pelvis on later page...
Epaxial muscles

dorsal to transverse processes

extensors of the neck and back & stabilize the vertebral column

innervated by dorsal branches of the spinal nerves

**Transversospinalis system** from the head to the sacrum

**Splenius**
lies beneath clidocephalicus

**Semispinalis capitis**
2 parts (we don't need to know them) but if you look between them you find the nuchal ligament in the dog

**Multifidus**
considered a “deep” epaxial very medial, next to spinous processes of vertebrae

Stabilizes vertebral column and probably helps coordinate action in the cat especially

**Longissimus system** from the head to the pelvis (ilium)

**Longissimus capitis**
going up to the skull

**Longissimus cervicis**
to the transverse processes of the cervical vertebrae

**Longissimus thoracis**
to the ribs

**Longissimus lumborum**
to the last few ribs

**Iliocostalis system** from rib 1 to the pelvis (ilium)

- ventral/lateral to other epaxials
- cranial edge has “fingers” extending just beyond the 1st rib
- combines with the longissimus system in the lumbar region

Example Cross Sections of the epaxial systems at different points

- mid-thorax
- cranial abdomen
- more caudal abdomen

@DayDVM
Hypaxial muscles
ventral to transverse processes
flexors of the neck and back &
stabilize the vertebral column
innervated by ventral branches of the spinal nerves

NECK

**Longus colli**
along the dorsal midline,
ventral to the body of cervical vertebrae.
L + R muscles fused
flex the neck

**Longus capitis**
run lateral to the longus colli (L+R)
flex the neck

Esophagus, Trachea, & Carotid Sheath

**Esophagus** - dorsal to trachea and slightly to the □ in the neck then dorsal again in thorax

**Trachea** - ventral to the esophagus

**CAROTID SHEATH**
contains:
- vagosympathetic trunk
- common carotid artery
- internal jugular vein
- tracheal duct

The recurrent laryngeal nerve is not in this specific fold but still within the deep fascia of the sheath

THORAX & ABDOMINAL WALLS

**Serratus dorsalis cranialis**
muscle of inspiration
attaches from median raphe/supraspinous ligament (fascial attachment) to the ribs

**Serratus dorsalis caudalis**
muscle of expiration
attaches from the supraspinous ligament to the last few ribs

**Internal Intercostals**
support the chest wall & contribute to breathing by pulling ribs together
attach between ribs

**External Intercostals**
support the chest wall & contribute to breathing by pulling ribs together
attach between ribs

**Rectus Thoracis**
attaches to middle scalenus and via aponeurosis to the rectus abdominus
involved in assisting respiration and stabilizing rib cage

@DayDVM
**External Abdominal Obliques**
Caudal attachment - aponeurosis that inserts on the linea alba

**Internal Abdominal Obliques**
Arises from the thoracolumbar fascia to the costal arch, last rib, linea alba and prepubic tendon

**Transversus Abdominus**

**Rectus Abdominus**
Attaches from pelvis to cranial aponeurosis with the rectus thoracis

---

**Inguinal Ligament**
Aponeurosis of the external and internal abdominal obliques
- connection to pelvic limb
- muscular lacuna - opening for:
  - iliopsoas
  - femoral nerve
- vascular lacuna - opening for:
  - femoral artery + vein
- superficial inguinal ring - opening for:
  - spermatic cord
  - external pudendal artery + vein
  - genito-femoral N

**Linea Alba**
Where the left and right tendon sheath of the rectus abdominis join at the ventral midline
(involves aponeurosis of external and internal abdominal obliques and transversus abdominis)
**PELVIC LIMB**

<table>
<thead>
<tr>
<th><strong>Tensor Fasciae Latae</strong></th>
<th><strong>Semitendinosus</strong></th>
<th><strong>Piriformis</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cranial + caudal</td>
<td><em>Ischiatic tuberosity on pelvis</em></td>
<td><em>Greater trochanter of femur</em></td>
</tr>
<tr>
<td><em>Tuber coxae of ilium</em></td>
<td><em>Proximomedial surface of tibia + calcanean tuberosity</em></td>
<td>Innervated by cranial or caudal gluteal N</td>
</tr>
<tr>
<td><em>Fascia lata</em></td>
<td>Innervated by tibial N</td>
<td>Extends hip abducts limb</td>
</tr>
<tr>
<td>Flexes hip</td>
<td>Extends stifle</td>
<td></td>
</tr>
<tr>
<td>Extends stifle</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Superficial Gluteal</strong></th>
<th><strong>Semimembranosus</strong></th>
<th><strong>External obturator</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Sacro, Cd1, sacrotuberous ligament</em></td>
<td><em>Ischiatic tuberosity</em></td>
<td><em>Ventral surface of pelvis</em></td>
</tr>
<tr>
<td><em>Third trochanter of femur</em></td>
<td><em>Cranial head - distal/medial femur</em></td>
<td><em>Trochanteric fossa of femur</em></td>
</tr>
<tr>
<td>Innervated by caudal gluteal N</td>
<td>Innervated by tibial N</td>
<td>Innervated by obturator N</td>
</tr>
<tr>
<td>Extends the hip</td>
<td>Extends hip</td>
<td>Laterally rotates femur</td>
</tr>
<tr>
<td>Abducts the limb</td>
<td>Flexes stifle</td>
<td>Adducts limb</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Middle Gluteal</strong></th>
<th><strong>Internal obturator</strong></th>
<th><strong>Gemelli</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gluteal surface + wing of ilium</td>
<td><em>Dorsal surface of pubis + ischium</em></td>
<td><em>Lesser ischiatic notch</em></td>
</tr>
<tr>
<td>Greater trochanter of femur</td>
<td><em>Trochanteric fossa of femur</em></td>
<td><em>Trochanteric fossa of femur</em></td>
</tr>
<tr>
<td>Innervated by cranial gluteal N</td>
<td>Innervated by sciatic nerve</td>
<td>Innervated by sciatic N</td>
</tr>
<tr>
<td>Extensor of the hip joint</td>
<td>Laterally rotates the femur</td>
<td>Laterally rotates the femur</td>
</tr>
<tr>
<td>Abductor of the pelvic limb</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Deep Gluteal</strong></th>
<th><strong>Caudal Crural abductor</strong></th>
<th><strong>Quadratus femoris</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gluteal surface of ilium</td>
<td><em>Sacrotuberous ligament</em></td>
<td><em>Ventromedial to ischiatic tuber</em></td>
</tr>
<tr>
<td>Greater trochanter of femur</td>
<td><em>Cranial fibra, mid tibia</em></td>
<td><em>Distal to trochanteric fossa</em></td>
</tr>
<tr>
<td>Innervated by cranial gluteal N</td>
<td>Innervated by sciatic N</td>
<td>Innervated by sciatic N</td>
</tr>
<tr>
<td>Extends the hip joint</td>
<td>Extends hip</td>
<td>Extends hip</td>
</tr>
<tr>
<td>Abducts the pelvic limb</td>
<td>Abducts limb</td>
<td>Laterally rotates femur</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Biceps femoris</strong></th>
<th><strong>Gracilis</strong></th>
<th><strong>Iliopsoas</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Ischiatic tuberosity + sacrotuberous L.</em></td>
<td><em>Pelvic symphysis</em></td>
<td><em>Transverse process of L2, L3</em></td>
</tr>
<tr>
<td><em>Patellar ligament, cranial border of the tibia, + calcanean tuber</em></td>
<td><em>Cranial tibial border</em></td>
<td><em>Sacropelvic ilium, vertebral ends of last 2 ribs</em></td>
</tr>
<tr>
<td>Innervated by caudal gluteal N</td>
<td>Innervated by obturator N</td>
<td><em>Lesser trochanter of femur</em></td>
</tr>
<tr>
<td>Sciatic N</td>
<td>Innervated by ventral branches of lumbar NS and femoral N</td>
<td>Innervated by ventral branches of the ilium H and femoral N</td>
</tr>
<tr>
<td>Tibial N</td>
<td>Extends the tarsus</td>
<td>Flexes + laterally rotates hip</td>
</tr>
<tr>
<td>Extends the hip</td>
<td>Flexes stiffe</td>
<td>Flexes lumbar vertebral column</td>
</tr>
<tr>
<td>Extends and flexes the stifle</td>
<td>Tibial</td>
<td>Tarsus</td>
</tr>
<tr>
<td>Extends the tarsus</td>
<td>Flexes</td>
<td>Calcanean</td>
</tr>
</tbody>
</table>

---

*CAT does NOT have a sacrotuberous ligament*
**Fascia Latae**

Deep fascia covering stifle and cranial thigh muscles, with several muscle attachments.

**Inguinal canal**

**Common Calcanean Tendon**

1. Gastrocnemius
2. SDF
3. Gracilis
   - Semitendinosus
   - Biceps femoris
   - and Soleus in CATS!

**Sacrotuberous Ligament**

*DOGS only*

- Attachments:
  - Superficial gluteal
  - Biceps femoris
  - Piriformis
  - Caudal crural abductor

**Bursa under internal obturator tendon**

Because tendon swings caudally and lays on bone.

**Symphysial tendon**

Thick and flat tendon which connects the Gracilis to the pelvic symphysis.

**Muscular lacuna**

The iliopsoas passes thru here, part of inguinal ligament, just dorsal to the vascular lacuna.

**Crural extensor retinaculum**

Proximal to tarsal joint
- Cranial tibial + long digital extensor tendons AND Cranial tibial artery

**Tarsal extensor retinaculum**

Distal to crural extensor retinaculum encloses the long digital extensor tendon.

**Superficial inguinal LN**

Cranial inguinal region.

**Popliteal LN**

Found in the popliteal area "crook of the knee".

**Popliteal Fossa**

"The crook of the knee".

**Femoral Triangle**

Where femoral A+V are found AFTER they pass thru vascular lacuna to enter the leg.
TIBIA + FIBULA

CRANIAL

CAUDAL

BONES OF TARSUS + PES

MEDIAL
JOINTS

sacroiliac joint

acetabular labrum

ligament of head of femur

acetabular ligament

bursa on ischium beneath tendon of internal obturator m.

pelvic symphysis

pubic symphysis

ischial symphysis

transverse acetabular ligament

(over acetabular notch)

lateral and medial femorotibial joint sacs

b/w femur + tibia

femoropatellar joint sac

b/w patella and femur/tibia

femoropatellar ligaments

medial collateral ligament

patellar ligament

ligament of popliteus

tendon of popliteus

lateral collateral ligament

lateral meniscus

caudal cruciate ligament

cranial cruciate ligament

meniscofemoral ligament (of lateral meniscus)

medial meniscus

tarsocrural joint

talus - tibia

Popliteal tendon acts as a bursa for lateral collateral ligament and lateral meniscus

Cranial Cruciate Ligament

cranial tibia to caudal femur

Caudal Cruciate Ligament

caudal tibia to cranial femur

think of the first word as referring to the ligaments and second attachment

@DayDVM
NERVES

LUMBOSACRAL PLEXUS

SPINAL NERVES

dorsal branches = epaxialis
vertical branches = hypaxialis

NERVES

cutaneous

genitofemoral

lateral cutaneous femoral

cranial
cutoff cervical lateral plexus

femoral

Sartorius
rectus femoris
vastus lateralis
vastus medialis
vastus intermedius
iliopsoas

sciatic

caudal

common fibular

cranial tibial

long digital extensor

fibularis longus

caudal crural abductor

internal obturator
gemelli

quadratus femoris

sciatic/tibial

biceps femoris
semimembranosus
semitendinosus

tibial

gastrocnemius

superficial digital flexor
depth digital flexor

popliteus

soleus (cutaneous)

(pudendal branch of pudendal)

pelvic - parasympathetic to abdominal organs

perineal - cutaneous

caudal rectal - external anal sphincter

cutaneous nerves:

- genitofemoral
- lateral cutaneous femoral
- caudal cutaneous femoral

1st cutaneous fibers

(perineal - branch of pudendal)
VESSELS

ARTERIES

- aorta
- R external iliac A.
- deep femoral A.
- femoral A.
- saphenous A.
- popliteal A.
- cranial tibial A.
- dorsal pedal A.

VEINS

- caudal vena cava
- internal iliac V.
- external iliac V.
- deep femoral V.
- femoral V.
- saphenous V.
- cranial tibial V.
- cranial medial femoral V.
- cranial lateral femoral V.
- caudal medial femoral V.
- caudal lateral femoral V.
- lateral saphenous V.

Vessels this makes sense - no arteries really on the lateral side, safe "inside" - if these are cut, v. easy to die!

- external pudendal A+V travel out of the superficial inguinal ring alongside the genito-femoral N
- deep circumflex iliac A+V run alongside lateral cutaneous femoral N
- cranial gluteal A+V can be found running alongside cranial gluteal N
- caudal gluteal A+V can be found running alongside caudal gluteal N
CROSS SECTION (pelvic limb)

1.)
2.)
3.)
4.)
5.)
6.)
7.)
8.)
9.)
10.)
11.)
12.)
13.)
14.)
15.)
16.)
17.)

- ID muscle 1
  - Is this muscle part of a group of muscles?
  - If so, identify the numbers and names of the other muscles
  - What nerve innervates muscle 1?
  - What is the action of muscle 1 on the hip?
  - What is the action of muscle 1 on the stifle?
  - Does muscle 1 attach to the pelvis (os coxae), if so, where?
Fig. 2-47 Transverse section of left thigh.
1. Rectus femoris
2. Sartorius, cranial part
3. Sartorius, caudal part
4. Vastus medialis
5. Femoral a. and v.
6. Pectineus
7. Adductor
8. Gracilis
9. Semimembranosus
10. Semitendinosus
11. Caudal crural abductor
12. Sciatic n.
13. Biceps femoris
14. Femur
15. Vastus intermedius
16. Vastus lateralis
17. Fascia lata