

Lab 1

<b>Regions and spaces of the Skull</b>		
<b>Osteology</b>	<b>Comments</b>	<b>Species Differences</b>
Cranium	Part of skull that encloses the brain.	
cranial cavity	Created by the bones of the cranium, brain resides in this cavity	
calvaria	Roof of the cranium.	
Face (facies)	Part of skull that encloses respiratory and alimentary tracts	

<b>Bones of the Skull</b>		
<b>Osteology</b>	<b>Features</b>	<b>Species Differences/identify in</b>
Bones.of.the.cranium		
Frontal bone	Cornual process	Ruminant
Parietal bone	External sagittal crest	Carnivore, horse
	Temporal lines	Horse, ruminant
Interparietal bone		
Occipital bone	External occipital protuberance	
	Occipital condyles	
	Paracondylar processes	
	Nuchal crest	
	Foramen magnum – where brainstem exits cranial cavity to continue as spinal cord	
Basisphenoid bone		
Presphenoid bone		
Pterygoid bone		
Temporal bone	Squamous part	Zygomatic process
		Mandibular fossa

		Retroarticular process	
	Tympanic part	Tympanic bulla	Contains tympanic cavity that is subdivided in cat by septum bulla
		External acoustic meatus	
	Petrous part	Mastoid process	
Ethmoid bone		Cribriform plate	
Vomer		Singular bone of skull on ventral midline, supports nasal septum	

Bones.of.the.face		
Maxilla	Facial crest	Horse
	Facial tuberosity	Ruminant, pig
Nasal bone		
	Nasoincisive notch between nasal and incisive bones	
Incisive bone		
Lacrimal bone		
Palatine bone		
Zygomatic bone	Forms zygomatic arch along with portions from temporal and frontal bones	In carnivore, pig: connects to orbital ligament.
Mandible	Body	
	Ramus	
	Coronoid process	
	Condylar process	
	Angular process	Carnivore
Os rostrale (rostral bone)	supports the snout	Pig

<b>Additional features and joints of the Skull</b>	
<b>Feature</b>	<b>Description/Species Difference</b>
Nasal aperture	bony opening to nasal cavity
Nasoincisive notch	created by nasal and incisive bones, prominent in ungulates.
Orbit	Orbital margin – consists of multiple bones combining to form rim.
	Orbital ligament – carnivore, pig; bridges frontal to zygomatic bone, usually fibrous, may ossify in mature cats to form a complete bony rim.
Zygomatic arch	Formed by zygomatic, temporal and sometimes frontal bones; species variation
Pterygopalatine fossa	caudoventral to orbit, skull region between maxilla and pterygoid process of basisphenoid bone
Temporomandibular joint	synovial joint
Intermandibular articulation	(= mandibular symphysis),

<b>Hyoid apparatus</b>					
<b>Bone</b>		<b>Species Difference/comments</b>			
Tympanohyoid (not seen)		joins stylohyoid to temporal bone			
Stylohyoid		Divides guttural pouch compartments in horse			
Epihyoid		Carnivore, ox (vestigial in horse)			
Ceratohyoid		Surgical removal to treat temporohyoid osteoarthropathy in horse			
Basihyoid					
Lingual process		Horse and ox			
Thyrohyoid					
<b>Vertebral formula</b>					
	Cervical (C)	Thoracic (T)	Lumbar (L)	Sacral (S)	Caudal (Ca)
Carnivore	7	13	7	3	20
Horse	7	18	6	5	variable
Ruminant	7	13	6	5	variable
Pig	7	14/15	6	4	variable

<b>Osteology of the vertebral column</b>	
<b>Osteology</b>	<b>Features and comments</b>
<b>All vertebrae</b>	Body (except C1, which has a ventral arch instead)
	(Dorsal) Spinous process
	Transverse process
	Articular process
	Vertebral foramen
	Arch (consists of two pedicles and a lamina)
	Vertebral canal
	Intervertebral foramen – for spinal nerves to exit vertebral canal.
<b>Cervical vertebrae</b>	
C1 = Atlas	Wings of atlas (= transverse processes)
	Transverse foramen – for pathway of vertebral vessels and nerve.
	Lateral vertebral foramen – for exit of C1 spinal nerve
C2 = Axis	Dens
	Transverse foramen
C3-C7	Transverse foramen (except C7)
	Ventral lamina of C6 (sled runners)

<b>Thoracic vertebrae</b>	Costal fovea
	Anticlinal vertebra
<b>Lumbar vertebrae</b>	As above for all vertebra
<b>Sacral vertebrae (sacrum)</b>	Sacral foramina – for exiting of branches of sacral spinal nerves.
	Auricular face – articulates with ilium (to form sacroiliac joint)
	Promontory – ventral border of cranial base of sacrum
<b>Caudal (coccygeal) vertebrae</b>	Hemal arches (V shaped fusion of processes on ventral aspect of caudal vertebra, bovine and carnivore).



<b>Features of the vertebral column</b>		
<b>Feature</b>	<b>Landmark</b>	<b>Species Difference</b>
Atlanto-occipital joint	the 'yes' joint	
Dorsal atlanto-occipital ligament (membrane)		
Atlantoaxial joint	the 'no' joint	
Dorsal atlantoaxial ligament		
Transverse ligament of atlas	Examine in carnivore models.	Present in carnivore and pig.
Intervertebral disc	Anulus fibrosus	
	Nucleus pulposus	
Supraspinous ligament	Between consecutive tips of spinous processes of thoracic and lumbar vertebrae.	
Yellow ligament	between adjacent vertebral arches, dorsal margin.	
Intercapital ligament	between paired rib heads	for ribs 2-10 in the dog.

<b>Muscles/structures</b>		
Epaxial mm.	Iliocostalis system	
	Longissimus system	
	Transversospinalis system	
	Semispinalis capitis m.	Carnivore, horse, ruminant
Splenius		all; has 2 parts in ungulates
Hypaxial mm.	Longus capitis m.	
	Longus colli m.	
Nuchal ligament	Funiculus nuchae	Dog, horse, ruminant
	Lamina nuchae (paired)	Horse, ruminant
	Lamina nuchae (un-paired)	Ruminant – identify in calf
Bursa	Supraspinous bursa	Horse – often hard to specifically identify but let's have a good crack at it.
	Cranial (and caudal if present) nuchal bursa	Horse – don't look for these but be aware of location
Rectus capitis dorsalis mm.		Horse, ruminant
Obliquus capitis caudalis m.		Horse, ruminant

<b>Muscle attachments and actions</b>		
<b>Muscle/structure</b>	<b>Attachments</b>	<b>Action</b>
Iliocostalis system	Overlapping fascicles from ilium to rib 1	Extension and lateral movement of vertebral column
Longissimus system	Overlapping fascicles from ilium to skull	Extension and lateral movement of vertebral column
Transversospinalis system	Overlapping fascicles from sacrum to skull	Extension and lateral movement of vertebral column
Semispinalis capitis	Thoracic vertebrae to skull	Extend head and neck, lateral flexion of neck
Splenius	Spinous processes T1-3 and median raphe to skull	Extend and raise head and neck, lateral flexion of neck
Longus colli	Ventral vertebral bodies and transverse processes T6 to C1	Flex neck
Longus capitis	Transverse processes cervical vertebrae to skull	Flex atlanto-occipital joint and draw neck ventrally

Lab 5

<b>Thorax osteology and arthrology</b>	
<b>Thoracic vertebrae</b>	Canine 13, Ruminant 13, Pig 14-15, Horse 18
	(Dorsal) spinous process
	transverse process
	cranial/caudal articular processes
	body
	arch (consisting of two pedicles and the lamina)
	costal fovea
	anticlinal vertebra (T11) in canine
<b>Ribs – paired. Same number as thoracic vertebrae</b>	Head
	Neck
	Tubercle
	Body
	Costochondral junction
	Costal cartilage
	Costal arch
	Intercostal space

<b>Sternum – sternebrae and number</b>	carnivore 8, horse and ruminant 7, pig 6
	Manubrium
	Xiphoid process
<b>Thoracic inlet</b>	define boundaries
<b>Thoracic outlet</b>	define boundaries
<b>Thoracocentesis</b>	define typical location as described
<b>Thoracic wall myology and comments</b>	
Serratus dorsalis mm.	cranial and caudal divisions
Scalenus m.	multiple slips or divisions
External intercostal mm.	
Internal intercostal mm.	
Rectus thoracis m.	
Transversus thoracis m.	Learn on a model at this time