

## Bones of the Back Region - Listed in Superior to Inferior Order

Bone	Structure	Description	Notes
<b>occipital</b>		the bone forming the posterior surface of the skull	it articulates superolaterally with the parietal bones through the lambdoid suture, anteroinferiorly with the temporal bone and anteriorly with the body of the sphenoid bone
	external occipital protuberance	a low process on the external surface of the occipital bone in the midline	it is an attachment site for the ligamentum nuchae; the superior nuchal lines of the two sides meet in the midline at the external occipital protuberance; also known as: inion
	inferior nuchal line	a low ridge that runs transversely on the external surface of the squamous part of the occipital bone inferior to the superior nuchal line	it is an attachment site for deep neck muscles
	superior nuchal line	a low ridge that runs transversely on the external surface of the squamous part of the occipital bone	it is an attachment site the for the trapezius and splenius mm.
	occipital condyle	a low, wide projection from the inferior surface of the lateral part of the occipital bone	paired; it articulates with the atlas
<b>vertebra</b>		one of a series of irregular bones that form the spine	a vertebra has two parts: the vertebral body and the vertebral arch; there are 33 vertebrae total: 7 cervical, 12 thoracic, 5 lumbar, 5 fused to form the sacrum, 4 coccygeal; features of a typical vertebra include: body, pedicles,

			transverse processes, laminae, articular processes, spinous process
	vertebral body	the largest part of the vertebra	it is shaped like a short cylinder; adjacent vertebral bodies articulate through a symphysis
	vertebral arch	the ring of bone formed by the paired pedicles and paired laminae of the vertebra	the transverse processes and spinous process are attached to the neural arch; the neural arch protects the spinal cord
	pedicle	short strong process that extends posteriorly from the posterolateral surface of the vertebral body	paired; it connects the body with the transverse process; it is marked by superior & inferior vertebral notches;
	transverse process	a lateral process the extends from the junction of the pedicle and the lamina of the vertebra	a site for muscle attachment and rib articulation
	lamina	a broad flat plates of bone located between the transverse process and the spinous process of the vertebra	paired; it is flattened markedly in the anteroposterior direction; ligamenta flava span the interval between the laminae of adjacent vertebrae
	articular processes	processes that project inferiorly and superiorly from the junction of the lamina and pedicle of the vertebra	two pair on each vertebra (superior and inferior); the superior articular processes of one vertebra articulate with the inferior processes of the adjacent vertebra through synovial joints
	intervertebral notch	a notch on the superior and inferior surface of the vertebral pedicle	the superior intervertebral notch of one vertebra combined with the inferior intervertebral notch of the adjacent vertebra forms the intervertebral foramen
	intervertebral foramen	an opening between the pedicles of	adjacent intervertebral notches form the intervertebral foramen; an

		adjacent vertebrae	opening for passage of the spinal nerve
	vertebral canal	the opening formed by the combination of the body and the vertebral arch	it contains the spinal cord, meninges, epidural fat and the internal vertebral plexus of veins
	spinous process	a posterior midline process arising from the junction of the two laminae of the vertebra	it projects downward and inferiorly; it is an important site of muscle attachment; spinous processes of cervical vertebra 2-6 are bifid
<b>cervical vertebrae</b>		the seven vertebrae of the neck	cervical vertebrae have the features of the typical vertebra plus all have transverse foramina (for passage of the vertebral artery); C2-C6 have bifid spinous processes; cervical vertebrae have relatively small bodies; several cervical vertebra are named: atlas, axis, vertebra prominens
	atlas (C1)	the first cervical vertebra	it is called atlas in comparison the mythological Greek Titan Atlas, who bore the weight of the world on his shoulders; it has no vertebral body, only anterior & posterior arches; it articulates with the odontoid process of the axis
	axis (C2)	the second cervical vertebra	the odontoid process (dens) projects superiorly from its body; it articulates with the anterior arch of the atlas
	vertebra prominens	the seventh cervical vertebra	it has a long, non-bifid spinous process which is prominent at the nape of the neck, hence its name
<b>thoracic vertebrae</b>		the 12 vertebrae associated with the thoracic region	thoracic vertebrae have the features of a typical vertebra plus they are characterized by long slender spines that project inferiorly; they have facets for

			articulation with ribs; thoracic vertebrae have bodies of intermediate size
	costal articular facet on the body	small smooth areas at the junction of the body and the vertebral arch	most thoracic vertebrae have 2 costal facets on each side (one superior and one inferior); the superior costal facet of one vertebra and the inferior costal facet of the adjacent vertebra both articulate with the head of the same rib; also known as demifacets
	costal articular facet on the transverse process	a small smooth area on the transverse process of the thoracic vertebra	it articulates with the articular facet on the tubercle of the rib
<b>lumbar vertebrae</b>		the 5 vertebrae located in the lumbar region	lumbar vertebrae have the features of a typical vertebra plus they are characterized by short, blunt spines that project posteriorly; lumbar spines do not overlap making the lumbar level a good one for spinal tap; lumbar vertebrae are built strong and have the largest bodies of all vertebrae
<b>sacrum</b>		a triangular bone that is the posterior skeletal element forming the pelvis	it is formed by 5 fused vertebrae; the sacrum and two os coxae bones form the pelvis
	anterior sacral foramina	an opening in the anterior surface of the sacrum	there are four pairs; each transmits the ventral primary ramus of the respective sacral spinal nerve; branches of the lateral sacral aa. enter the sacral canal through these openings
	posterior sacral foramina	an opening in the posterior surface of the sacrum	there are four pairs; each transmits the dorsal primary ramus of the respective sacral spinal nerve
	promontory	a projection of the superior part of the sacrum in an anterior	the body of the fifth lumbar vertebra sits on the sacral promontory and articulates with it

		direction	through a symphysis
	sacral canal	the opening in the center of the sacrum	it is the continuation of the vertebral canal at sacral vertebral levels
	articular surface	the roughened area located on the lateral surface of the sacrum	this surface articulates with the ilium in the sacroiliac articulation
	body	the central portion of the sacrum	the body is equivalent to the bodies of the other vertebra
	base	the superior surface of the sacrum	the base of the sacrum articulates with the fifth lumbar vertebra through an intervertebral disk
	sacral hiatus	an opening in the posterior surface of the sacrum in the midline	it is a normal feature that results from the failure of fusion of the laminae of the fifth sacral segment (and sometimes the fourth) during development
	ala	the lateral portion of the sacrum	paired; it projects laterally from the body of the sacrum; it represents the fused costal and transverse processes of the first sacral vertebra
<b>coccyx</b>		the most inferior portion of the vertebral column	the coccyx results from the fusion of the four coccygeal vertebrae; it may be a single bone or the first coccygeal vertebra may be separated from the other three; it articulates with the fifth sacral segment; coccygeal vertebrae are reduced in complexity, having no pedicles, laminae or spines

<b>Bones of the Thorax</b>			
<b>Bone</b>	<b>Structure</b>	<b>Description</b>	<b>Notes</b>
<b>rib</b>		the bone forming the lateral thoracic wall	12 pairs; several types are described: typical or "true" ribs, "false" ribs,

			"floating" ribs; all three types of ribs have many features in common: head, neck, tubercle, angle, body, costal groove
	head	posteromedial end of the rib	it articulates with demifacets of two adjacent vertebral bodies
	neck	the constricted region lateral to the head of the rib	the neck of the rib is located between the head and the tubercle
	tubercle	a projection located posteroinferior and lateral to the neck of the rib	it articulates with the transverse process of a vertebra
	body	the shaft of the rib	the body is the longest part of a typical rib
	angle	the marked angulation of the body located just lateral to the tubercle	the angle of the rib is its most posterior part
	costal groove	the groove on the inner surface of the inferior border of the body of the rib	it accommodates the intercostal neurovascular bundle; the costal groove provides a protective function for the intercostal neurovascular bundle,
<b>ribs 1-7</b>		"true" ribs - those which attach directly to the sternum	true ribs actually attach to the sternum by means of a costal cartilage and a true synovial joint
<b>rib 1</b>		the most cephalic rib	it is the broadest, shortest and widest of the ribs; the scalene tubercle marks its superior surface and is an elevation between grooves for the subclavian vein & artery; the scalene tubercle is the attachment site of the scalenus anterior m.
<b>rib 2</b>		the rib attached to the 1st and 2nd thoracic vertebrae	it articulates via a costal cartilage with the sternum at the level of the sternal angle; its superior surface is roughened by the attachments of the scalene mm.

<b>rib 8-10</b>		"false" ribs	they articulate via costal cartilages with the costal cartilage of rib 7
<b>rib 11-12</b>		"floating" ribs	the anterior ends of these ribs do not articulate with the sternum or the costal cartilage of the rib above; their costal cartilages are short and end in the muscle of the posterolateral abdominal wall
<b>sternum</b>		the broad flat bone forming the anterior thoracic wall	it is formed by three parts: manubrium, body, xiphoid process
	manubrium	the superior part of the sternum	manubrium means "handle", as in the handle of a sword
	jugular (suprasternal) notch	a notch on the superior border of the manubrium	it is located between the clavicular notches which articulate with the sternal ends of the clavicles
	clavicular notch	a notch on the superolateral border of the manubrium	it articulates with the sternal end of the clavicle
	sternal angle	the junction of the manubrium and body of the sternum	it is an anterior projection located at the level of the costal cartilage of rib 2; an important landmark for internal thoracic anatomy
	body	the middle part of the sternum	it articulates with the manubrium superiorly and the xiphoid process inferiorly; laterally it articulates with the costal cartilages of ribs 2-7
	xiphoid process	the inferior part of the sternum	xiphoid means "sword shaped"; it is variable in size, shape & ossification; it articulates with the body of the sternum superiorly

## Bones of the Abdominal Region

Bone	Structure	Description	Notes
<b>os coxae</b>		one of three bones that form the pelvis	paired; the os coxae forms the lateral part of the pelvis; it is formed by three

			fused bones: ischium, ilium & pubis; also known as the innominate bone
	acetabulum	a cup-shaped depression in the lateral surface of the os coxae bone	acetabulum means vinegar cup; it is the socket for the head of the femur; it is formed by the: ilium (1/5), ischium (2/5) and pubis (2/5); the acetabular fossa lies in the floor of the acetabulum
	acetabular notch	a notch in the inferior margin of the acetabulum	it is spanned by the transverse acetabular ligament; the acetabular br. of the obturator a. enters the hip joint by passing through the acetabular notch
	acetabular fossa	a roughened depression in the center of the acetabulum	the ligament of the head of the femur occupies the acetabular fossa
	lunate surface of the acetabulum	the smooth articular surface of the acetabulum	the lunate surface surrounds the acetabular fossa and the acetabular notch
	obturator foramen	a large foramen formed by the pubic and ischial rami	obturator means to occlude or stop up, a reference to the fact that the obturator membrane closes the obturator foramen almost completely; a site of attachment for the obturator externus m. and the obturator internus m.
<b>pubis</b>		an angulated bone the forms the anterior part of the pelvis	one of three bones that form the os coxae: ilium, ischium, pubis; its body forms 1/5 of the acetabulum; its symphyseal surface unites with the pubis of the opposite side to form the pubic symphysis; the superior and inferior pubic rami participate in the formation of the obturator foramen
	body	superolateral portion of the pubis	the body of the pubis forms about 1/5 of the acetabulum
	pubic crest	ridge on the superior border of the superior ramus	attachment of rectus abdominis & pyramidalis mm.
	pubic tubercle	process at the lateral end of pubic crest	attachment point of the medial end of the inguinal ligament

	superior ramus	superior "limb" that passes medially from the body of the pubis	articulates with the superior ramus of the opposite side at the pubic symphysis
	pecten	ridge on superior surface of the superior pubic ramus	attachment point of the pectineal ligament
	inferior ramus	inferior "limb" that passes inferolaterally from the pubic symphysis	articulates with the ischial ramus to form the ischiopubic ramus; attachment site for the root of the penis (clitoris)
	obturator groove	groove on the inferior surface of the superior pubic ramus	marks the area of passage of the obturator vessels and n. in the obturator canal
<b>ischium</b>		the "V"- shaped bone that forms the posteroinferior part of the pelvis	one of the three bones that form the os coxae: ilium, ischium, pubis
	ischial ramus	the limb of the ischium that passes anteriorly and superomedially toward the pubis	it articulates with the inferior ramus of the pubis
	body	the part of the ischium that participates in the formation of the acetabulum	it articulates with the ilium and the pubis at the acetabulum; the body of the ischium forms 2/5 of the acetabulum
	ischial tuberosity	the roughened projection that protrudes posteroinferiorly from the body of the ischium	it is the site of attachment of the sacrotuberous ligament; it is the site of origin of the inferior gemellus m., quadratus femoris m. and the hamstring mm. (semitendinosus, semimembranosus, long head of biceps femoris, ischiocondylar portion of the adductor magnus)
	lesser sciatic notch	the notch located between the ischial tuberosity and the ischial spine	the lesser sciatic notch is converted to the lesser sciatic foramen by the sacrospinous ligament and the sacrotuberous ligament
	ischial spine	the spine that arises	it is the site of attachment of the

		just superior to the lesser sciatic notch	sacrospinous ligament and the site of origin of the superior gemellus m.
<b>ilium</b>		fan-shaped bone that forms the lateral prominence of the pelvis	one of three bones that form the os coxae: ilium, ischium, pubis
	body	the portion of the ilium that participates in the formation of the acetabulum	the body of the ilium forms 2/5 of the acetabulum
	iliac crest	arching superior edge the ilium that forms the rim of the "fan"	attachment for abdominal wall muscles
	iliac fossa	broad depression on the medial surface of the ilium	iliac fossa is part of the false (greater) pelvis
	iliac tubercle	roughened area along the outer edge of the iliac crest	
	anterior superior iliac spine	spine at the anterior end of the iliac crest	lateral attachment of the inguinal ligament
	posterior superior iliac spine	spine at the posterior end of the iliac crest	position marked by a dimpling of the skin
	arcuate line	ridge running from anteroinferior to posterosuperior on the inner surface of the ilium	inferior boundary of the iliac fossa; marks the plane of transition from abdominal cavity to pelvic cavity
<b>sacrum</b>		a triangular bone that is the posterior skeletal element forming the pelvis	it is formed by 5 fused vertebrae; the sacrum and two os coxae bones form the pelvis
	base	the superior part of the sacrum	the base of the sacrum includes the articular surface for the fifth lumbar vertebra and the superior portion of the two ala
	promontory	a projection of the	the body of the fifth lumbar vertebra

		superior part of the sacrum in an anterior direction	sits on the sacral promontory and articulates with it through a symphysis
	ala	the lateral portion of the sacrum	paired; it projects laterally from the body of the sacrum; it represents the fused costal and transverse processes of the first sacral vertebra
	anterior sacral foramina	an opening in the anterior surface of the sacrum	there are four pairs; each transmits the ventral primary ramus of the respective sacral spinal nerve; branches of the lateral sacral aa. Enter the sacral canal through these openings
	posterior sacral foramina	an opening in the posterior surface of the sacrum	there are four pairs; each transmits the dorsal primary ramus of the respective sacral spinal nerve
	sacral canal	the opening in the center of the sacrum	it is the continuation of the vertebral canal at sacral vertebral levels
	sacral hiatus	an opening in the posterior surface of the sacrum in the midline	it is a normal feature that results from the failure of fusion of the laminae of the fifth sacral segment (and sometimes the fourth) during development
	articular surface	the roughened area located on the lateral surface of the sacrum	this surface articulates with the ilium in the sacroiliac articulation
	body	the central portion of the sacrum	the body is equivalent to the bodies of the other vertebra
	base	the superior surface of the sacrum	the base of the sacrum articulates with the fifth lumbar vertebra through an intervertebral disk
<b>coccyx</b>		the most inferior portion of the vertebral column	the coccyx results from the fusion of the four coccygeal vertebrae; it may be a single bone or the first coccygeal vertebra may be separated from the other three; it articulates with the fifth sacral segment; coccygeal vertebrae are reduced in complexity, having no pedicles, laminae or spines

## Bones of the Pelvis and Perineum

Bone	Structure	Description	Notes
<b>os coxae</b>		one of three bones that form the pelvis	paired; the os coxae forms the lateral part of the pelvis; it is formed by three fused bones: ischium, ilium & pubis; also known as the innominate bone
	acetabulum	a cup-shaped depression in the lateral surface of the os coxae bone	acetabulum means vinegar cup; it is the socket for the head of the femur; it is formed by the: ilium (1/5), ischium (2/5) and pubis (2/5); the acetabular fossa lies in the floor of the acetabulum
	acetabular notch	a notch in the inferior margin of the acetabulum	it is spanned by the transverse acetabular ligament; the acetabular br. of the obturator a. enters the hip joint by passing through the acetabular notch
	acetabular fossa	a roughened depression in the center of the acetabulum	the ligament of the head of the femur occupies the acetabular fossa
	lunate surface of the acetabulum	the smooth articular surface of the acetabulum	the lunate surface surrounds the acetabular fossa and the acetabular notch
	obturator foramen	a large foramen formed by the pubic and ischial rami	obturator means to occlude or stop up, a reference to the fact that the obturator membrane closes the obturator foramen almost completely; a site of attachment for the obturator externus m. and the obturator internus m.
<b>pubis</b>		an angulated bone the forms the anterior part of the pelvis	one of three bones that form the os coxae: ilium, ischium, pubis; its body forms 1/5 of the acetabulum; its symphyseal surface unites with the pubis of the opposite side to form the pubic symphysis; the superior and inferior pubic rami participate in the formation of the obturator foramen
	body	superolateral portion of the pubis	the body of the pubis forms about 1/5 of the acetabulum

	pubic crest	ridge on the superior border of the superior ramus	attachment of rectus abdominis & pyramidalis mm.
	pubic tubercle	process at the lateral end of pubic crest	attachment point of the medial end of the inguinal ligament
	superior ramus	superior "limb" that passes medially from the body of the pubis	articulates with the superior ramus of the opposite side at the pubic symphysis
	pecten	ridge on superior surface of the superior pubic ramus	attachment point of the pectineal ligament
	inferior ramus	inferior "limb" that passes inferolaterally from the pubic symphysis	articulates with the ischial ramus to form the ischiopubic ramus; attachment site for the root of the penis (clitoris)
	obturator groove	groove on the inferior surface of the superior pubic ramus	marks the area of passage of the obturator vessels and n. in the obturator canal
<b>ischium</b>		the "V"- shaped bone that forms the posteroinferior part of the pelvis	one of the three bones that form the os coxae: ilium, ischium, pubis
	ischial ramus	the limb of the ischium that passes anteriorly and superomedially toward the pubis	it articulates with the inferior ramus of the pubis
	body	the part of the ischium that participates in the formation of the acetabulum	it articulates with the ilium and the pubis at the acetabulum; the body of the ischium forms 2/5 of the acetabulum
	ischial tuberosity	the roughened projection that protrudes posteroinferiorly from the body of the ischium	it is the site of attachment of the sacrotuberous ligament; it is the site of origin of the inferior gemellus m., quadratus femoris m. and the hamstring mm. (semitendinosus, semimembranosus, long head of biceps femoris, ischiocondylar portion of the adductor magnus)

	lesser sciatic notch	the notch located between the ischial tuberosity and the ischial spine	the lesser sciatic notch is converted to the lesser sciatic foramen by the sacrospinous ligament and the sacrotuberous ligament
	ischial spine	the spine that arises just superior to the lesser sciatic notch	it is the site of attachment of the sacrospinous ligament and the site of origin of the superior gemellus m.
<b>ilium</b>		fan-shaped bone that forms the lateral prominence of the pelvis	one of three bones that form the os coxae: ilium, ischium, pubis
	body	the portion of the ilium that participates in the formation of the acetabulum	the body of the ilium forms 2/5 of the acetabulum
	iliac crest	arching superior edge of the ilium that forms the rim of the "fan"	attachment for abdominal wall muscles
	iliac tubercle	roughened area along the outer edge of the iliac crest	
	anterior superior iliac spine	spine at the anterior end of the iliac crest	lateral attachment of the inguinal ligament
	posterior superior iliac spine	spine at the posterior end of the iliac crest	position marked by a dimpling of the skin
	arcuate line	ridge running from anteroinferior to posterosuperior on the inner surface of the ilium	inferior boundary of the iliac fossa; marks the plane of transition from abdominal cavity to pelvic cavity
<b>sacrum</b>		a triangular bone that is the posterior skeletal element forming the pelvis	it is formed by 5 fused vertebrae; the sacrum and two os coxae bones form the pelvis
	base	the superior part of the sacrum	the base of the sacrum includes the articular surface for the fifth lumbar vertebra and the superior portion of the

			two ala
	promontory	a projection of the superior part of the sacrum in an anterior direction	the body of the fifth lumbar vertebra sits on the sacral promontory and articulates with it through a symphysis
	ala	the lateral portion of the sacrum	paired; it projects laterally from the body of the sacrum; it represents the fused costal and transverse processes of the first sacral vertebra
	anterior sacral foramina	an opening in the anterior surface of the sacrum	there are four pairs; each transmits the ventral primary ramus of the respective sacral spinal nerve; branches of the lateral sacral aa. Enter the sacral canal through these openings
	posterior sacral foramina	an opening in the posterior surface of the sacrum	there are four pairs; each transmits the dorsal primary ramus of the respective sacral spinal nerve
	sacral canal	the opening in the center of the sacrum	it is the continuation of the vertebral canal at sacral vertebral levels
	sacral hiatus	an opening in the posterior surface of the sacrum in the midline	it is a normal feature that results from the failure of fusion of the laminae of the fifth sacral segment (and sometimes the fourth) during development
	articular surface	the roughened area located on the lateral surface of the sacrum	this surface articulates with the ilium in the sacroiliac articulation
	body	the central portion of the sacrum	the body is equivalent to the bodies of the other vertebra
	base	the superior surface of the sacrum	the base of the sacrum articulates with the fifth lumbar vertebra through an intervertebral disk
<b>coccyx</b>		the most inferior portion of the vertebral column	the coccyx results from the fusion of the four coccygeal vertebrae; it may be a single bone or the first coccygeal vertebra may be separated from the other three; it articulates with the fifth sacral segment; coccygeal vertebrae are reduced in complexity, having no pedicles, laminae or spines

## Bones of the Upper Limb - Listed in Proximal to Distal Order

Bone	Structure	Description	Notes
<b>clavicle</b>		an "S" shaped bone located between the sternum and the scapula	it articulates medially with the manubrium of the sternum and laterally with the acromion process of the scapula; it forms a strut that supports the upper limb; it is frequently fractured; it is the first bone to begin ossification during development
	sternal extremity	the thickened proximal end of the clavicle	it is triangular in cross-section; it articulates with the clavicular notch of the sternum through a synovial joint with two joint cavities separated by an articular disk; the sternoclavicular joint has the action of a ball and socket joint, but not the physical shape of one
	acromial extremity	the flattened lateral end of the clavicle	it is marked on its inferior surface at the junction of the medial 2/3 and the lateral 1/3 by a roughened area for attachment of the coracoclavicular ligament; it articulates with the coracoid process of the scapula through a syndesmosis; it articulates with the acromion process of the scapula through a synovial joint; due to the shape of the distal clavicle, the acromion process passes inferior to the clavicle in acromioclavicular dislocations
<b>scapula</b>		the bone of the shoulder	the scapula floats in a sea of muscles, so it is difficult to fracture; it articulates with only one bone - the clavicle at the coracoclavicular and

			acromioclavicular joints
	superior border	the superior edge of the scapula	the superior border of the scapula is marked by the scapular notch laterally
	medial border	the border of the scapula that runs from the superior angle to the inferior angle	it is an important site of muscle attachments for the intermediate layer of back muscles
	superior angle	the angle of the scapula formed at the union of the superior and medial borders	it is the attachment site for the levator scapulae m.
	lateral border	the portion of the scapula that runs inferomedially from the infraglenoid tubercle to the inferior angle	it is an important site of muscle attachments for the teres major m., teres minor m. and the long head of the triceps brachii m.; it has a groove for passage of the circumflex scapular a.
	inferior angle	the angle of the scapula formed by the union of the medial and lateral borders	the inferior angle of the scapula often has a slip of origin of the latissimus dorsi attached to it
	glenoid cavity	the articular surface located at the junction of the superior and lateral borders of the scapula	it articulates with the head of the humerus; it is deepened by a fibrocartilaginous rim called the glenoid labrum
	supraglenoid tubercle	a projection of bone located superior to the glenoid cavity	it is the attachment site for the tendon of the long head of the biceps brachii m.
	infraglenoid tubercle	a projection of bone located inferior to the glenoid cavity	it is the attachment site of the tendon of the long head of the triceps brachii m.
	spine	a heavy ridge that runs from the medial border of the scapula	it supports the acromion process; it divides the posterior surface of the scapula into a supraspinatous

		to the acromion process	fossa and an infraspinatous fossa
	scapular notch	a notch on the superior border of the scapula located medial to the attachment of the coracoid process	it is bridged by the superior transverse scapular ligament; the suprascapular a. passes superior to the superior transverse scapular ligament and the suprascapular n. passes inferior to it ( <u>A</u> rmy goes over the bridge, <u>N</u> avy goes under the bridge)
	coracoid process	a beak-like process that projects anteriorly from the lateral end of the superior border of the scapula	it is the attachment site for the short head of the biceps brachii m., the coracobrachialis m., the pectoralis minor m. and the coracoacromial and coracoclavicular ligaments
	acromion	a broad, flat process located at the lateral end of the scapular spine	it articulates with the clavicle through a synovial joint (acromioclavicular joint)
	supraspinatous fossa	a broad depression located superior to the spine of the scapula	it is the site of origin of the supraspinatus m.
	infraspinatous fossa	a broad depression located inferior to the spine of the scapula	it is the site of origin of the infraspinatus m.
<b>humerus</b>		the bone of the arm (brachium)	the humerus articulates proximally with the scapula at the glenoid fossa; it articulates distally with the radius and ulna at the elbow joint
	head	the smooth, rounded proximal end of the ulna	it articulates with the glenoid cavity of the scapula to form the shoulder joint
	anatomical neck	the constricted region located inferolateral to the head	it is located at the circumference of the smooth articular surface of the head

	surgical neck	the proximal part of the shaft of the humerus	it is located inferior to the greater and lesser tubercles; it is a site of frequent fracture; fractures of the surgical neck of the humerus endanger the axillary n. and the posterior circumflex humeral a.
	greater tubercle	the large projection located lateral to the head of the humerus	it is the attachment site of the supraspinatus, infraspinatus & teres minor mm.
	lesser tubercle	the projection located lateral to the head of the humerus on the anterior surface	it is the insertion site of the subscapularis m.
	intertubercular groove	the groove on the anterior surface of the humerus that is located between the crest of the greater tubercle and the crest of the lesser tubercle	it is occupied by the tendon of the long head of the biceps brachii m.; the transverse humeral ligament spans the intertubercular groove and holds the biceps tendon in place; it is the attachment site for the tendon of the pectoralis major (lateral lip), teres major (medial lip), and latissimus dorsi (floor)
	crest of the greater tubercle	the ridge of bone on the anterior surface of the humerus extending inferiorly from the greater tubercle	it forms the lateral lip of the intertubercular groove; it is the attachment site for the transverse humeral ligament and the pectoralis major m.
	crest of the lesser tubercle	the ridge of bone on the anterior surface of the humerus extending inferiorly from the lesser tubercle	it forms the medial lip of the intertubercular groove; it is the attachment site for the transverse humeral ligament and the teres major m.
	deltoid tuberosity	the roughened process on the lateral surface of the mid-shaft of the humerus	it is the insertion site of the deltoid m.
	radial groove	the groove that spirals around the	it is a depression for the radial n. and the deep brachial vessels;

		posterior surface of the shaft of the humerus	fracture of the humerus at mid-shaft can injure the radial nerve and deep brachial vessels because they are in contact with bone at this location
	medial supracondylar ridge	a narrow ridge running proximally from the medial epicondyle of the humerus	the pronator teres m. takes origin from the common flexor tendon near the most inferior part of the medial supracondylar ridge
	lateral supracondylar ridge	a narrow ridge running proximally from the lateral epicondyle of the humerus	it is the site of origin of the brachioradialis m. and the extensor carpi radialis longus m.
	lateral epicondyle	a knob-like projection on the lateral side of the humerus proximal to the capitulum	it is the site of attachment of the common extensor tendon which is the origin of several forearm extensor muscles (extensor carpi radialis brevis m., extensor digitorum m., extensor digiti minimi m., extensor carpi ulnaris m. and supinator m.); inflammation of the attachment of the common extensor tendon is called lateral epicondylitis which is also known as "tennis elbow"
	medial epicondyle	a knob-like projection on the medial side of the humerus proximal to the trochlea	it is the attachment site of the common flexor tendon which is the origin for the superficial group of forearm flexor muscles (pronator teres m., flexor carpi radialis m., palmaris longus m., flexor carpi ulnaris m. and flexor digitorum superficialis m.); inflammation of the attachment of the common flexor tendon is called medial epicondylitis which is also known as "tennis elbow"; the ulnar nerve is in contact with bone as it courses posterior to the medial epicondyle where it is susceptible to injury from blunt

			trauma or fracture
	coronoid fossa	the depression on the anterior surface of the humerus located proximal to the trochlea near the elbow	it accommodates the coronoid process of ulna when the elbow is flexed
	radial fossa	the depression on the anterior surface of the humerus located proximal to the capitulum near the elbow	it accommodates the head of the radius when the elbow is flexed
	olecranon fossa	the depression on the posterior surface of the humerus located just proximal to the elbow	it accommodates the olecranon process of the ulna when the elbow is extended
	capitulum	the rounded process that caps the distal end of the lateral condyle of the humerus	it articulates with the head of the radius; capitulum means "little head"
	trochlea	the grooved process that caps the distal end of the medial condyle of the humerus	it articulates with the trochlear notch of the ulna; the shape of the trochlea and the trochlear notch limits side-to-side movement and guarantees a hinge action; trochlea means "pulley"
<b>ulna</b>		the bone on the medial side of the forearm (antebrachium)	the ulna articulates proximally with the trochlea of the humerus and the head of the radius; it articulates distally with the ulnar notch of the radius
	olecranon	the proximal end of the ulna	it is the insertion site of the tendon of the triceps brachii m.; when the elbow is extended, the olecranon of the ulna engages the olecranon fossa of the humerus
	trochlear notch	the crescent shaped	it is located between the olecranon

		notch on the anterior surface of the proximal end of the ulna	and the coronoid process; it articulates with the trochlea of the humerus; a ridge within the trochlear notch fits into the groove in the trochlea of the ulna which limits side-to-side movement and guarantees a hinge action
	coronoid process	the anterior projection of bone located distal to the trochlear notch	it is the insertion site of the brachialis m.
	radial notch	the notch on the lateral surface of the humerus located just distal to the trochlear notch	it accommodates the head of the radius; the annular ligament of the radius attaches to the anterior and posterior edges of the radial notch of the ulna to encircle the head of the radius
	body	the long slender midportion of the ulna	it is also called the shaft or diaphysis; the interosseous membrane attaches to the entire length of the interosseous border of the body of the ulna
	head	the distal end of the ulna	it is small and rounded for articulation with the radius
	styloid process	a small projection from the distal surface of the head of the ulna	it is the site of attachment of the articular disk of the distal radioulnar joint
<b>radius</b>		the bone on the lateral side of the forearm (antebrachium)	the radius pivots on its long axis and crosses the ulna during pronation
	head	the rounded proximal end of the radius	it has a smooth, rounded surface for articulation with the ulna; the head of the radius is encircled by the annular ligament (4/5 of a circle) and the radial notch of the ulna (1/5 of a circle)
	neck	the constricted area of the radius located	the annular ligament of the radius surrounds the head of the radius,

		distal to the head	not the neck of the radius
	radial tuberosity	a roughened area on the anteromedial surface of the radius located just distal to the neck	it is the insertion site of the tendon of the biceps brachii m.
	body	the long, slender midportion of the radius	it is also known as the shaft or diaphysis; the interosseous membrane attaches to the entire length of the body of the radius along its interosseous border; a fracture of the distal end of the body of the radius with a dorsal displacement of the distal fragment is quite common and is called a Colles' fracture
	ulnar notch	a shallow notch located on the medial surface of the distal end of the radius	it articulates with the head of the ulna
	styloid process	the distal-most projection from the lateral side of the radius	the radial styloid process projects lateral to the proximal row of carpal bones
<b>carpal bones</b>		the bones of the wrist	eight bones arranged in two rows; a mnemonic for memorizing the carpal bones is "some lovers try positions that they can't handle" - the first letters of these eight words are the first letters of the names of the eight carpal bones arranged from lateral to medial, proximal row first: scaphoid, lunate, triquetrum, pisiform/trapezium, trapezoid, capitate, hamate
	proximal row	lateral to medial: scaphoid, lunate, triquetrum, pisiform	the scaphoid and lunate bones of the proximal row articulate with the distal end of the radius
	distal row	lateral to medial:	the distal row of carpal bones

		trapezium, trapezoid, capitate, hamate	articulates with the metacarpal bones of the hand
<b>scaphoid</b>		the most lateral carpal bone of the proximal row	the scaphoid bone is located in the floor of the anatomical snuff box; it is frequently fractured by hyperextension and abduction of the wrist; scaphoid means "boat-shaped"
<b>lunate</b>		the carpal bone located between the scaphoid and triquetrum in the proximal row	the lunate is so named because it is "moon-shaped" (crescent shaped) in longitudinal section; the head of the capitate sits within the crescent of the lunate
<b>triquetrum</b>		the most medial bone in the proximal row of carpal bones	it articulates with the pisiform which sits anterior to it
<b>pisiform</b>		a sesamoid bone in the tendon of the flexor carpi ulnaris m.	it articulates with the lunate; the pisiform bone provides a protective function for the flexor carpi ulnaris tendon by bearing the forces generated by the tendon riding across the triquetrum, especially during wrist extension; pisiform means "pea-shaped"
<b>trapezium</b>		the most lateral carpal bone of the distal row	it forms a saddle joint with the metacarpal bone of the thumb; "the thumb swings on the trapezium"
<b>trapezoid</b>		the carpal bone located between the trapezium and the capitate in the distal row	the trapezoid is named for its trapezoid shape
<b>capitate</b>		the carpal bone located between the trapezoid and the hamate in the distal carpal row	the capitate is the largest carpal bone; it is named for its rounded head; forces generated in the hand (as during a punching blow with the fist) are transmitted through the third metacarpal bone to the capitate and proximally through the lunate to the radius

<b>hamate</b>		the most medial carpal bone in the distal row	the hamulus (hook) of the hamate is its distinguishing characteristic; it is an attachment point of the flexor retinaculum
<b>metacarpal bones</b>		the bones located between the carpal bones and the phalanges of the hand	there are a total of five metacarpal bones in the hand; the metacarpals of the four fingers are bound together by ligaments to form a firm foundation for finger movements; the metacarpal of the thumb is more independent in its range of motion
	base	the proximal end of the metacarpal	it articulates with the distal row of carpal bones
	body	the slender shaft of the metacarpal	it is also known as the diaphysis
	head	the rounded distal end of the metacarpal	it articulates with the proximal phalanx of the corresponding digit
<b>phalanx (phalanges)</b>		the distal two or three bones in the digits of the hand	there are a total of 14 phalanges in the hand; the thumb has two phalanges (proximal and distal) and each finger has three phalanges (proximal, middle and distal); phalanx means "line of soldiers"
	base	the proximal end of the phalanx	the base of the proximal phalanx articulates with the head of the corresponding metacarpal bone; the base of the middle or distal phalanx articulates with the head of the next most proximal phalanx
	body	the slender shaft of the phalanx	also known as the diaphysis; the body of the distal phalanx is very short
	head	the distal end of the phalanx	the proximal, middle and distal phalanges each have a head; the head of a proximal or middle phalanx articulates with the base of the next most distal phalanx

## Bones of the Lower Limb - Listed in Proximal to Distal Order

Bone	Structure	Description	Notes
<b>pubis</b>		an angulated bone the forms the anterior part of the pelvis	one of three bones that form the os coxae: ilium, ischium, pubis; its body forms 1/5 of the acetabulum; its symphyseal surface unites with the pubis of the opposite side to form the pubic symphysis; the superior and inferior pubic rami participate in the formation of the obturator foramen
	body	superolateral portion of the pubis	the body of the pubis forms about 1/5 of the acetabulum
	pubic crest	ridge on the superior border of the superior ramus	attachment of rectus abdominis & pyramidalis mm.
	pubic tubercle	process at the lateral end of pubic crest	attachment point of the medial end of the inguinal ligament
	superior ramus	superior "limb" that passes medially from the body of the pubis	articulates with the superior ramus of the opposite side at the pubic symphysis
	pecten	ridge on superior surface of the superior pubic ramus	attachment point of the pectineal ligament
	inferior ramus	inferior "limb" that passes inferolaterally from the pubic symphysis	articulates with the ischial ramus to form the ischiopubic ramus; attachment site for the root of the penis (clitoris)
	obturator groove	groove on the inferior surface of the superior pubic ramus	marks the area of passage of the obturator vessels and n. in the obturator canal
<b>ischium</b>		the "V"- shaped bone that forms the posteroinferior part	one of the three bones that form the os coxae: ilium, ischium, pubis

		of the pelvis	
	ischial ramus	the limb of the ischium that passes anteriorly and superomedially toward the pubis	it articulates with the inferior ramus of the pubis
	body	the part of the ischium that participates in the formation of the acetabulum	it articulates with the ilium and the pubis at the acetabulum; the body of the ischium forms 2/5 of the acetabulum
	ischial tuberosity	the roughened projection that protrudes posteroinferiorly from the body of the ischium	it is the site of attachment of the sacrotuberous ligament; it is the site of origin of the inferior gemellus m., quadratus femoris m. and the hamstring mm. (semitendinosus, semimembranosus, long head of biceps femoris, ischiocondylar portion of the adductor magnus)
	lesser sciatic notch	the notch located between the ischial tuberosity and the ischial spine	the lesser sciatic notch is converted to the lesser sciatic foramen by the sacrospinous ligament and the sacrotuberous ligament
	ischial spine	the spine that arises just superior to the lesser sciatic notch	it is the site of attachment of the sacrospinous ligament and the site of origin of the superior gemellus m.
<b>ilium</b>		fan-shaped bone that forms the lateral prominence of the pelvis	one of three bones that form the os coxae: ilium, ischium, pubis
	body	the portion of the ilium that participates in the formation of the acetabulum	the body of the ilium forms 2/5 of the acetabulum
	iliac crest	arching superior edge the ilium that forms the rim of the "fan"	attachment for abdominal wall muscles

	iliac fossa	broad depression on the medial surface of the ilium	iliac fossa is part of the false (greater) pelvis
	iliac tubercle	roughened area along the outer edge of the iliac crest	
	anterior superior iliac spine	spine at the anterior end of the iliac crest	lateral attachment of the inguinal ligament
	posterior superior iliac spine	spine at the posterior end of the iliac crest	position marked by a dimpling of the skin
	arcuate line	ridge running from anteroinferior to posterosuperior on the inner surface of the ilium	inferior boundary of the iliac fossa; marks the plane of transition from abdominal cavity to pelvic cavity
	<b>sacrum</b>	a triangular bone that is the posterior skeletal element forming the pelvis	it is formed by 5 fused vertebrae; the sacrum and two os coxae bones form the pelvis
	base	the superior part of the sacrum	the base of the sacrum includes the articular surface for the fifth lumbar vertebra and the superior portion of the two ala
	promontory	a projection of the superior part of the sacrum in an anterior direction	the body of the fifth lumbar vertebra sits on the sacral promontory and articulates with it through a symphysis
	ala	the lateral portion of the sacrum	paired; it projects laterally from the body of the sacrum; it represents the fused costal and transverse processes of the first sacral vertebra
	anterior sacral foramina	an opening in the anterior surface of the sacrum	there are four pairs; each transmits the ventral primary ramus of the respective sacral spinal nerve; branches of the lateral sacral aa. Enter the sacral canal through these openings

	posterior sacral foramina	an opening in the posterior surface of the sacrum	there are four pairs; each transmits the dorsal primary ramus of the respective sacral spinal nerve
	sacral canal	the opening in the center of the sacrum	it is the continuation of the vertebral canal at sacral vertebral levels
	sacral hiatus	an opening in the posterior surface of the sacrum in the midline	it is a normal feature that results from the failure of fusion of the laminae of the fifth sacral segment (and sometimes the fourth) during development
	articular surface	the roughened area located on the lateral surface of the sacrum	this surface articulates with the ilium in the sacroiliac articulation
	body	the central portion of the sacrum	the body is equivalent to the bodies of the other vertebra
	base	the superior surface of the sacrum	the base of the sacrum articulates with the fifth lumbar vertebra through an intervertebral disk
<b>coccyx</b>		the most inferior portion of the vertebral column	the coccyx results from the fusion of the four coccygeal vertebrae; it may be a single bone or the first coccygeal vertebra may be separated from the other three; it articulates with the fifth sacral segment; coccygeal vertebrae are reduced in complexity, having no pedicles, laminae or spines
<b>femur</b>		the bone of the thigh	the femur is the longest and strongest bone in the body
	head	smooth, rounded proximal end	the head of the femur articulates with the acetabulum of the pelvis
	fovea capitis femoris	a shallow pit in the head of the femur	it is the attachment site of the ligamentum capitis femoris; a small artery for supply of the head is found within this

			ligament
	neck	the constricted area distal to the head of the femur	most of the blood supply to the head of the femur courses along the surface of the neck; fractures of the neck of the femur may result in avascular necrosis of the head
	greater trochanter	a large process that projects superiorly from the junction of the neck and shaft of the femur	the greater trochanter is the insertion site of the gluteus medius m., gluteus minimus m., piriformis m. and obturator internus m.
	gluteal tuberosity	a roughened area located on the posterior surface of the femur at the superior end of the lateral lip of the linea aspera	it is one of the insertion sites of the gluteus maximus m.
	lesser trochanter	a large process that projects from the posteromedial surface of the femur just distal to neck	it is the insertion site of the common tendon of the psoas major and iliacus mm. (iliopsoas m.)
	trochanteric fossa	a depression on the medial side of the greater trochanter on its posterior surface where the greater trochanter joins the neck	it is the insertion site of the obturator internus m., superior gemellus m. and inferior gemellus m.
	intertrochanteric line	a ridge on the anterior surface of the femur that connects the greater and lesser trochanters	it is the line of attachment of the fibrous joint capsule
	intertrochanteric crest	a heavy ridge on the posterior surface of the femur that connects the greater and lesser trochanters	the quadratus femoris m. inserts on the intertrochanteric crest

	body	the long slender shaft of the femur	the linea aspera runs the entire length of the posterior surface of the body
	linea aspera	a vertical ridge on posterior surface of the femur	it is the insertion site of the medial (adductor) group of thigh muscles and the origin of the vastus intermedius m. and the short head of the biceps femoris m.
	adductor tubercle	a process that projects superior to the medial epicondyle of the femur	it is the insertion site of the ischiocondylar part of the adductor magnus m.
	medial epicondyle	the enlargement of bone on the medial side of the femur just superior to the medial condyle	it is the attachment site of the tibial collateral ligament of the knee joint
	lateral epicondyle	the enlargement of bone on the lateral side of the femur just superior to the lateral condyle	it is the attachment site of the fibular collateral ligament and the site of origin of the popliteus m.
	medial condyle	the rounded inferior end of the femur on the medial side	it articulates with the medial condyle of the tibia
	lateral condyle	the rounded inferior end of the femur on the lateral side	it articulates with the lateral condyle of the tibia
	intercondylar fossa	the deep depression on the posterior surface of the femur between the condyles	the anterior and posterior cruciate ligaments are located here
	patellar surface	the smooth anterior surface at the inferior end of the femur	it articulates with the posterior surface the patella
	<b>patella</b>	the bone that forms the knee cap	the patella is a sesamoid bone in the tendon of the quadriceps femoris muscle; it provides a

			protective function by withstanding the grinding forces of the quadriceps femoris tendon against the patellar surface of the femur, especially in full knee flexion
<b>tibia</b>		the bone on the medial side of the leg	the tibia is the weight-bearing bone of the leg
	medial condyle	the heavy prominence on the medial side of the proximal end of the tibia	the medial condyle articulates with the medial condyle of the femur; it is larger than the lateral condyle of the tibia
	lateral condyle	the heavy prominence on the lateral side of the proximal end of the tibia	the lateral condyle articulates with the lateral condyle of the femur and with the head of the fibula
	intercondylar eminence	the ridge of bone on the proximal end of the tibia that projects between the condyles	the intercondylar eminence has a medial and a lateral tubercle; it is the attachment site for the cruciate ligaments, medial meniscus and lateral meniscus
	tibial tuberosity	the roughened protuberance on the anterior surface of the tibia located just distal to the condyles	it is the attachment site of the patellar ligament, which represents the insertion of the quadriceps femoris tendon
	body	the long, robust shaft of the tibia	the medial surface of the body of the tibia is subcutaneous throughout its length; when the shin is painfully bumped, the nerve endings are stimulated in the periosteum covering the body of the tibia
	interosseous border	the sharp ridge that runs longitudinally along the junction of the lateral surface and the posterior surface of the tibia	the interosseous membrane attaches to the interosseous border of the tibia

	soleal line	a ridge of bone that descends obliquely from lateral to medial on the posterior surface of the tibia	it is the site of origin of the soleus m.
	medial malleolus	the large bony prominence on the medial side of the ankle	the medial malleolus of the tibia forms the medial side of the ankle joint; it articulates with the medial surface of the talus
<b>fibula</b>		the slender bone on the lateral side of the leg	the fibula is not a weight-bearing bone, it is a muscle attachment bone
	head	the enlarged proximal end of the fibula	it articulates with the lateral condyle of tibia; the fibular collateral ligament of the knee attaches to the head of the fibula
	neck	the constricted portion of the fibula located just inferior to the head	fractures of the neck of the fibula can injure the common fibular n.
	body	the long slender shaft of the fibula	the interosseous membrane attaches to the entire length of the interosseous border of the fibula
	interosseous border	the sharp ridge that runs longitudinally along the medial surface of the fibula	the interosseous membrane attaches to the interosseous border of the fibula
	lateral malleolus	the enlarged distal end of the fibula	the lateral malleolus of the fibula forms the lateral side of the ankle joint; it articulates with the lateral surface of the talus; forcible lateral displacement of the foot can cause the fibula to fracture superior to the lateral malleolus, a condition called a Pott's fracture
<b>tarsal</b>		the bones of the ankle	there are seven tarsal bones:

<b>bones</b>			talus, calcaneus, navicular, medial cuneiform, intermediate cuneiform, lateral cuneiform, cuboid
<b>talus</b>		the most proximal of the tarsal bones	the talus articulates with the medial malleolus of the tibia and the lateral malleolus of the fibula to form the ankle mortise joint
	body	the proximal part of the talus	its superior (trochlear) part participates in the ankle joint and its inferior part articulates with the calcaneus
	trochlea	the superior portion of the body of the talus that lies between the two malleoli	it has a smooth articular surface; it participates in the formation of the ankle joint
	head	the portion of the talus that projects anteriorly	it articulates with the navicular bone
	neck	the constricted part of the talus located proximal to the head	
<b>calcaneus</b>		the tarsal bone which forms the heel	it is the largest and strongest bone in the foot; a fracture of the calcaneus which separates the tuberosity from the body can be a debilitating injury
	calcaneal tuberosity	the posterior roughened area of the calcaneus which contacts the ground during weight-bearing	it is the insertion site of the calcaneal (Achilles') tendon
	sustentaculum tali	the shelf-like medial projection of bone located inferior to the medial malleolus	it is a shelf of bone that articulates with and supports the talus; it is grooved inferiorly by the tendon of the flexor hallucis longus m.

<b>navicular</b>		the tarsal bone located distal to the talus and proximal to the three cuneiform bones	it articulates with the head of the talus and all three cuneiform bones; it is the attachment site for an important ligament (plantar calcaneonavicular or "spring" ligament) that supports the medial longitudinal arch of the foot
<b>cuneiform, medial</b>		the most medial bone in the distal row of tarsal bones	the cuneiform bones articulate with the navicular bone proximally and the bases of the metatarsal bones distally
<b>cuneiform, middle</b>		the intermediate bone of the three cuneiform bones	the cuneiform bones articulate with the navicular bone proximally and the bases of the metatarsal bones distally
<b>cuneiform, lateral</b>		the bone that is located between the middle cuneiform and the cuboid bone	the cuneiform bones articulate with the navicular bone proximally and the bases of the metatarsal bones distally
<b>cuboid</b>		the most lateral bone in the distal row of tarsal bones	the cuboid bone articulates with the calcaneus proximally and the fourth and fifth metatarsal bones distally
<b>metatarsals</b>		the bones located between the tarsal bones and the phalanges	there are five metatarsal bones in the foot
	base	the proximal end of the metatarsal	it articulates with the distal row of tarsal bones
	body	the slender shaft of the metatarsal	it is also known as the diaphysis
	head	the rounded distal end of the metatarsal	it articulates with the proximal phalanx of the corresponding digit
<b>phalanx (phalanges)</b>		the distal two or three bones in the digits of the foot	there are a total of 14 phalanges in the foot; the great toe has two phalanges (proximal and distal) and each of the other four toes has three phalanges (proximal,

			middle and distal); phalanx means "line of soldiers"
	base	the proximal end of the phalanx	the base of the proximal phalanx articulates with the head of the corresponding metatarsal bone; the base of the middle or distal phalanx articulates with the head of the next most proximal phalanx
	body	the slender shaft of the phalanx	also known as the diaphysis; the body of the distal phalanx is very short
	head	the distal end of the phalanx	the proximal, middle and distal phalanges each have a head; the head of a proximal or middle phalanx articulates with the base of the next most distal phalanx

## Bones and Cartilages of the Head and Neck - Listed Alphabetically

Bone/Cartilage	Structure	Description	Notes
<b>arytenoid cartilage</b>		a pyramid shaped cartilage located on the superior margin of the cricoid lamina	paired; each is connected to the epiglottis above via the aryepiglottic m. and to the thyroid cartilage anteriorly via the vocal ligament; paired arytenoid cartilages are pulled together (adducted) by the arytenoid m.
<b>corniculate cartilage</b>		a small cartilage located on the apex of the arytenoid cartilage	corniculate cartilage is found in the base of the aryepiglottic fold; it is yellow elastic cartilage
<b>cricoid cartilage</b>		the inferior & posterior cartilage of	connected: above to the thyroid cartilage via the

		the larynx; it forms a complete cartilaginous ring; its arch projects anteriorly and its lamina is broad and flat posteriorly	inferior horn of the thyroid cartilage, to the conus elasticus, to the arytenoid cartilages which sit atop the lamina; connected below to the first tracheal ring via the cricotracheal ligament
<b>cuneiform cartilage</b>		small cartilaginous nodule located in the aryepiglottic fold	cuneiform cartilage is yellow elastic cartilage
<b>epiglottis</b>		the superior part of the larynx	epiglottic cartilage is covered by a mucous membrane
<b>ethmoid</b>		delicate bone located between the two orbits	highly pneumatized bone that contains the ethmoid air cells; forms the fragile medial wall of the orbit
	cribriform plate	perforated portion of ethmoid bone on either side of the crista galli	perforated for passage of the olfactory nerves
	crista galli	superior midline projection of the ethmoid bone into the anterior cranial fossa; it arises between the cribriform plates	"cock's comb"; anterior anchor point of the falx cerebri
	perpendicular plate	midline process projecting inferiorly into the nasal cavity	forms the superior part of the bony nasal septum
	superior nasal concha	medial projection of the ethmoid bone from the superolateral wall of the nasal cavity	forms the superior nasal meatus below it and the sphenoethmoidal recess above it
	middle nasal concha	portion of the ethmoid bone that projects inferomedially from	forms the superior nasal meatus above it and the middle nasal meatus (which overlies the bulla

		the lateral wall of the nasal cavity	ethmoidalis and hiatus semilunaris) below it
	bullae ethmoidalis	rounded elevation on the lateral wall of the nasal cavity	located under cover of the middle nasal concha; middle ethmoidal air cells drain at its apex
	ethmoidal air cells	pneumatized spaces (3-18 in number) within the ethmoid bone; located between the orbits	three groups may be identified: anterior (drain into the hiatus semilunaris in the middle nasal meatus), middle (drain onto the apex of the bullae ethmoidalis in the middle nasal meatus), posterior (drain into the superior nasal meatus)
	ethmoidal foramen, anterior	opening in the medial wall of the orbit	transmits anterior ethmoidal vessels and nerve
	ethmoidal foramen, posterior	opening in the medial wall of the orbit	transmits posterior ethmoidal vessels and nerve
	hiatus semilunaris	groove in the ethmoid portion of the lateral nasal wall between the uncinat process below and bullae ethmoidalis above	receives the frontonasal duct anterosuperiorly, opening of the maxillary sinus posteroinferiorly, and the openings of the anterior ethmoidal air cells in between
<b>frontal</b>		the anterior bone of the skull which underlies the forehead	articulates with the parietal bone posteriorly; zygomatic, ethmoid and sphenoid bones inferiorly; maxilla, nasal and lacrimal bones anteriorly; it is formed from two ossification centers which normally fuse in the midline - if they do not fuse, a midline "metopic suture" is the result
	orbital plate	flat portion of frontal that forms the roof of	a very thin portion of the frontal bone which is like an

		the orbit	egg shell in thickness
	foramen cecum	opening near the anterior end of the crista galli	transmits an emissary vein which may result in transfer of infectious materials from the nasal cavity to the cranial cavity with resulting meningitis
	frontal sinus	pneumatized space in the frontal bone	usually paired; each drains through the frontonasal duct into the uppermost part of the hiatus semilunaris in the middle nasal meatus
	superior orbital margin	arch of bone above the orbital opening	skin over this region is supplied by branches of the frontal nerve (supraorbital and supratrochlear nn.)
	superciliary arch	the ridge of bone above the orbital margin	located deep to the eyebrow, blunt trauma to this region often results in cuts within the eyebrow
	glabella	midline point between the paired superciliary arches	
	supraorbital notch	notch in the superior orbital margin	occasionally present as a foramen; opening for the passage of the supraorbital neurovascular bundle
<b>hyoid</b>		a "U"-shaped bone consisting of several parts: body, 2 greater horns, 2 lesser horns	the hyoid bone ossifies completely in middle life; the body articulates with the greater horns via cartilage and with the lesser horns via fibrous joints prior to ossification; an important site for muscle attachments (suprahyoid and infrahyoid muscle groups)
	body	the middle portion of the "U"-shaped bone	the body of the hyoid bone articulates with the greater

			horns posteriorly
	greater horn (cornu)	posteriorly directed limbs of the "U"-shaped bone	each greater horn articulates with the body and lesser horns anteriorly; origin of middle pharyngeal constrictor m. and hyoglossus m.
	lesser horn (cornu)	articulates with the greater horn at its junction with the body	the inferior end of the stylohyoid ligament attaches to the lesser horn
<b>inferior nasal concha</b>		a separate bone on the lateral wall of the nasal cavity	it articulates with the maxilla; forms the inferior nasal meatus below it and the middle nasal meatus above it
<b>lacrimal</b>		small bone forming part of the medial wall of the orbit	articulates: anteriorly with frontal process of maxilla, superiorly with frontal bone, posteriorly with ethmoid, inferiorly with orbital process of maxilla; forms part of the canal for the nasolacrimal duct
<b>mandible</b>		the U-shaped bone forming the lower jaw	contains the inferior teeth; formed from the mesenchyme of the 1st pharyngeal arch, and its muscles are innervated by the nerve of the 1st arch (mandibular division of cranial nerve V)
	body	the anterior part of the mandible	paired halves are fused in the midline at the symphysis menti
	symphysis menti	the midline symphysis between the two halves of the mandible	the two halves of the mandible fuse during the first postnatal year
	mental	the projection on the	the bone of the chin; mental

	protuberance	anterior midline of the mandible	means relating to the mind, a reference to the act of resting the chin on the hand while thinking (see the sculpture by Rodin: "The Thinker")
	mental spines (genial tubercles)	the spines on the inner surface of the mandible posterior to the mental protuberance	attachment site for the genioglossus and geniohyoid mm.
	mylohyoid line	the ridge running obliquely from posterosuperior to anteroinferior on the medial surface of the body of the mandible	attachment site for the mylohyoid muscle; the submandibular gland is located inferior to this line and the sublingual gland is located superior to this line
	mental foramen	the opening on the anterior surface of the body of the mandible inferior to the premolar teeth	transmits the mental neurovascular bundle; covered superficially by the depressor anguli oris and depressor labii inferioris mm.
	ramus	the angled portion of the mandible that joins the posterior portion of the body	it rises nearly vertically from the body; the chondyloid process and the coronoid process extend from the superior end of the ramus; the mandibular foramen is located on the medial surface of the ramus; the medial pterygoid m. attaches to the medial surface and the masseter m. attaches to the lateral surface of the ramus
	angle	the posteroinferior bend formed by the union of the body and the ramus	
	mandibular foramen	the opening on the medial surface of the	it is the opening into the mandibular canal; it

		ramus	transmits the inferior alveolar neurovascular bundle
	mandibular canal	the canal that runs through the body of the mandible	it transmits the inferior alveolar neurovascular bundle from the infratemporal fossa to the mandibular teeth and gingivae
	lingula	the projection of bone medial to the mandibular foramen	it is the attachment site of the inferior end of the sphenomandibular ligament
	coronoid process	the process that projects anterosuperiorly from the ramus of the mandible	it is the attachment site of the temporalis m.
	condylar process	the rounded process that projects posterosuperiorly from the ramus of the mandible	it articulates with the mandibular fossa of the temporal bone
	mandibular notch	the notch between the coronoid and condylar processes	it transmits the masseteric neurovascular bundle from the infratemporal fossa to the deep surface of the masseter m.
	mandibular neck	the constriction below the articular chondyle on the condylar process of the mandible	part of the lateral pterygoid m. inserts into the pterygoid fossa of the mandibular neck
	pterygoid fossa of the neck	a shallow depression on the anterior surface of the neck of the mandible	part of the lateral pterygoid m. inserts into the pterygoid fossa of the mandibular neck
<b>maxilla</b>		bone forming the midface	it forms the inferior orbital margin and contains the teeth and maxillary sinus
	frontal process	the part of the	it articulates with the nasal

		maxilla that projects superiorly medial to the orbit	bone, the frontal bone and the lacrimal bone; it forms part of medial orbital wall & margin; it forms the anterior part of the canal for the nasolacrimal duct
	orbital process	the part of the maxilla that forms the floor of the orbit	also known as the orbital surface of the maxilla; it contains the infraorbital groove and canal; it forms the roof of the maxillary sinus
	zygomatic process	the lateral projection of the maxilla	it articulates with the zygomatic bone
	infraorbital groove	groove in orbital process of the maxilla located in the posterior part of the orbit	transmits the infraorbital neurovascular bundle from the infraorbital fissure to the infraorbital canal
	infraorbital canal	canal in orbital process of the maxilla located in the anterior part of the orbit	the direct continuation of the infraorbital groove; transmits the infraorbital neurovascular bundle from the infraorbital groove to the infraorbital foramen
	infraorbital foramen	opening at the anterior end of the infraorbital canal located inferior to the orbit	it transmits the infraorbital neurovascular bundle
	alveolar process	"U"-shaped process of bone that holds the maxillary teeth	contains sockets (alveoli) for the roots of the maxillary teeth
	maxillary tuberosity	the roughened posterior aspect of the body of the maxilla	the posterior superior alveolar nn. Enter the maxilla directly superior to this structure
	anterior nasal spine	anterior projection of bone in the midline, inferior to the	the cartilaginous part of the nasal septum sits atop this structure

		anterior nasal aperture	
	maxillary sinus	pneumatized hollow center of the body of the maxilla	paired; each maxillary sinus drains through the hiatus semilunaris into the middle nasal meatus
	palatine process	shelf of bone that projects horizontally to meet at the midline in the intermaxillary suture	paired; together, they form the roof of the oral cavity (hard palate) and the floor of the nasal cavity
	incisive foramen	opening in the midline, posterior to the maxillary incisor teeth	it transmits the terminal branches of the nasopalatine nn. & sphenopalatine aa.; it marks the point of union during development of the primary and secondary palate
<b>nasal</b>		thin bone that forms part of the bridge of the nose	articulates with the frontal bone superiorly, the frontal process of the maxilla laterally and the contralateral nasal bone medially
<b>occipital</b>		the bone forming the posterior surface of the skull	it articulates superolaterally with the parietal bones through the lambdoid suture, anteroinferiorly with the temporal bone and anteriorly with the body of the sphenoid bone
	pharyngeal tubercle	projection located anterior to the foramen magnum	attachment site for the superior pharyngeal constrictor m.
	squamous part	the flat, thin portion of the occipital bone located posterior to the foramen magnum	it articulates with the petrous part of the temporal bone anteroinferiorly and the parietal bones superolaterally at the lambdoid suture

	external occipital protuberance	a projection on the external surface of the squamous part of the occipital bone in the midline	it is the attachment site of the ligamentum nuchae and the trapezius m.; its highest point is called the inion
	inferior nuchal line	a low ridge that runs transversely on the external surface of the squamous part of the occipital bone inferior to the superior nuchal line	it is an attachment site for deep neck muscles
	superior nuchal line	a low ridge that runs transversely on the external surface of the squamous part of the occipital bone	it is the attachment is the for the trapezius and splenius mm.
	foramen magnum	the opening in the occipital bone posterior to the basal part	it transmits the spinal cord, two vertebral aa., and two spinal accessory nerves
	basal part	the portion of the occipital bone located anterior to the foramen magnum	it articulates with the body of the sphenoid bone
	lateral part	the portion of the occipital bone located lateral to the foramen magnum	paired; it is pierced by the hypoglossal canal and the condylar canal
	hypoglossal canal	an opening in the lateral part of the occipital bone	paired; it transmits the hypoglossal nerve
	condylar canal	an opening in the lateral part of the occipital bone	paired; it transmits the condylar emissary vein
	occipital condyle	a low, wide projection from the inferior surface of the lateral part of the occipital bone	paired; it articulates with the atlas

	<b>jugular notch</b>	a notch located on the anterolateral edge of the lateral part of the occipital bone	it forms the posterior margin of the jugular foramen; the temporal bone forms the anterior margin of the jugular foramen
<b>ossicles</b>		a chain of three bones in the tympanic cavity (middle ear) connecting the tympanic membrane to the oval window; arranged from lateral to medial: malleus, incus, stapes	the ossicles are joined by synovial articulations that may become arthritic in old age, resulting in conductive deafness
	<b>incus</b>	the middle ossicle of the middle ear	articulates with the head of the malleus and the head of the stapes; incus means "anvil"
	<b>malleus</b>	the lateral ossicle of the middle ear	the manubrium is attached by its handle to the inner surface of the tympanic membrane at the umbo; its head articulates with the incus; malleus means "hammer"
	<b>stapes</b>	the medial ossicle of the middle ear	it articulates with the long process of the incus and its base fills the fenestra vestibuli (oval window); stapes means "stirrup"
<b>palatine</b>		the bone that forms the posterior part of the hard palate	paired; failure of the perpendicular plates to fuse during development leads to a midline defect (cleft palate)
	<b>perpendicular plate</b>	the vertical portion of the palatine bone located posteriorly on either side of the nasal cavity	it articulates anteriorly with the maxilla; posteriorly it forms the medial wall of the pterygopalatine fossa and the lateral wall of the nasal cavity; its posterior edge

			contributes to 1/2 of the sphenopalatine foramen
	sphenopalatine notch	a notch at the posterosuperior margin of the perpendicular plate of the palatine bone	along with the sphenoid bone it forms the sphenopalatine foramen
	sphenopalatine foramen	an opening in the lateral wall of the nasal cavity formed by the perpendicular plate of the palatine bone and the body of the sphenoid bone	it transmits the nasopalatine nerve and the sphenopalatine vessels
	orbital process	a small, superior projection from the perpendicular plate of the palatine bone	it forms a small part of the floor of the orbit located posteroinferiorly near the apex
	horizontal plate	the portion of the palatine bone that forms the posterior 1/3 of the hard palate	paired; the two horizontal plates meet at the midline
	greater palatine foramen	an opening in the hard palate located medial to the 3rd maxillary molar tooth	it transmits the greater palatine neurovascular bundle; it is an important site for oral anesthesia
	lesser palatine foramen	an opening in the hard palate located posterior to the greater palatine foramen	there may be more than one; it transmits the lesser palatine n. and vessels
<b>parietal</b>		a broad, flat bone forming the lateral surface of the skull	paired; this bone articulates with the contralateral parietal bone in the midline at the sagittal suture; it articulates anteriorly with frontal bone at coronal suture; it articulates posteriorly with the occipital bone at the lambdoid suture; it

			articulates inferiorly with the greater wing of the sphenoid bone at the pterion, the squamous part of the temporal bone at the squamous suture and the mastoid part of the temporal bone at the parietomastoid suture
	inferior temporal line	an arching ridge on the external surface of the parietal bone	it is an attachment site for the temporalis muscle
	superior temporal line	an arching ridge on the external surface of the parietal bone	it is an attachment site for the temporalis muscle and the temporal fascia
	parietal foramen	an opening in the parietal bone located near the sagittal suture	it transmits the parietal emissary vein, a valveless vein which connects the scalp to the cranial cavity
	granular foveolae	small pits located on the inner table of the parietal bone	for the arachnoid granulations
<b>thyroid cartilage</b>		the large anterior cartilage of the larynx; it has several parts: laminae (2), superior horns (2), inferior horns (2), oblique line, superior thyroid notch,	connected above to the hyoid bone via the thyrohyoid membrane; connected below to the cricoid cartilage via the inferior horn of the thyroid cartilage; connected posteriorly: to the arytenoid cartilage via the vocal ligament and thyroarytenoid m., to the epiglottic cartilage via the thyroepiglottic ligament; it tilts anteriorly to increase the length of the vocal ligament and raise the pitch of the voice
	lamina	a broad flat plate of cartilage forming one side of the thyroid	the laryngeal prominence is the line of fusion of the two laminae; each lamina is

		cartilage; two laminae fuse anteriorly in the midline to form the thyroid cartilage	connected superiorly to the hyoid bone by the thyrohyoid membrane
	superior horn	the rounded, superior projection of the posterior border of the thyroid lamina	it is connected superiorly to the greater horn of the hyoid bone by the lateral thyrohyoid ligament
	inferior horn	the rounded, inferior projection of the posterior border of the thyroid lamina	it is connected inferiorly to the cricoid cartilage by the cricothyroid articulation (a synovial joint)
	oblique line	ridge which descends diagonally from superior to inferior on the lateral surface of the thyroid lamina	a line of muscle attachment
	laryngeal prominence	the line of fusion of the thyroid laminae	known to the lay person as the "Adam's apple"; the laryngeal prominence is a secondary sexual characteristic - in postpuberal males the angle of the laryngeal prominence is approximately 90°; and in females the angle is approximately 120°
	superior thyroid notch	the notch at the superior end of the laryngeal prominence	it is connected to the hyoid bone by the median thyrohyoid ligament
<b>sphenoid</b>		an irregularly shaped bone forming the central portion of the skull	it has many parts, including a body, greater wing, lesser wing and pterygoid plates
	body	central part of the sphenoid bone	contains the sphenoid sinuses; attachment point for the wings and pterygoid plates
	sphenoid sinuses	pneumatized spaces	usually paired; it drains into

		within the body of the sphenoid bone	the sphenoidal recess of the nasal cavity
	jugum	the anterior-most portion of the sphenoid bone	articulates with the cribriform plate of the ethmoid bone
	chiasmatic sulcus	the groove for the optic chiasm	located between the jugum & the tuberculum sellae
	optic canal	canal located at the lateral end of the chiasmatic sulcus and medial to the anterior clinoid process	paired; it transmits the optic nerve and the ophthalmic artery from the cranial cavity to the apex of the orbit
	tuberculum sellae	the anterior limit of the sella turcica	the middle clinoid processes project from its lateral ends
	sella turcica	depression on the superior surface of the body of the sphenoid bone	"Turkish saddle"; roughly equivalent to the hypophyseal fossa; area between the tuberculum sellae and the posterior clinoid processes
	anterior clinoid process	projection at the medial end of the lesser wing of the sphenoid bone	the internal carotid artery passes medial to this structure
	lesser wing of the sphenoid	thin rim of bone projecting laterally from the anterior clinoid process	bilateral; it forms the posterior margin of anterior cranial fossa; it articulates anteriorly with the orbital plate of the frontal bone
	greater wing of the sphenoid	broad plate of bone swinging laterally from the body of the sphenoid bone	bilateral; it forms the medial part of the floor of the middle cranial fossa, part of temporal fossae laterally, and the posterior part of the lateral wall of orbit; it articulates anteriorly with the zygomatic bone, superiorly with the frontal & parietal bones (at the pterion), posteriorly with

			the squamous & petrous portions of the temporal bone
	superior orbital fissure	slit-like opening between the lesser & greater wings of the sphenoid bone	it transmits the oculomotor nerve, the trochlear nerve, the abducens nerve, branches of ophthalmic division of the trigeminal nerve, the superior ophthalmic vein and lymphatics from the cranial cavity into the orbit
	foramen rotundum	opening in the floor of the middle cranial fossa through the greater wing of the sphenoid bone	it transmits the maxillary division of the trigeminal nerve
	foramen ovale	opening in the floor of the middle cranial fossa through the greater wing of the sphenoid bone	it transmits the mandibular division of the trigeminal nerve; it is located between the foramen rotundum and the foramen spinosum
	foramen spinosum	opening in the floor of the middle cranial fossa through the greater wing of the sphenoid bone	it transmits the middle meningeal artery and the meningeal br. of the mandibular division of the trigeminal nerve (cranial nerve V)
	spine of the sphenoid	process of bone that projects inferiorly from undersurface of greater wing of the sphenoid	it is the superior attachment for the sphenomandibular ligament
	pterygoid process	process that projects inferiorly from the junction of the body & greater wing of the sphenoid bone	it has several parts: lateral & medial pterygoid plates, hamulus, pterygoid fossa, scaphoid fossa; the pterygoid plates are separated by the large pterygoid fossa throughout most of their length, and by the small scaphoid fossa

			superiorly
	lateral pterygoid plate	thin plate of bone that projects posterolaterally from the pterygoid process	it is the attachment site of the lateral & medial pterygoid muscles (lateral pterygoid m. on its lateral surface, medial pterygoid m. on its medial surface)
	medial pterygoid plate	thin plate of bone that projects posteriorly from the pterygoid process	it is the attachment of the superior pharyngeal constrictor m. & the pharygobasilar fascia
	scaphoid fossa	an oval depression at the superior end of the lateral pterygoid plate	it is the site of origin of the tensor veli palatini m.
	pterygoid hamulus	hook-like projection from the inferior end of the medial pterygoid plate	it acts as a pulley for the tendon of the tensor veli palatini m.
	pterygoid canal	canal that occurs at the junction of the greater wing, the pterygoid process and the body of the sphenoid bone	it transmits the nerve of the pterygoid canal from the pterygoid region to the pterygopalatine fossa
<b>temporal</b>		bone forming the lateral side of the skull	temporal refers the passage of time, which is marked by the appearance of gray hair on the side of the head
	petrous part	the hard part of the temporal bone located in the floor of the cranial cavity	it contains the tympanic cavity (middle ear) and the bony labyrinth of the inner ear
	internal acoustic meatus	the opening on the posteromedial surface of the petrous part of the temporal bone	it transmits the facial n., the vestibulocochlear n., and the labyrinthine a.
	facial canal	a canal which courses through the	it transmits the facial n. from the internal acoustic

		petrous part of the temporal bone	meatus to the stylomastoid foramen
	carotid canal	a canal which courses through the petrous part of the temporal bone	it transmits the internal carotid a. and the internal carotid plexus of nerves into the cranial cavity
	mastoid process	the process located posteroinferior to the external acoustic meatus	it projects inferiorly from the junction of the petrous and squamous parts of the temporal bone; it contains the mastoid air cells that open into tympanic cavity through the mastoid antrum
	tegmen tympani	thin plate of bone forming the roof of the tympanic cavity	located on the floor of the middle cranial fossa
	jugular fossa	a depression on the posterior surface of the petrous part of the temporal bone	it forms the anterior margin of the jugular foramen; the occipital bone forms the posterior margin of the jugular foramen
	styloid process	the spike of bone that projects inferiorly from the petrous part of the temporal bone	it is the attachment site for the stylohyoid, styloglossus and stylopharyngeus mm. and the stylomandibular and stylohyoid ligaments
	tympanic part	the part of the temporal bone consisting of the external acoustic meatus and the tympanic ring	the medial 1/3 of the external acoustic meatus is bony and the lateral 2/3 is formed by cartilage
	external acoustic meatus	the opening in the lateral surface of the temporal bone	it extends medially from the surface to the tympanic membrane; it allows sound to reach the tympanic membrane; the medial 1/3 of the external acoustic meatus is bony and the lateral 2/3 is formed by cartilage

	tympanic ring	the rim of bone surrounding the medial end of the external acoustic meatus	it is the attachment site of the tympanic membrane
	squamous part	the thin flat portion of the temporal bone that constitutes the side of the skull above the ear	it articulates with the parietal bone and the greater wing of the sphenoid bone at the squamous suture
	zygomatic process	the projection of bone that arises anterior to the external acoustic meatus	it articulates with the temporal process of the zygomatic bone to form the zygomatic arch
	mandibular fossa	the depression located medial to the origin of the zygomatic process	it articulates with the condylar process of the mandible
	articular tubercle	an inferior projection located anterior to the mandibular fossa	dislocations of the temporomandibular joint result when the mandibular condyle slides anterior to this structure
<b>vomer</b>		thin plate of bone forming the posteroinferior part of the nasal septum	articulates superiorly with the perpendicular plate of the ethmoid bone and the body of the sphenoid bone; articulates inferiorly with the palatine processes of the maxilla and the horizontal plate of the palatine bone
<b>wormian bone</b>		small irregular bone that occurs between sutures of the skull	wormian bones are variable in occurrence and are especially common at the junction of the squamous suture and the lambdoid suture
<b>zygomatic</b>		the bone that forms the cheek	the zygomatic bone is frequently fractured in blows to the side of the

			orbit; the temporal fascia attaches to the zygomatic arch
	temporal process	the portion of the zygomatic bone that projects posteriorly	it articulates with the zygomatic process of the temporal bone to form the zygomatic arch
	frontal process	the portion of the zygomatic bone that projects superiorly and medially	it forms the inferior part of the lateral orbital margin and the anteroinferior part of the lateral orbital wall; it articulates with the frontal bone anteriorly and the greater wing of the sphenoid bone posteriorly
	maxillary process	the part of the zygomatic bone that projects medially	it forms the lateral part of the inferior orbital margin and the anterolateral part of the orbital floor; it articulates with the maxilla
	zygomaticofacial foramen	a small opening on the lateral surface of the zygomatic bone	it transmits the zygomaticofacial n.

### **Bones of the Back Region - Listed in Superior to Inferior Order**

<b>Bone</b>	<b>Structure</b>	<b>Description</b>	<b>Notes</b>
<b>occipital</b>		the bone forming the posterior surface of the skull	it articulates superolaterally with the parietal bones through the lambdoid suture, anteroinferiorly with the temporal bone and anteriorly with the body of the sphenoid bone
	external occipital protuberance	a low process on the external surface of the occipital bone in the midline	it is an attachment site for the ligamentum nuchae; the superior nuchal lines of the two sides meet in the midline at the external

			occipital protuberance; also known as: inion
	inferior nuchal line	a low ridge that runs transversely on the external surface of the squamous part of the occipital bone inferior to the superior nuchal line	it is an attachment site for deep neck muscles
	superior nuchal line	a low ridge that runs transversely on the external surface of the squamous part of the occipital bone	it is an attachment site the for the trapezius and splenius mm.
	occipital condyle	a low, wide projection from the inferior surface of the lateral part of the occipital bone	paired; it articulates with the atlas
<b>vertebra</b>		one of a series of irregular bones that form the spine	a vertebra has two parts: the vertebral body and the vertebral arch; there are 33 vertebrae total: 7 cervical, 12 thoracic, 5 lumbar, 5 fused to form the sacrum, 4 coccygeal; features of a typical vertebra include: body, pedicles, transverse processes, laminae, articular processes, spinous process
	vertebral body	the largest part of the vertebra	it is shaped like a short cylinder; adjacent vertebral bodies articulate through a symphysis
	vertebral arch	the ring of bone formed by the paired pedicles and paired laminae of the vertebra	the transverse processes and spinous process are attached to the neural arch; the neural arch protects the spinal cord
	pedicle	short strong process that extends posteriorly from the posterolateral surface	paired; it connects the body with the transverse process; it is marked by superior & inferior vertebral notches;

		of the vertebral body	
	transverse process	a lateral process the extends from the junction of the pedicle and the lamina of the vertebra	a site for muscle attachment and rib articulation
	lamina	a broad flat plate of bone located between the transverse process and the spinous process of the vertebra	paired; it is flattened markedly in the anteroposterior direction; ligamenta flava span the interval between the laminae of adjacent vertebrae
	articular processes	processes that project inferiorly and superiorly from the junction of the lamina and pedicle of the vertebra	two pair on each vertebra (superior and inferior); the superior articular processes of one vertebra articulate with the inferior processes of the adjacent vertebra through synovial joints
	intervertebral notch	a notch on the superior and inferior surface of the vertebral pedicle	the superior intervertebral notch of one vertebra combined with the inferior intervertebral notch of the adjacent vertebra forms the intervertebral foramen
	intervertebral foramen	an opening between the pedicles of adjacent vertebrae	adjacent intervertebral notches form the intervertebral foramen; an opening for passage of the spinal nerve
	vertebral canal	the opening formed by the combination of the body and the vertebral arch	it contains the spinal cord, meninges, epidural fat and the internal vertebral plexus of veins
	spinous process	a posterior midline process arising from the junction of the two laminae of the vertebra	it projects inferiorly; it is an important site of muscle attachment; spinous processes of cervical vertebra 2-6 are bifid
	<b>cervical vertebrae</b>	the seven vertebrae of the neck	cervical vertebrae have the features of the typical vertebra plus all have transverse foramina (for passage of the vertebral artery);

			C2-C6 have bifid spinous processes; cervical vertebrae have relatively small bodies; several cervical vertebra are named: atlas, axis, vertebra prominens
	atlas (C1)	the first cervical vertebra	it is called atlas in comparison the mythological Greek Titan Atlas, who bore the weight of the world on his shoulders; it has no vertebral body, only anterior & posterior arches; it articulates with the odontoid process of the axis
	axis (C2)	the second cervical vertebra	the odontoid process (dens) projects superiorly from its body; it articulates with the anterior arch of the atlas
	vertebra prominens	the seventh cervical vertebra	it has a long, non-bifid spinous process which is prominent at the nape of the neck, hence its name
<b>thoracic vertebrae</b>		the 12 vertebrae associated with the thoracic region	thoracic vertebrae have the features of a typical vertebra plus they are characterized by long slender spines that project inferiorly; they have facets for articulation with ribs; thoracic vertebrae have bodies of intermediate size
	costal articular facet on the body	small smooth areas at the junction of the body and the vertebral arch	most thoracic vertebrae have 2 costal facets on each side (one superior and one inferior); the superior costal facet of one vertebra and the inferior costal facet of the adjacent vertebra both articulate with the head of the same rib; also known as demifacets
	costal articular facet on the transverse process	a small smooth area on the transverse process of the thoracic vertebra	it articulates with the articular facet on the tubercle of the rib

<b>lumbar vertebrae</b>		the 5 vertebrae located in the lumbar region	lumbar vertebrae have the features of a typical vertebra plus they are characterized by short, blunt spines that project posteriorly; lumbar spines do not overlap making the lumbar level a good one for spinal tap; lumbar vertebrae are built strong and have the largest bodies of all vertebrae
<b>sacrum</b>		a triangular bone that is the posterior skeletal element forming the pelvis	it is formed by 5 fused vertebrae; the sacrum and two os coxae bones form the pelvis
	anterior sacral foramina	an opening in the anterior surface of the sacrum	there are four pairs; each transmits the ventral primary ramus of the respective sacral spinal nerve; branches of the lateral sacral aa. enter the sacral canal through these openings
	posterior sacral foramina	an opening in the posterior surface of the sacrum	there are four pairs; each transmits the dorsal primary ramus of the respective sacral spinal nerve
	promontory	a projection of the superior part of the sacrum in an anterior direction	the body of the fifth lumbar vertebra sits on the sacral promontory and articulates with it through a symphysis
	sacral canal	the opening in the center of the sacrum	it is the continuation of the vertebral canal at sacral vertebral levels
	articular surface	the roughened area located on the lateral surface of the sacrum	this surface articulates with the ilium in the sacroiliac articulation
	body	the central portion of the sacrum	the body is equivalent to the bodies of the other vertebra
	base	the superior surface of the sacrum	the base of the sacrum articulates with the fifth lumbar vertebra through an intervertebral disk
	sacral hiatus	an opening in the posterior surface of the sacrum in the	it is a normal feature that results from the failure of fusion of the laminae of the fifth sacral segment

		midline	(and sometimes the fourth) during development
	ala	the lateral portion of the sacrum	paired; it projects laterally from the body of the sacrum; it represents the fused costal and transverse processes of the first sacral vertebra
<b>coccyx</b>		the most inferior portion of the vertebral column	the coccyx results from the fusion of the four coccygeal vertebrae; it may be a single bone or the first coccygeal vertebra may be separated from the other three; it articulates with the fifth sacral segment; coccygeal vertebrae are reduced in complexity, having no pedicles, laminae or spines

## Bones of the Upper Limb - Listed in Proximal to Distal Order

Bone	Structure	Description	Notes
<b>clavicle</b>		an "S" shaped bone located between the sternum and the scapula	it articulates medially with the manubrium of the sternum and laterally with the acromion process of the scapula; it forms a strut that supports the upper limb; it is frequently fractured; it is the first bone to begin ossification during development
	sternal extremity	the thickened proximal end of the clavicle	it is triangular in cross-section; it articulates with the clavicular notch of the sternum through a synovial joint with two joint cavities separated by an articular disk; the sternoclavicular joint has the action of a ball and socket joint, but not the physical shape of one
	acromial extremity	the flattened lateral end of the clavicle	it is marked on its inferior surface at the junction of the medial 2/3 and the lateral 1/3 by a roughened

			area for attachment of the coracoclavicular ligament; it articulates with the coracoid process of the scapula through a syndesmosis; it articulates with the acromion process of the scapula through a synovial joint; due to the shape of the distal clavicle, the acromion process passes inferior to the clavicle in acromioclavicular dislocations
<b>scapula</b>		the bone of the shoulder	the scapula floats in a sea of muscles, so it is difficult to fracture; it articulates with only one bone - the clavicle at the coracoclavicular and acromioclavicular joints
	superior border	the superior edge of the scapula	the superior border of the scapula is marked by the scapular notch laterally
	medial border	the border of the scapula that runs from the superior angle to the inferior angle	it is an important site of muscle attachments for the intermediate layer of back muscles
	superior angle	the angle of the scapula formed at the union of the superior and medial borders	it is the attachment site for the levator scapulae m.
	lateral border	the portion of the scapula that runs inferomedially from the infraglenoid tubercle to the inferior angle	it is an important site of muscle attachments for the teres major m., teres minor m. and the long head of the triceps brachii m.; it has a groove for passage of the circumflex scapular a.
	inferior angle	the angle of the scapula formed by the union of the medial and lateral borders	the inferior angle of the scapula often has a slip of origin of the latissimus dorsi attached to it

	glenoid cavity	the articular surface located at the junction of the superior and lateral borders of the scapula	it articulates with the head of the humerus; it is deepened by a fibrocartilaginous rim called the glenoid labrum
	supraglenoid tubercle	a projection of bone located superior to the glenoid cavity	it is the attachment site for the tendon of the long head of the biceps brachii m.
	infraglenoid tubercle	a projection of bone located inferior to the glenoid cavity	it is the attachment site of the tendon of the long head of the triceps brachii m.
	spine	a heavy ridge that runs from the medial border of the scapula to the acromion process	it supports the acromion process; it divides the posterior surface of the scapula into a supraspinatous fossa and an infraspinatous fossa
	scapular notch	a notch on the superior border of the scapula located medial to the attachment of the coracoid process	it is bridged by the superior transverse scapular ligament; the suprascapular a. passes superior to the superior transverse scapular ligament and the suprascapular n. passes inferior to it (Army goes over the bridge, Navy goes under the bridge)
	coracoid process	a beak-like process that projects anteriorly from the lateral end of the superior border of the scapula	it is the attachment site for the short head of the biceps brachii m., the coracobrachialis m., the pectoralis minor m. and the coracoacromial and coracoclavicular ligaments
	acromion	a broad, flat process located at the lateral end of the scapular spine	it articulates with the clavicle through a synovial joint (acromioclavicular joint)
	supraspinatous fossa	a broad depression located superior to the spine of the scapula	it is the site of origin of the supraspinatus m.
	infraspinatous	a broad depression	it is the site of origin of the

	fossa	located inferior to the spine of the scapula	infraspinatus m.
<b>humerus</b>		the bone of the arm (brachium)	the humerus articulates proximally with the scapula at the glenoid fossa; it articulates distally with the radius and ulna at the elbow joint
	head	the smooth, rounded proximal end of the ulna	it articulates with the glenoid cavity of the scapula to form the shoulder joint
	anatomical neck	the constricted region located inferolateral to the head	it is located at the circumference of the smooth articular surface of the head
	surgical neck	the proximal part of the shaft of the humerus	it is located inferior to the greater and lesser tubercles; it is a site of frequent fracture; fractures of the surgical neck of the humerus endanger the axillary n. and the posterior circumflex humeral a.
	greater tubercle	the large projection located lateral to the head of the humerus	it is the attachment site of the supraspinatus, infraspinatus & teres minor mm.
	lesser tubercle	the projection located lateral to the head of the humerus on the anterior surface	it is the insertion site of the subscapularis m.
	intertubercular groove	the groove on the anterior surface of the humerus that is located between the crest of the greater tubercle and the crest of the lesser tubercle	it is occupied by the tendon of the long head of the biceps brachii m.; the transverse humeral ligament spans the intertubercular groove and holds the biceps tendon in place; it is the attachment site for the tendon of the pectoralis major (lateral lip), teres major (medial lip), and latissimus dorsi (floor)
	crest of the greater	the ridge of bone on the anterior surface	it forms the lateral lip of the intertubercular groove; it is the

	tubercle	of the humerus extending inferiorly from the greater tubercle	attachment site for the transverse humeral ligament and the pectoralis major m.
	crest of the lesser tubercle	the ridge of bone on the anterior surface of the humerus extending inferiorly from the lesser tubercle	it forms the medial lip of the intertubercular groove; it is the attachment site for the transverse humeral ligament and the teres major m.
	deltoid tuberosity	the roughened process on the lateral surface of the mid-shaft of the humerus	it is the insertion site of the deltoid m.
	radial groove	the groove that spirals around the posterior surface of the shaft of the humerus	it is a depression for the radial n. and the deep brachial vessels; fracture of the humerus at mid-shaft can injure the radial nerve and deep brachial vessels because they are in contact with bone at this location
	medial supracondylar ridge	a narrow ridge running proximally from the medial epicondyle of the humerus	the pronator teres m. takes origin from the common flexor tendon near the most inferior part of the medial supracondylar ridge
	lateral supracondylar ridge	a narrow ridge running proximally from the lateral epicondyle of the humerus	it is the site of origin of the brachioradialis m. and the extensor carpi radialis longus m.
	lateral epicondyle	a knob-like projection on the lateral side of the humerus proximal to the capitulum	it is the site of attachment of the common extensor tendon which is the origin of several forearm extensor muscles (extensor carpi radialis brevis m., extensor digitorum m., extensor digiti minimi m., extensor carpi ulnaris m. and supinator m.); inflammation of the attachment of the common extensor tendon is called lateral epicondylitis which

			is also known as "tennis elbow"
	medial epicondyle	a knob-like projection on the medial side of the humerus proximal to the trochlea	it is the attachment site of the common flexor tendon which is the origin for the superficial group of forearm flexor muscles (pronator teres m., flexor carpi radialis m., palmaris longus m., flexor carpi ulnaris m. and flexor digitorum superficialis m.); inflammation of the attachment of the common flexor tendon is called medial epicondylitis which is also known as "tennis elbow"; the ulnar nerve is in contact with bone as it courses posterior to the medial epicondyle where it is susceptible to injury from blunt trauma or fracture
	coronoid fossa	the depression on the anterior surface of the humerus located proximal to the trochlea near the elbow	it accommodates the coronoid process of ulna when the elbow is flexed
	radial fossa	the depression on the anterior surface of the humerus located proximal to the capitulum near the elbow	it accommodates the head of the radius when the elbow is flexed
	olecranon fossa	the depression on the posterior surface of the humerus located just proximal to the elbow	it accommodates the olecranon process of the ulna when the elbow is extended
	capitulum	the rounded process that caps the distal end of the lateral condyle of the humerus	it articulates with the head of the radius; capitulum means "little head"
	trochlea	the grooved process that caps the distal	it articulates with the trochlear notch of the ulna; the shape of the

		end of the medial condyle of the humerus	trochlea and the trochlear notch limits side-to-side movement and guarantees a hinge action; trochlea means "pulley"
<b>ulna</b>		the bone on the medial side of the forearm (antebrachium)	the ulna articulates proximally with the trochlea of the humerus and the head of the radius; it articulates distally with the ulnar notch of the radius
	olecranon	the proximal end of the ulna	it is the insertion site of the tendon of the triceps brachii m.; when the elbow is extended, the olecranon of the ulna engages the olecranon fossa of the humerus
	trochlear notch	the crescent shaped notch on the anterior surface of the proximal end of the ulna	it is located between the olecranon and the coronoid process; it articulates with the trochlea of the humerus; a ridge within the trochlear notch fits into the groove in the trochlea of the ulna which limits side-to-side movement and guarantees a hinge action
	coronoid process	the anterior projection of bone located distal to the trochlear notch	it is the insertion site of the brachialis m.
	radial notch	the notch on the lateral surface of the humerus located just distal to the trochlear notch	it accommodates the head of the radius; the annular ligament of the radius attaches to the anterior and posterior edges of the radial notch of the ulna to encircle the head of the radius
	body	the long slender midportion of the ulna	it is also called the shaft or diaphysis; the interosseous membrane attaches to the entire length of the interosseous border of the body of the ulna
	head	the distal end of the ulna	it is small and rounded for articulation with the radius
	styloid process	a small projection	it is the site of attachment of the

		from the distal surface of the head of the ulna	articular disk of the distal radioulnar joint
<b>radius</b>		the bone on the lateral side of the forearm (antebrachium)	the radius pivots on its long axis and crosses the ulna during pronation
	head	the rounded proximal end of the radius	it has a smooth, rounded surface for articulation with the ulna; the head of the radius is encircled by the annular ligament (4/5 of a circle) and the radial notch of the ulna (1/5 of a circle)
	neck	the constricted area of the radius located distal to the head	the annular ligament of the radius surrounds the head of the radius, not the neck of the radius
	radial tuberosity	a roughened area on the anteromedial surface of the radius located just distal to the neck	it is the insertion site of the tendon of the biceps brachii m.
	body	the long, slender midportion of the radius	it is also known as the shaft or diaphysis; the interosseous membrane attaches to the entire length of the body of the radius along its interosseous border; a fracture of the distal end of the body of the radius with a dorsal displacement of the distal fragment is quite common and is called a Colles' fracture
	ulnar notch	a shallow notch located on the medial surface of the distal end of the radius	it articulates with the head of the ulna
	styloid process	the distal-most projection from the lateral side of the radius	the radial styloid process projects lateral to the proximal row of carpal bones

<b>carpal bones</b>		the bones of the wrist	eight bones arranged in two rows; a mnemonic for memorizing the carpal bones is "some lovers try positions that they can't handle" - the first letters of these eight words are the first letters of the names of the eight carpal bones arranged from lateral to medial, proximal row first: scaphoid, lunate, triquetrum, pisiform/trapezium, trapezoid, capitate, hamate
	proximal row	lateral to medial: scaphoid, lunate, triquetrum, pisiform	the scaphoid and lunate bones of the proximal row articulate with the distal end of the radius
	distal row	lateral to medial: trapezium, trapezoid, capitate, hamate	the distal row of carpal bones articulates with the metacarpal bones of the hand
<b>scaphoid</b>		the most lateral carpal bone of the proximal row	the scaphoid bone is located in the floor of the anatomical snuff box; it is frequently fractured by hyperextension and abduction of the wrist; scaphoid means "boat-shaped"
<b>lunate</b>		the carpal bone located between the scaphoid and triquetrum in the proximal row	the lunate is so named because it is "moon-shaped" (crescent shaped) in longitudinal section; the head of the capitate sits within the crescent of the lunate
<b>triquetrum</b>		the most medial bone in the proximal row of carpal bones	it articulates with the pisiform which sits anterior to it
<b>pisiform</b>		a sesamoid bone in the tendon of the flexor carpi ulnaris m.	it articulates with the triquetrum; the pisiform bone provides a protective function for the flexor carpi ulnaris tendon by bearing the forces generated by the tendon riding across the triquetrum, especially during wrist extension; pisiform means "pea-shaped"
<b>trapezium</b>		the most lateral	it forms a saddle joint with the

		carpal bone of the distal row	metacarpal bone of the thumb; "the thumb swings on the trapezium"
<b>trapezoid</b>		the carpal bone located between the trapezium and the capitate in the distal row	the trapezoid is named for its trapezoid shape
<b>capitate</b>		the carpal bone located between the trapezoid and the hamate in the distal carpal row	the capitate is the largest carpal bone; it is named for its rounded head; forces generated in the hand (as during a punching blow with the fist) are transmitted through the third metacarpal bone to the capitate and proximally through the lunate to the radius
<b>hamate</b>		the most medial carpal bone in the distal row	the hamulus (hook) of the hamate is its distinguishing characteristic; it is an attachment point of the flexor retinaculum
<b>metacarpal bones</b>		the bones located between the carpal bones and the phalanges of the hand	there are a total of five metacarpal bones in the hand; the metacarpals of the four fingers are bound together by ligaments to form a firm foundation for finger movements; the metacarpal of the thumb is more independent in its range of motion
	base	the proximal end of the metacarpal	it articulates with the distal row of carpal bones
	body	the slender shaft of the metacarpal	it is also known as the diaphysis
	head	the rounded distal end of the metacarpal	it articulates with the proximal phalanx of the corresponding digit
<b>phalanx (phalanges)</b>		the distal two or three bones in the digits of the hand	there are a total of 14 phalanges in the hand; the thumb has two phalanges (proximal and distal) and each finger has three phalanges (proximal, middle and

			distal); phalanx means "line of soldiers"
	base	the proximal end of the phalanx	the base of the proximal phalanx articulates with the head of the corresponding metacarpal bone; the base of the middle or distal phalanx articulates with the head of the next most proximal phalanx
	body	the slender shaft of the phalanx	also known as the diaphysis; the body of the distal phalanx is very short
	head	the distal end of the phalanx	the proximal, middle and distal phalanges each have a head; the head of a proximal or middle phalanx articulates with the base of the next most distal phalanx

## Bones and Cartilages of the Head and Neck - Listed Alphabetically

Bone/Cartilage	Structure	Description	Notes
<b>arytenoid cartilage</b>		a pyramid shaped cartilage located on the superior margin of the cricoid lamina	paired; each is connected to the epiglottis above via the aryepiglottic m. and to the thyroid cartilage anteriorly via the vocal ligament; paired arytenoid cartilages are pulled together (adducted) by the arytenoid m.
<b>corniculate cartilage</b>		a small cartilage located on the apex of the arytenoid cartilage	corniculate cartilage is found in the base of the aryepiglottic fold; it is yellow elastic cartilage
<b>cricoid cartilage</b>		the inferior and posterior cartilage of the larynx; it forms a complete cartilaginous ring; its arch projects	connected: above to the thyroid cartilage via the inferior horn of the thyroid cartilage, to the conus elasticus, to the arytenoid cartilages which sit atop the

		anteriorly and its lamina is broad and flat posteriorly	lamina; connected below to the first tracheal ring via the cricotracheal ligament
<b>cuneiform cartilage</b>		small cartilaginous nodule located in the aryepiglottic fold	cuneiform cartilage is yellow elastic cartilage
<b>epiglottis</b>		the superior part of the larynx	epiglottic cartilage is covered by a mucous membrane
<b>ethmoid</b>		delicate bone located between the two orbits	highly pneumatized bone that contains the ethmoid air cells; forms the fragile medial wall of the orbit
	cribriform plate	perforated portion of ethmoid bone on either side of the crista galli	perforated for passage of the olfactory nerves
	crista galli	superior midline projection of the ethmoid bone into the anterior cranial fossa; it arises between the cribriform plates	"cock's comb"; anterior anchor point of the falx cerebri
	perpendicular plate	midline process projecting inferiorly into the nasal cavity	forms the superior part of the bony nasal septum
	superior nasal concha	medial projection of the ethmoid bone from the superolateral wall of the nasal cavity	forms the superior nasal meatus below it and the sphenoethmoidal recess above it
	middle nasal concha	portion of the ethmoid bone that projects inferomedially from the lateral wall of the nasal cavity	forms the superior nasal meatus above it and the middle nasal meatus (which overlies the bulla ethmoidalis and hiatus semilunaris) below it
	bulla ethmoidalis	rounded elevation on the lateral wall of the	located under cover of the middle nasal concha;

		nasal cavity	middle ethmoidal air cells drain at its apex
	ethmoidal air cells	pneumatized spaces (3-18 in number) within the ethmoid bone; located between the orbits	three groups may be identified: anterior (drain into the hiatus semilunaris in the middle nasal meatus), middle (drain onto the apex of the bulla ethmoidalis in the middle nasal meatus), posterior (drain into the superior nasal meatus)
	ethmoidal foramen, anterior	opening in the medial wall of the orbit	transmits anterior ethmoidal vessels and nerve
	ethmoidal foramen, posterior	opening in the medial wall of the orbit	transmits posterior ethmoidal vessels and nerve
	hiatus semilunaris	groove in the ethmoid portion of the lateral nasal wall between the uncinat process below and bulla ethmoidalis above	receives the frontonasal duct anterosuperiorly, opening of the maxillary sinus posteroinferiorly, and the openings of the anterior ethmoidal air cells in between
<b>frontal</b>		the anterior bone of the skull which underlies the forehead	articulates with the parietal bone posteriorly; zygomatic, ethmoid and sphenoid bones inferiorly; maxilla, nasal and lacrimal bones anteriorly; it is formed from two ossification centers which normally fuse in the midline - if they do not fuse, a midline "metopic suture" is the result
	orbital plate	flat portion of frontal that forms the roof of the orbit	a very thin portion of the frontal bone which is like an egg shell in thickness
	foramen cecum	opening near the anterior end of the crista galli	transmits an emissary vein which may result in transfer of infectious materials from

			the nasal cavity to the cranial cavity with resulting meningitis
	frontal sinus	pneumatized space in the frontal bone	usually paired; each drains through the frontonasal duct into the uppermost part of the hiatus semilunaris in the middle nasal meatus
	superior orbital margin	arch of bone above the orbital opening	skin over this region is supplied by branches of the frontal nerve (supraorbital and supratrochlear nn.)
	superciliary arch	the ridge of bone above the orbital margin	located deep to the eyebrow, blunt trauma to this region often results in cuts within the eyebrow
	glabella	midline point between the paired superciliary arches	
	supraorbital notch	notch in the superior orbital margin	occasionally present as a foramen; opening for the passage of the for supraorbital neurovascular bundle
<b>hyoid</b>		a "U"-shaped bone consisting of several parts: body, 2 greater horns, 2 lesser horns	the hyoid bone ossifies completely in middle life; the body articulates with the greater horns via cartilage and with the lesser horns via fibrous joints prior to ossification; an important site for muscle attachments (suprahyoid and infrahyoid muscle groups)
	body	the middle portion of the "U"-shaped bone	the body of the hyoid bone articulates with the greater horns posteriorly
	greater horn (cornu)	posteriorly directed limbs of the "U"-shaped bone	each greater horn articulates with the body and lesser horns anteriorly; origin of

			middle pharyngeal constrictor m. and hyoglossus m.
	lesser horn (cornu)	articulates with the greater horn at its junction with the body	the inferior end of the stylohyoid ligament attaches to the lesser horn
<b>inferior nasal concha</b>		a separate bone on the lateral wall of the nasal cavity	it articulates with the maxilla; forms the inferior nasal meatus below it and the middle nasal meatus above it
<b>lacrimal</b>		small bone forming part of the medial wall of the orbit	articulates: anteriorly with frontal process of maxilla, superiorly with frontal bone, posteriorly with ethmoid, inferiorly with orbital process of maxilla; forms part of the canal for the nasolacrimal duct
<b>mandible</b>		the U-shaped bone forming the lower jaw	contains the inferior teeth; formed from the mesenchyme of the 1st pharyngeal arch, and its muscles are innervated by the nerve of the 1st arch (mandibular division of cranial nerve V)
	body	the anterior part of the mandible	paired halves are fused in the midline at the symphysis menti
	symphysis menti	the midline symphysis between the two halves of the mandible	the two halves of the mandible fuse during the first postnatal year
	mental protuberance	the projection on the anterior midline of the mandible	the bone of the chin; mental means relating to the mind, a reference to the act of resting the chin on the hand while thinking (see the sculpture by Rodin: "The

			Thinker")
	mental spines (genial tubercles)	the spines on the inner surface of the mandible posterior to the mental protuberance	attachment site for the genioglossus and geniohyoid mm.
	mylohyoid line	the ridge running obliquely from posterosuperior to anteroinferior on the medial surface of the body of the mandible	attachment site for the mylohyoid muscle; the submandibular gland is located inferior to this line and the sublingual gland is located superior to this line
	mental foramen	the opening on the anterior surface of the body of the mandible inferior to the premolar teeth	transmits the mental neurovascular bundle; covered superficially by the depressor anguli oris and depressor labii inferioris mm.
	ramus	the angled portion of the mandible that joins the posterior portion of the body	it rises nearly vertically from the body; the chondyloid process and the coronoid process extend from the superior end of the ramus; the mandibular foramen is located on the medial surface of the ramus; the medial pterygoid m. attaches to the medial surface and the masseter m. attaches to the lateral surface of the ramus
	angle	the posteroinferior bend formed by the union of the body and the ramus	
	mandibular foramen	the opening on the medial surface of the ramus	it is the opening into the mandibular canal; it transmits the inferior alveolar neurovascular bundle
	mandibular canal	the canal that runs	it transmits the inferior

		through the body of the mandible	alveolar neurovascular bundle from the infratemporal fossa to the mandibular teeth and gingivae
	lingula	the projection of bone medial to the mandibular foramen	it is the attachment site of the inferior end of the sphenomandibular ligament
	coronoid process	the process that projects anterosuperiorly from the ramus of the mandible	it is the attachment site of the temporalis m.
	condylar process	the rounded process that projects posterosuperiorly from the ramus of the mandible	it articulates with the mandibular fossa of the temporal bone
	mandibular notch	the notch between the coronoid and condylar processes	it transmits the masseteric neurovascular bundle from the infratemporal fossa to the deep surface of the masseter m.
	mandibular neck	the constriction below the articular chondyle on the chondylar process of the mandible	part of the lateral pterygoid m. inserts into the pterygoid fossa of the mandibular neck
	pterygoid fossa of the neck	a shallow depression on the anterior surface of the neck of the mandible	part of the lateral pterygoid m. inserts into the pterygoid fossa of the mandibular neck
<b>maxilla</b>		bone forming the midface	it forms the inferior orbital margin and contains the teeth and maxillary sinus
	frontal process	the part of the maxilla that projects superiorly medial to the orbit	it articulates with the nasal bone, the frontal bone and the lacrimal bone; it forms part of medial orbital wall & margin; it forms the

			anterior part of the canal for the nasolacrimal duct
	orbital process	the part of the maxilla that forms the floor of the orbit	also known as the orbital surface of the maxilla; it contains the infraorbital groove and canal; it forms the roof of the maxillary sinus
	zygomatic process	the lateral projection of the maxilla	it articulates with the zygomatic bone
	infraorbital groove	groove in orbital process of the maxilla located in the posterior part of the orbit	transmits the infraorbital neurovascular bundle from the infraorbital fissure to the infraorbital canal
	infraorbital canal	canal in orbital process of the maxilla located in the anterior part of the orbit	the direct continuation of the infraorbital groove; transmits the infraorbital neurovascular bundle from the infraorbital groove to the infraorbital foramen
	infraorbital foramen	opening at the anterior end of the infraorbital canal located inferior to the orbit	it transmits the infraorbital neurovascular bundle
	alveolar process	"U"-shaped process of bone that holds the maxillary teeth	contains sockets (alveoli) for the roots of the maxillary teeth
	maxillary tuberosity	the roughened posterior aspect of the body of the maxilla	the posterior superior alveolar nn. Enter the maxilla directly superior to this structure
	anterior nasal spine	anterior projection of bone in the midline, inferior to the anterior nasal aperture	the cartilaginous part of the nasal septum sits atop this structure
	maxillary sinus	pneumatized hollow center of the body of	paired; each maxillary sinus drains through the hiatus

		the maxilla	semilunaris into the middle nasal meatus
	palatine process	shelf of bone that projects horizontally to meet at the midline in the intermaxillary suture	paired; together, they form the roof of the oral cavity (hard palate) and the floor of the nasal cavity
	incisive foramen	opening in the midline, posterior to the maxillary incisor teeth	it transmits the terminal branches of the nasopalatine nn. & sphenopalatine aa.; it marks the point of union during development of the primary and secondary palate
<b>nasal</b>		thin bone that forms part of the bridge of the nose	articulates with the frontal bone superiorly, the frontal process of the maxilla laterally and the contralateral nasal bone medially
<b>occipital</b>		the bone forming the posterior surface of the skull	it articulates superolaterally with the parietal bones through the lambdoid suture, anteroinferiorly with the temporal bone and anteriorly with the body of the sphenoid bone
	pharyngeal tubercle	projection located anterior to the foramen magnum	attachment site for the superior pharyngeal constrictor m.
	squamous part	the flat, thin portion of the occipital bone located posterior to the foramen magnum	it articulates with the petrous part of the temporal bone anteroinferiorly and the parietal bones superolaterally at the lambdoid suture
	external occipital protuberance	a projection on the external surface of the squamous part of the occipital bone in the midline	it is the attachment site of the ligamentum nuchae and the trapezius m.; its highest point is called the inion

	inferior nuchal line	a low ridge that runs transversely on the external surface of the squamous part of the occipital bone inferior to the superior nuchal line	it is an attachment site for deep neck muscles
	superior nuchal line	a low ridge that runs transversely on the external surface of the squamous part of the occipital bone	it is the attachment is the for the trapezius and splenius mm.
	foramen magnum	the opening in the occipital bone posterior to the basal part	it transmits the spinal cord, two vertebral aa., and two spinal accessory nerves
	basal part	the portion of the occipital bone located anterior to the foramen magnum	it articulates with the body of the sphenoid bone
	lateral part	the portion of the occipital bone located lateral to the foramen magnum	paired; it is pierced by the hypoglossal canal and the condylar canal
	hypoglossal canal	an opening in the lateral part of the occipital bone	paired; it transmits the hypoglossal nerve
	condylar canal	an opening in the lateral part of the occipital bone	paired; it transmits the condylar emissary vein
	occipital condyle	a low, wide projection from the inferior surface of the lateral part of the occipital bone	paired; it articulates with the atlas
	jugular notch	a notch located on the anterolateral edge of the lateral part of the occipital bone	it forms the posterior margin of the jugular foramen; the temporal bone forms the anterior margin of the jugular foramen

<b>ossicles</b>		a chain of three bones in the tympanic cavity (middle ear) connecting the tympanic membrane to the oval window; arranged from lateral to medial: malleus, incus, stapes	the ossicles are joined by synovial articulations that may become arthritic in old age, resulting in conductive deafness
	<b>incus</b>	the middle ossicle of the middle ear	articulates with the head of the malleus and the head of the stapes; incus means "anvil"
	<b>malleus</b>	the lateral ossicle of the middle ear	the manubrium is attached by its handle to the inner surface of the tympanic membrane at the umbo; its head articulates with the incus; malleus means "hammer"
	<b>stapes</b>	the medial ossicle of the middle ear	it articulates with the long process of the incus and its base fills the fenestra vestibuli (oval window); stapes means "stirrup"
<b>palatine</b>		the bone that forms the posterior part of the hard palate	paired; failure of the perpendicular plates to fuse during development leads to a midline defect (cleft palate)
	perpendicular plate	the vertical portion of the palatine bone located posteriorly on either side of the nasal cavity	it articulates anteriorly with the maxilla; posteriorly it forms the medial wall of the pterygopalatine fossa and the lateral wall of the nasal cavity; its posterior edge contributes to 1/2 of the sphenopalatine foramen
	sphenopalatine notch	a notch at the posterosuperior margin of the	along with the sphenoid bone it forms the sphenopalatine foramen

		perpendicular plate of the palatine bone	
	sphenopalatine foramen	an opening in the lateral wall of the nasal cavity formed by the perpendicular plate of the palatine bone and the body of the sphenoid bone	it transmits the nasopalatine nerve and the sphenopalatine vessels
	orbital process	a small, superior projection from the perpendicular plate of the palatine bone	it forms a small part of the floor of the orbit located posteroinferiorly near the apex
	horizontal plate	the portion of the palatine bone that forms the posterior 1/3 of the hard palate	paired; the two horizontal plates meet at the midline
	greater palatine foramen	an opening in the hard palate located medial to the 3rd maxillary molar tooth	it transmits the greater palatine neurovascular bundle; it is an important site for oral anesthesia
	lesser palatine foramen	an opening in the hard palate located posterior to the greater palatine foramen	there may be more than one; it transmits the lesser palatine n. and vessels
<b>parietal</b>		a broad, flat bone forming the lateral surface of the skull	paired; this bone articulates with the contralateral parietal bone in the midline at the sagittal suture; it articulates anteriorly with frontal bone at coronal suture; it articulates posteriorly with the occipital bone at the lambdoid suture; it articulates inferiorly with the greater wing of the sphenoid bone at the pterion, the squamous part of the temporal bone at the squamous suture and the

			mastoid part of the temporal bone at the parietomastoid suture
	inferior temporal line	an arching ridge on the external surface of the parietal bone	it is an attachment site for the temporalis muscle
	superior temporal line	an arching ridge on the external surface of the parietal bone	it is an attachment site for the temporalis muscle and the temporal fascia
	parietal foramen	an opening in the parietal bone located near the sagittal suture	it transmits the parietal emissary vein, a valveless vein which connects the scalp to the cranial cavity
	granular foveolae	small pits located on the inner table of the parietal bone	for the arachnoid granulations
<b>thyroid cartilage</b>		the large anterior cartilage of the larynx; it has several parts: laminae (2), superior horns (2), inferior horns (2), oblique line, superior thyroid notch,	connected above to the hyoid bone via the thyrohyoid membrane; connected below to the cricoid cartilage via the inferior horn of the thyroid cartilage; connected posteriorly: to the arytenoid cartilage via the vocal ligament and thyroarytenoid m., to the epiglottic cartilage via the thyroepiglottic ligament; it tilts anteriorly to increase the length of the vocal ligament and raise the pitch of the voice
	lamina	a broad flat plate of cartilage forming one side of the thyroid cartilage; two laminae fuse anteriorly in the midline to form the thyroid cartilage	the laryngeal prominence is the line of fusion of the two laminae; each lamina is connected superiorly to the hyoid bone by the thyrohyoid membrane

	superior horn	the rounded, superior projection of the posterior border of the thyroid lamina	it is connected superiorly to the greater horn of the hyoid bone by the lateral thyrohyoid ligament
	inferior horn	the rounded, inferior projection of the posterior border of the thyroid lamina	it is connected inferiorly to the cricoid cartilage by the cricothyroid articulation (a synovial joint)
	oblique line	ridge which descends diagonally from superior to inferior on the lateral surface of the thyroid lamina	a line of muscle attachment
	laryngeal prominence	the line of fusion of the thyroid laminae	known to the lay person as the "Adam's apple"; the laryngeal prominence is a secondary sexual characteristic - in postpuberal males the angle of the laryngeal prominence is approximately 90°; and in females the angle is approximately 120°
	superior thyroid notch	the notch at the superior end of the laryngeal prominence	it is connected to the hyoid bone by the median thyrohyoid ligament
	<b>sphenoid</b>	an irregularly shaped bone forming the central portion of the skull	it has many parts, including a body, greater wing, lesser wing and pterygoid plates
	body	central part of the sphenoid bone	contains the sphenoid sinuses; attachment point for the wings and pterygoid plates
	sphenoid sinuses	pneumatized spaces within the body of the sphenoid bone	usually paired; it drains into the sphenoidal recess of the nasal cavity
	jugum	the anterior-most portion of the sphenoid bone	articulates with the cribriform plate of the ethmoid bone

	chiasmatic sulcus	the groove for the optic chiasm	located between the jugum & the tuberculum sellae
	optic canal	canal located at the lateral end of the chiasmatic sulcus and medial to the anterior clinoid process	paired; it transmits the optic nerve and the ophthalmic artery from the cranial cavity to the apex of the orbit
	tuberculum sellae	the anterior limit of the sella turcica	the middle clinoid processes project from its lateral ends
	sella turcica	depression on the superior surface of the body of the sphenoid bone	"Turkish saddle"; roughly equivalent to the hypophyseal fossa; area between the tuberculum sellae and the posterior clinoid processes
	anterior clinoid process	projection at the medial end of the lesser wing of the sphenoid bone	the internal carotid artery passes medial to this structure
	lesser wing of the sphenoid	thin rim of bone projecting laterally from the anterior clinoid process	bilateral; it forms the posterior margin of anterior cranial fossa; it articulates anteriorly with the orbital plate of the frontal bone
	greater wing of the sphenoid	broad plate of bone swinging laterally from the body of the sphenoid bone	bilateral; it forms the medial part of the floor of the middle cranial fossa, part of temporal fossae laterally, and the posterior part of the lateral wall of orbit; it articulates anteriorly with the zygomatic bone, superiorly with the frontal & parietal bones (at the pterion), posteriorly with the squamous & petrous portions of the temporal bone
	superior orbital fissure	slit-like opening between the lesser & greater wings of the	it transmits the oculomotor nerve, the trochlear nerve, the abducens nerve,

		sphenoid bone	branches of ophthalmic division of the trigeminal nerve, the superior ophthalmic vein and lymphatics from the cranial cavity into the orbit
	foramen rotundum	opening in the floor of the middle cranial fossa through the greater wing of the sphenoid bone	it transmits the maxillary division of the trigeminal nerve
	foramen ovale	opening in the floor of the middle cranial fossa through the greater wing of the sphenoid bone	it transmits the mandibular division of the trigeminal nerve; it is located between the foramen rotundum and the foramen spinosum
	foramen spinosum	opening in the floor of the middle cranial fossa through the greater wing of the sphenoid bone	it transmits the middle meningeal artery and the meningeal br. of the mandibular division of the trigeminal nerve (cranial nerve V)
	spine of the sphenoid	process of bone that projects inferiorly from undersurface of greater wing of the sphenoid	it is the superior attachment for the sphenomandibular ligament
	pterygoid process	process that projects inferiorly from the junction of the body & greater wing of the sphenoid bone	it has several parts: lateral & medial pterygoid plates, hamulus, pterygoid fossa, scaphoid fossa; the pterygoid plates are separated by the large pterygoid fossa throughout most of their length, and by the small scaphoid fossa superiorly
	lateral pterygoid plate	thin plate of bone that projects posterolaterally from the pterygoid process	it is the attachment site of the lateral & medial pterygoid muscles (lateral pterygoid m. on its lateral surface, medial pterygoid

			m. on its medial surface)
	medial pterygoid plate	thin plate of bone that projects posteriorly from the pterygoid process	it is the attachment of the superior pharyngeal constrictor m. & the pharygobasilar fascia
	scaphoid fossa	an oval depression at the superior end of the lateral pterygoid plate	it is the site of origin of the tensor veli palatini m.
	pterygoid hamulus	hook-like projection from the inferior end of the medial pterygoid plate	it acts as a pulley for the tendon of the tensor veli palatini m.
	pterygoid canal	canal that occurs at the junction of the greater wing, the pterygoid process and the body of the sphenoid bone	it transmits the nerve of the pterygoid canal from the pterygoid region to the pterygopalatine fossa
<b>temporal</b>		bone forming the lateral side of the skull	temporal refers the passage of time, which is marked by the appearance of gray hair on the side of the head
	petrous part	the hard part of the temporal bone located in the floor of the cranial cavity	it contains the tympanic cavity (middle ear) and the bony labyrinth of the inner ear
	internal acoustic meatus	the opening on the posteromedial surface of the petrous part of the temporal bone	it transmits the facial n., the vestibulocochlear n., and the labyrinthine a.
	facial canal	a canal which courses through the petrous part of the temporal bone	it transmits the facial n. from the internal acoustic meatus to the stylomastoid foramen
	carotid canal	a canal which courses through the petrous part of the temporal bone	it transmits the internal carotid a. and the internal carotid plexus of nerves into the cranial cavity

	mastoid process	the process located posteroinferior to the external acoustic meatus	it projects inferiorly from the junction of the petrous and squamous parts of the temporal bone; it contains the mastoid air cells that open into tympanic cavity through the mastoid antrum
	tegmen tympani	thin plate of bone forming the roof of the tympanic cavity	located on the floor of the middle cranial fossa
	jugular fossa	a depression on the posterior surface of the petrous part of the temporal bone	it forms the anterior margin of the jugular foramen; the occipital bone forms the posterior margin of the jugular foramen
	styloid process	the spike of bone that projects inferiorly from the petrous part of the temporal bone	it is the attachment site for the stylohyoid, styloglossus and stylopharyngeus mm. and the stylomandibular and stylohyoid ligaments
	tympanic part	the part of the temporal bone consisting of the external acoustic meatus and the tympanic ring	the medial 1/3 of the external acoustic meatus is bony and the lateral 2/3 is formed by cartilage
	external acoustic meatus	the opening in the lateral surface of the temporal bone	it extends medially from the surface to the tympanic membrane; it allows sound to reach the tympanic membrane; the medial 1/3 of the external acoustic meatus is bony and the lateral 2/3 is formed by cartilage
	tympanic ring	the rim of bone surrounding the medial end of the external acoustic meatus	it is the attachment site of the tympanic membrane
	squamous part	the thin flat portion	it articulates with the

		of the temporal bone that constitutes the side of the skull above the ear	parietal bone and the greater wing of the sphenoid bone at the squamous suture
	zygomatic process	the projection of bone that arises anterior to the external acoustic meatus	it articulates with the temporal process of the zygomatic bone to form the zygomatic arch
	mandibular fossa	the depression located medial to the origin of the zygomatic process	it articulates with the condylar process of the mandible
	articular tubercle	an inferior projection located anterior to the mandibular fossa	dislocations of the temporomandibular joint result when the mandibular condyle slides anterior to this structure
<b>vomer</b>		thin plate of bone forming the posteroinferior part of the nasal septum	articulates superiorly with the perpendicular plate of the ethmoid bone and the body of the sphenoid bone; articulates inferiorly with the palatine processes of the maxilla and the horizontal plate of the palatine bone
<b>wormian bone</b>		small irregular bone that occurs between sutures of the skull	wormian bones are variable in occurrence and are especially common at the junction of the squamous suture and the lambdoid suture
<b>zygomatic</b>		the bone that forms the cheek	the zygomatic bone is frequently fractured in blows to the side of the orbit; the temporal fascia attaches to the zygomatic arch
	temporal process	the portion of the zygomatic bone that projects posteriorly	it articulates with the zygomatic process of the temporal bone to form the

			zygomatic arch
	frontal process	the portion of the zygomatic bone that projects superiorly and medially	it forms the inferior part of the lateral orbital margin and the anteroinferior part of the lateral orbital wall; it articulates with the frontal bone anteriorly and the greater wing of the sphenoid bone posteriorly
	maxillary process	the part of the zygomatic bone that projects medially	it forms the lateral part of the inferior orbital margin and the anterolateral part of the orbital floor; it articulates with the maxilla
	zygomaticofacial foramen	a small opening on the lateral surface of the zygomatic bone	it transmits the zygomaticofacial n.

## Bones of the Thorax

Bone	Structure	Description	Notes
<b>rib</b>		the bone forming the lateral thoracic wall	12 pairs; several types are described: typical or "true" ribs, "false" ribs, "floating" ribs; all three types of ribs have many features in common: head, neck, tubercle, angle, body, costal groove
	head	posteromedial end of the rib	it articulates with demifacets of two adjacent vertebral bodies
	neck	the constricted region lateral to the head of the rib	the neck of the rib is located between the head and the tubercle
	tubercle	a projection located posteroinferior and lateral to the neck of the rib	it articulates with the transverse process of a vertebra
	body	the shaft of the rib	the body is the longest part of a typical rib
	angle	the marked	the angle of the rib is its most

		angulation of the body located just lateral to the tubercle	posterior part
	costal groove	the groove on the inner surface of the inferior border of the body of the rib	it accommodates the intercostal neurovascular bundle; the costal groove provides a protective function for the intercostal neurovascular bundle,
<b>ribs 1-7</b>		"true" ribs - those which attach directly to the sternum	true ribs actually attach to the sternum by means of a costal cartilage and a true synovial joint
<b>rib 1</b>		the most cephalic rib	it is the broadest, shortest and widest of the ribs; the scalene tubercle marks its superior surface and is an elevation between grooves for the subclavian vein & artery; the scalene tubercle is the attachment site of the scalenus anterior m.
<b>rib 2</b>		the rib attached to the 1st and 2nd thoracic vertebrae	it articulates via a costal cartilage with the sternum at the level of the sternal angle; its superior surface is roughened by the attachments of the scalene mm.
<b>rib 8-10</b>		"false" ribs	they articulate via costal cartilages with the costal cartilage of rib 7
<b>rib 11-12</b>		"floating" ribs	the anterior ends of these ribs do not articulate with the sternum or the costal cartilage of the rib above; their costal cartilages are short and end in the muscle of the posterolateral abdominal wall
<b>sternum</b>		the broad flat bone forming the anterior thoracic wall	it is formed by three parts: manubrium, body, xiphoid process
	manubrium	the superior part of the sternum	manubrium means "handle", as in the handle of a sword
	jugular (suprasternal) notch	a notch on the superior border of the manubrium	it is located between the clavicular notches which articulate with the sternal ends of the clavicles

	clavicular notch	a notch on the superolateral border of the manubrium	it articulates with the sternal end of the clavicle
	sternal angle	the junction of the manubrium and body of the sternum	it is an anterior projection located at the level of the costal cartilage of rib 2; an important landmark for internal thoracic anatomy
	body	the middle part of the sternum	it articulates with the manubrium superiorly and the xiphoid process inferiorly; laterally it articulates with the costal cartilages of ribs 2-7
	xiphoid process	the inferior part of the sternum	xiphoid means "sword shaped"; it is variable in size, shape & ossification; it articulates with the body of the sternum superiorly

## Bones of the Abdomen, Pelvis and Perineum

Bone	Structure	Description	Notes
<b>os coxae</b>		one of three bones that form the pelvis	paired; the os coxae forms the lateral part of the pelvis; it is formed by three fused bones: ischium, ilium & pubis; also known as the innominate bone
	acetabulum	a cup-shaped depression in the lateral surface of the os coxae bone	acetabulum means vinegar cup; it is the socket for the head of the femur; it is formed by the: ilium (1/5), ischium (2/5) and pubis (2/5); the acetabular fossa lies in the floor of the acetabulum
	acetabular notch	a notch in the inferior margin of the acetabulum	it is spanned by the transverse acetabular ligament; the acetabular br. of the obturator a. enters the hip joint by passing through the acetabular notch
	acetabular fossa	a roughened depression in the center of the acetabulum	the ligament of the head of the femur occupies the acetabular fossa
	lunate surface of the	the smooth articular surface of the acetabulum	the lunate surface surrounds the acetabular fossa and the acetabular notch

	acetabulum		
	obturator foramen	a large foramen formed by the pubic and ischial rami	obturator means to occlude or stop up, a reference to the fact that the obturator membrane closes the obturator foramen almost completely; a site of attachment for the obturator externus m. and the obturator internus m.
<b>pubis</b>		an angulated bone the forms the anterior part of the pelvis	one of three bones that form the os coxae: ilium, ischium, pubis; its body forms 1/5 of the acetabulum; its symphyseal surface unites with the pubis of the opposite side to form the pubic symphysis; the superior and inferior pubic rami participate in the formation of the obturator foramen
	body	superolateral portion of the pubis	the body of the pubis forms about 1/5 of the acetabulum
	pubic crest	ridge on the superior border of the superior ramus	attachment of rectus abdominis & pyramidalis mm.
	pubic tubercle	process at the lateral end of pubic crest	attachment point of the medial end of the inguinal ligament
	superior ramus	superior "limb" that passes medially from the body of the pubis	articulates with the superior ramus of the opposite side at the pubic symphysis
	pecten	ridge on superior surface of the superior pubic ramus	attachment point of the pectineal ligament
	inferior ramus	inferior "limb" that passes inferolaterally from the pubic symphysis	articulates with the ischial ramus to form the ischiopubic ramus; attachment site for the root of the penis (clitoris) and perineal membrane
	obturator groove	groove on the inferior surface of the superior pubic ramus	marks the area of passage of the obturator vessels and n. in the obturator canal
<b>ischium</b>		the "V"- shaped bone that forms the posteroinferior part of the pelvis	one of the three bones that form the os coxae: ilium, ischium, pubis

	ischial ramus	the limb of the ischium that passes anteriorly and superomedially toward the pubis	it articulates with the inferior ramus of the pubis to form the ischiopubic ramus; attachment site for the perineal membrane
	body	the part of the ischium that participates in the formation of the acetabulum	it articulates with the ilium and the pubis at the acetabulum; the body of the ischium forms 2/5 of the acetabulum
	ischial tuberosity	the roughened projection that protrudes posteroinferiorly from the body of the ischium	it is the site of attachment of the sacrotuberous ligament; it is the site of origin of the inferior gemellus m., quadratus femoris m. and the hamstring mm. (semitendinosus, semimembranosus, long head of biceps femoris, ischiocondylar portion of the adductor magnus)
	lesser sciatic notch	the notch located between the ischial tuberosity and the ischial spine	the lesser sciatic notch is converted to the lesser sciatic foramen by the sacrospinous ligament and the sacrotuberous ligament
	ischial spine	the spine that arises just superior to the lesser sciatic notch	it is the site of attachment of the sacrospinous ligament and the site of origin of the superior gemellus m.
	<b>ilium</b>	fan-shaped bone that forms the lateral prominence of the pelvis	one of three bones that form the os coxae: ilium, ischium, pubis
	body	the portion of the ilium that participates in the formation of the acetabulum	the body of the ilium forms 2/5 of the acetabulum
	iliac crest	arching superior edge the ilium that forms the rim of the "fan"	attachment for abdominal wall muscles
	iliac fossa	broad depression on the medial surface of the ilium	iliac fossa is part of the false (greater) pelvis
	iliac tubercle	roughened area along	

		the outer edge of the iliac crest	
	anterior superior iliac spine	spine at the anterior end of the iliac crest	lateral attachment of the inguinal ligament
	posterior superior iliac spine	spine at the posterior end of the iliac crest	position marked by a dimpling of the skin
	arcuate line	ridge running from anteroinferior to posterosuperior on the inner surface of the ilium	inferior boundary of the iliac fossa; marks the plane of transition from abdominal cavity to pelvic cavity
<b>sacrum</b>		a triangular bone that is the posterior skeletal element forming the pelvis	it is formed by 5 fused vertebrae; the sacrum and two os coxae bones form the pelvis
	base	the superior part of the sacrum	the base of the sacrum includes the articular surface for the fifth lumbar vertebra and the superior portion of the two ala
	promontory	a projection of the superior part of the sacrum in an anterior direction	the body of the fifth lumbar vertebra sits on the sacral promontory and articulates with it through a symphysis
	ala	the lateral portion of the sacrum	paired; it projects laterally from the body of the sacrum; it represents the fused costal and transverse processes of the first sacral vertebra
	anterior sacral foramina	an opening in the anterior surface of the sacrum	there are four pairs; each transmits the ventral primary ramus of the respective sacral spinal nerve; branches of the lateral sacral aa. enter the sacral canal through these openings
	posterior sacral foramina	an opening in the posterior surface of the sacrum	there are four pairs; each transmits the dorsal primary ramus of the respective sacral spinal nerve
	sacral canal	the opening in the center of the sacrum	it is the continuation of the vertebral canal at sacral vertebral levels

	sacral hiatus	an opening in the posterior surface of the sacrum in the midline	it is a normal feature that results from the failure of fusion of the laminae of the fifth sacral segment (and sometimes the fourth) during development
	articular surface	the roughened area located on the lateral surface of the sacrum	this surface articulates with the ilium in the sacroiliac articulation
	body	the central portion of the sacrum	the body is equivalent to the bodies of the other vertebra
	base	the superior surface of the sacrum	the base of the sacrum articulates with the fifth lumbar vertebra through an intervertebral disk
<b>coccyx</b>		the most inferior portion of the vertebral column	the coccyx results from the fusion of the four coccygeal vertebrae; it may be a single bone or the first coccygeal vertebra may be separated from the other three; it articulates with the fifth sacral segment; coccygeal vertebrae are reduced in complexity, having no pedicles, laminae or spines

## Bones of the Lower Limb - Listed in Proximal to Distal Order

Bone	Structure	Description	Notes
<b>femur</b>		the bone of the thigh	the femur is the longest and strongest bone in the body
	head	smooth, rounded proximal end	the head of the femur articulates with the acetabulum of the pelvis
	fovea capitis femoris	a shallow pit in the head of the femur	it is the attachment site of the ligamentum capitis femoris; a small artery for supply of the head is found within this ligament
	neck	the constricted area distal to the head of the femur	most of the blood supply to the head of the femur courses along the surface of the neck; fractures of the neck of the femur may result in avascular necrosis of the

			head
	greater trochanter	a large process that projects superiorly from the junction of the neck and shaft of the femur	the greater trochanter is the insertion site of the gluteus medius m., gluteus minimus m., piriformis m. and obturator internus m.
	gluteal tuberosity	a roughened area located on the posterior surface of the femur at the superior end of the lateral lip of the linea aspera	it is one of the insertion sites of the gluteus maximus m.
	lesser trochanter	a large process that projects from the posteromedial surface of the femur just distal to neck	it is the insertion site of the common tendon of the psoas major and iliacus mm. (iliopsoas m.)
	trochanteric fossa	a depression on the medial side of the greater trochanter on its posterior surface where the greater trochanter joins the neck	it is the insertion site of the obturator internus m., superior gemellus m. and inferior gemellus m.
	intertrochanteric line	a ridge on the anterior surface of the femur that connects the greater and lesser trochanters	it is the line of attachment of the fibrous joint capsule
	intertrochanteric crest	a heavy ridge on the posterior surface of the femur that connects the greater and lesser trochanters	the quadratus femoris m. inserts on the intertrochanteric crest
	body	the long slender shaft of the femur	the linea aspera runs the entire length of the posterior surface of the body

	linea aspera	a vertical ridge on posterior surface of the femur	it is the insertion site of the medial (adductor) group of thigh muscles and the origin of the vastus intermedius m. and the short head of the biceps femoris m.
	adductor tubercle	a process that projects superior to the medial epicondyle of the femur	it is the insertion site of the ischiocondylar part of the adductor magnus m.
	medial epicondyle	the enlargement of bone on the medial side of the femur just superior to the medial condyle	it is the attachment site of the tibial collateral ligament of the knee joint
	lateral epicondyle	the enlargement of bone on the lateral side of the femur just superior to the lateral condyle	it is the attachment site of the fibular collateral ligament and the site of origin of the popliteus m.
	medial condyle	the rounded inferior end of the femur on the medial side	it articulates with the medial condyle of the tibia
	lateral condyle	the rounded inferior end of the femur on the lateral side	it articulates with the lateral condyle of the tibia
	intercondylar fossa	the deep depression on the posterior surface of the femur between the condyles	the anterior and posterior cruciate ligaments are located here
	patellar surface	the smooth anterior surface at the inferior end of the femur	it articulates with the posterior surface the patella
<b>patella</b>		the bone that forms the knee cap	the patella is a sesamoid bone in the tendon of the quadriceps femoris muscle; it provides a protective function by

			withstanding the grinding forces of the quadriceps femoris tendon against the patellar surface of the femur, especially in full knee flexion
<b>tibia</b>		the bone on the medial side of the leg	the tibia is the weight-bearing bone of the leg
	medial condyle	the heavy prominence on the medial side of the proximal end of the tibia	the medial condyle articulates with the medial condyle of the femur; it is larger than the lateral condyle of the tibia
	lateral condyle	the heavy prominence on the lateral side of the proximal end of the tibia	the lateral condyle articulates with the lateral condyle of the femur and with the head of the fibula
	intercondylar eminence	the ridge of bone on the proximal end of the tibia that projects between the condyles	the intercondylar eminence has a medial and a lateral tubercle; it is the attachment site for the cruciate ligaments, medial meniscus and lateral meniscus
	tibial tuberosity	the roughened protuberance on the anterior surface of the tibia located just distal to the condyles	it is the attachment site of the patellar ligament, which represents the insertion of the quadriceps femoris tendon
	body	the long, robust shaft of the tibia	the medial surface of the body of the tibia is subcutaneous throughout its length; when the shin is painfully bumped, the nerve endings are stimulated in the periosteum covering the body of the tibia
	interosseous border	the sharp ridge that runs longitudinally along the junction of the lateral surface and the posterior	the interosseous membrane attaches to the interosseous border of the tibia

		surface of the tibia	
	soleal line	a ridge of bone that descends obliquely from lateral to medial on the posterior surface of the tibia	it is the site of origin of the soleus m.
	medial malleolus	the large bony prominence on the medial side of the ankle	the medial malleolus of the tibia forms the medial side of the ankle joint; it articulates with the medial surface of the talus
<b>fibula</b>		the slender bone on the lateral side of the leg	the fibula is not a weight-bearing bone, it is a muscle attachment bone
	head	the enlarged proximal end of the fibula	it articulates with the lateral condyle of tibia; the fibular collateral ligament of the knee attaches to the head of the fibula
	neck	the constricted portion of the fibula located just inferior to the head	fractures of the neck of the fibula can injure the common fibular n.
	body	the long slender shaft of the fibula	the interosseous membrane attaches to the entire length of the interosseous border of the fibula
	interosseous border	the sharp ridge that runs longitudinally along the medial surface of the fibula	the interosseous membrane attaches to the interosseous border of the fibula
	lateral malleolus	the enlarged distal end of the fibula	the lateral malleolus of the fibula forms the lateral side of the ankle joint; it articulates with the lateral surface of the talus; forcible lateral displacement of the foot can cause the fibula to fracture superior to the lateral malleolus, a condition called a Pott's fracture
<b>tarsal bones</b>		the bones of the	there are seven tarsal bones:

		ankle	talus, calcaneus, navicular, medial cuneiform, intermediate cuneiform, lateral cuneiform, cuboid
<b>talus</b>		the most proximal of the tarsal bones	the talus articulates with the medial malleolus of the tibia and the lateral malleolus of the fibula to form the ankle mortise joint
	body	the proximal part of the talus	its superior (trochlear) part participates in the ankle joint and its inferior part articulates with the calcaneus
	trochlea	the superior portion of the body of the talus that lies between the two malleoli	it has a smooth articular surface; it participates in the formation of the ankle joint
	head	the portion of the talus that projects anteriorly	it articulates with the navicular bone
	neck	the constricted part of the talus located proximal to the head	
<b>calcaneus</b>		the tarsal bone which forms the heel	it is the largest and strongest bone in the foot; a fracture of the calcaneus which separates the tuberosity from the body can be a debilitating injury
	calcaneal tuberosity	the posterior roughened area of the calcaneus which contacts the ground during weight-bearing	it is the insertion site of the calcaneal (Achilles') tendon
	sustentaculum tali	the shelf-like medial projection of bone located inferior to the medial malleolus	it is a shelf of bone that articulates with and supports the talus; it is grooved inferiorly by the tendon of the flexor hallucis longus m.
<b>navicular</b>		the tarsal bone	it articulates with the head of the

		located distal to the talus and proximal to the three cuneiform bones	talus and all three cuneiform bones; it is the attachment site for an important ligament (plantar calcaneonavicular or "spring" ligament) that supports the medial longitudinal arch of the foot
<b>cuneiform, medial</b>		the most medial bone in the distal row of tarsal bones	the cuneiform bones articulate with the navicular bone proximally and the bases of the metatarsal bones distally
<b>cuneiform, middle</b>		the intermediate bone of the three cuneiform bones	the cuneiform bones articulate with the navicular bone proximally and the bases of the metatarsal bones distally
<b>cuneiform, lateral</b>		the bone that is located between the middle cuneiform and the cuboid bone	the cuneiform bones articulate with the navicular bone proximally and the bases of the metatarsal bones distally
<b>cuboid</b>		the most lateral bone in the distal row of tarsal bones	the cuboid bone articulates with the calcaneus proximally and the fourth and fifth metatarsal bones distally
<b>metatarsals</b>		the bones located between the tarsal bones and the phalanges	there are five metatarsal bones in the foot
	base	the proximal end of the metatarsal	it articulates with the distal row of tarsal bones
	body	the slender shaft of the metatarsal	it is also known as the diaphysis
	head	the rounded distal end of the metatarsal	it articulates with the proximal phalanx of the corresponding digit
<b>phalanx (phalanges)</b>		the distal two or three bones in the digits of the foot	there are a total of 14 phalanges in the foot; the great toe has two phalanges (proximal and distal) and each of the other four toes has three phalanges (proximal, middle and distal); phalanx

			means "line of soldiers"
	base	the proximal end of the phalanx	the base of the proximal phalanx articulates with the head of the corresponding metatarsal bone; the base of the middle or distal phalanx articulates with the head of the next most proximal phalanx
	body	the slender shaft of the phalanx	also known as the diaphysis; the body of the distal phalanx is very short
	head	the distal end of the phalanx	the proximal, middle and distal phalanges each have a head; the head of a proximal or middle phalanx articulates with the base of the next most distal phalanx

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