

The A to Z of Bones, Joints, Ligaments & the Back



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Introduction

This book is particularly useful when used with the *The A to Z of Peripheral Nerves* and *The A to Z of Skeletal Muscles*, parts of the material is also covered in the *The A to Z of the Head and Neck bones & muscles*, but all the **A to Zs** are cross-referenced and together are forming a comprehensive set covering the all structural elements of the human body.

As an adjunct to this book – the first in the series of the new *The A to Z of...failure* books is the *The A to Z of Bone & Joint Failure*, Eventually there will be a companion book to each of the current and future **A to Zs** - *the sick and the well*.

So ... please let us know if there is a structure / subject not yet covered by the A to Zs, as the feedback often determines the order of the new books.

The A to Zs may be viewed on 2 sites –
www.amandasatoz.com and
<http://www.aspenpharma.com.au/atlas/student.htm>

Acknowledgement

Thank you Aspenpharmacare Australia for your support and assistance in this valuable project, particularly Greg Lan and Rob Koster. Thank you to everyone who provided feedback.

Dedication

To aging “*healthily*” – if not necessarily gracefully!!

How to use this book

The first section contains: basic anatomical concepts, movements, planes, classification and definitions of terms used in this book. Additional images of articulated bones are included to help with regionalization, along with the colour tags at the base of the bone & joint illustrations, which correspond to the colours of the Regional skeletons.

Bones, Joints and Ligaments are listed alphabetically and cross referenced with their common names (e.g. the SHOULDER JOINT

is the GLENOHUMERAL JOINT and the COLLAR BONE is the CLAVICLE), with each bone and joint shown from at least 2 aspects.

"Overviews" are used throughout the book. For example the RIBS together form the RIB CAGE.

At the back of the book there is - THE BACK!

The back cover has been modified in all the new editions of the A to Zs to include an additional **fold over** which serves as a means of identifying the book on the shelf (i.e. the fold over has the title down the "spine"). Hence the spiral binding is preserved, but the book can easily be identified if this **fold over** is placed outward in the bookshelf.

The fold over may also be used as a fold in / bookmark and it is designed to lay flat if **folded over** onto the back cover.

Thank you

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Abbreviations



A	= actions /movements of a joint	pl.	= plural
aa	= anastomosis or anastomoses	PLL	= posterior longitudinal ligament
adj.	= adjective	post.	= posterior
aka	= also known as	proc	= process
ALL	= anterior longitudinal ligament	prox	= proximal
alt.	= alternative	PS	= public symphysis
ant.	= anterior	R	= Right
art.	= articulation (joint w/o the additional support structures)	ROM	= range of movement
AS	= Alternative Spelling, generally referring to the diff. b/n British & American spelling	sing.	= singular
		SC	= spinal cord
b/n	= between	SN	= spinal nerve
BM	= bone marrow	SP	= spinous process
BS	= blood supply	TP	= transverse process
BV	= blood vessel	UL	= upper limb aka arm
C	= carpal / carpo	V	= vertebra(e) / vein
co	= cortex	VB	= vertebral body
c.f.	= compared to	VC	= vertebral column
CNS	= central nervous system	w/n	= within
collat.	= collateral	w/o	= without
CSF	= Cerebrospinal fluid	&	= and
CT	= connective tissue		
D	= diaphysis		
E	= epiphysis		
e.g.	= example		
EC	= extracellular (outside the cell)		
ext.	= extensor (as in muscle to extend across a joint)		
GC	= giant cells		
Gk.	= Greek		
IC	= intercarpal / intercarpo		
IP	= interphalangeal		
IT	= intertarsal / intertarso		
jt(s)	= joints = articulations		
L	= Left / Lumbar		
LB	= long bones		
LL	= lower limb aka leg		
Lt.	= Latin		
lig.	= ligament		
M	= metaphysis		
MC	= metacarpal / metacarpo		
med	= medial / medula		
Met	= metastasis		
MT	= metatarsal / metatarso		
NS	= nervous system / nerve supply		
NT	= nervous tissue		
OC	= osteoclast		
P	= phalangeal / phalanges / phalango		

Common terms in Osteology and Skeletal Anatomy

Ablation	The removal of part of the body, generally a bony part, most commonly the teeth.
Acral	in the extremities - bones at the apex or end of limbs.
Acromegaly	A continuation of growth of the ends of cartilage covered bone (after fusion of the long bones) hence a gross change in the features (most noticeable in the jaw and digits) without growth in height, due mainly to the over activity of the pituitary gland.
Ala	A wing, hence a wing-like process as in the Ethmoid bone <i>pl. - alae</i> .
Alveolus	Air filled bone - tooth socket <i>adj. - alveolar</i> (as in air filled bone in the maxilla) - coalescence of alveoli helps in the formation of the sinuses. This device also lightens the weight of the bone particularly the skull.
Ankle	Bend = angle usually referring to the bend just above the foot, hence the ankle is the joint b/n the foot and the lower leg.
Annulus fibrosis	The peripheral fibrous ring around the intervertebral disc.
Aperture	An opening or space between bones or within a bone.
Appendicular	Refers to the appendices of the axial i.e. in the skeleton, the limbs upper and lower which hang from the axial skeleton, this also includes the pectoral and pelvic girdles but not the sacrum.
Areola	Small, open spaces as in the areolar part of the Maxilla may lead or develop into sinuses.

**Arth-
Arthritis** **To do with joints hence...**
Inflammation of a joint.



early disease loss of cartilage inflammation of jt laxity of lig & permanent damage

Arthropathy	Diseases of the joints.
Arthrosis	Joint types.
Articulation	Joint, description of the bone surfaces joining w/o the supporting structures = point of contact b/n 2 opposing bones hence the articulation of humerus and scapula is the articulation of the shoulder joint.
Attrition	Tooth wear and tear.
Auditory	Pertaining to hearing, hence, pertaining to the ear. (Auditory exostosis = a bony growth on the walls of the External Auditory Meatus).
Avulsion	Forceable tearing away of a structure or part of a structure as in an avulsed fracture where a fragment bone is torn away from the main bone.
Axial	Refers to the head and trunk (vertebrae, ribs and sternum) of the body.
Ball and Socket	Generally referring to a joint which resembles a ball sitting tightly in a socket - very stable, limited range of movement e.g. hip joint.
Basilar	Relating to the base or bottom of structures.
Basiocranium	Bones of the base of the skull.
Boss	A smooth round broad eminence - mainly in the frontal bone female > male.

Bow-legged	<i>See Vargus.</i>
Bregma	Refers to a junction of more than 2 bones in a joint as in the Bregma of the skull, junction between the coronal and sagittal sutures which in the infant is not closed and can be felt pulsating – site of the anterior fontanelle.
Buccal	Pertaining to the cheek.
Callus	Hard tissue formed in the osteogenic layer of the periosteum as a fracture repair tissue it is replaced over time with compact bone.
Calotte	The calotte consists of the calvaria from which the base has been removed
Calvaria	The calvaria refers to the cranium without the facial bones attached.
Canal	Tunnel / extended foramen as in the carotid canal at the base of the skull adj.- canular (canicular - small canal).
Cancellous bone	= Trabecular bone
	A spongy porous bone with spicules (trabeculae) of compact bone. It is found at the ends of long bones and in the bones of the axial skeleton. Red BM is found b/n the spicules.
Caput / Kaput	The head or of a head, adj.- capitate = having a head (c.f. decapitate)
Carotid	To put to sleep; compression of the common or internal carotid artery causes coma. This refers to bony points related to the Carotid vessels.
Carpus	Wrist.
Cavity	An open area or sinus within a bone or formed by two or more bones (adj.- cavernous), may be used interchangeably with fossa. Cavity tends to be more enclosed, fossa a shallower bowl-like space (Orbital fossa-Orbital cavity).
Cavum	A cave.
Cephalic	Pertaining to the head.
Cervico	Pertaining to the Neck.
Clinoid	Like a bed-post, part of a four poster bed so that clinoid processes look like bed posts eg. in the Sphenoid bone.
Clivus	A slope hence in the anterior cranial fossa referring to a slope on the base of the cavity.
Cochlea	A snail, hence snail-like shape relating to the Organ of Corti in the ear.
Compact bone	= Cortical bone = Dense bone
	Bone found in the shafts and on external bone surfaces. Highly structured in concentric circles or Haversian systems. It is constantly changing and remodeling depending upon the lines of force.
Concha	A shell shaped bone as in the ear or nose (pl. conchae adj.- chonchoid) old term for this turbinate.
Condyle	A rounded enlargement or process possessing an articulating surface.
Cornu	A horn (as in the Hyoid).
Corona	A crown. adj.- coronary, coronoid or coronal ; hence a coronal plane is parallel to the main arch of a crown which passes from ear to ear (c.f. coronal suture).
Costa / Costo	Pertaining to the ribs.
Cranium	The cranium of the skull comprises all of the bones of the skull except for the mandible.
Crest	Prominent sharp thin ridge of bone formed by the attachment of muscles particularly powerful ones eg Temporalis/Sagittal crest.
Cribiform	A sieve or bone with small sieve-like holes. Ethmoid.

Cuneate/Cuneus	A wedge / wedge-shaped.
Dens	A tooth hence dentine and dental relating to teeth, denticulate having tooth-like projections adj.- dentate See also <i>odontoid</i> .
Depression	A concavity on a surface.
Detrition	Wearing away of the tooth surfaces of OA.
Detritus	The material left after the wearing away or rubbing.
Diaphysis	The shaft or body of a long bone. In the young this is the region b/n the growth plates and is composed of compact bone. pl.- diaphyses adj.- diaphyseal.
Diploë	The cancellous bone between the inner and outer tables of the skull, adj.- diploic.
Edentulous	Without teeth.
Elbow	Any angular bend often in the arm, usually referring to the joint b/n the arm and the forearm.
Eminence	A smooth projection or elevation on a bone as in iliopubic eminence.
Endocranium	Refers to the interior of the "braincase" adj.- endocranial divided into the 3 major fossae anterior (for the Frontal lobes) middle (containing Temporal lobes) and posterior (for the containment of the Cerebellum).
Endostium	A mesodermal CT which lines the inner surface of all bones and is the conduit for the NS and BS of the bone lifting of the endostium causes cancellous bone to be laid down to fill the gap b/n the bone and the cellular layer and this device may be used to encourage bone growth/repair. See <i>periosteum</i> .
Epiphysis = Metaphysis	The end of a long bone beyond the growth plate or epiphyseal plate. Generally develops as a secondary ossification centre. There are 2 epiphyses to each long bone. In a long bone the shafts are generally compact bone and the ends = epiphyses are trabecular bone pl.= epiphyses adj.- epiphyseal.
Ethmoid =	Cribiform.
External Auditory Meatus	Ear hole.
Exostosis	A bony outgrowth from a bony surface, often due to irritation (as in Swimmer's ear) and may involve ossification of surrounding tissues such as muscles or ligaments.
Facet	A face, a small bony surface (occlusal facet on the chewing surfaces of the teeth) seen in planar joints.
Falciform	Relating to shapes that are in a sickle shape so falciform ligaments curve around and end in a sharp point.
Fissure	A narrow slit or gap from cleft.
Fontanelle	A fountain, associated with the palpable pulsation of the brain as in the anterior fontanelle of an infant. These soft spots on the skull are cartilagenous CT covering "joints" which allow for skull cranial expansion and then become the mould for the bone development and shape joining along the sutural lines, later becoming the Bregma.
Foramen	A natural hole in a bone usually for the transmission of BS and/or nerves. pl. foramina.
Fornix	An arch.
Fossa	A pit, depression, or concavity, on a bone, or formed from several bones as in temporomandibular fossa. Shallower and more like a

"bowl" than a cavity. *pl. fossae.*

Fovea

A small pit (usually smaller than a fossa)- as in the fovea of the occlusal surface of the molar tooth.

Fracture = break hence ...

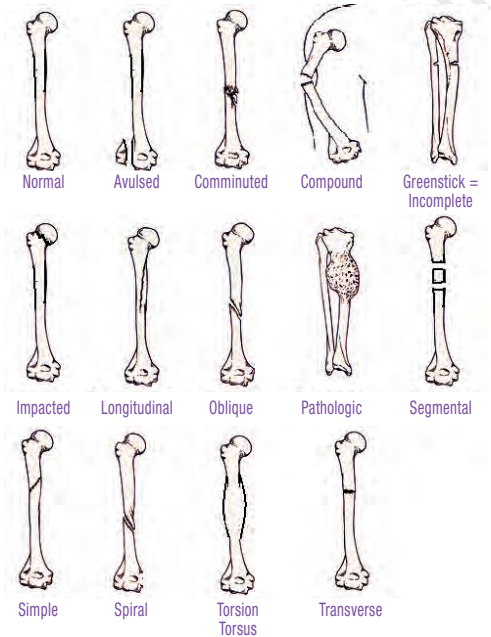
Avulsed fracture - bone break due to a tearing away of part of a bone under stress.

Complete fracture - complete break b/n 1 or more bones.

Compound fracture - break of a bone where the bone is exposed to the air.

Incomplete = Greenstick fracture - where there is an incomplete break along with bending or changing of the bone shape: it is generally seen in young bones.

Pathological fracture - a break which has to do with a disease, generally thinning of the bone for example in osteoporosis or weakening due to a tumour as in osteosarcoma or from other causes as in osteomalacia (Paget's disease) and causes the bone to break with little or no force.



Gallus / Galli

A cock, hence, crista galli, the cock's comb (*i.e. possessive form of gallus*).

Genu / genio

Knee adj. - referring to the knee.

Gigantism -

Overgrowth of the length of the long bones due to excess growth hormone before the fusion of the long bones (if this occurs after fusion it is acromegaly).

Gomphosis

Joint b/n the roots of the teeth and the jaw bones *pl. - gomphoses.*

Groove

Long pit or furrow.

Growth plate

A plate of cartilage b/n the diaphysis and epiphysis to allow growth of

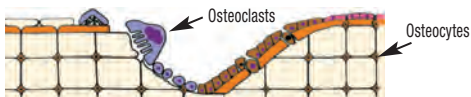
a long bone. The plate disappears, converting to bone, upon attainment of the full height/length of the bone.

Hallux	The big toe = the first toe.
Hamus	A hook hence the term used for bones which "hook" around other bones or where other structures are able to attach by hooking - hamulus = a small hook.
Harris lines	Lines of increased bone density due to assault. They may occur across the growth plate and arrest growth of the length of the long bone.
Haversian canals = secondary osteons = lamellar bone.	The system of concentric circles of bone matrix and osteocytes, which continually forms and reforms, during the life of the bone.
Hinge joint	Joint with movement in one plane e.g. elbow or knee.
Hydroxyapatite	A dense organic filling; the second component of bone.
Hyoid	U-shaped.
Hyperostosis	Abnormal bone growth generally overgrowth or ectopic growth.
Incisura	A notch.
Inter	Between.
Intra	Within.
Introitus	An orifice or point of entry to a cavity or space.
Joint =	Articulation + supporting structures.
Jugum	A bridge between 2 halves of a bone <i>pl. juga</i> as in Sphenoid.
Knock-knees	<i>See Valgus.</i>
Kyphosis	Collapse of vertebral body(ies) causing sharp convexity of the spine.
Lacerum	Something lacerated, mangled or torn e.g. foramen lacerum a small sharp hole at the base of the skull. This often tears tissues.
Lacrimal	Related to tears and tear drops. (<i>noun lacrima</i>).
Lambda	From the Greek letter a capital 'L' and written as an inverted V. (<i>adj. - lambdoid</i>) and used to name the point of connection b/n the 3 skull bones Occipital and Temporals.
Lamellar bone =	Haversian system.
	Bone with sheets of concentric collagen fibres around Haversian canals in compact bone.
Lamina	A plate as in the lamina of the vertebra, a plate of bone connecting the vertical and transverse spines (<i>pl. laminae</i>).
Ligament	A band of tissue which connects bones (articular ligaments) or viscera - organs (visceral ligaments). A Ligament is a tie or a connection. Originally <i>sing. ligamentum pl. ligamenta</i> from ligate or to tie up is generally composed of collagen fibres. <i>See classification of ligaments.</i>
	
Linea	A line as in the Nuchal lines of the Occiput/Occipital bone.
Lingual	Pertaining to the tongue.
Lipping	Bone projecting over the usual margin, excessive production generally pathological as in osteoarthritis, may interfere with joint movement.
Locus	A place (<i>c.f. location, locate, dislocate</i>).
Lordosis	Increased cervical and/ or lumbar curve also called 'sway back'.

Magnum	Large <i>pl. magna</i> .
Malleus	Hammer (as in the ear ossicle).
Mandible	From the verb to chew, hence, the movable lower jaw; <i>adj. - mandibular</i> .
Mastoid	A breast or teat shape - mastoid process of the Temporal bone.
Maxilla	The jaw-bone; now used only for the upper jaw; <i>adj. - maxillary</i> .
Meatus	A short passage; <i>adj. - meatal</i> as in external acoustic meatus connecting the outer ear with the middle ear.
Meniscus	Gk. crescent.
Mental	Relating to the chin (mentum = chin, not mens = mind).
Meta	An extension of: cf. metacarpal = extension of the wrist.
Metaphysis =	Epiphysis The slightly expanded end of the shaft of a bone. (pl. metaphysis).
Neurocranium	The neurocranium refers only to the braincase of the skull.
Notch	An indentation in the margin of a structure.
Nucha	The nape or back of the neck <i>adj. - nuchal</i> .
Occiput	The prominent convexity of the back of the head Occipitum = Occipital bone <i>adj. - occipital</i> .
Oculus	An eye.
Odontoid	Relating to teeth, toothlike. <i>See Dens</i> .
Ontogeny	The development of an individual growth pattern.
Orbit	A circle; the name given to the bony socket in which the eyeball rotates; <i>adj. - orbital</i> .
Orifice	An opening.
Os	A bone or pertaining to bones <i>adj. - osseus</i> .
Ossicle	A small bone as in the ear ossicles: stapes (stirrup), incus (anvil) and malleus (hammer).

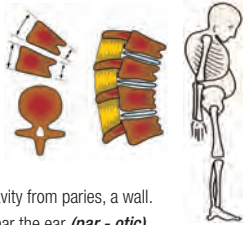
Ossification The process of turning something into bone, i.e. from one tissue to another as in cartilagenous ossification from cartilage into bone.
Two other forms are primary ossification (in the shaft of the long bone where the bone forms from CT and secondary ossification where the bone has formed and secondary centres develop as at the ends of the long bones).

Osteitis	Inflammation of the bone.
Osteoblasts	Bone cells capable of dividing and laying down matrix - 'baby' osteocytes
Osteochondroma	Bone & cartilagenous tumour benign often arising in the ephyseal plate or line & protrude at right angles, common & asymptomatic.
Osteoclasts	Multinuclear cells which resorb or phagocytose bone = resorption of bone = Giant cells.
Osteocytes	Bone cells incapable of dividing but maintain the extracellular matrix of the bone.
Osteogenesis	Formation and growth of bone.

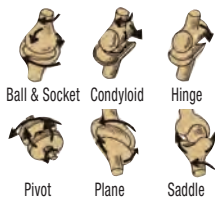
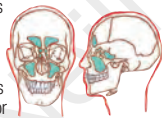


Osteoma	Tumour of the bone tissue.
Osteomalacia	Disease of softening of the bones / Paget's disease.

Osteomyelitis	Inflammatory disease of the bone due to infection.
Osteoporosis	A thinning of the bones which can result in bone weakness & fracture.
Osteosarcoma	Malignant tumour of bone tissue.
Ostium	A door, an opening, an orifice.
Otic	Pertaining to the ear.
Ovale	Oval shaped.
Palate	A roof adj.- palatal or platatine.
Parietal	Pertaining to the outer wall of a cavity from paries, a wall.
Parotid	Pertaining to a region beside or near the ear (par - otic)
Pars	A part of / nearby (adj.- para)
Pecten	A comb.
Perikymata	Transverse ridges and the grooves on the surfaces of teeth
Periosteum	Layer of fascial tissue (connective tissue) on the outside of compact bone not present on articular (joint) surfaces. <i>See endostium.</i>
Periostitis	Inflammation on the outer surface of the bone.
Periostosis	Abnormal growth of long bones on their outer surfaces.
Petrous	Pertaining to a rock / rocky / stoney adj.- petrosal.
Phalanx	Pertaining to flanks of soldiers - phalanges a row of soldiers used for a row of fingers or toes.
Planar joints	Joints which allow for sliding across the joint as in the wrist, foot and ribs movement in one plan.
Pneumatic	Air filled <i>see Classification of Bones.</i>
Pollex	Thumb.
Process	A general term describing any marked projection or prominence as in the mandibular process.
Prominens	A projection.
Pseudoarthrosis	False or new joint due to the nonhealing of a fracture.
Pterion	A wing; the region where the tip of the greater wing of the sphenoid meets or is close to the parietal, separating the frontal from the squamous region of the temporal bone. (TERY-on) Alternatively the region where these 4 bones meet.
Pterygoid	Wing shaped.
Pubis	Hairy, that part of the hip bone with hair over the surface adj.- pubic pl. pubes.
Ramus	Branch as in the superior pubic ramus the superior or higher branch of the pubic bone (Pubis).
Recess	A secluded area or pocket; a small cavity set apart from a main cavity.
Rectus	Straight - erect.
Re-modelling	The forming and reforming of bone in its normal growth cycle with the normal bone cells involved: osteoclasts to resorb the old bone to move under the covering layer of fascial cells - osteum: osteoblasts to move into the new cavity: divide and spread out: osteocytes to lay down the matrix in the new bone & give it its strength
Retinaculum	A device to hold structures in place - generally composed of CT - such as the flexor retinaculum. <i>See Classification of Ligaments.</i>



Rickets	Form of osteomalacia or bone softening due to Vitamin D deficiency.
Ridge	Elevated bony growth often roughened.
Rotundum	Round.
Sagittal	An arrow, the sagittal suture is notched posteriorly, making it look like lightning arrows.
Scoliosis	A deviation from the vertical plane of the Vertebral column laterally (as opposed to exaggeration of vertical curves in kyphosis and lordosis).
Sella	A saddle; adj. - sellar , sella turcica = Turkish saddle.
Sesamoid	Grainlike.
Sigmoid	S-shaped, from the letter Sigma which is S in Greek.
Sinus	A space usually within a bone, lined with mucous membrane, such as the frontal and maxillary sinuses in the head. A modified BV usually vein, with an enlarged lumen for blood storage & containing no or little muscle in its wall. Sinuses may contain air, venous or arterial blood, lymph or serous fluid depending upon location & health of the subject adj. - sinusoid .
Skull	The skull refers to all of the bones that comprise the 'head'.
Spheno-	A wedge i.e. the Sphenoid is the bone which wedges in the base of the skull between the unpaired frontal & occipital bones adj. - sphenoid .
Spine	A thorn adj. - spinous descriptive of a sharp, slender process/protrusion.
Splanchocranium	The splanchocranium refers to the facial bones of the skull.
Stylos	An instrument for writing hence adj. - styloid a pencil-like structure.
Sulcus	Long wide groove often due to a BV indentation.
Sustenaculum	A supportive structure as in the sustenaculum tali = a structure which supports the Talus in the foot.
Suture	The saw-like edge of a cranial bone that serves as joint b/n bones of the skull.
Symphysis	A cartilagenous joint or a growth with bone-cartilage-bone. <i>See Classification of Joints.</i>
Syn-	Together i.e... the close proximity of or fusion of 2 structures.
Syndesmosis	Tight inflexible joints b/n 2 bones little to no movement. Many axial joints are of this type.
Synostosis	Fusion of any joints.
Synovial joints	Any moveable joint with synovial fluid b/n the 2 opposing bones - most moving joints are synovial.
Talus	Ankle (Gk. bend).
Tarsus	Pertaining to any bones joining the foot with the leg adj. - tarsal (Gk wickerwork referring to the basketlike structure of the os tarsus with its ligaments).
Tectum	A roof.
Tegmen	A covering.



Temporal Refers to time and the fact that grey hair (marking the passage of time) often appears first at the site of the temporal bone.

Tendon A tie or cord of collagen fibres connecting muscle with bone (as opposed to articular **ligaments** which connect bone with bone).



Tentorium A tent.

Torus Protruberance *pl. tori*.

Trabecula A "little" beam i.e. supporting structure or strut *pl. trabeculae = spicule*.

Trephination The practice of making an artificial hole in the cranium practiced in many ancient religions used to relieve cranial pressure.

Trochanter Pertaining to a small wheel or disc. In the femur it is a large disc = shaped tuberosity.

Trochlea A pulley that part of the bone or ligamentous attachment that pulls the bone in another direction as in the elbow or the ankle (**adj.- Trochlear**).

Tubercle A small process or bump, an eminence.

Tuberculum A very small prominence, process or bump.

Tuberosity A large rounded process or eminence, a swelling or large rough prominence often associated with a tendon or ligament attachment.

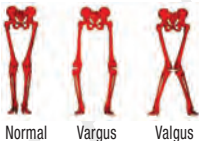
Turbinate A child's spinning top, hence shaped like a top. An old term for the nasal conchae.

Tympanum A drum *pl. tympani*.

Ulna = Elbow or arm (**adj.- ulnar**)

Uncus A hook **adj.- uncinat**.

Valgus-Vargus



Volar Pertaining to the palm (hand) or the sole (foot).

Wormian bone Extrasutural bone in the skull.

Zygoma A yoke, hence, the bone joining the maxillary, frontal, temporal & sphenoid bones **adj.- zygomatic**.

For more medical terms in this or other areas see the A to Z of Medical terms.

Notes...



Anatomical position and Anatomical planes

This is the anatomical position.

A= Anterior Aspect from the front, Posterior Aspect from the back, used interchangeably with ventral and dorsal respectively.

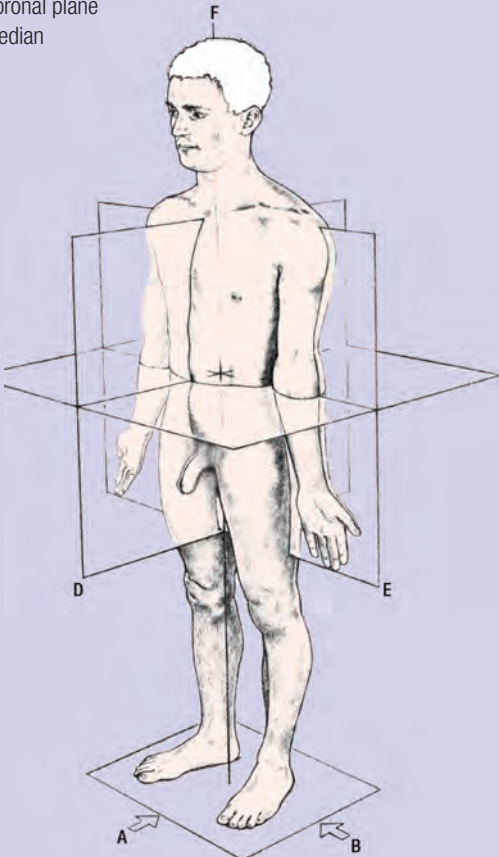
B= Lateral Aspect from either side

C= Transverse / Horizontal plane

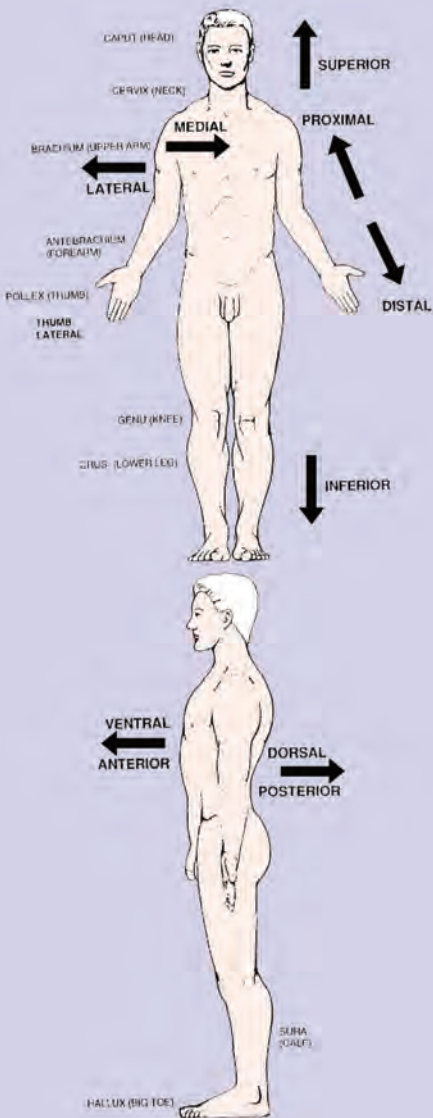
D= Midsagittal plane = Median plane; trunk moving away from this plane = lateral flexion or lateral movement moving into this plane = medial movement; limbs moving away from this direction = abduction; limbs moving closer to this plane = adduction

E= Coronal plane

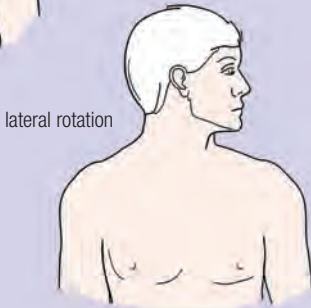
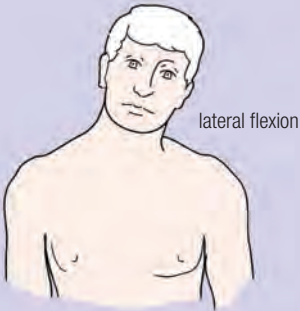
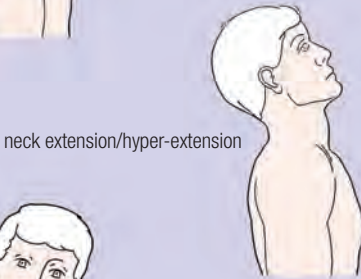
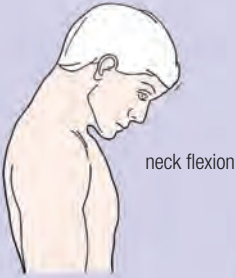
F= Median



Anatomical relations



Joint movements of the Neck



note: extension of the neck is in the normal anatomical position

Joint movements of the Back

flexion of the VC



extension of the VC



lateral flexion



rotation of the VC

A FOOT joints = Intertarsal joints (IT jts)

B *dorsal / plantar*

C **Bones of the "Foot" = Tarsal (T), Metatarsals (MTs) & Toes (Phalanges - P) + Sesamoid bones encased in tendons = 26 bones (hand 27).**

D **The MTs are longer than the hand Metacarpals (MCs) and the toes are shorter than the fingers, as the functional emphasis goes from gripping to weightbearing & shock absorbing.**

F **As with the Hand - IP joints hinge joints - flexion and extension**
G **only IT joints planar joints - slight gliding + rotation**

H **MT joints gliding and planar - slight gliding + rotation**

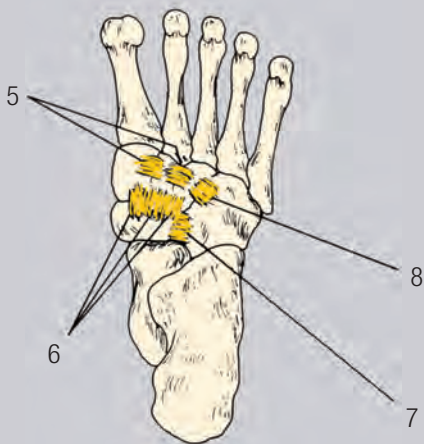
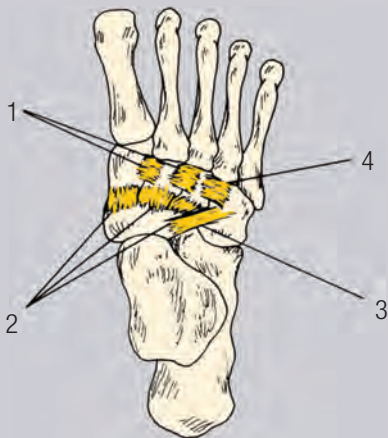
I ***BS branches of dorsalis pedis, medial & lat. plantar arteries.***

K ***NS deep peroneal medial & lat. plantar Ns (S1-2)***

L ***A the actions of the foot joints are much more limited than the hand and are primarily to assist with inversion / eversion of the foot and weight dispersal***

- M**
- N**
- O** 1 dorsal intercuneiform ligs.
- P** 2 dorsal cuneonavicular lig.
- Q** 3 dorsal cuboidenonavicular lig.
- R** 4 dorsal cuneocuboid lig.
- S** 5 plantar intercuneiform ligs.
- T** 6 plantar cuneonavicular lig.
- U** 7 plantar cuboidenonavicular lig.
- V** 8 plantar cuneocuboid lig.
- W**
- X**
- Y**
- Z**

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A **Frontal bone**

B *anterior / lateral / inferior*

C **(Unpaired largest and very robust anterior bone forming the forehead - horizontal section forming the roof of the orbit.)**

D 1 Frontal tuberosity - Frontal bossing

E 2 Superciliary arch

F 3 Supraorbital margin and notch

G 4 Nasal spine

H 5 Superior and inferior temporal lines

I 6 Superior Orbital plate - pars orbitalis

J 7 Frontal & Ethmoid air cells - Frontal sinus

K 8 Posterior Ethmoidal foramen

L 9 Anterior Ethmoidal foramen

M 10 Zygomatic process

N 11 Supra-Orbital notch or foramen

O 12 Lacrimal fossa

P 13 Metopic suture - frontal suture, Glabella

Q 14 Frontal squama

R 15 Ethmoidal notch

R *Hammate see Carpus - disarticulated*

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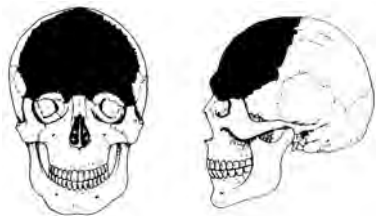
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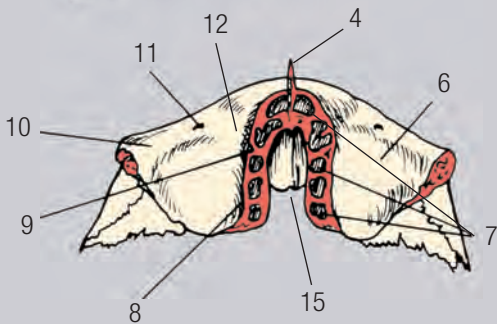
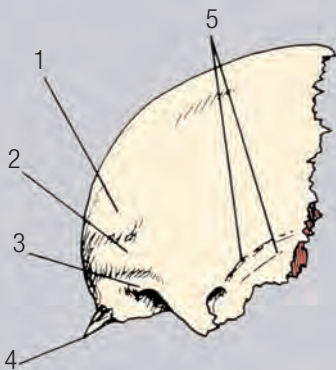
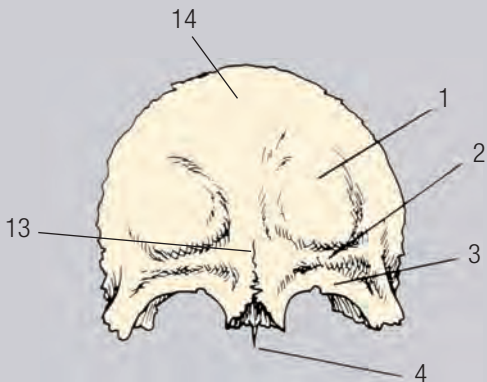
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A **HAND & WRIST** bones overview

B *dorsal*

C Bones of the "Hand + Wrist" = Carpals (C), Metacarpals (MCs)
& Fingers (Phalanges - P) + Sesamoid bones encased in
D tendons = 27 bones (foot 26).

E The MCs are shorter than the foot Metatarsals (MTs) and the fingers
F much longer, as the functional emphasis is for gripping and fine motor
G skills rather than weightbearing. Each finger has a proximal, middle
and distal phalanx, except the thumb (Pollux), which does not have a
middle phalanx.

- H
- 1 distal ends of forearm bones
 - I 2 carpus or wrist bones in 2 layers
 - J 3 MCs
 - K 4 phalanx / phalanges, P = finger bones
 - L 5 Ulna, distal end
 - M 6 Radius, distal end
 - N 7 Scaphoid (part of os carpus/wrist)
 - O 8 1st MC
 - P 9 proximal P of thumb (pollux)
 - Q 10 distal P of thumb
 - R 11 middle P of 2nd finger (index finger)
 - S 12 distal P of index finger
 - T 13 distal P of 3rd finger (middle finger)
 - U 14 distal P of 4th finger (ring finger)

U

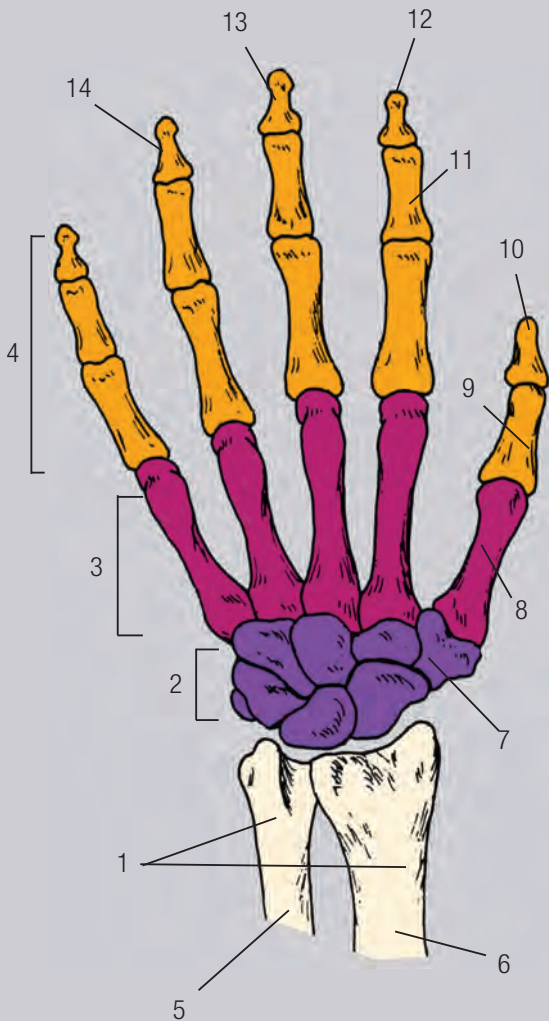
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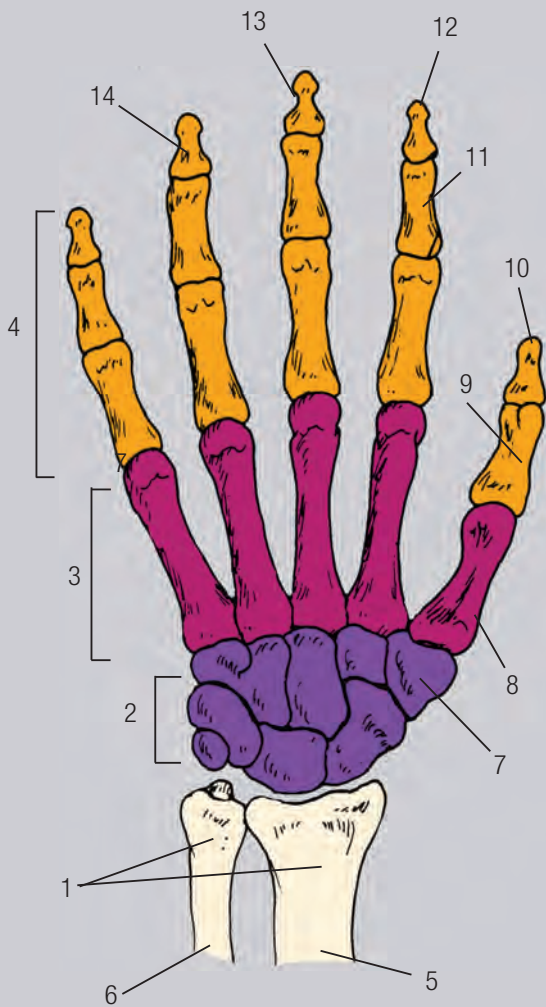
A **HAND & WRIST** bones overview

B *palmar*

C Bones of the “Hand + Wrist ” = Carpals (C), Metacarpals (MCs)
& Fingers (Phalanges - P) + Sesamoid bones encased in
D tendons = 27 bones (foot 26).

E The MCs are shorter than the foot Metatarsals (MTs) and the fingers
F much longer, as the functional emphasis is for gripping and fine motor
G skills rather than weightbearing. Each finger has a proximal, middle
and distal phalanx, except the thumb (Pollux), which only has 2.

- H 1 distal ends of forearm bones
I 2 carpus or wrist bones in 2 layers
J 3 MCs
K 4 phalanx / phalanges, P = finger bones
L 5 Ulna, distal end
M 6 Radius, distal end
N 7 Scaphoid (part of os carpus/wrist)
O 8 1st MC
P 9 proximal P of thumb (pollux)
Q 10 distal P of thumb
R 11 middle P of 2nd finger (index finger)
S 12 distal P of index finger
T 13 distal P of 3rd finger (middle finger)
U 14 distal P of 4th finger (ring finger)
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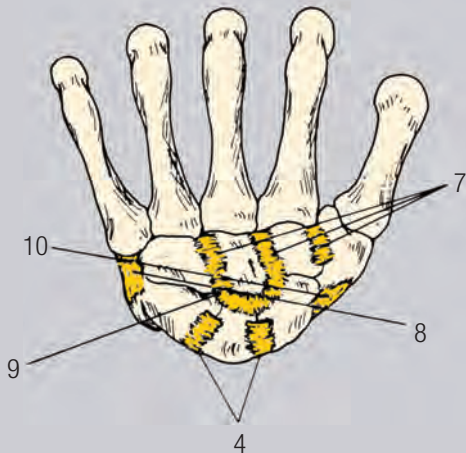
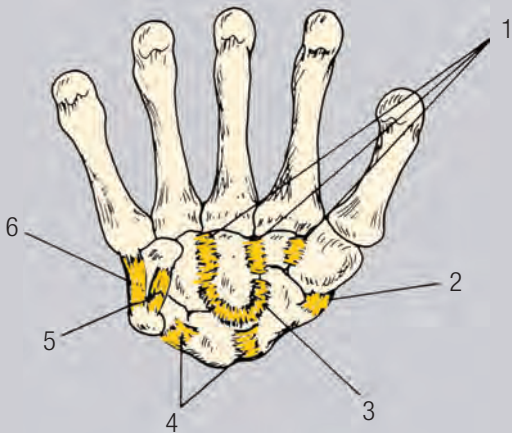
- A **Hand - Intercarpal joints =**
- B **IC joints b/n the wrist and the fingers**
- C *dorsal / palmar*

D	Articulations:	main levels forearm with wrist	radiocarpal / radioulnar
E		wrist with hand hand with fingers	C-MC MC-P
F		sublevel within the wrist along the fingers	IC IP
G			
H	Special features	thumb/pollux only has 2 phalanges proximal & distal all other fingers have 3 (middle)	MC-P jt in the thumb = saddle jt - hence addi- tional mobility
I			
J			
K			

- L **BS** *anterior interosseus C & MC branches of radial & ulnar art. and deep palmar arch rich aa*
- M
- N **NS** *ant. post. interosseus Ns (C6-8)*
- O **A** *sliding and gliding to allow increased wrist range of movement, radial and ulna deviation*
- P

- Q 1 palmar C-MC lig.
 - R 2 radial collat. . lig.
 - S 3 palmer radiate C lig.
 - T 4 proximal IC lig.
 - U 5* pisiohamate lig.
 - V 6* pisio-MC lig.
 - W 7 distal dorsal IC lig.
 - X 8 radial collat. lig.
 - Y 9 dorsal radiate lig.
 - Z 10 dorsal C-MC lig.
- * Bifurcate ligament

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A HAND JOINTS - Carpo-metacarpal and
B Intercarpal joints = C-MC IC joints b/n the
C forearm and the fingers

D *dorsal / palmar*

E	Articulations:	main levels forearm with wrist	radiocarpal / radioulnar
F		wrist with hand	C-MC MC-P
G		hand with fingers	
H		sublevel within the wrist along the fingers	IC IP
I	Special features	thumb/pollux only has 2 phalanges proximal & distal all other fingers have 3 (middle)	MC-P jt in the thumb = saddle jt - hence additional mobility

L **BS** *anterior interosseus, carpal and metacarpal*
M *branches of radial and ulnar arteries and deep*
N *palmar arch rich aa*

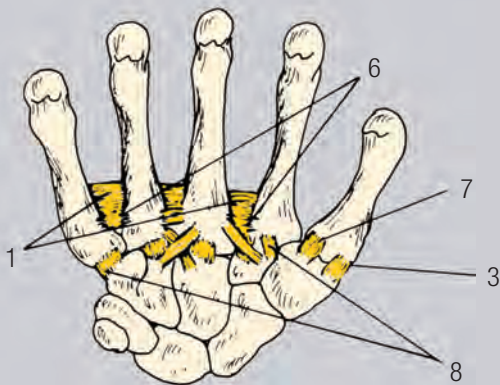
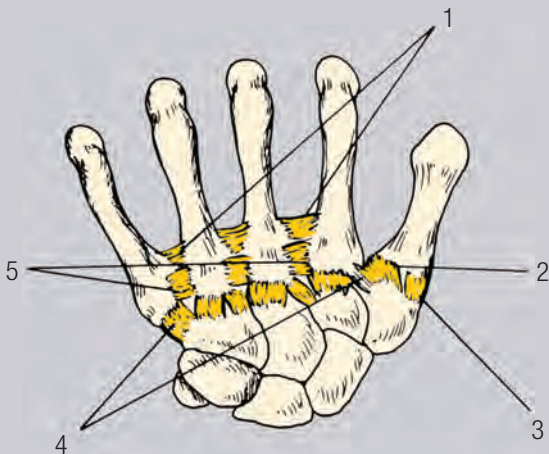
O **NS** *ant. & post. interosseus Ns (C6-8)*

P **A** *sliding and gliding to allow for the fingers and*
Q *thumb to increase range of movements*

- R** 1 interosseous MC lig.
- S** 2 dorsal lig. of the thumb
- T** 3 lateral lig. of the thumb
- U** 4 dorsal C-MC lig.
- V** 5 dorsal MC-MC lig. (inter MC)
- W** 6 palmar MC-MC lig. (interMC)
- X** 7 palmar lig. of the thumb
- Y** 8 palmar C-MC lig.

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A **Hip bone = Innominate bone**

B **(unnamed bone) = Os Coxae**

C *lateral*

D **(Hip bone - unnamed because it does not resemble anything)**

E **Articulations/Special features - see Pelvic Girdle**

F 1 ASIS = anterior superior iliac spine

G 2 Iliac fossa

H 3 Iliac crest

I 4 Iliac tuberosity

J 5 PSIS = posterior superior iliac spine

K 6 Auricular surface / articular surface of Ilium with sacrum

L 7 PIIS = posterior inferior iliac spine

M 8 greater sciatic notch (enclosed with a ligament in life)

N 9 ischial spine

O 10 lesser sciatic notch

P 11 ischial body

Q 12 ischial tuberosity

R 13 ischiopubic junction

S 13A ischiopubic ramus

T 14 pubic symphysis

U 15 pubic crest

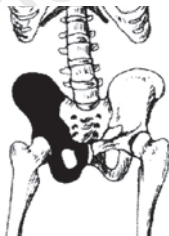
V 16 pubic tubercle

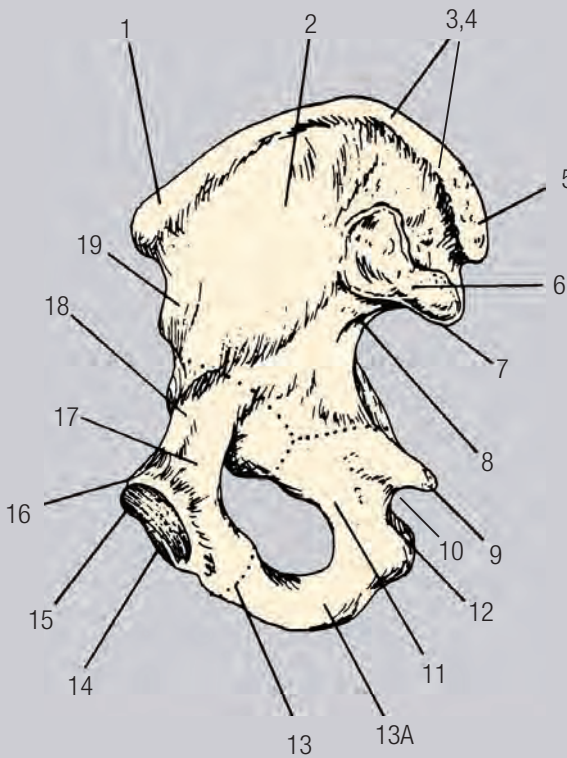
W 17 superior ramus of Pubis

X 18 iliopubic eminence

Y 19 AIIS = anterior inferior iliac spine

Z



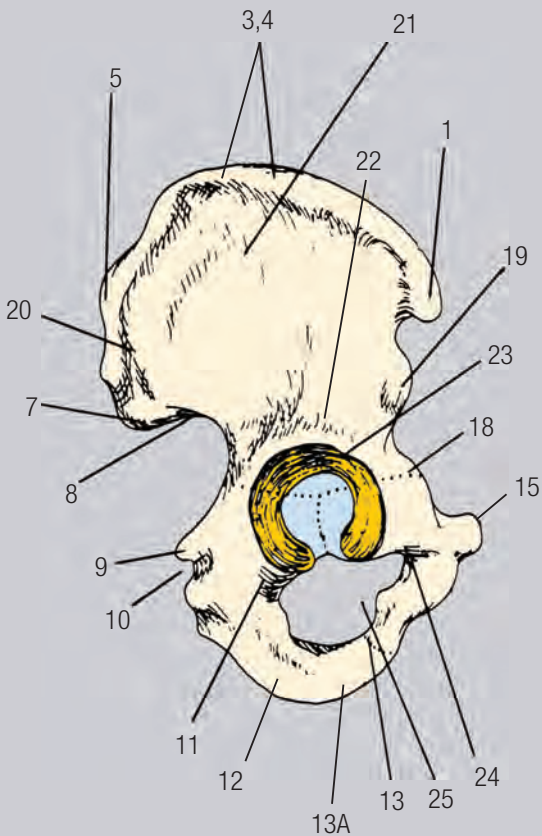


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- A Hip bone = Innominate bone**
B (unnamed bone) = Os Coxae
C sagittal plane - (looking into the joint through the femur)
D (Hip bone - unnamed because it does not resemble anything)
E made up of 3 bones **ILIUM**, **ISCHIUM**, **PUBIS** which meet in the Acetabulum - lunate surface
F 1 ASIS = anterior superior iliac spine
G 2 iliac fossa
H 3, 4 iliac crest, iliac tuberosity
I 5 PSIS = posterior superior iliac spine
J 7 PIIS = posterior inferior iliac spine
K 8 greater sciatic notch (+ lig. - greater sciatic foramen)
L 9 ischial spine
M 10 lesser sciatic notch (+ lig. lesser sciatic foramen)
N 11 ischial body
O 13/13A ischiopubic junction / ramus
P 15 pubic crest
Q 18 iliopubic eminence
R 19 AIIS = anterior inferior iliac spine
S 20 post. gluteal line / superior gluteal line
T 21 ant. gluteal line
U 22 inf. gluteal line
V 23 Rim of Acetabulum n
W 24 Obturator groove
X 25 Obturator foramen
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A **Hip joint**

B *anterior / posterior*

C **BS** *articular branches of: obturator, medial circumflex femoral, superior and inferior gluteal arteries*

D

E **NS** *gluteal, obturator Ns (L2-4)*

F

F **A** *flexion / extension, adduction / abduction / circumduction, rotation*

G

H 1 iliofemoral lig.

I 2 pubofemoral lig.

J 3 medial band of iliofemoral lig.

K 4 central band of iliofemoral lig

L 5 lateral band of iliofemoral lig

M 6 ischiofemoral lig

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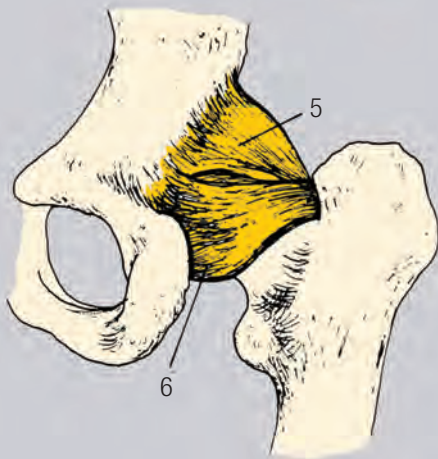
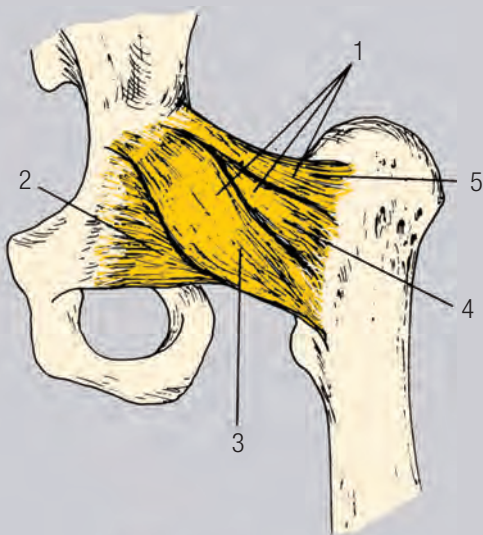
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A **Hip joint**

B *sagittal plane - (looking into the joint from inside of the pelvis)*

C **BS** *articular branches of: obturator, medial circumflex femoral, superior and inferior gluteal arteries*

D

E **NS** *gluteal, obturator Ns (L2-4)*

F

F **A** *flexion / extension, adduction / abduction / circumduction, rotation*

G

H 1 iliofemoral lig.

I 2 pubofemoral lig.

J 3 ischeal ramus

K 4 pubic ramus

L 5 femur

L 6 acetebulum - edge

M 7 ligament of femoral head

N 8 ischeal spine

O 9 transverse ligament

P 10 head of femur in acetabulum - cavity

Q

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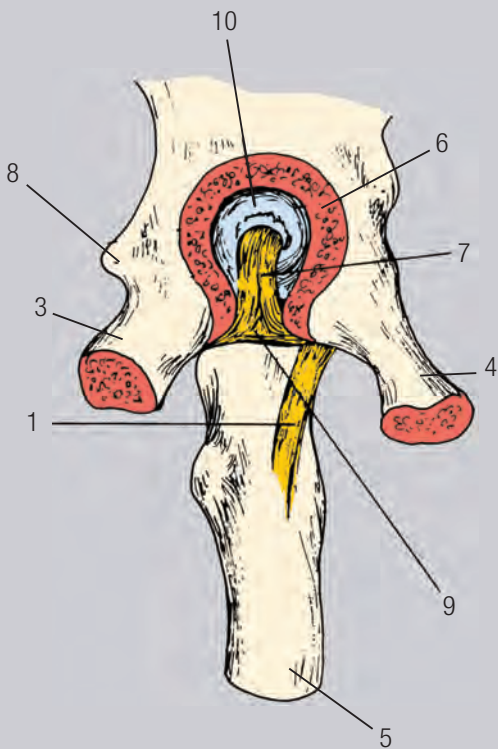
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A Humerus = ARM bone (upper arm bone)

B *anterior / posterior*

C (Humerus = largest bone in the upper limb)

D	Articulations	proximal/upper end arm with scapula	glenohumeral joint = shoulder joint
E		distal/lower end elbow	elbow = humerus + ulna + radius
F	Special features	ossifies from 8 centres	shaft, head, 2 tubercles, capitulum, trochlea, 2 epicondyles

I 1 head of Humerus / epiphysis

J 2 anatomical neck

K 3 surgical neck

L 4 medial lip of intertubercular sulcus

M 5 shaft of Humerus / diaphysis and nutrient foramen

N 6 medial supracondylar ridge

O 7 coronoid fossa

P 8 medial epicondyle

Q 9 trochlea

R 10 capitulum

S 11 lateral epicondyle

T 12 radial fossa

U 13 lateral supracondylar ridge

V 14 deltoid tuberosity

W 15 lesser tubercle

X 16 greater tubercle

Y 17 sulcus for radial N

Z 18 olecranon fossa

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