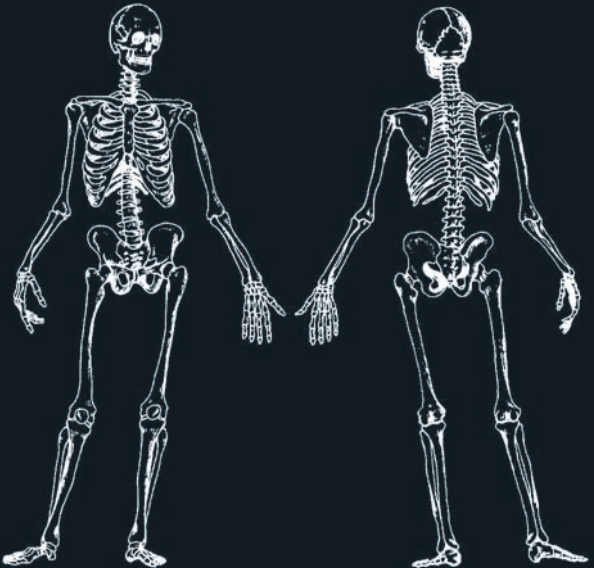


The A to Z of Bones, Joints and Ligaments

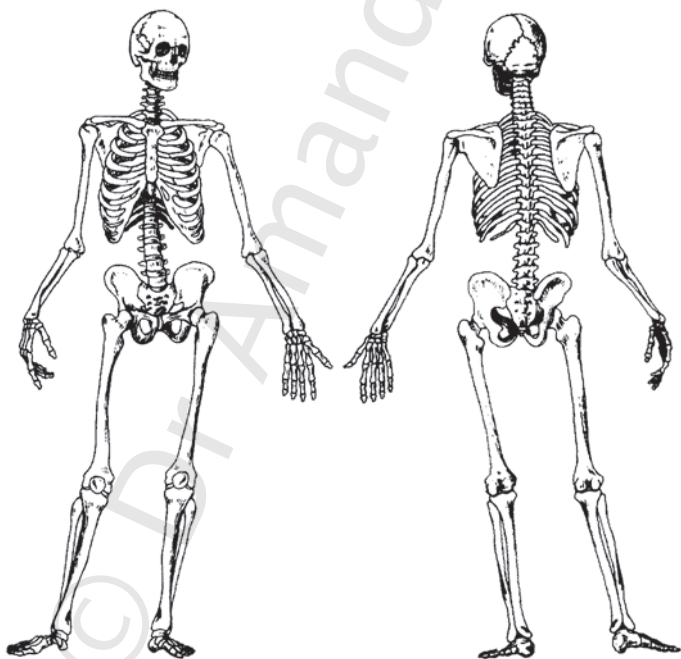


Dr A. L. Neill

BSc MSc MBBS PhD FACBS

medicalamanda@gmail.com

The A to Z of Bones, Joints and Ligaments



Introduction

This is now the fourth in the A to Z series and looks like as I had hoped that it will be part of a greater A to Z project with a website which will have all the images for student and health professional use. Using the positive feedback I have obtained from the A to Z of the Skull, I have enlarged the scope of the book to include all the bones, joints and ligaments of the human body. I have added and changed the presentation to incorporate some of the excellent suggestions I have had from the Skull and other books.

Again I have included a feedback page at the end of this book and I hope that from it if there are any suggestions or ideas about the publication that this will be used as a guide to any of you who may have some ideas for this project. However if you just want to write fax, email or other send your suggestions to me, I am always pleased to hear them.

I am always grateful for the feedback I have received from the other publications.

Acknowledgement

Again I would like and need to thank Aspen Pharmacare for their support and assistance in this valuable project particularly Greg Lan. In a day when there is deep concern within the medical and other health care professional bodies that anatomy and other basic sciences are not being taught adequately to new students, this type of resource is even more important. Students are aware of what they need to know and nowadays are extremely resourceful in finding information. Doctors and other Health professionals are on a continuing pathway in the quest to review their knowledge and keep abreast with new and changing factors in medicine and it is hoped this resource will help in these searches of the new and the experienced, of all those interested in health and medicine.

Dedication

To Ali, Zoe, Mickey, Quentin and Jody for support help and love over the years. In memory of Monkey and Spook. And... hello to Jack.

How to use this book

Bones, Joints and Ligaments have been listed alphabetically and cross referenced as much as possible with their common names (e.g. the SHOULDER JOINT is the GLENOHUMERAL JOINT and the COLLAR BONE is the CLAVICLE) preference is made to list them as their proper anatomical names with cross referencing in the index to their common names, but each item may be looked up with either terminology.

Bones and joints are shown generally from at least 2 aspects, with numbered features on the diagram page and the key or index to these on the opposite page. Numbering is generally started anew with each diagram except where it is obvious the diagrams are related and then the numbering is continued on to the second diagram and the key to the features is the same for both.

Occasionally bones or groups of bones are also shown “in situ”, or as an “overview” to relate them to the whole body structure, in other words as they lay in body or cavity anatomically. For example the RIBS together form the RIB CAGE and anatomically this bony structure is the way most of the ribs function most of the time not as individual bones.

Capitalization is used to demonstrate the bones involved in several structures including joints of all kinds (e.g. sutures). In other words the parietomastoid suture is listed as Parieto-Mastoid suture to further remind the reader of the involved bones or bony features involved in the composition of the structure. This helps to further orientate the reader to the structural components of the feature.

It is hoped that this will prove a valuable resource for those examining individual bones and their articulations and support structures to build up the complete joint as in the study of ANATOMY and its many uses such as: archeology, anthropology, chiropractic dentistry, forensics, geology, medicine, orthopaedics, osteology, paleontology, paleobiology, physiotherapy, massage therapy and surgery. Hence any suggestions on format or inclusions will be gratefully received.

Note: colour coding on base is regional.

Thank you

Amanda Neill

BSc MSc MBBS PhD FACBS

ISBN 1 74138 167 5



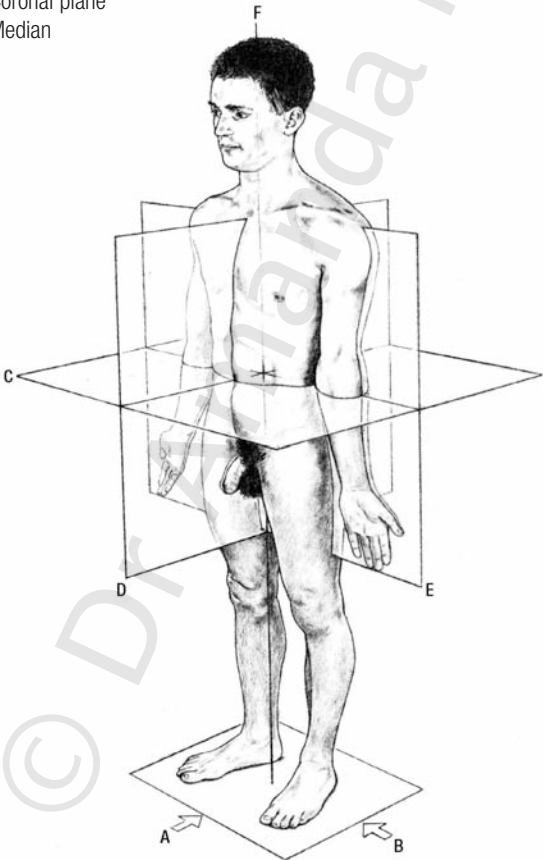
Abbreviations

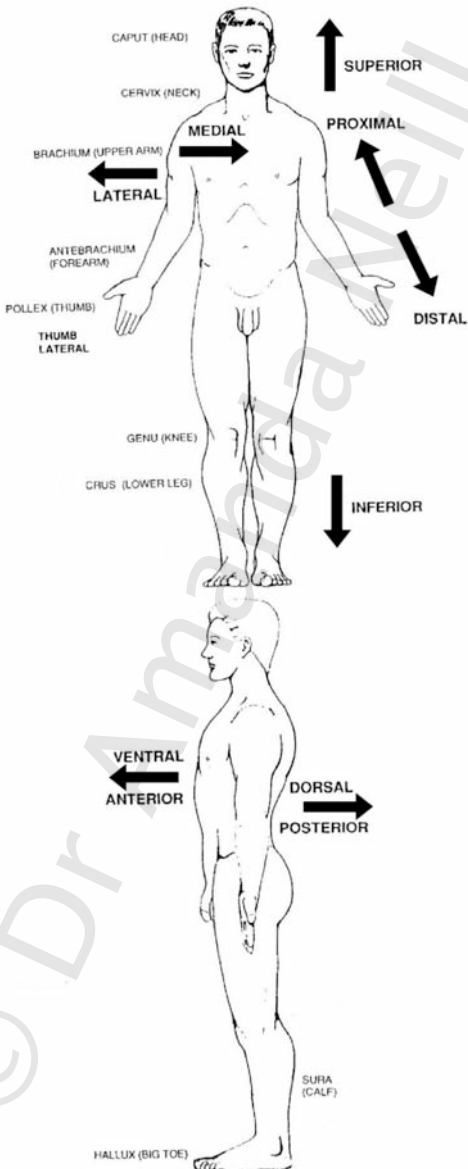
A	= actions /movements of a joint
aa	= anastomosis or anastomoses
adj.	= adjective
aka	= also known as
ALL	= anterior longitudinal ligament
alt.	= alternative
ant	= anterior
art	= articulation (joint w/o the additional support structures)
AS	= Alternative Spelling, generally referring to the diff. b/n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

Guide to Anatomical Planes and Relations

This is the anatomical position.

- A= Anterior Aspect from the front Posterior Aspect from the back
- 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 Movements



Hip flexion



Hip extension



Hip abduction



Hip adduction



Hip lateral and medial rotation



Hip circumduction



Knee flexion



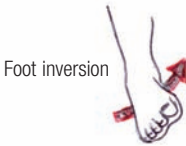
Knee extension



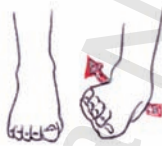
Foot dorsiflexion



Foot plantar flexion



Foot inversion



Foot eversion

Foot normal position



Fingers extension



Fingers flexion



Forearm pronation



Forearm supination



Hand deviation
radial/laterally
ulna/medially



Fingers abduction



Fingers adduction



Thumb opposition

Table of contents

Introduction	1
Acknowledgement	1
Dedication	2
How to use this book	2
Abbreviations	4
Guide to Anatomical Planes and Relations	5
Anatomical movements	7
Table of contents	9
The Bones, Joints and Ligaments - order of illustrations	10
Common terms in Osteology and Skeletal Anatomy	15
Classification and Summary of Bones	25
Bone structure - Long Bone	26
Articulated Skeleton - anterior / posterior	27
Disarticulated Bones	29
Classification and Summary of Joints	31
Synovial Joint	32
Classification and Summary of Ligaments	33

OVERVIEWS to be found in this book

Anterior Chest	43
Arm	45
Carpus / Wrist	59
Ear Bones in situ	85-88
Fingers	99
Foot (aka Metatarsals)	103
Hand (aka Metacarpals)	111-114
Leg	139
Pectoral Girdle / Shoulders	179
Pelvic Girdle / Hips	181-184
Rib Cage / Thoracic Cavity	195
Skull	211
Spine / Vertebral Column	249

The Bones, Joints and Ligaments

This is the order of the listing of illustrations in the book (note if beside the title there is a listing to see ... it will be listed at that site and hence placed in the book at that point).

Bones are listed in **BLACK** ; **Joints** are listed in **DARK YELLOW** and **ligaments** when referred to separately are listed in **ORANGE**. Generally **ligaments** will be referred to in joint diagrams and not listed demonstrated in separate diagrams.

Overviews of regions are listed in **MAROON (DARK RED)**.

Acetabular joint (see HIP JOINT)

Acromioclavicular articulation & joint

ANKLE BONE (see Talus - (biggest of the Tarsal bones *aka* Tarsus))

ANKLE JOINT = Talocrual joint
= Subtalar joints

ANTERIOR CHEST overview

ARM = upper limb articulations overview

ARM (see Humerus)

Atlas (C1) - (Vertebra - cervical)

Atlanto-Axial joints

Atlanto-Occipital joint (see Craniovertebral joint)

Axial-Occipital joint (see Craniovertebral joint)

Auditory Ossicles (*aka* EAR BONES)

Axis (C2) - (Vertebra - cervical)

BREAST BONE (see Manubriosternum)

Calcaneus (*aka* HEEL)

Capitate see also Carpus, Hand, Wrist (Os Carpus = Wrist bones)

Carpus - carpal bones wrist (Os Carpus = Wrist bones) overview
also see individual bones

1st row - trapezium, scaphoid, lunate, triquetral, pisiform,

2nd row - trapezoid, capitate, hamate

Carpometacarpal joints (see HAND and WRIST joints)

CHEEK BONES (see Zygoma)

CHIN (see Mandible)

Clavicle (*aka* COLLAR BONE)

Coccyx -Os coccygis

Costovertebral articulations & joints (RIB & SPINAL joints)

Costovertebral articulations of atypical ribs 1 & 2

Cranial Fossae (see Skull internal views)

Craniovertebral joints (HEAD/SPINE joints aka Atlanto-Occipital joints & Axial-Occipital joints)

Cuboid (ankle)

Cuniforms (foot)

1st - medial cuniformal , 2nd intermediate cuniformal , 3rd lateral cuniformal ,

EAR BONES (aka Auditory Ossicles)

in situ **INCUS** = *anvil*, **MALLEUS** = *hammer*, **STAPES** = *stirrup*

LABYRINTH = *cochlea*

ELBOW - articulation, joint (humeroulnar)

Ethmoid bone

Femur (upper leg bone) *aka thigh bone aka leg bone*

Fibula (lower leg lateral bone)

FINGERS (see also hand, phalanges) overview

FINGER JOINTS = interphalangeal joints

FOREARM (see Radius , Ulna)

FOOT BONES (tarsal + metatarsal + phalanges) overview (see also Metatarsals)

FOOT JOINTS (aka Intertarsal joints)

Frontal bone

Glenohumeral joint (see SHOULDER JOINT)

Hamate (see also Carpus, Hand, Wrist)

HAND (and WRIST bones) overview

Carpal, Metacarpal bones and Phalanges - articulations

HAND BONES (see Metacarpals individually listed)

HAND JOINTS intercarpal joints = IC joints

carpometacarpal intercarpal joints = C-MC, IC joints

HANGING joint (see Atlanto-Axial median joint)

HEAD/SPINE JOINTS (see Craniovertebral joints)

HEEL (see Calcaneus)

Hip (*aka Os Coxae - Innominate*)

HIP ISCHIUM, ILEUM, PUBIS overview

HIP (also see PELVIC GIRDLE Sacrum + Hip articulations)

Humeroulnar joint (see ELBOW JOINT)

Humerus = ARM bone (upper arm bone)

Hyoid

Inferior Nasal Concha (see Nasal bones and cavity)

Innominate (see HIP)

Intertarsal joints (see FOOT joints)

JAW (see Mandible)

KNEE CAP (see Patella)

KNEE (JOINTS Tibiofemoral + [Tibiofibular] + Femoropatellar + Tibiopatellar)

Lacrimal

LEG = lower limb articulations overview

Lunate (see also wrist, carpus, hand)

Mandible (*aka* JAW *aka* CHIN)

Mandibular joint (see Temporomandibular joint)

Manubriocostal joints (see Sternocostal joints)

Manubriosternum = Manubrium + Sternum + Xiphoid process *aka* BREAST BONE

Manubrium (see Manubriosternum)

Maxilla (*aka* UPPER JAW)

Metacarpals *aka* HAND BONES (see wrist/hand) overview

Metacarpal fifth (bone to the little finger)

first (bone to the thumb)

fourth (bone to the ring finger)

second (bone to the index finger)

third (bone to the middle finger)

Metatarsals (bones b/n the ankle & the toes) *aka* FOOT BONES - overview

Metatarsals (individual views)

first (bone to the big toe) / second (bone to the second toe)

third / fourth / fifth (bone to the little toe)

Nasal bones and cavity = NOSE

Navicular (ankle)

NOSE see Nasal bones and cavity

Occipital

Odontoid Joint (see Atlanto-Axial median joint)

Palantine

Parietal

Patella (KNEE CAP)

Pectoral girdle = SHOULDERS overview

Pelvic girdle = HIPS (see Hip)

Phalanges = FINGERS TOES

Pisiform (see also hand, wrist)

Pubic Symphysis part of Hip / Pelvic girdle

Radiocarpal joint see WRIST JOINT

Radioulnar joints (also see ELBOW)

Radius

RIB CAGE overview = Thoracic cavity (see also PECTORAL GIRDLE)

Rib typical

RIB JOINT see costovertebral joint

Rib atypical -ribs1, 2

Ribs 1,2 and 10-12 (atypical)

Sacroiliac joint

Sacroiliac articulation - posterior

Sacroiliac ligaments - posterior

Sacrum (lower BACK BONE)

Scaphoid (thumb hand)

Scapula (aka SHOULDER BLADE)

SHIN (see Tibia)

SHOULDER JOINT (aka Glenohumeral joint)

Sinuses overview

Skull External Views

Internal Views

Sphenoid

SPINE overview (see vertebral column overview)

SPINAL JOINTS (see vertebro-vertebral joints)

Sternoclavicular joints

Sternocostal joints

Sternum (see Manubriosternum)

Talus (aka Tarsus aka ANKLE)

Temporal bone

Temporomandibular joint

Tibia (aka lower leg bone aka SHIN (shin bone))

Tibiofemoral joint (see KNEE which includes this joint)

Tibiofibula joints

Trapezium Trapezoid, Triquetral (see also Carpus - Hand)

Ulna (aka FOREARM)

Vertebrae

Cervical Atypical (see C1= Atlas, C2 = Axis)

Typical (C3-7)

Lumbar Typical L1-5

Thoracic Atypical (see rib articulations T1, T10-12)

Typical T2-T9

Vertebral Column overview

Vertebro-vertebral joints b/n vertebral bodies

Vertebro-vertebral joints b/n vertebral processes and facets (*aka* SPINAL JOINTS)

Vomer

Wrist bones (see Carpal bones / Metacarpal bones)

Wrist joint (*aka* radiocarpal joint)

Xiphoid (see Manubriosternum)

Zygapophyseal joints (see Vertebro-vertebral joints)

Zygoma (*aka* CHEEK BONES)



Common terms in Osteology and Skeletal Anatomy

Ablation	The removal of part of the body generally a bony part most commonly the teeth
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)
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 (not the sacrum)
Areola	Small, open spaces as in the areolar part of the Maxilla may lead or develop into sinuses .
Arth- Arthritis Arthropathy Arthrosis Articulation	To do with joints hence... Inflammation of a joint Diseases of the joints Joint types 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
Basioocranium	Bones of the base of the skull
Boss	A smooth round broad eminence - mainly in the frontal bone female > male
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 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, lightweight with bone spicules or trabeculae parallel to lines of force found at the ends of long bones (epiphyses) with surrounding BM, found sandwiched b/n lamellae of compact bone, in the vertebral bodies and in areas of increased bone thickness
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
Carp	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 process looks like a bed post (generally with other posts) as in the Sphenoid bone.
Clivus	A slope hence in the anterior cranial fossa referring to a slope on the base of the cavity.

The A to Z of Bones, Joints and Ligaments

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 constantly changing and remodeling depending upon the lines of force, often enclosing the lighter trabecula bone.

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*).

Cost Pertaining to the rib

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 /Ethmoid A sieve or bone with small sieve-like holes.

Cuneate /Cuneus A wedge / wedge-shaped

Dens A tooth hence dentine and dental relating to teeth, denticulate having tooth-like projections *adj dentate* See odontoid

Depression A concavity on a surface

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.
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
External Auditory Meatus	Ear hole
Exostosis	A bony outgrowth from a bony surface, often due to irritation (as in Swimmers 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 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 connective tissue coverings "joints" which allow for skull cranial expansion and then become the mould for the bone development and shape joining long the sutural lines, later becoming the Bregma.
Foramen	A natural hole in a bone usually for the transmission of blood vessels 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
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 in 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' disease) and causes the bone to break with little or no force

The A to Z of Bones, Joints and Ligaments

Gallus /Galli	A cock, hence, crista galli, the cock's comb (<i>i e possessive form of gallus</i>).
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 it is acromegaly)
Gomphosis	Joint b/n the roots of the teeth and the jaw bones <i>pl - gomphoses</i>
Groove	Long pit or furrow
Gyrus	A circle, hence a coil of brain cortex.
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	See structure of bone the system of concentric circles of bone matrix and osteocytes laying down rings of compact bone and collagen fibres with central BVs, Ns and Lymph anastomosing in the centre of the circle
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
Jugum	A bridge between 2 halves of a bone <i>pl.(juga)</i> as in Sphenoid .
Kyphosis	Collapse of vertebral body(les) causing sharp convexity of the spine
Lacerum	Something lacerated, mangled or torn eg foramen lacerum small sharp hole at the base of the skull often ripping tissue in trauma.
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. (adj. lambdoid) 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 (pl. laminae)
Ligament -	A band of tissue which connects bones (articular ligaments) or viscera organs (visceral ligaments). A Ligament is a tie or a connection Originally sing. ligamentum pl ligamenta from ligate or to tie up generally composed of collagen fibres.
Linea	A line as in the Nuchal lines of the Occipitum
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 (c.f. location, locate, dislocate).
Lordosis	Increased cervical and/ or lumbar curve also called sway back
Magnum	Large pl magna
Malleus	Hammer (as in the ear ossicle)
Mandible	From the verb to chew, hence, the movable lower jaw; adj.- mandibular .
Mastoid	A breast or teat shape - mastoid process of the Temporal bone.
Maxilla	The jaw-bone; now used only for the upper jaw; adj.- maxillary .
Meatus	A short passage; adj.- meatal 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.
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 adj.- nuchal .

Ossification	= the process of turning into bone this happens in the body in several ways hence ... endochondral ossification The process where bone develops after a cartilage model of the shape is first laid down
Occiput	The prominent convexity of the back of the head Occipitum = Occipital bone adj. occipital
Occulus	An eye
Odontoid	Relating to teeth, toothlike see Dens
Ontogeny	The development of an individual growth pattern
Orbit	A circle; the name given to the bony socket in which the eyeball rotates; adj.- orbital .
Orifice	An opening.
Os	A bone or pertaining to bones adj.- osseus
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 cartilagineous 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
Osteochondroma	Bone and cartilaginous tumour benign often arising in the epiphyseal plate or line and protrude at right angles, common and asymptomatic
Osteoclasts	Multinuclear cells which resorb or phagocytose bone = resorption of bone
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 due to age and/or calcium deficiency
Osteosarcoma	Malignant tumor 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
Pars	A part of
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 see endostium
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	Joint which allows for sliding across the joint as in the wrist and foot and ribs
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.

The A to Z of Bones, Joints and Ligaments

Rectus	Straight - erect
Rickets	Form of osteomalacia or bone softening due to Vitamen D deficiency
Ridge	Elevated bony growth often roughened.
Rotundum	Round
Sagittal	An arrow, the sagittal suture is notched posteriorly, making it look like
Scoliosis	A deviation from the vertical 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, (also, a modified BV usually vein with an enlarged lumen for blood storage and containing no or little muscle in its wall). Sinuses may contain air, venous or arterial blood, lymph or serous fluid depending upon location and 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 and occipital bones adj.- sphenoid .
Spine	A thorn adj.- spinous descriptive of a sharp, slender process/protrusion.
Splanchnocranium	The splanchnocranium refers to the facial bones of the skull.
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 of the skull.	The saw-like edge of a cranial bone that serves as joint between bones
Stylos	An instrument for writing hence adj.- styloid a pencil-like structure.
Symphysis	A cartilagenous joint or a growth with bone-cartilage-bone
Syn-	Means together ie the close proximity of or fusion of 2 structures
Syndesmosis	Tight inflexible joints b/n 2 bones little to no movement many axial joints
Synostosis	Fusion of any joints

Synovial joint	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 the 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.
Trabecula	A "little" beam i.e. supporting structure or strut pl. trabeculae
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
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
Uncus	A hook adj. - uncinata.
Vagina	A sheath; hence, invagination is the acquisition of a sheath by pushing inwards into a structure, and evagination is similar but produced by pushing outwards adj. - vaginal.
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.

Classification and Summary of Bones

Flat bones Thin flattened and usually curved bones: most Skull bones, Scapula, Manubrium generally surrounded by a layer of compact bone with cancellous or spongy bone in b/n.

Irregular bones Various shapes not easily classified Sphenoid, Vertebrae, Hip, Ear Bones irregular growth centres

Long bone Longer than wide 2 ends epiphysis and a central diaphysis. Growth mainly lengthwise: most limb bones: Femur, Fibula, Humerus, Radius, Tibia, Ulna, and digits Phalanges see diagram showing a long bone the covering is of COMPACT BONE which is present only in the shaft and the ends have compact bone covering with CANCELLOUS BONE in the cavity along with red marrow .

Pneumatic bone/Alveolar bone

Bones filled with air to lighten their weight -
Maxilla, Frontal, Mandible, Ethmoid and bones with "sinuses"

Sesamoid bone Bones completely surrounded by soft tissue w/o joints Hyoid

Short bone Roughly cubic in shape. Most wrist (Carpal) and ankle (Tarsal) bones; many of the bones at the base of the skull.

Sutural bone "Wormian" bone small bones which occur within the skull sutures sometimes called extra-sutural if the main part of the bone is outside of the suture. Generally they are unnamed although the Incus is given to the large extra-sutural bone when present.

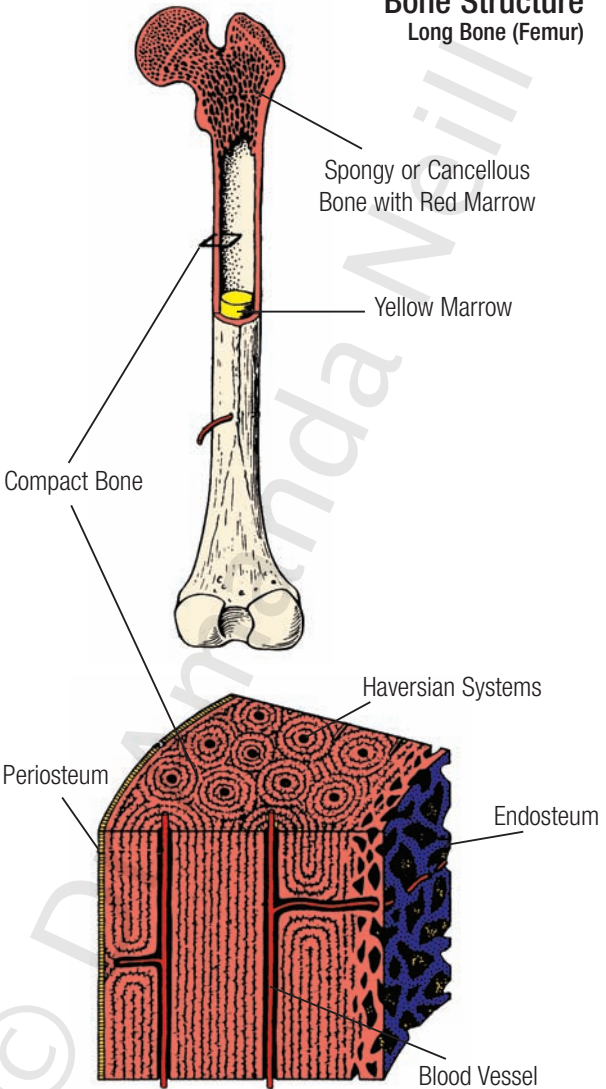
There are: There are between 600 and 620 bones in the body including the various sesamoid and Wormian bones and other areas where there may be separate or ossified joints.
22 paired skull bones including the ear ossicles / not including the teeth.
5 single bones mainly on the base of the skull
1 mandible
1 hyoid
variable sutural and extra-sutural bones (generally between 3-5)

There are: **56** digit bones or Phalanges plus an additional 3 to 4 small sesamoid bones in the foot over the big toe and the thumb

Each limb has a single long bone proximally (arm and thigh), a hinge joint and 2 bones distally (the forearm and shin) joined by an interosseous upper membrane - ligament. Each pair of limbs is supported by a **GIRDLE** of supporting bones the **PECTORAL GIRDLE** and the lower **PELVIC GIRDLE**.

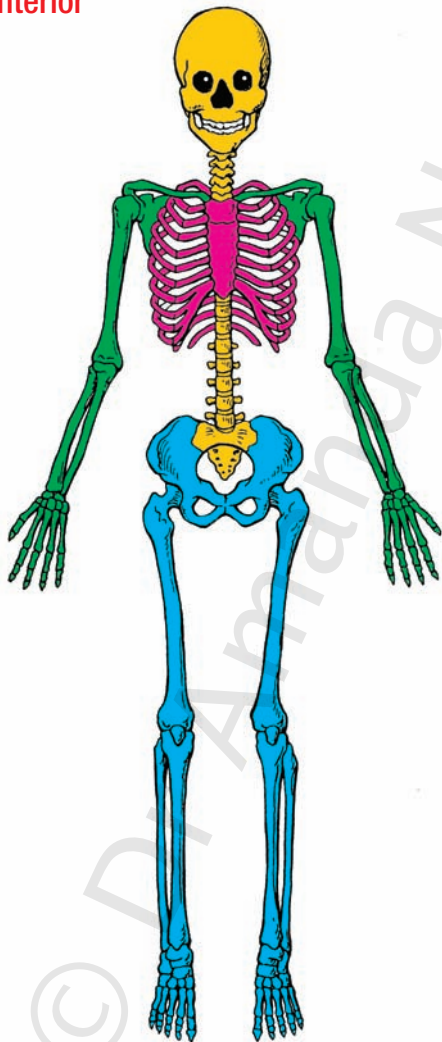
Bone Structure

Long Bone (Femur)



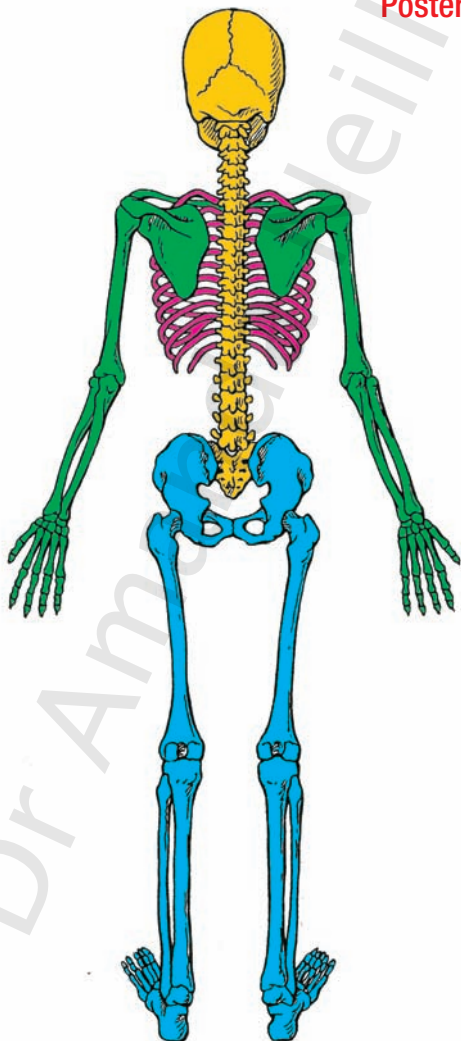
Articulated Skeleton

Anterior



Articulated Skeleton

Posterior



Disarticulated Bones





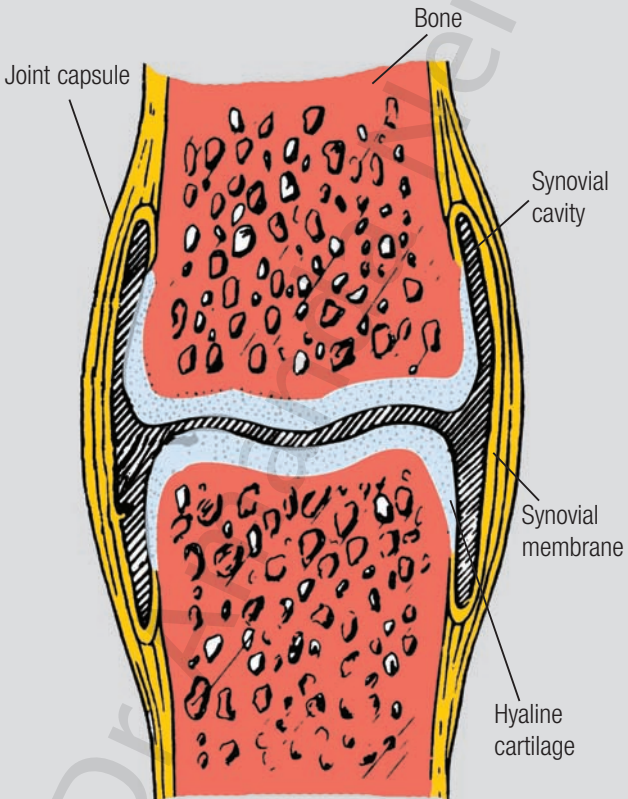
Classification and Summary of Joints

definition: joint = any BONE something BONE

B+?+B i.e whenever 2 or more bones meet

TYPE OF JOINT	STRUCTURE	MOVEMENT	EXAMPLES
GOMPHOSIS	BONE - FIBRES TOOTH	nil	teeth / jaw bone
SYNARTHROSES = FIBROUS JOINT	BONE - FIBRES - BONE	little / nil	
eg SUTURE (short fibrous connection b/n bones)	BONE - FIBRES - BONE	nil	joints in the Skull joints b/n flat bones
eg SYNDESMOSIS (longer fibres more cartilage)	BONE - FIBRES - BONE	little	Tibiofibula joint Radioulna joint
SYNCHONDROSIS = 1° CARTILAGENOUS JOINT (Amphiarthrosis)	BONE - HYALINE- CARTILAGE - BONE	due to the elasticity of the CARTILAGE	1 st costal cartilage to the Manubrium rib cartilage Manubriosternum
SYMPLYSIS (2° cartilagenous joint)	BONE - FIBRO- CARTILAGE - BONE	little in all directions - may be influenced by HORMONES	MOST joints in axial skeleton eg b/n VERTEBRAL BODIES b/n Pubic bones
SYNOVIAL (Diarthrosis)	BONE - HYALINE CARTILAGE SYNOVIAL FLUID HYALINE CARTILAGE BONE	Full movement type depends upon the shape of the boney surfaces	MOST joints in the appendicular skeleton, upper limb, lower limb, feet and hand joints
eg PLANE		gliding / sliding	costovertebral zygapophyseal
eg HINGE		one directional	elbow /knee /finger /toe
eg PIVOT		movement around an axis	atlanto-axial medial joint
eg CONDYLOID		movement in 2 directions	wrist /ankle
eg BALL & SOCKET		movement in many directions - common centre	hip / shoulder
eg SADDLE		movement in 2 planes	thumb C-MC joint

Synovial Joint



Classification and Summary of Ligaments

definition: a band of tissue connecting bones, viscera or other body structures, may be distinct fibrous bands or fascial folds or nonfunctional remnants of foetal structures

NAME	DESCRIPTION	EXAMPLES	SHOWN IN
accessory = collateral	any "helping" lig. supporting/strengthening the primary lig generally used where there are many short bones in a crowded area	the: palm (palmar), sole (plantar), phalanges (volar) temporomandibular joint (Henle), humerus and wrist	hand overview, foot overview, TMJ views, shoulder joint, wrist overview
annular also see retinaculum	any circular lig.	annulus fibrosis annular lig. of the Radius	vertebro-vertebral joints elbow
arcuate anterior	any curved lig. description of any lig in front of the named structure (also used to describe those fibres in front of a structure)	arcuate pubic ligament ANTERIOR LONGITUDINAL LIGAMENT = ALL	pelvic girdle overview craniovertebral jts thoracic cage vertebro-vertebral jts.
bifurcate	lig with 2 insertions	calcaneocuboid + calcaneonavicular pisio-hamate + pisio-metacarpal	ankle joint-subtalar dorsum of the hand
collateral = accessory	any "helping" lig. supporting/strengthening the primary lig generally used with outer ligs over bigger joints	radial collat lig	elbow, knee jts wrist
cruciform	ligaments which cross over	CRUCIATE LIGAMENTS (of the knee) cruciate ligs of the odontoid jt	knee jt atlanto-axial jt craniovertebral jts
deltoid	ligs which fan out as a "D"	DELTOID LIGAMENT	ankle jt

The ligaments included in this book are those associated with the musculoskeletal system, bones and skeletal muscles. Tendons which join muscle to bone are not discussed nor are other ligamentous structures such as the aponeuroses or ligaments of organs such as the Hepatic ligaments.

NAME	DESCRIPTION	EXAMPLES	SHOWN IN
flava	ligs with large amounts of elastic fibres hence yellow in colour	LIGAMENTUM FLAVA	vertebra-vertebro jts
interarticular (may also be called synovial)	ligs which enter the synovium and are inside the joint	long head of Biceps cruciate ligs of the knee acetabular lig	shoulder jt knee jts hip jt
inter-osseous	ligs which span across 2 bones for a considerable length - deep lig acting as a surface for muscle attachment	interosseous membrane of the forearm interosseous membrane of the lower leg OBTURATOR LIG	forearm radioulna jts lower leg tibiofibular jts pelvic overview
inter-spinous	ligs which are b/n 2 spines deep lig acting as a surface for muscle attachment.	INTERSPINOUS LIGAMENTS	vertebral column overview
long "interspinous"	ligs which attach 2 bones over long distances acting as an extended surface for muscle attachment - more supf than the inter- lig	SUPRASPINOUS LIGAMENTUM NUCHAE SACROSPINOUS SACROTUBEROUS INGUINAL LIG	vertebro-vertebral jts craniovertebral jts pelvic girdle overview sacrum pelvic girdle
posterior	description of any lig behind the named structure (also used to describe those fibres of a lig behind a structure)	POSTERIOR LONGITUDINAL LIGAMENT = PLL	vertebro-vertebral jts
radiate	lig which fans out (smaller deltoid shape)	radiate lig of the rib	thoracic cage, costovertebral jts
synovial = interarticular			

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Acromio-Clavicular articulation & joint = part of the pectoral girdle

anterior (ribs cut away)

BS *supra scapular artery, thoracoacromial artery*

NS *suprascapular, lat. pectoral Ns (C5-C6)*

Movements *associated with scapula: elevation /
depression, protraction/retraction, rotation*

- 1 Acromion
- 1A Acromio-Clavicular lig.
- 2 Coracoid process of Scapula
- 2A Coraco-Acromial lig
- 2B Coraco-Clavicular lig.- Trapezoid part
- 2C Coraco-Clavicular lig. - conoid part
- 3 supra-scapula notch
- 3A supra-scapular lig
- 4 Clavicle - sternal end
- 5 Clavicle - acromial end
- 6 Acromio-Clavicular art.

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

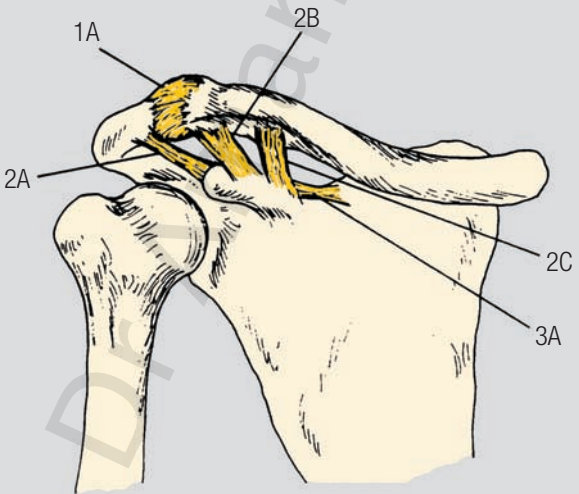
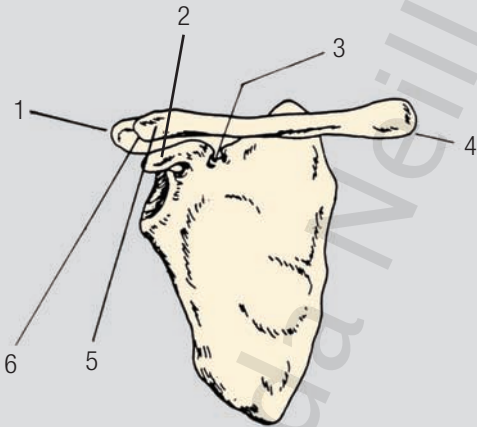
V

W

X

Y

Z



A ANKLE JOINT = Talocrural joint

medial / lateral

BS *ant. tibial & peroneal arteries*

NS *deep peroneal tibial NS deep peroneal = ant tibial (L4-S2)*

A *dorsiflexion plantarflexion*

1D Tibio-Calcaneal (deep) lig

2D Tibio-navicular lig.

3D Tibio-Calcaneal lig

4D Tibio-Talar (deep) lig

5 anterior Talo-Fibular lig

6 Tibio-Talar lig

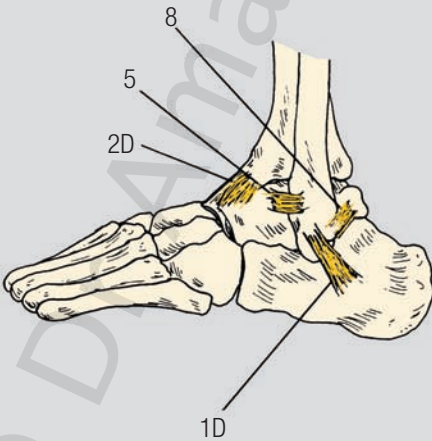
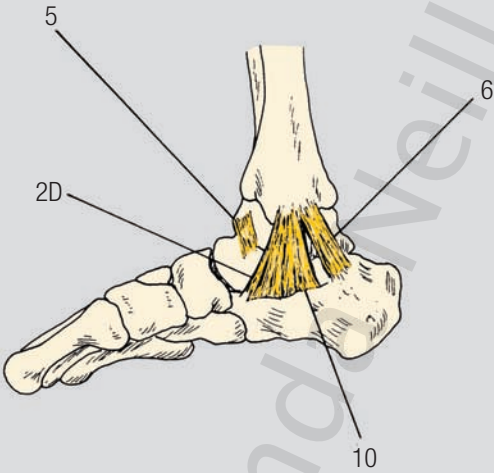
7 Tibio-fibular lig

8 post. Talo-Fibular lig

9 Talo-Fibular lig - tibial fibres

10 Calcaneo-Fibular lig

*D = all parts of the DELTOID lig -from TIBIA to ankle bones in a "D" shape



A ANKLE JOINT = Talocrural joint

B *posterior*

C **BS** *ant. tibial & peroneal arteries*

D **NS** *deep peroneal = ant tibial (L4-S2)*

E **A** *dorsiflexion plantarflexion*

G 1D* Tibio-Calcaneal (deep) lig

H 2D Tibio-Navicular lig.

I 3D Tibio-Calcaneal lig

J 4D Tibio-Talar (deep) lig

K 5 ant. Talo-Fibular lig

L 6 Tibio-Talar lig

M 7 Tibio-fibular lig

N 8 post. Talo-Fibular lig

O 9 Talo-Fibular lig - Tibial fibres

P 10 Calcaneo-Fibular lig

Q
R *D = all parts of the DELTOID lig -from TIBIA to ankle
S bones in a “D” shap

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

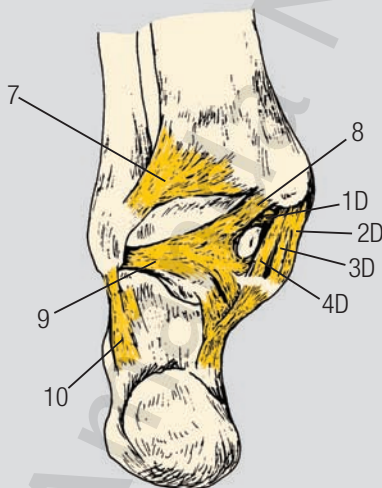
V

W

X

Y

Z



A ANKLE JOINTS lower = SUBTALAR joints

lateral / medial

BS* *anastomotic network around jts from ant. post. tibial arteries, dorsalis pedis, peroneal arteries*

NS *medial lateral plantar Ns (L4-S3)*

A *inversion eversion (foot) gliding and rotation (subtalar joints individually)*

- 1 interosseous Talo-Calcaneal lig
- 2 cervical lig
- 3 Talo-Navicular lig
- 4B lat. Calcaneo-Navicular lig
- 5B med. Calcaneo-Cuboidal lig
- 6 long plantar lig
- 7 lat. Talo-Calcaneal lig
- 8 subtalar jt
- 9 med. Talo-Calcaneal lig
- 10 Talo-Calcaneo-Navicular jt
- 11 Spring lig / plantar Calcaneo-cuboidal lig
- 12 short plantar lig

*B = BIFURCATED lig (2 heads) also called Bifurcate lig.

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

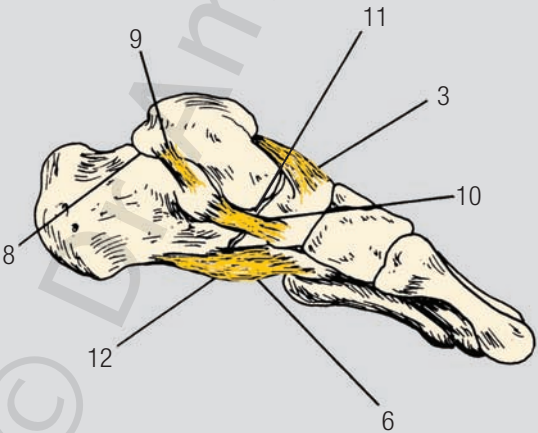
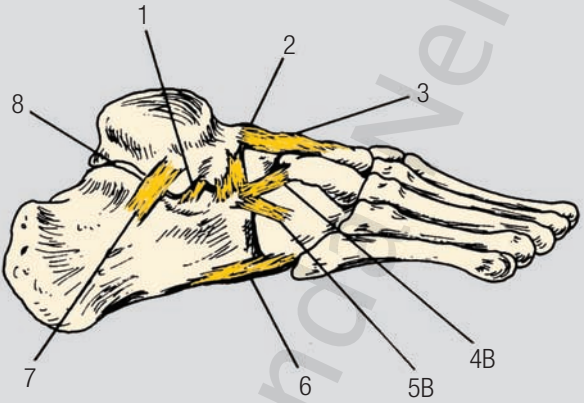
V

W

X

Y

Z



A

ANTERIOR CHEST - OVERVIEW

B

SHOWING

C

D

vertebral jts - CERVICAL & THORACIC regions

E

VB with VB via intervertebral discs = INTERVERTEBRAL jts
(fibrocartilagenous)

F

articular processes superior/inferior = ZYGAPOPHYSEAL jts
(plane synovial)

G

H

I

first rib with manubrium jt / COSTO-STERNAL jt (synovial)

J

clavicular jts - proximal CLAVICULO-STERNAL (synovial)

K

-distal ACROMIO-CLAVICULAR (synovial)

L

M

scapula with humerus / SHOULDER jt = GLENOHUMERAL jt
(synovial)

N

ribs with sternomanubrium jts / COSTOSTERNAL jts (varied)

O

ribs with vertebrae - COSTOVERTEBRAL jts (synovial)

P

manubrium with sternum - MANUBRIOSTERNAL jt
(fibrocartilagenous)

Q

sternum with xiphoid process - XIPHISTERNUM jt
(fibrocartilagenous- may ossify)

R

S

1 ist rib

T

2 clavicle

U

3 acromion f the scapula

V

4 humerus

W

5 5th rib

X

6 manubrium

Y

7 sternum

Z

8 Xiphoid process

9 12th rib

10 L1 vertebral body

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

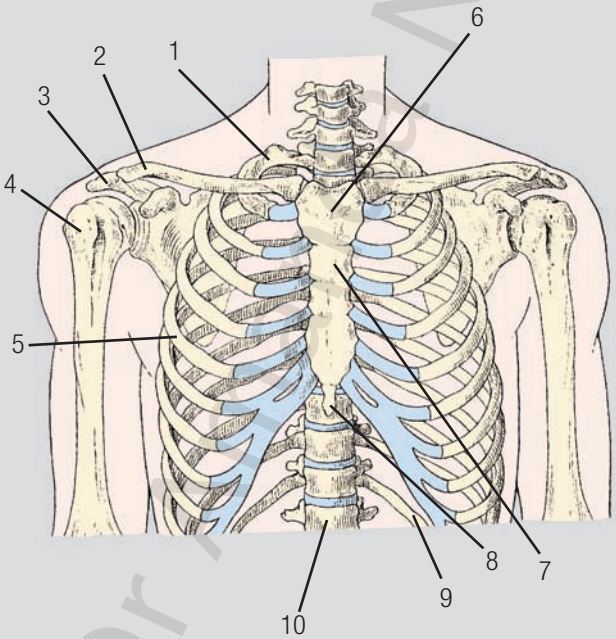
V

W

X

Y

Z



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

ARM Articulations = Upper limb overview

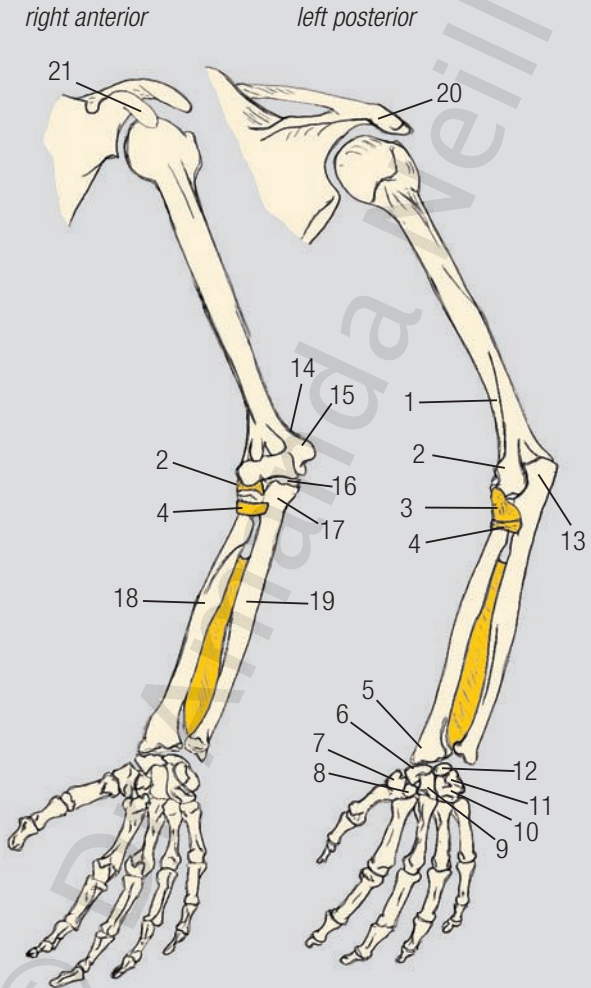
anterior FRONT (L) / posterior BACK

BS *brachial artery*

NS *brachial plexus (C2-T1)*

A *all movements - shoulder
flexion extension - elbow
supination pronation - forearm
radial ulna deviations / flexion extension
circumduction - wrist*

- 1 Lateral supracondylar ridge
- 2 Lateral epicondyle
- 3 Radial collateral ligament
- 4 annular ligament
- 5 styloid process
- 6 Scaphoid
- 7 Trapezium
- 8 Trapezoid
- 9 Capitate
- 10 Hamate
- 11 Triquetrium
- 12 Lunate
- 13 Olecranon
- 14 Medial Supracondylar ridge
- 15 Medial epicondyle
- 16 Trochlea
- 17 Head of Ulna
- 18 Shaft of Radius
- 19 Shaft of Ulna
- 20 acromoin
- 21 coracoid process



A

Atlas = C1 = First Cervical VertebraB *anterior / superior*C *(Atlas - Gk demigod who held up the world on his shoulders)*

D <i>Articulations:</i>	<i>Atlanto-Axial jts (3)</i>	<i>C1-C2</i>
E	<i>Atlanto-Occipital jts (2)</i>	<i>C1-Occiput</i> <i>(Base of the skull)</i>
F <i>Special features</i>	<i>no vertebral body</i> <i>no spinous process</i> <i>no articular discs</i>	<i>special anterior facet for dens</i> <i>(odontoid process)</i>

- I 1 facet for odontoid / dens process
- J 2 ant. tubercle
- K 3 superior articular facet
- L 4 inferior articular facet
- M 5 posterior tubercle
- N 6 posterior arch
- O 7 groove for vertebral BVs & suboccipital N
- P 8 Foramen Transversarium = transverse foramen
- Q 9 TP
- R 10 lat. mass
- S 11 vertebral foramen
- T 12 ant. arch
- U
- V
- W
- X
- Y
- Z

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

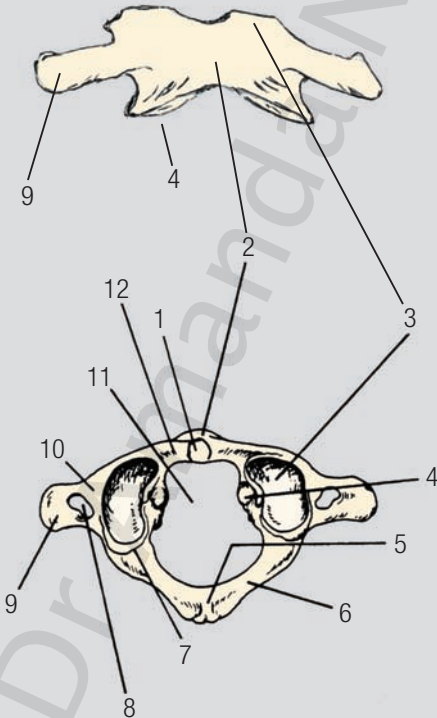
V

W

X

Y

Z



A Atlanto-Axial joint - *median* = ODONTOID JOINT AKA *hanging joint*

BS *spinal branches of vertebral art.*

NS *spinal Ns dorsal rami (C1-2)*

A *rotation, circumduction*

Atlanto-Axial joints - *lateral* = zygapophyseal joints of C1/C2

BS *spinal branches of vertebral art.*

NS *spinal Ns dorsal rami (C1-2)*

A *flexion, extension, lateral flexion, rotation*

- 1 Dens - Odontoid process (C2)
- 2 transverse lig of Axis (C2)
- 3 transverse foramen of Axis (C2)
- 4 medial tubercle of Atlas (C1)
- 5 transverse foramen of Axis (C2)
- 6 post arch and tubercle of Atlas (C1)
- 7 lamina and spine of Axis (C2)
- 8 body of Axis (C2)
- 9 superior articular facet of atlanto-occipital jt
- 10 ant arch of Atlas (C1)
- 11 facet for Dens (C2)
- 12 ant tubercle of Atlas (C1)

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

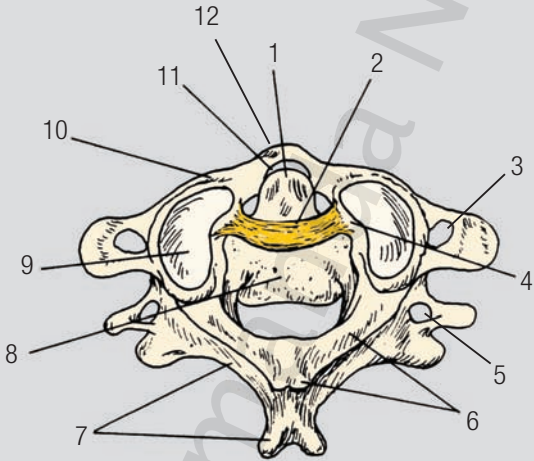
V

W

X

Y

Z



A **Auditory ossicles = Ear bones - middle**
B **ear (in the Temporal bone)**

C *Overview - In situ -individual bones*

D **Description - 3 bones incus = anvil, malleus = hammer, stapes = stirrup**
E **in the Temporal bone middle ear cavity Malleus abuts the Tympanic**
F **membrane of the middle ear (eardrum) articulates with the Incus and**
G **then the Stapes which abuts to the round window**

	Articulations:	Malleo-Incus	Hammer with the eardrum
		Incus-Stapes	inter ear ossicle articulation
		Stapo - Temporal	stirrup with the Temporal bone round membrane
	Special features	small bones with delicate balance to transmit sound	articulate with membrane stretched across bone at both ends

- L 1 External Auditory Meatus = Earhole
M 2 External ear
N 3 Tympanic membrane = Lateral border for the middle ear
O 4 Inner ear
P 5 Auditory tube
Q 6 Cochlea
R 7 Cochlea N
S 8 Facial N
T 9 Vestibular N
U 10 Oval Window with Stapes
V 11 Vestibular canals
W 12 Incus
X 13 Malleus
Y 14 Promontory
Z 15 Round Window

View of individual bones actual size
Right and Left sides respectively
from above down
Stapes Incus Malleus

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

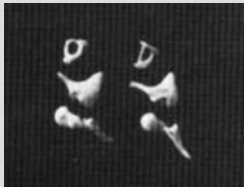
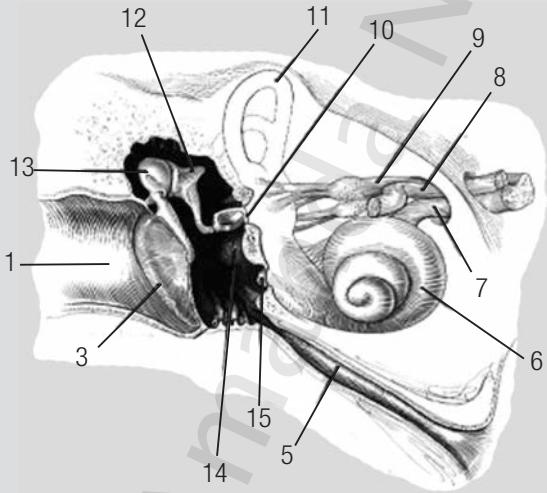
V

W

X

Y

Z



A

Axis = C2 = Second Cervical VertebraB *anterior / superior*C **(Axis - pivot for movement of the head all movements but nodding)**

D Articulations:	Atlanto-Axial jts (3)	C1-C2
E	vertebro-axial Axial jts (2) (Base of the skull)	C1-Occiput
F Special features	no vertebral body dens / odontoid process no articular discs	Dens acts as an AXIS for rotation at C1

- I 1 Dens = Odontoid process (tooth)
- J 2 attachment of Alar ligament
- K 3 groove for Transverse ligament
- L 4 pedicle
- M 5 body
- N 6 vertebral foramen
- O 7 spinous process
- P 8 lamina
- Q 9 inferior articular process
- R 10 transverse process
- S 11 transverse notch / foramen (if closed)
- T 12 superior articular facet
- U 13 facet for odontoid / dens process
- V
- W
- X
- Y
- Z

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

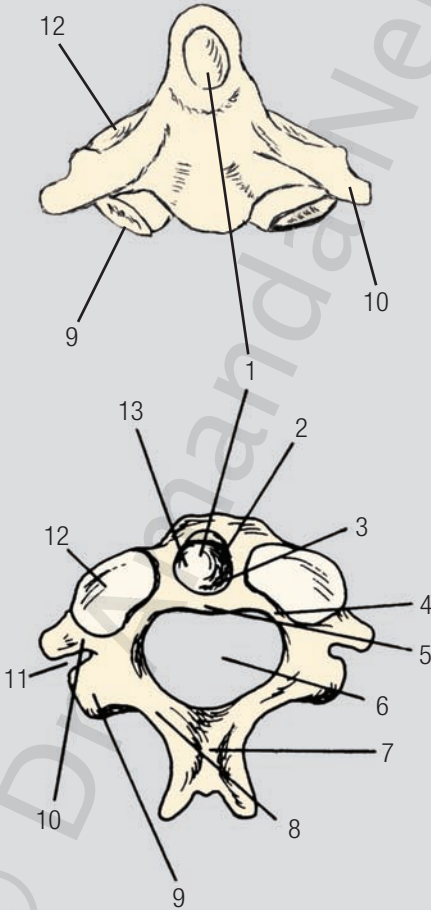
V

W

X

Y

Z



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Calcaneus = Os Calcis = Heel bone

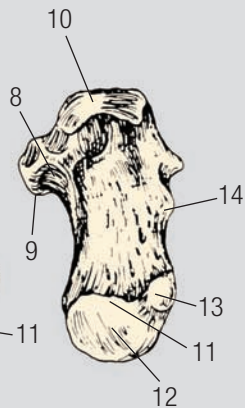
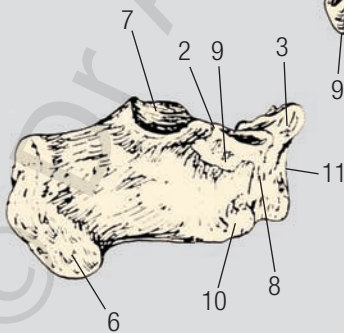
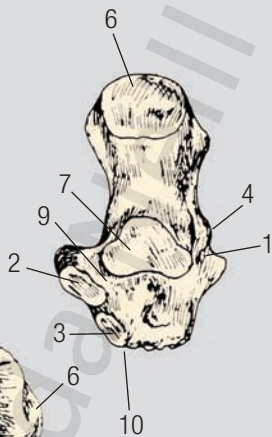
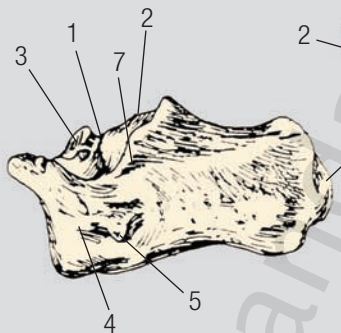
lateral / medial

Inferior / Superior

(Calcaneus - large quadrangular bone at the back of the Talus - largest of the Tarsal bones/Os Tarsus i.e. foot bones)

Articulations:	3 articular surfaces for the Os Tarsus (tarsal bones)	Calcaneo-navicular Calcaneo-talus Calcaneo-cuboid
-----------------------	--	--

- 1 Sulcus Calcanei = Calcaneal sulcus
- 2 middle articulation surface with foot bones / Os Talus
- 3 anterior articulation surface with foot bones / Os Tarsus
- 4 peroneal trochlea
- 5 attachment for the calcaneofibular ligament
- 6 posterior surface
- 7 posterior part of the joint surface for the Talus
- 8 groove for Flexor Hallicus Longus
- 9 Sustenaculum Tali
- 10 articular surface for Cuboid
- 11 medial process
- 12 Calcaneal tuberosity
- 13 lateral process
- 14 Peroneal tubercle



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

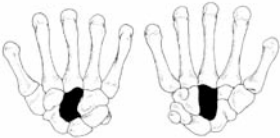
Capitate = Os Capitus = part of Os Carpus (wrist bones)

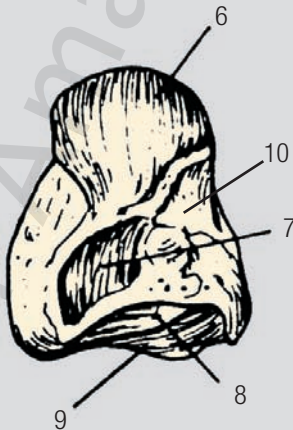
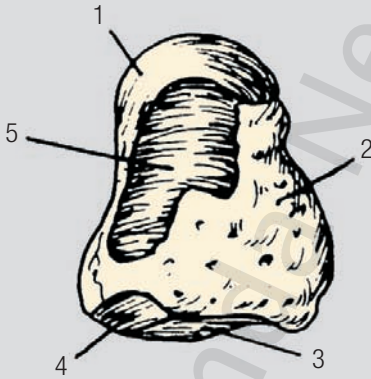
lateral / medial

(Capitate - small cap-like bone in the wrist, 2nd row of carpal bones = part of the os carpus consists mainly of articulating facets)

Articulations:	the other bones in the wrist and 4 of the 5 metacarpal bones	capito-lunate capito-hamate capito-scaphoid capito-trapezoid carpometacarpal joints with all the metacarpals except the 1 st (thumb)
----------------	--	---

- 1 facet for Lunate
- 2 palmar surface
- 3 facet for 3rd MC
- 4 facet for 4th MC
- 5 facet for Hamate
- 6 facet for Scaphoid
- 7 facet for Trapezoid
- 8 facet for 2nd MC
- 9 facet for 3rd MC
- 10 dorsal surface





Carpus = Carpal Bones = WRIST BONES

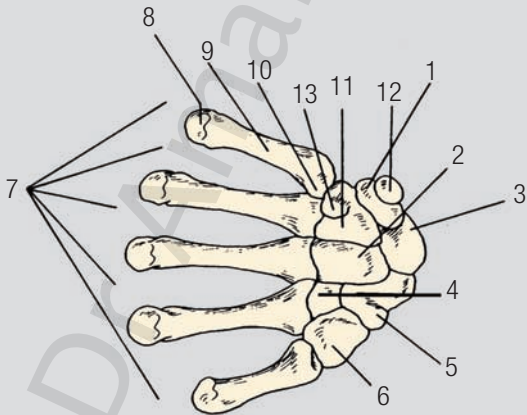
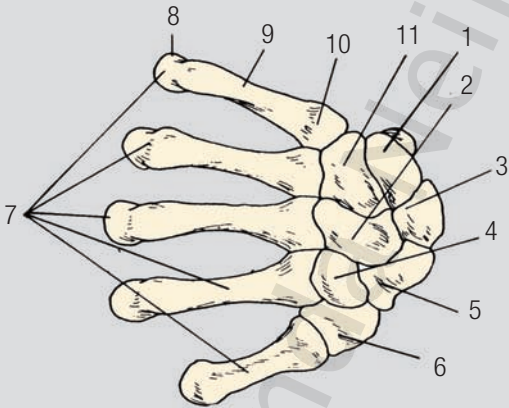
overview

dorsal / palmar

(Carpus = Os Carpus = wrist bones = 2 rows of bones between the fingers and the forearm)

1 st row	2 nd row
trapezium, scaphoid, lunate, triquetral, pisiform,	trapezoid, capitate hamate

- 1 Triquetral
- 2 Capitate
- 3 Lunate
- 4 Trapezoid
- 5 Scaphoid
- 6 Trapezium
- 7 Metacarpals = MC
- 8 head of 5th MC
- 9 shaft of 5th MC
- 10 base of 5th MC
- 11 Hamate
- 12 Pisiform
- 13 Hook of Hamate



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

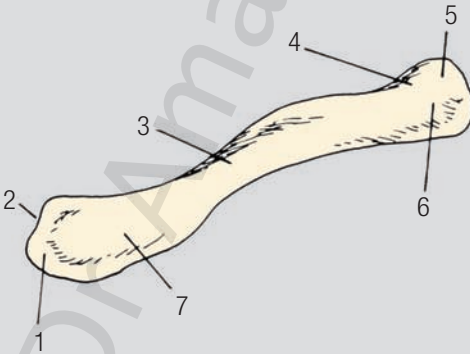
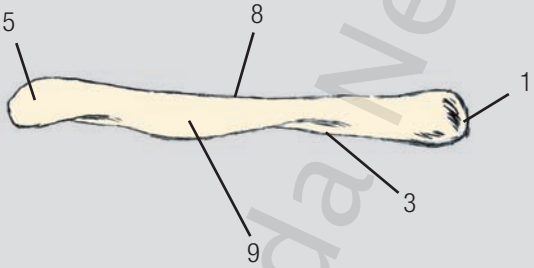
Clavicle = COLLAR BONE

inferior / anterior

Articulations:	with manubrium proximally sterno-clavicular	with acromion (scapula) distally acromio-clavicular
-----------------------	--	--

- 1 Sternal end of Clavicle
- 2 facet for first costal cartilage
- 3 groove for subclavian artery
- 4 coronoid tubercle
- 5 acromial end of Clavicle
- 6 trapezoid line
- 7 impression for costoclavicular lig
- 8 superior surface
- 9 anterior surface





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

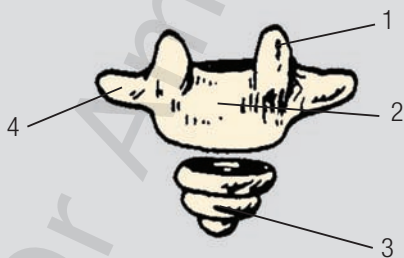
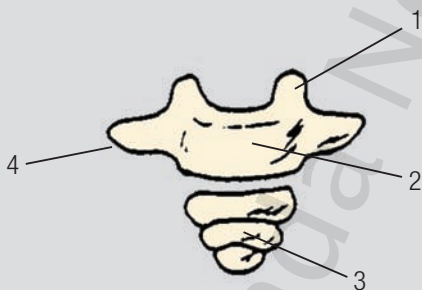
Coccyx = Os Coccygis

anterior / posterior

(Coccyx = Small tail bones at the base of the spine - functions as an anchor for many regional muscles and ligaments = the vestigial tail - looks like a cuckoo's bill)

Articulations:	with each other 3-5 bones which may be fused	S1-3/5 average 4
	with the sacrum superiorly	sacro-coccygeal
Special features:	less features inferiorly after S1 no pedicles, laminae or spinous processes	may fuse with sacrum late in life looks like the bill of the cuckoo

- 1 superior articular surface
- 2 body of coccyx 1
- 3 fused bodies C3-5
- 4 TP = transverse process



Costovertebral joints = RIB/SPINE joints

articulations-superior / joints-superior

(Costovertebral joints = 3 joints in each typical rib, 2 with the bodies of the vertebrae, 1 with the transverse process of the respective thoracic vertebra)

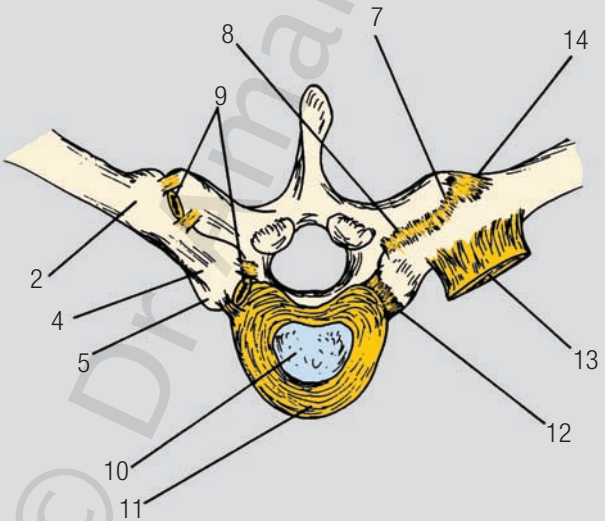
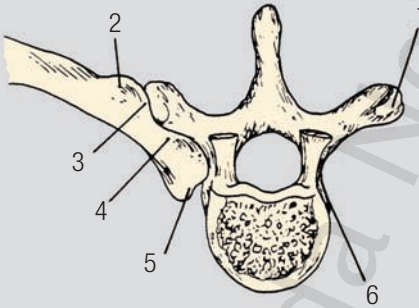
BS *posterior intercostals -spinal branches of the thoracic Aorta*

NS *posterior intercostals Ns spinal branches (C8,T1-12)*

A *gliding in inspiration
upper 6 elevation (pump handle)
lower 4 eversion (bucket handle)
lowest 2 no movement*

Articulations:	with VB 2 demi-joints eg RIB 3 articulates with T2,T3 VB	demifacets on the bodies of 2 adj vertebrae and their connenting disc
	with the TP of the equivalent vertebra eg RIB 3 with T3	transverse costovertebral joint = costotransverse joint

- 1 articular facet for (TP) transverse process
- 2 tubercle of rib
- 3 articular part of rib
- 4 neck of rib
- 5 facet on the head of the rib
- 6 superior demi-facet on the base of the VB
- 7 articular capsule of the costotransverse joint
- 8 costotransverse lig
- 9 joint capsule
- 10 intervertebral disc inner -nucleus pulposis
- 11 intervetebral disc outer- annulus fibrosis
- 12 intra-articular lig
- 13 superior costotransverse lig
- 14 lat costotransverse lig



Costovertebral joints = RIB/SPINE joints

articulations, joints / lateral

(Costovertebral joints = 3 joints in each typical rib, 2 with the bodies of the vertebrae, 1 with the transverse process of the respective thoracic vertebra)

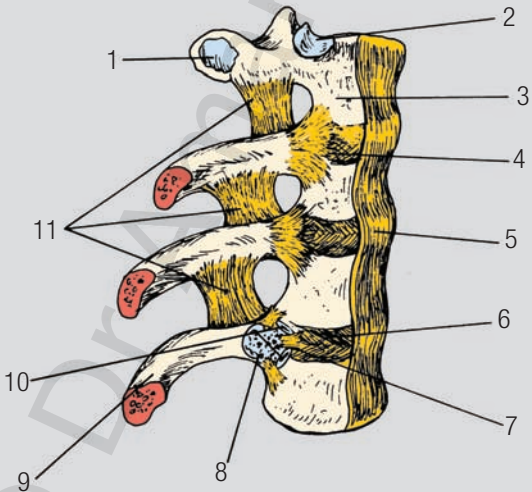
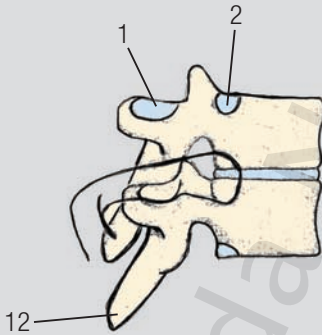
BS *posterior intercostals -spinal branches of the thoracic Aorta*

NS *posterior intercostals Ns spinal branches (C8,T1-12)*

A *gliding in inspiration
upper 6 elevation (pump handle)
lower 4 eversion (bucket handle)
lowest 2 no movement*

Articulations:	with VB 2 demi-joints eg RIB 3 articulates with T2,T3 VB	demifacets on the bodies of 2 adj vertebrae and their connenting disc
	with the TP of the equivalent vertebra eg RIB 3 with T3	transverse costovertebral joint = costotransverse joint

- 1 articular facet for TP
- 2 superior demi-facet on the base of the VB
- 3 VB = vertebral body
- 4 radiate lig
- 5 ALL = anterior longitudinal lig
- 6 intervertebral disc
- 7 intra-articular lig
- 8 head of rib
- 9 angle and shaft of rib
- 10 paired synovial joints planar with demi-facets
- 11 superior costotranverse lig
- 12 spine of thoracic vertebra
- 13 superior costo-demi-facet on inferior aspect of VB



Costovertebral joints = RIB/SPINE joints of ATYPICAL RIBS 1 & 2

articulations / anterolateral

(Costovertebral joints = 3 joints in each typical rib, 2 with the bodies of the vertebrae, 1 with the transverse process of the respective thoracic vertebra atypical ribs have only 2 articulating with their own vertebral body)

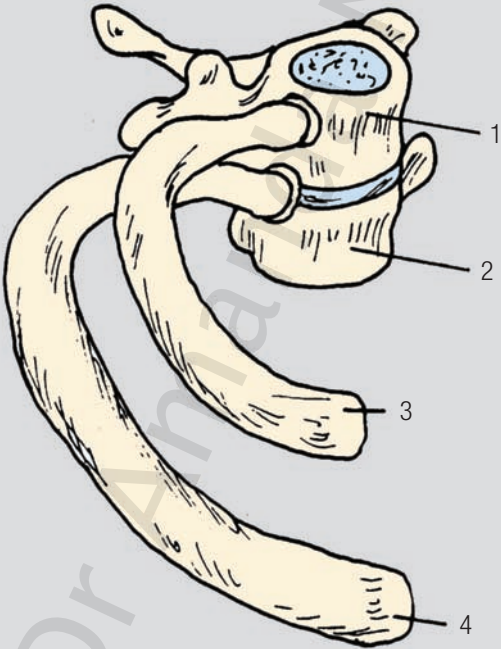
BS *posterior intercostals -spinal branches of the thoracic Aorta*

NS *posterior intercostals Ns spinal branches (C8, T1-2)*

A *gliding in inspiration
Rib1 does not move much
Rib 2 elevation*

Articulations:	RIB 1 with vertebral body and transverse process of T1 only	RIB 2 with T1 T2 vertebral bodies transverse process of T2
----------------	---	--

- 1 T1
- 2 T2
- 3 first rib
- 4 second rib



Craniovertebral joints = HEAD/SPINE joints

anterior

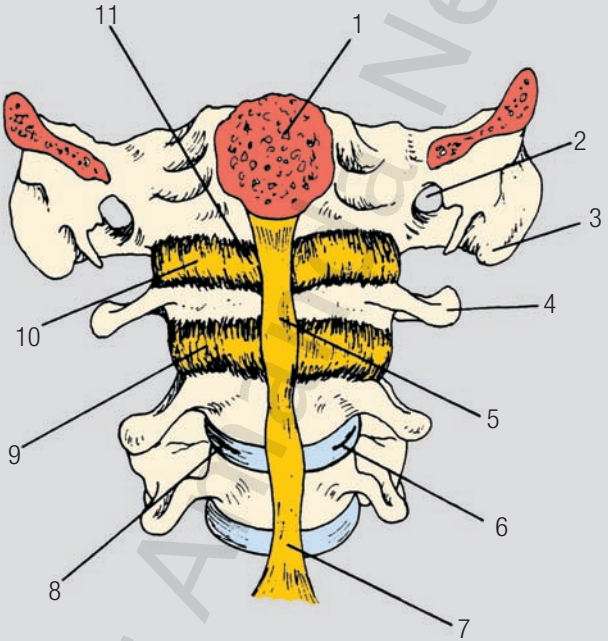
(made up of median and lateral Atlanto-Occipital (C1/head) and Axial-Occipital joints (C2/head) joints)

BS *vertebral arteries*

NS *medial branches of dorsal rami, recurrent laryngeal spinal branches of ventral rami (C1-3)*

A *flexion/extension, lateral flexion, rotation*

- 1 basilar of Occiput
- 2 jugular foramen (transverse foramen in the base of the skull)
- 3 mastoid process
- 4 transverse process of C1
- 5 ALL = anterior longitudinal lig, attached to tubercle of Atlas
- 6 intervertebral disc C2, C3
- 7 ALL
- 8 C2 C3 zygapophyseal joint L
- 9 capsule of the lateral atlanto-occipital joint
- 10 capsule of the lateral atlanto-axial joint
- 11 ant atlanto-occipital membrane



Craniovertebral joints = HEAD/SPINE joints

lateral

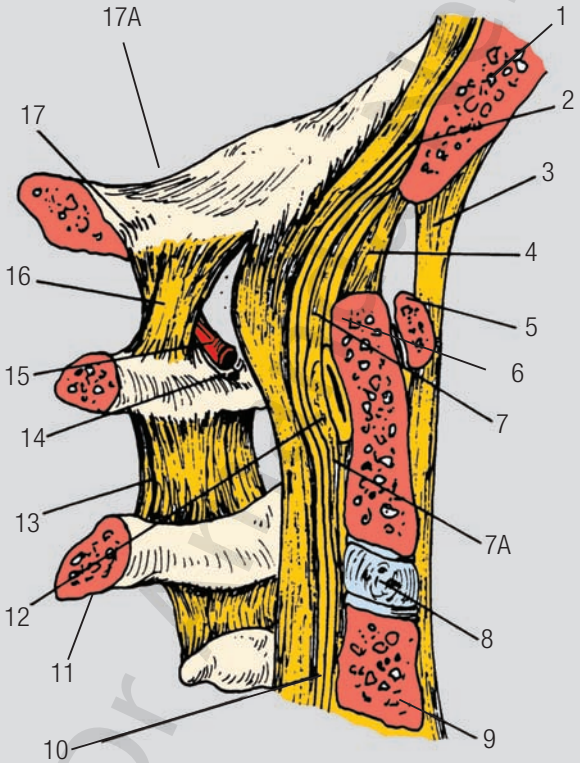
(made up of median and lateral Atlanto-Occipital (C1/head) and Axial-Occipital joints (C2/head) joints)

BS *vertebral arteries*

NS *medial branches of dorsal rami, recurrent laryngeal spinal branches of ventral rami (C1-3)*

A *flexion/extension, lateral flexion, rotation*

- 1 basilar of Occiput
- 2 tectorial membrane
- 3 ant atlanto-occipital membrane
- 4 apical lig of Dens
- 5 ant arch of Atlas C1
- 6 Dens of C2
- 7 longitudinal band of cruciform lig superior (becomes 7A)
- 7A longitudinal band of cruciform lig inferior
- 8 C2 C3 intervertebral disc
- 9 body of C3
- 10 post. longitudinal lig =PLL
- 11 lamina of C2
- 12 transverse lig of atlas (C1)
- 13 post atlanto-occipital lig
- 14 post arch of C1
- 15 vertebral artery
- 16 post atlanto-occipital lig
- 17 space which leads to foramen magnum and then ...
- 17A vertebral foramen



Craniovertebral joints = HEAD/SPINE joints

posterior

(made up of median and lateral Atlanto-Occipital (C1/head) and Axial-Occipital joints (C2/head) joints)

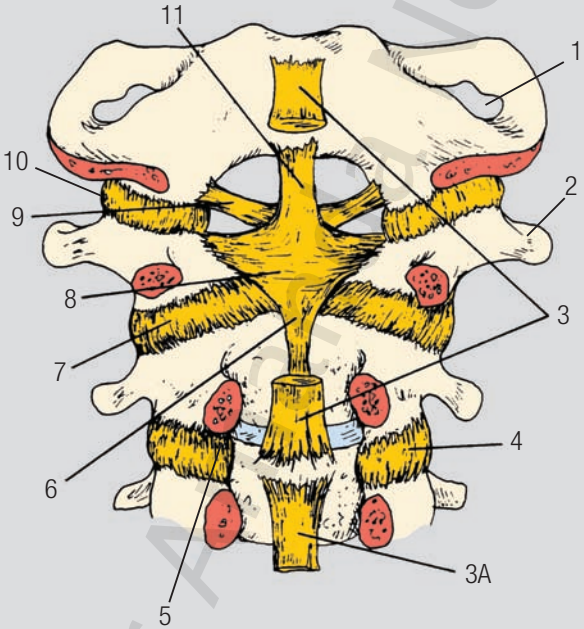
BS *vertebral arteries*

NS *medial branches of dorsal rami, recurrent laryngeal spinal branches of ventral rami (C1-3)*

A *flexion/extension, lateral flexion, rotation*

- 1 jugular foramen
- 2 transverse process of Atlas
- 3 tectoral membrane
- 3A PLL
- 4 capsule of zygapophyseal joints
- 5 C2 C3 intervertebral disc
- 6 longitudinal band of cruciform lig inferior
- 7 capsule of lat joint of C1 C2
- 8 transverse band of cruciform lig over the deeper stronger transverse lig of the Atlas (C1)
- 9 alar lig*
- 10 capsule of lat atlanto-occipital jt
- 11 longitudinal band of cruciform lig superior

*broken in hanging



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

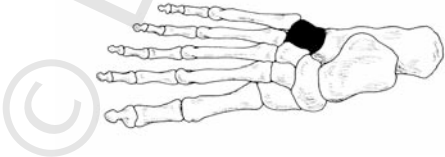
Cuboid = part of Os Tarsus / bones of the foot

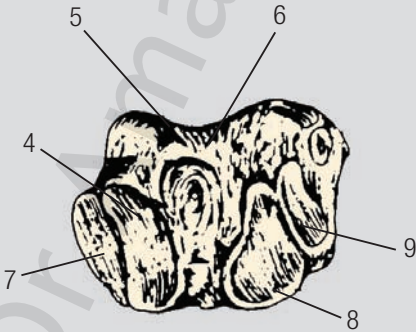
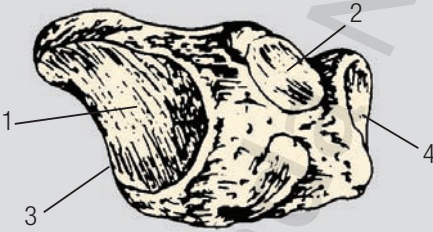
lateral / medial

(Cuboid = large cubic bone of the tarsal bones b/n calcaneus and the 4th and 5th metatarsals, has a tuberosity and groove to support the passage of peroneus longus tendon of the foot)

Articulations:	with Calcaneus posteriorly with 4 th and 5 th MTs anteriorly	cubo-calcaneal cubo-metatarsal joints
Special features	cuboid shape with large tuberosity on the inferolateral surface	underneath and to the side

- 1 facet for lateral cuniform
- 2 facet for Navicular
- 3 facet for Calcaneus
- 4 facet for 4th MT
- 5 dorsal surface
- 6 lateral surface
- 7 facet for 5th MT
- 8 groove for peroneus longus tendon
- 9 facet on tuberosity for sesamoid bone in the tendon





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

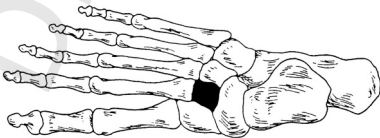
**Cuniform intermediate = the second
Cuniform part of Os Tarsus / bones of
the foot**

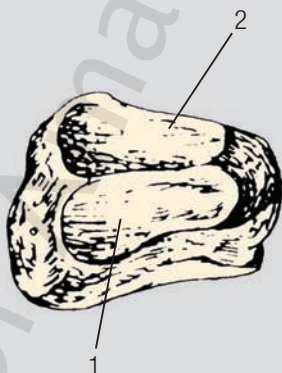
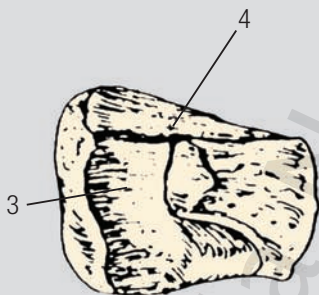
lateral / medial

(Cuniform bones = 3 + Cuboid, the most lateral of the Cuniform bones)

Articulations:	with Navicular posteriorly	also joins to the other cunifoms on either side
	with 2 nd metatarsal anteriorly	
Special features	is the smallest of the cunifoms	

- 1 facet for lateral cuniform
- 2 facet for Navicular
- 3 facet for medial cuniform
- 4 facet for 2nd metatarsal





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

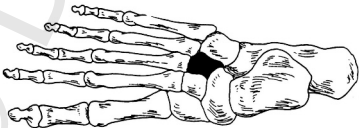
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

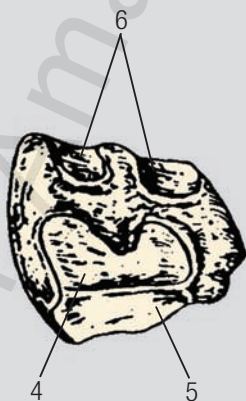
Cuniformalateral = the third Cuniformal part of Os Tarsus / bones of the foot
lateral / medial

(Cuniformal bones = 3 + Cuboid the most lateral of the Cuniformal bones)

Articulations:	with Navicular posteriorly laterally	with the Cuboid
	with 2 nd , 3 rd , 4 th metatarsals anteriorly	with 2 nd cuniformal medially
Special features	is the intermediate in size	

- 1 facet for 4th metatarsal (MT)
- 2 facet for 3rd MT
- 3 facet for Cuboid
- 4 facet for intermediate cuniformal
- 5 facet for Navicular
- 6 facet for tendon 2nd MT





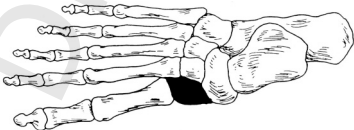
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

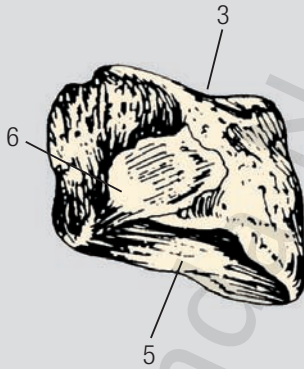
Cuniformal medial = the first Cuniformal part of Os Tarsus / bones of the foot
lateral / medial

(Cuniformal bones = 3 + Cuboid the most lateral of the Cuniformal bones)

Articulations:	with Navicular posteriorly	cubo-calcaneal
	with 1 st and 2 nd MT anteriorly	cubo metatarsal joints
Special features	is the largest of the cuniforms	kidney shaped facet at the base of the 1 st MT

- 1 facet for 2nd metatarsal (MT)
- 2 facet for peroneus longus tendon
- 3 facet for Navicular
- 4 facet for intermediate cuniformal
- 5 facet for 1st MT
- 6 facet for tendon of Tibialis Anterior





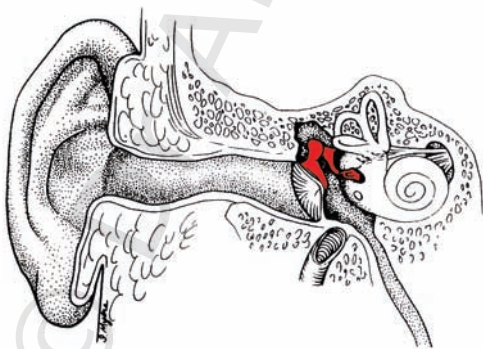
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

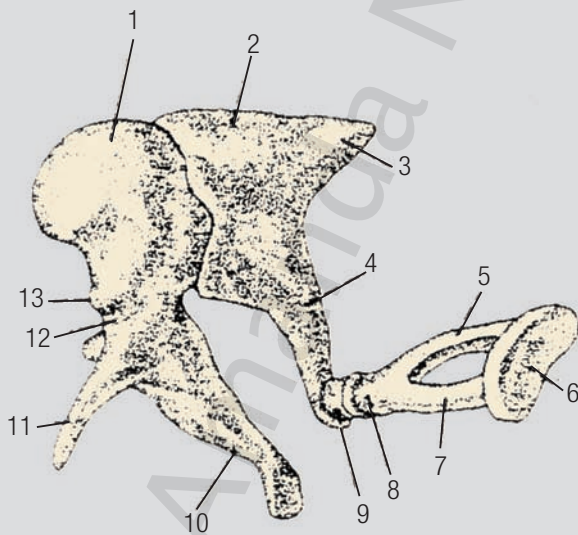
EAR BONES = Auditory Ossicles

in situ

middle ear / INCUS, MALLEUS & STAPES

- 1 head of Malleus
- 2 body of Incus
- 3 short process of Incus
- 4 ant malleolar process
- 5 post crus of stapes
- 6 base of Stapes
- 7 ant crus of Stapes
- 8 long process of Stapes
- 9 lenticular process of Incus
- 10 handle of Malleus
- 11 ant process of Malleus
- 12 neck of Malleus
- 13 lateral malleolar process





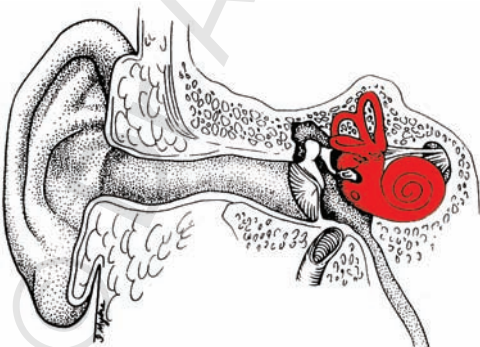
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

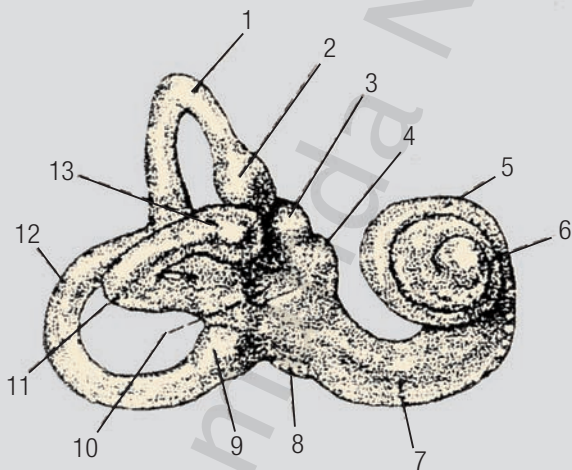
EAR BONES =Auditory Ossicles

in situ

cochlea / labyrinth

- 1 ant semicircular canal
- 2 ant bony ampulla
- 3 elliptical recess
- 4 spherical recess
- 5 cochlea
- 6 cupola of cochlea
- 7 base of cochlea
- 8 oval window - fenestra vestibuli
- 9 post bony ampulla
- 10 round window - fenestra cochlea
- 11 lat semicircular canal
- 12 post semicircular canal
- 13 lat bony ampulla





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

ELBOW joint / humero-ulnar

articulation, anterior / posterior

Extended

(Elbow joint -hinge joint between the Ulna and the Humerus only one dimensional movement)

BS *anastomoses around joint from brachial, profunda brachii, radial and ulnar arteries*

NS *musculocutaneous, radial, ulnar and median Ns (C5-7)*

A *flexion and extension -elbow supination pronation - proximal & distal radioulnar jts at the wrist*

Articulations:	hinge jt Ulna and Humerus	hinge joint
	inferior is the proximal radio-ulnar joint	pivot joint

1 Humerus

2 Radius

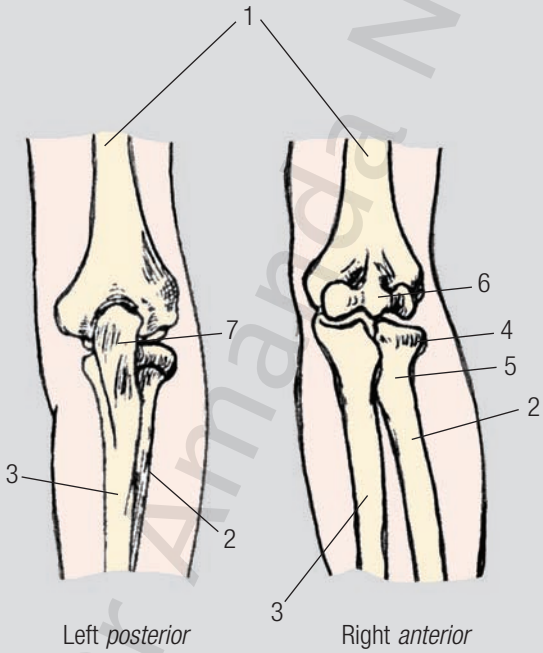
3 Ulna

4 head of Radius

5 neck of Radius

6 Trochlea of Humerus

7 Olecranon of Ulna



ELBOW joint / humero-ulna

joint, lateral / medial Flexed

(Elbow joint -hinge joint between the Ulna and the Humerus only one dimensional movement)

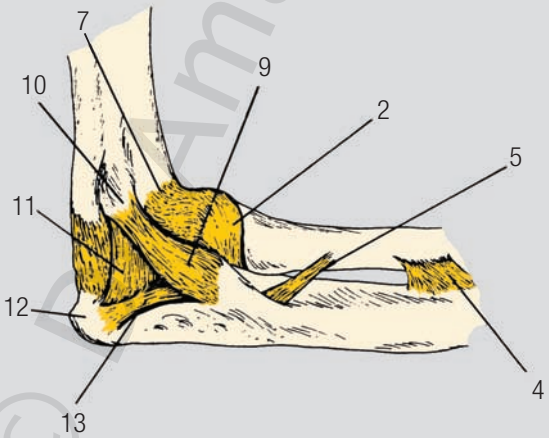
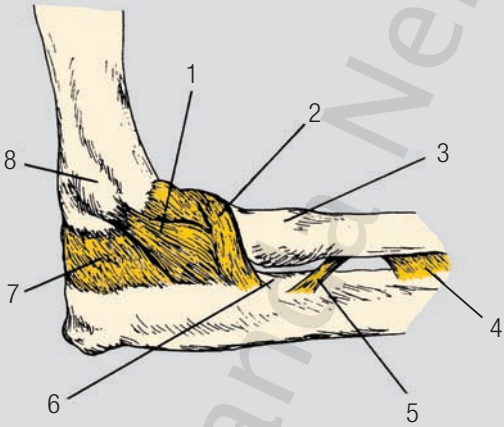
BS *anastomoses around joint from brachial, profunda brachii, radial and ulnar arteries*

NS *musculocutaneous, radial, ulnar and median Ns (C5-7)*

A *flexion and extension -elbow supination pronation - proximal & distal radioulnar jts at the wrist*

Articulations:	hinge jt Ulna and Humerus	hinge joint
	inferior is the proximal radio-ulnar joint	pivot joint

- 1 radial collateral lig
- 2 annular lig (covering the head of the Radius)
- 3 radial tuberosity
- 4 interosseous membrane
- 5 oblique cord
- 6 supinator crest of Ulna
- 7 articular capsule
- 8 lat epicondyle of Humerus
- 9 ant band of Ulnar collateral lig
- 10 medial epicondyle
- 11 post band of Ulnar collateral lig
- 12 Olecranon of Ulna
- 13 oblique band of Ulnar collateral lig

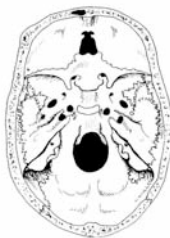
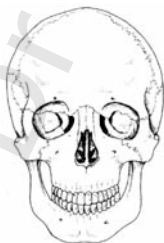


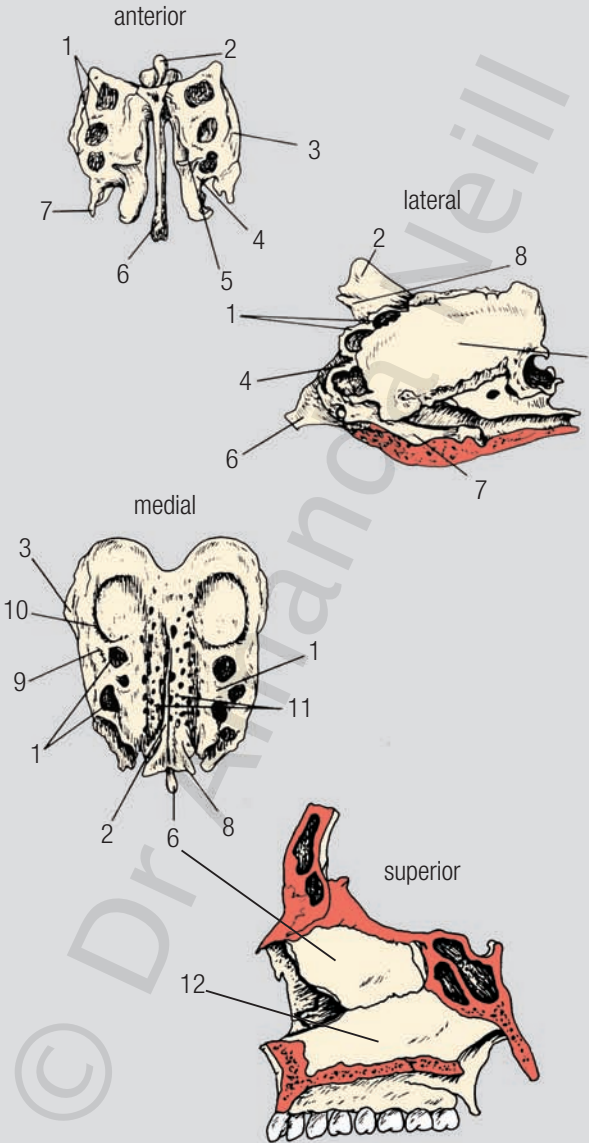
Ethmoid bones

anterior / lateral / medial / superior

(Ethmoid = sieve light spongy cubic bone sitting b/n the 2 orbital cavities).

- 1 Ethmoidal labyrinth containing air cells (part of the Ethmoid sinus) continuous with the Sphenoid sinus
- 2 Crista Galli
- 3 Orbital plate of Ethmoid bone (part of the Orbital cavity)
- 4 Middle Nasal concha
- 5 Jugum of Sphenoid - Jugum Sphenoidale
(Bridge connecting the 2 wings of the Sphenoid bone)
- 6 Perpendicular plate of the Palatine bone
- 7 Uncinate process
- 8 Ala (of Crista Galli)
- 9 Anterior groove (on the Ethmoid)
- 10 Posterior groove (on the Ethmoid)
- 11 Cribriform plate (entrance for the Olfactory nerve)
- 12 Vomer





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Femur = Thigh bone aka LEG BONE

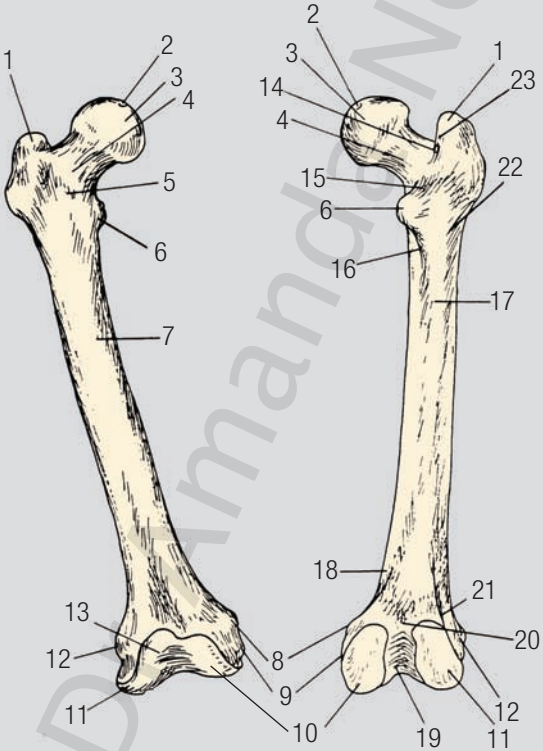
anterior / posterior

(Femur = is the longest heaviest and strongest bone in the body)

Articulations:	with acetabulum superiorly / proximally	with the hip
	with patella and tibia distally	with the knee and only 1 bone of the lower leg

- 1 greater trochanter
- 2 fovea on the head
- 3 Head of the femur
- 4 neck of the femur
- 5 intertrochanteric line
- 6 lesser trochanter
- 7 shaft of the femur
- 8 adductor tubercle
- 9 medial epicondyle
- 10 medial condyle
- 11 lateral condyle
- 12 lateral epicondyle
- 13 patella surface of the femur
- 14 trochanteric fossa
- 15 intertrochanteric crest
- 16 spiral line
- 17 linea aspera
- 18 medial supracondylar line
- 19 intertrochanteric fossa
- 20 popliteal surface
- 21 lateral supracondylar line
- 22 quadrate tubercle
- 23 gluteal tuberosity





Fibula = lower leg bone aka SHIN BONE

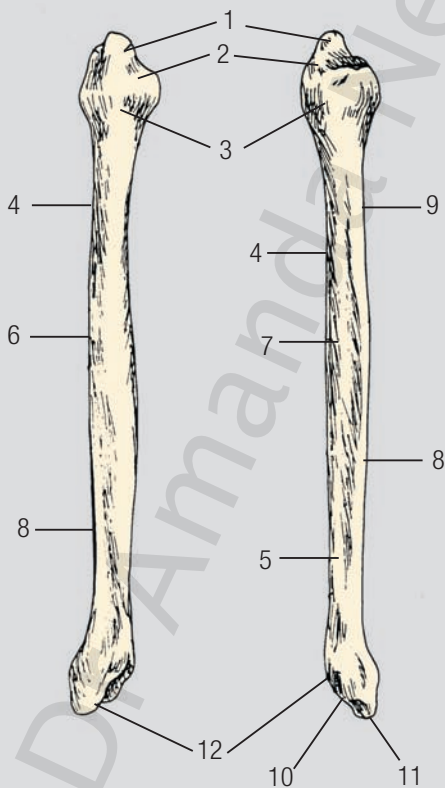
anterior / posterior

(Fibula = is a long thin lateral bone of the lower leg incidental at the knee joint pivotal at the ankle)

Articulations:	with Tibia superiorly not the knee	Tibiofibular jt
	with Talus distally lateral malleolus	Talofibular jt lateral side

- 1 styloid process
- 2 articular facet for Tibia
- 3 head of Fibula
- 4 lateral surface
- 5 lateral border
- 6 anterior border
- 7 posterior surface
- 8 interosseus border
- 9 medial surface
- 10 Tubercle between articulations
- 11 fossa for lateral malleolus
- 12 fossa for Tibia (distal)





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

FINGERS OVERVIEW = Phalanges

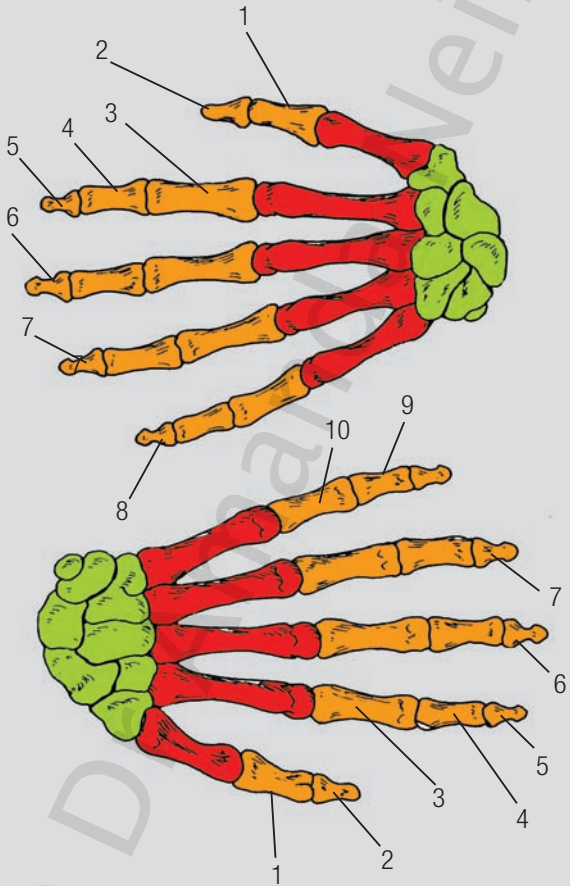
see also - *Phalanges*
dorsal / palmar

(Fingers = made up of 3 phalanges, small long bones in the hand distal to the Metacarpals. Each finger has a proximal, middle and distal phalanx, except the thumb (pollux) which only has 2 a proximal and distal phalanx)

Articulations	proximal phalanx proximal joint distal joint	with the respective metacarpal - <i>planar joint</i> the thumb - <i>saddle joint</i> with the middle phalanx - <i>hinge joint</i>
	middle phalanx proximal distal	as above with the distal phalanx - <i>hinge joint</i>
	distal phalanx	as above

- 1 proximal phalanx of the thumb
- 2 distal phalanx of the thumb
- 3 proximal phalanx of the index finger
- 4 middle phalanx of the index finger
- 5 distal phalanx of the index finger
- 6 distal phalanx of the third finger
- 7 distal phalanx of the ring finger
- 8 distal phalanx of the little finger
- 9 middle phalanx of the little finger
- 10 proximal phalanx of the fifth/little finger

orange = phalanges
red = metacarpal bones
green = carpal bones



FINGER joints = Interphalangeal joints (IP jts)

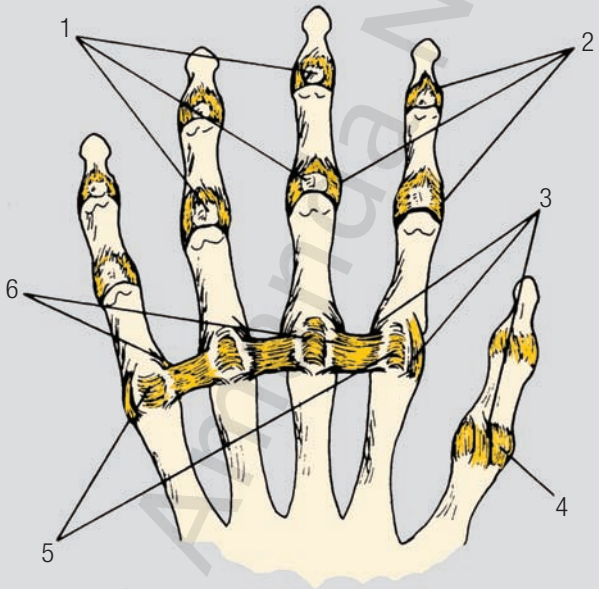
(Fingers = made up of 3 phalanges, small long bones in the hand distal to the Metacarpals. Each finger has a proximal, middle and distal phalanx, except the thumb (pollux) which only has 2 a proximal and distal phalanx)

BS *princes pollicis, radialis indicis, palmar and dorsal digital arteries NO ANASTOMOSES ACROSS THE FINGERS hence blocking both sides of the finger will result in tissue death eg wearing a tight ring*

NS *median N for medial 3½ fingers ulna N for the rest*

A *IP extension and flexion
MCP flexion / extension, rotation,
adduction / abduction circumduction*

- 1 palmar lig of IP joints
- 2 collateral ligs of IP joints
- 3 collateral ligs of MCP joints
- 4 capsule for MCP of the thumb
- 5 deep transverse MC lig
- 6 palmar lig grooved for flexor tendons



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

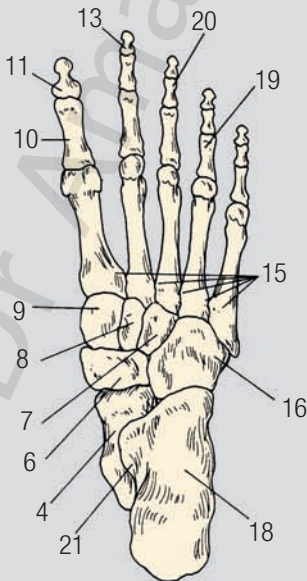
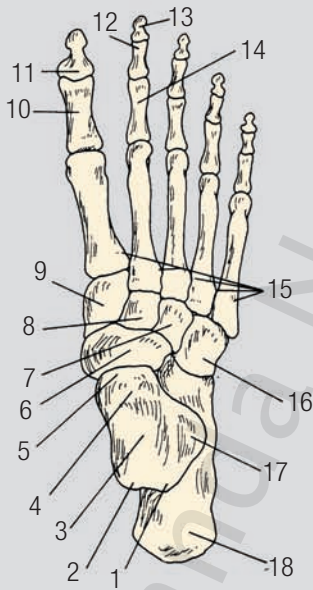
FOOT BONES overview

dorsal / plantar

(Foot defined as = Tarsal, Metatarsal bones and phalanges)

Articulations:	“foot” with Tibia & Fibula to make up the medial & lat. malleoli respectively	Talo-Fibular jt = lateral malleoli (lateral ankle) Talo-Tibial jt = medial malleoli (medial ankle)
	within the foot T-MT jts MT-P jts IP jts	foot to the ball of the foot jts ie the arch ball of the foot to the toes and toe jts

- 1 lateral tubercle of Talus
- 2 medial tubercle of Talus
- 3 trochlea of Talus
- 4 neck of Talus
- 5 head of Talus
- 6 Navicular
- 7 lat. Cuniform
- 8 intermed. Cuniform
- 9 medial Cuniform
- 10 proximal phalanx of Hallux (big toe)
- 11 distal phalanx of Hallux (big toe)
- 12 middle phalanx of 2nd toe
- 13 distal phalanx of 2nd toe
- 14 proximal phalanx of 2nd toe
- 15 MTs
- 16 Cuboid
- 17 facet for medial malleolus
- 18 calcaneus
- 19 middle phalanx of 4th toe
- 20 phalanx of 3rd toe
- 21 Sustenaculum Tali of Calcaneus



FOOT joints = Intertarsal joints (IT jts)

dorsal / plantar

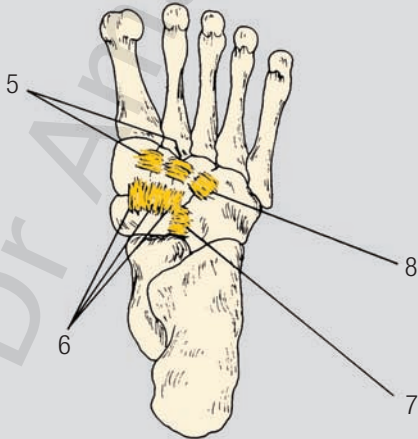
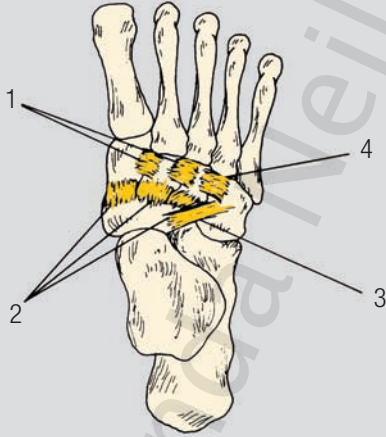
(The foot is made up of the Tarsals Metatarsals and the Toes (phalanges), small long bones in the foot distal to the Metatarsals. Each toe has a proximal, middle and distal phalanx, except the big toe (hallux) which only has 2, a proximal and distal phalanx)

BS *branches of dorsalis pedis medial & lat. plantar art.*

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

A *slight gliding and rotation to assist with inversion / eversion of the foot*

- 1 dorsal intercunifform ligs
- 2 dorsal cuneonavicular lig
- 3 dorsal cuboidenonavicular lig
- 4 dorsal cuneocuboid lig
- 5 plantar intercunifform ligs
- 6 plantar cuneonavicular lig
- 7 plantar cuboidenonavicular lig
- 8 plantar cuneocuboid lig



A Frontal bones

B *anterior / lateral / inferior*

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

E 1 Frontal tuberosity -Frontal bossing

F 2 Superciliary arch

G 3 Supraorbital margin and notch

H 4 Nasal spine

I 5 Superior and inferior temporal lines

J 6 Superior Orbital plate - pars orbitalis

K 7 Frontal and Ethmoid air cells - Frontal sinus

L 8 Posterior Ethmoidal foramen

M 9 Anterior Ethmoidal foramen

N 10 Zygomatic process

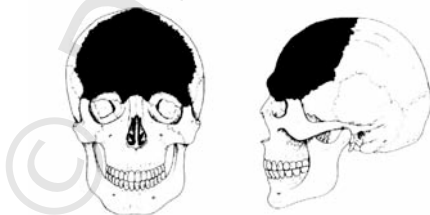
O 11 Supra-Orbital notch or foramen

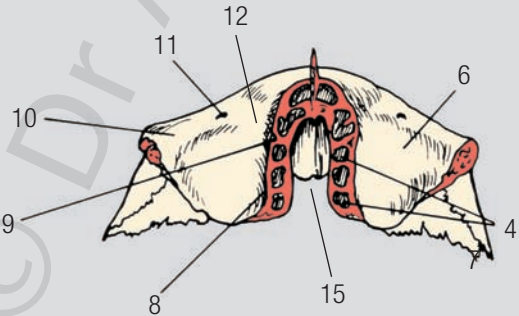
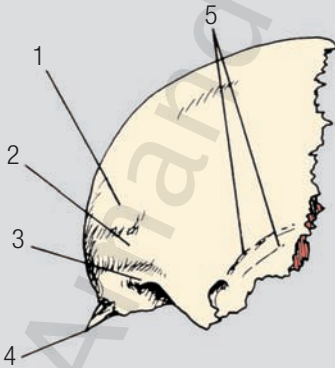
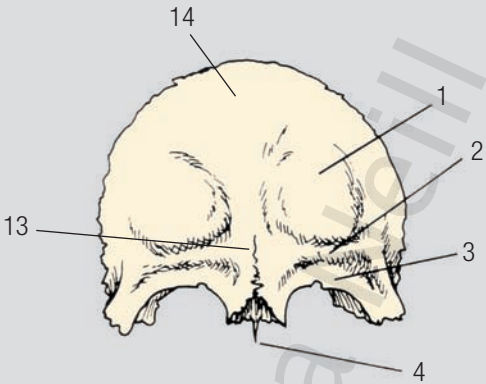
P 12 Lacrimal fossa

Q 13 Metopic suture - frontal suture, Glabella

R 14 Frontal squama

S 15 Ethmoidal notch





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

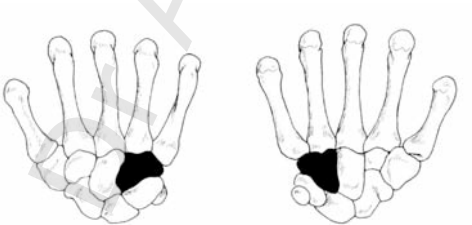
Hamate = hammer

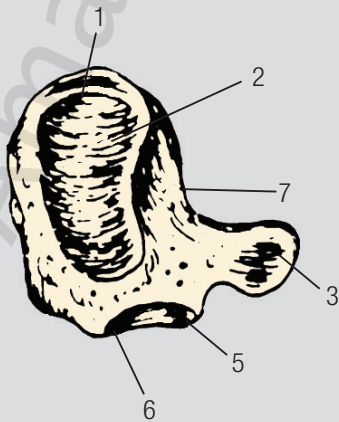
lateral / medial

(Hamate or hammer like bone in the first row of the Carpus or Wrist bones)

Articulations:	with Triquetral proximally	with 4 th and 5 th Metacarpals (MC) distally
	with Capitate lateroproximally	with Lunate medially

- 1 articular surface for Lunate
- 2 articular surface for Triquetral
- 3 Hook / Hamulus
- 4 articular surface for Capitate
- 5 articular surface for 5th MC
- 6 articular surface for 4th MC
- 7 palmar surface
- 8 dorsal surface





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

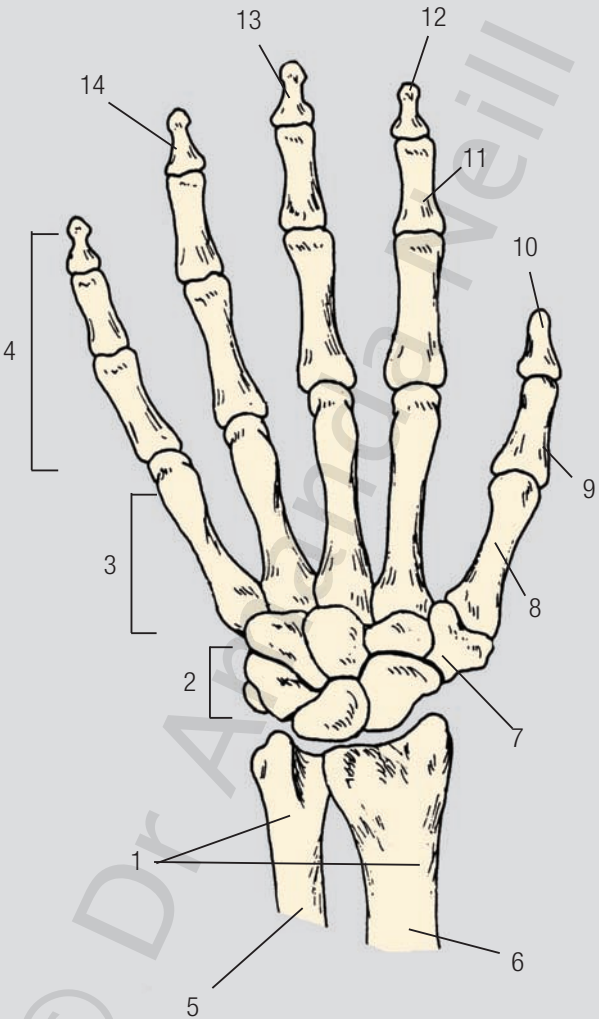
HAND and WRIST bones overview

dorsal

(Hand bones = metacarpals + phalanges (finger bones))

Wrist bones = carpals - 2 layers of irregular bones)

- 1 distal ends of forearm bones
- 2 carpus or wrist bones in 2 layers
- 3 metacarpal bones
- 4 phalanges = finger bones
- 5 Ulna, distal end
- 6 Radius, distal end
- 7 Scaphoid (part of os carpus/wrist)
- 8 first metacarpal bone
- 9 proximal phalanx of thumb (pollux)
- 10 distal phalanx of thumb
- 11 middle phalanx of 2nd finger (index finger)
- 12 distal phalanx of index finger
- 13 distal phalanx of 3rd finger (middle finger)
- 14 distal phalanx of 4th finger (ring finger)



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

HAND (and WRIST) bones overview

palmar

(Hand bones = metacarpals + phalanges (finger bones))

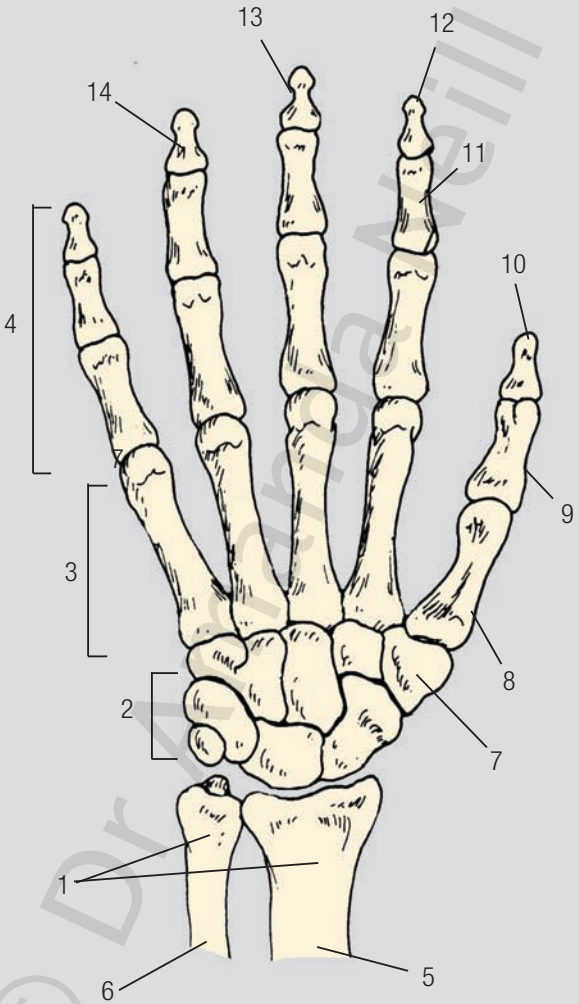
Wrist bones = carpals - 2 layers of irregular bones)

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

Articulations	main levels forearm with wrist wrist with hand hand with fingers	radiocarpal / radioulna carpometacarpal (C-MC) metacarpophalangeal (MC-P)
	sublevel within the wrist along the fingers	intercarpal (IC) interphalangeal (IP)
Special features	thumb/pollux only has 2 phalanges proximal & distal all other fingers have 3 (middle)	MC-P in the thumb = saddle joint - hence additional mobility

- 1 distal ends of forearm bones
- 2 carpus or wrist bones in 2 layers
- 3 metacarpal bones
- 4 phalanges = finger bones
- 5 Ulna, distal end
- 6 Radius, distal end
- 7 Scaphoid (part of os carpus/wrist)
- 8 first metacarpal bone
- 9 proximal phalanx of thumb (pollux)
- 10 distal phalanx of thumb
- 11 middle phalanx of 2nd finger (index finger)
- 12 distal phalanx of index finger
- 13 distal phalanx of 3rd finger (middle finger)
- 14 distal phalanx of 4th finger (ring finger)





Hand - Intercarpal joints = IC joints b/n the wrist and the fingers

dorsal / palmar

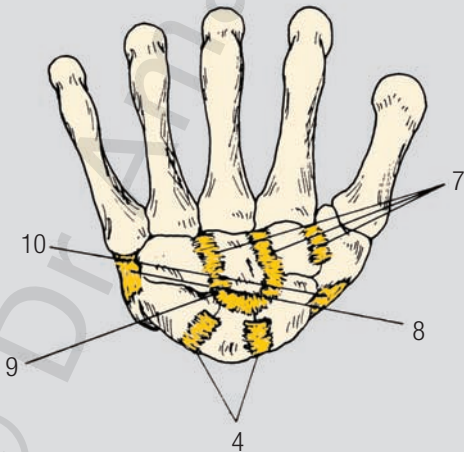
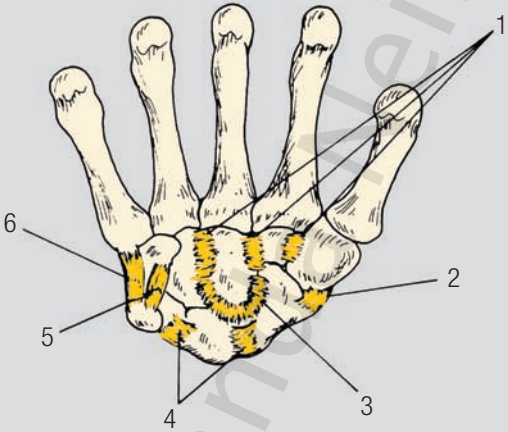
BS *anterior interosseus C & MC branches of radial & ulna art. and deep palmar arch rich aa*

NS *ant post interosseus Ns (C6-8)*

A *sliding and gliding to allow increased wrist range of movement, radial and ulnar deviation*

- 1 palmar C-MC lig
- 2 radial collat lig
- 3 palmar radiate C lig
- 4 proximal IC lig
- 5* pisiohamate lig
- 6* pisio-MC lig
- 7 distal dorsal IC lig
- 8 radial collat lig
- 9 dorsal radiate lig
- 10 dorsal C-MC lig

* Bifurcate ligament



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

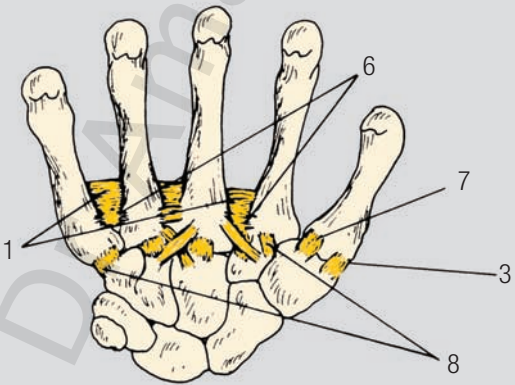
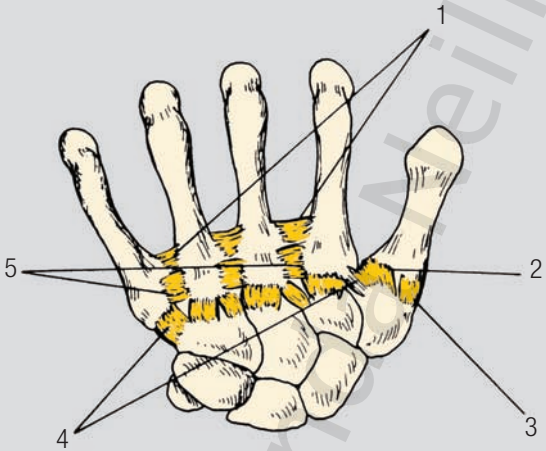
palmar / dorsal

BS *anterior interosseus carpal and metacarpal branches of radial and ulna arteries and deep palmar arch rich aa*

NS *ant post interosseus Ns (C6-8)*

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

- 1 interosseous MC lig
- 2 dorsal lig of the thumb
- 3 lateral lig of the thumb
- 4 dorsal C-MC lig
- 5 dorsal MC-MC lig (inter MC)
- 6 palmar MC-MC lig (inter MC)
- 7 palmar lig of the thumb
- 8 palmar C-MC lig

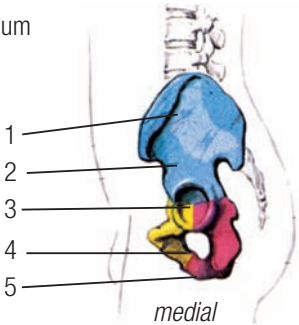


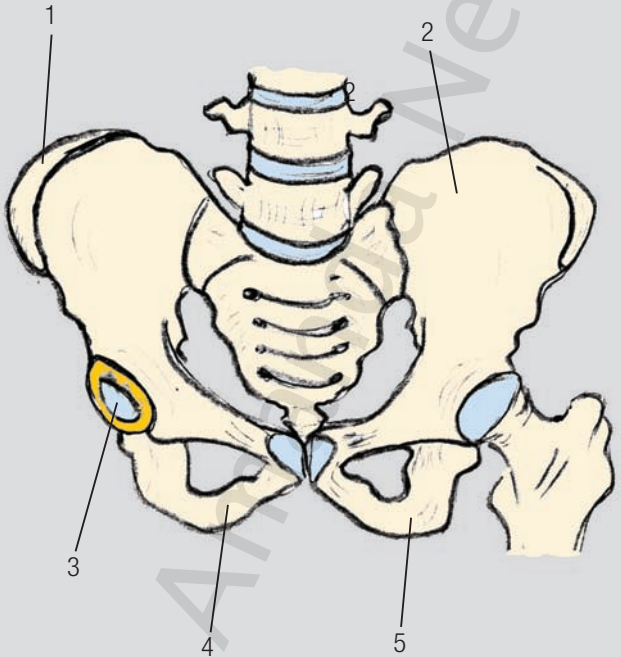
Hip bone = Innominate bone (unnamed bone) = Os Coxae

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

Articulations	Pubis to Pubis defining the Sagittal plane	Pubic symphysis
	Femur with Acetabulum	hip joint = ball and socket
	Ilium with Sacrum	Iliosacral joint
Special features	3 component bones PUBIS/pubic bone (yellow), ILEUM (blue) & ISCHIUM (pink) with separate ossification centres completely fuse in adolescence	Acetabulum intersection of the 3 component bones
	hip+sacrum+hip = pelvic girdle (PG)	PG longer ♂ wider ♀

- 1 crest of Ilium
- 2 Ala of Ilium
- 3 Acetabulum - cavity with the junction of all 3 bones
- 4 ramus of Pubis/Pubic bone
- 5 tuberosity of the Ischium





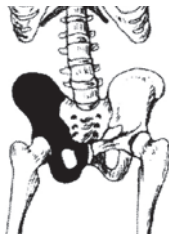
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

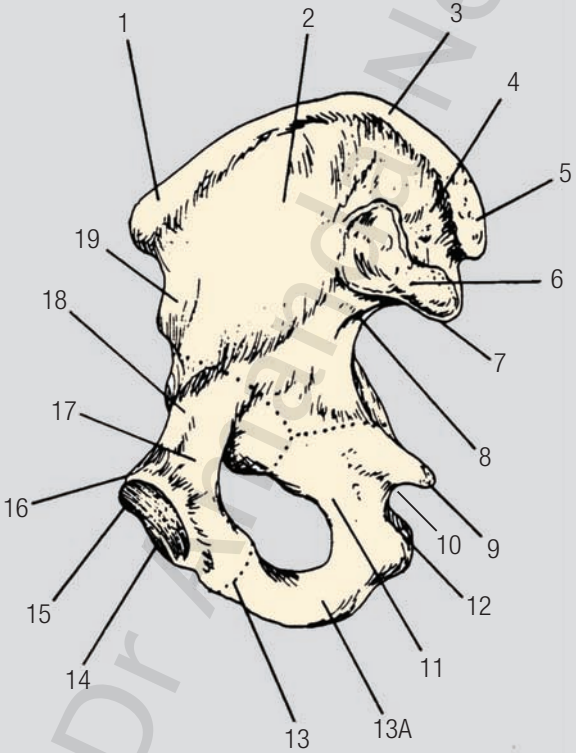
Hip bone = Innominate bone (unnamed bone) = Os Coxae

lateral

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

- 1 ASIS = anterior superior iliac spine
- 2 Iliac fossa
- 3 Iliac crest
- 4 Iliac tuberosity
- 5 PSIS = posterior superior iliac spine
- 6 Auricular surface / articular surface of Ilium with sacrum
- 7 PIIS = posterior inferior iliac spine
- 8 greater sciatic notch (enclosed with a ligament in life)
- 9 ischial spine
- 10 lesser sciatic notch
- 11 ischial body
- 12 ischial tuberosity
- 13 ischiopubic junction
- 13A ischiopubic ramus
- 14 pubic symphysis
- 15 pubic crest
- 16 pubic tubercle
- 17 superior ramus of Pubis
- 18 iliopubic eminence
- 19 AIIS = anterior inferior iliac spine



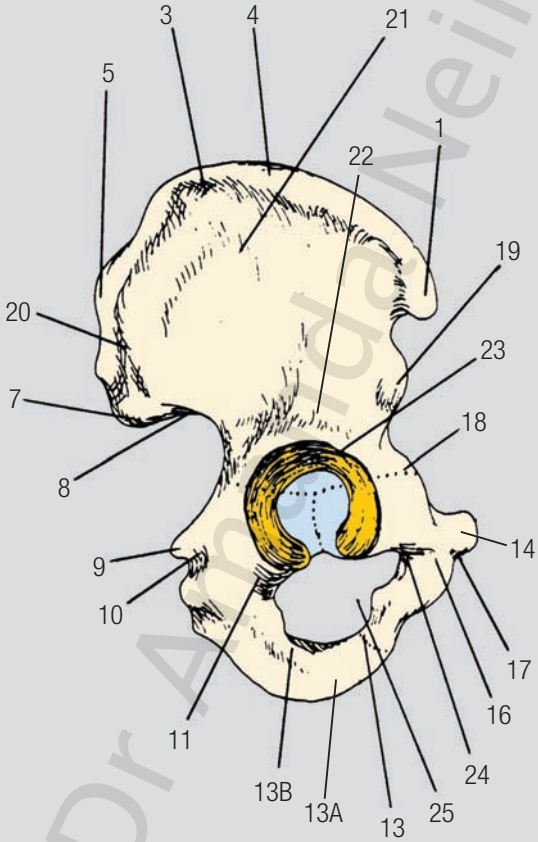


Hip bone = Innominate bone (unnamed bone) = Os Coxae

medial

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

- 1 ASIS = anterior superior iliac spine
- 2 Iliac fossa
- 3 Iliac crest
- 4 Iliac tuberosity
- 5 PSIS = posterior superior iliac spine
- 6 Auricular surface / articular surface of Ilium with sacrum
- 7 PIIS = posterior inferior iliac spine
- 8 greater sciatic notch (enclosed with a ligament in life)
- 9 ischial spine
- 10 lesser sciatic notch
- 11 ischial body
- 12 ischial tuberosity
- 13 ischiopubic junction
- 13A ischiopubic ramus
- 13B ischio ramus
- 14 pubic symphysis
- 15 pubic crest
- 16 pubic tubercle
- 17 superior ramus of Pubis
- 18 iliopubic eminence
- 19 AIIIS = anterior inferior iliac spine
- 20 post. gluteal line
- 21 inf. gluteal line
- 22 crest of Acetabulum
- 23 rim of Acetabulum
- 24 obturator groove
- 25 obturator foramen



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Hip joint

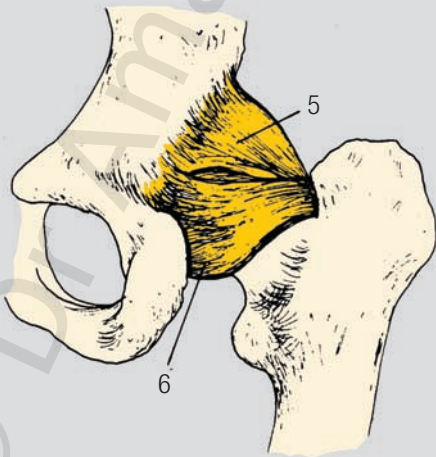
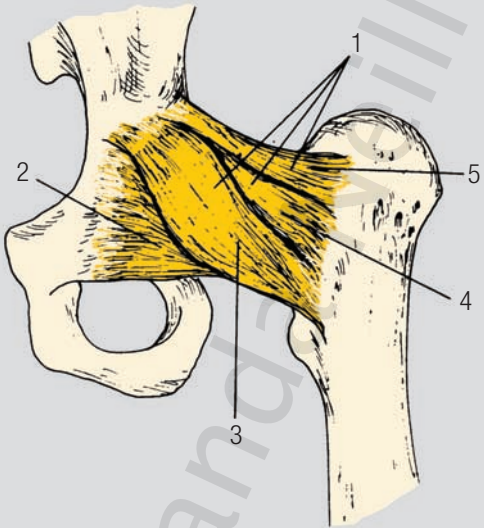
anterior / posterior

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

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

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

- 1 iliofemoral lig
- 2 pubofemoral lig
- 3 medial band of iliofemoral lig
- 4 central band of iliofemoral lig
- 5 lateral band of iliofemoral lig
- 6 ischiofemoral lig



Hip joint

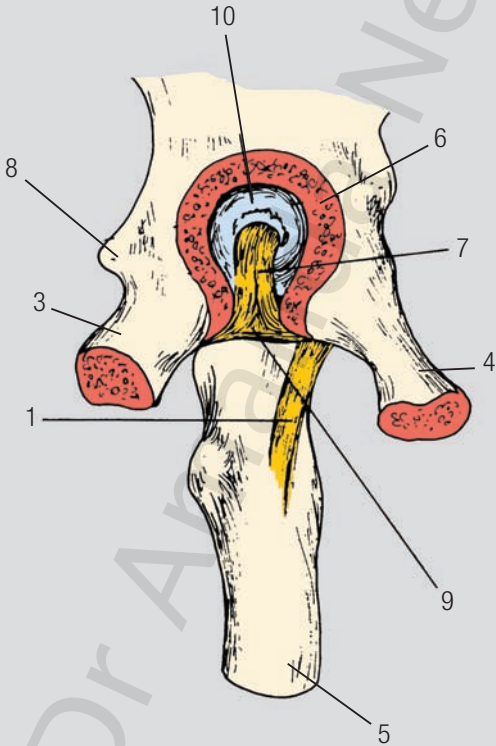
medial

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

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

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

- 1 iliofemoral lig
- 2 pubofemoral lig
- 3 ischeal ramus
- 4 pubic ramus
- 5 femur
- 6 acetebulum-edge
- 7 ligament of femoral head
- 8 ischeal spine
- 9 transverse ligament
- 10 head of femur in acetabulum-cavity



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

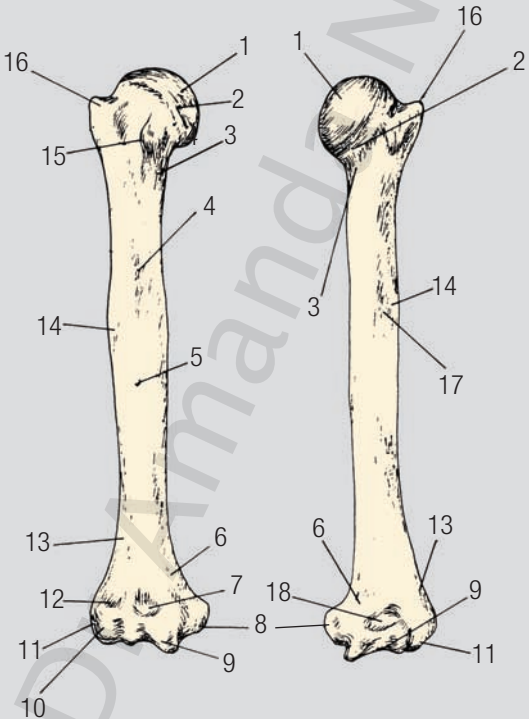
Humerus = ARM bone (upper arm bone)

anterior / posterior

(Humerus = largest bone in the upper limb)

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

- 1 head of Humerus / epiphysis
- 2 anatomical neck
- 3 surgical neck
- 4 medial lip of intertubercular sulcus
- 5 shaft of Humerus / diaphysis and nutrient foramen
- 6 medial supracondylar ridge
- 7 coronoid fossa
- 8 medial epicondyle
- 9 trochlea
- 10 capitulum
- 11 lateral epicondyle
- 12 radial fossa
- 13 lateral supracondylar ridge
- 14 deltoid tuberosity
- 15 lesser tubercle
- 16 greater tubercle
- 17 sulcus for radial N
- 18 olecranon fossa



Hyoid

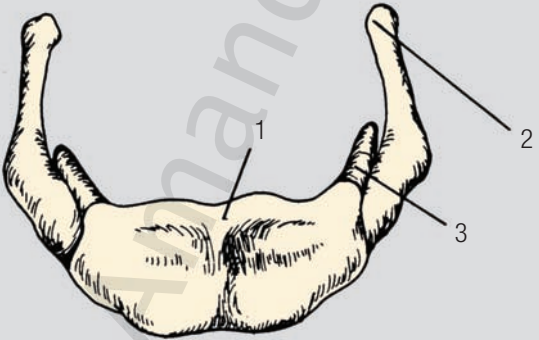
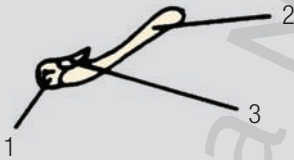
Description - Small U-shaped bone. Attached to the styloid processes via ligaments. This bone has no articulations -the only bone in the body - and is not normally broken in trauma, protected by the mandible / CHIN. It may be broken in hanging and strangulation.

Articulations:	nil
Special features	of interest in Forensic investigation rarely broken unless specific pressure on this bone because of its site, acts to shape the jawline by supporting and bending the strap muscles

- 1 body of hyoid
- 2 greater horn (cornu)
- 3 lesser horn (cornu)



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z



KNEE articulation

anterior / posterior

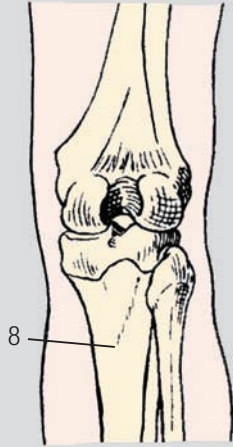
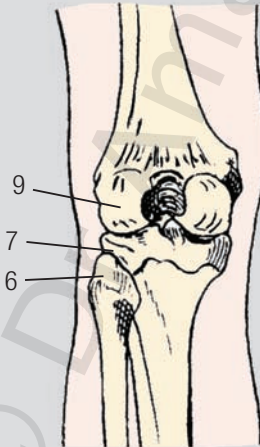
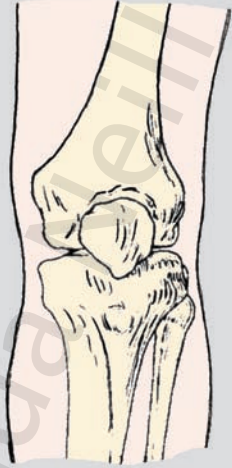
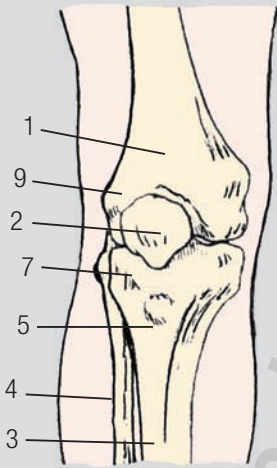
(the knee is the most unstable peripheral joint in the body)

BS *genicular branches of the following: femoral, ant. tibial and peroneal*

NS *tibial (S1-2)*

A *hinge joint - flexion/extension slight lateral and medial rotation for "locking" and "unlocking"*

- 1 Femur
- 2 Patella
- 3 Tibia
- 4 Fibula
- 5 Tibial tuberosity
- 6 styloid process of Fibula
- 7 lateral condyle of Tibia
- 8 soleal line
- 9 lateral condyle of Femur



KNEE JOINT

(the knee is the most unstable peripheral joint in the body)

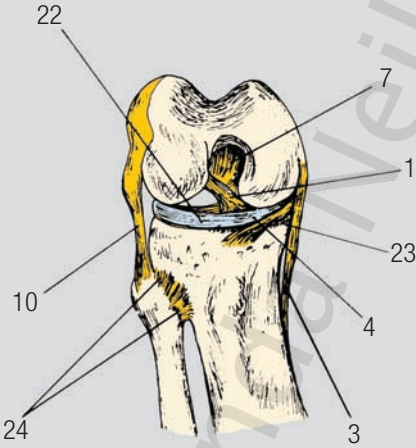
BS *genicular branches of the following: femoral, ant. tibial and peroneal*

NS *tibial, N (S1-2)*

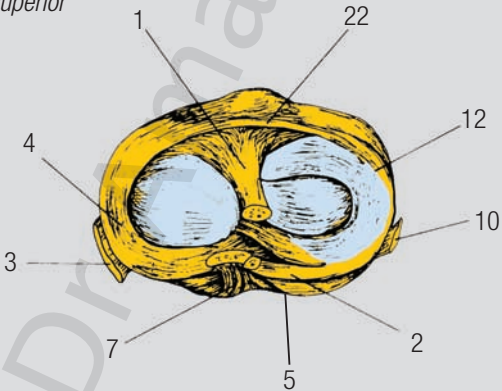
A *hinge joint - flexion/extension slight lateral and medial rotation for "locking" and "unlocking"*

- 1 ant. cruciate lig
- 2 post. meniscomfemoral lig
- 3 tibial collat lig
- 4 medial meniscus
- 5 tendon of semimembranosis
- 6 oblique popliteal lig
- 7 post. cruciate lig
- 8 popliteal muscle
- 9 arcuate lig
- 10 fibular collat lig
- 11 tendon of popliteal
- 12 lateral meniscus
- 13 suprapatellar bursa
- 14 tendon of quadratus
- 15 patella
- 16 subcutaneous prepatella bursa
- 17 infrapatella fat pad
- 18 patella lig
- 19 deep infrapatella bursa
- 20 synovial cavity
- 21 fibrous capsule
- 22 transverse lig of the knee
- 23 coronary lig
- 24 ant lig of the proximal tibiofibular joint

anterior flexed



superior



KNEE JOINT

posterior / lateral

(the knee is the most unstable peripheral joint in the body genu = knee)

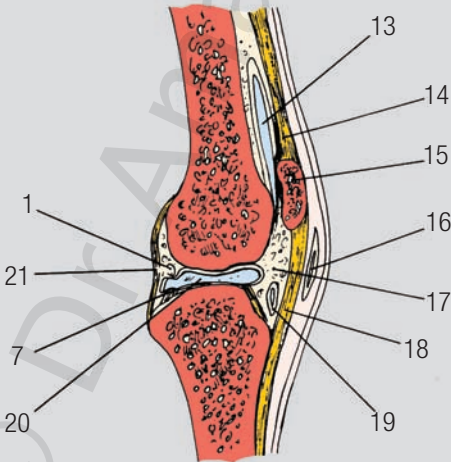
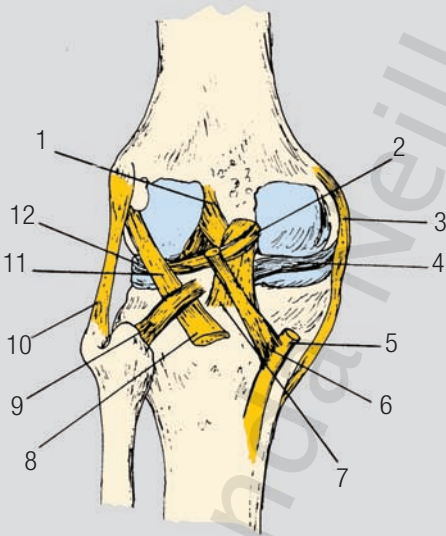
BS *genicular branches of the following: femoral, ant. tibial and peroneal*

NS *tibial, Ns (S1-2)*

A *hinge joint - flexion/extension slight lateral and medial rotation for “locking” and “unlocking”*

intra-articular MENISCI, CRUCIATE LIGAMENTS, structures

- 1 ant. cruciate lig
- 2 post. meniscomfemoral lig
- 3 tibial collat lig
- 4 medial meniscus
- 5 tendon of semimembranosis
- 6 oblique popliteal lig
- 7 post. cruciate lig
- 8 popliteal muscle
- 9 arcuate lig
- 10 fibular collat lig
- 11 tendon of popliteal
- 12 lateral meniscus
- 13 suprapatellar bursa
- 14 tendon of quadratus
- 15 patella
- 16 subcutaneous prepatella bursa
- 17 infrapatella fat pad
- 18 patella lig
- 19 deep infrapatella bursa
- 20 synovial cavity
- 21 fibrous capsule



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

LEG = Lower limb

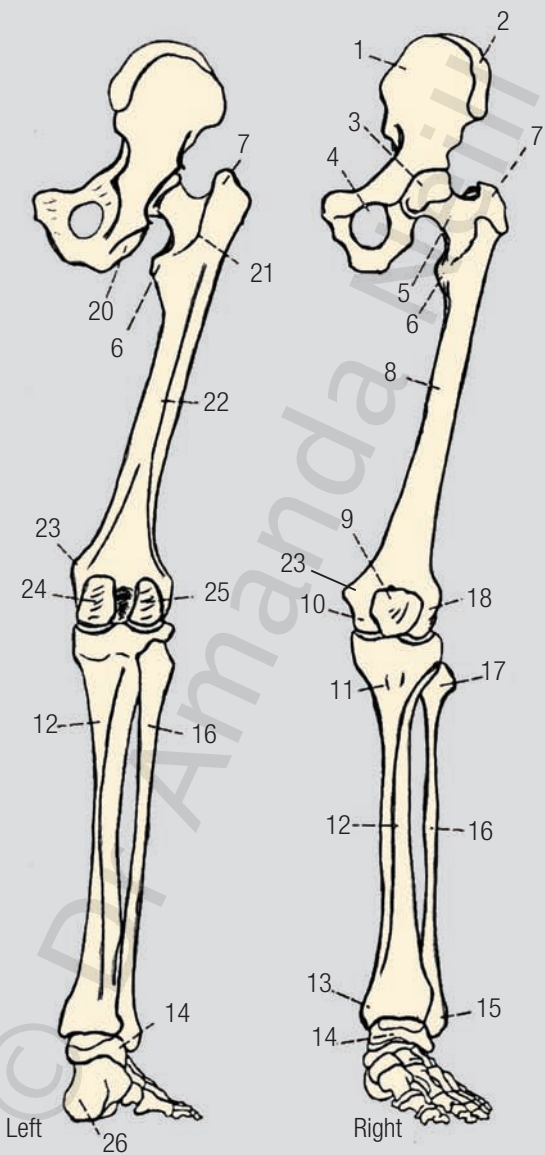
anterior FRONT / posterior BACK

BS *femoral, obturator, arteries*

NS *femoral - anterior thigh, obturator - medial thigh
sciatic - posterior thigh and everything below the
knee (including the foot) (L2-S1)*

A *hip - all movements,
knee - flexion extension
ankle - dorsiflexion/plantarflexion eversion/inversion
toes as with fingers*

- 1 iliac crest
- 2 Hip / coxal bone
- 3 head of Femur (epiphysis)
- 4 obturator foramen
- 5 neck of Femur
- 6 lesser trochanter
- 7 greater trochanter
- 8 shaft of femur (diaphysis)
- 9 Patella (knee cap)
- 10 medial epicondyle
- 11 tibial tuberosity
- 12 Tibia
- 13 medial malleolus (ankle)
- 14 Talus
- 15 lateral malleolus
- 16 Fibula
- 17 head of Fibula
- 18 lateral epicondyle
- 19 proximal phalanx of the big toe
- 20 ischeal tuberosity
- 21 intertrochanteric crest
- 22 linea aspera
- 23 adductor tubercle
- 24 medial condyle
- 25 lateral condyle
- 26 Calcaneus (heel)

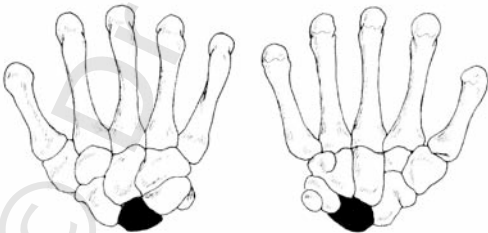


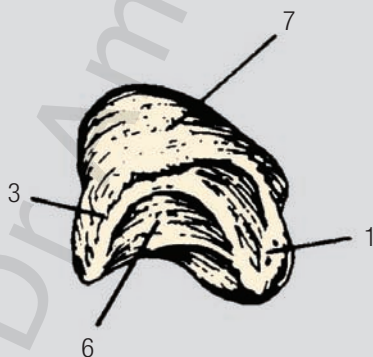
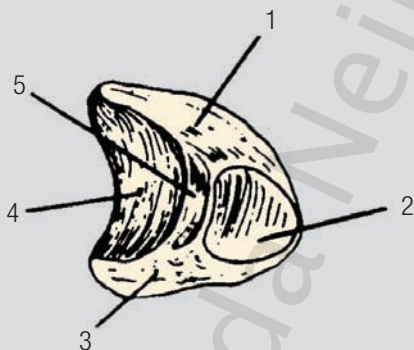
**Lunate = Os Lunatus = part of Os Carpus
(wrist bones)**

(Lunate - small moon shaped of the wrist, 1st row of carpal bones = part of the os carpus consists mainly of articulating facets)

Articulations	the other bones in the wrist and the distal end of the radius	capito - lunate radio - lunate luno - scaphoid luno - triquetral luno - hamate
---------------	---	--

- 1 palmar surface
- 2 facet for Triquetral
- 3 dorsal surface
- 4 facet for Capitate
- 5 facet for Hamate
- 6 facet for Scaphoid
- 7 facet for Radius





A **Mandible = JAW**

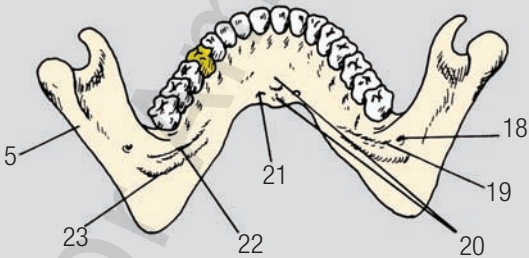
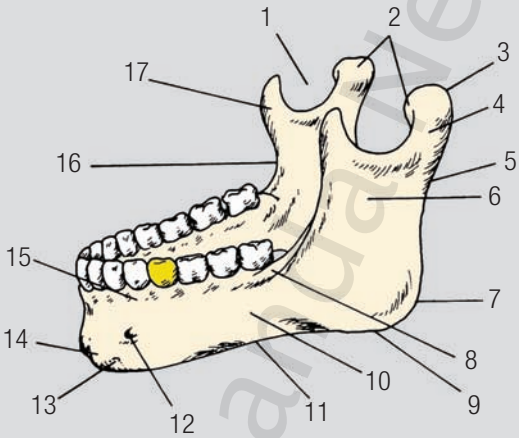
B *lateral / posterior*

C (Mandible - lower jaw bone joins the skull via the condyles and a
D cartilaginous articular plate in the Temporal fossa.
E Primary function - mastication, houses all the bottom teeth).

Articulations	with the Temporal fossa - this shallow fossa makes it easy to dislocate this joint	TMJ = temporomandibular joint
---------------	--	-------------------------------

- I 1 mandibular notch
J 2 pterygoid fovea
K 3 head of Mandible - condylar process
L 4 neck of Mandible
M 5 post. border of ramus of Mandible
N 6 ramus - vertical ramus
O 7 angle of mandible
P 8 oblique line
Q 9 inferior border
R 10 body - horizontal ramus
S 11 base
T 12 mental foramen
U 13 mental tubercle - Gnathion
V 14 mental protuberance
W 15 alveolar bone surrounding teeth
X 16 anterior border of ramus
Y 17 coronoid process - endocoronial ridge
Z 18 mandibular foramen
19 lingula
20 superior and inferior mental spines
21 digastric fossa
22 mylohyoid line
23 mylohyoid groove





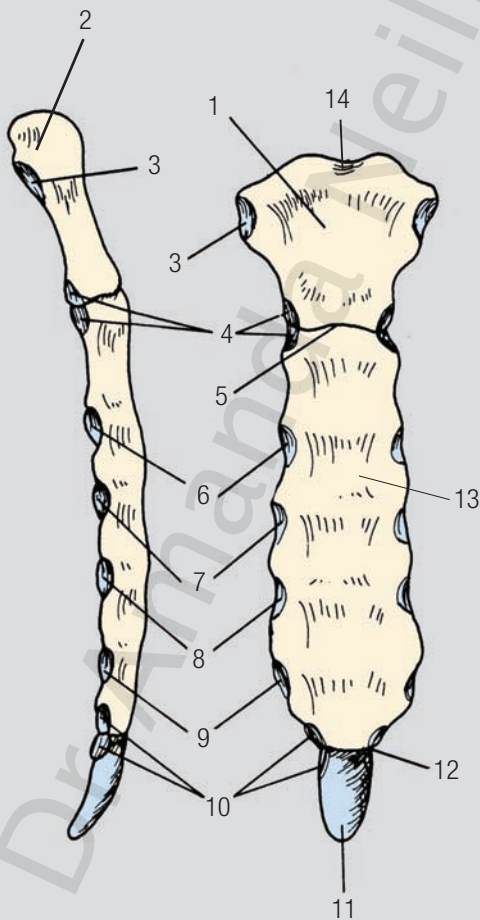
Manubriosternum = BREAST BONE

(Combination of 3 bones = Manubrium + Sternum + Xiphoid)

Articulations	Manubrium + Sternum Manubrium + 1 st rib; 2 nd rib Manubrium + Clavicle Sternum with all costal cartilages except the 1 st Xiphoid with Sternum Xiphoid with 7 th rib	manubriosternum manubrioclavicular costomanubrial costosternal xiphisternal
Special features	6 ossification centres Xiphoid bone bizarre patterns of ossification	

- 1 Manubrium
- 2 clavicular notch
- 3 notch for 1st costal cartilage (rib)
- 4 notch for 2nd costal cartilage (cartilaginous part of the rib)
- 5 sternal angle / manubriosternal joint - fibrous
- 6 notch for 3rd costal cartilage
- 7 notch for 4th costal cartilage
- 8 notch for 5th costal cartilage
- 9 notch for 6th costal cartilage
- 10 notch for 7th costal cartilage
- 11 xiphoid process
- 12 Xiphisternal joint
- 13 Sternum
- 14 Jugular notch





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

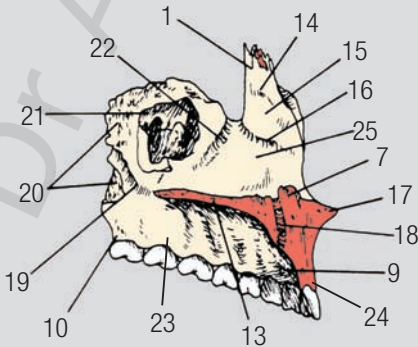
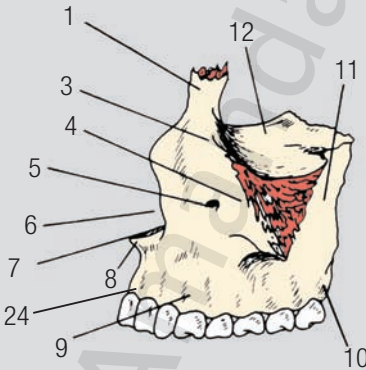
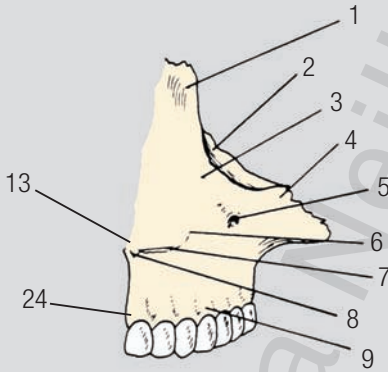
Maxilla / Maxillae Bones

anterior / lateral / medial

(The Maxillae are 2 paired bones which form the dominant portion of the face and hold the upper teeth. The “overgrowth” of the Maxilla is often the reason for orthodontic treatment.)

- 1 frontal process
- 2 medial orbital surface
- 3 infra-orbital margin
- 4 zygomatic process
- 5 infra-orbital foramen
- 6 nasal notch
- 7 nasal crest
- 8 anterior nasal spine
- 9 alveolar bone around teeth
- 10 tuberosity
- 11 infra-temporal surface
- 12 orbital surface
- 13 palatine process
- 14 ethmoid crest
- 15 middle meatus
- 16 conchal crest
- 17 anterior Nasal spine
- 18 *premaxillary suture is here - fuses with completed jaw growth*
Incisive canal supported by the canine jugun
- 19 Greater Palatine canal - groove
- 20 articulating surface – with Palatine bones
- 21 maxillary hiatus continues with the sinus
- 22 Nasal Lacrimal process
- 23 alveolus -bone containing tooth root
- 24 canine jugun
- 25 inferior meatus





Metacarpals = HAND BONES

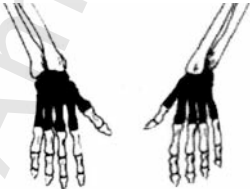
(metacarpals = bones between the wrist and the fingers)

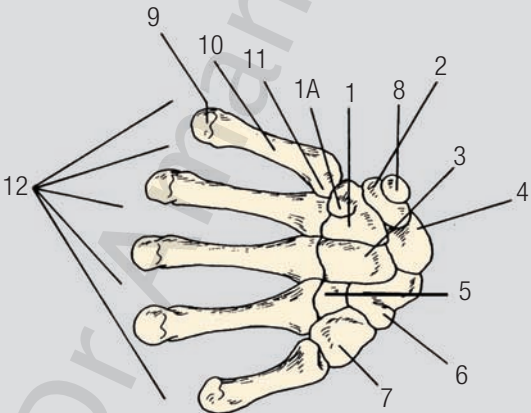
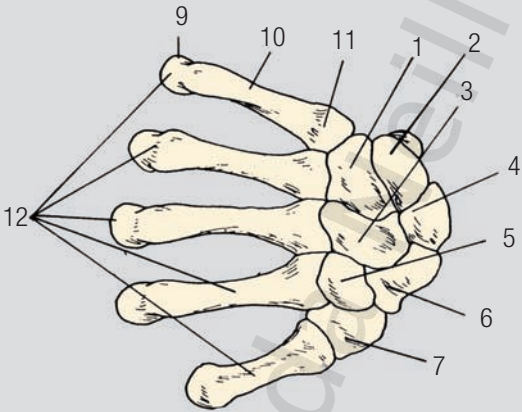
Articulations	proximal - 2 nd row of carpal bones (wrist bones) metacarpals either side distal - proximal end of the approp. proximal phalanx
Special features	these are long bones

upper dorsal (back of the hand)
lower palmar (palm of the hand)

- 1 Hamate
- 1A hook of Hamate
- 2 Triquetral
- 3 Capitate
- 4 Lunate
- 5 Trapezoid
- 6 Scaphoid
- 7 Trapezium
- 8 Pisiform
- 9 head
- 10 shaft
- 11 base
- 12 METACARPAL bones from above down

5th (to the little finger), 4th (to the ring finger),
3rd, (to the middle finger), 2nd (to the index finger)
and 1st (to the thumb)





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

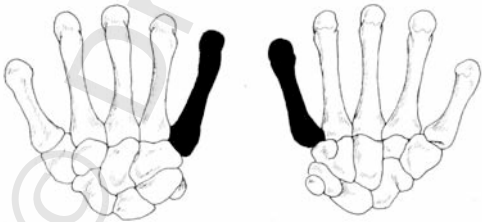
Metacarpal fifth = bone to the little finger

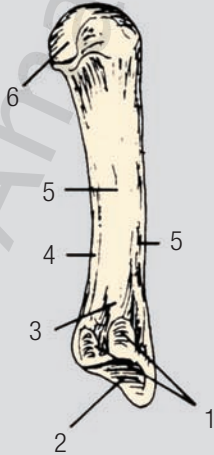
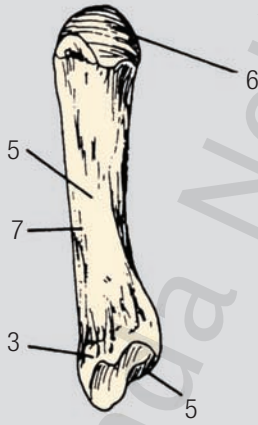
(metacarpal = bone between the wrist and the fingers)

Articulations	proximal - 2 nd row of carpal bone Hamate / 4 th metacarpal distal - proximal end of the fifth proximal phalanx
Special features	these are long bones

upper - lateral
lower - medial

- 1 articular surface for 4th metacarpal
- 2 articular surface for Hamate
- 3 Base / proximal end
- 4 palmar surface
- 5 shaft
- 6 head / distal end articulates with 5th phalanx
- 7 dorsal surface





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

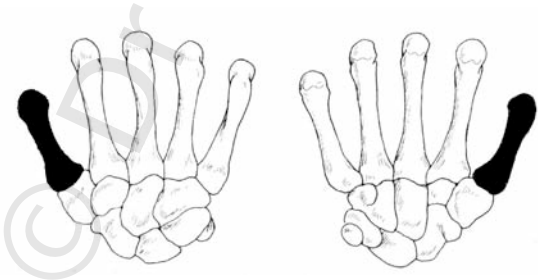
Metacarpal first = bone to the thumb

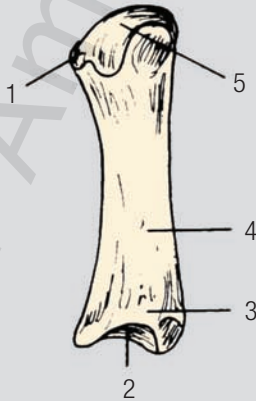
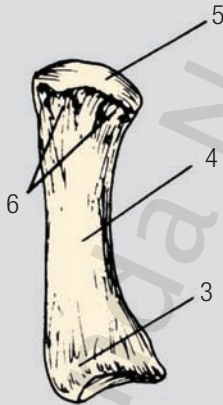
(metacarpal = bone between the wrist and the fingers)

Articulations	proximal - 2 nd row carpal bone Trapezium / distal - proximal end of the first proximal phalanx	
Special features	long bone	wide ranging joint does not articulate with the next metacarpal set apart

upper - lateral
lower - medial

- 1 articular eminence associated with sesamoid bone
- 2 articular surface for Trapezium
- 3 Base / proximal end
- 4 shaft
- 5 Head / distal end articulates with 1st phalanx
- 6 groove crossed by Flexor Pollicis Brevis and Longus





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

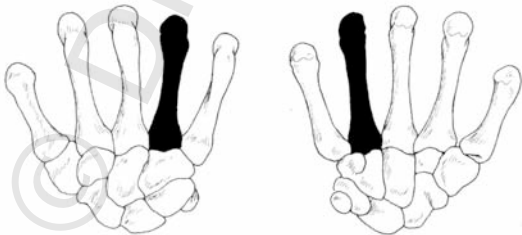
Metacarpal fourth = bone to the ring finger

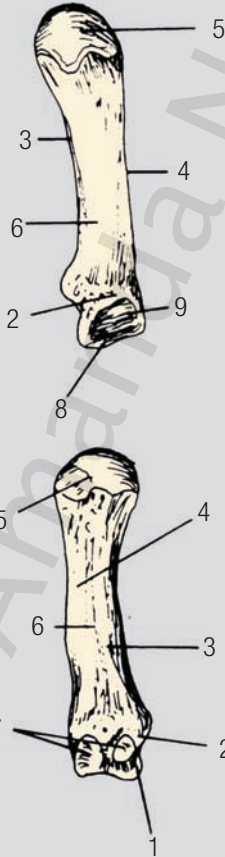
(metacarpal = bone between the wrist and the fingers)

Articulations	proximal - 2 nd row carpal bone Hamate / 3 rd metacarpal, 5 th metacarpal
	distal - proximal end of the 4 th proximal phalanx
Special features	long bone

upper - lateral
lower - medial

- 1 articular surface for Capitate
- 2 Base / proximal end
- 3 palmar surface
- 4 dorsal surface
- 5 Head / distal end articulates with 4th phalanx head
- 6 shaft
- 7 articular surface for 3rd metacarpal
- 8 articular surface for Hamate
- 9 articular surface for 5th metacarpal





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

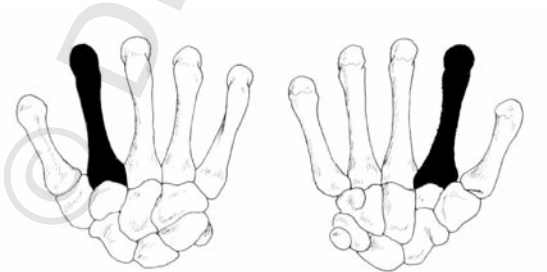
Metacarpal second = bone to the index finger

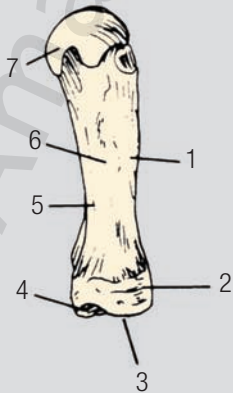
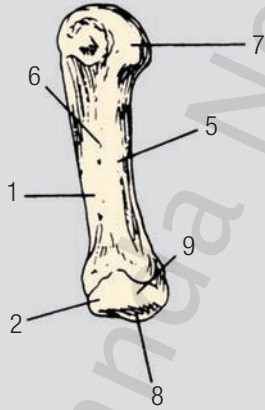
(metacarpal = bone between the wrist and the fingers)

Articulations	proximal - 2 nd row carpal bone Trapezoid / Trapezium / Capitate
	3 rd metacarpal, 4 th metacarpal distal - proximal end of the 2 nd proximal phalanx
Special features	long bone

upper - lateral
lower - medial

- 1 dorsal surface
- 2 Base / proximal end
- 3 articulation with Trapezoid
- 4 articulation with Trapezium
- 5 palmar surface
- 6 shaft
- 7 Head - articulation with phalanx of index finger
- 8 articular surface for Capitate
- 9 articular surface for 3rd metacarpal





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

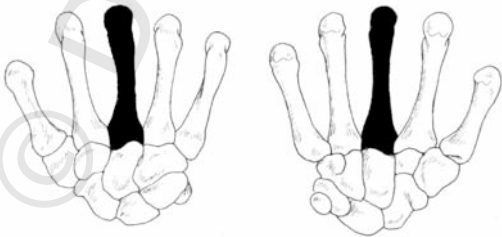
Metacarpal third = bone to the middle finger

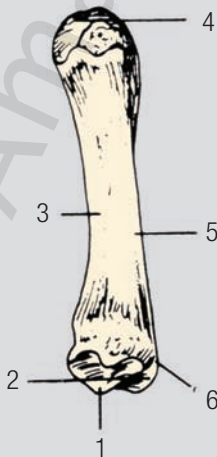
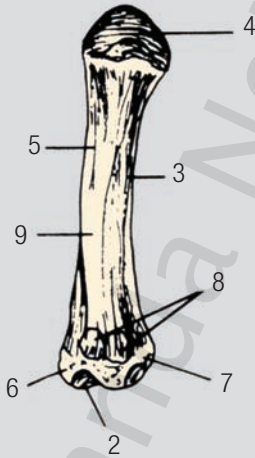
(metacarpal = bone between the wrist and the fingers)

Articulations	proximal - 2 nd row carpal bone Capitate
	2 nd metacarpal, 4 th metacarpal distal - proximal end of the 3 rd proximal phalanx
Special features	long bone

upper - lateral
lower - medial

- 1 articular surface for 2nd metacarpal
- 2 articular surface for Capitate
- 3 palmar surface
- 4 Head - articulation with proximal phalanx of middle finger
- 5 dorsal surface
- 6 Styloid process
- 7 Base / proximal end -
- 8 articular surface for 4th metacarpal
- 9 shaft





Metatarsals Overview = FOOT BONES (not ankle)

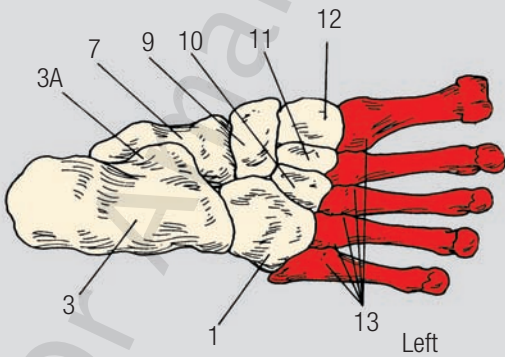
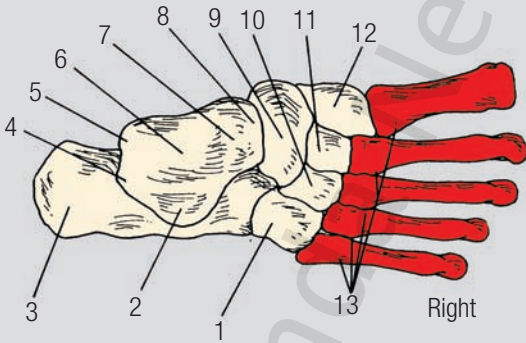
(metatarsals = bones between the ankle and the toes)

Articulations	proximal - tarsal bones (ankle bones) metatarsals either side
	distal - proximal end of the approp. proximal phalanx
Special features	these are long bones

upper dorsal (back of the foot)

lower palmar (sole of the foot)

- 1 Cuboid
- 2 facet for medial malleolus
- 3 Calcaneus
- 3A Sustenaculum Tali of Calcaneus
- 4 lateral tubercle of Talus
- 5 medial tubercle of Talus
- 6 trochlear surface of Talus
- 7 neck of Talus
- 8 head of Talus
- 9 Navicular
- 10 lateral Cuniform
- 11 intermediate Cuniform
- 12 medial Cuniform
- 13 METATARSAL from bottom up
 - 5th (to the little toe), 4th (to the 4th toe),
 - 3rd, (to the 3rd toe), 2nd (to the 2nd toe)
 - and 1st (to the big toe)



Metatarsals = FOOT BONES (not ankle)

(metatarsals = bones between the ankle and the toes)

Articulations	proximal - tarsal bones (ankle bones) metatarsals either side
	distal - proximal end of the approp. proximal phalanx
Special features	these are long bones

View of the FIRST metatarsal

lateral

medial

rounded articulation for the proximal phalanx of the BIG TOE

facets for the medial cuneiform ± second metatarsal

view of the SECOND metatarsal

lateral

medial

rounded articulation for the SECOND TOE

facets for the lateral & intermediate cuneiforms + third metatarsal



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Metatarsals = FOOT BONES (not ankle)

(metatarsals = bones between the ankle and the toes)

Articulations	proximal - tarsal bones (ankle bones) metatarsals either side
	distal - proximal end of the approp. proximal phalanx
Special features	these are long bones

View of the THIRD metatarsal

lateral

medial

rounded articulation for the proximal phalanx of the
MIDDLE TOE

facets for the lateral cuneiform + second and fourth
metatarsals

View of the FOURTH metatarsal

lateral

medial

rounded articulation for the FOURTH TOE

facets for the lateral cuneiform & cuboid + third and fifth
metatarsals

View of the FIFTH metatarsal

lateral

medial

rounded articulation for the LITTLE TOE

facets for the cuboid + fourth metatarsal

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Nasal Bones and Cavity = NOSE

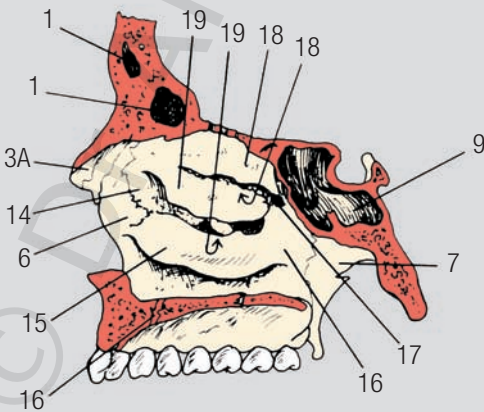
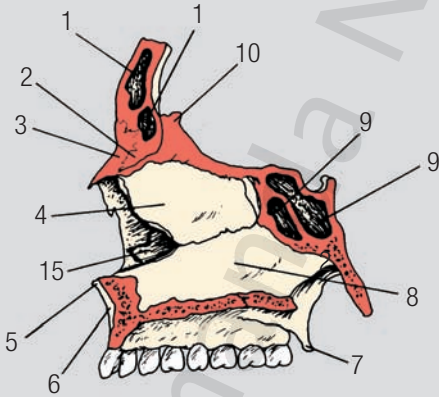
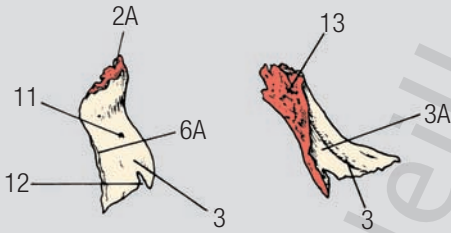
CAVITY - lateral / medial
BONES - external / internal

The NOSE consists of: - 2 small thin rectangular bones below the Glabella, the NASAL BONES; 2 lateral walls which house the 3 PAIRED TURBINATES or CONCHAE; the MEDIAL SEPTUM - made up of the VOMER and the ETHMOID bones and the many cartilages which determine the length and shape of the nose and nasal nares (nostrils).

The cavity is surrounded by sinuses which open into it and superiorly by the Ethmoid plate allowing the OLFACTORY nerves to drop processes into the cavity.

Articulations	with Frontal superiorly with Lacrimal laterally with itself medially with Ethmoid inferiorly	All 2° fibrocartilagenous joints
SPECIAL FEATURES	“articulates” with nasal cartilages anteriorly	BS in septum does not extend to cartilage
superior & middle nasal conchae	parts of the Ethmoid bone	
inferior nasal conchae	2 small snail like bones lying on top of Palantine bones	

- 1 frontal sinus
- 2 Nasal spine of frontal bone
- 3 Nasal bone -external surface
- 3A Nasal bone internal surface
- 4 perpendicular plate of Ethmoid
- 5 ant. nasal spine
- 6 Maxilla
- 6A articulation b/n Nasal bones and Maxilla
- 7 Sphenoid bone
- 8 Vomer
- 9 Sphenoidal sinus
- 10 Crista Galli
- 11 foramen for Nasal vein
- 12 notch for external nasal Nerve
- 13 articulation with other Nasal bone
- 14 Lacrimal bone
- 15 Inferior concha and meatus
- 16 Palantine bone - perpendicular plate
- 17 sphenopalantine meatus
- 18 superior concha and meatus
- 19 middle concha and meatus



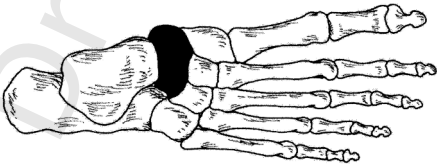
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

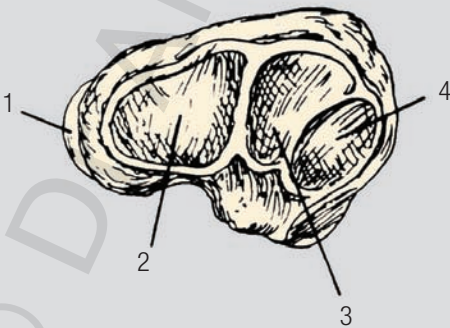
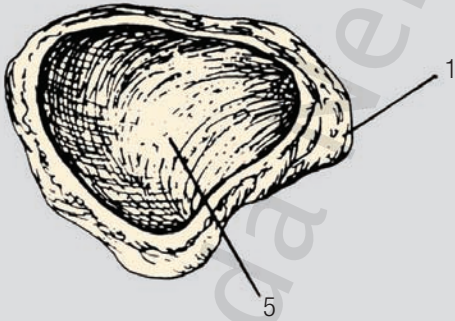
Navicular = part of Os Tarsus / bones of the foot

distal / proximal

Articulations	with all the cuniforms distally
	with Talus proximally

- 1 tuberosity
- 2 facet for medial cuniformal
- 3 facet for intermediate cuniformal
- 4 facet for lateral cuniformal
- 5 facet for head of Talus





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

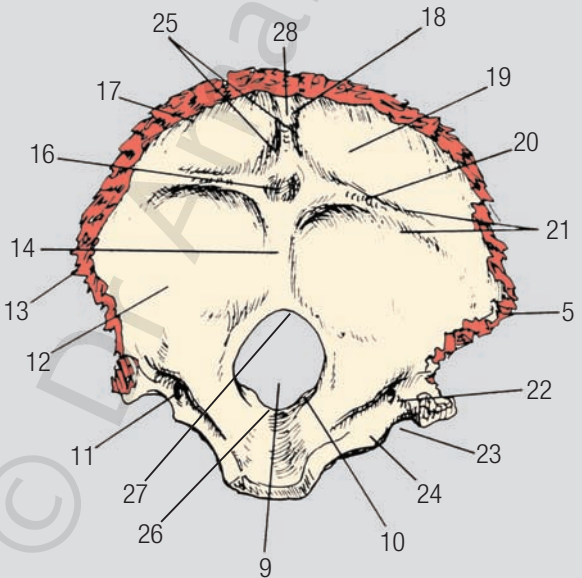
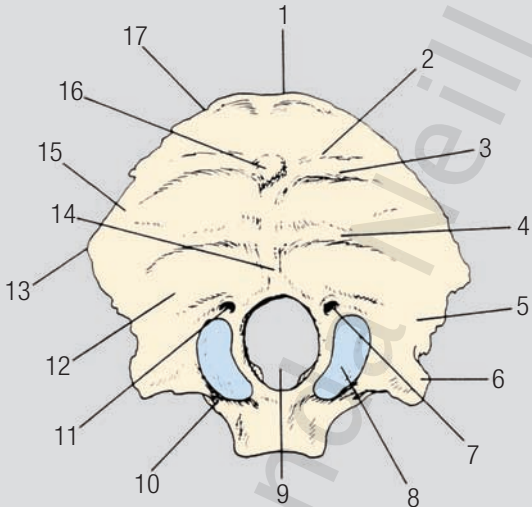
Occipital bone

external / internal

Articulations	with Vertebral Column	
	with C1 with C2	laterally
Special features	large bowl like bone with a hole at the infero-posterior portion of the skull	

- 1 superior angle
- 2 highest nuchal line
- 3 superior nuchal line
- 4 inferior nuchal line
- 5 Mastoid margin
- 6 jugular process
- 7 condylar fossa
- 8 Occipital condyle
- 9 foramen magnum
- 10 hypoglossal canal
- 11 condylar canal
- 12 lateral surface
- 13 lateral angle
- 14 external / internal Occipital crest
- 15 squamous surface
- 16 external / internal Occipital protuberance
- 17 lamboid margin
- 18 groove for superior sagittal sinus
- 19 cerebral fossa
- 20 groove for transverse sinus
- 21 attachment for Tentorium Cerebelli
- 22 groove for superior sigmoid sinus
- 23 jugular notch
- 24 jugular tubercle
- 25 attachments for Falx Cerebri
- 26 opisthion
- 27 basion
- 28 Occipital sulcus - sagittal sinus





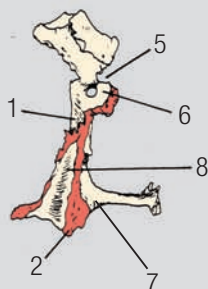
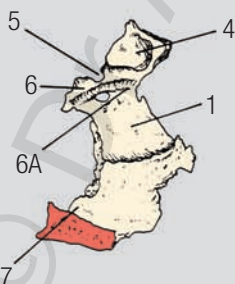
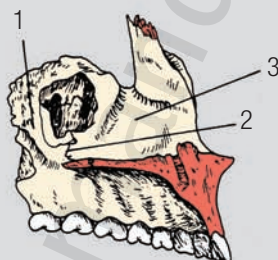
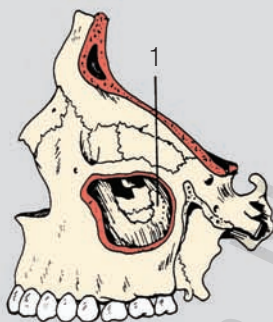
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Palatine bones (Left)

sagittal / medial / anterior / posterior

Articulations	mainly with the upper jaw (Maxilla) and the Sphenoid	2° fibrocartilagenous joints
Special features	L-shaped bones - forms the floor of the Nasal cavity	

- 1 perpendicular plate - vertical plate
- 2 Palato-Maxillary suture
- 3 Maxilla
- 4 Orbital process
- 5 Spheno-Papalatine notch
- 6 Sphenoidal process -
- 6A Pterygo-Palatine canal
- 7 horizontal plane



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

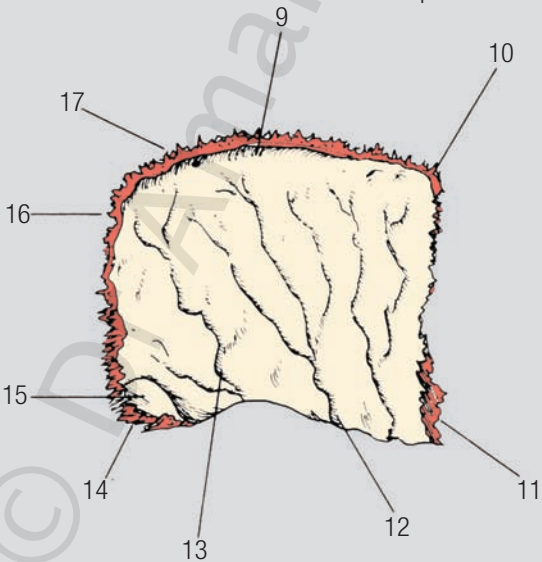
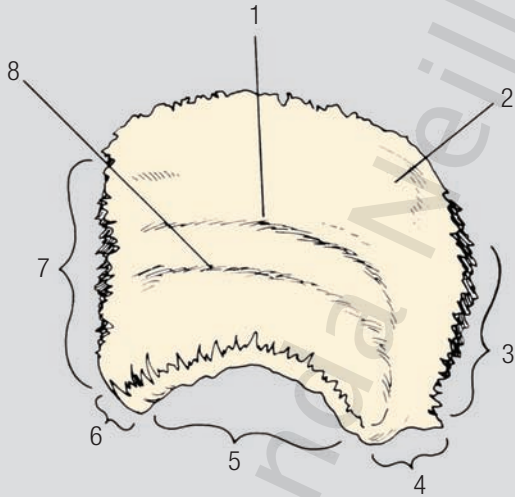
Parietal bone (Left)

external / internal

Articulations	with the Frontal - anterior with the Temporal - inferiorly with the Occipital - posteriorly with itself medially	All 2° fibro- cartilagenous joints
Special features	large square bone - largest of the cranial vault - even thickness all 4 corners made up the basis of the fontanelles in the infant	

- superior temporal line
- parietal eminence
- articulation with the Occipital bone (*Lambdoid suture*)
- articulation with the Temporal bone (Mastoid)
Parieto-Mastoid suture
- articulation with the Temporal (Squamous)
Temporo-Parietal suture
- articulation with the Sphenoid (Greater wing)
Spheno-Parietal suture
- articulation with the Frontal bone *Coronal suture*
- inferior Temporal line
- groove for superior sagittal sinus
- frontal angle
- sphenoidal angle
- groove for frontal branch of Middle Meningeal vessels
- groove for parietal branch of Middle Meningeal vessels
- mastoid angle
- groove for sigmoid sinus
- occipital angle
- articulation between Parietal bones *Sagittal suture*





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

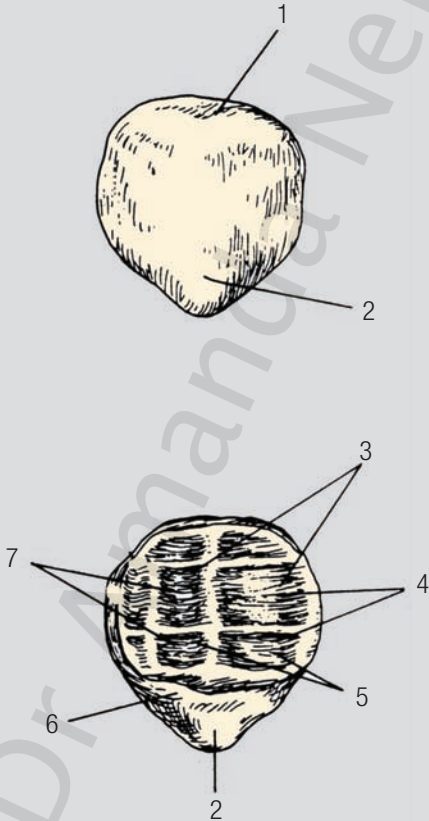
Patella = KNEE CAP

anterior / posterior

Articulations	with the Femur
Special features	large round bone

- 1 base
- 2 apex
- 3 femur articulation in flexion
- 4 femur articulation - lateral condyle
- 5 femur articulation in extension
- 6 area for infra-patella fat pad
- 7 femur articulation - medial condyle





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

PECTORAL GIRDLE = SHOULDERS

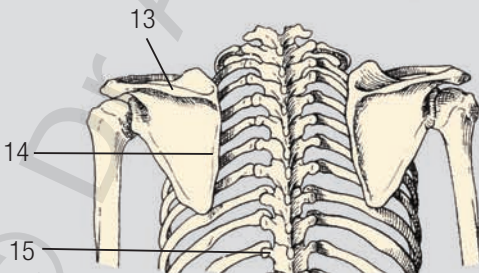
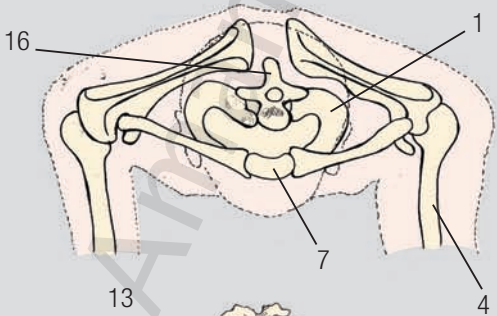
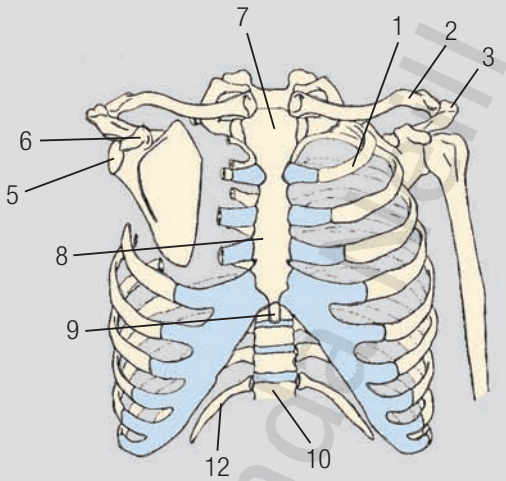
anterior / superior / posterior

SPECIAL FEATURES

to support the upper limb

to act as accessory structure in respiration

- 1 first rib
- 2 Clavicle
- 3 Acromion of Scapula
- 4 Humerus
- 5 glenoid fossa of Scapula
- 6 coracoid process of Scapula
- 7 Manubrium (part of the Manubriosternum)
- 8 Sternum (part of the Manubriosternum)
- 9 Xphisternum
- 10 vertebral body of T12
- 11 rib 11
- 12 rib 12
- 13 spine of Scapula
- 14 medial border of Scapula
- 15 transverse processes
- 16 spine of vertebrae



A PELVIC GIRDLE = HIPS

B *posterior*

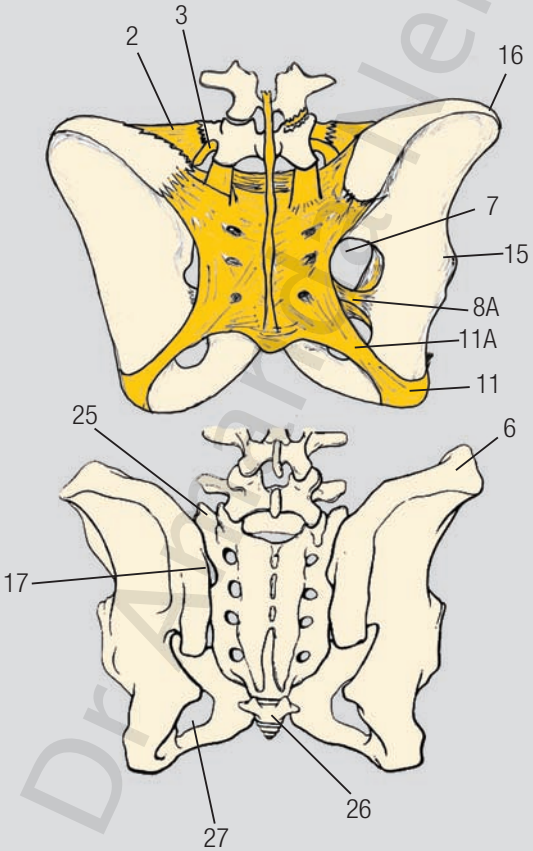
C SPECIAL FEATURES

D **to support the body weight**

E **to support the pelvic organs and contents**

F **to support the lower limbs**

- G 1 anterior longitudinal lig = ALL
- H 2 iliolumbar lig superior band
- I 3 iliolumbar lig inferior band
- J 4 ant. sacroiliac lig
- K 5 iliac fossa
- L 6 iliac crest
- M 7 greater sciatic foramen
- N 8 spine of Ischium
- O 8A sacrospinal lig
- P 9 lesser sciatic foramen
- Q 10 pectoneal lig = Cooper's lig
- R 11 tuberosity of Ischium
- S 11A sacrotuberous lig
- T 12 superior pubic lig
- U 13 interpubic disc
- V 14 iliopectoneal eminence
- W 15 ant inferior iliac spine = AIIIS
- X 16 ant superior iliac spine = ASIS
- Y 17 sacroiliac joint
- Z 18 base of sacrum
- 18A sacral canal
- 19 inguinal lig (thickened portion)
- 19A reflected inguinal lig
- 19B inguinal lig
- 20 aponeurosis of the external oblique muscle
- 21 lacuna lig
- 22 supf inguinal ring
- 23 medial crus
- 24 lateral crus
- 25 ala of Sacrum
- 26 Coccyx
- 27 obturator foramen



PELVIC GIRDLE = HIPS

anterior

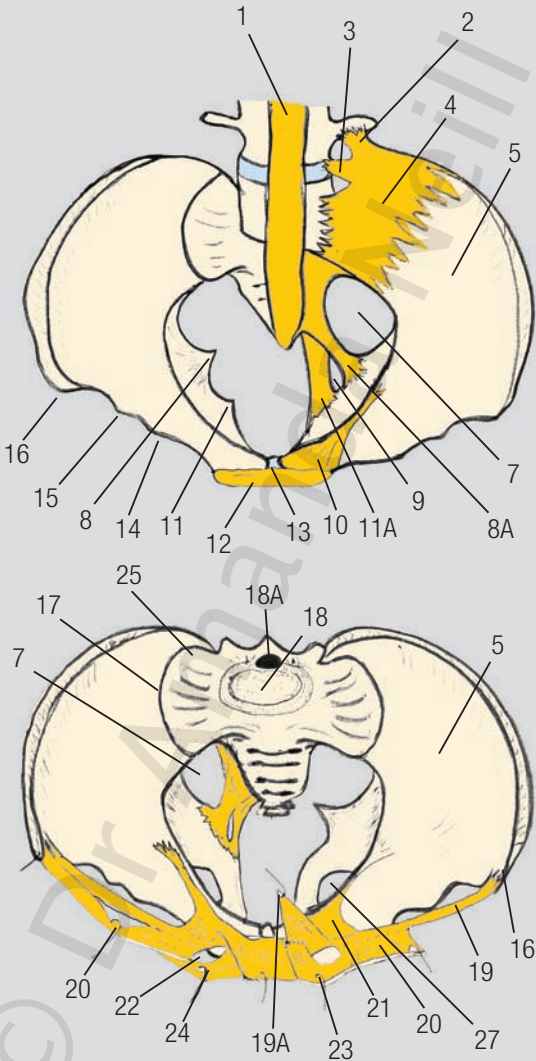
SPECIAL FEATURES

to support the body weight

to support the pelvic organs and contents

to support the lower limbs

- 1 anterior longitudinal lig = ALL
- 2 iliolumbar lig superior band
- 3 iliolumbar lig inferior band
- 4 ant. sacroiliac lig
- 5 iliac fossa
- 6 iliac crest
- 7 greater sciatic foramen
- 8 spine of Ischium
- 8A sacrospinal lig
- 9 lesser sciatic foramen
- 10 pectoneal lig = Cooper's lig
- 11 tuberosity of Ischium
- 11A sacrotuberous lig
- 12 superior pubic lig
- 13 interpubic disc
- 14 iliopectoneal eminence
- 15 ant inferior iliac spine = AIIIS
- 16 ant superior iliac spine = ASIS
- 17 sacroiliac joint
- 18 base of sacrum
- 18A sacral canal
- 19 inguinal lig (thickened portion)
- 19A reflected inguinal lig
- 19B inguinal lig
- 20 aponeurosis of the external oblique muscle
- 21 lacuna lig
- 22 supf inguinal ring
- 23 medial crus
- 24 lateral crus
- 25 ala of Sacrum
- 26 Coccyx
- 27 obturator foramen



Phalanges = DIGITS

FINGERS lateral / anterior / posterior

TOES lateral / anterior / posterior

ARTICULATIONS

with the metacarpals or metatarsals proximally

with other phalanges distally

each digit except the first has 3 phalanges

first digits :thumb/pollux and big toe/hallux, have only 2 phalanges

SPECIAL FEATURES

hinge joints - flexion and extension only b/n phalanges

1 distal phalanx

2 joint capsule

3 middle phalanx

4 proximal phalanx

5T plantar ligament

5F palmar ligament

6 deep transverse ligament

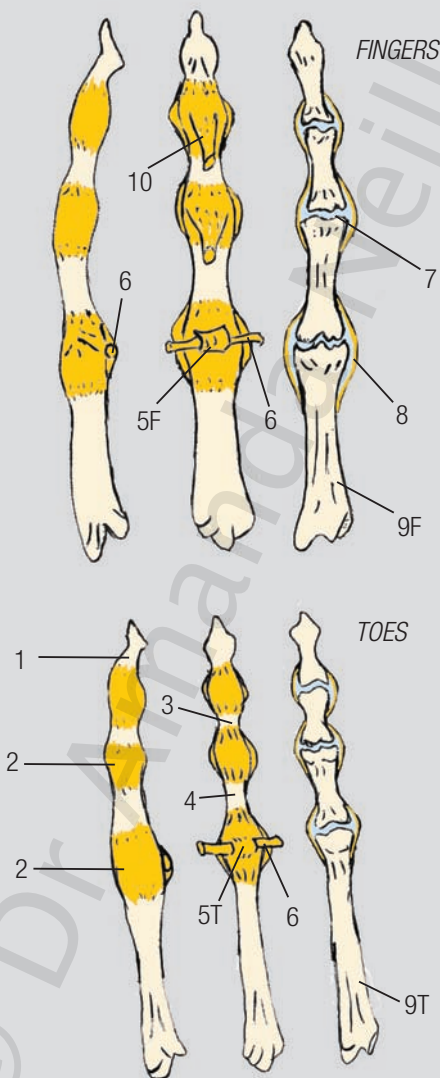
7 synovial joint space

8 collateral ligaments +/- capsule

9T metatarsal

9F metacarpal

10 insertion of flexor ligaments



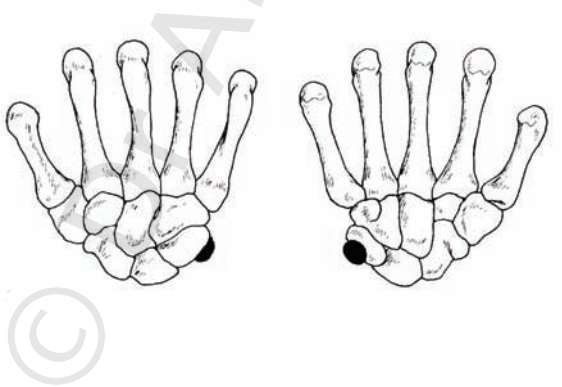
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

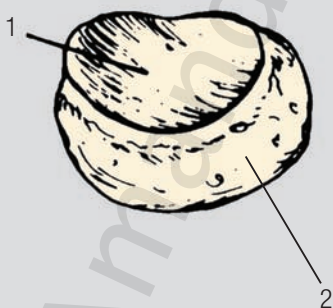
Pisiform part of Os Carpus / bones of the hand

lateral / medial

Articulations	with Triquetral
---------------	-----------------

- 1 facet for Triquetral
- 2 dorsal surface (medial side)





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Pubic Symphysis = Pubic joint

anterior

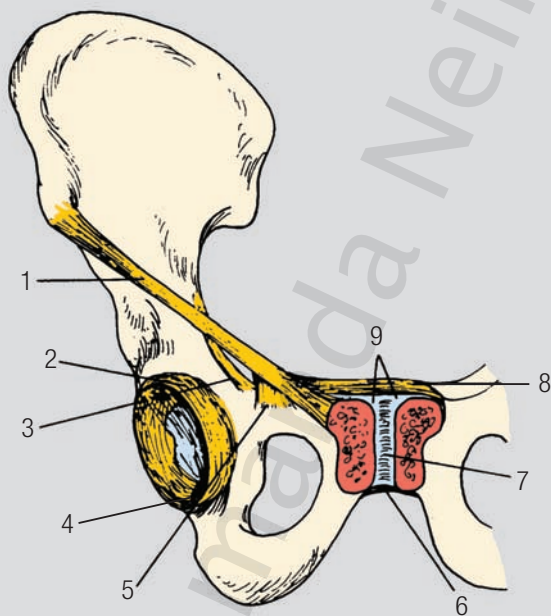
(Pubic symphysis is a secondary fibrocartilagenous joint)

BS internal pudendal

NS internal pudendal Ns perineal branch (S2-4)

A nil - except under hormonal influence eg childbirth

- 1 inguinal lig
- 2 acetabular labrium
- 3 pectineal lig
- 4 transverse acetabular lig
- 5 lacuna lig
- 6 arcuate pubic lig
- 7 interpubic disc of fibrocartilage
- 8 superior pubic lig
- 9 hyaline cartilage



Radio-Ulnar joint proximal (below the elbow) distal (above the wrist)

anterior

(pivot joint between the Ulna and the Radius allowing turning one bone over the other)

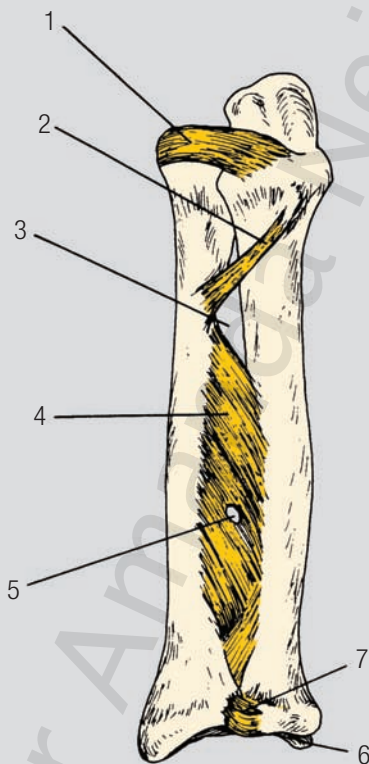
BS *anastomoses around joint from brachial, profunda brachii, radial and ulna arteries*

NS *radial and median Ns (C7-8)*

A *supination / pronation*

Articulations	superior is the elbow joint	hinge joint
	inferior is the wrist joint	

- 1 annular lig
- 2 oblique cord
- 3 gap for the posterior interosseous vessels
- 4 interosseous membrane
- 5 gap for the posterior interosseous vessels
- 6 styloid process
- 7 sacciform recess of the capsule of distal radioulnar joint



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

X

Y

Z

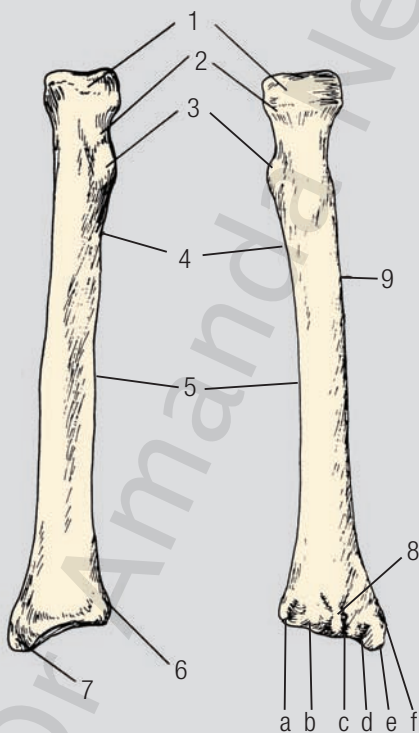
Radius

anterior / posterior

Articulations	with Ulna proximally & distally	mid radio-ulnar joint = interosseous
	with first row of carpal bones distally	scaphoid, lunate, triquetral

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- a-f
- a
- b
- c
- d
- e
- f
- head
- neck
- radial tuberosity
- shaft
- interosseous border
- ulnar notch
- styloid process
- dorsal tubercle
- posterior border
- grooves for the tendons crossing the Radius
- ext. digitorum
- ext. indicis
- ext. carpi radialis brevis
- ext. carpi radialis longus
- ext. pollicis brevis
- ext. pollicis longus





RIB CAGE overview

Thorax Cavity

anterior

ARTICULATIONS -

anterior (see sternocostal joints)

RIB 1 with Manubrium

RIB 2 with the Manubrium and Sternum

RIBS 3-6 with the Sternum directly TRUE RIBS

RIBS 7-10 with Sternum via costocartilagenous ridge FALSE RIBS

RIBS 11-12 do not articulate FLOATING RIBS

DO NOT MOVE with respiration - anchor the DIAPHRAGM

cartilaginous joints

Manubrium with Sternum

Sternum with Xiphisternum

secondary fibrocartilagenous joints

posterior (see costovertebral joints)

EACH RIB with the same VB and the one above medially

and

with the transverse process of the VB laterally

planar synovial joints

SPECIAL FEATURES (see Rib typical)

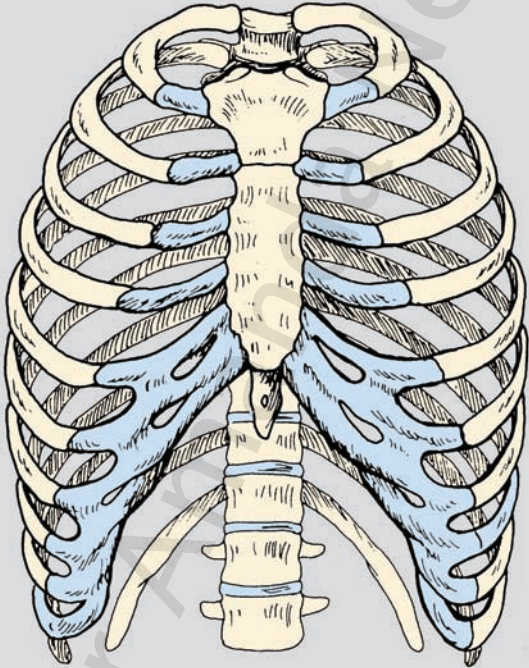
UPPER 6 ribs - pump movement -up & down in respiration

LOWER 4 ribs- bucket handle movement -up and out & down

and in respiration

upper border = thoracic inlet = 1st rib + clavicle +manubrium + VB

lower border = thoracic outlet = Xiphisternum + 12th rib + VB



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

A **Ribs - atypical 1,2**

B articulations

C superior

D bones

E superior

G 1/1A T1 - RIB 1

H 2/2A T2 RIB 2

I 3 costovertebral joints

J 3A demi-facets on head of Rib 2 b/n T1 and T2

K crest in b/n single facet on head of Rib 1 for T1

L 4 spine of T1 + TP

M 5 tubercles

N 6 shafts

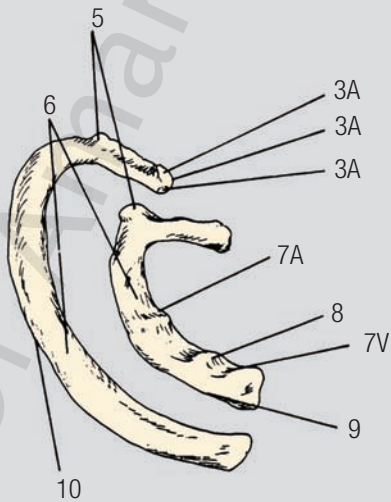
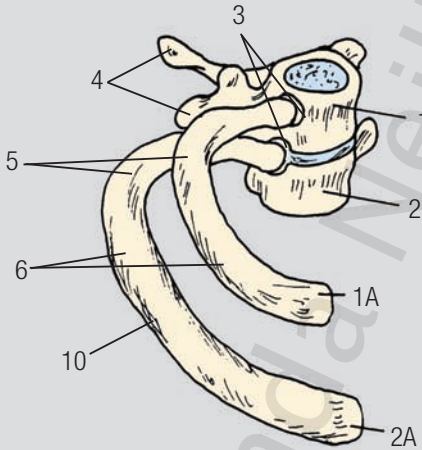
O 7A 7V groove for subclavian artery and N and vein

P 8 scalene tubercle

Q 9 attachment of costovertebral lig

R 10 lig of Serratus Anterior





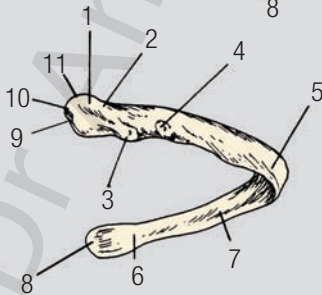
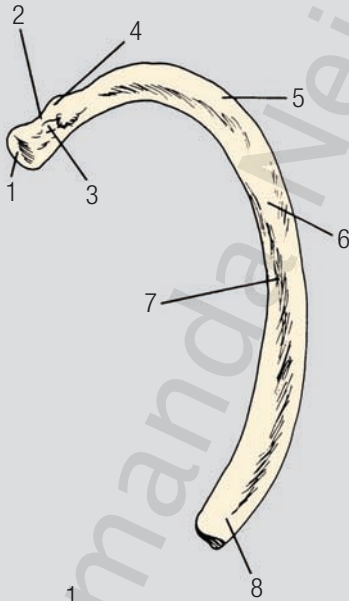
Ribs - typical 3-10

inferior / posterior

Articulations	with VC -transverse process (TP) posteriolaterally	at the same level eg RIB 3 = T3 artic.
	with VB posteriorly synovial joints	at the same level and above eg RIB 3 = T2/3 artic.
	with Sternum directly or through costal cartilage ridge	cartilaginous joints bone cartilage bone
Special features	each rib has a costal groove which protects the segmental BS and NS	

- 1 head
- 2 neck
- 3 tubercle facet
- 4 tubercle
- 5 angle
- 6 shaft / body
- 7 costal groove
- 8 costal end
- 9 demi-facet for vertebra
- 10 interarticular crest
- 11 demi-facet for vertebra





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Sacroiliac joint (part of the Pelvic girdle)

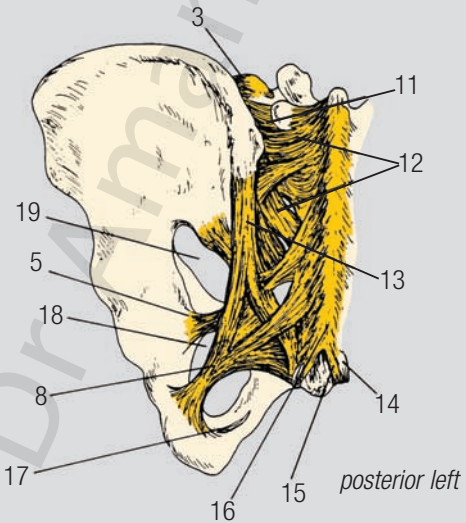
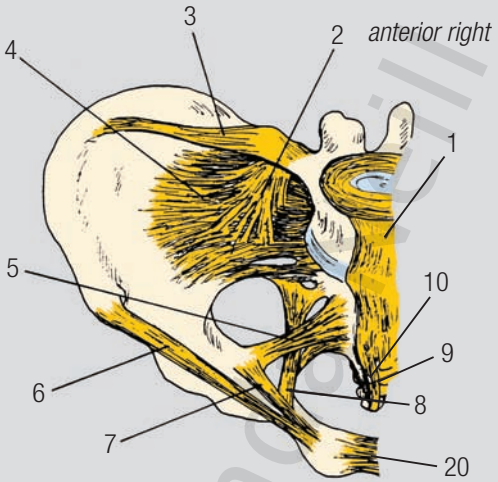
anterior / posterior

BS *anastomoses around joint: superior gluteal, iliolumbar and sacral arteries*

NS *superior gluteal, sacral plexus (L4,5 S1)*

A *slight AP rotation*

- 1 anterior longitudinal lig = ALL
- 2 lumbosacral lig
- 3 iliolumbar lig
- 4 ant. sacroiliac lig
- 5 sacrospinous lig
- 6 inguinal lig
- 7 pectineal lig
- 8 sacrotuberous lig
- 9 ant. sacrococcygeal lig
- 10 lateral sacrococcygeal lig (ant. aspect)
- 11 lumbosacral lig
- 12 short dorsal sacroiliac lig
- 13 long dorsal sacroiliac lig
- 14 lateral sacrococcygeal lig (post aspect)
- 15 intercornu lig
- 16 supf. dorsal sacrococcygeal lig
- 17 falciform process
- 18 lesser sciatic foramen
- 19 greater sciatic foramen
- 20 superior pubic lig

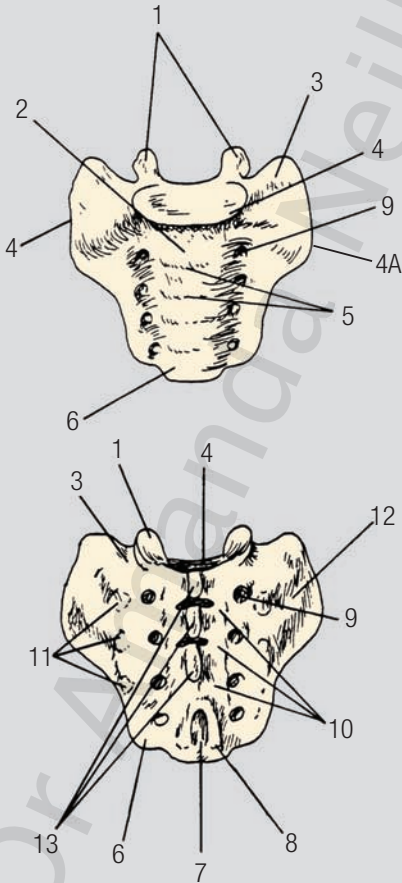


Sacrum (+ Coccyx) = part of the PELVIC GIRDLE

anterior / posterior

Articulations	with Iliac laterally with L5 superiorly with Coccyx inferiorly	fibrocartilagenous synovial synovial +
Special features	is the fused structure of 5 Sacral vertebral bodies	

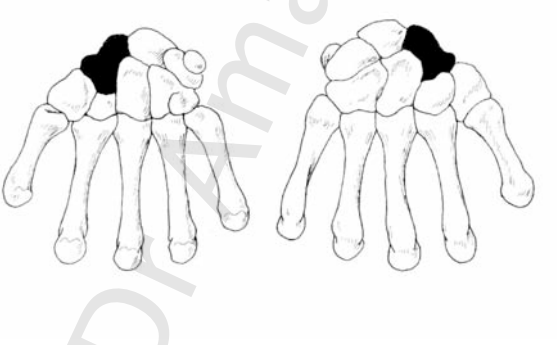
- 1 superior articular process
- 2 body
- 3 alar
- 4 articular surface for L5
- 4A articular surface for Ilium
- 5 fusion b/n 2 VB
- 6 inferior lateral angle
- 7 sacral canal hiatus
- 8 sacral cornu
- 9 dorsal sacral foramen
- 10 lateral crest & tubercles
- 11 lamina
- 12 transverse process
- 13 median sacral crest & spinous process

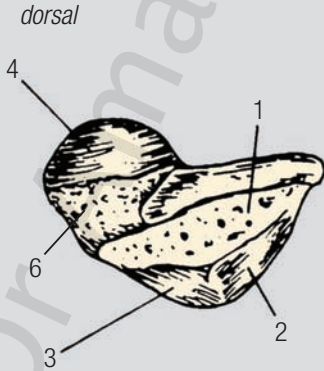
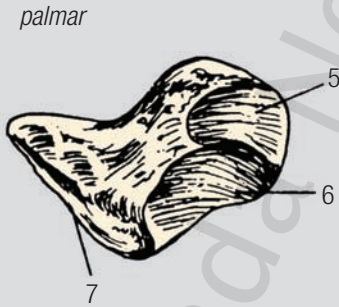


A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Scaphoid

- 1 dorsal surface non-articulating
- 2 articulation surface for Trapezium
- 3 articulation surface for Trapezoid
- 4 articulation surface for Radius
- 5 articulation surface for Lunate
- 6 articulation surface for Capitate
- 7 tubercle





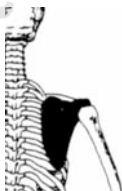
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

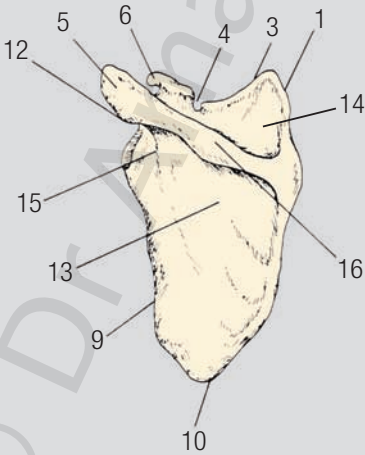
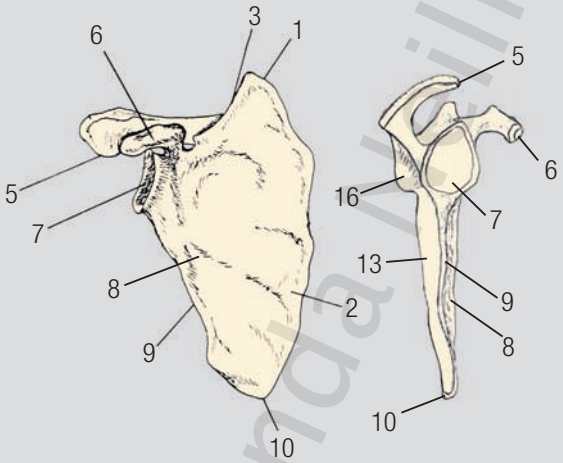
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Scapula = part of the PECTORAL GIRDLE

anterior / posterior / lateral

- 1 superior angle
- 2 medial edge
- 3 superior border
- 4 suprascapula notch
- 5 acromion
- 6 coracoid process
- 7 glenoid fossa
- 8 subscapula fossa
- 9 lateral axillary border
- 10 inferior angle
- 11 body
- 12 acromial angle
- 13 infraspinous fossa
- 14 supraspinous fossa
- 15 spinoglenoid notch
- 16 spine of scapula





SHOULDER JOINT = Glenohumeral joint

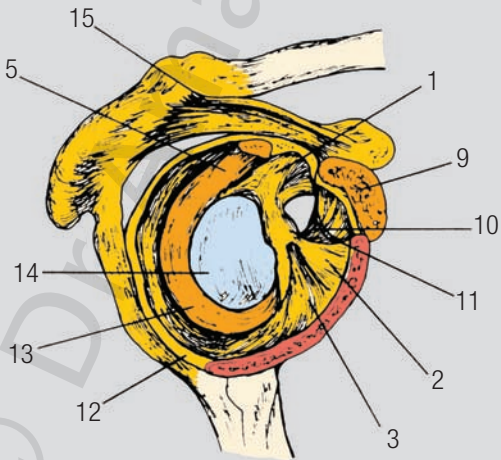
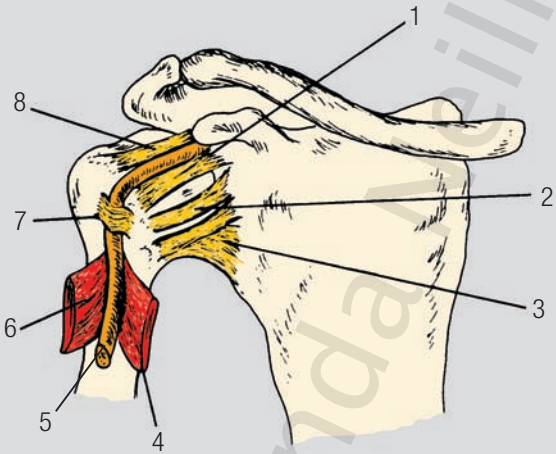
(Articulation b/n the Glenoid fossa of the Scapula and the head of the Humerus - Ball and Socket joint of ill fitting bony surfaces great mobility inferior instability)

BS *posterior circumflex, humeral and suprascapular arteries*

NS *posterior cord of the Brachial Plexus
suprascapular, axillary & lateral pectoral Ns (C5-6)*

A *flexion/extension, abduction/adduction,
lateral/medial rotation, circumduction*

- 1 superior glenohumeral lig
- 2 middle glenohumeral lig
- 3 inferior glenohumeral lig
- 4 Latissimus Dorsi
- 5 tendon of long head of Biceps
- 6 Pectoralis Major (cut)
- 7 transverse lig of Humerus
- 8 coracohumeral lig
- S** 9 Supraspinatus tendon
- T 10 articular capsule
- U 11 Subscapularis bursa
- V 12 edge of the articular capsule
- W 13 glenoid labrum
- X 14 glenoid cavity
- Y 15 Subscapularis tendon

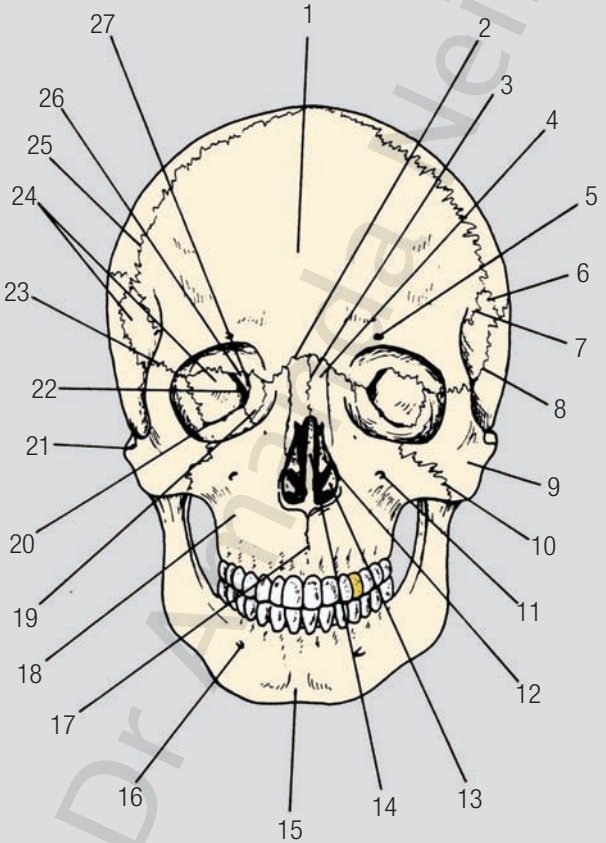


A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Skull External Views

anterior

- 1 Frontal bone
- 2 Fronto-Nasal suture
- 3 Inter-Nasal suture
- 4 Nasal bone, Lacrimal bone
- 5 Supra-Orbital foramen
- 6 Spheno-Parietal suture
- 7 Spheno-Frontal suture
- 8 Spheno-Squamosal suture
- 9 Zygoma
- 10 Zygomatico-Maxillary suture
- 11 Infra-orbital foramen
- 12 Middle Nasal concha – turbinate (*from Ethmoid bone*)
- 13 Inferior nasal concha – turbinate (*from Ethmoid bone*)
- 14 Vomer
- 15 Mandible
- 16 Mental foramen
- 17 Inter-Maxillary suture
- 18 Maxilla
- 19 Ethmoid bone (*Orbital plate*)
- 20 Inferior Orbital fissure
- 21 Temporo-Zygomatic suture
- 22 Superior Orbital suture
- 23 Fronto-Zygomatic suture
- 24 Greater wing of the Sphenoid
- 25 Coronal suture - Fronto-Parietal suture
- 26 Lesser wing of the Sphenoid
- 27 Optic foramen



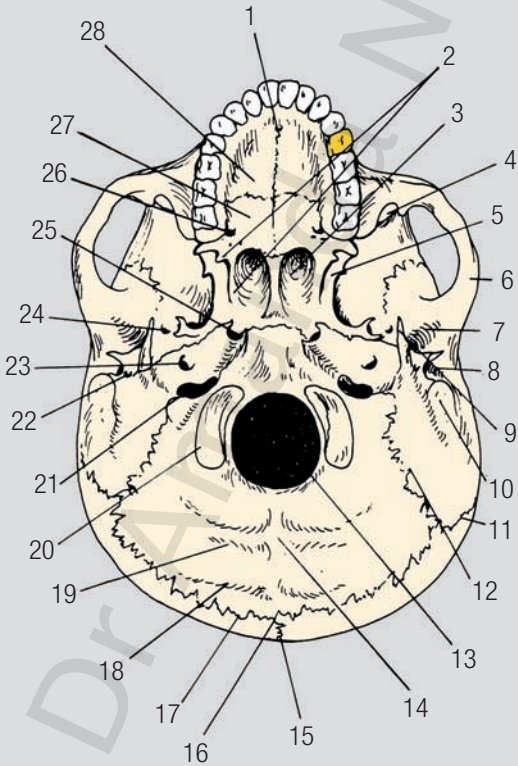
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Skull External Views

inferior base of skull

- 1 Incisive fossa - Alveolare
- 2 Medial Pterygoid plate and Hamulus (Ethmoid)
- 3 Posterior Nasal aperture
- 4 Pterygoid plate (ethmoid)
- 5 Lateral Pterygoid plate (Ethmoid)
- 6 Zygomatic arch
- 7 Mandibular fossa
- 8 External Auditory meatus
- 9 Styloid process
- 10 Mastoid process
- 11 Parieto-Mastoid suture
- 12 Occipito-Mastoid suture
- 13 Foramen magnum
- 14 External Occipital protuberance
- 15 Sagittal suture - *Parieto-Parieto suture*
- 16 Lambda
- 17 Lambda suture
- 18 Superior nuchal line (*Occipital*)
- 19 Inferior nuchal line (*Occipital*)
- 20 Occipital condyle
- 21 Jugular foramen (fossa)
- 22 Stylo-Mastoid foramen
- 23 Carotid foramen - Carotid canal
- 24 Foramen spinosum
- 25 Foramen lacerum - Basilar suture
- 26 Greater Palatine foramen
- 27 Horizontal plate of Palatine
- 28 Palatine process of the Maxilla



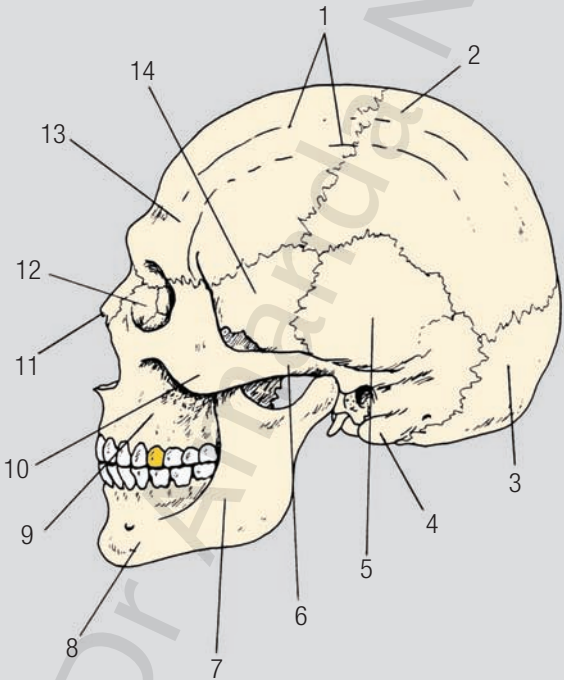
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Skull External Views

lateral

- 1 Frontal bone - Temporal ridges for attachment of Temporalis
- 2 Parietal bone
- 3 Occipital bone
- 4 Mastoid process
- 5 Temporal bone
- 6 Zygomatic arch
- 7 Mandible
- 8 Body of Mandible
- 9 Maxilla
- 10 Zygoma
- 11 Nasal bone
- 12 Lacrimal bone
- 13 Frontal bone
- 14 Greater Wing of the Sphenoid



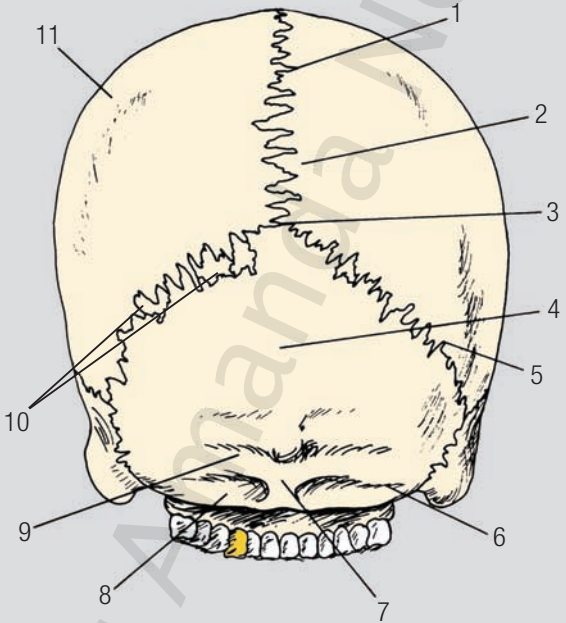
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Skull External Views

posterior

- 1 Sagittal sinus
- 2 Parietal foramen
- 3 Lambda *Pareito-Occipital suture*
- 4 Occipital bone
- 5 Lambdoid suture -
- 6 Inferior nuchal groove
- 7 External Occitipal protruberance
- 8 Occitipal bone
- 9 Superior nuchal groove
- 10 Sutural bones - Inca
- 11 Parietal bone

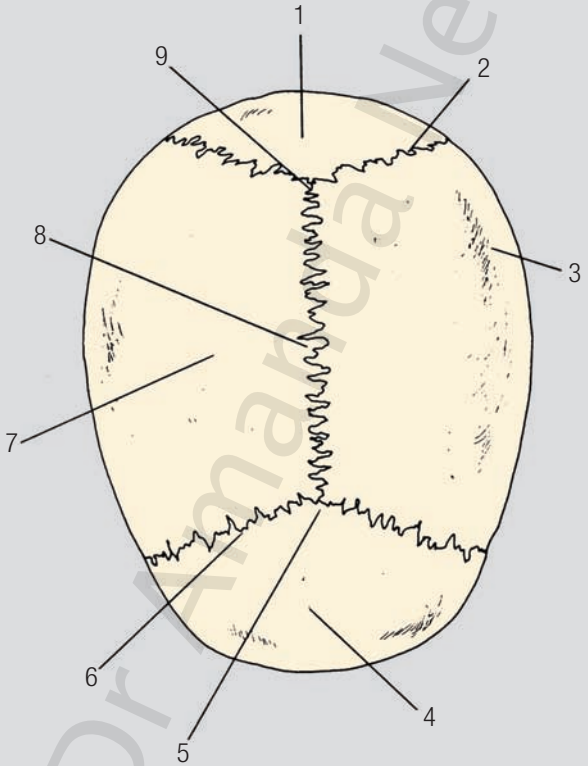


A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Skull External Views

superior

- 1 Occipital bone
- 2 Lambdoid suture - *Occipito-Parieto suture*
- 3 Parietal eminence - Euryon
- 4 Frontal bone
- 5 Bregma
- 6 Coronal suture
- 7 Parietal bone
- 8 Sagittal suture
- 9 Lambda



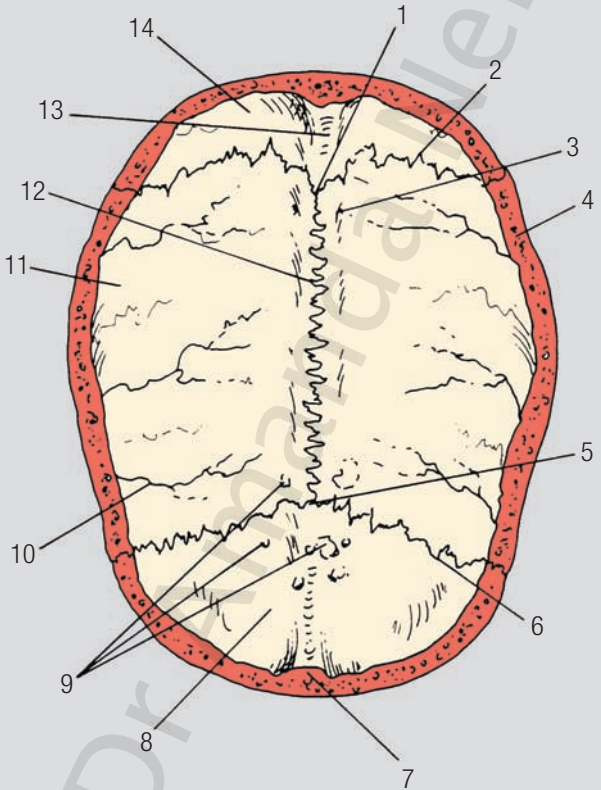
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Skull Internal Views

inferior Skull cap

- 1 Lambda
- 2 Lambdoid suture
- 3 Parietal foramen
- 4 Diploe
- 5 Bregma
- 6 Coronal suture
- 7 Frontal crest
- 8 Frontal bone
- 9 Depressions for arachnoid granulations
- 10 Grooves for middle meningeal vessels
- 11 Parietal bone
- 12 Sagittal suture
- 13 Groove for superior sagittal sinus
- 14 Occipital bone



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

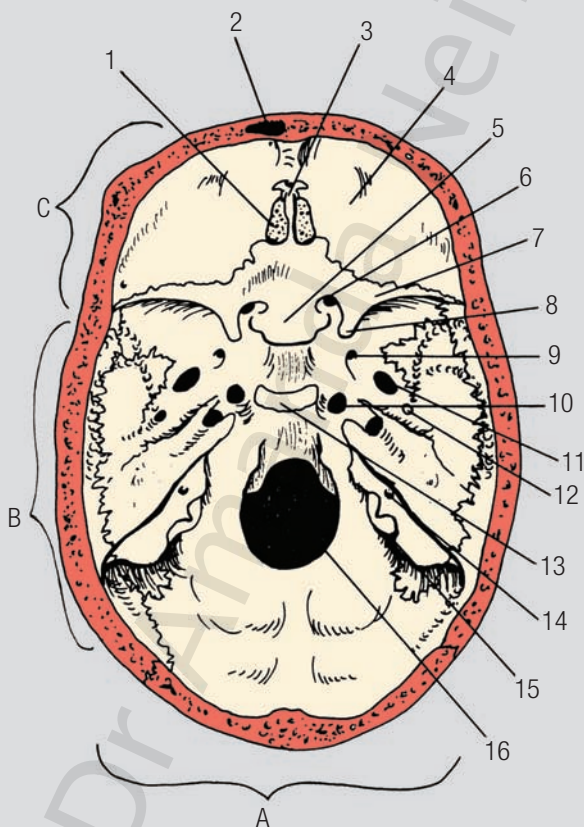
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Skull Internal Views

superior internal base - cranial fossae

- 1 Cribiform plate
- 2 Frontal sinus
- 3 Crista Galli
- 4 Orbital plate of Frontal bone
- 5 Jugum of Sphenoid
- 6 Optic canal
- 7 Lesser wing of the Sphenoid bone
- 8 Anterior Clinoid process
- 9 Foramen rotundum
- 10 Foramen lacerum
- 11 Foramen ovale
- 12 Foramen spinosum
- 13 Dorsum sellae
- 14 Internal acoustic meatus
- 15 Jugular foramen
- 16 Foramen magnum

- A POSTERIOR FOSSA
B MIDDLE FOSSA
C ANTERIOR FOSSA



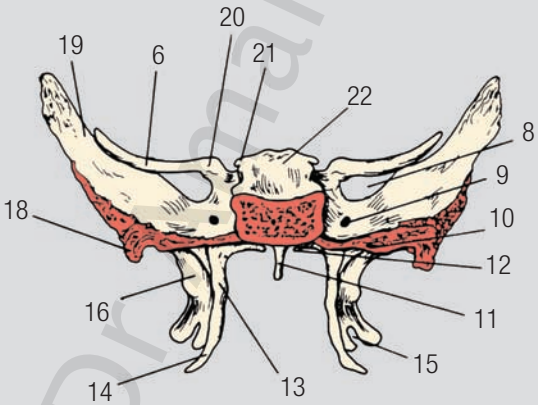
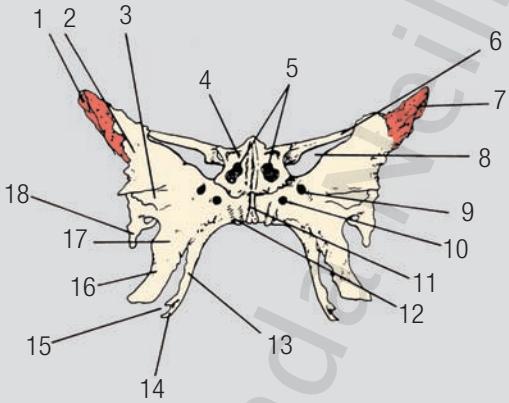
A Sphenoid

B *anterior / posterior*

C **A single wedge-shaped bone consisting of four parts: the central body;**
D **the lateral greater wings, the medial lesser wings and the lower**
E **ptergoid plates. The bone looks like a bat in flight and is the centre**
piece of the skull.

- F 1 articulation with Left Temporal bone
G 2 orbital surface
H 3 infratemporal crest
I 4 body of the Sphenoid
J 5 openings for sphenoidal sinuses
K 6 lesser wing
L 7 squamosal suture - articulation with right Temporal bone
M 8 superior orbital fissure
N 9 foramen rotundum
O 10 pterygoid canal
P 11 rostrum
Q 12 vaginal process
R 13 medial pterygoid plate
S 14 pterygoid hamulus
T 15 pterygoid notch
U 16 lateral pterygoid plate
V 17 pterygoid process
W 18 sphenoid spine
X 19 cerebral surface of the greater wing
Y 20 anterior clinoid process
Z 21 posterior clinoid process
22 dorsum sellae





Sterno-Clavicular joints

Sterno-Costal joints

anterior

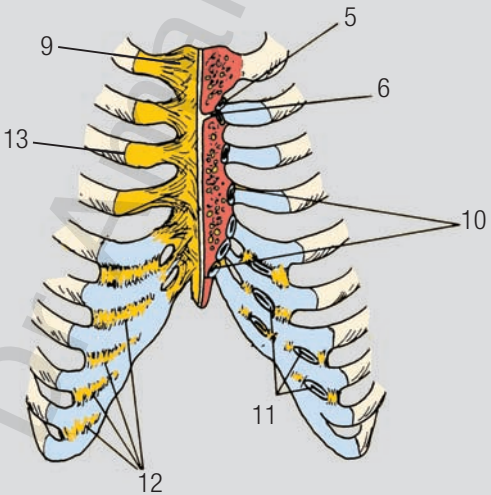
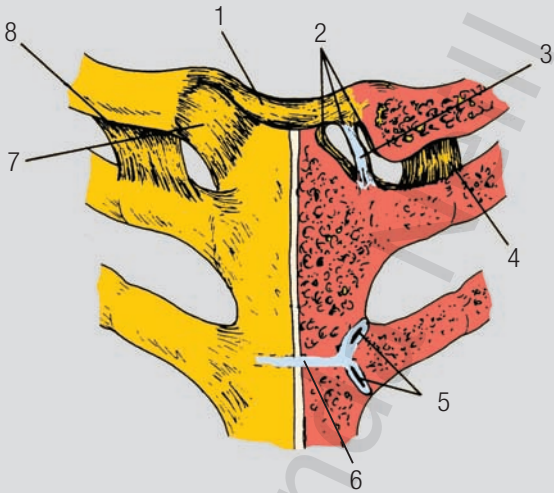
(joints b/n the Manubriosternum and the Clavicle **SYNOVIAL JOINTS**, joints with **INTRA-ARTICULAR DISC** b/n the Manubriosternum and the RIBS 3-9 **SYNOVIAL JOINTS**, RIBS 6-10 **10 CARTILAGENOUS JOINTS - SYNCHONDROSIS** with synovial cavity)

BS *internal thoracic artery*

NS *ant supraclavicular & N to subclavius ant cutaneous branches of intercostal Ns (C8-T1-12)*

A *elevation/ depression, retraction/ protraction, rotation*

- 1 interclavicular lig
- 2 fibrocartilage artice surface
- 3 articular disc
- 4 costoclavicular lig
- 5 double synovial joint cavity RIB 2 with intrarticular lig.
sternocostal / manubriocostal joints
- 6 manubriosternal symphysis (20 cartilagenous)
- 7 ant sternoclaviular lig
- 8 costoclavicular lig
- 9 sternocostal lig
- 10 sternocostal joints (R3-9) PLANE synovial joints
- 11 interchondral synovial joint cavities (R6-10)
synchondrosis
- 12 interchondral ligs syndesmosis
- 13 costochondral junction



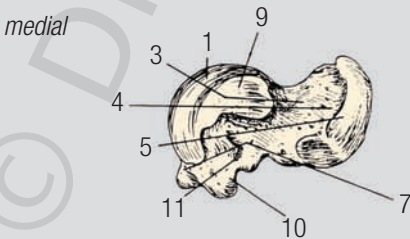
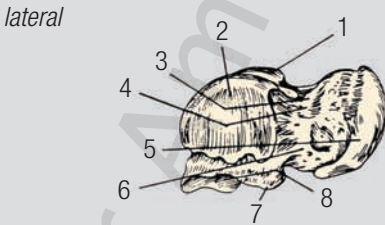
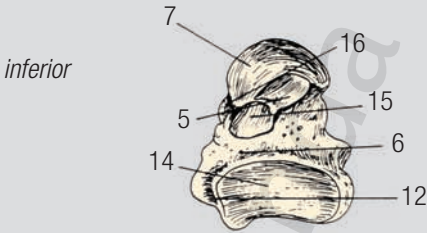
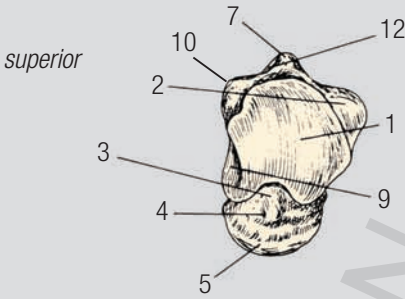
Talus = ANKLE BONE

(Talus biggest of the Tarsal bones in the foot - irregular bone)

Articulations	with Tibia superiomedially with Calcaneus inferiorly with Navicular anteriorly with Fibula laterally	Tibiotalar joint Talocrural joint Subtalar joint Talofibular
---------------	---	---

- 1 trochlea surface for Tibia
- 2 facet for medial malleous
- 3 neck
- 4 groove for anterior lig of Ankle
- 5 artie surface for Navicular
- 6 sulcus tali
- 7 lateral process
- 8 posterior calcaneal facet plantar surface
- 9 facet for medial malleous
- 10 medial tubercle
- 11 roughened surface for Deltoid lig
- 12 groove for Hallucis longus
- 13 medial tubercle
- 14 anterior surface for calcaneus
- 15 middle calcaneal surface
- 16 plantar calcaneonavicular lig





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

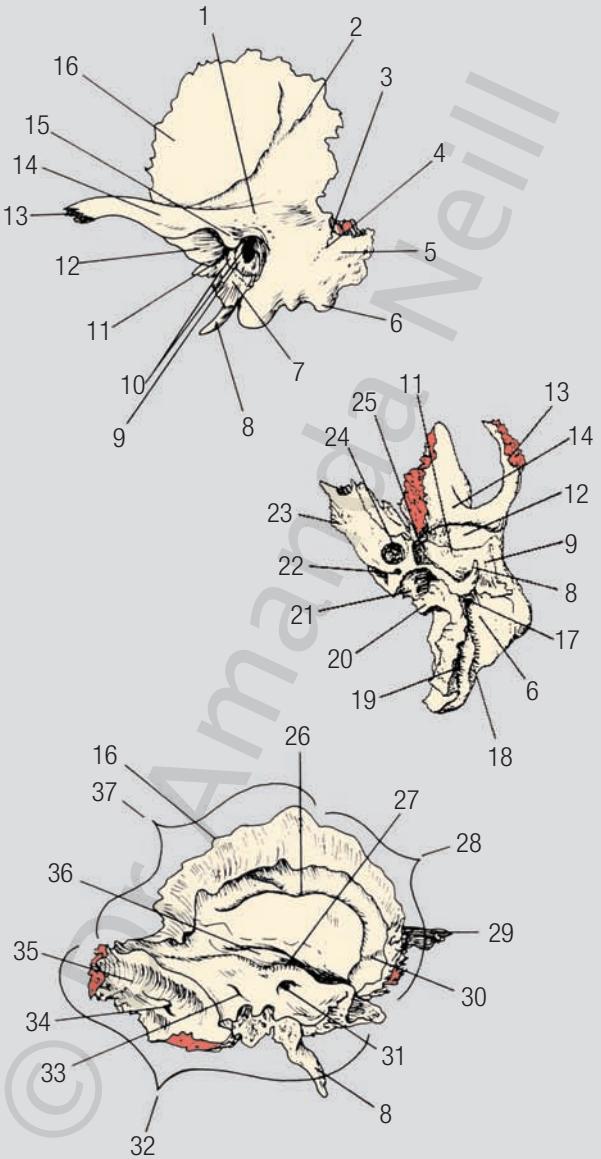
Temporal bone (Left)

external / inferior / internal

Temporal = TIME. This bone shows first signs of aging - grey hair. It is involved in both the wall and the base of the skull. Temporal bones contain the auditory ossicles/ear bones & form the only joint with the mandible.

- 1 suprameatal triangle
- 2 groove for middle Temporal artery
- 3 parietal notch
- 4 squamo-Mastoid suture
- 5 mastoid area
- 6 mastoid process
- 7 sheath of styloid process
- 8 styloid process
- 9 tympanic part I
- 10 external acoustic meatus / anterior border (bony ear hole)
- 11 tympanosquamosal (squamotympanic) fissure
- 12 mandibular fossa
- 13 zygomatic process
- 14 articular tubercle
- 15 postglenoid tubercle
- 16 squamous part - Squama
- 17 stylomastoid foramen
- 18 mastoid notch - Digastric groove
- 19 occipital groove
- 20 jugular surface
- 21 jugular fossa
- 22 canaliculus (opening) for Tympanic nerve
- 23 petrous part
- 24 carotid canal
- 25 edge of tegmen tympani
- 26 groove for the middle meningeal vessels
- 27 groove for the superior Petrosal sinus
- 28 articulation with the greater wing of the Sphenoid
- 29 Spheno-Temporal suture
- 30 Zygomatic process
- 31 groove for the middle meningeal vessels
- 32 internal acoustic meatus
- 33 articulates with the Occipital bone
- 34 aqueduct of the vestibule
- 35 mastoid foramen
- 36 groove for sigmoid sinus - sigmoid sulcus
- 37 arcuate eminence
- 38 articulates with the parietal bone Temporoparietal suture





A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Temporo-Mandibular joint = TMJ

closed - lateral / medial

open - sagittal

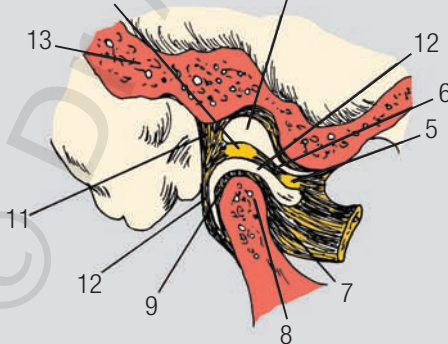
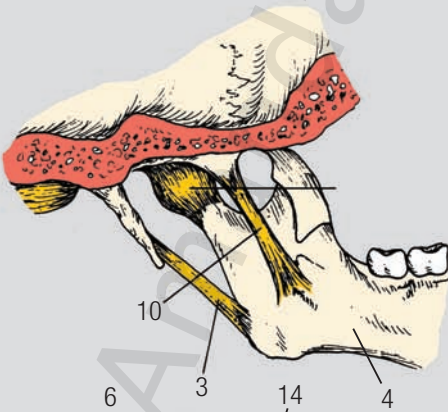
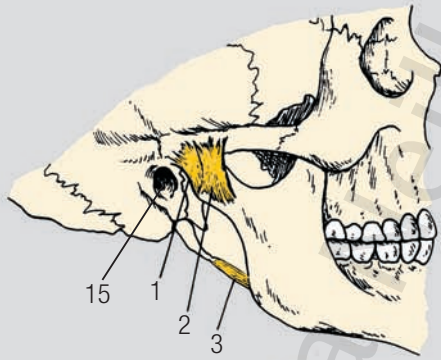
(only SYNOVIAL joint in the skull)

BS *superficial temporal & maxillary arteries*

NS *auriculotemporal & masseteric branches of
mandibular branch of Trigeminal N (CN5)*

A *depression/elevation, protrusion/retraction, lateral
movements*

- 1 fibrous capsule
- 2 lateral TMJ lig
- 3 stylomandibular lig
- 4 Mandible
- 5 ant Temporal attachment of Meniscus
- 6 meniscus
- 7 ant. mandibular attachment
- 8 condyle of mandible
- 9 posterior attachment
- 10 sphenomandibular lig
- 11 posterior temporal attachment
- 12 lower joint compartment
- 13 Temporal bone
- 14 upper compartment
- 15 ext. auditory meatus



A

B

Tibia

anterior / posterior

C

D

E

Articulations	with Fibula laterally distally and proximally with Talus inferiorly	syndesmosis synovial - condyloid
---------------	---	---

- F
- G
- H
- I
- J
- K
- L
- M
- N
- O
- P
- Q
- R
- S
- T
- U
- V
- W
- X
- Y
- Z
- 1

interosseous border
- 2

medial malleolus
- 3

tibial tuberosity
- 4

posterior border
- 5

anterior border
- 6

fibular notch
- 7

articular facet for Fibula
- 8

lateral condyle
- 9

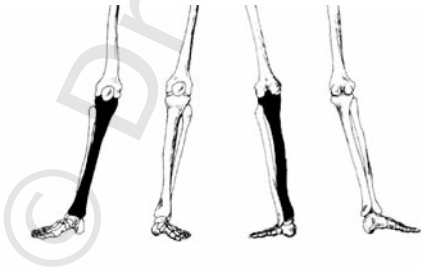
soleal line
- 10

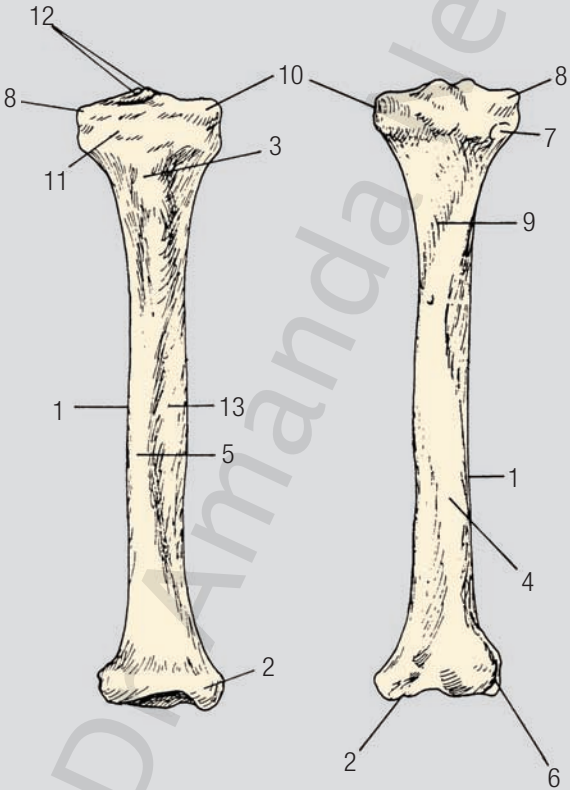
medial condyle
- 11

attachment of iliotibial tract
- 12

tubercles of intercondylar eminence
- 13

medial surface





Tibio-Fibula joints

posterior

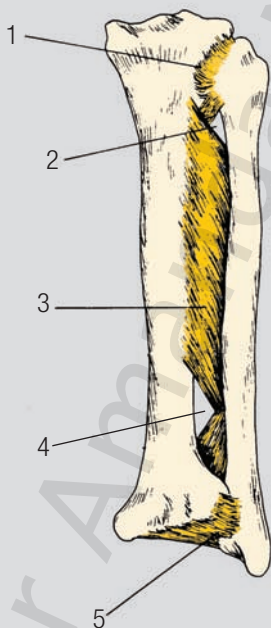
(3 joints distal, proximal and along the shafts via the interosseous membrane)

BS proximal - ant tibial artery
distal - ant & post tibial arteries

NS proximal - tibial N (S2-3)
distal - deep peroneal and tibial Ns (L5 S1-3)

A proximal - lateral at. rotation with dorsiflexion of foot
distal - as above

- 1 proximal post. Tibiofibula lig
- 2 opening for ant tibial vessels
- 3 interosseous membrane
- 4 opening for peroneal artery
- 5 distal post Tibiofibula lig



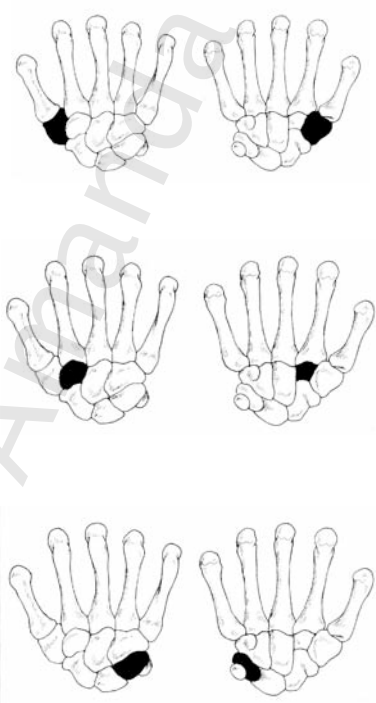
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

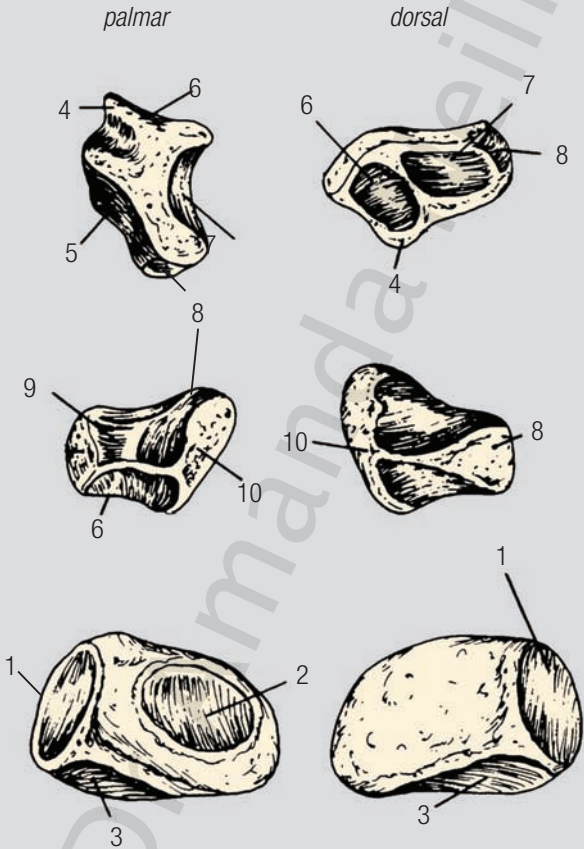
Trapezium / Trapezoid / Triquetral = Carpal bones

Small “irregular bones” as with foot bones / tarsal bones, similar movements mainly gliding joints to allow small movements in the hand in several directions to facilitate movements of the fingers.

mainly describing the articular facets for adjacent bones

- 1 for Lunate
- 2 for Pisiform
- 3 for Hamate
- 4 tubercle
- 5 for 1st MC
- 6 for Scaphoid
- 7 for Trapezoid
- 8 for 2nd MC
- 9 for Capitate
- 10 dorsal surface

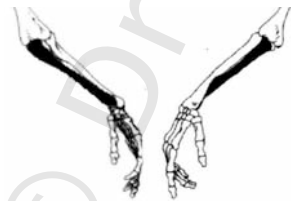


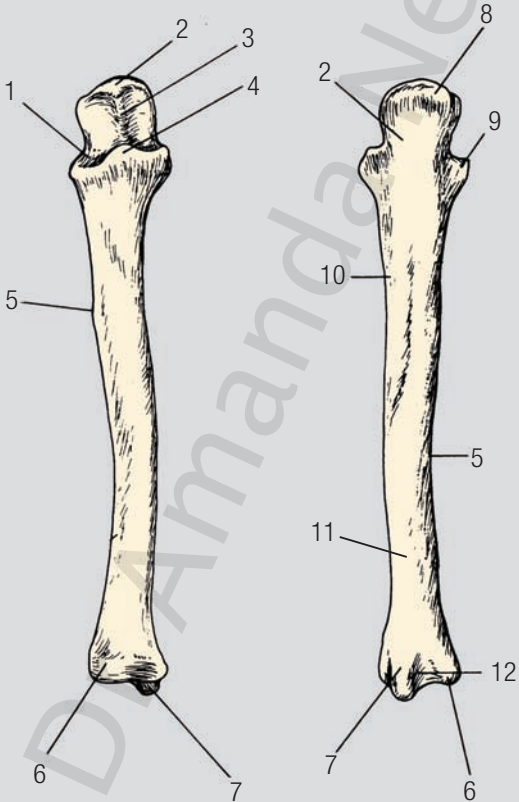


A **Ulna**
B *anterior / posterior*

C Articulations	D with Radius proximally and distally	E pivot joint
	F with Humerus proximally	G hinge jt ELBOW

- H 1 radial notch
I 2 olecranon
J 3 trochlea notch
K 4 coronoid process
L 5 interosseous border
M 6 head
N 7 styloid process
O 8 subcutaneous area of olecranon
P 9 crest for supinator
Q 10 medial surface
R 11 posterior border / surface
S 12 groove for ext. carpi ulnaris





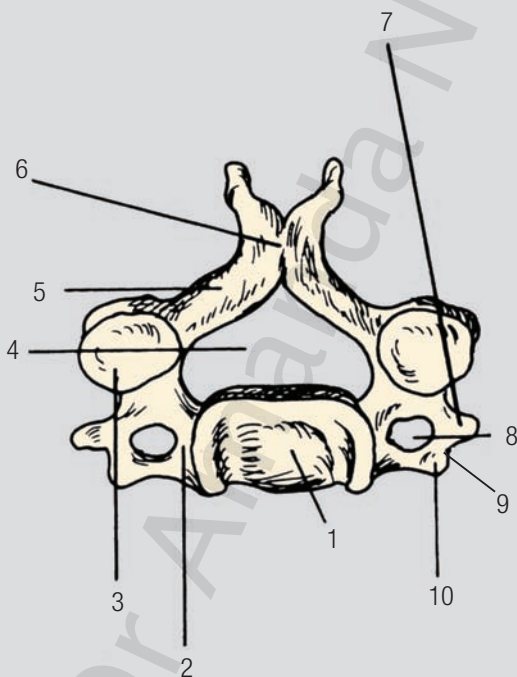
Vertebrae

*Typical cervical C3-7
superior*

Articulations	with vertebra above & below -2 unpaired joints 2 paired joints	VB -VB joints symphysis Spinous process joints syndesmosis paired zygapophyseal planar synovial paired TP joints fibrous sydesmosis
Special features	transverse foramen bifid spinous process small curved bodies	

- body
- pedicle
- superior articular facet
- vertebral foramen
- lamina
- spinous process -bifid*
- post tubercle of TP
- transverse foramen*
- sulcus for peripheral N outlet
- anterior tubercle of TP

* only in cervical vertebrae



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

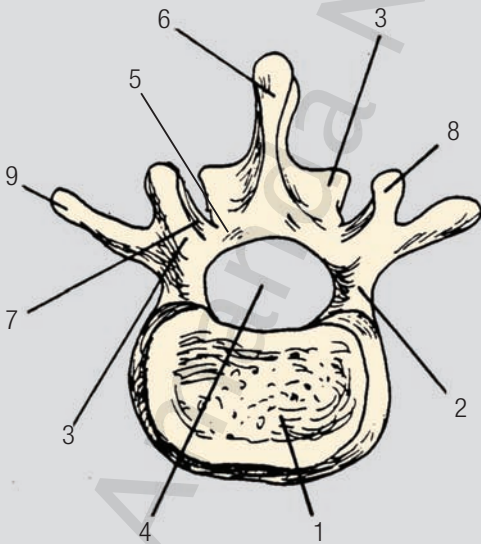
Vertebrae

Typical lumbar L1-5 superior

Articulations	with vertebra above & below -2 unpaired joints 2 paired joints	VB -VB joints symphysis Spinous process joints syndesmosis paired zygapophyseal planar synovial paired TP joints fibrous syndesmosis
Special features	large body large prominent processes for strong muscle attachment	

- 1 body
- 2 pedicle
- 3 superior articular facet
- 4 vertebral foramen
- 5 lamina
- 6 spinous process
- 7 superior articular facet
- 8 mamillary body*
- 9 transverse process

* only in Lumbar vertebrae



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

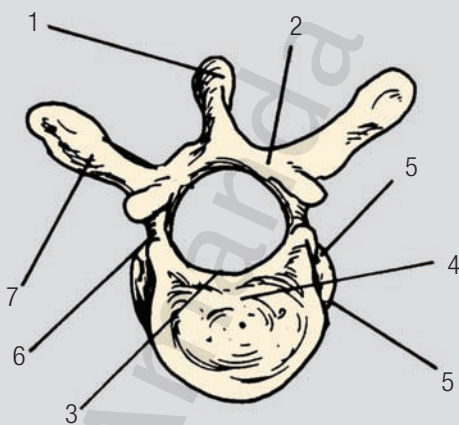
Vertebrae

*Typical thoracic T2-9
superior*

Articulations	with vertebra above & below -2 unpaired joints 2 paired joints + 1 pair for ribs TP 2 demi facets for ribs	VB -VB joints symphysis + demifacets across the disc b/n bodies Spinous process joints syndesmosis paired zygapophyseal + costotransverse planar synovial paired TP joints fibrous sydesmosis
special features	costal facets	articulates with the ribs only in the thoracic region

- 1 spinous process
- 2 lamina
- 3 vertebral foramen
- 4 body
- 5 superior & inferior costal demi-facets*
- 6 pedicle
- 7 transverse process with articular facet for rib*

*only in thoracic vertebrae



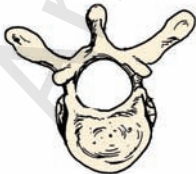
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

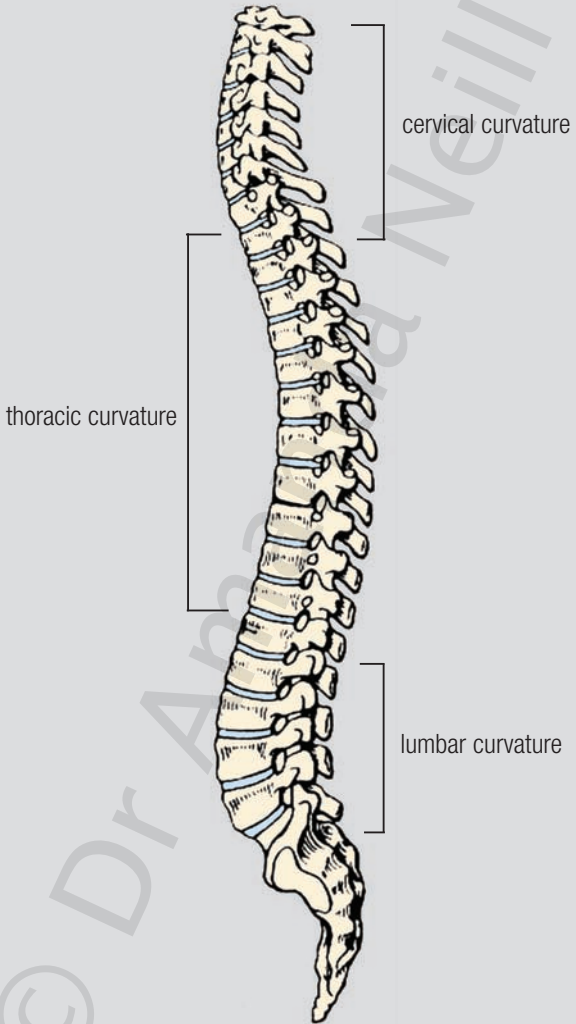
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Vertebrae

Typical

	<i>cervical</i>	<i>thoracic</i>	<i>lumbar</i>
<i>spinous process</i>	<i>long bifid</i>	<i>long downpointing</i>	<i>short bulky</i>
<i>transverse process</i>	<i>transverse foramen inside</i>	<i>costal articulations</i>	<i>short bulky with mammillary body</i>
<i>body</i>	<i>small curved</i>	<i>medium straight</i>	<i>thick bulky</i>
<i>foramen</i>	<i>large</i>	<i>medium</i>	<i>small</i>





Vertebro-vertebral joints = joints b/n the Vertebral bodies

posterior coronal section / anterior coronal section

(symphyses - bone - fibrocartilagenous disc - bone)

BS *spinal arteries of the regional arteries*

NS *branches from the dorsal rami of the adjacent
spinal Ns*

A *extensive movement possible b/n disc and disc but
altered by the zygapophyseal joint's angulation
which changes regionally \pm costal joints
lumbar - flexion/extension lateral flexion, rotation
thoracic - rotation
cervical - flexion/extension, lateral flexion,*

1 posterior longitudinal lig = PLL

2 pedicle

3 body

4 intervertebral disc

5 space b/n ligamenta flavum

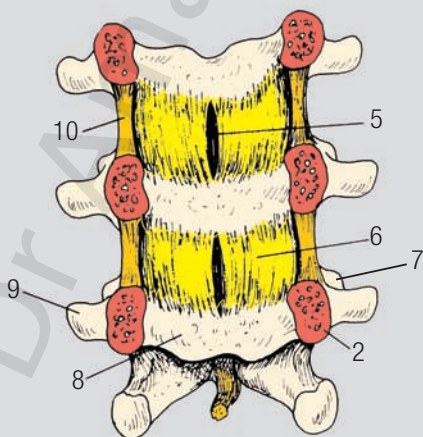
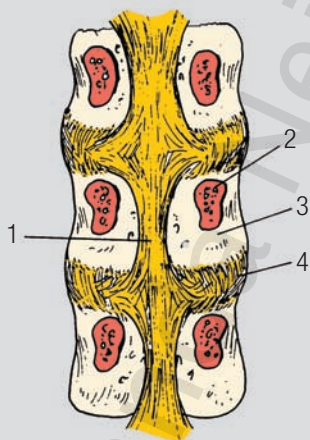
6 ligamenta flavum = LF

7 mammillary body

8 lamina

9 transverse process

10 LF with capsule of joint laterally



**Vertebro-vertebral joints = joints b/n the
Vertebral bodies & b/n vertebral processes
= zygapophyseal joints, interspinous joints,
intertransverse joints** also see Costovertebral joints

lateral / medial

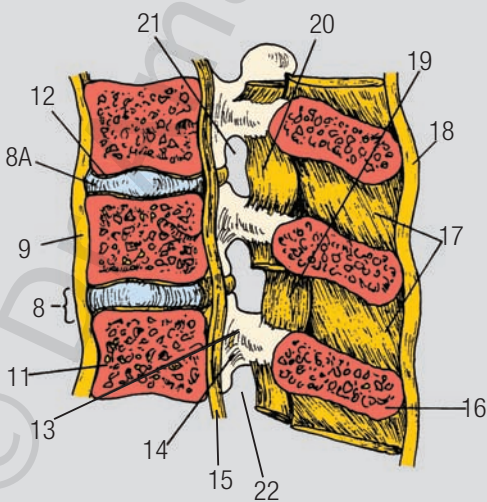
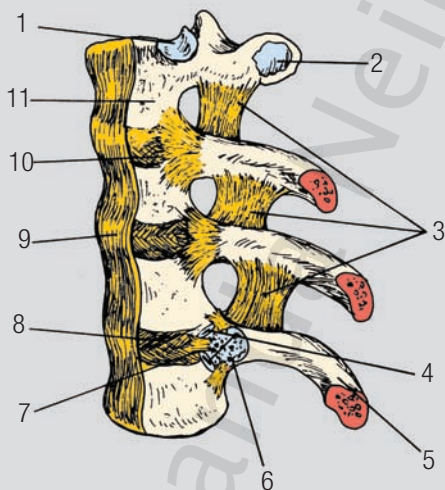
(symphyses - bone - fibrocartilagenous disc - bone b/n bodies fibrous
joints b/n processes spinous (SP) transverse (TP) synovial joints b/n
superior & inferior facets = zygapophyseal)

BS *spinal arteries of the regional arteries*

NS *branches from the dorsal rami of the adjacent
spinal Ns*

A *extensive movement possible b/n VB and discs but
altered by the zygapophyseal joints angulation
which changes regionally \pm costal joints
lumbar - flexion/extension lateral flexion, rotation
thoracic - rotation
cervical - flexion/extension, lateral flexion,*

- 1 superior demi-facet for costal head of rib
- 2 facet on TP for tubercle of rib
- 3 superior costotransverse lig
- 4 paired synovial joints
- 5 rib shaft
- 6 rib head
- 7 intra-articular lig
- 8 intervertebral disc
- 8A annulus fibrosis
- 9 anterior longitudinal lig = ALL
- 10 radiate lig
- 11 vertebral body
- 12 hyaline cartilage
- 13 lamina
- 14 pedicle
- 15 PLL
- 16 spine
- 17 interspinous lig
- 18 supraspinous lig
- 19 LF
- 20 capsule for zygapophyseal jt
- 21 intervertebral foramen
- 22 intervertebral notch

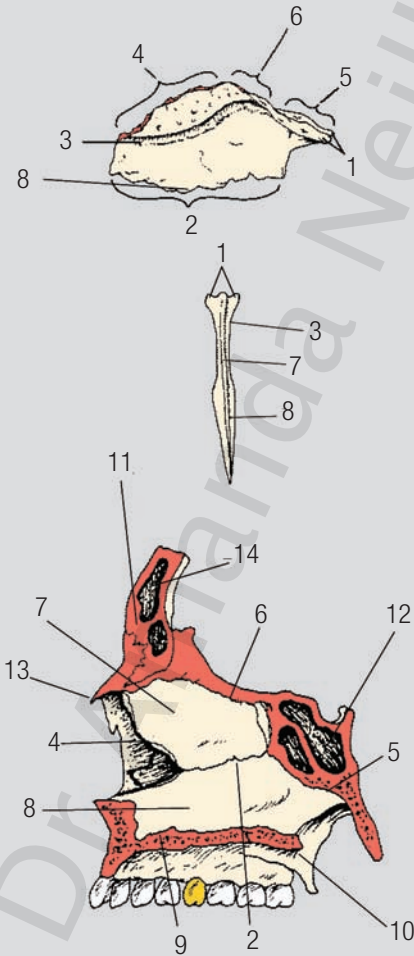


Vomer

lateral / posterior / in situ

A single small narrow frail plough-shaped midline bone. It is the deviation of this bone which may obstruct the nasal airways.

- 1 Ala (Alae)
- 2 Articulation with Maxillae and Palatine
Maxillovomer suture / palatinovomer suture
- 3 Groove for the nasopalantine nerves and vessels
- 4 articulation with nasal cartilages
- 5 articulation with Sphenoid bone
- 6 articulation with the Ethmoid plate
- 7 Perpendicular plate of the Ethmoid
- 8 Body of Vomer
- 9 Maxillae areolar bone
- 10 Medial pterygoid plate
- 11 Frontal bone
- 12 Sphenoid sinus
- 13 anterior of nasal bones
- 14 Frontal sinus



A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

WRIST JOINT = Radiocarpal joints

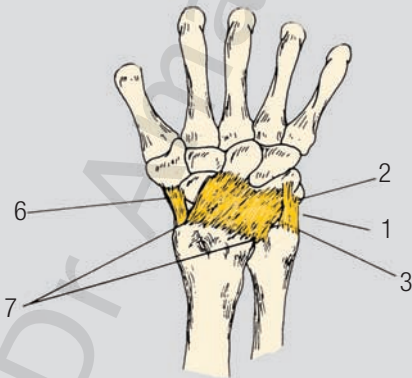
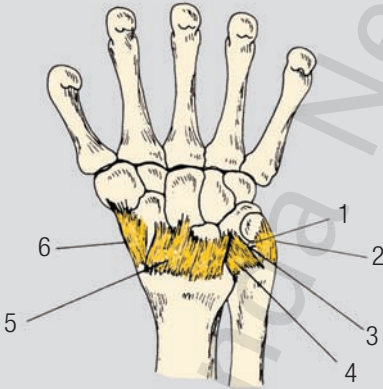
palmar / dorsal

BS *anterior interosseous, ant post carpal branches of the radial and ulnar art*

NS *ant post interosseous Ns (C6-8)*

A *flexion / extension
ulna and radial deviation
circumduction,*

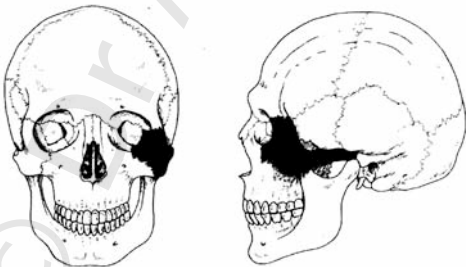
- 1 meniscus
- 2 ulna collateral lig
- 3 articular disc
- 4 palmar ulnocarpal lig
- 5 palmar radio carpal lig
- 6 radial collateral lig
- 7 dorsal radio carpal ligs

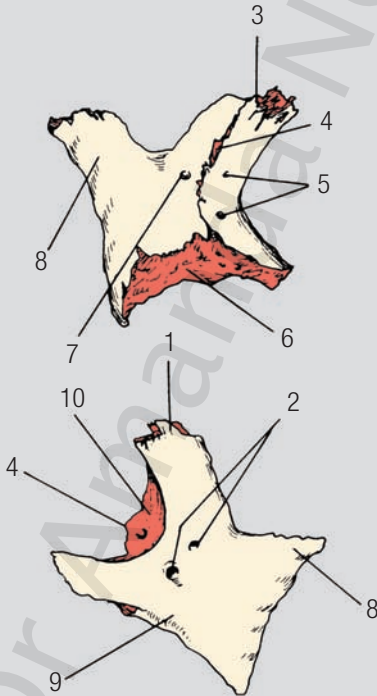


Zygoma = CHEEK BONES
Antero-Lateral / Postero-Medial
antero-lateral / postero-medial

These bones form the prominent corners of the face under the orbital rim.

- 1 frontal process
- 2 Zygomatico-Facial foramina
- 3 articulation with the Frontal bone
- 4 articulation with the Sphenoid
- 5 Zygomatico-Orbital foramina
- 6 articulation with Maxilla
- 7 Zyomatico-Temporal foramina
- 8 temporal process
- 9 maxillary process
- 10 orbital surface





Biography and Aim of the A to Z and Dr Amanda Neill

Dr Amanda Neill has a medical degree with specializations and research in the areas of Histology, Pathology, and Anatomy and Forensic medicine, with a separate specialization (MSc in renal glomerular disease). After teaching for many years at university of Sydney and completing her PhD on "the immunopathology of cerebral malaria" Amanda developed the only accredited RCAGP continuing education course on anatomy. Developing courses on the anatomy of the Back (Back to the Back) and the Head and Neck the PG program for Dental graduates and writing a number of manuals, booklets and programs for medical, dental, nursing and other health students. Qualifying as a GMP (Graduate medical program) facilitator she has seen and been involved in the transition from the classic medical course to the GMP and the integration and amalgamation of the classic preclinical and clinical medical subjects to the total self directed computer content based course. Moving to Macquarie University, she brought and developed her anatomy and histology program from scratch, conceptualizing and developing the virtual anatomy laboratory using her Flagship grant. This massive project is still in development.

Despite modern computer developments and because of her diverse teaching, research and medical background Amanda knows the value of learning the fundamental building blocks the A to Z of health and medicine in order to write and know the whole medical book. She is passionate about developing accessible and wide reaching medical and educational programs for all levels: the student, the postgraduate, the health and medical professional. Particularly in anatomy and its branches after all we are all ANATOMY!!

Looking for collaboration in her projects Amanda developed links with the NSW Department of Forensic medicine, the University of Sydney, the Coroner's court, the Royal colleges of Anaesthetists and Biomedical scientists (of which she is currently the secretary) and commercial sponsors such as Aspen.

So anatomy@mac has spread and involved students from all the university divisions and the all walks of life.

Always looking to improve accessibility and application of knowledge and skills (such as Anatomy in Action and morphing@mac Art Anatomy exhibitions) and schools science projects Amanda and Aspen are collaborating on a series of A to Z pocket references to be used as handy guides and aids for all those interested in health and medicine, particularly the busy medical practitioner.

We want these to be a guide and a help for you and want your help and feedback in order to make the manuals and the accompanying websites a benefit for you. You can be a part of this project too. Write to us
And

Of course if you want to get a HEAD do Amanda's A to Z.

www.amandasatoz.com



The A to Z Project so far.....

Pocket Reference Books

- **The A to Z of Skeletal muscles** (origins insertions actions BS & NS of each muscle listed alphabetically)
- **The A to Z of the Bones of the Skull** (including radiology of the Skull)
- **The A to Z of Anatomical, Histological and Medical terms** (inc. pronunciation guide, anatomy word builder, abbrev. of medical qualifications and organ wgt.)
- **The A to Z of Bones, Joints and Ligaments** (each bone's features and its articulation group relations, individual joints, movements, BS & NS, and joint classifications listed)

Website www.aspenatlas.com (www.anatomyatmac.com)
email us for complete access to the many A to Z educational aids

- The A to Z of Histological and Anatomical images
- The A to Z of Skeletal Muscles
- The A to Z of Medical quizzes

Other proposed titles

list in order of priority

- *The A to Z of Surface Anatomy.*
- *The A to Z of Nerves*
- *The A to Z of Neuroanatomy*
- *The A to Z of Emergency Medicine*
- *The A to Z of Anatomical Quizzes*
- *The A to Z of Gynecological terms*
- *The A to Z of Radiology*

☐
☐
☐
☐
☐
☐
☐

Research projects

The A to Z of Topographical anatomical mapping
in conjunction with the Forensic Institute of NSW and Anatomy Update

What did you use this text for ?

- Student use
Medical use - continuing education/patient explanation
Forensic use
Health professional use / other
Personal use

☐
☐
☐
☐
☐

please email any comments or to order additional copies special student rates
medicalamanda@gmail.com amanda@amandasatoz.com
fax 61 2 93651000 phone 0414248747 mobile: 0414248747

Name: _____
E-mail: _____
Other contact: _____





Dr. A. L. NEILL

BSc MSc MBBS PhD FACBS

medicalamanda@gmail.com

www.amandasatoz.com

0414248747

Contact www.aspenpharma.com.au for
login and passwords for the complete
A to Z and the AspenAtlas online.



Aspen Pharmacare Australia Pty Ltd
34-36 Chandos Street, St Leonards NSW 2065
ABN 51 096 236 985