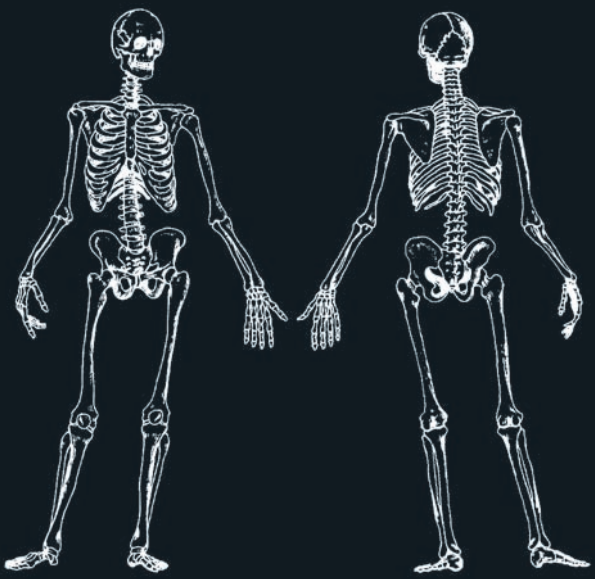
The A to Z of Bones, Joints and Ligaments



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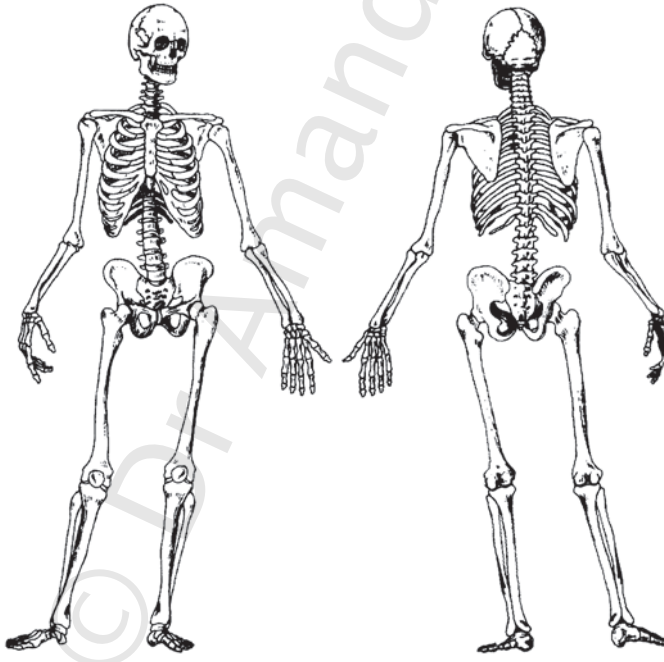

Introduction

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

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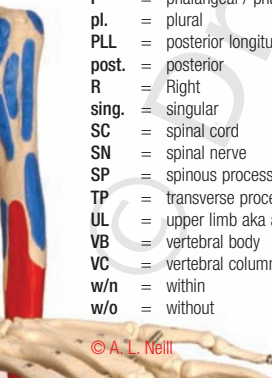
Abbreviations

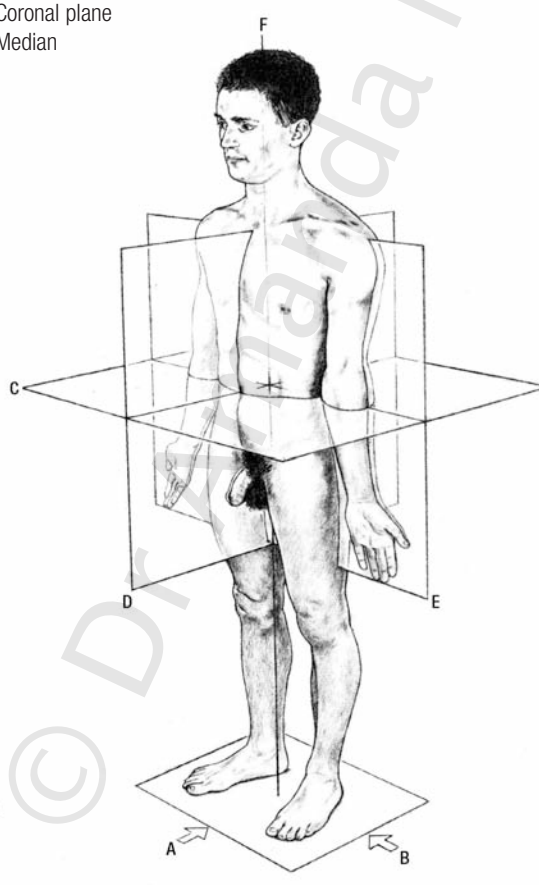
A = actions /movements of a joint
aa = anastomosis or anastomoses
adj. = adjective
aka = also known as
ALL = anterior longitudinal ligament
alt. = alternative
ant = anterior
art = articulation (joint w/o the additional support structures)
AS = Alternative Spelling, generally referring to the diff. b/n 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

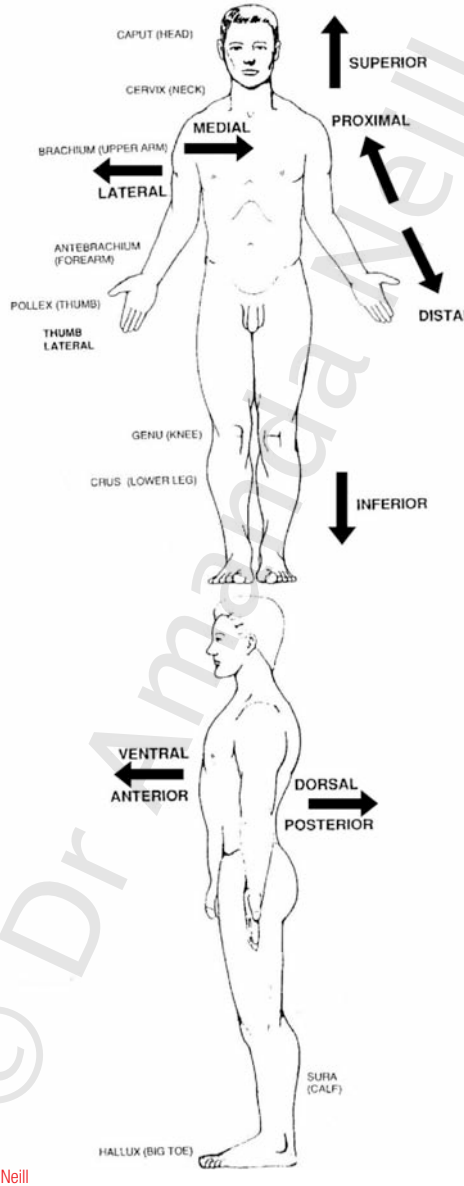


Guide to Anatomical Planes and Relations

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

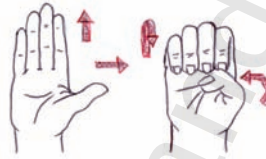
Foot dorsiflexion

Foot plantar flexion

Foot inversion

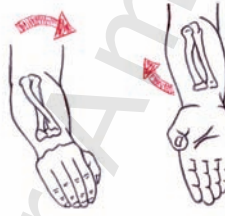
Foot eversion

Foot normal position



Fingers extension

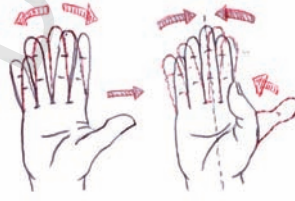
Fingers flexion



Forearm pronation

Forearm supination

Hand deviation
radial/laterally
ulna/medially



Fingers abduction

Fingers adduction

Thumb opposition

Table of contents

OVERVIEWS to be found in this book

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).

Cranial Fossae (see Skull internal views)
Craniovertebral joints (HEAD/SPINE joints *aka* Atlanto-Occipital joints & Axial-Occipital joints)
Cuboid (ankle)
Cuniforms (foot)
1st - medial cuniform , 2nd intermediate cuniform , 3rd lateral cuniform ,
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)
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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)
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Metacarpal fifth (bone to the little finger)
first (bone to the thumb)
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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)
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third / fourth / fifth (bone to the little toe)
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Palantine
Parietal
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Pectoral girdle = SHOULDERS overview
Pelvic girdle = HIPS (see Hip)
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Pisiform (see also hand, wrist)
Pubic Symphysis part of Hip / Pelvic girdle
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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)
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Sacroiliac articulation - posterior
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Sacrum (lower BACK BONE)
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Scapula (*aka* SHOULDER BLADE)
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SPINE overiew (see vertebral column overview)
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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 boney 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 ***pl. - alae.***

Alveolus Air filled bone - tooth socket ***adj - alveolar*** (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- **To do with joints hence…**
Arthritis Inflammation of a joint
Arthropathy Diseases of the joints
Arthrosis Joint types
Articulation Joint, description of the bone surfaces joining w/o the supporting structures = point of contact b/n 2 opposing bones hence the articulation of humerus and scapula is the articulation of the shoulder joint.

Attrition Tooth wear and tear

Auditory Pertaining to hearing, hence, pertaining to the ear. (***Auditory exostosis*** = a bony growth on the walls of the External Auditory Meatus)

Avulsion Forceable tearing away of a structure or part of a structure as in an avulsed fracture where a fragment bone is torn away from the main bone

Axial Refers to the head and trunk (vertebrae, ribs and sternum) of the body.

Ball and Socket Generally referring to a joint which resembles a ball sitting tightly in a socket - very stable, limited range of movement e.g. hip joint

Basilar Relating to the base or bottom of structures
Basiocranium Bones of the base of the skull

Boss A smooth round broad eminence - mainly in the frontal bone female > male

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 f 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

Carpo 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.

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. Llifting 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 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 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

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

Genu /genio Knee adj referring to the knee

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

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

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

Hydroxyapetite 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 ***pl.(juga)*** as in Sphenoid .

Kyphosis Collapse of vertebral body(ies) 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. ***(noun lacrima)***

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 Occitipum

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 cartilagneous 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 centeres devlop 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 ephyseal 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 maintin the extracelluarl 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.

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.

Splanchocranium The splanchocranium 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 The saw-like edge of a cranial bone that serves as joint between bones of the skull.

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 jointd 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 artifical 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 ligamantous 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.- uncinate.***
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 f the bone is outside of the suture. Generally they are unnamed although the Incus is given to the large extra-sutural bone when present.

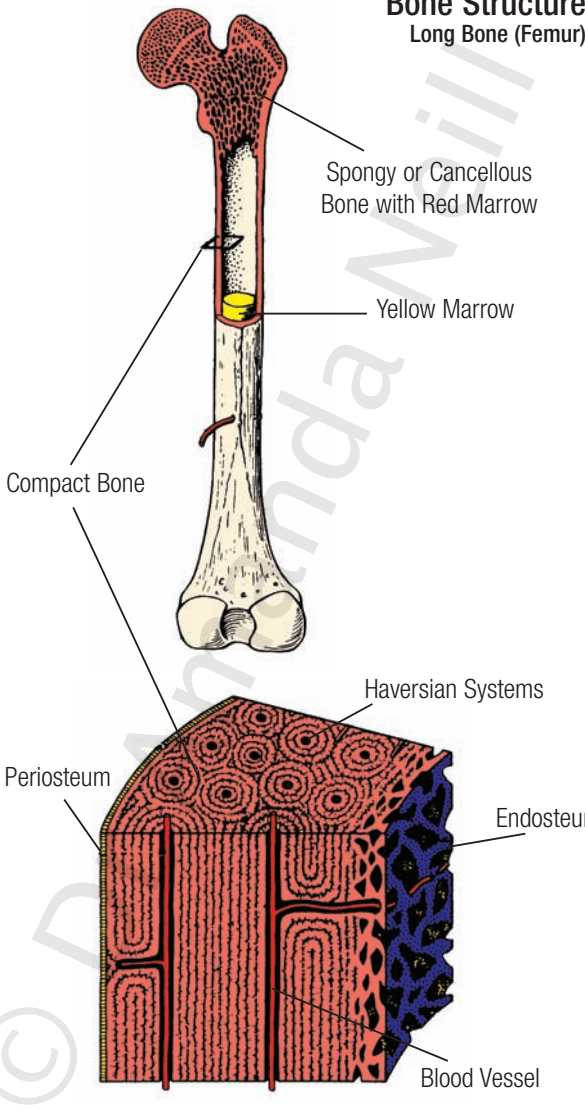
There are: There are between 600 and 620 bones in the body including the various sesamoid and Wormian bones and other areas where there may be separate or ossified joints.
22 paired skull bones including the ear ossicles / not including the teeth.
5 single bones mainly on the base of the skull
1 mandible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

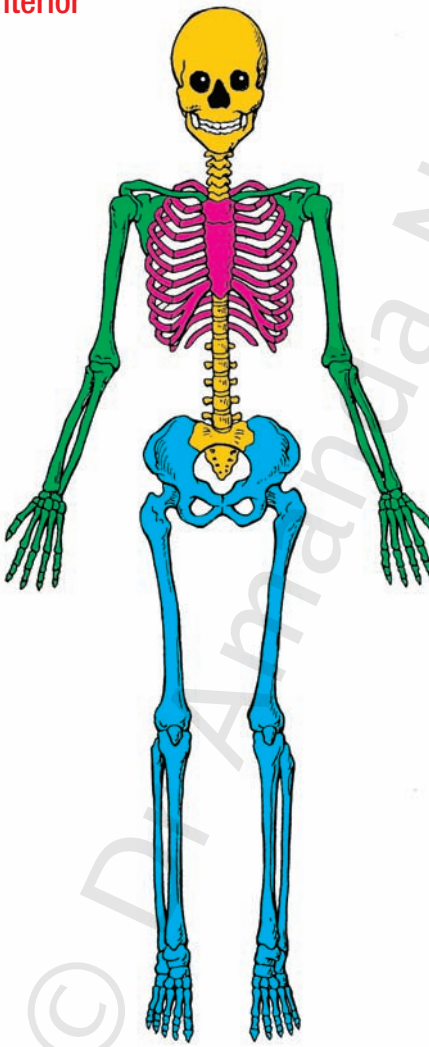
Bone Structure

Long Bone (Femur)



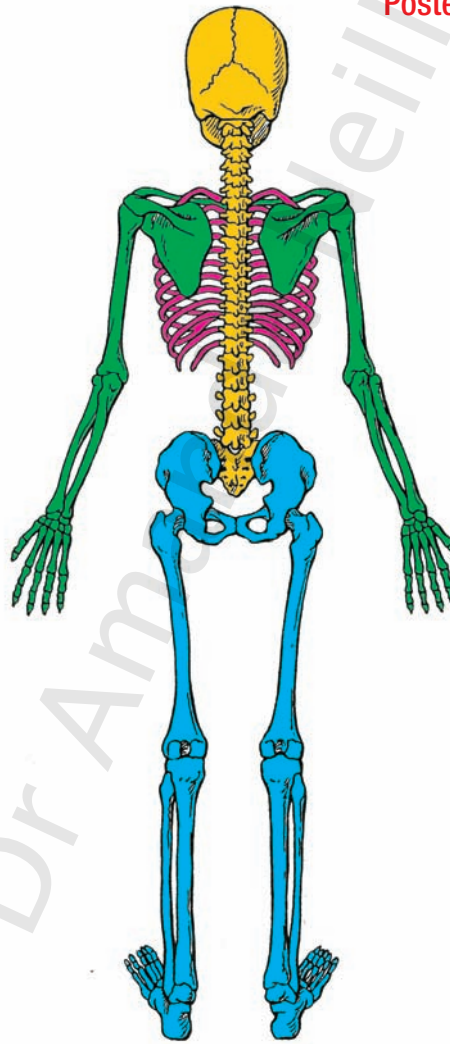
Articulated Skeleton

Anterior



Articulated Skeleton

Posterior



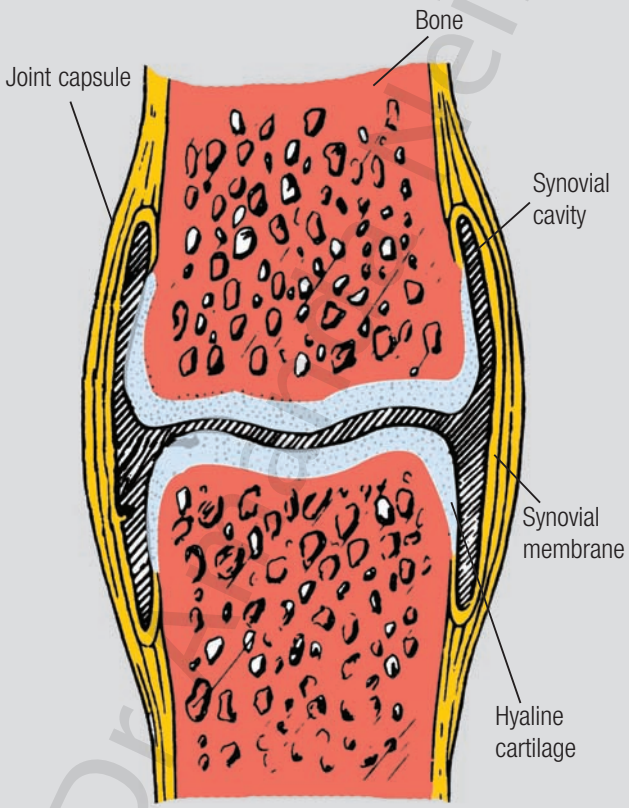
Disarticulated Bones

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 = 1º CARTILAGENOUS JOINT (Amphiarthrosis)	BONE - HYALINE-CARTILAGE - BONE	due to the elasticity of the CARTILAGE	1st costal cartilage to the Manubrium rib cartilage Manubriosternum
SYMPHYSIS (2º 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 ligs 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 ligs 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- ligs	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			

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

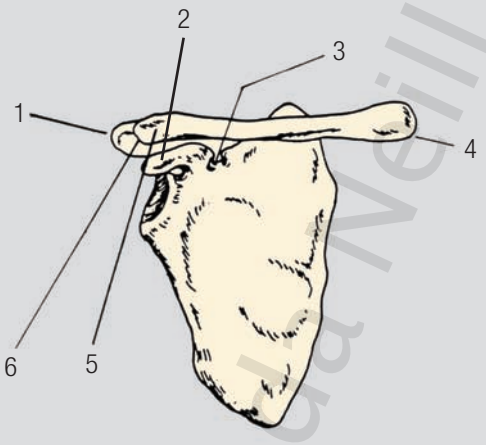
anterior (ribs cut away)

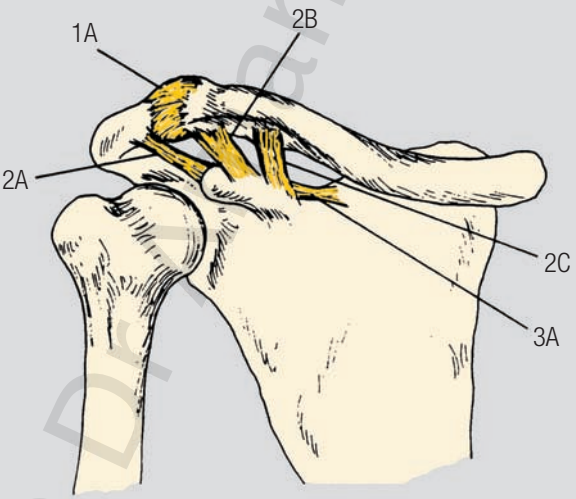
BS ***supra scapular artery, thoracoacromial artery***

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

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

1 Acromion
1A Aromio-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.





ANKLE JOINT = Talocrural joint

medial / lateral

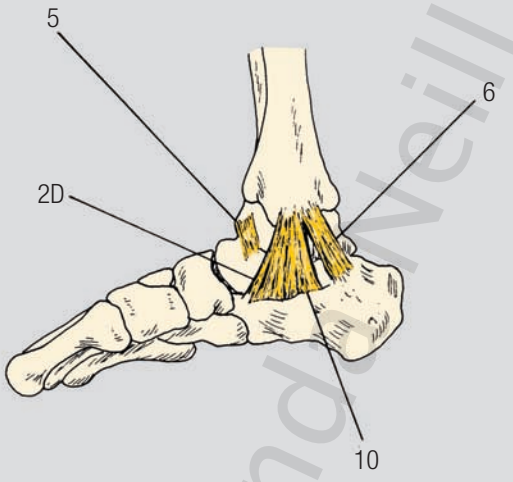
BS ***ant. tibial & peroneal arteries***

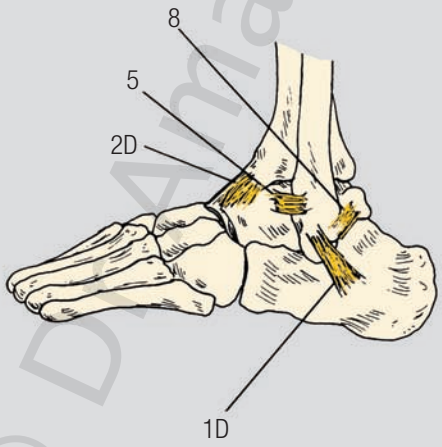
NS ***deep peroneal tibial NS deep peroneal = ant tibial (L4-S2)***

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





ANKLE JOINT = Talocrural joint

posterior

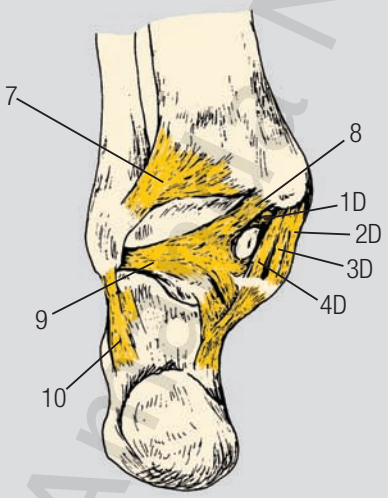
BS ***ant. tibial & peroneal arteries***

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	ant. 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” shap



ANKLE JOINTS lower = SUBTALAR joints

lateral / medial

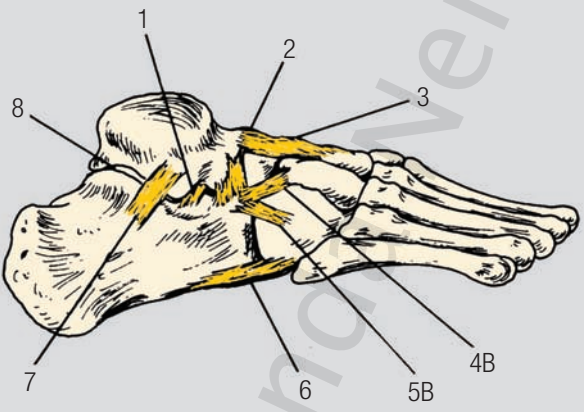
BS* *anastomotic network around jts from ant. post. tibial arteries, dorsalis pedis, peroneal arteries*

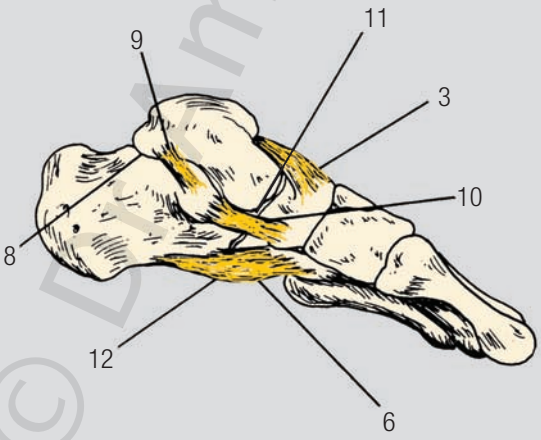
NS *medial lateral plantar Ns (L4-S3)*

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.





ANTERIOR CHEST - OVERVIEW

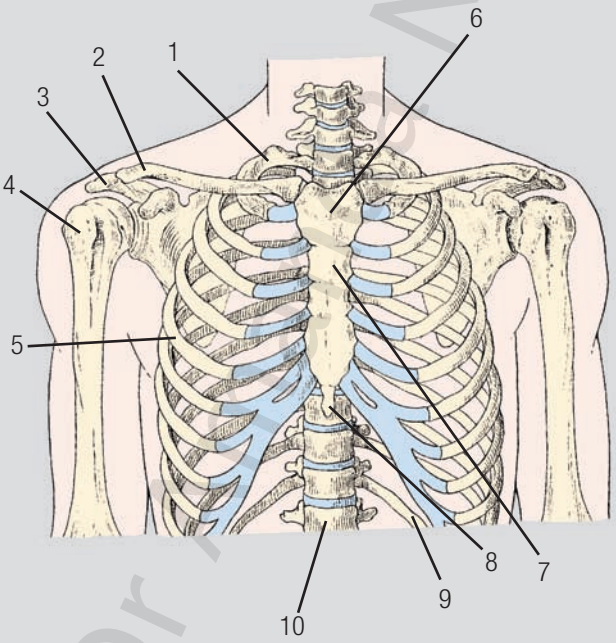
SHOWING

vertebral jts - CERVICAL & THORACIC regions
VB with VB via intervertebral discs = INTERVERTEBRAL jts (fibrocartilagenous)
articular processes superior/inferior = ZYGAPOPHYSEAL jts (plane synovial)

first rib with manubrium jt / COSTO-STERNAL jt (synovial)
clavicular jts - proximal CLAVICULO-STERNAL (synovial)
-distal ACROMIO-CLAVICULAR (synovial)

scapula with humerus / SHOULDER jt = GLENOHUMERAL jt (synovial)
ribs with sternomanubrium jts / COSTOSTERNAL jts (varied)
ribs with vertebrae - COSTOVERTEBRAL jts (synovial)
manubrium with sternum - MANUBRIOSTERNAL jt (fibrocartilagenous)
sternum with xiphoid process - XIPHISTERNUM jt (fibrocartilagenous- may ossify)

1 ist rib
2 clavicle
3 acromion f the scapula
4 humerus
5 5th rib
6 manubrium
7 sternum
8 Xiphoid process
9 12th rib
10 L1 vertebral body



ARM Articulations = Upper limb overview

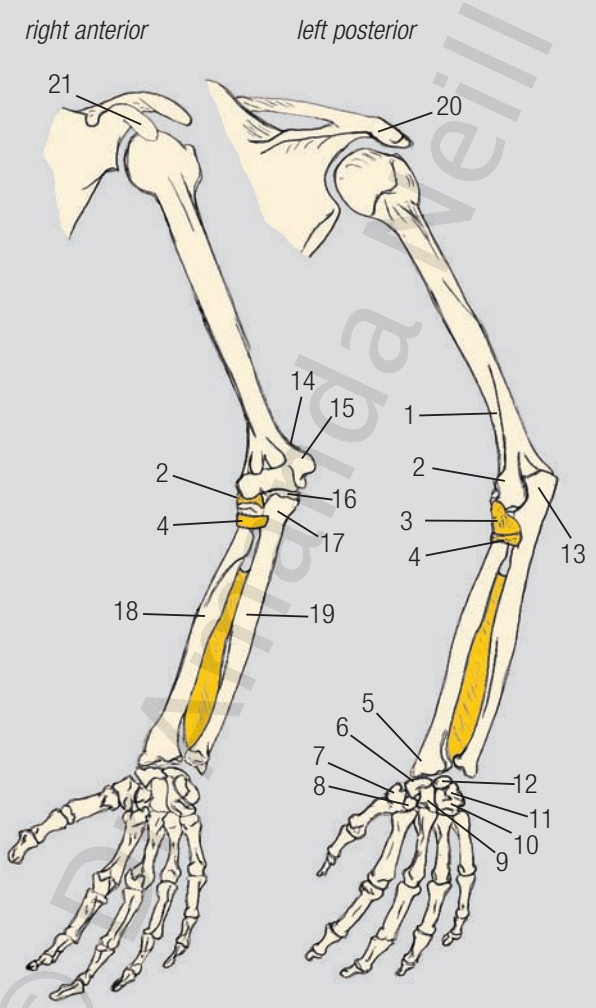
anterior FRONT (L) / posterior BACK

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



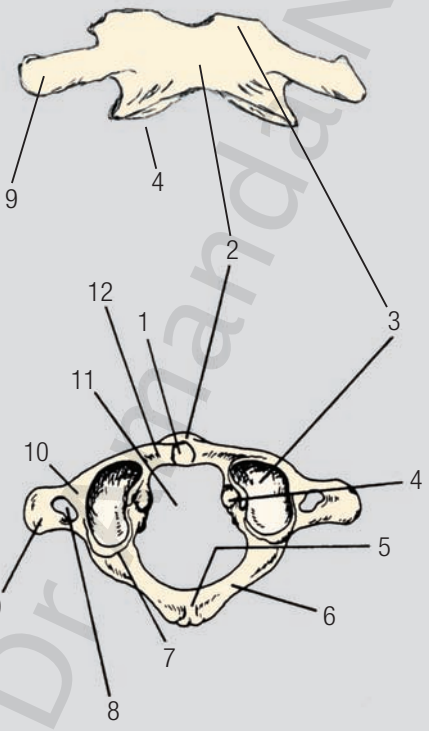
Atlas = C1 = First Cervical Vertebra

anterior / superior

(Atlas - Gk demigod who held up the world on his shoulders)

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

1 facet for odontoid / dens process
2 ant. tubercle
3 superior articular facet
4 inferior articular facet
5 posterior tubercle
6 posterior arch
7 groove for vertebral BVs & suboccipital N
8 Foramen Transversarium = transverse foramen
9 TP
10 lat. mass
11 vertebral foramen
12 ant. arch



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***

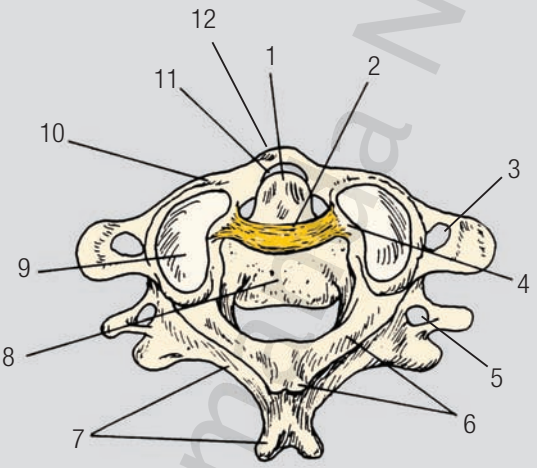
Atlanto-Axial joints - *lateral* = zygapophyseal joints of C1/C2

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 tranverse 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)



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

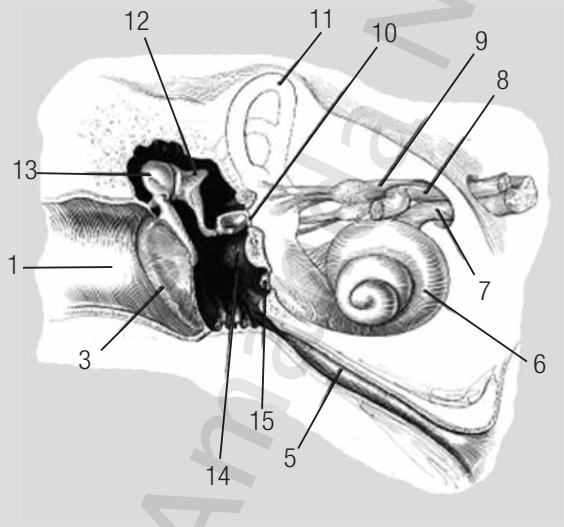
Overview - In situ -individual bones

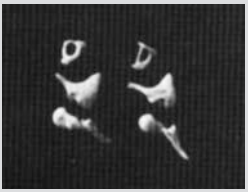
Description - 3 bones incus = anvil, malleus = hammer, stapes = stirrup in the Temporal bone middle ear cavity Malleus abuts the Tympanic membrane of the middle ear (eardrum) articulates with the Incus and then the Stapes which abuts to the round window

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**

1 External Auditory Meatus = Earhole
2 External ear
3 Tympanic membrane = Lateral border for the middle ear
4 Inner ear
5 Auditory tube
6 Cochlea
7 Cochlea N
8 Facial N
9 Vestibular N
10 Oval Window with Stapes
11 Vestibular canals
12 Incus
13 Malleus
14 Promontory
15 Round Window

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





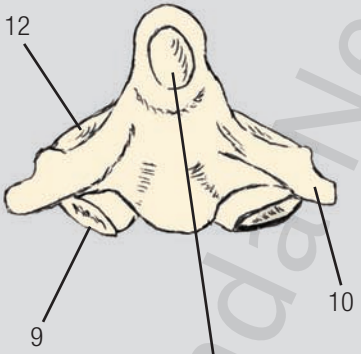
Axis = C2 = Second Cervical Vertebra

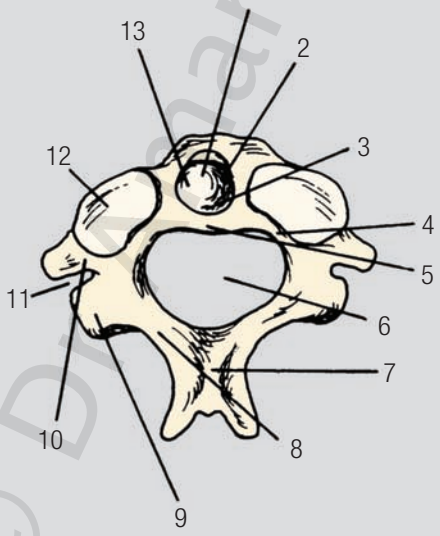
anterior / superior

(Axis - pivot for movement of the head all movements but nodding)

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

1 Dens = Odontoid process (tooth)
2 attachment of Alar ligament
3 groove for Transverse ligament
4 pedicle
5 body
6 vertebral foramen
7 spinous process
8 lamina
9 inferior articular process
10 transverse process
11 transverse notch / foramen (if closed)
12 superior articular facet
13 facet for odontoid / dens process





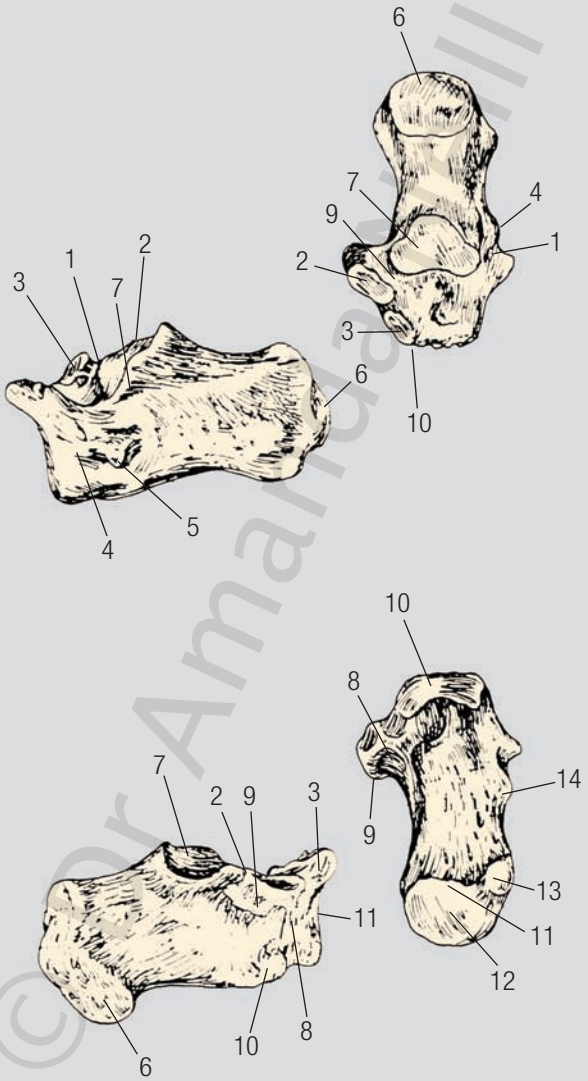
Calcaneus = Os Calcis = Heel bone

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



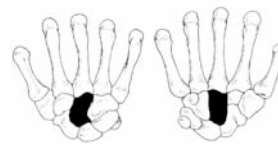
Capitate = Os Capitus = part of Os Carpus (wrist bones)

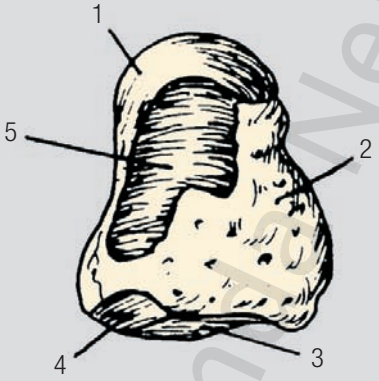
lateral / medial

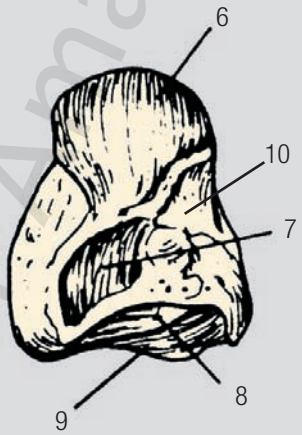
(Capitate - small cap-like bone in the wrist, 2nd row of carpal bones = part of the os carpus consists mainly of articulating facets)

Articulations:	the other bones in the wrist and 4 of the 5 metacarpal bones	capito-lunate capito-hamate capito-scaphoid capito-trapezoid carpometacarpo joints with all the metacarpals except the 1st (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 Trapezopid
8 facet for 2nd MC
9 facet for 3rd MC
10 dorsal surface







Carpus = Carpal Bones = WRIST BONES

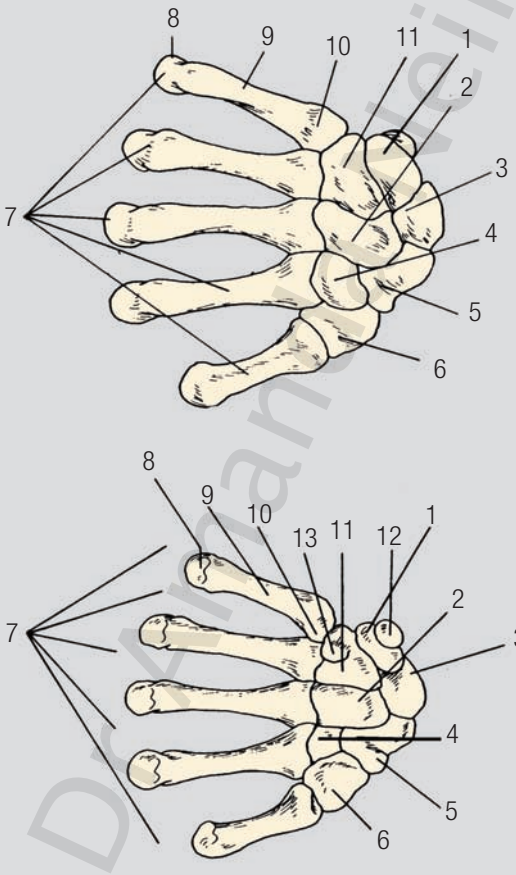
overview

dorsal / palmar

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

1st row	2nd 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

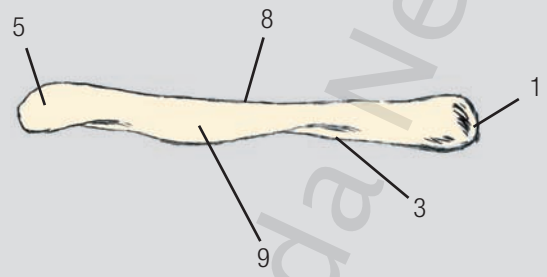


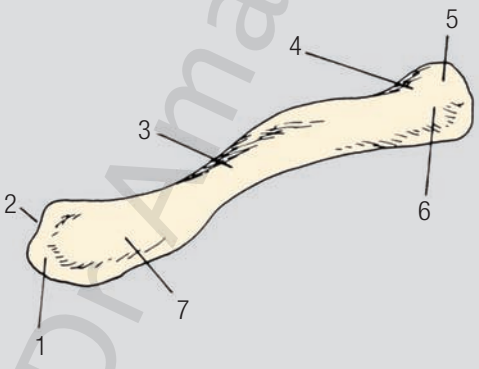
Clavicle = COLLAR BONE

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





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)

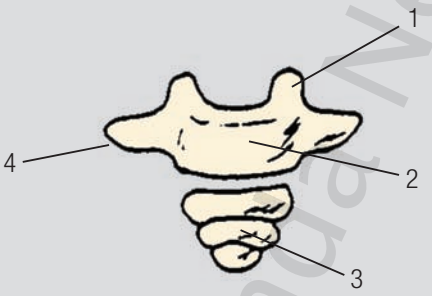
Articulations:	with each other 3-5 bones which may be fused	S1-3/5 average 4
	with the sacrum superiorly	sacro-coccygeal
Special features:	less features inferiorly after S1 no pedicles, laminae or spinous processes	may fuse with sacrum late in life looks like the bill of the cuckoo

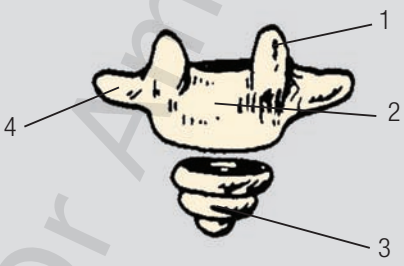
1 superior articular surface

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)

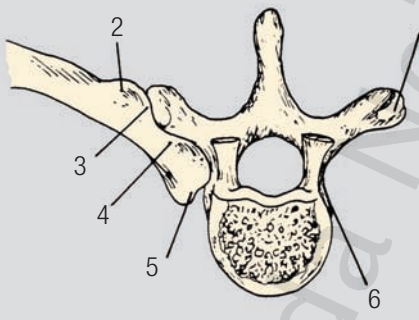
BS ***posterior intercostals -spinal branches of the thoracic Aorta***

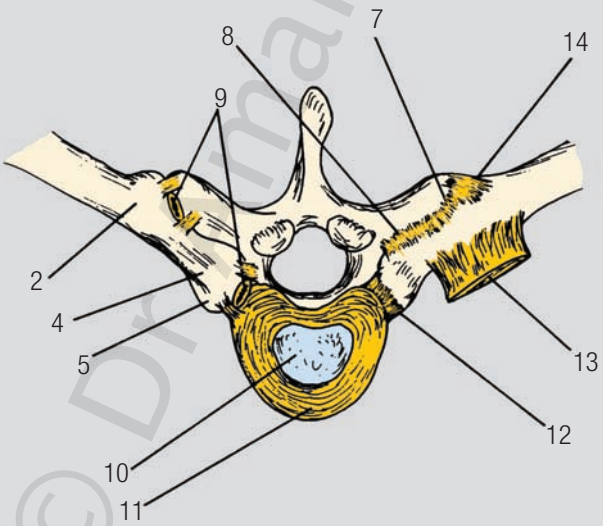
NS ***posterior intercostals Ns spinal branches (C8,T1-12)***

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)

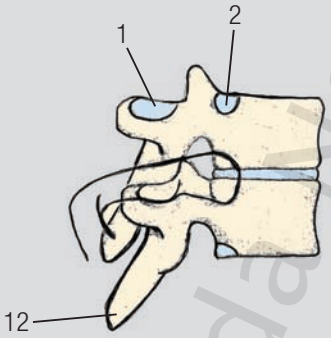
BS posterior intercostals -spinal branches of the thoracic Aorta

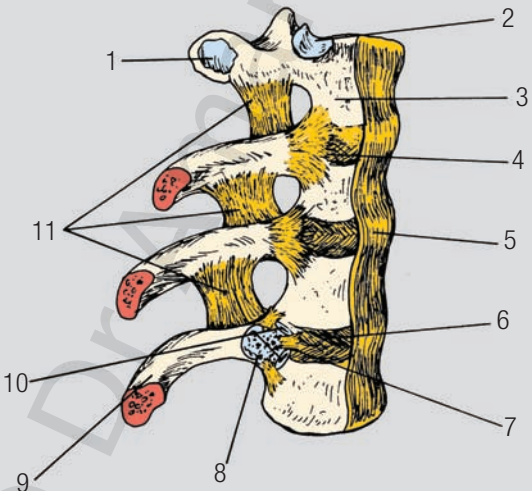
NS posterior intercostals Ns spinal branches (C8,T1-12)

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)

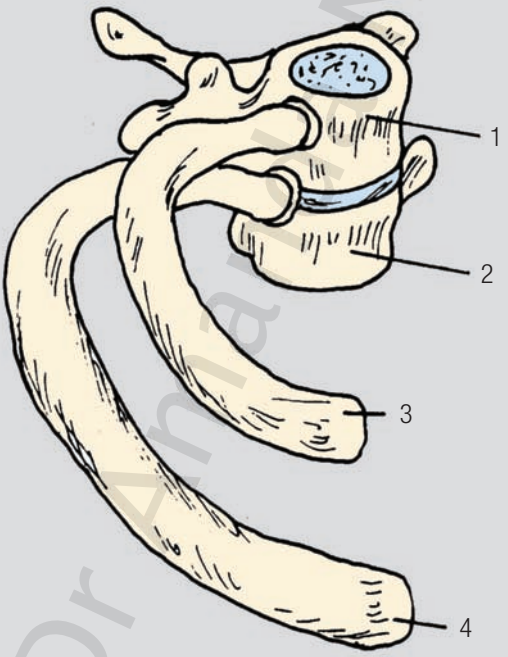
BS posterior intercostals -spinal branches of the thoracic Aorta

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 tranverse process of T2

1 T1
2 T2
3 first rib
4 second rib



Craniovertebral joints = HEAD/SPINE joints

anterior

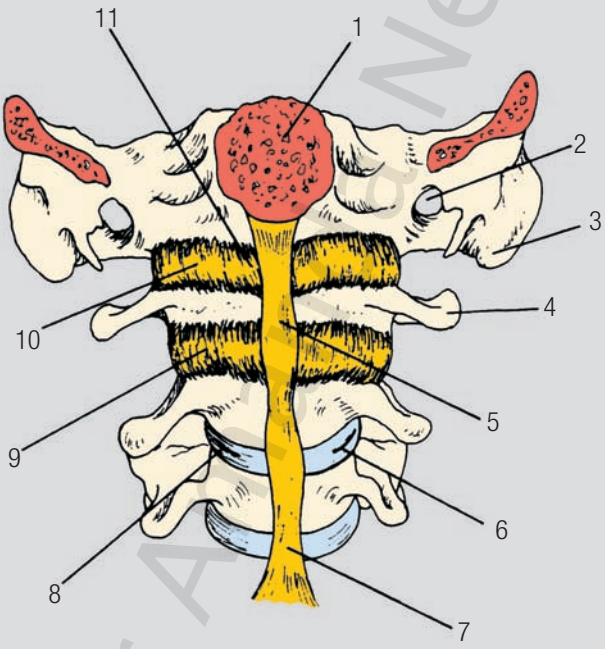
(made up of median and lateral Atlanto-Occipital (C1/head) and Axial-Occipital joints (C2/head) joints)

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-occiptal joint
10. capsule of the lateral atlanto-axial joint
11. ant atlanto-occipital membrane



Craniovertebral joints = HEAD/SPINE joints

lateral

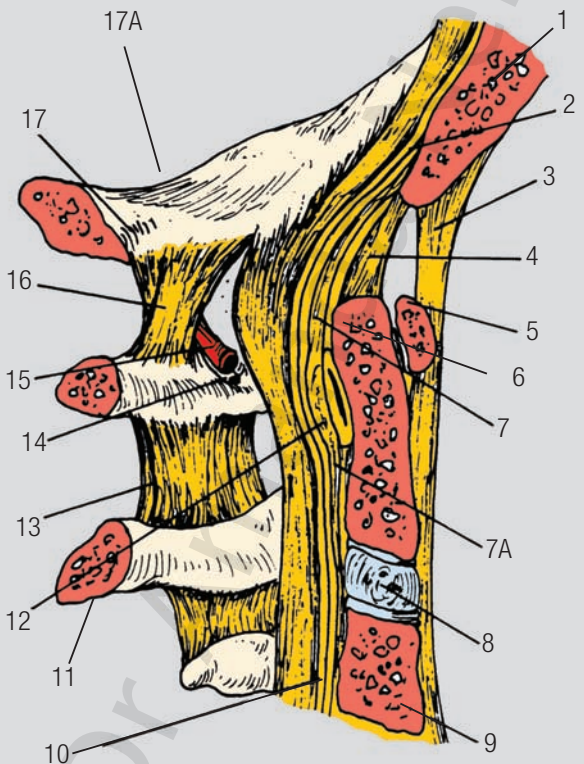
(made up of median and lateral Atlanto-Occipital (C1/head) and Axial-Occipital joints (C2/head) joints)

BS vertebral arteries

NS smedial 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)

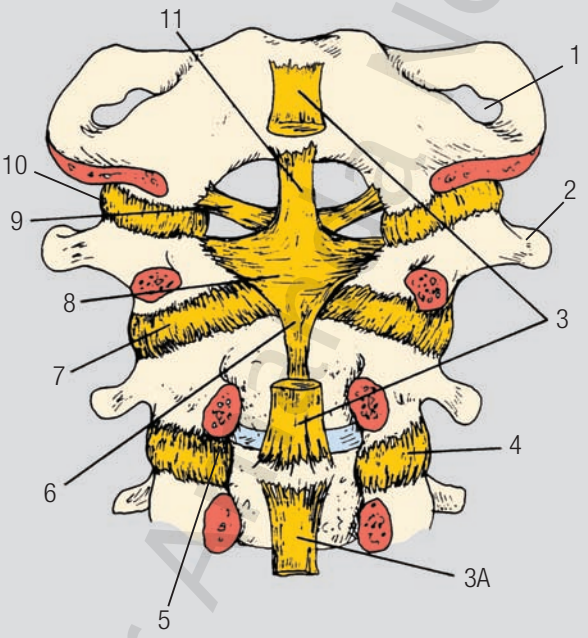
BS vertebral arteries

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



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**	**cubo-calcaneal**
	with 4th and 5th MTs anteriorly	**cubo-metatarsal joints**
Special features	**cuboid shape with large tuberosity on the inferolateral surface**	**underneath and to theside**

1 facet for lateral cuniform

2 facet for Navicular

3 facet for Calcaneus

4 facet for 4th MT

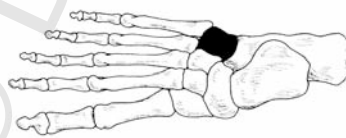
5 dorsal surface

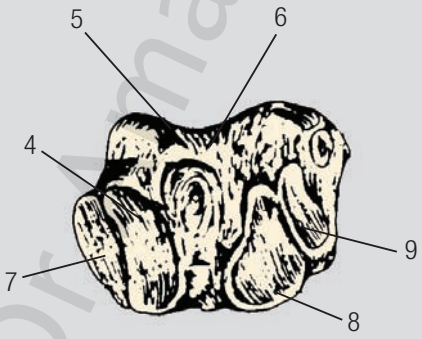
6 lateral surface

7 facet for 5th MT

8 groove for peroneus longus tendon

9 facet on tuberosity for sesamoid bone in the tendon





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)

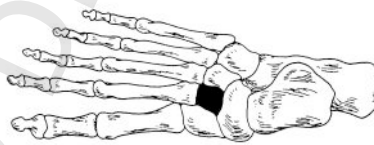
Articulations:	with Navicular posteriorly	also joins to the other cuniforms on either side
	with 2nd metatarsal anteriorly	
Special features	is the smallest of the cuniforms	

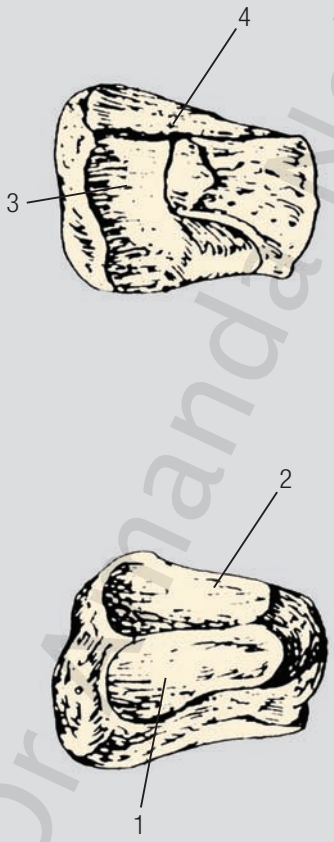
1 facet for lateral cuniform

2 facet for Navicular

3 facet for medial cuniform

4 facet for 2nd metatarsal





Cuniform lateral = the third 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 laterally**	**with the Cuboid**
	with 2nd, 3rd, 4th metatarsals anteriorly	**with 2nd cuniform medially**
Special features	**is the intermediate in size**	

1 facet for 4th metatarsal (MT)

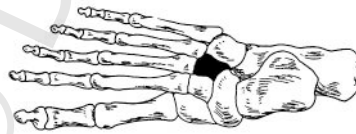
2 facet for 3rd MT

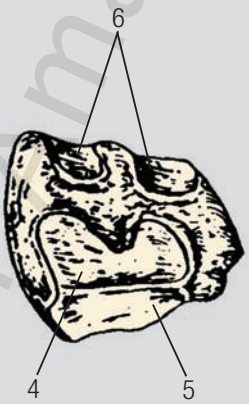
3 facet for Cuboid

4 facet for intermediate cuniform

5 facet for Navicular

6 facet for tendon 2nd MT





Cuniform medial = the first 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**	**cubo-calcaneal**
	with 1st and 2nd MT anteriorly	**cubo metatarsal joints**
Special features	**is the largest of the cuniforms**	**kidney shaped facet at the base of the 1st MT**

1 facet for 2nd metatarsal (MT)

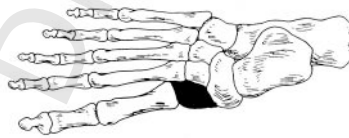
2 facet for peroneus longus tendon

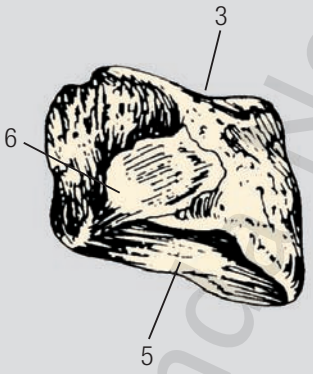
3 facet for Navicular

4 facet for intermediate cuniform

5 facet for 1st MT

6 facet for tendon of Tibialis Anterior



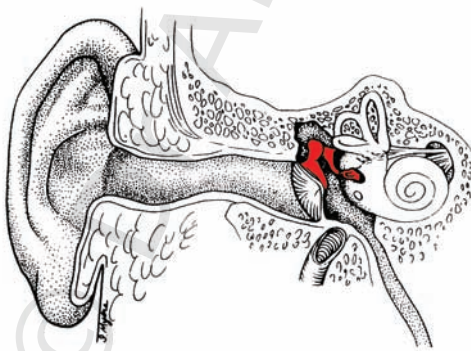


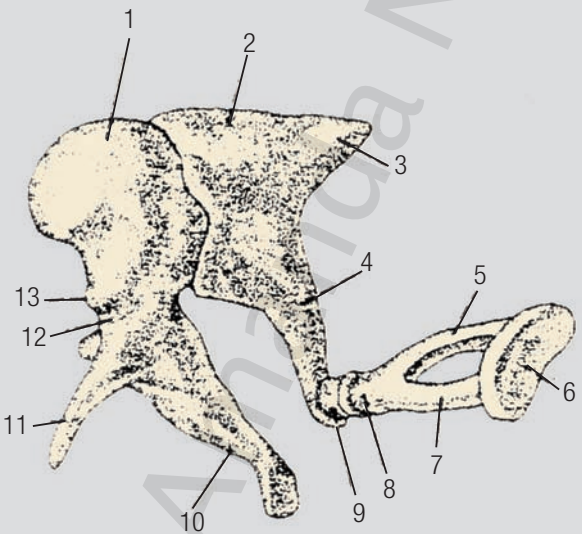
EAR BONES = Auditory Ossicles

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



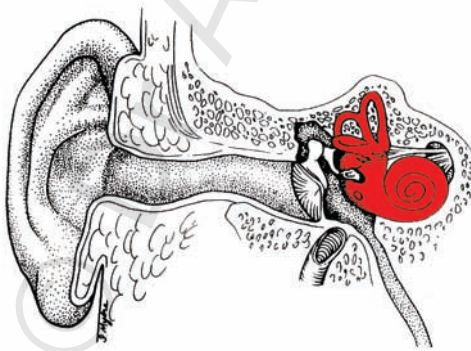


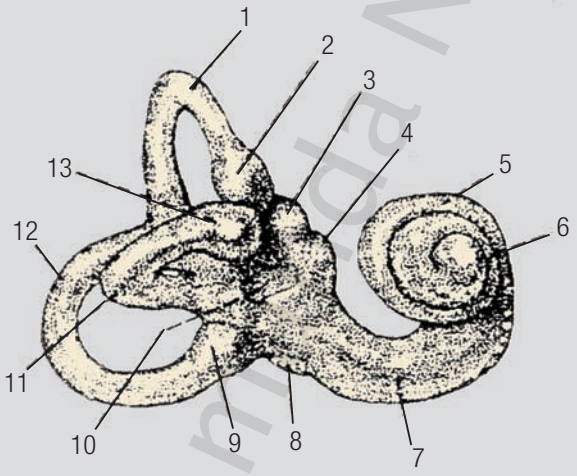
EAR BONES =Auditory Ossicles

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





ELBOW joint / humero-ulnar

articulation, anterior / posterior

Extended

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

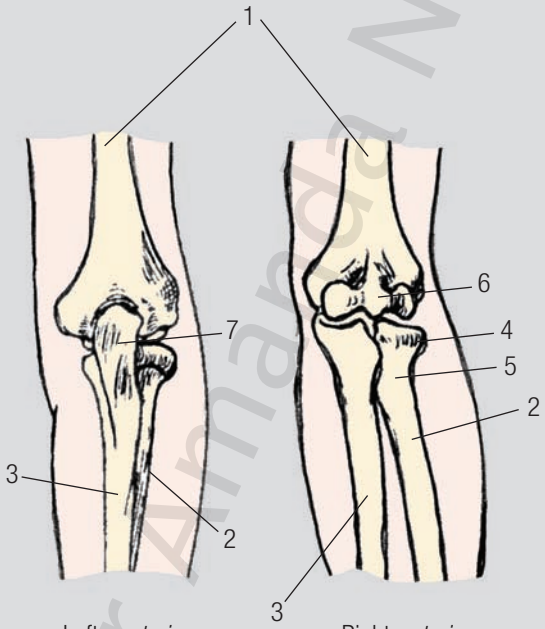
BS anastomosies around joint from brachial, profunda brachii, radial and ulnar arteries

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



Left *posterior* Right *anterior*

ELBOW joint / humero-ulna

joint, lateral / medial **Flexed**

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

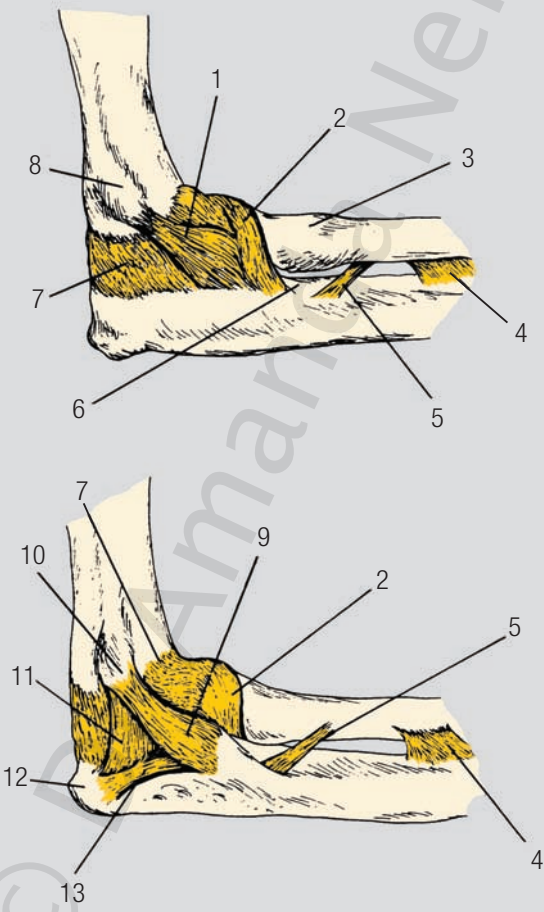
BS anastomosies around joint from brachial, profunda brachii, radial and ulnar arteries

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

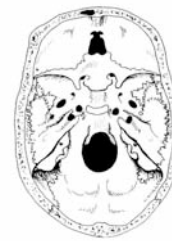


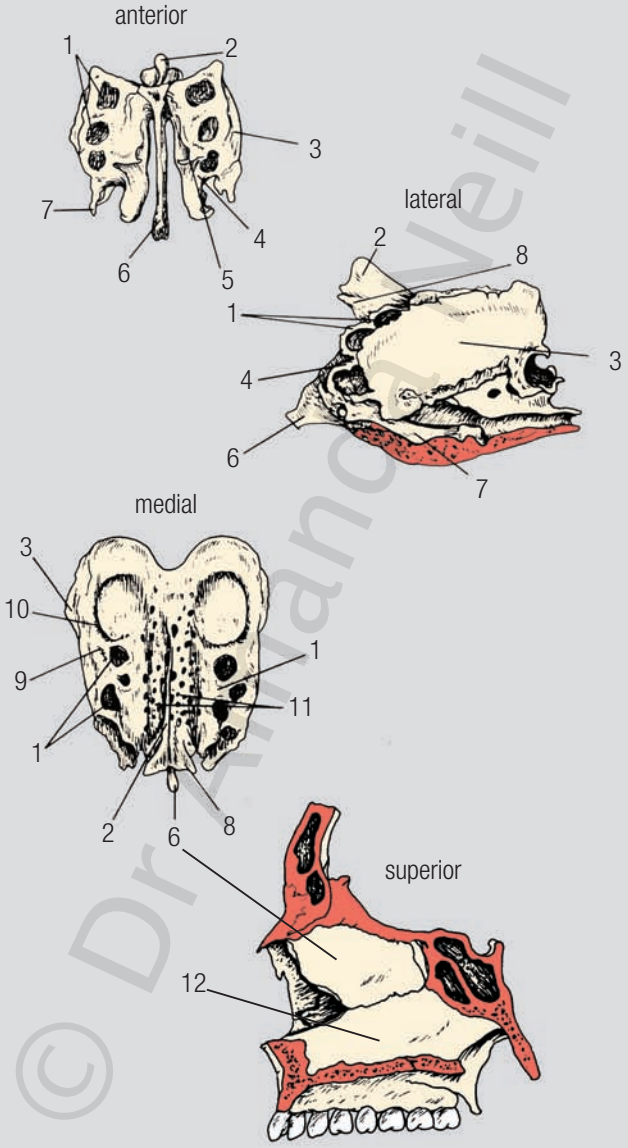
Ethmoid bones

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 Cribiform plate (entrance for the Olfactory nerve)
12 Vomer





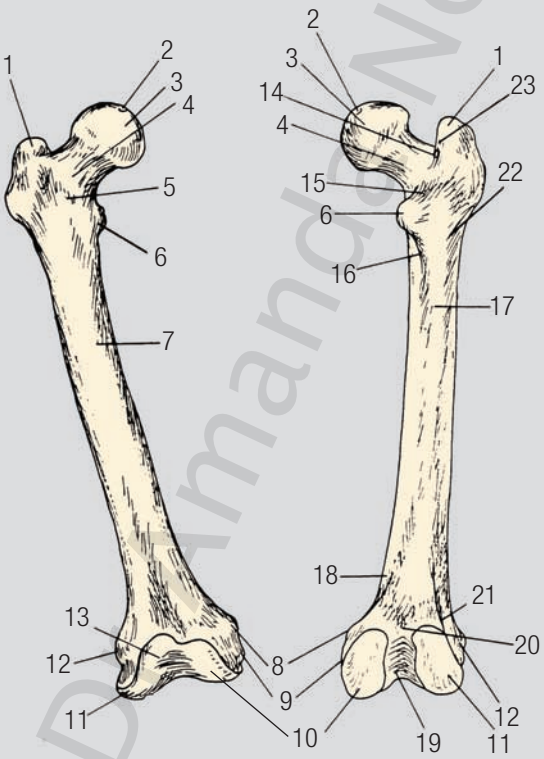
Femur = Thigh bone aka LEG BONE

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



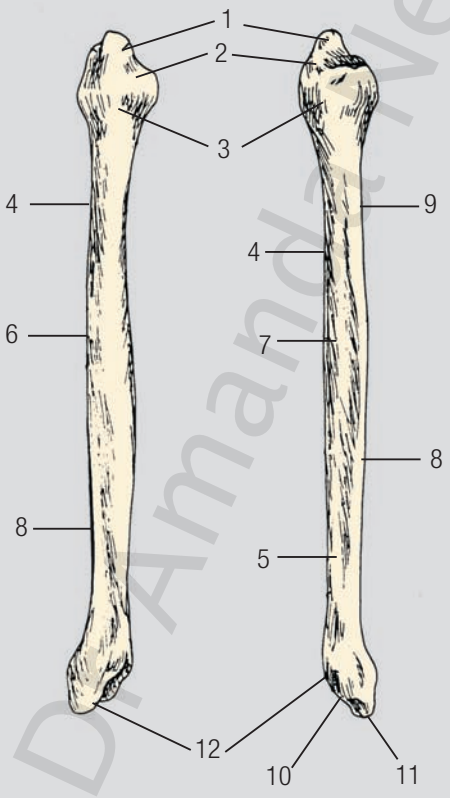
Fibula = lower leg bone aka SHIN BONE

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)



FINGERS OVERVIEW = Phalanges

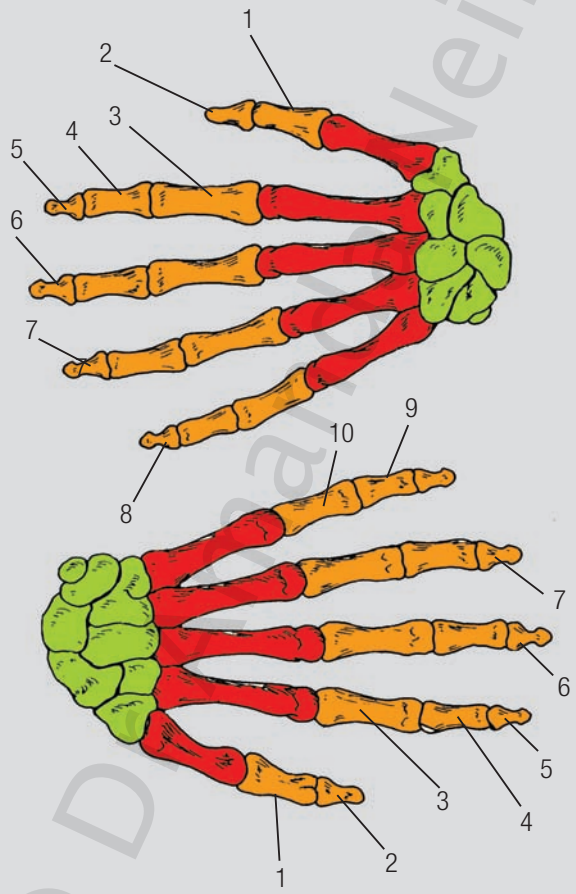
see also - Phalanges
dorsal / palmar

(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 - *planar joint*** **the thumb - *saddle joint*** **with the middle phalanx - *hinge joint***
	middle phalanx **proximal** **distal**	 **as above** **with the distal phalanx - *hinge joint***
	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)

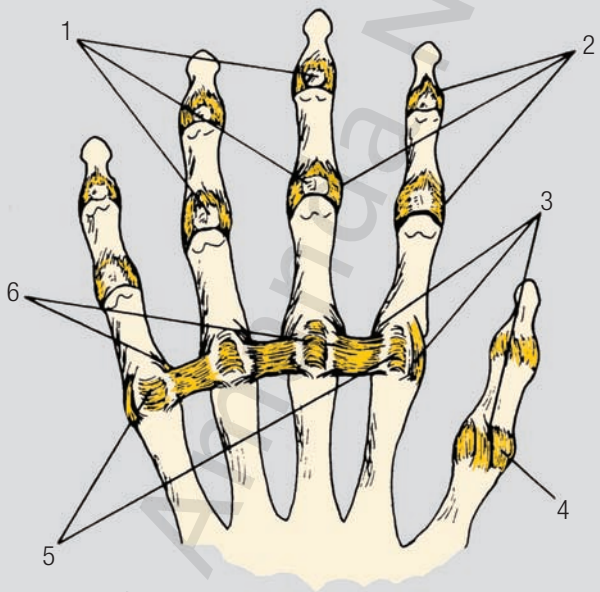
(Fingers = made up of 3 phalanges, small long bones in the hand distal to the Metacarpals. Each finger has a proximal, middle and distal phalanx, except the thumb (pollux) which only has 2 a proximal and distal phalanx)

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 ligs
6. palmar ligs grooved for flexor tendons



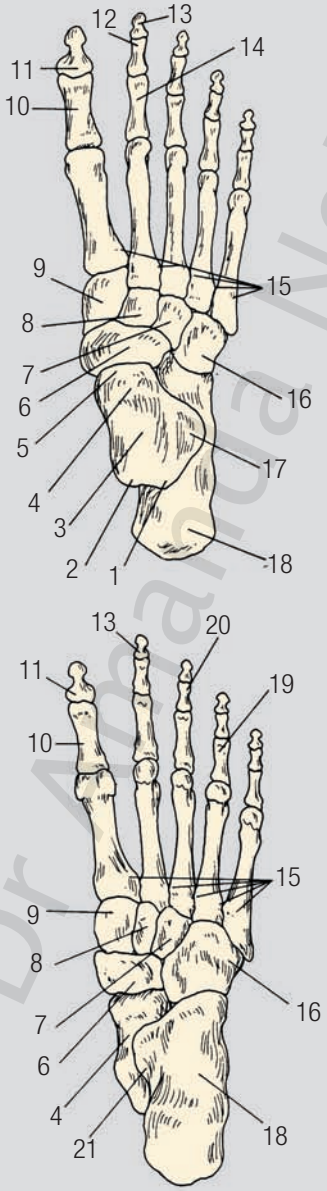
FOOT BONES overview

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

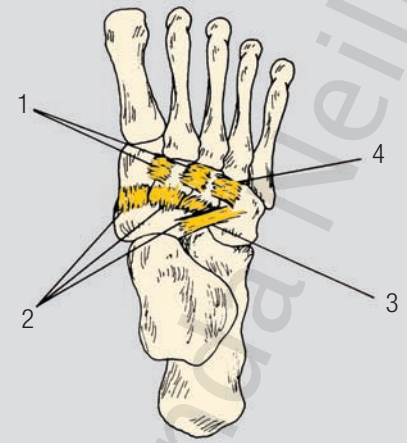
(The foot is made up of the Tarsals Metatarsals and the Toes (phalanges), small long bones in the foot distal to the Metatarsals. Each toe has a proximal, middle and distal phalanx, except the big toe (hallux) which only has 2, a proximal and distal phalanx)

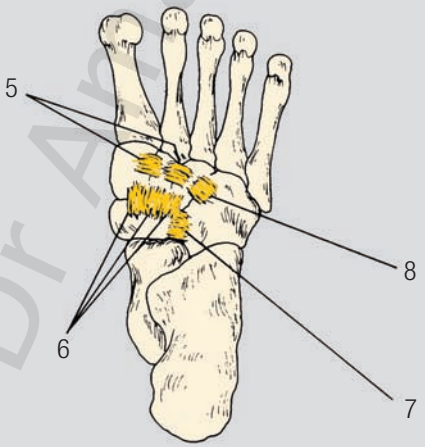
BS ***branches of dorsalis pedis medial & lat. plantar art.***

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

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

1. dorsal intercuniform ligs
2. dorsal cuneonavicular lig
3. dorsal cuboidenonavicular lig
4. dorsal cuneocuboid lig
5. plantar intercuniform ligs
6. plantar cuneonavicular lig
7. plantar cuboidenonavicular lig
8. plantar cuneocuboid lig



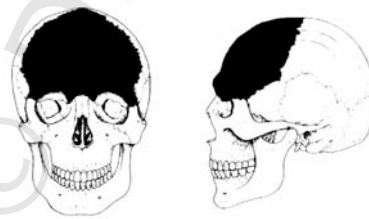


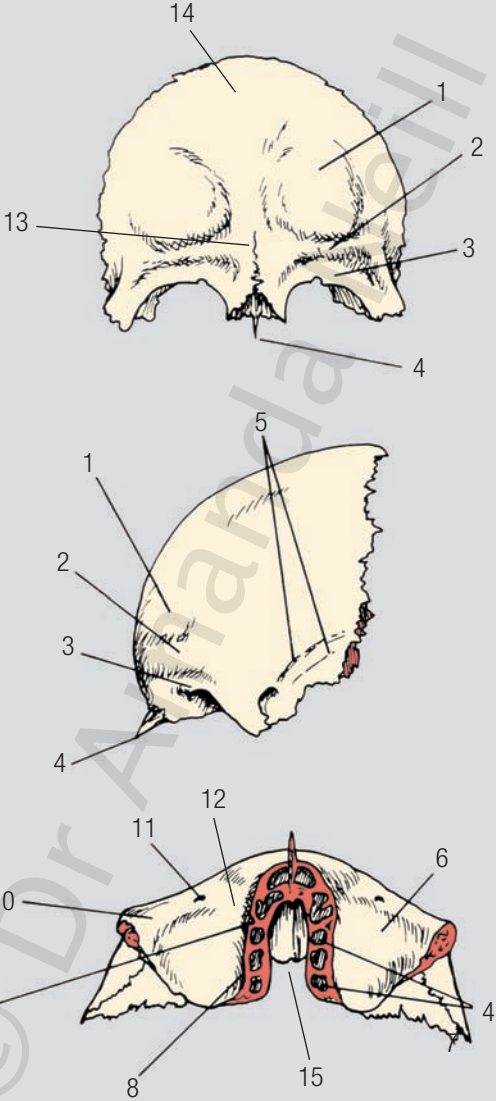
Frontal bones

anterior / lateral / inferior

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

1 Frontal tuberosity -Frontal bossing
2 Superciliary arch
3 Supraorbital margin and notch
4 Nasal spine
5 Superior and inferior temporal lines
6 Superior Orbital plate - pars orbitalis
7 Frontal and Ethmoid air cells - Frontal sinus
8 Posterior Ethmoidal foramen
9 Anterior Ethmoidal foramen
10 Zygomatic process
11 Supra-Orbital notch or foramen
12 Lacrimal fossa
13 Metopic suture - frontal suture, Glabella
14 Frontal squama
15 Ethmoidal notch





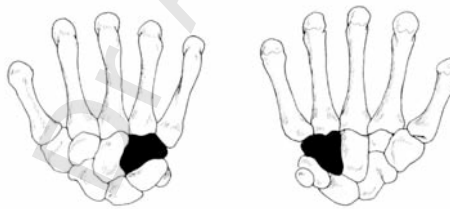
Hamate = hammer

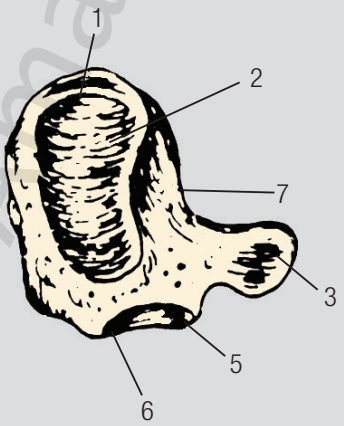
lateral / medial

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

Articulations:	with Triquetral proximally	with 4th and 5th 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



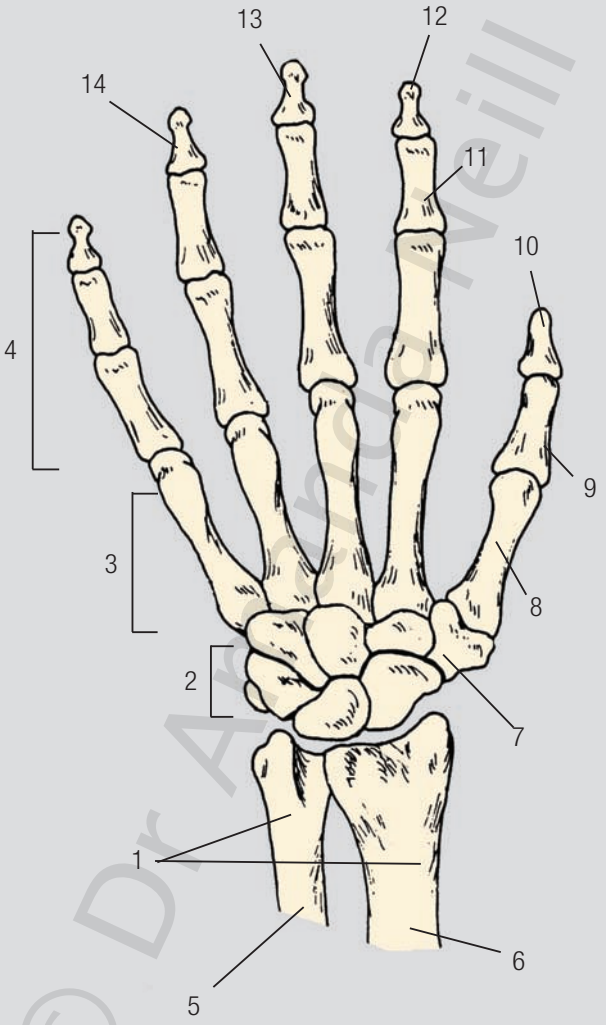


HAND and WRIST bones overview

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)



HAND (and WRIST) bones overview

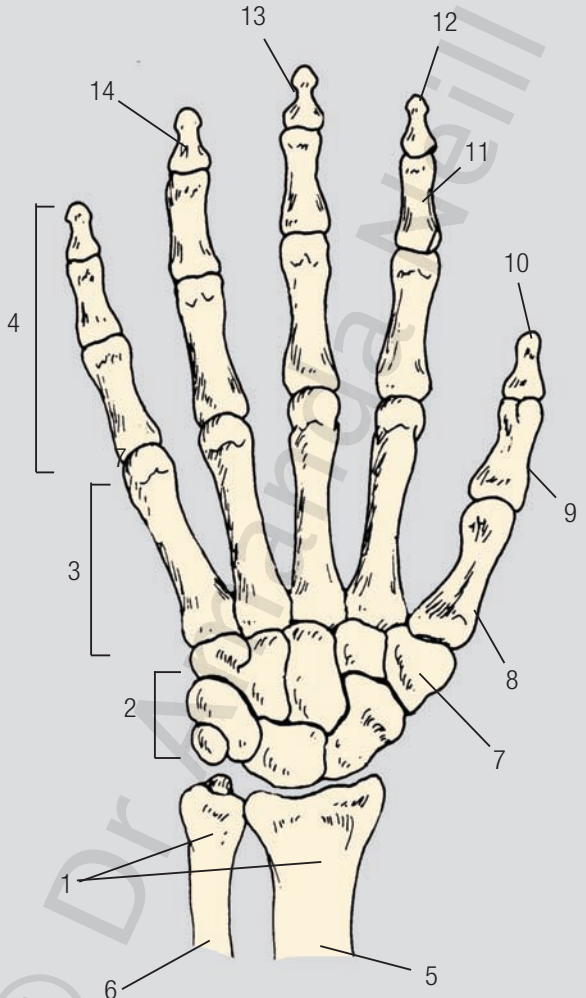
palmar

(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

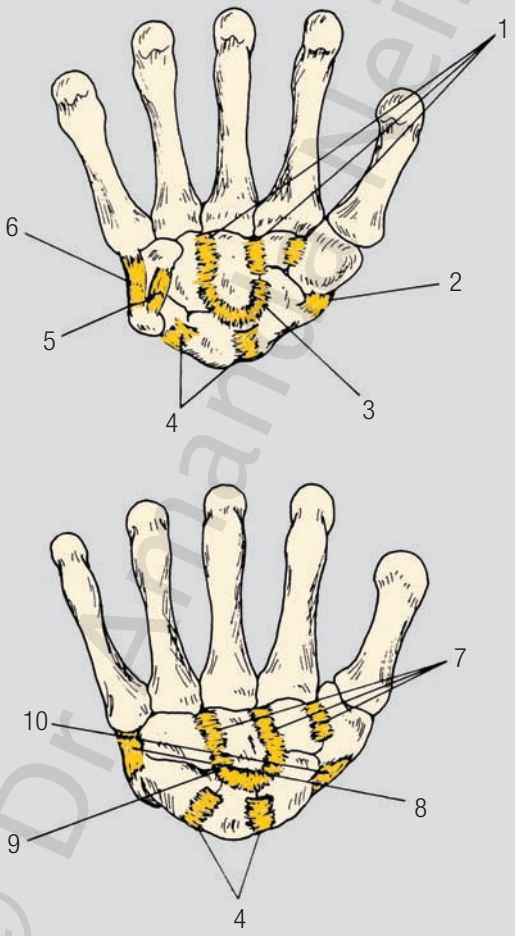
BS ***anterior interosseus C & MC branches of radial & ulna art. and deep palmar arch rich aa***

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

* Bifurcate ligament



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

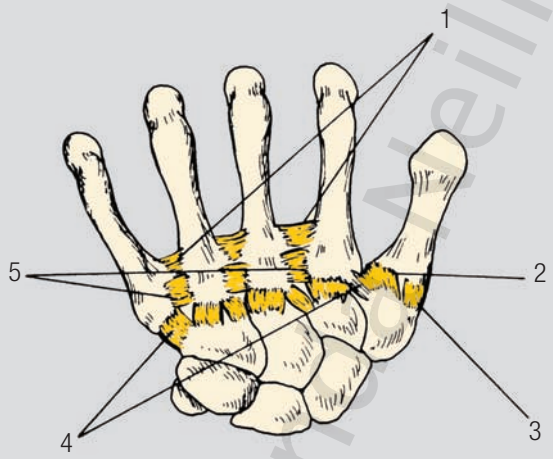
palmar / dorsal

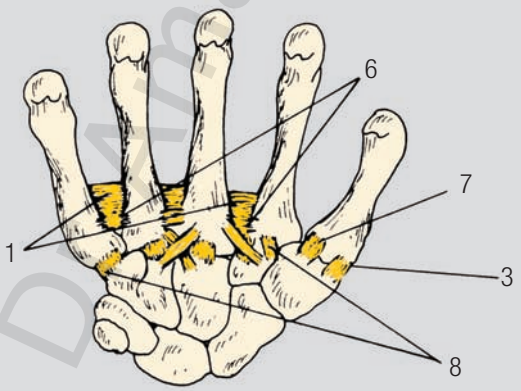
BS ***anterior interosseus carpal and metacarpal branches of radial and ulna arteries and deep palmar arch rich aa***

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 ligs (inter MC)
6. palmar MC-MC lig (inter MC)
7. palmar lig of the thumb
8. palmar C-MC ligs



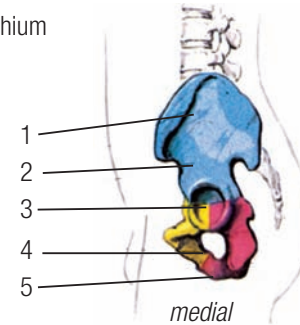


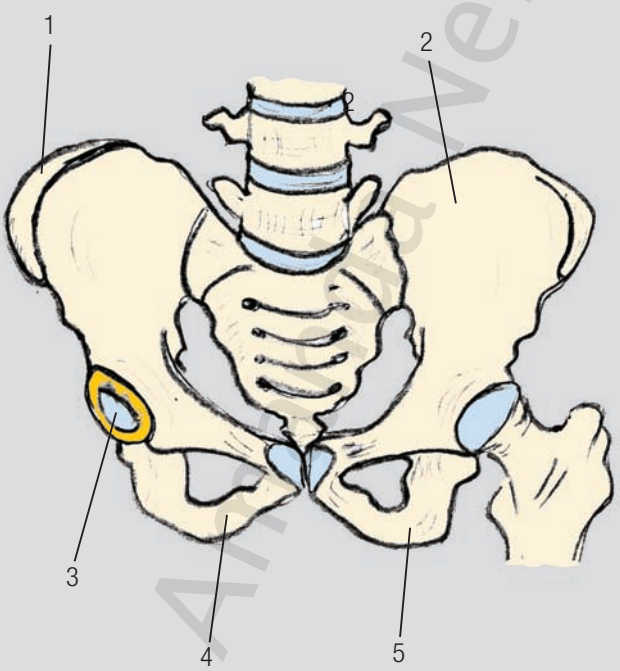
Hip bone = Innominate bone (unnamed bone) = Os Coxae

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



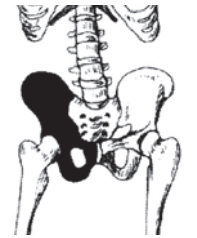


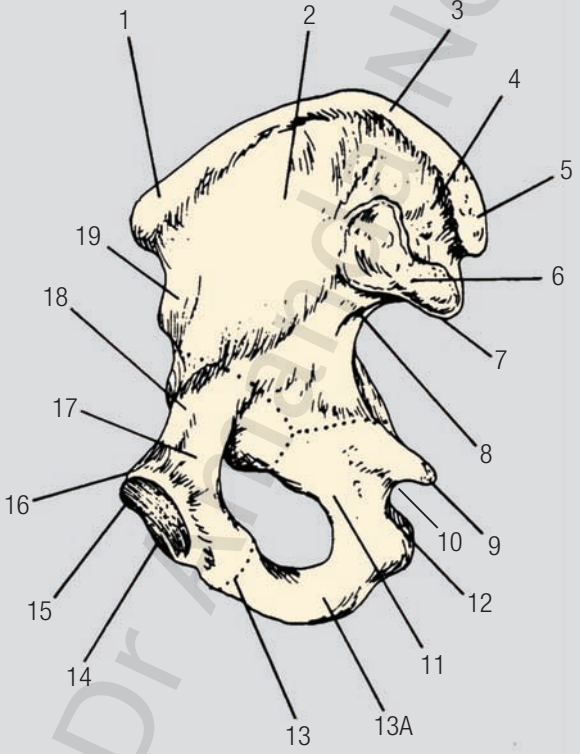
Hip bone = Innominate bone (unnamed bone) = Os Coxae

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



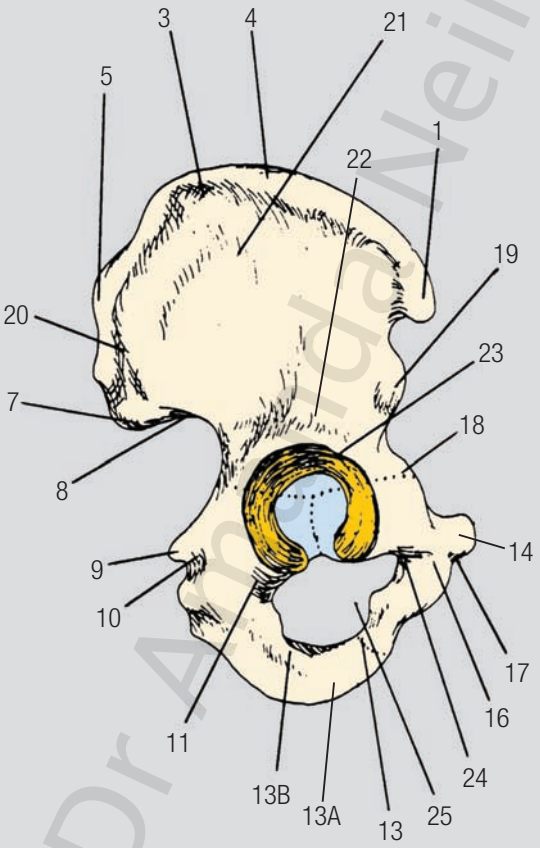


Hip bone = Innominate bone (unnamed bone) = Os Coxae

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 AIIS = 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



Hip joint

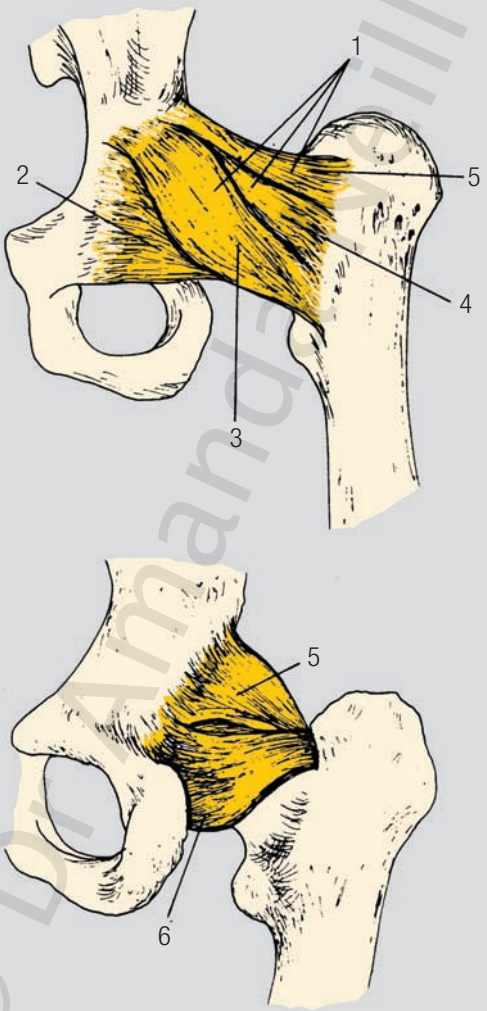
anterior / posterior

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

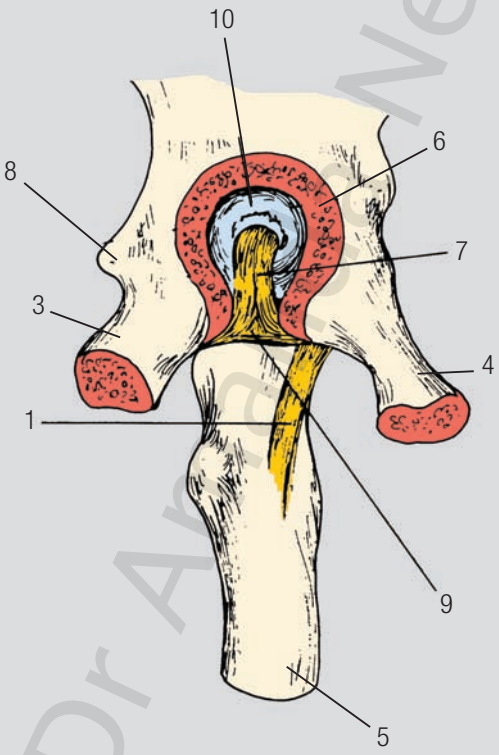
medial

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



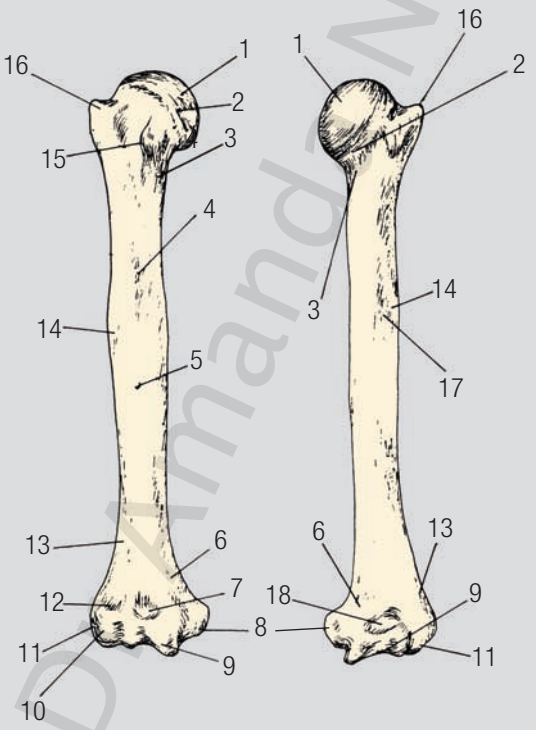
Humerus = ARM bone (upper arm bone)

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

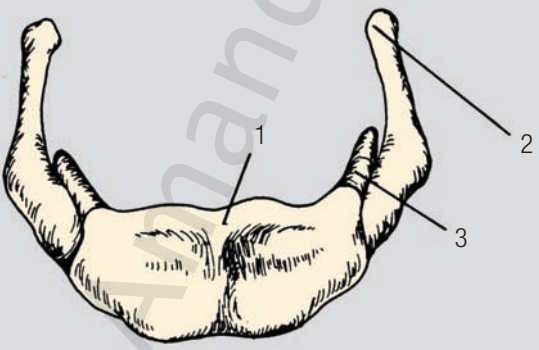
Description - Small U-shaped bone. Attached to the styloid processes via ligaments. This bone has no articulations -the only bone in the body - and is not normally broken in trauma, protected by the mandible / CHIN. It may be broken in hanging and strangulation.

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)



KNEE articulation

anterior / posterior

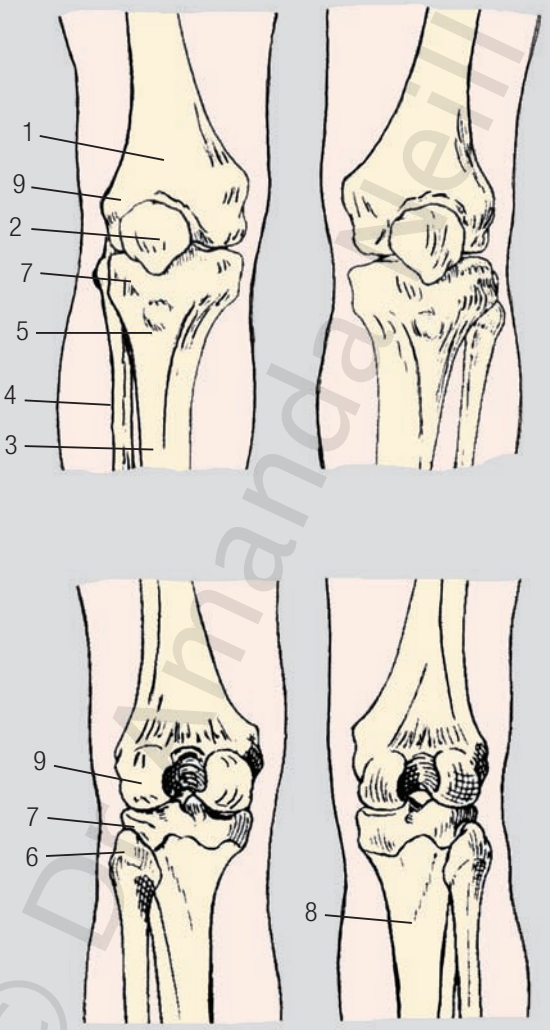
(the knee is the most unstable peripheral joint in the body)

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)

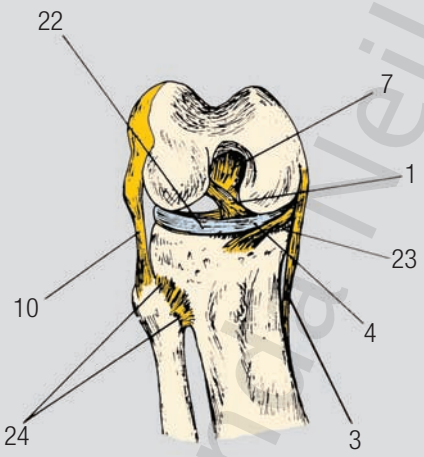
BS ***genicular branches of the following: femoral, ant. tibial and peroneal***

NS ***tibial, N (S1-2)***

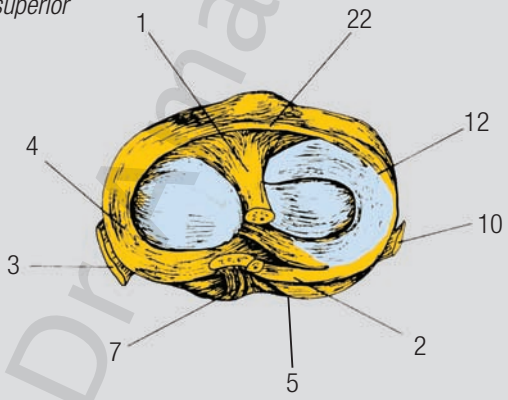
A ***hinge joint - flexion/extension slight lateral and medial rotation for "locking" and "unlocking"***

1 ant. cruciate lig
2 post. meniscofemoral 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 ligs 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)

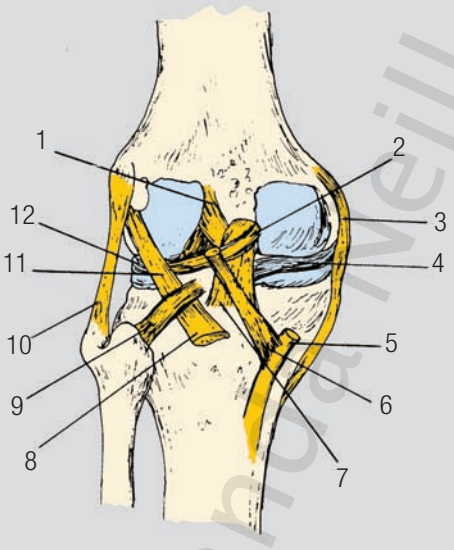
BS genicular branches of the following: femoral, ant. tibial and peroneal

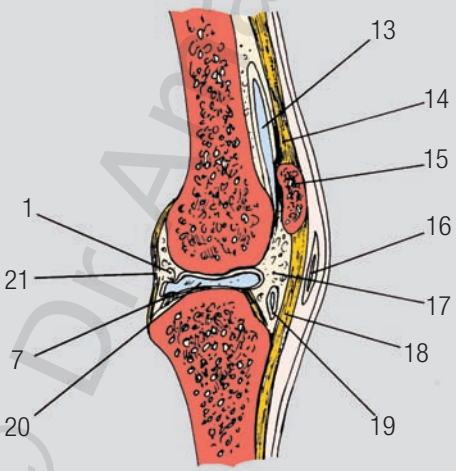
NS tibial, Ns (S1-2)

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

intra-articular structures MENISCI, CRUCIATE LIGAMENTS,

1 ant. cruciate lig
2 post. meniscofemoral 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





LEG = Lower limb

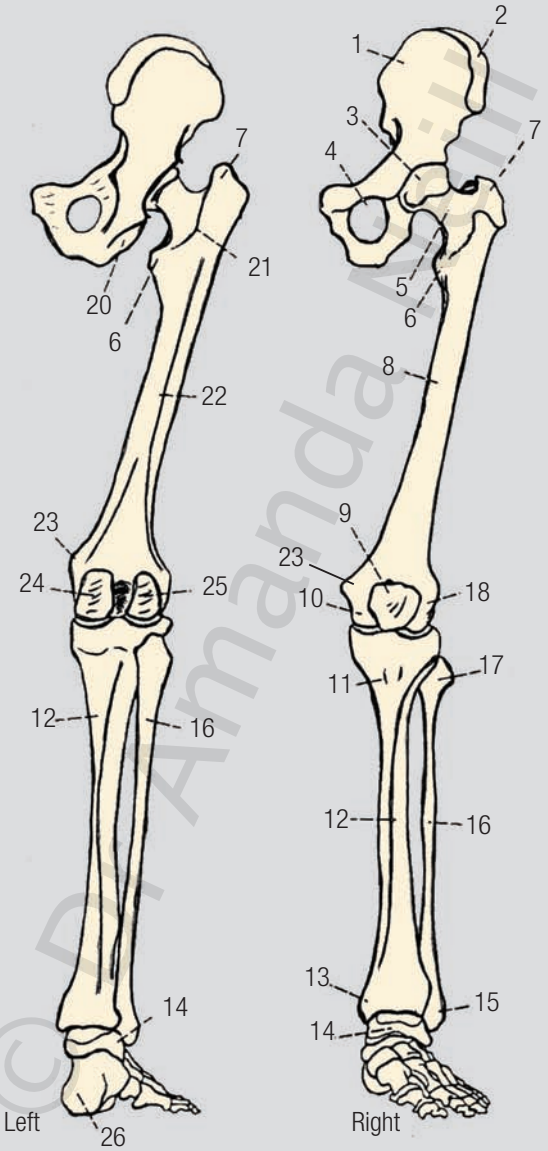
anterior FRONT / posterior BACK

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 malleous (ankle)
14 Talus
15 lateral malleous
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)

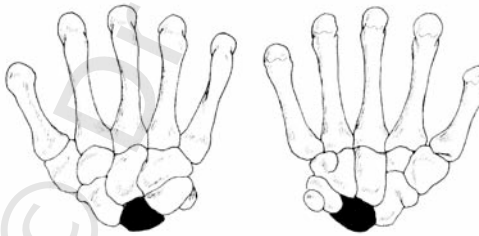


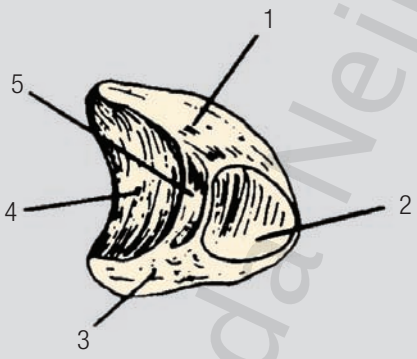
Lunate = Os Lunatus = part of Os Carpus (wrist bones)

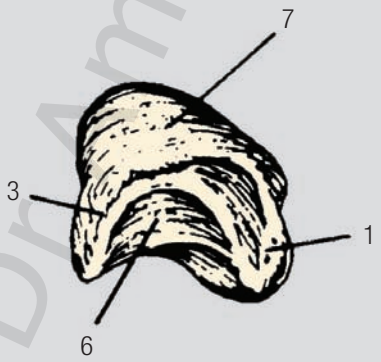
(Lunate - small moon shaped of the wrist, 1st row of carpal bones = part of the os carpus consists mainly of articulating facets)

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







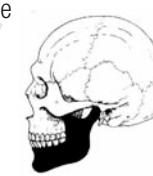
Mandible = JAW

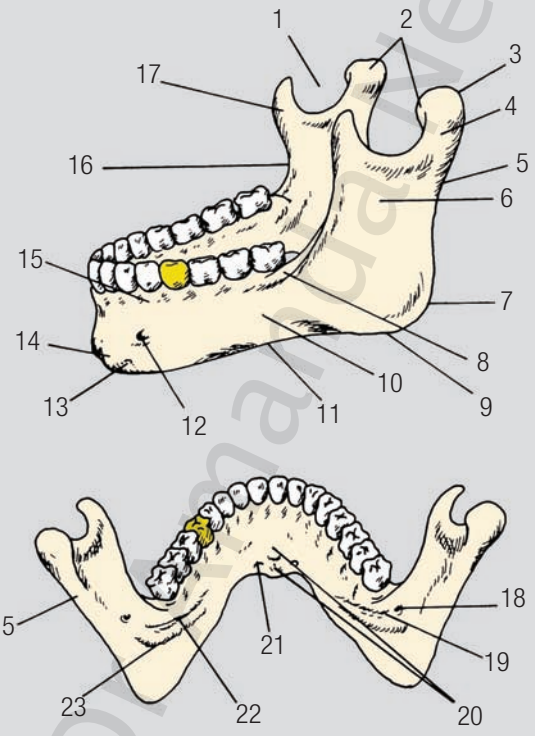
lateral / posterior

**(Mandible - lower jaw bone joins the skull via the condyles and a cartilaginous articular plate in the Temporal fossa.
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

1 mandibular notch
2 pterygoid fovea
3 head of Mandible - condylar process
4 neck of Mandible
5 post. border of ramus of Mandible
6 ramus - vertical ramus
7 angle of mandible
8 oblique line
9 inferior border
10 body - horizontal ramus
11 base
12 mental foramen
13 mental tubercle - Gnathion
14 mental protuberance
15 alveolar bone surrounding teeth
16 anterior border of ramus
17 coronoid process - endocoronial ridge
18 mandibular foramen
19 lingula
20 superior and inferior mental spines
21 digastric fossa
22 mylohyoid line
23 mylohyoid groove



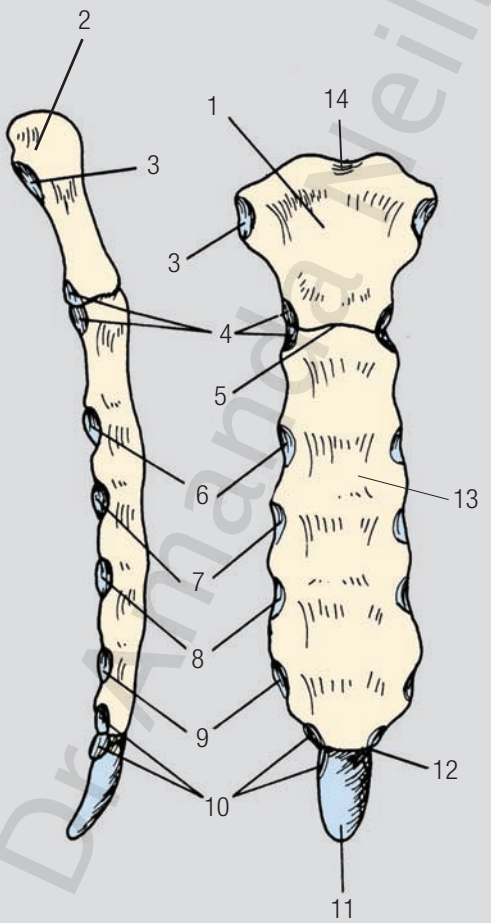


Manubriosternum = BREAST BONE

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

Articulations	**Manubrium + Sternum** **Manubrium + 1st rib; 2nd rib** **Manubrium + Clavicle** **Sternum with all costal cartilages except the 1st** **Xiphoid with Sternum** **Xiphoid with 7th 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

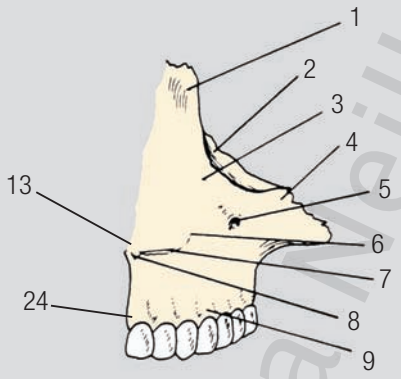


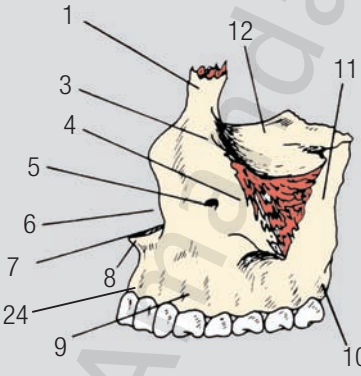
Maxilla / Maxillae Bones

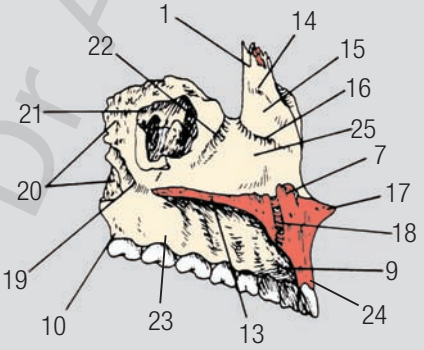
anterior / lateral / medial

(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







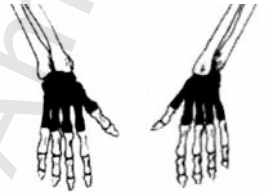
Metacarpals = HAND BONES

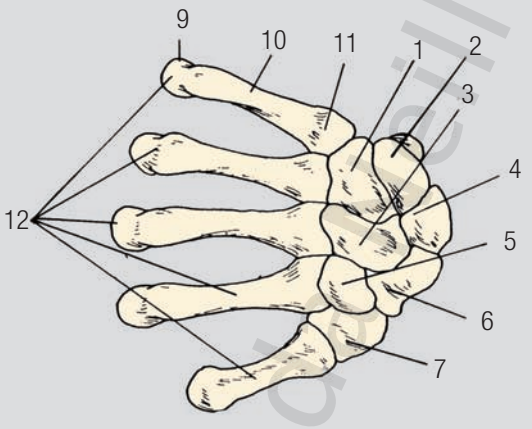
(metacarpals = bones between the wrist and the fingers)

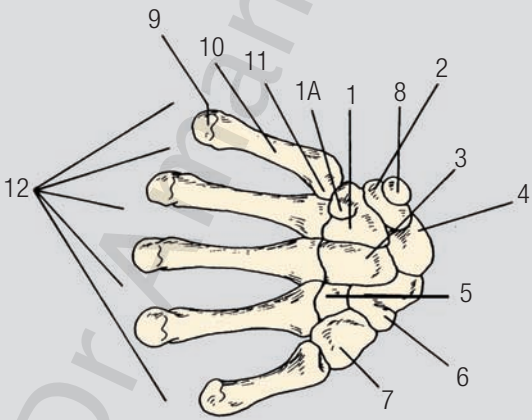
Articulations	**proximal - 2nd row of carpal bones (wrist bones) metacarpals either side distal - proximal end of the approp. proximal phalanx**
Special features	**these are long bones**

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)







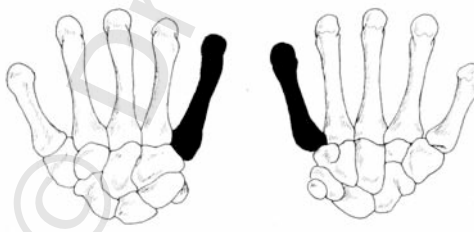
Metacarpal fifth = bone to the little finger

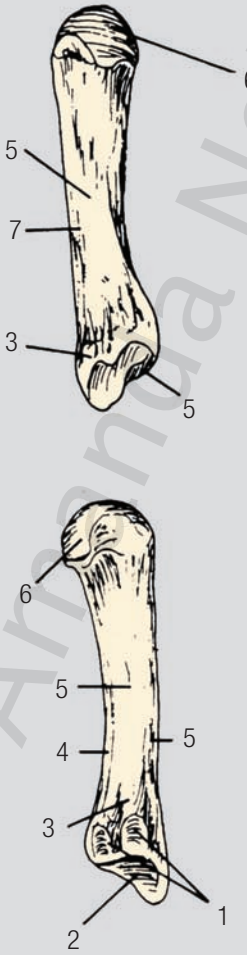
(metacarpal = bone between the wrist and the fingers)

Articulations	**proximal - 2nd row of carpal bone Hamate / 4th 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





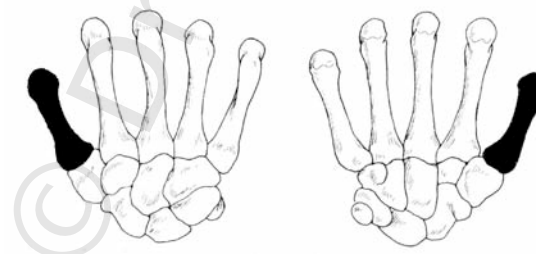
Metacarpal first = bone to the thumb

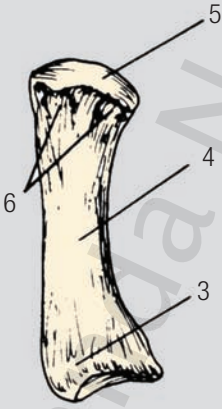
(metacarpal = bone between the wrist and the fingers)

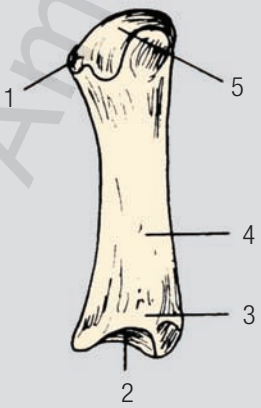
Articulations	**proximal - 2nd row carpal bone Trapezium / distal - proximal end of the first proximal phalanx**	
Special features	**long bone**	**wide ranging joint does not articulate with the next metacarpal set apart**

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 Pollicus Brevis and Longus







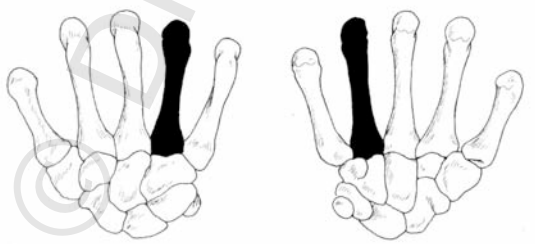
Metacarpal fourth = bone to the ring finger

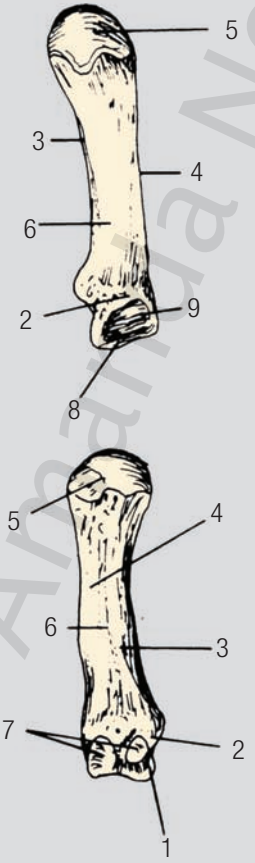
(metacarpal = bone between the wrist and the fingers)

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





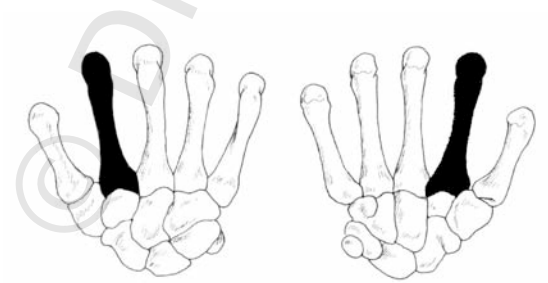
Metacarpal second = bone to the index finger

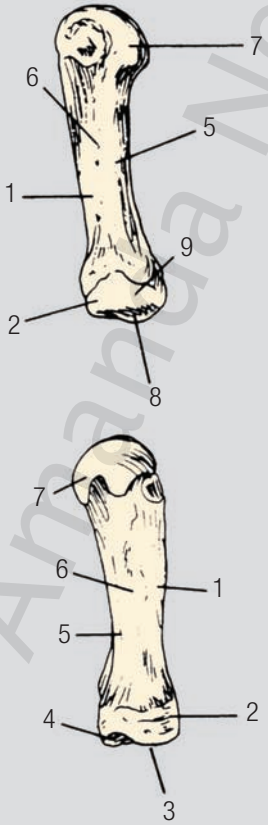
(metacarpal = bone between the wrist and the fingers)

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





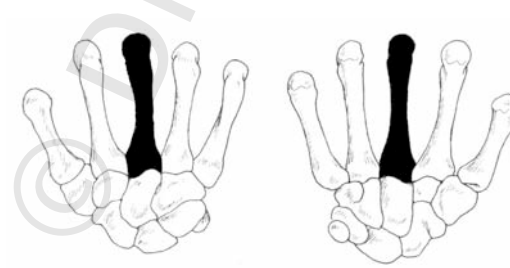
Metacarpal third = bone to the middle finger

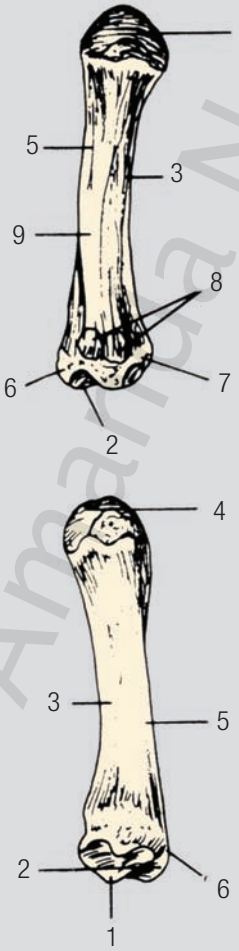
(metacarpal = bone between the wrist and the fingers)

Articulations	**proximal - 2nd row carpal bone Capitate**
	2nd metacarpal, 4th metacarpal
	distal - proximal end of the 3rd 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





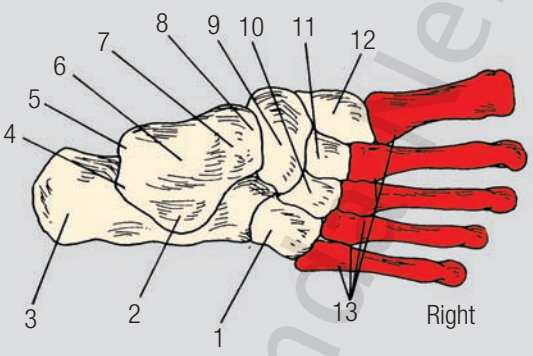
Metatarsals Overview = FOOT BONES (not ankle)

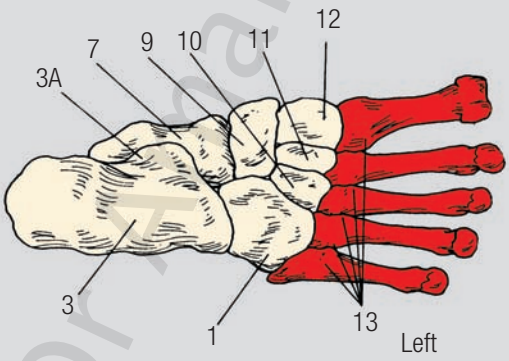
(metatarsals = bones between the ankle and the toes)

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
5^{th} (to the little toe), 4^{th} (to the 4^{th} toe), 3^{rd}, (to the 3rd toe), 2^{nd} (to the 2^{nd} toe) and 1^{st} (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 cuniform ± second metatarsal

view of the SECOND metarsal
lateral
medial
rounded articulation for the SECOND TOE
facets for the lateral & intermediate cuniforms + third metatarsal

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 cuniform + second and fourth metatarsals

View of the FOURTH metatarsal
lateral
medial
rounded articulation for the FOURTH TOE
facets for the lateral cuniform & cuboid + third and fifth metatarsals

View of the FIFTH metatarsal
lateral
medial
rounded articulation for the LITTLE TOE
facets for the cuboid + fourth metatarsal

Nasal Bones and Cavity = NOSE

CAVITY - lateral / medial

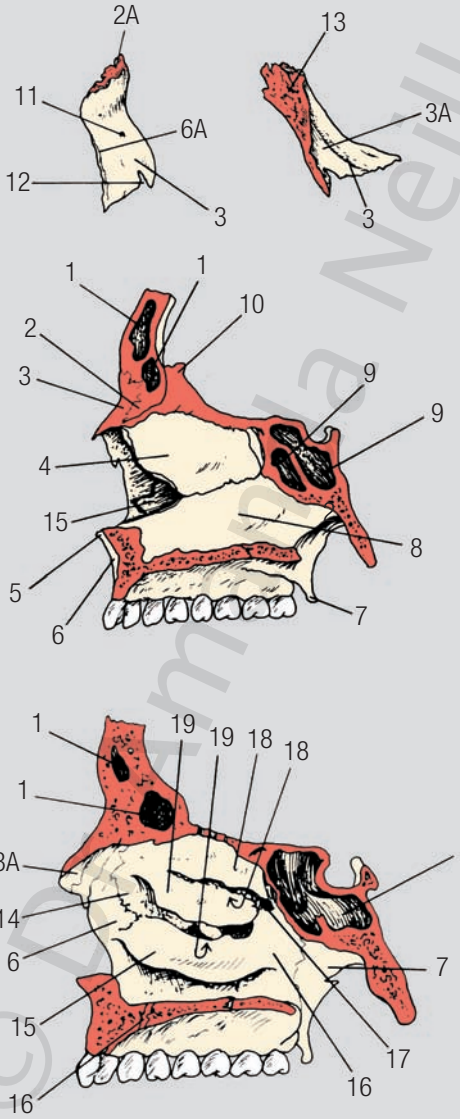
BONES - external / internal

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

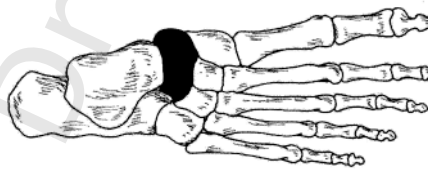


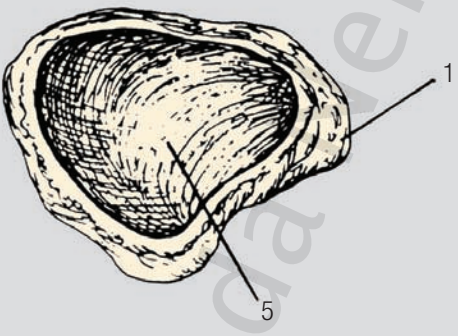
Navicular = part of Os Tarsus / bones of the foot

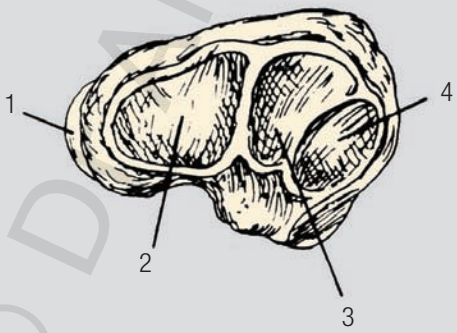
distal / proximal

Articulations	with all the cuniforms distally
	with Talus proximally

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





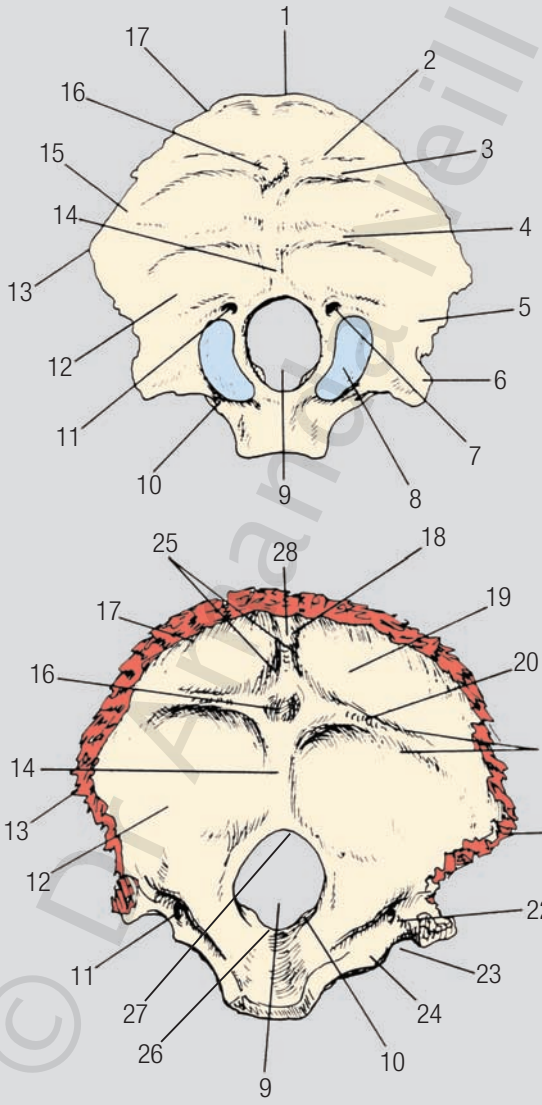


Occipital bone

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 jugluar notch
24 jugular tubercle
25 attachments for Falx Cerebri
26 opisthion
27 basion
28 Occipital sulcus - sagittal sinus



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

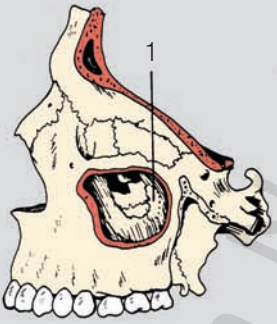
4 Orbital process

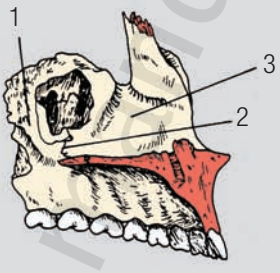
5 Spheno-Papalatine notch

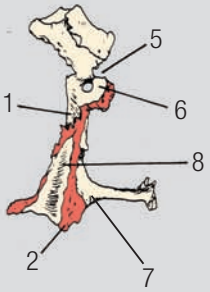
6 Spenoidal process -

6A Pterygo-Palatine canal

7 horizontal plane





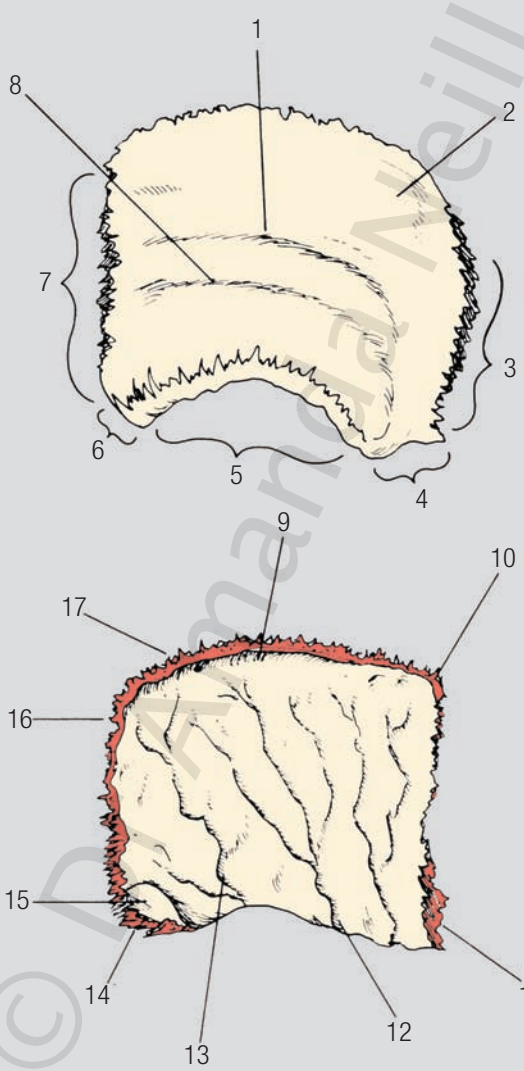


Parietal bone (Left)

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**	

1 superior temporal line
2 parietal eminence
3 articulation with the Occipital bone *(Lambdoid suture)*
4 articulation with the Temporal bone (Mastoid)
Parieto-Mastoid suture
5 articulation with the Temporal (Squamous)
Temporo-Parietal suture
6 articulation with the Sphenoid (Greater wing)
Spheno-Parietal suture
7 articulation with the Frontal bone *Coronal suture*
8 inferior Temporal line
9 groove for superior sagittal sinus
10 frontal angle
11 sphenoidal angle
12 groove for frontal branch of Middle Meningeal vessels
13 groove for parietal branch of Middle Meningeal vessels
14 mastoid angle
15 groove for sigmoid sinus
16 occipital angle
17 articulation between Parietal bones *Sagittal suture*

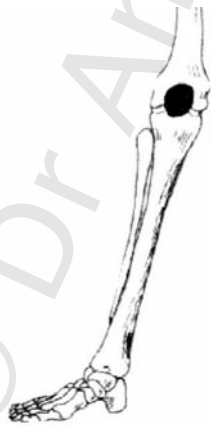


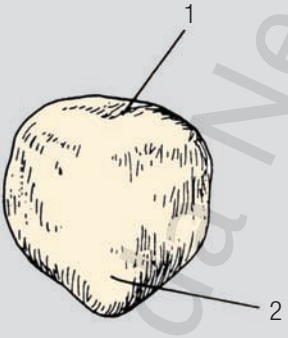
Patella = KNEE CAP

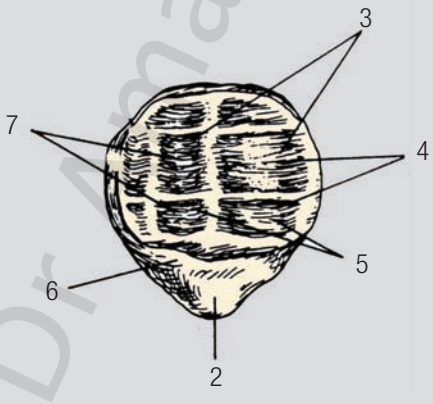
anterior / posterior

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





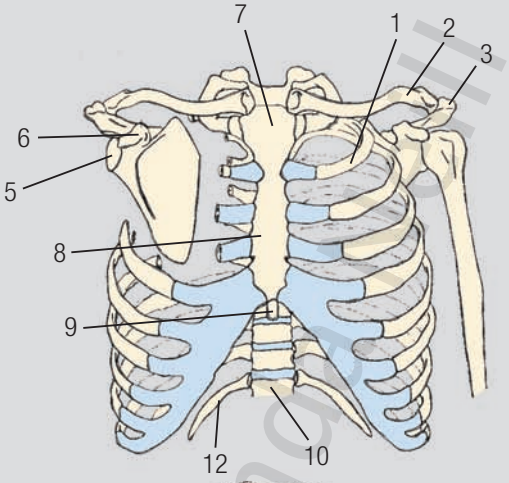


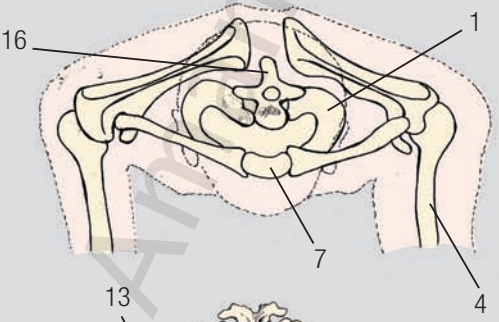
PECTORAL GIRDLE = SHOULDERS

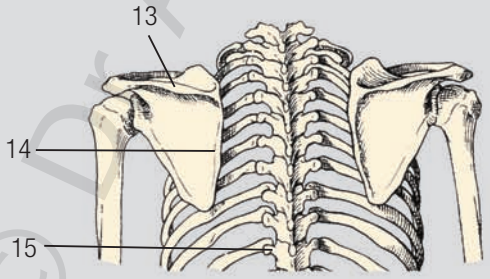
anterior / superior / posterior

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





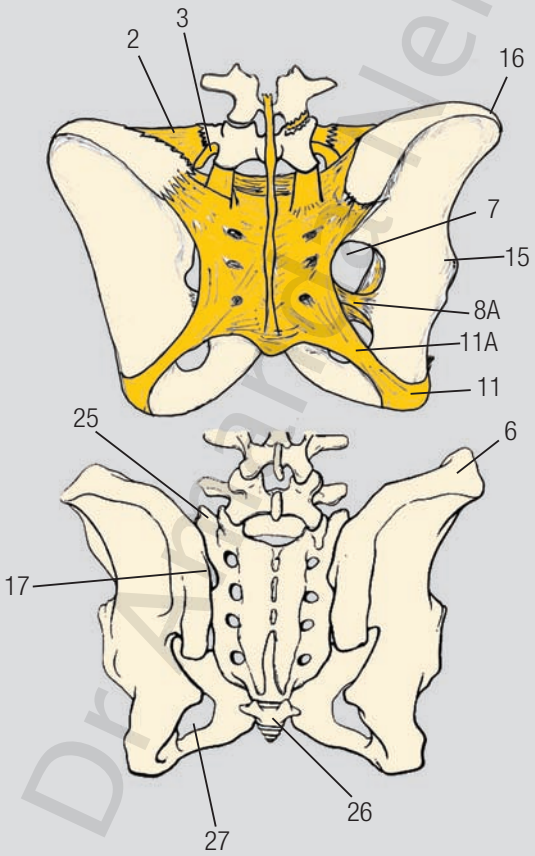


PELVIC GIRDLE = HIPS

posterior

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 = AIIS
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



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
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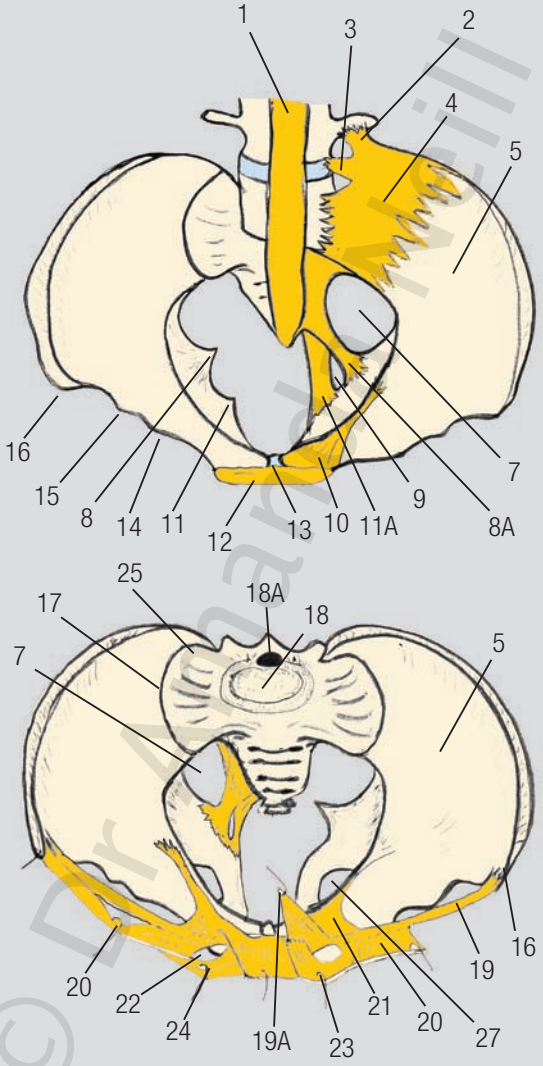


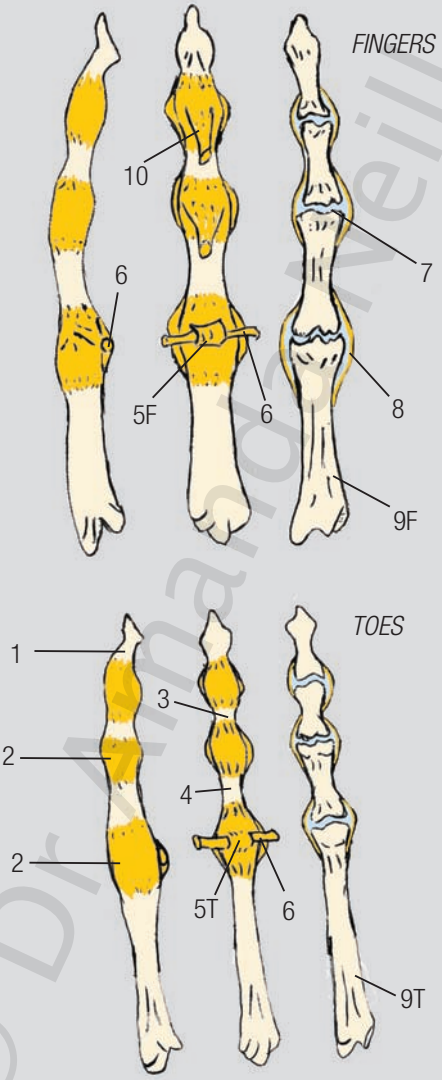
Phalanges = DIGITS

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
fist 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



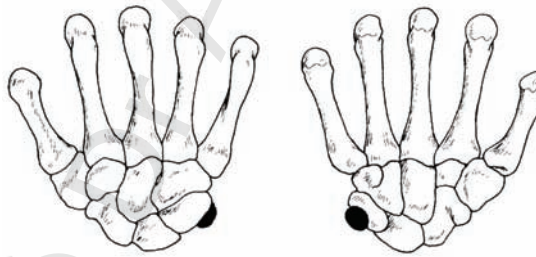
Pisiform part of Os Carpus / bones of the hand

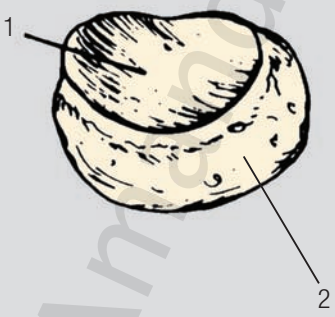
lateral / medial

Articulations	with Triquetral

1 facet for Triquetral

2 dorsal surface (medial side)





Pubic Symphysis = Pubic joint

anterior

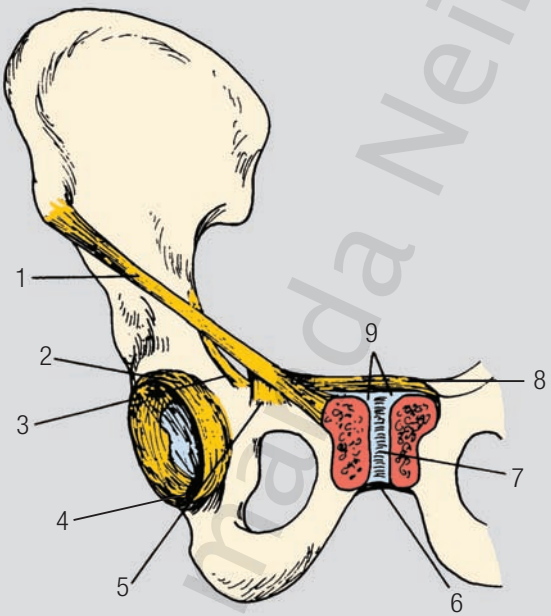
(Pubic symphysis is a secondary fibrocartilagenous joint)

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)

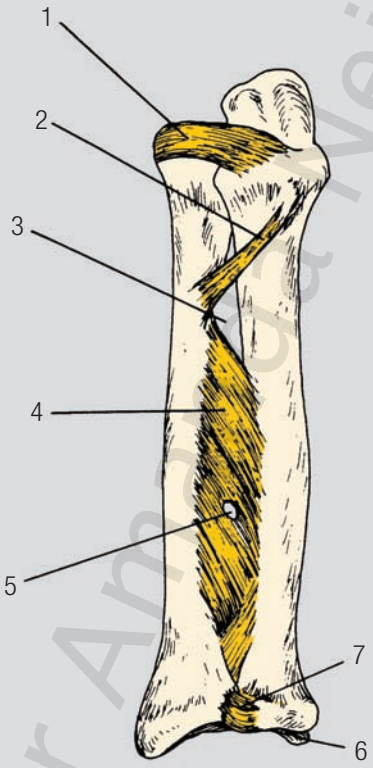
BS ***anastomosies around joint from brachial, profunda brachii, radial and ulna arteries***

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

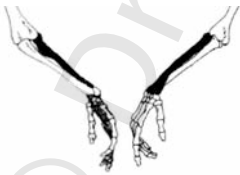


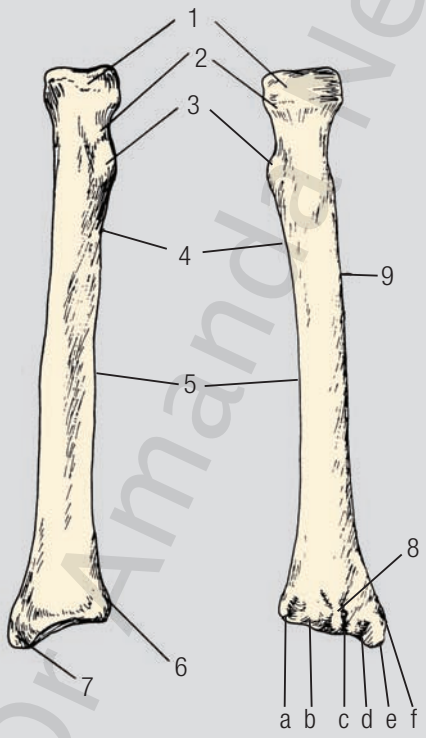
Radius

anterior / posterior

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

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

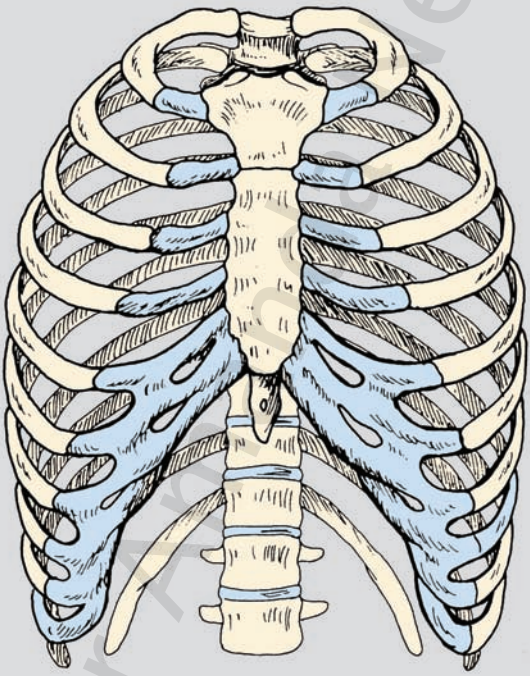
SPECIAL FEATURES (see Rib typical)

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 = Xphisternum + 12th rib + VB

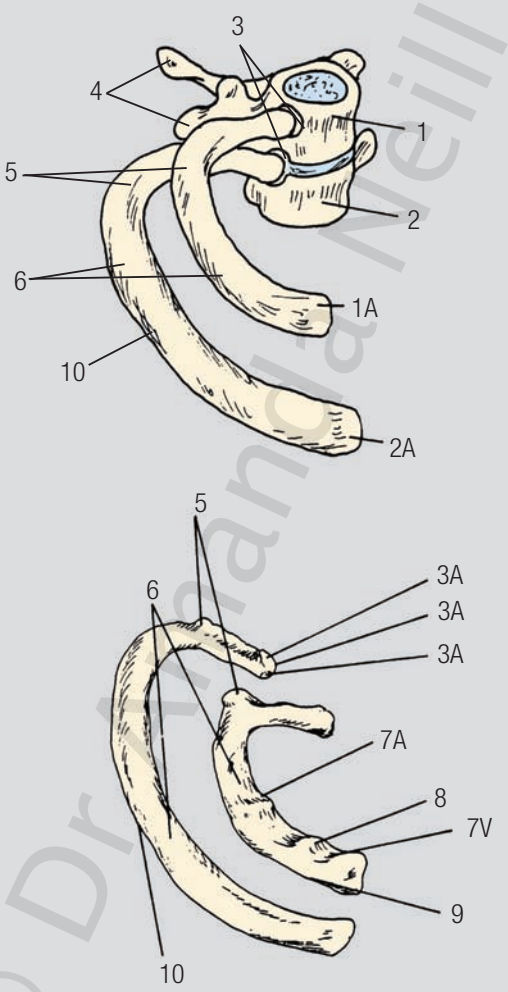


Ribs - atypical 1,2

articulations
superior

bones
superior

1/1A	T1 - RIB 1
2/2A	T2 RIB 2
3	costovertebral joints
3A	demi-facets on head of Rib 2 b/n T1 and T2
	crest in b/n single facet on head of Rib 1 for T1
4	spine of T1 + TP
5	tubercles
6	shafts
7A 7V	groove for subclavian artery and N and vein
8	scalene tubercle
9	attachment of costovertebral lig
10	lig of Serratus Anterior

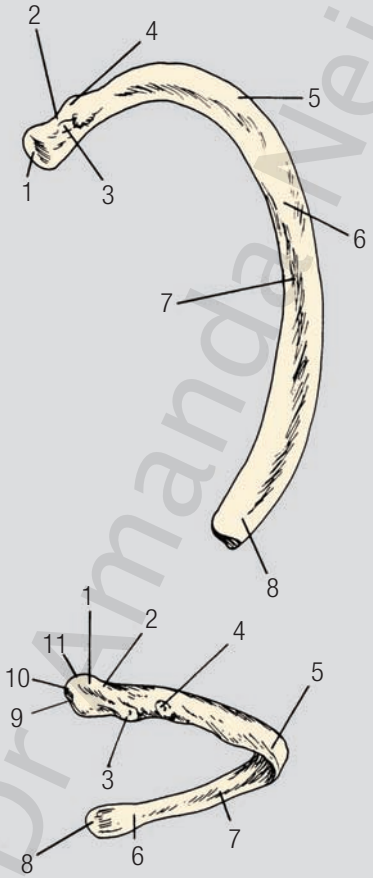


Ribs - typical 3-10

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



Sacroiliac joint (part of the Pelvic girdle)

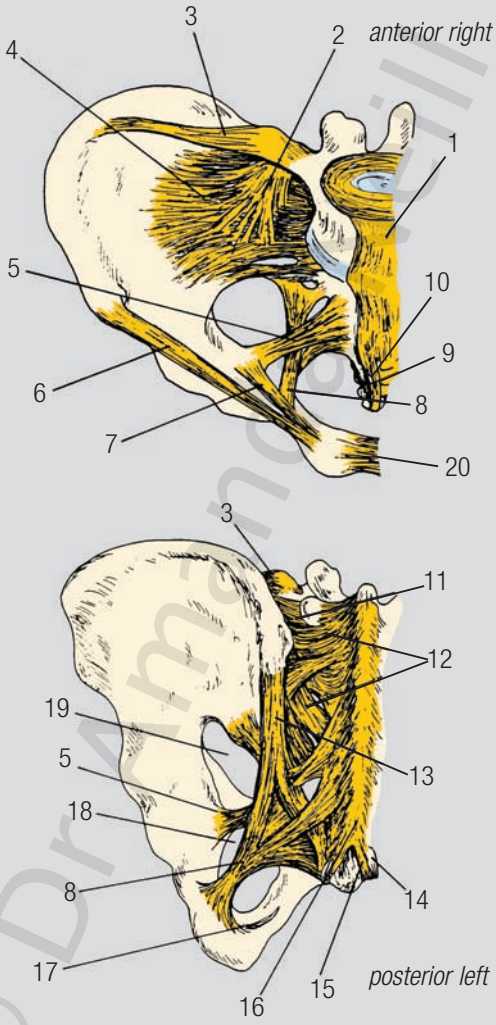
anterior / posterior

BS ***anastomosies 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 lubosacral 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 sacrococygeal lig (ant. aspect)
11 lumbosacral lig
12 short dorsal sacroiliac lig
13 long dorsal sacroiliac lig
14 lateral sacrococygeal lig (post aspect)
15 intercornu lig
16 supf. dorsal sacrococygeal lig
17 falciform process
18 lesser sciatic foramen
19 greater sciatic foramen
20 superior pubic lig

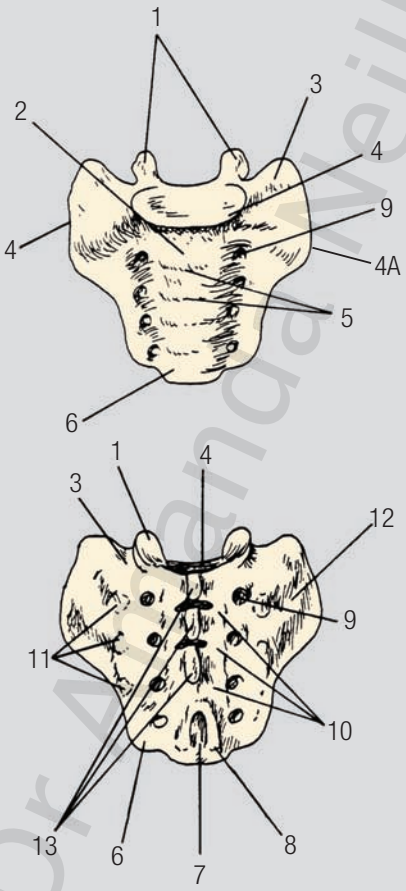


Sacrum (+ Coccyx) = part of the PELVIC GIRDLE

anterior / posterior

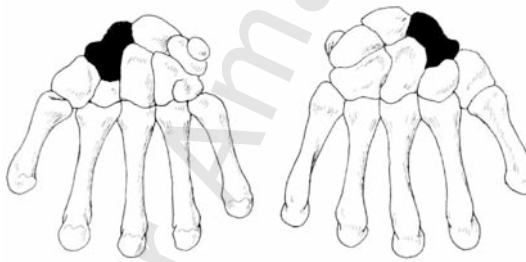
Articulations	**with Iliac laterally** **with L5 superiorly** **with Coccyx inferiorly**	**fibrocartilagenous** **synovial** **synovial +**
Special features	**is the fused structure of 5 Sacral vertebral bodies**	

1 superior articular process
2 body
3 alar
4 articular surface for L5
4A articular surface for Ileum
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

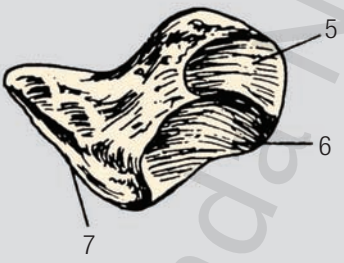


Scaphoid

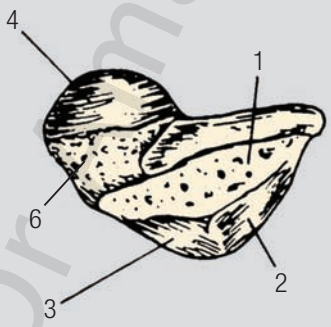
1 dorsal surface non-articulating
2 articulation surface for Trapezium
3 articulation surface for Trapezoid
4 articulation surface for Radius
5 articulation surface for Lunate
6 articulation surface for Capitate
7 tubercle



palmar



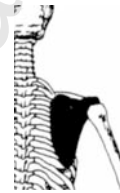
dorsal

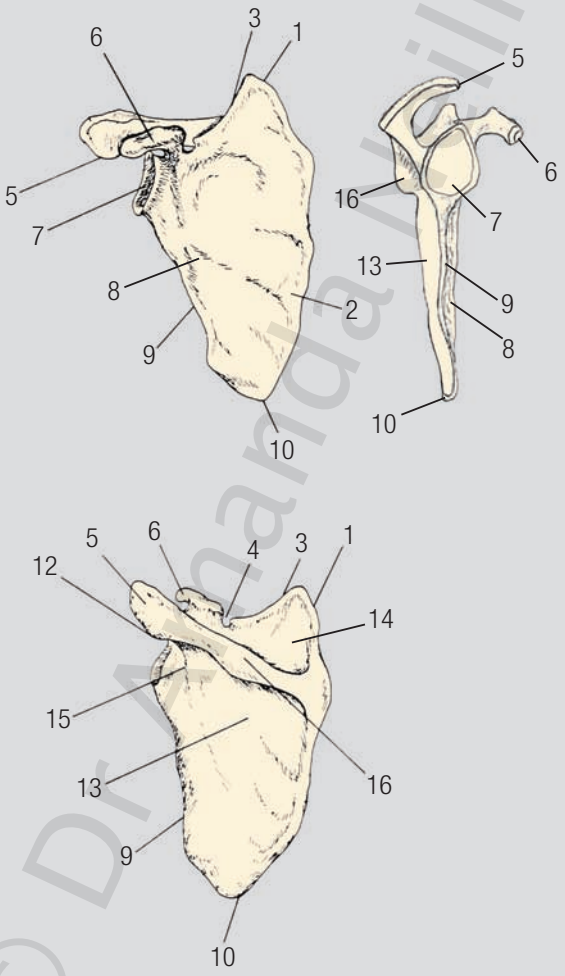


Scapula = part of the PECTORAL GIRDLE

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

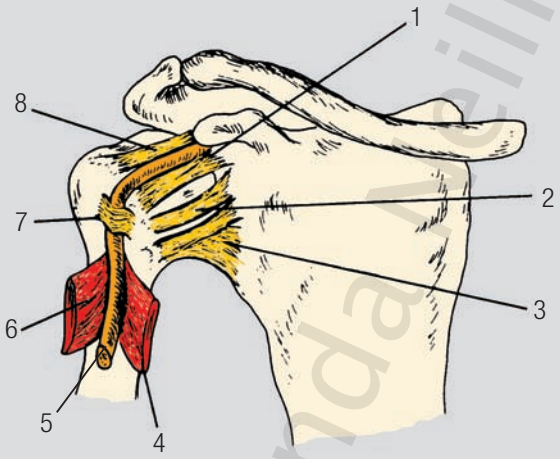
(Articulation b/n the Glenoid fossa of the Sacpula and the head of the Humerus - Ball and Socket joint of ill fitting boney surfaces great mobility inferior instability)

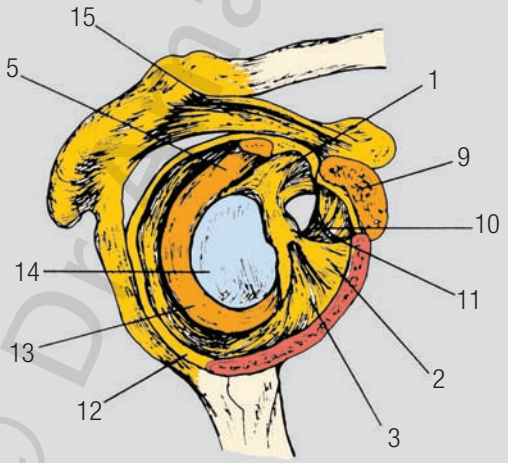
BS ***posterior circumflex, humeral and suprascapular arteries***

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
9. Supraspinatus tendon
10. articular capsule
11. Subscapularis bursa
12. edge of the articular capsule
13. glenoid labrium
14. glenoid cavity
15. Subscapularis tendon

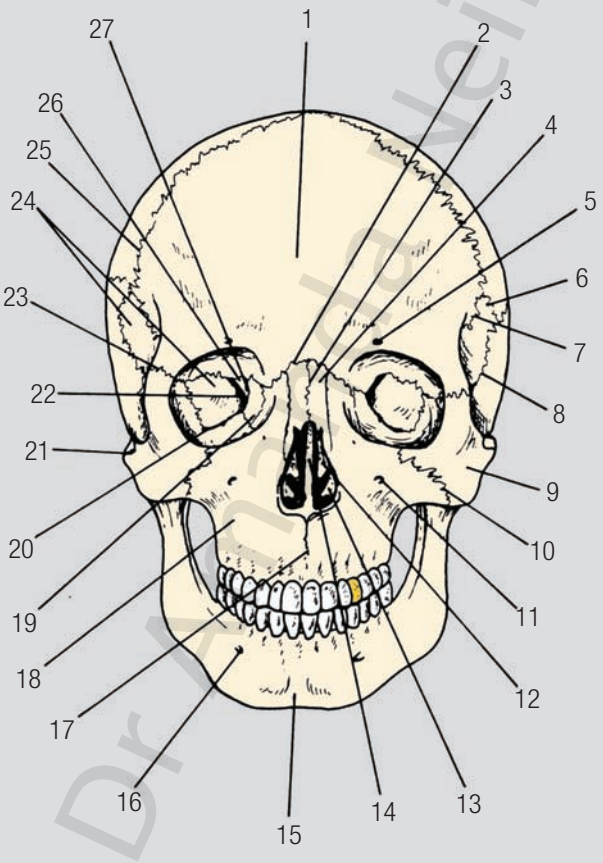




Skull External Views

anterior

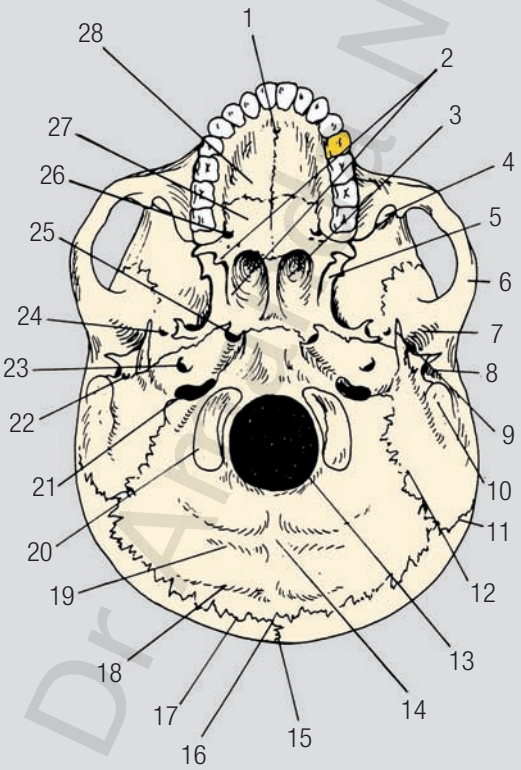
1 Frontal bone
2 Fronto-Nasal suture
3 Inter-Nasal suture
4 Nasal bone, Lacrimal bone
5 Supra-Orbital foramen
6 Spheno-Parietal suture
7 Spheno-Frontal suture
8 Spheno-Squamosal suture
9 Zygoma
10 Zygomatico-Maxillary suture
11 Infra-orbital foramen
12 Middle Nasal concha – turbinate *(from Ethmoid bone)*
13 Inferior nasal concha – turbinate *(from Ethmoid bone)*
14 Vomer
15 Mandible
16 Mental foramen
17 Inter-Maxllary 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



Skull External Views

inferior base of skull

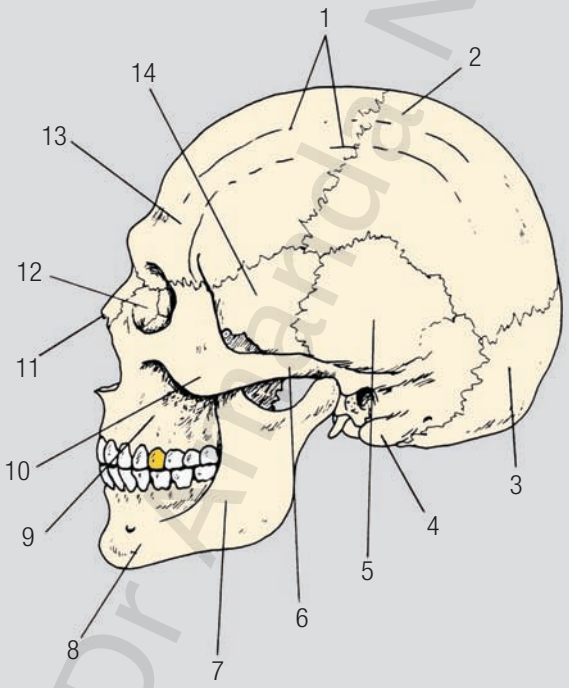
1 Incisive fossa - Alveolare
2 Medial Pterygoid plate and Hamulus (Ethmoid)
3 Posterior Nasal aperture
4 Pterygoid plate (ethmoid)
5 Lateral Pterygoid plate (Ethmoid)
6 Zygomatic arch
7 Mandibular fossa
8 External Auditory meatus
9 Styloid process
10 Mastoid process
11 Parieto-Mastoid suture
12 Occipito-Mastoid suture
13 Foramen magnum
14 External Occipital proturberance
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



Skull External Views

lateral

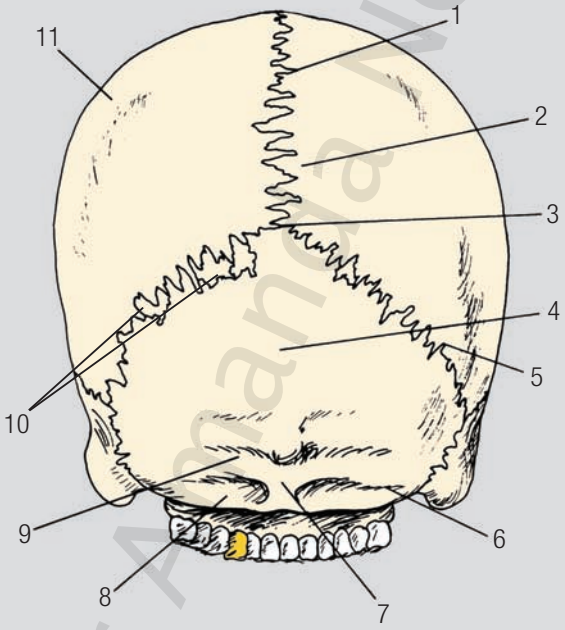
1 Frontal bone - Temporal ridges for attachment of Temporalis
2 Parietal bone
3 Occipital bone
4 Mastoid process
5 Temporal bone
6 Zygomatic arch
7 Mandible
8 Body of Mandible
9 Maxilla
10 Zygoma
11 Nasal bone
12 Lacrimal bone
13 Frontal bone
14 Greater Wing of the Sphenoid



Skull External Views

posterior

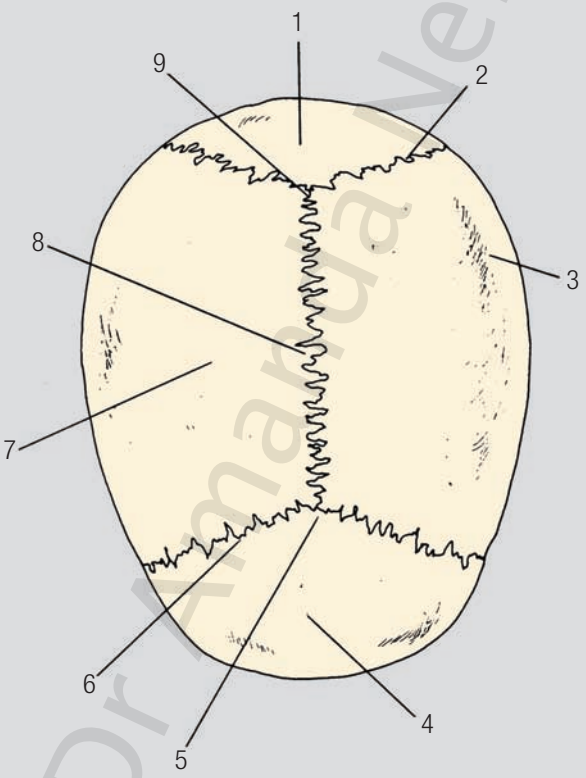
1 Sagittal sinus
2 Parietal foramen
3 Lambda *Pareito-Occipital suture*
4 Occipital bone
5 Lambdoid suture -
6 Inferior nuchal groove
7 External Occitipal protruberance
8 Occitipal bone
9 Superior nuchal groove
10 Sutural bones - Inca
11 Parietal bone



Skull External Views

superior

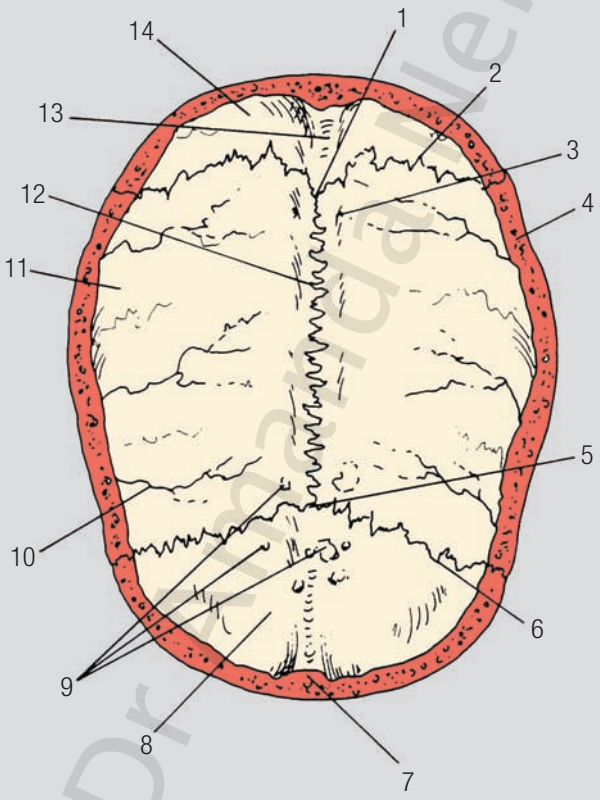
1 Occipital bone
2 Lambdoid suture - *Occipito-Parieto suture*
3 Parietal eminence - Euryon
4 Frontal bone
5 Bregma
6 Coronal suture
7 Parietal bone
8 Sagittal suture
9 Lambda



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

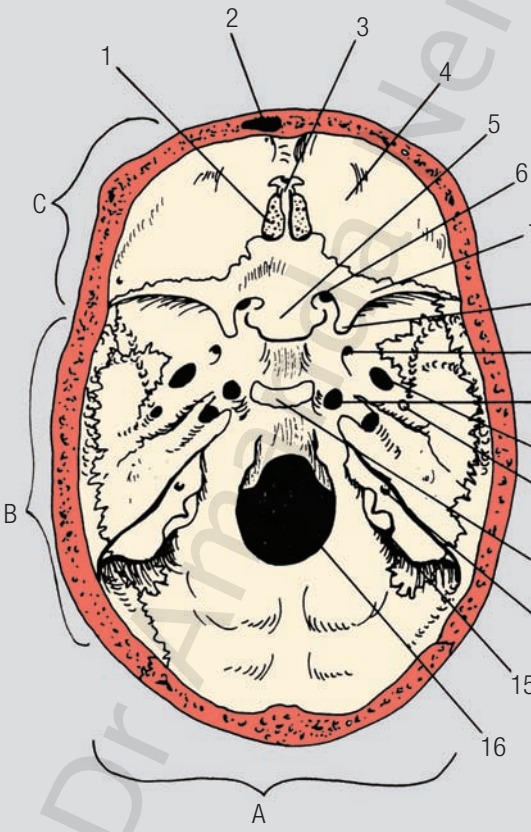


Skull Internal Views

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

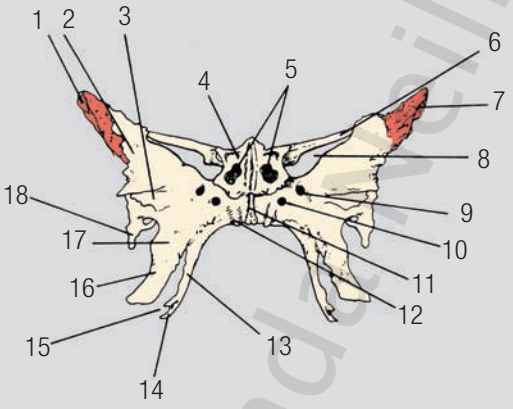


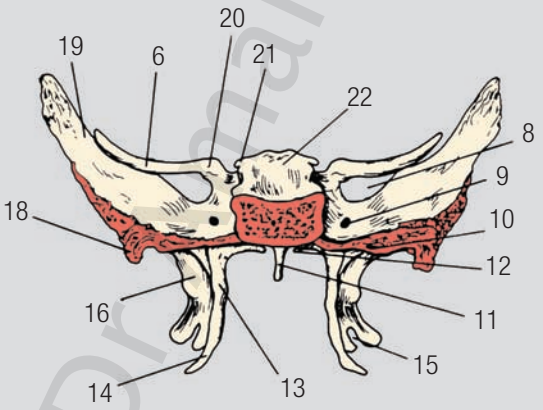
Sphenoid

anterior / posterior

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

1 articulation with Left Temporal bone
2 orbital surface
3 infratemporal crest
4 body of the Sphenoid
5 openings for sphenoidal sinuses
6 lesser wing
7 squamosal suture - articulation with right Temporal bone
8 superior orbital fissure
9 foramen rotundum
10 pterygoid canal
11 rostrum
12 vaginal process
13 medial pterygoid plate
14 pterygoid hamulus
15 pterygoid notch
16 lateral pterygoid plate
17 pterygoid process
18 sphenoid spine
19 cerebral surface of the greater wing
20 anterior clinoid process
21 posterior clinoid process
22 dorsum sellae





Sterno-Clavicular joints
Sterno-Costal joints

anterior

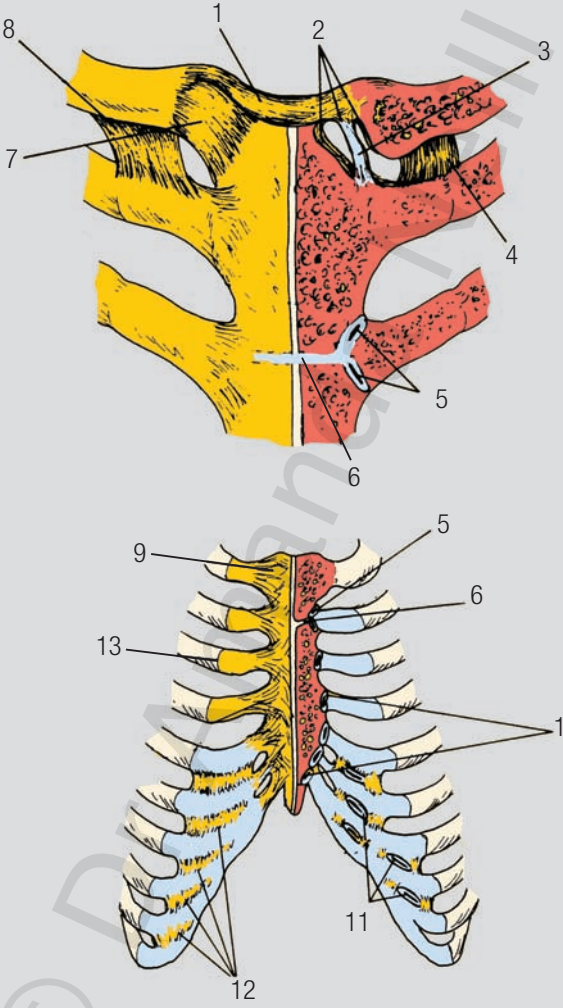
(joints b/n the Manubriosternum and the Clavicle SYNOVIAL JOINTS, joints with INTRA-ARTICULAR DISC b/n the Manubriosternum and the RIBS 3-9 SYNOVIAL JOINTS, RIBS 6-10 10 CARTILAGENOUS JOINTS - SYNCHONDROSIS with synovial cavity)

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 artic 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



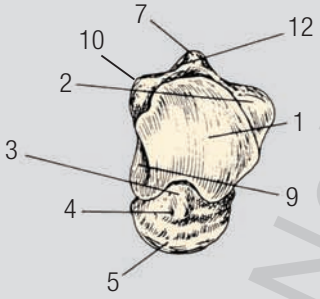
Talus = ANKLE BONE

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

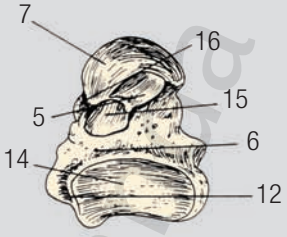
Articulations	with Tibia superiomedially with Calcaneus inferiorly with Navicular anteriorly with Fibula laterally	Tibiotalar joint Talocrural joint Subtalar joint Talofibular

1 trochlea surface for Tibia
2 facet for medial malleous
3 neck
4 groove for anterior lig of Ankle
5 artic 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

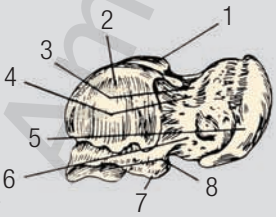
superior



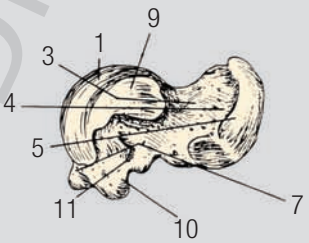
inferior



lateral



medial

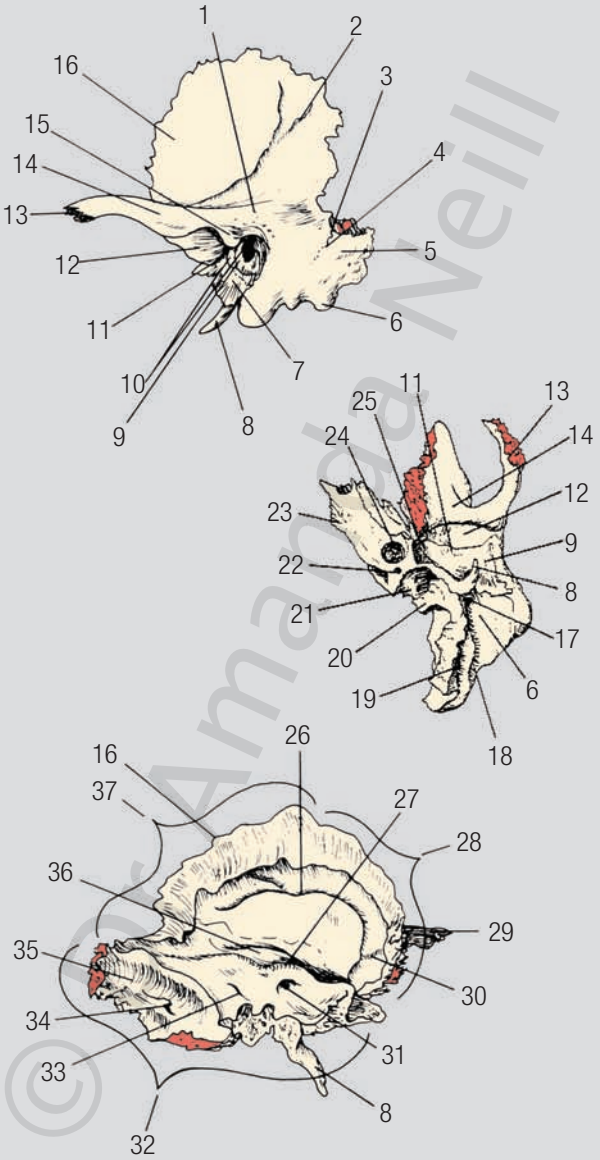


Temporal bone (Left)

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
Spheno-Temporal suture
29 Zygomatic process
30 groove for the middle meningeal vessels
31 internal acoustic meatus
32 articulates with the Occipital bone
33 aqueduct of the vestibule
34 mastoid foramen
35 groove for sigmoid sinus - sigmoid sulcus
36 arcuate eminence
37 articulates with the parietal bone Temporoparietal suture



Temporo-Mandibular joint = TMJ

closed - lateral / medial
open - sagittal

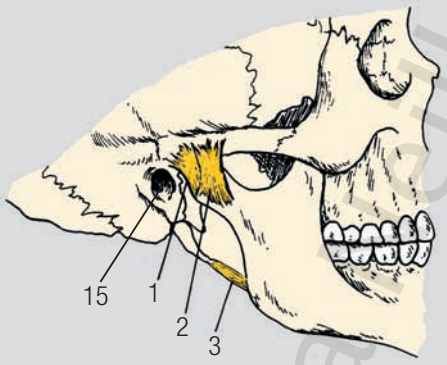
(only SYNOVIAL joint in the skull)

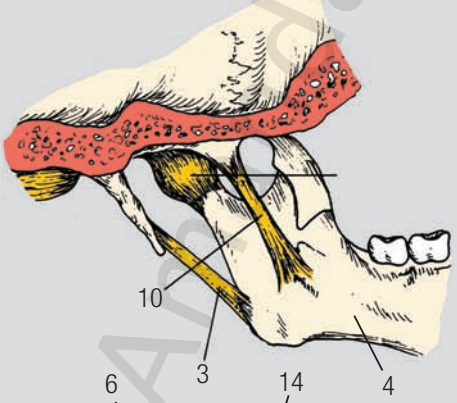
BS superficial temporal & maxillary arteries

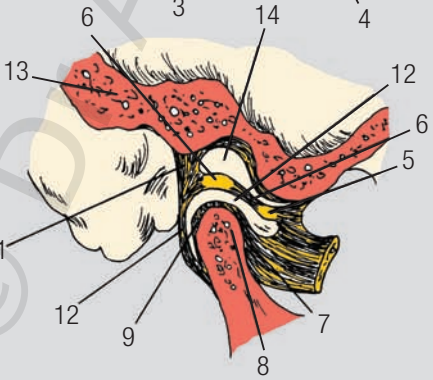
NS auriculotemporal & masseteric branches of mandibular branch of Trigeminal N (CN5)

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





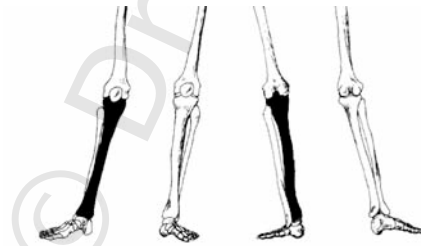


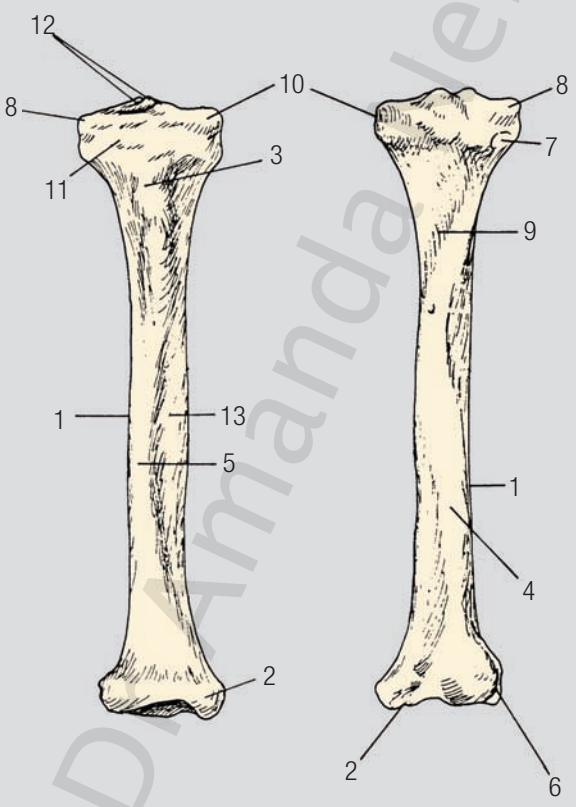
Tibia

anterior / posterior

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

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

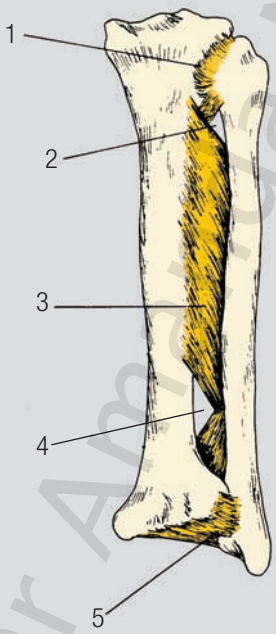
(3 joints distal, proximal and along the shafts via the interosseous membrane)

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

NS ***proximal - tibal 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

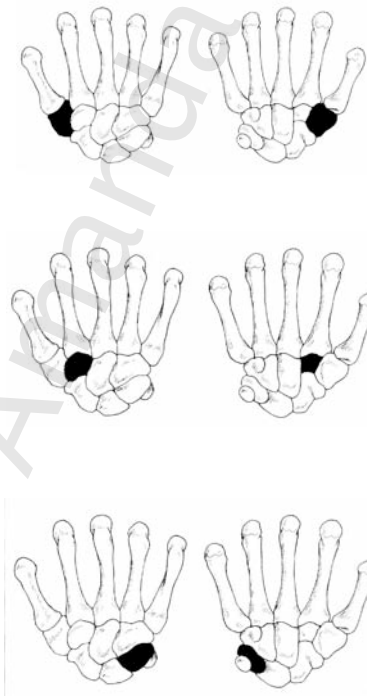


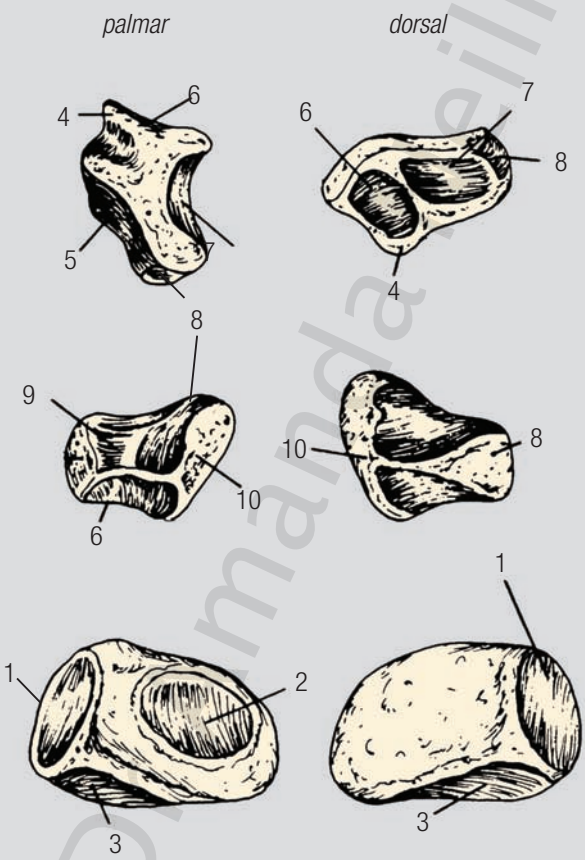
Trapezium / Trapezoid / Triquetral = Carpal bones

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



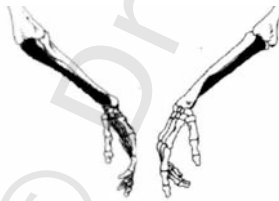


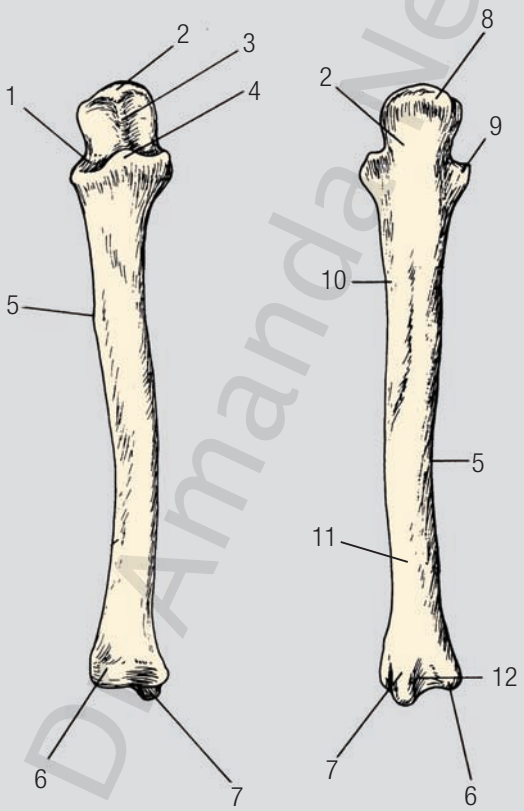
Ulna

anterior / posterior

Articulations	with Radius proximally and distally	pivot joint
	with Humerus proximally	hinge jt ELBOW

1 radial notch
2 olecranon
3 trochlea notch
4 coronoid process
5 interosseous border
6 head
7 styloid process
8 subcutaneous area of olecranon
9 crest for supinator
10 medial surface
11 posterior border / surface
12 groove for ext. carpi ulnaris





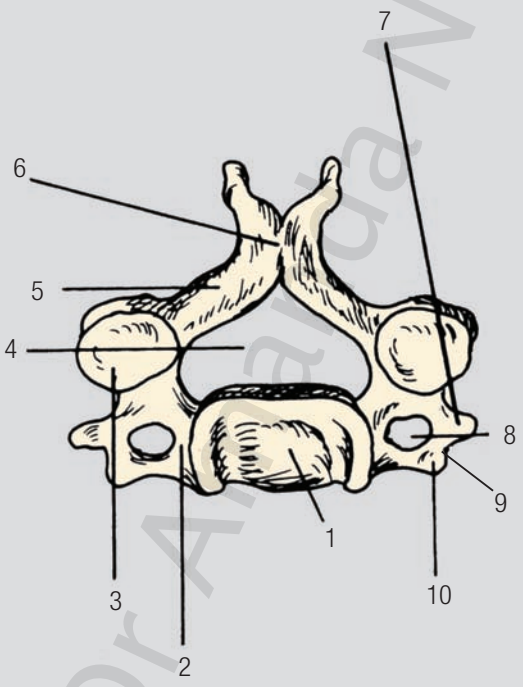
Vertebrae

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 zgyapophyseal planar synovial paired TP joints fibrous sydesmosis
Special features	transverse foramen bifid spinous process small curved bodies	

1 body
2 pedicle
3 superior articular facet
4 vertebral foramen
5 lamina
6 spinous process -bifid*
7 post tubercle of TP
8 transverse foramen*
9 sulcus for peripheral N outlet
10 anterior tuberble of TP

* only in cervical vertebrae



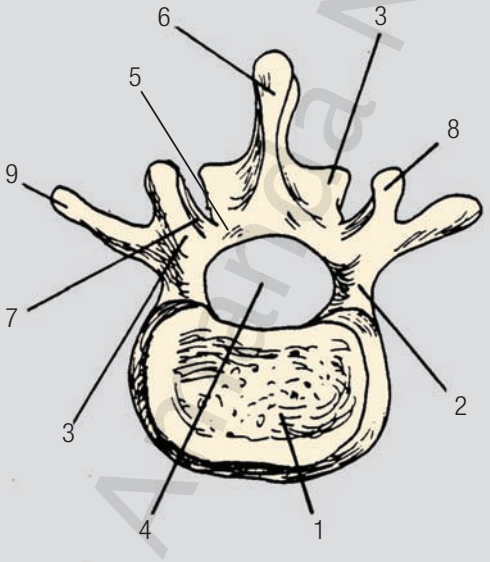
Vertebrae

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 zgyapophyseal planar synovial paired TP joints fibrous sydesmosis
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



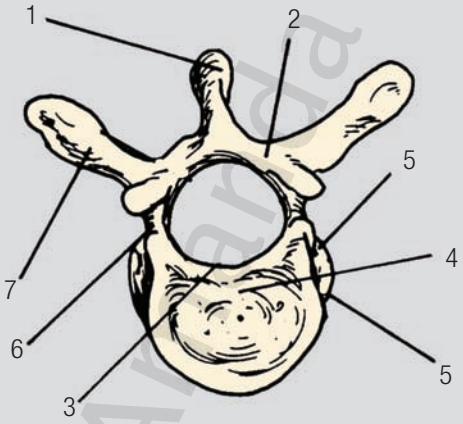
Vertebrae

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 zgyapophyseal + 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*

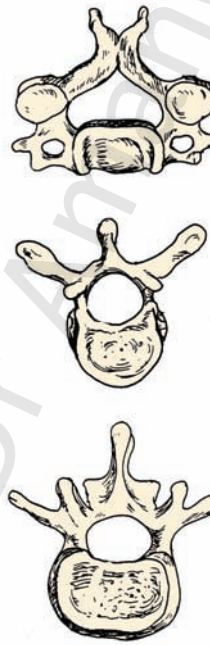
*only in thoracic vertebrae

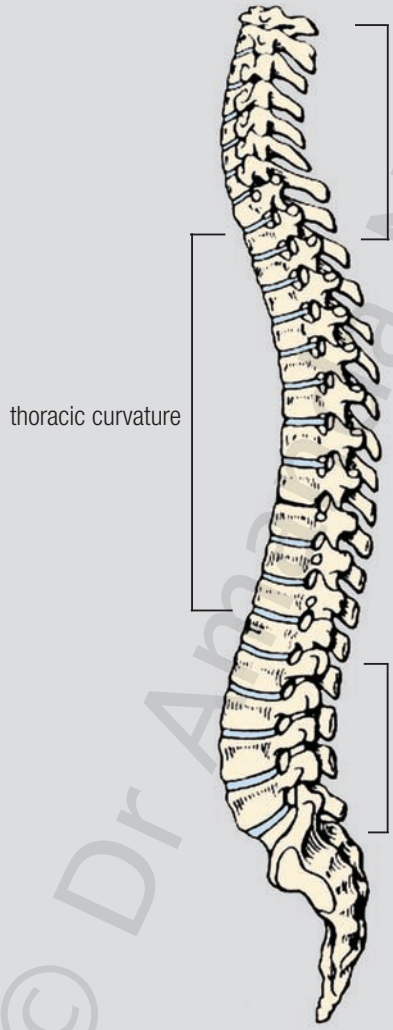


Vertebrae

Typical

	cervical	*thoracic*	*lumbar*
spinous process	*long bifid*	*long downpointing*	*short bulky*
transverse process	*transverse foramen inside*	*costal articulations*	*short bulky with mammilary body*
body	*small curved*	*medium straight*	*thick bulky*
foramen	*large*	*medium*	*small*





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

posterior coronal section / anterior coronal section

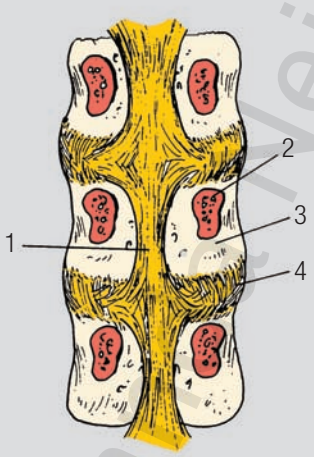
(symphyses - bone - fibrocartilagenous disc - bone)

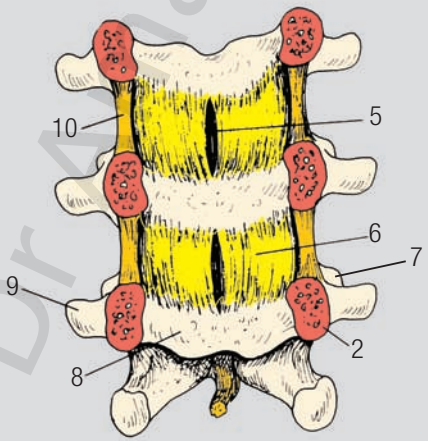
BS ***spinal arteries of the regional arteries***

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 ±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 mammilary 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

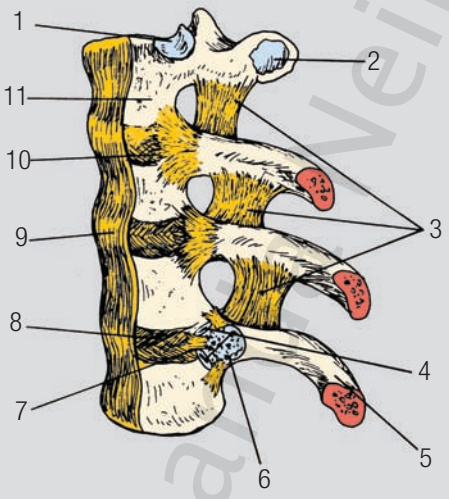
(symphyses - bone - fibrocartilagenous disc - bone b/n bodies fibrous joints b/n processes spinous (SP) transverse (TP) synovial joins b/n superior & inferior facets = zygapophyseal)

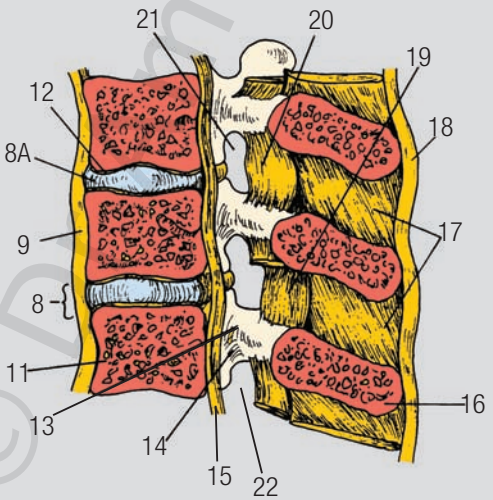
BS *spinal arteries of the regional arteries*

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 ±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 ligs
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 veterbral 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

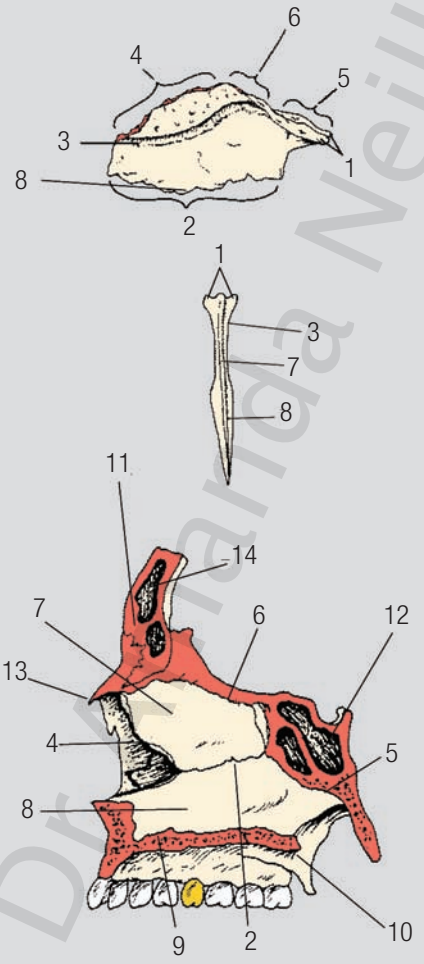
10 Medial pterygoid plate

11 Frontal bone

12 Sphenoid sinus

13 anterior of nasal bones

14 Frontal sinus



WRIST JOINT = Radiocarpal joints

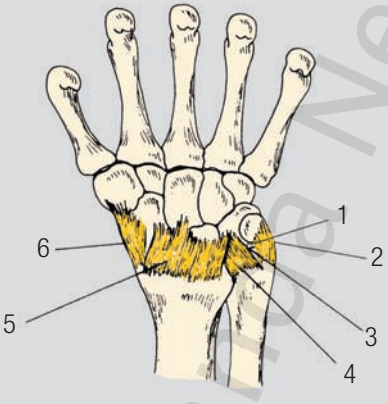
palmar / dorsal

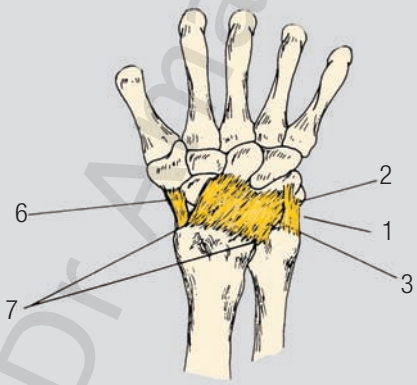
BS ***anterior interosseous, ant post carpal branches of the radial and ulan art***

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



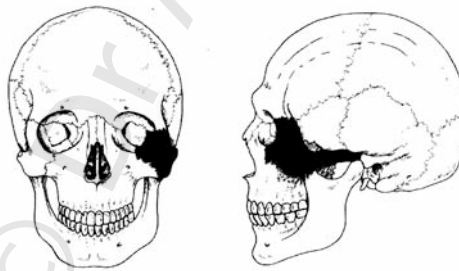


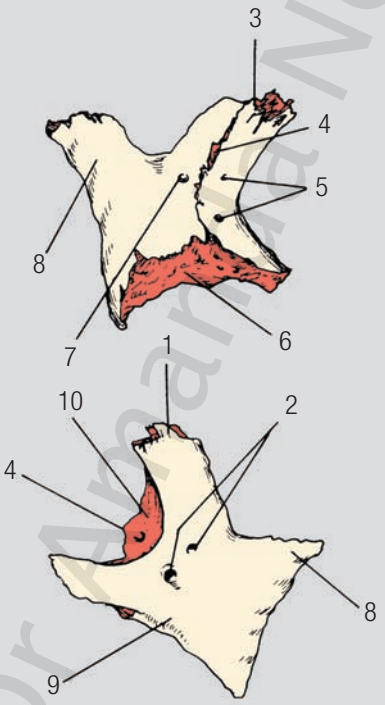
Zygoma = CHEEK BONES
Antero-Lateral / Postero-Medial

antero-lateral / postero-medial

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

1. frontal process
2. Zygomatico-Facial formina
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 form 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 Anaethetists 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 ☐
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