The **A** to **Z** of **Head & Neck**

(Bones & Muscles)

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Introduction

This book is particularly useful when used with the *A to Z of Peripheral Nerves* and the *A to Z of the Bones, Joints, Ligaments & the Back*, The *A to Z of Skeletal Muscles* and the *A to Z of the Brain and Cranial Nerves* but all the A to Zs are cross-referenced and together are forming a set covering the all structural elements of the human body; and now including pathological considerations in the new ***The A to Z of... failure*** series e.g. The *A to Z of Bone & Joint Failure.*

If there is a structure/subject you want to see in the A to Zs let us know.

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

Acknowledgement

I would like to thank Aspenpharmacare Australia: Mr Greg Lan CEO, & Mr Robert Koster in particular & all those who have helped in the contribution of this edition & in the feedback of the other books in this series. Thankyou.

Dedication

To hard work but not necessarily to working hard.

How to use this book

The format of this A to Z book has been maintained as in the last edition - the bones of the Head & Neck are in the front followed by the muscles. Each section listed in alphabetical order as with the other A to Zs. The book is its own index in each section. In the front of each section, as usual, there are overviews of bone or muscle groupings such as the bones surrounding and forming cranial cavities and groupings of muscles around the larynx, as well as individual views of each and every bone and muscle. The skull has a separate listing.

As with all the A to Zs - think of it and then find it alphabetically. Cross referencing in the index is in the usual manner i.e. see for go to and see also for additional images listed under that heading.

Thank you,

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Table of contents

Abbreviations

A = actions / movements of a joint
aa = anastomosis or anastomoses
ACF = anterior cranial fossa
adj. = adjective
aka = also known as
ALL = anterior longitudinal ligament
alt. = alternative
ANS = autonomic nervous system
ant. = anterior
art. = articulation (joint w/o the additional support structures)
AS = Alternative Spelling, generally referring to the diff. b/n British & American spelling
ASIS = anterior superior iliac spine (of hip bone)
bc = because
b/n = between
BP = brachial plexus
BS = Blood Supply
BVs = blood vessels
C = cervical
c.f. = compared to
CF = cranial fossa
CH = cerebral hemispheres
CN = cranial nerve
CNS = central nervous system
Co = coccygeal
CP = cervical plexus
collat. = collateral
Cr = cranial
CSF = Cerebrospinal fluid
CT = connective tissue
diff. = difference(s)
dist. = distal
DM = dura mater
EB = eyeball
e.g. = example
EAM = external acoustic meatus
EC = extracellular (outside the cell)
EOM = extra-ocular muscles
ES = Erector Spinae group of muscles
ext. = extensor (as in muscle to extend across a joint)
Gk. = Greek
GM = Grey matter
I = insertion
IAM = internal acoustic meatus
IOM = intra-ocular muscles
jt(s) = joints = articulations
L = lumbar / left
LL = lower limb
lig = ligament
LP = lumbar plexus
Lt. = Latin
MCF = middle cranial fossa
MCL = mid clavicular line
med = medial
mm = mucous membranes
N (s) = nerve(s)
NAD = normal (size, shape)
NAD = no abnormality detected
NR = nerve root origin
NS = nervous supply / nerve system
NT = nervous tissue
nv = neurovascular bundle
O = origin
P = pressure
PaNS. = parasympathetic nervous system
ParaNs = parasympathetic nerves ± fibres
pl. = plural
PLL = posterior longitudinal ligament
PM = pia mater
PN = peripheral nerve
post. = posterior
proc. = process
prox. = proximal
R = right / resistance
ROM = range of motion
sing. = singular
SC = spinal cord
SN = spinal nerve
SP = spinous process / sacral plexus
SS = signs and symptoms
supf = superficial
T = TEST / thoracic
TOS = thoracic outlet syndrome
T = transverse process
UL = upper limb, arm
VB = vertebral body
VC = vertebral column
WM = white matter
w/n = within
w/o = without
wrt = with respect to
& = and
= intersection with

Ablation The removal of part of the body, generally a bony part, most commonly the teeth.

Acral in the extremities - bones at the apex or end of limbs.

Acromegaly A continuation of growth of the ends of cartilage covered bone (after fusion of the long bones) hence a gross change in the features (most noticeable in the jaw and digits) without growth in height, due mainly to the over activity of the pituitary gland.

Ala A wing, hence a wing-like process as in the Ethmoid bone ***pl. - alae.***

Alveolus Air filled bone - tooth socket ***adj. - alveolar*** (as in air filled bone in the maxilla) - coalescence of alveoli helps in the formation of the sinuses. This device also lightens the weight of the bone particularly the skull.

Ankle Bend = angle usually referring to the bend just above the foot, hence the ankle is the joint b/n the foot and the lower leg.

Annulus fibrosis The peripheral fibrous ring around the intervertebral disc.

Aperture An opening or space between bones or within a bone.

Appendicular Refers to the appendices of the axial i.e. in the skeleton, the limbs upper and lower which hang from the axial skeleton, this also includes the pectoral and pelvic girdles but not the sacrum.

Areola Small, open spaces as in the areolar part of the Maxilla may lead or develop into sinuses.

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

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

Arthropathy Diseases of the joints.
Arthrosis Joint types.
Articulation Joint, description of the bone surfaces joining w/o the supporting structures = point of contact b/n 2 opposing bones hence the articulation of humerus and scapula is the articulation of the shoulder joint.

Attrition Tooth wear and tear.

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

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

Axial Refers to the head and trunk (vertebrae, ribs & 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 it is replaced over time with compact bone.

Calotte The calotte consists of the calvaria from which the base has been removed

Calvaria The calvaria refers to the cranium without the facial bones attached.

Canal Tunnel / extended foramen as in the carotid canal at the base of the skull ***adj.- canular*** (canicular - small canal).

Cancellous bone = Trabecular bone

A spongy porous bone with spicules (trabeculae) of compact bone. It is found at the ends of long bones in the bones of the axial skeleton. Red BM is found b/n the spicules.

Caput / Kaput The head or of a head, ***adj.- capitate = having a head (c.f. decapitate)***

Carotid To put to sleep; compression of the common or internal carotid artery causes coma. This refers to bony points related to the Carotid vessels.

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 processes look like bed posts eg. in the Sphenoid bone.

Clivus A slope hence in the anterior cranial fossa referring to a slope on the base of the cavity.

Cochlea A snail, hence snail-like shape relating to the Organ of Corti in the ear.

Compact bone = Cortical bone = Dense bone
Bone found in the shafts and on external bone surfaces. Highly structured in concentric circles or Haversian systems. It is constantly changing and remodeling depending upon the lines of force.

Concha A shell shaped bone as in the ear or nose ***(pl. conchae adj.-. chonchoid)*** old term for this turbinate.

Condyle A rounded enlargement or process possessing an articulating surface.

Cornu A horn (as in the Hyoid).

Corona A crown. ***adj.- coronary, coronoid or coronal;*** hence a coronal plane is parallel to the main arch of a crown which passes from ear to ear ***(c.f. coronal suture)***.

Costa / Costo Pertaining to the ribs.

Cranium The cranium of the skull comprises all of the bones of the skull except for the mandible.

Crest Prominent sharp thin ridge of bone formed by the attachment of muscles particularly powerful ones eg Temporalis/Sagittal crest.

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

Cuneate/Cuneus A wedge / wedge-shaped.

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

Depression A concavity on a surface.

Detrition Wearing away of the tooth surfaces of OA.

Detritus	The material left after the wearing away or rubbing.
Diaphysis	The shaft or body of a long bone. In the young this is the region b/n the growth plates and is composed of compact bone. ***pl.- diaphyses adj.- diaphyseal.***
Diploë	The cancellous bone between the inner and outer tables of the skull**,** ***adj.- diploic***.
Edentulous	Without teeth.
Eminence	A smooth projection or elevation on a bone.
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. *See periosteum.*
Ethmoid =	**Cribiform.**
External Auditory Meatus	Ear hole.
Exostosis	A bony outgrowth from a bony surface, often due to irritation (as in Swimmer's ear) and may involve ossification of surrounding tissues such as muscles or ligaments.
Facet	A face, a small bony surface (occlusal facet on the chewing surfaces of the teeth) seen in planar joints.
Falciform	Relating to shapes that are in a sickle shape so falciform ligaments curve around and end in a sharp point.
Fissure	A narrow slit or gap from cleft.
Fontanelle	A fountain, associated with the palpable pulsation of the brain as in the anterior fontanelle of an infant. These soft spots on the skull are cartilagenous CT covering "joints" which allow for skull cranial expansion and then become the mould for the bone development and shape joining along the sutural lines, later becoming the Bregma.
Foramen	A natural hole in a bone usually for the transmission of BS and/or nerves. ***pl. foramina***.
Fornix	An arch.
Fossa	A pit, depression, or concavity, on a bone, or formed from several bones as in temporomandibular fossa. Shallower and more like a "bowl" than a cavity. ***pl. fossae.***
Fovea	A small pit (usually smaller than a fossa)- as in the fovea of the occlusal surface of the molar tooth.
Gallus / Galli	A cock, hence, crista galli, the cock's comb ***(i.e. possessive form of gallus)***.
Groove	Long pit or furrow.
Hyoid	U-shaped.
Hyperostosis	Abnormal bone growth generally overgrowth or ectopic growth.
Incisura	A notch.
Inter	Between.
Intra	Within.

Introitus An orifice or point of entry to a cavity or space.

Joint = **Articulation + supporting structures.**

Jugum A bridge between 2 halves of a bone ***pl. juga*** as in Sphenoid.

Kyphosis Collapse of vertebral body(ies) causing sharp convexity of the spine.

Lacerum Something lacerated, mangled or torn e.g. foramen lacerum a small sharp hole at the base of the skull. This often tears tissues.

Lacrimal Related to tears and tear drops. ***(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 is generally composed of collagen fibres. *See classification of ligaments.*

Linea A line as in the Nuchal lines of the Occiput/Occipital bone.

Lingual Pertaining to the tongue.

Lipping Bone projecting over the usual margin, excessive production generally pathological as in osteoarthritis, may interfere with joint movement.

Locus A place ***(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. (pl. metaphysis).

Neurocranium The neurocranium refers only to the braincase of the skull.

Notch An indentation in the margin of a structure.

Nucha The nape or back of the neck ***adj.- nuchal.***

Occiput The prominent convexity of the back of the head Occipitum = ccipital bone ***adj.- occipital.***

Oculus An eye ***adj.- ocular pl oculi***

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).

Osteitis Inflammation of the bone.

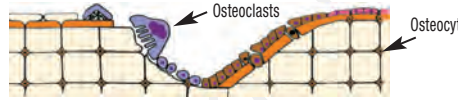
Osteoblasts Bone cells capable of dividing and laying down matrix - 'baby' osteocytes

Osteochondroma Bone & cartilagenous tumour benign often arising in the ephyseal plate or line & protrude at right angles, common & asymptomatic.

Osteoclasts Multinuclear cells which resorb or phagocytose bone = resorption of bone = Giant cells.

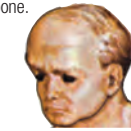
Osteocytes Bone cells incapable of dividing but maintain the extracelluar matrix of the bone.

Osteogenesis Formation and growth of bone.



Osteoma Tumour of the bone tissue.

Osteomalacia Disease of softening of the bones / Paget's disease. Affects the skull, causing it to enlarge with thick soft bone.



Ostium A door, an opening, an orifice.

Otic Pertaining to the ear.

Ovale Oval shaped.

Palate A roof ***adj.- palatal or platatine.***

Parietal Pertaining to the outer wall of a cavity from paries, a wall.

Parotid Pertaining to a region beside or near the ear ***(par - otic)***

Pars A part of / nearby ***(adj.- para)***

Pecten A comb.

Perikymata Transverse ridges and the grooves on the surfaces of teeth

Periosteum Layer of fascial tissue (connective tissue) on the outside of compact bone not present on articular (joint) surfaces. *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 Joints which allow for sliding across the joint as in the wrist, foot and ribs movement in one plan.

Pneumatic Air filled *see Classification of Bones.*

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.

Ridge Elevated bony growth often roughened.

Rotundum Round.

Sagittal An arrow, the sagittal suture is notched posteriorly, making it look like lightning arrows.

Scoliosis A deviation from the vertical plane of the Vertebral column laterally (as opposed to exaggeration of vertical curves in kyphosis and lordosis).

Sella A saddle; ***adj.- sellar***, sella turcica = Turkish saddle.

Sesamoid Grainlike.

Sigmoid S-shaped, from the letter Sigma which is S in Greek.

Sinus A space usually within a bone, lined with mucous membrane, such as the frontal and maxillary sinuses in the head. A modified BV usually vein, with an enlarged lumen for blood storage & containing no or little muscle in its wall. Sinuses may contain air, venous or arterial blood, lymph or serous fluid depending upon location & health of the subject ***adj.- sinusoid***.

Skull The skull refers to all of the bones that comprise the 'head'.

Spheno- A wedge i.e. the Sphenoid is the bone which wedges in the base of the skull between the unpaired frontal & occipital bones ***adj.- sphenoid.***

Spine A thorn ***adj.- spinous*** descriptive of a sharp, slender process/protrusion.

Splanchocranium The splanchocranium refers to the facial bones of the skull.

Stylos An instrument for writing hence ***adj.- styloid*** a pencil-like structure.

Sulcus Long wide groove often due to a BV indentation.

Sustenaculum A supportive structure as in the sustenaculum tali = a structure which supports the Talus in the foot.

Suture The saw-like edge of a cranial bone that serves as joint b/n bones of the skull.

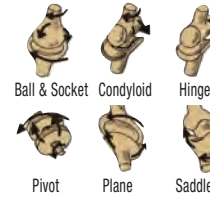
Symphysis A cartilagenous joint or a growth with bone-cartilage-bone. *See Classification of Joints.*

Syn- Together i.e... the close proximity of or fusion of 2 structures.

Syndesmosis Tight inflexible joints b/n 2 bones little to no movement. Many axial joints are of this type.

Synostosis Fusion of any joints.

Synovial joints Any moveable joint with synovial fluid b/n the 2 opposing bones - most moving joints are synovial.



Tectum A roof.

Tegmen A covering.

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

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

Tentorium A tent.

Torus Protruberance ***pl. tori***.

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

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

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

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

Tubercle A small process or bump, an eminence.

Tuberculum A very small prominence, process or bump.

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

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

Tympanum A drum ***pl. tympani.***

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

Uncus A hook ***adj.- uncinate.***

Wormian bone Extrasutural bone in the skull.

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

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

Anatomical planes and Anatomical positions

A = Anterior Aspect from the front = or / Posterior Aspect from the back.
Used interchangeably with ventral and dorsal respectively

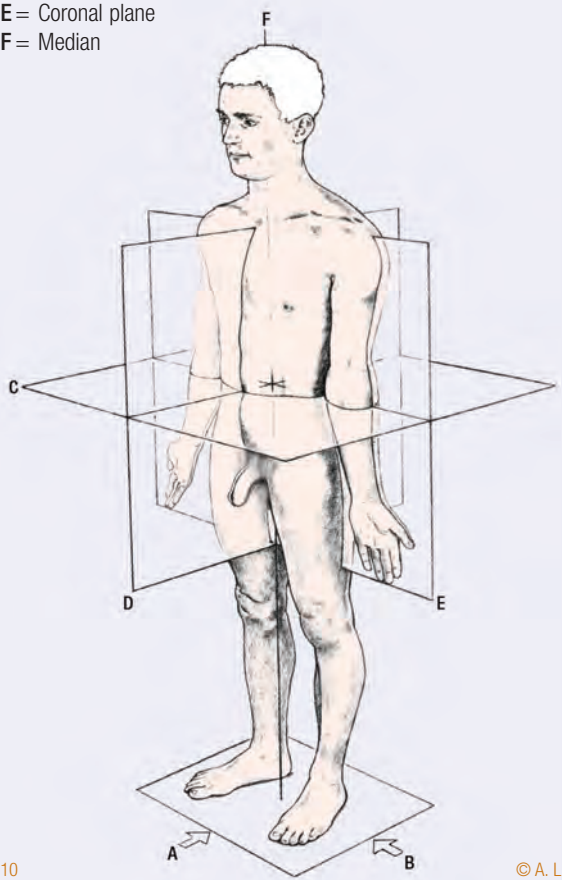
B = Lateral Aspect from either side

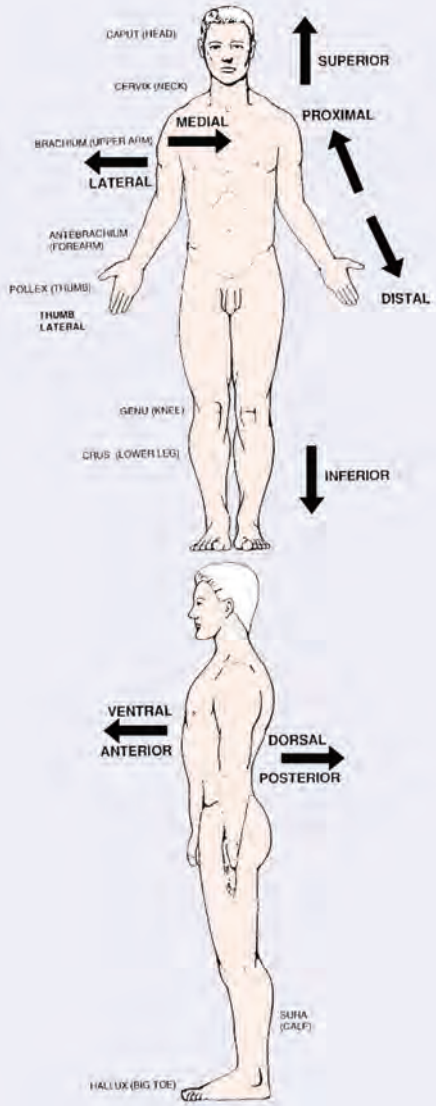
C = Transverse / Horizontal plane

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

E = Coronal plane

F = Median

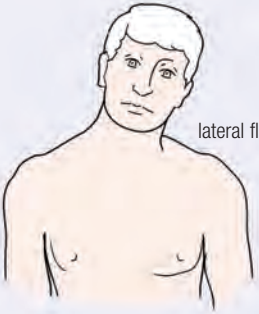



CAPUT (HEAD)
CERVIX (NECK)
BRACHIUM (UPPER ARM)
ANTEBRACHIUM (FOREARM)
POLLEX (THUMB)
THUMB LATERAL
GENU (KNEE)
CRUS (LOWER LEG)
SUPERIOR
PROXIMAL
MEDIAL
LATERAL
DISTAL
INFERIOR
VENTRAL
ANTERIOR
DORSAL
POSTERIOR
SURA (CALF)
HALLUX (BIG TOE)

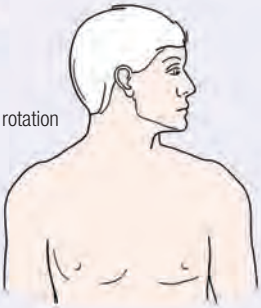
Movements of the Head & Neck

neck flexion

neck extension/hyper-extension

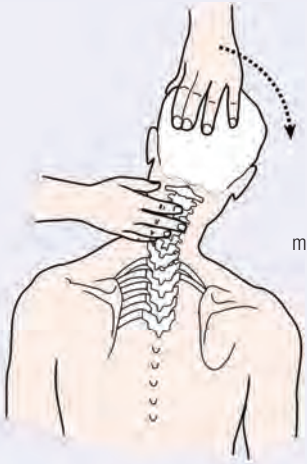


lateral flexion



lateral rotation

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

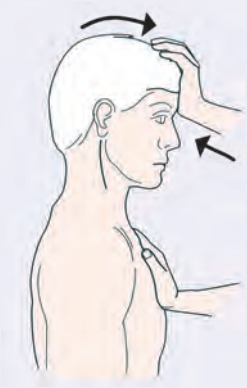


lateral flexion - testing for mobility and spinal tenderness

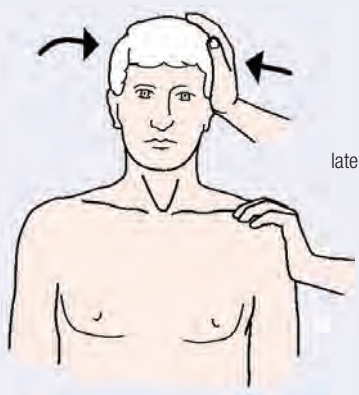
cervical flexion - testing for mobility and spinal tenderness

lateral rotation - testing for mobility and spinal tenderness

Movements of the Head & Neck Cont/



neck flexion - testing for strength against R



lateral flexion - testing for strength against R

extension / hyperextension - testing for strength against R

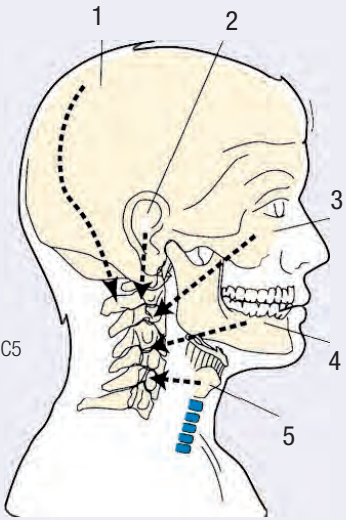
lateral rotation - testing for strength against R

cervical traction - testing for R and N irritation

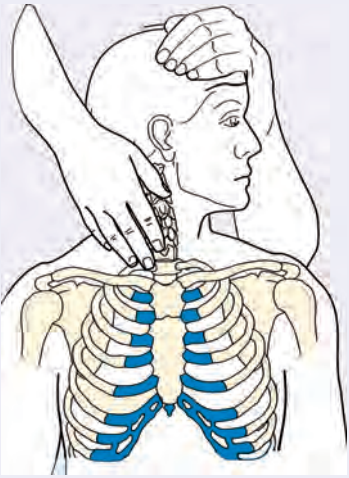
Movements of the Head & Neck Cont/

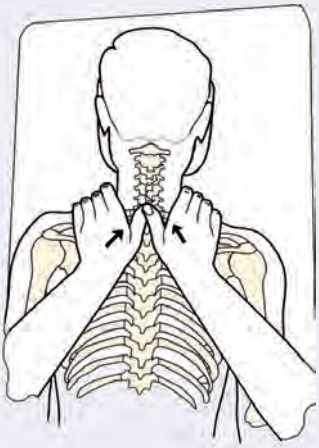
sites of referred pain in the cervical spine

scalp (1) to SP of C2
ear (2) to body of C2
face (3) to C3
jaw and teeth (4) to C3/4
thyroid, cricoid cartilages (5) to C5

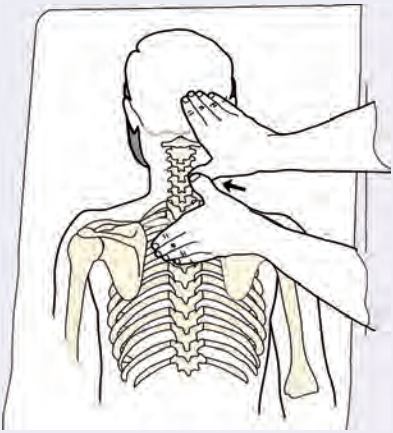


testing for mobility of C7/T1 and the first rib





examination for tenderness of the cervical spinous processes



examination for tenderness of the cervical transverse processes

The Skull & Neck

Cavities of the Skull

Cervical Spine Radiological Overview

Articulations of the Skull bones

Bones	Paired	ear	eth	fro	hy	lac	mn	max	nas	occ	pal	par	sphn	temp	vom	zyg	C1 C2
ear ossicles = ear	Yes												●	●			
ethmoid = eth	NO			●		●		●	●		●		●		●		
frontal = fro	NO		●	●		●		●	●			●	●				
hyoid = hy	NO																
lacrimal = lac	Yes		●	●				●	●								
mandible = mn	NO													●			
maxilla =max	Yes		●	●		●		●	●		●		●		●	●	
nasal = nas	Yes		●	●		●		●	●		●		●		●	●	
occipital = occ	NO											●	●	●	●		●
palatine = pal	Yes		●					●	●		●		●	●	●		
parietal = par	Yes			●						●		●	●	●			
sphenoid = sphn	NO	●	●	●				●	●	●	●	●		●	●	●	
temporal = temp	Yes	●								●		●	●			●	
vomer = vom	NO		●					●	●		●						
zygoma = zyg	Yes			●				●	●			●	●	●			

Red spots indicate when there is an articulation or joint between the bones. Please note the hyoid does not articulate with any bones and the mandible articulates at the only synovial joint in the skull- the TMJ -temporomandibular joint. All other joints are secondary cartilagenous bone-fibrocartilage-bone.

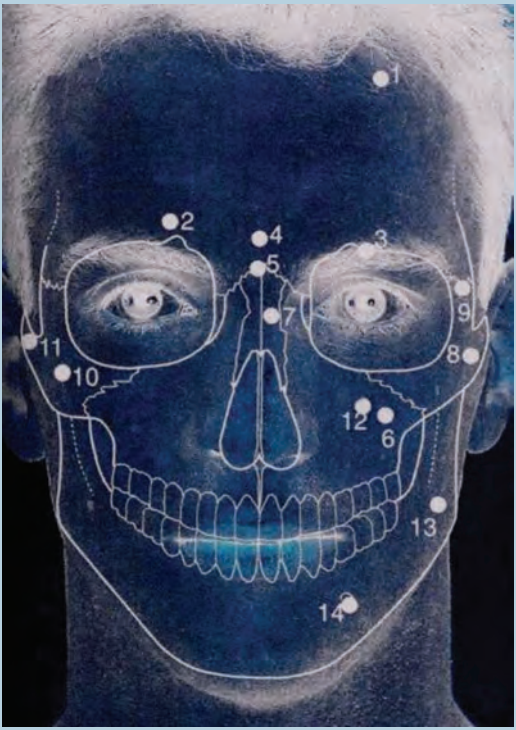
Skull Bones External Views

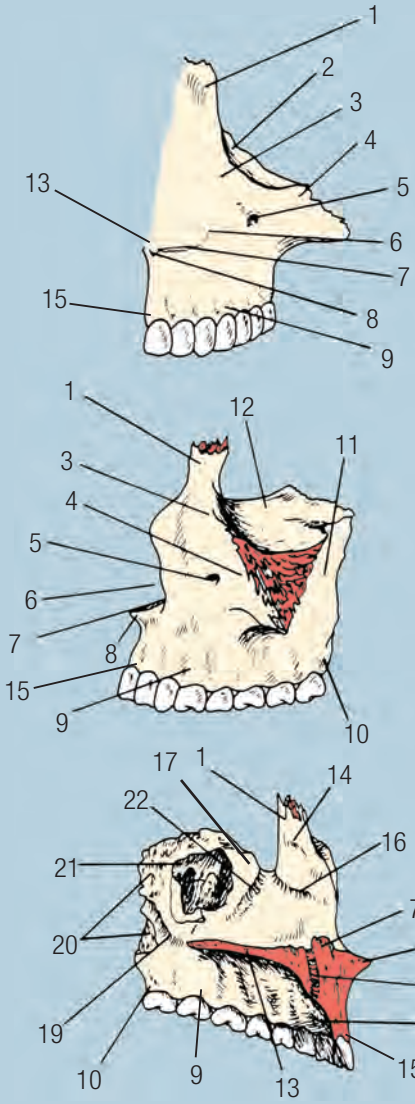
Face

Bones as they affect the face - surface projection

anterior

1 Frontal bone
2 Superciliary arch
3 Supra-orbital notch
4 Glabella
5 Nasion – fronto-nasal suture
6 Maxilla
7 Nasal bone
8 Zygoma
9 Fronto-zygomatic suture
10 Cheek prominence
11 Zygomatic arch
12 Infraorbital foramen
13 Angle of the jaw
14 Mental foramen

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Nasal Bones and Cavity = NOSE

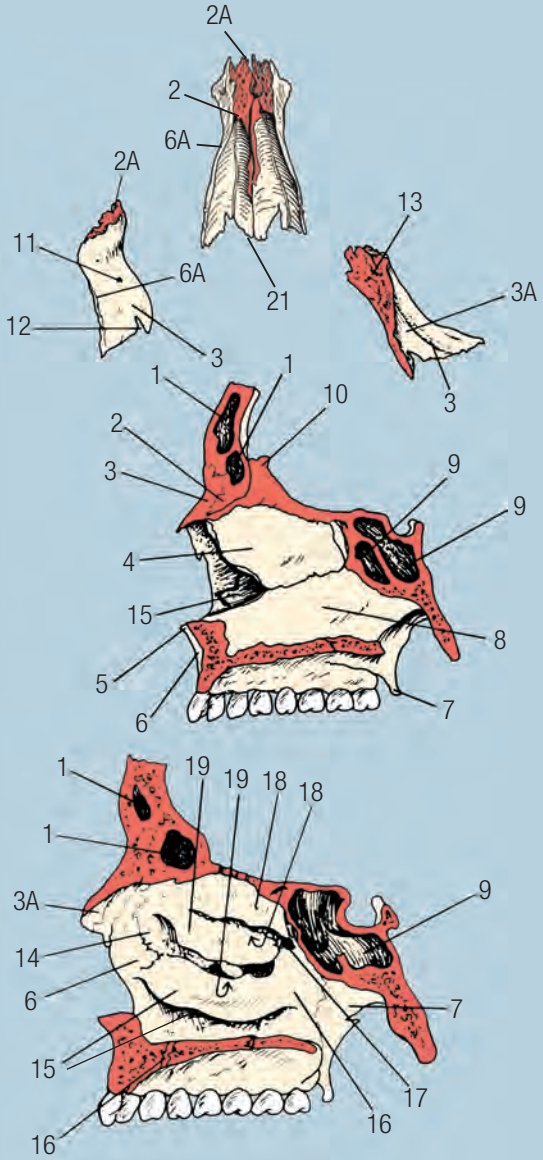
BONES external / internal / paired - posterior

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. More details in the A-Z of Surface Anatomy.

Articulations:	*with Frontal superiorly*	*All 2º*
	with Lacrimal laterally with itself medially with Ethmoid inferiorly	*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
2A Articulation with 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 - (pterygoid plates)
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 & incisive fossa
17 Sphenopalantine meatus
18 Superior concha and meatus
19 Middle concha and meatus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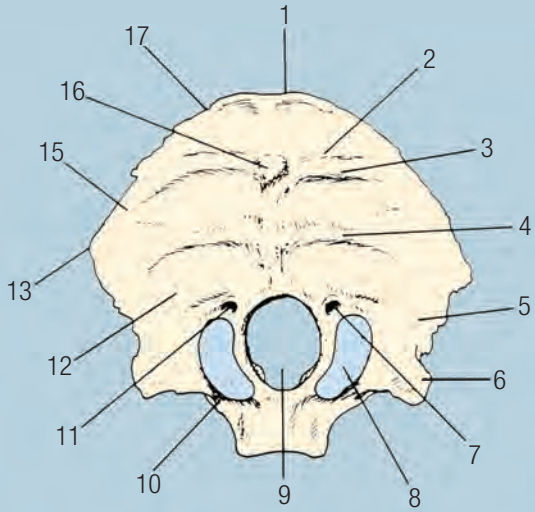
Occipital bone *external / internal*

Articulations:	*with Sphenoid*	*anteriorly*
	with Vertebral Column *with C1* *with C2*	*inferiorly* *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 Occipital crest (internal)
15 Squamous surface
16 Occipital protuberance (internal)
17 Lambdoid margin
18 Groove for superior sagittal sinus
19 Posterior cerebral fossa / occipital fossa
20 Groove for transverse sinus
21 Attachment for tentorium cerebelli
22 Groove for sigmoid sinus
23 Jugluar notch
24 Jugular tubercle
25 Attachments for falx cerebri
26 Opisthion
27 Basion
28 Occipital sulcus - sagittal sinus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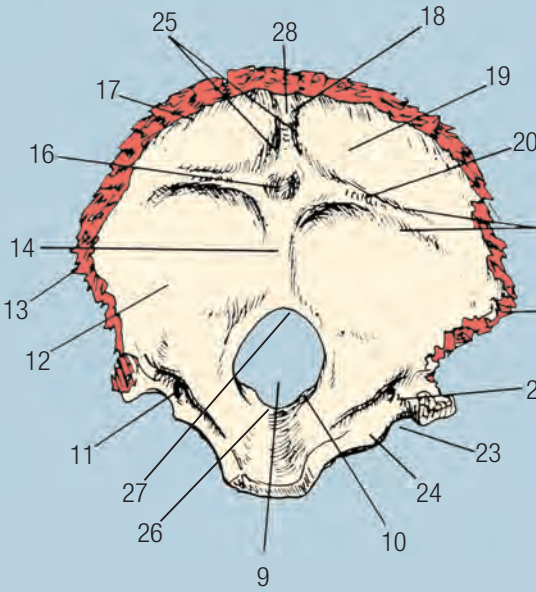
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Palate

Inferior view - looking up into the palate - roof of the mouth
Maxilla + Upper Teeth + Palatine bones

1 Nasopalatine NS emerging from the incisive foramen (alveolare)

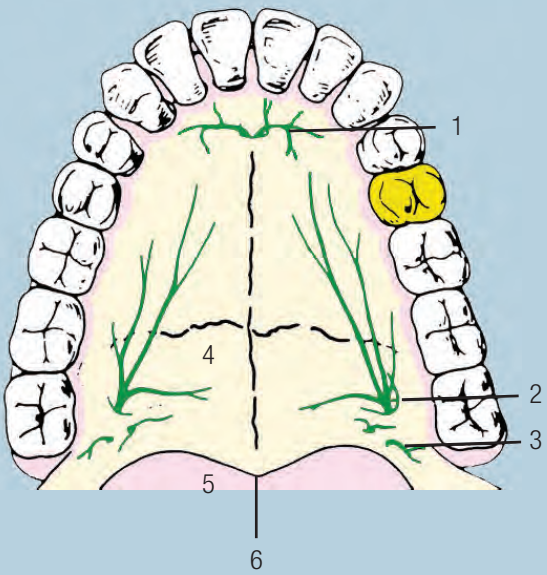
2 Greater palatine NS emerging from the greater palatine foraminae

3 Lesser palatine NS emerging from the lessser palatine foraminae

4 Hard palate

5 Soft palate

6 Nasal process



A

Palatine bones (Left)

B *sagittal / medial / anterior / posterior*

C D E F G

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

H

1 Perpendicular plate - vertical plate

I

2 Palato-maxillary suture

J

3 Maxilla

K

4 Orbital process

L

5 Spheno-palatine notch

M

6 Sphenoidal process -

N

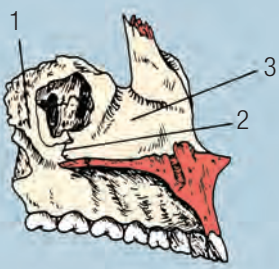
6A Pterygo-palatine canal

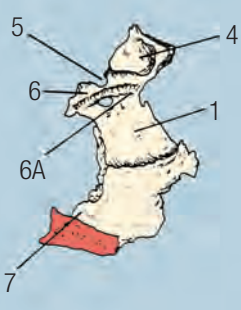
O

P

7 Horizontal plane

Q R S T U V W X Y Z





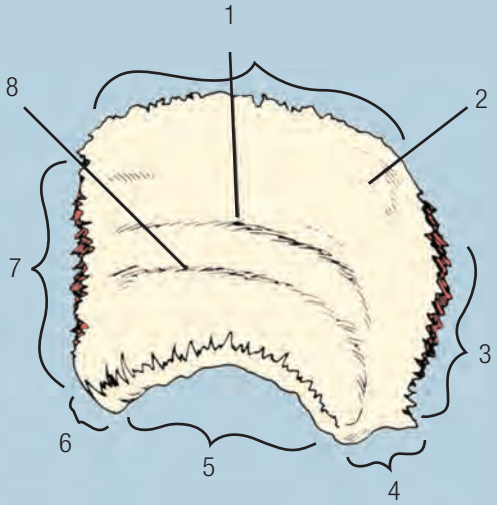
A B C D E F G H I J K L M N O **P** Q R S T U V W X Y Z

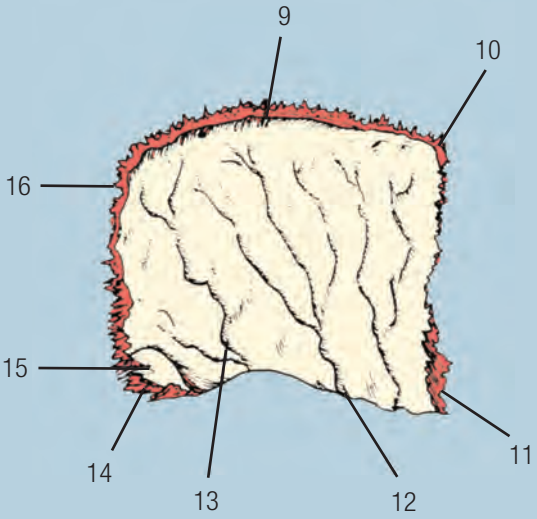
Parietal bone (Left)

external / internal

Articulations:	*with the Frontal - anteriorly*	*All 2°*
	with the Temporal - inferiorly with the Occipital - posteriorly with itself medially	*fibro - cartilagenous joints*
Special features	*large square bone - largest of the cranial vault - even thickness all 4 corners make 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 Articulation between parietal bones sagittal suture
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 Groove for superior sagittal sinus



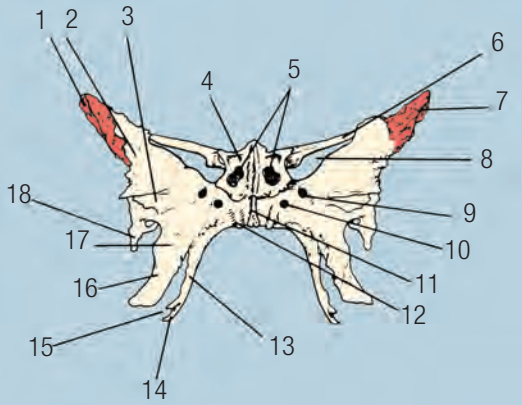


Sphenoid

anterior / posterior / schema - development

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

1 Articulation with L temporal bone
2 Orbital surface
3 Infratemporal crest
4 Body of the sphenoid
5 Openings for sphenoidal sinuses
6 Lesser wing (come across and meet to form jugum)
7 Squamosal suture - articulation with R 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 Greater wing
19A Cerebral surface of the greater wing
20 Anterior clinoid process
21 Posterior clinoid process
22 Dorsum sellae
23 Articulation with occiput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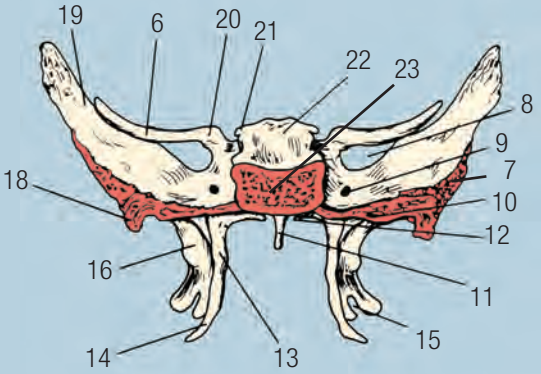
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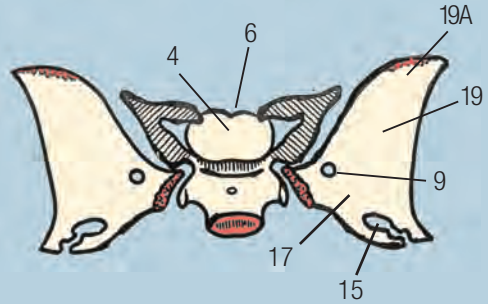
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Teeth *Overview*

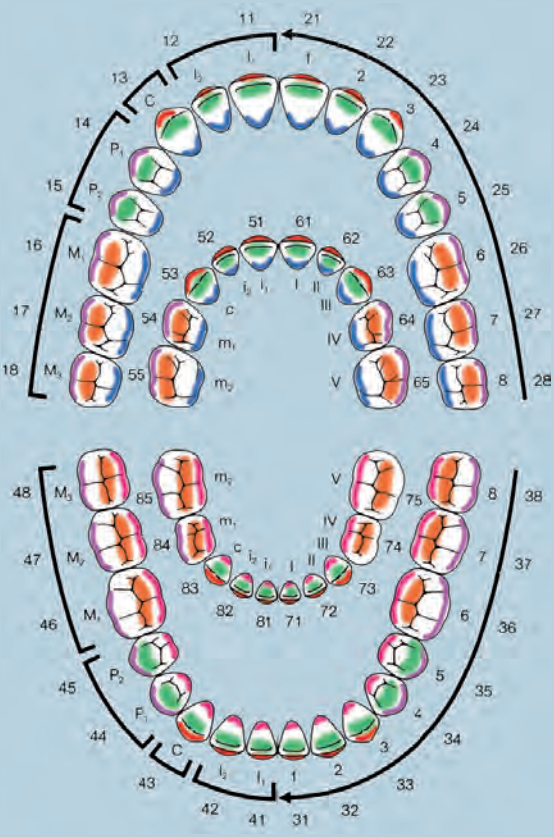
There are many different methods used to name teeth, define their positions and dentitions and describe their surfaces. This overview shows the 1o & 2o dentitions, describes their positions and tooth types using some of the better known methods.

Teeth are labeled XY on the Left and Right - X is the quadrant of the teeth and dentition type - adult or child - Y is the tooth type (devised by the Federation Dentaire Internationale).

1 Maxillary upper right quadrant - adult
2 Maxillary upper left quadrant - adult
3 Mandibular lower left quadrant - adult
4 Mandibular lower right quadrant - adult
5 Maxillary upper right quadrant - child
6 Maxillary upper left quadrant - child
7 Mandibular lower left quadrant - child
8 Mandibular lower right quadrant - child

1 Central Incisor
2 Lateral Incisor
3 Canine
4 First Pre-molar
5 Second Pre-molar
6 First Molar
7 Second Molar
8 Third Molar

A Palatal - upper tooth surface facing the inside of the mouth
B Buccal - any tooth surface facing the cheek
C Mesial - any tooth more anterior than the 1st molar
D Distal - all teeth behind the 1st molar
E Lingual - lower tooth surface facing the tongue
F Occlusal - any tooth surface which abuts with another tooth-bite surface (shown surface)
G Labial - any tooth surface facing the lips



Teeth are labeled by letters and subscripts on the Right letters

I = incisors 2° dention (adult) *i = incisors 1° dentition (child)*

C = canine *c= canine*

M = molar *m=molar*

P = premolar

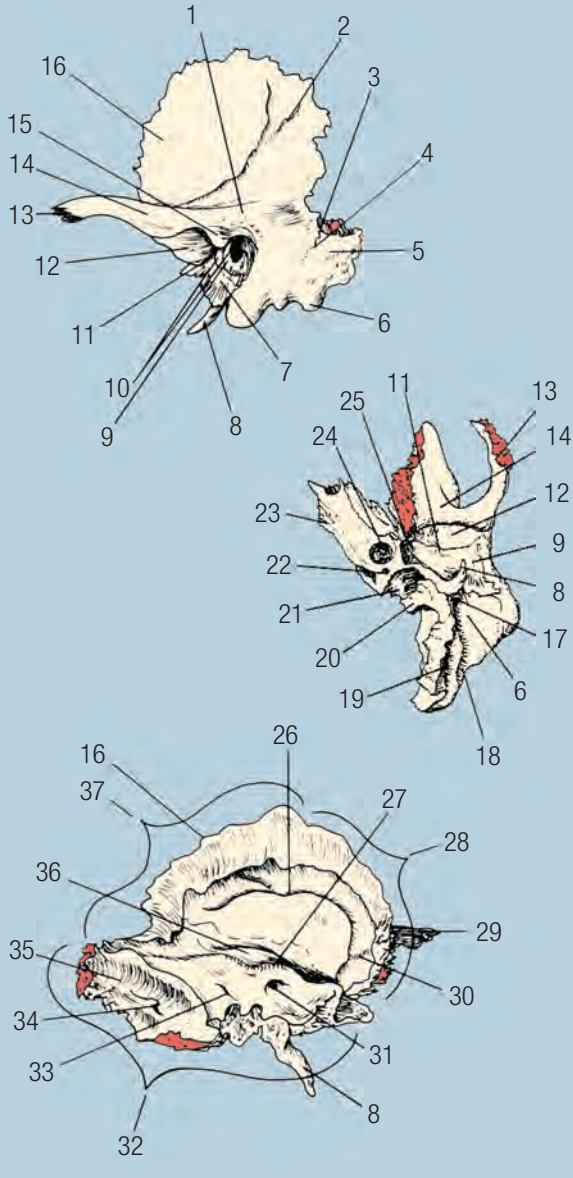
Teeth are labeled using roman numerals in the smaller circle to demonstrate this method - (not commonly used)

Each tooth has several surfaces and lies in different oral regions

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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Temporo-Mandibular Joint = TMJ

closed - lateral / medial
open - sagittal

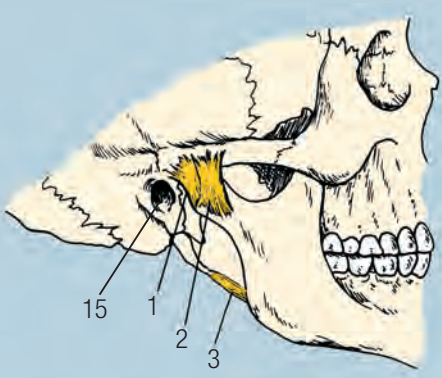
(only SYNOVIAL joint in the skull).

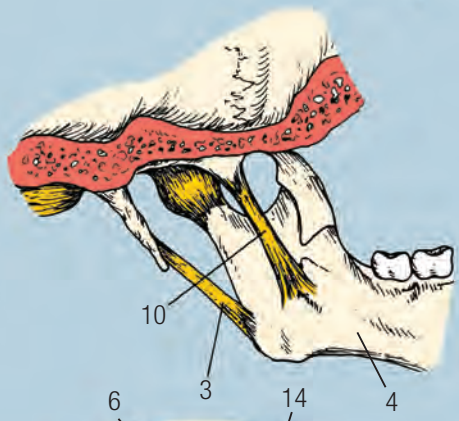
BS *superficial temporal & maxillary arteries*

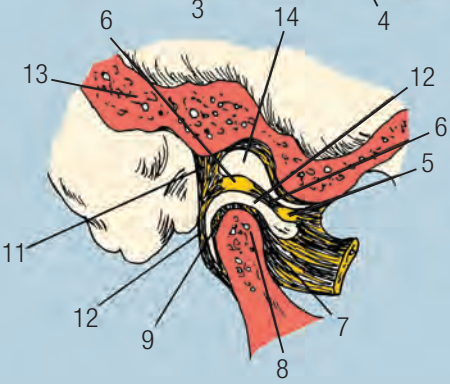
NS *auriculotemporal & masseteric branches of mandibular branch of Trigeminal N (CN5)*

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



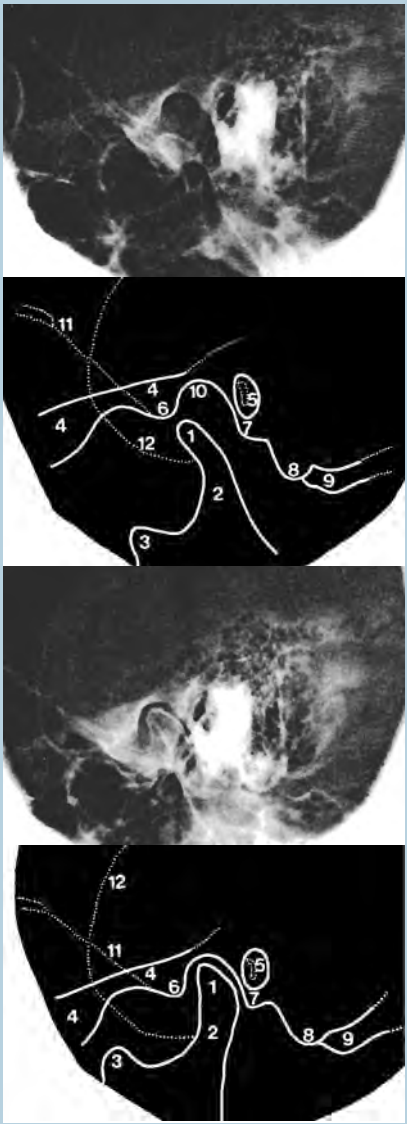




Temporo-Mandibular Joint (TMJ) *Lateral radiology*

Open - upper
Shut - lower

1 Head of mandible – condylar process
2 Neck of the mandible
3 Coronoid process
4 Zygomatic arch
5 External auditory meatus + handle of the malleus
6 Articular cubicle
7 Tympanic plate
8 Mastoid process
9 Groove for posterior belly of digastric muscle
10 Mandibular fossa
11 Greater wing of the sphenoid (basal surface)
12 Lesser wing of the sphenoid



Vertebrae *Typical cervical C3-7*

superior

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

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 tubercle of TP

** only in cervical vertebrae*

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

Vocalis

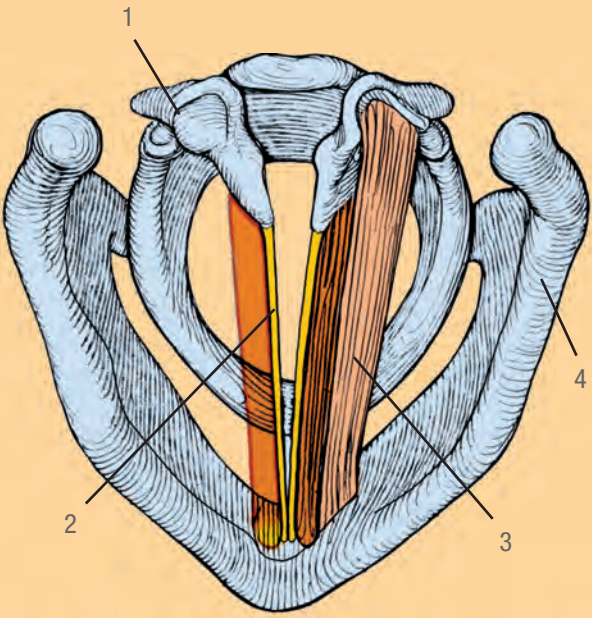
part of the muscles of phonation (voice production)

Superior

Moves the arytenoid cartilages and changes the tension on the vocal cords

O orbital surface (maxilla) inferior surface of thyroid cartilage cricothyroid ligament
I vocal processes of the arytenoid cartilages
A relaxes the vocal folds by protracting the arytenoid cartilages
NS vagus N (CN X) recurrent laryngeal branch
BS thyroids pharyngeal branches
T ability to change voice tone

1 Arytenoid cartilage
2 Vocal cord
3 Thyroarytenoid
4 Thyroid cartilage



A

Zygomaticus – Major, Minor

B *part of muscles of facial expression*

C

Zygomaticus Major

D
O Zygoma - cheekbone
I deep fascia at the angle of the mouth (modiolus)
E **A** draws mouth back smiling/laughing
NS facial N (CN VII)
F **BS** facial
T smile

G

H

I

J

K

L

M

N

O

Zygomaticus Minor

P
O Zygoma - cheekbone
deep fascia of the upper lip
Q **A** maintains nasolabial furrow - philtum
everts upper lip
R **NS** recurrent laryngeal N
BS facial

S

T

U

V

W

X

Y

Z *Often lost in cosmetic surgery i.e. no skin crease from nose to lips.*