Systematic Anatomy

Locomotor system - Part 3

Upper limb bones & their articulations

上肢骨及其连结

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English words quiz

Into Chinese:

1. Medial adduction
2. Maxilla
3. Infrasternal angle
4. Hyperostosis
5. Intervertebral foramen

Into English:

1. 矢状面
2. 翼点
3. 骨密质
4. 前囟
5. 蝶骨

Into Chinese:

1. Medial adduction 内收
2. Maxilla 上颌骨
3. Infrasternal angle 胸骨下角
4. Hyperostosis 骨质增生
5. Intervertebral foramen 椎间孔

Into English:

1. 矢状面 sagittal plane
2. 翼点 pterion
3. 骨密质 compact bone
4. 前囟 anterior fontanelle
5. 蝶骨 sphenoid

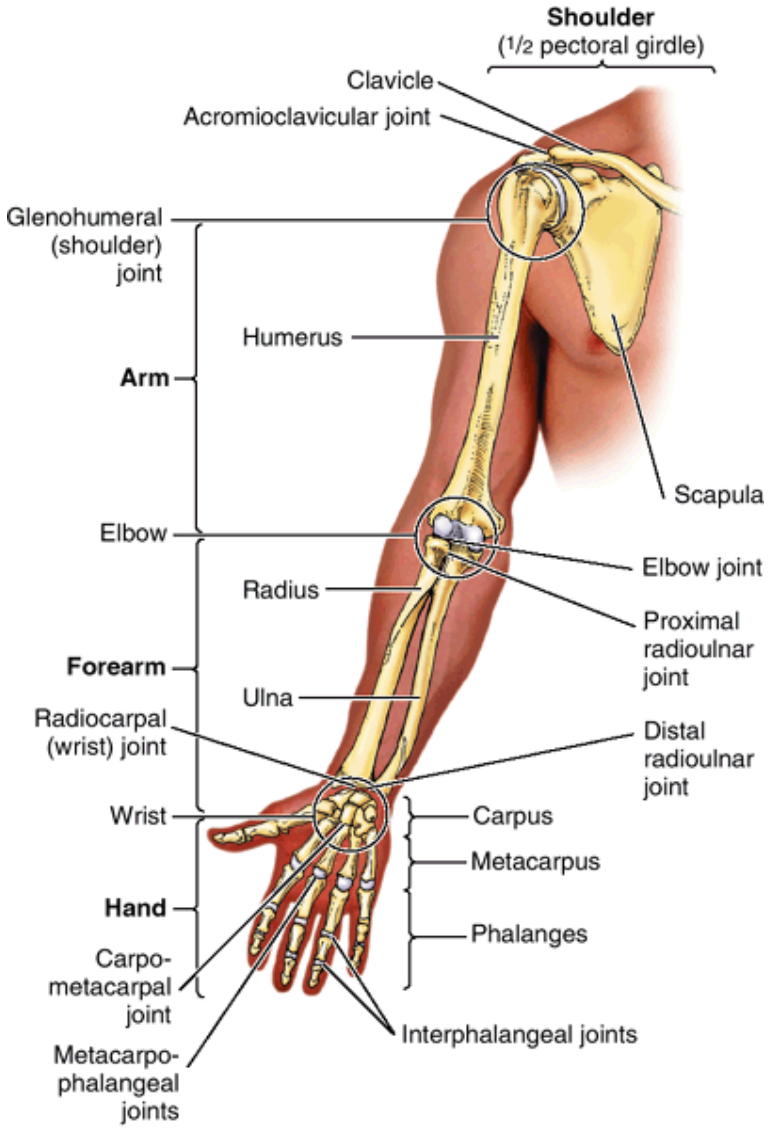
The bones of upper limb & their articulations

The upper limb is characterized by considerable mobility and is adapted for grasping & manipulation.

一般是上下肢骨和关节比较学习

Hands of patient with gout痛风

Bone of the upper limb-64



Bones of Shoulder girdle上肢带骨

1. Clavicle 锁骨 1
2. Scapula 肩胛骨1

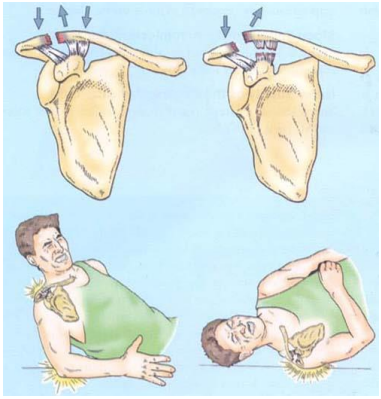
Bones of free upper limb 游离骨

1. Humerus 肱骨 1
2. Ulna 尺骨1
3. Radius 桡骨1
4. Carpal bones 腕骨 8
5. Metacarpal bones 掌骨 5
6. Phalangeal bones 指骨 14

腕八掌五指十四
肩锁肱尺桡各一

Clavicle 锁骨

Fracture of the clavicle



S-shaped long bone

1 shaft & 2 ends

Medial 2/3 convex forward

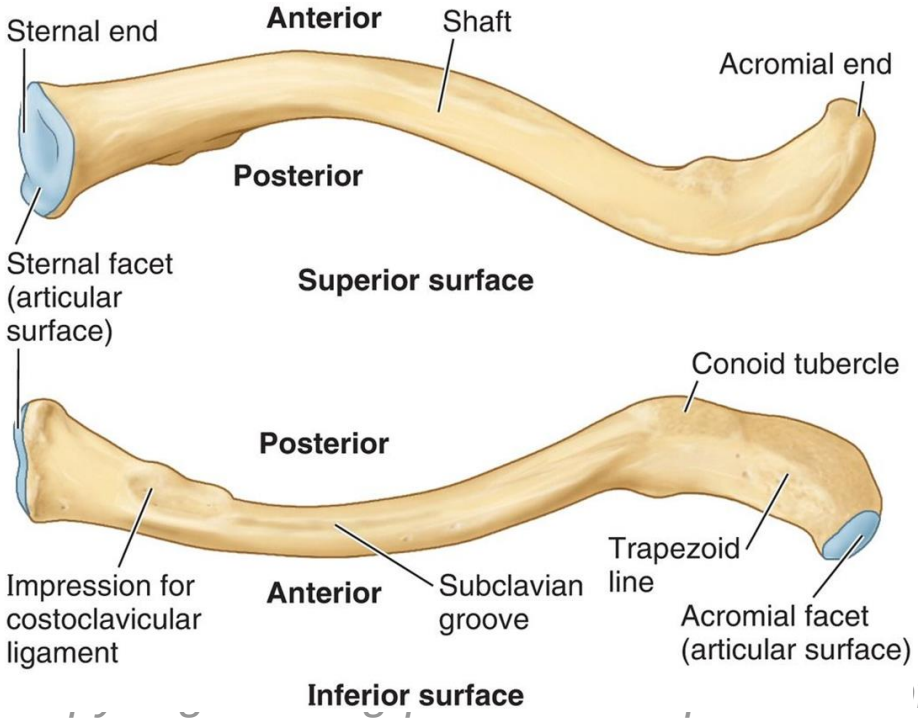
Lateral 1/3 convex backward

Sternal end medially

Acromial end laterally

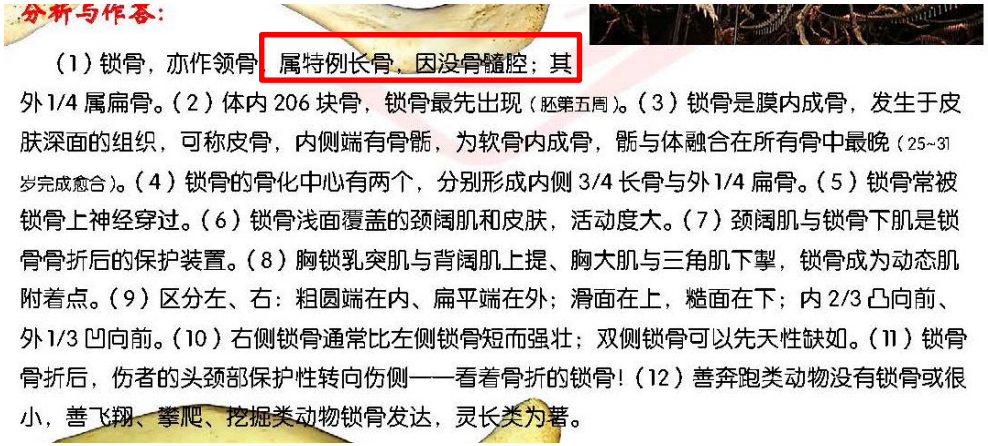
Superior surface

Inferior surface



Clavicle 锁骨

锁骨俗称"美人骨"，"为S状弯曲的细长骨，位于皮下，为颈与胸两部的分界，是上肢与躯干间唯一的骨性联系，维持肩关节在正常位置，增加上肢的活动范围和提高劳动效能。分布至上肢的大血管和神经均在锁骨中段后方通过。



分析与作答：

（1）锁骨，亦作领骨，属特例长骨，因没骨髓腔；其外1/4属扁骨。（2）体内206块骨，锁骨最先出现（胚第五周）。（3）锁骨是膜内成骨，发生于皮肤深面的组织，可称皮骨，内侧端有骨骺，为软骨内成骨，骺与体融合在所有骨中最晚（25~31岁完成愈合）。（4）锁骨的骨化中心有两个，分别形成内侧3/4长骨与外1/4扁骨。（5）锁骨常被锁骨上神经穿过。（6）锁骨浅面覆盖的颈阔肌和皮肤，活动度大。（7）颈阔肌与锁骨下肌是锁骨骨折后的保护装置。（8）胸锁乳突肌与背阔肌上提、胸大肌与三角肌下掣，锁骨成为动态肌附着点。（9）区分左、右：粗圆端在内、扁平端在外；滑面在上，糙面在下；内2/3凸向前、外1/3凹向前。（10）右侧锁骨通常比左侧锁骨短而强壮；双侧锁骨可以先天性缺如。（11）锁骨骨折后，伤者的头颈部保护性转向伤侧——看着骨折的锁骨！（12）善奔跑类动物没有锁骨或很小，善飞翔、攀爬、挖掘类动物锁骨发达，灵长类为著。

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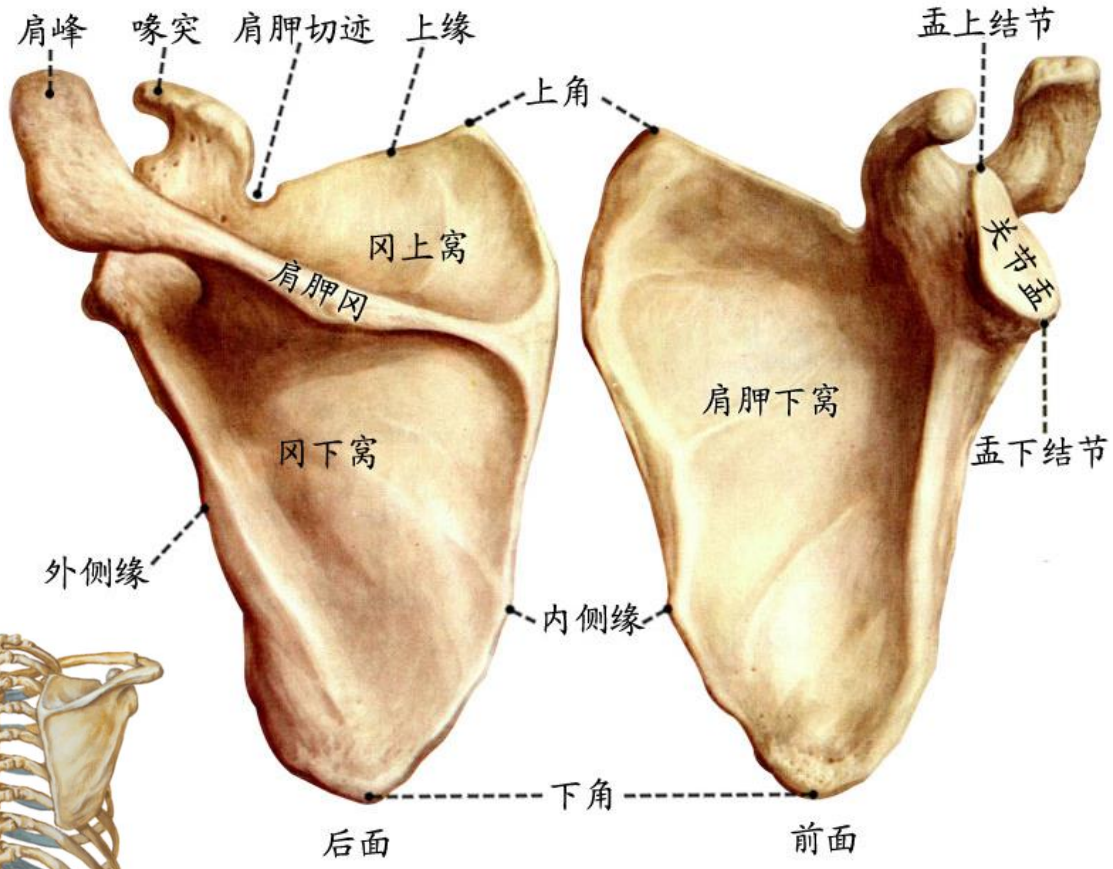
Scapula 肩胛骨

A broad triangular flat bone，Lie on posterolateral aspect of the thorax, Overlying the 2nd -7th ribs,3 angles, 3 borders, 2 surfaces,1spine.



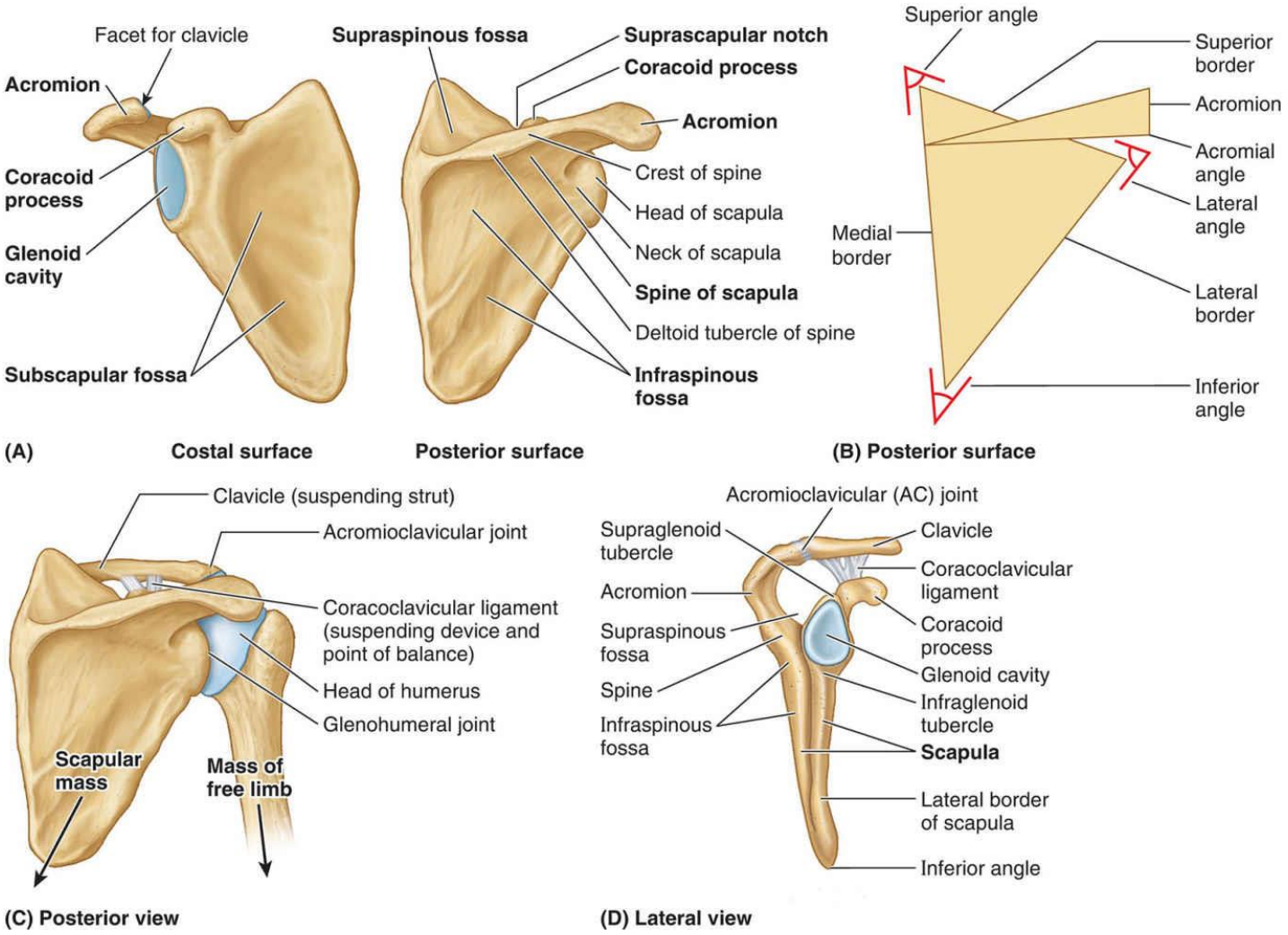
Ant. surface

- Acromion 肩峰
- Coracoid process 喙突
- Scapular notch 肩胛切迹
- Sup.border上缘
- Sup.angle上角
- Supraglenoid tubercle 盂上结节
- Glenoid cavity 关节盂
- Lat.border 外侧缘
- Infraglenoid tubercle 盂下结节
- Lat.border外侧缘
- Scapular spine 肩胛冈
- Supraspnial fossa 冈上窝
- Inf.scapular fossa 肩胛下窝
- Med.border 内侧缘
- Sup.angle 上角
- Inf.angle下角

Scapula 肩胛骨

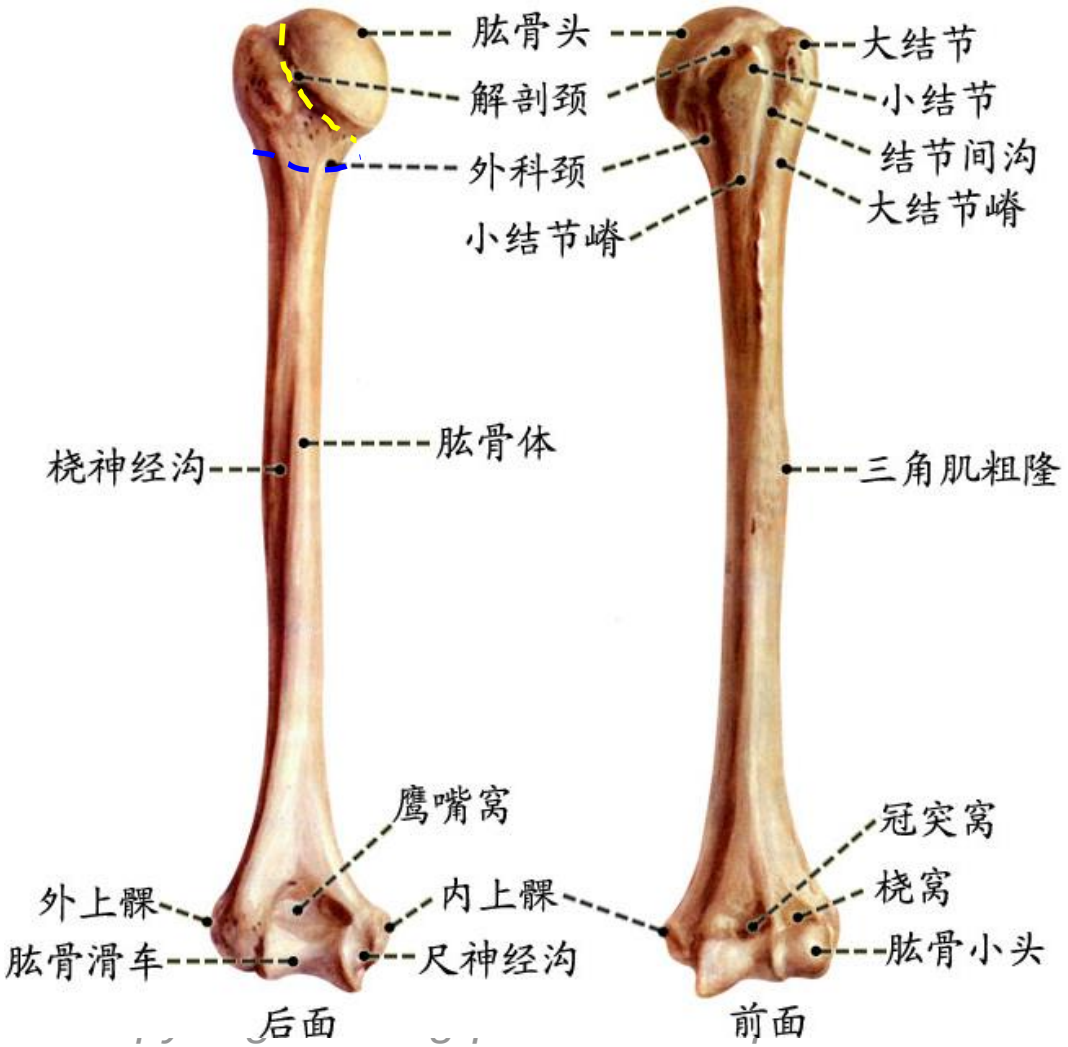
A broad triangular flat bone，Lie on posterolateral aspect of the thorax,

Overlying the 2nd -7th ribs,3 angles, 3 borders, 2 surfaces & 1 spine.



Humerus 肱 骨

Long bone,1 body and two ends



Head of humerus 肱骨头

Anatomical neck 解剖颈

Surgical neck 外科颈

Greater tubercles 大结节

Crest of greater Tubercle 大结节嵴

Lesser tubercles 小结节

Crest of lesser tubercle 小结节嵴

Intertubercular sulcus 结节间沟

Sulcus for radial nerve.桡神经沟

Shaft of humerus 肱骨体

Detoid tuberosity 三角肌粗隆

Lat. epicondyle 外上髁

Capitulum of humerus 肱骨小头

Trochlea of humerus 肱骨滑车

Coronoid fossa 冠突窝

Radial fossa 桡窝

Med. epicondyle 内上髁

Sulcus for ulnar n.尺神经沟

Ulna and radius 尺骨与桡骨

Head of radius 桡骨头

Olecranon 尺骨鹰嘴

Trochlear notch 滑车切迹

Coronoid process 冠突

Radial notch of ulna 桡骨切迹

Articular circumference 环状关节面

Radial tuberosity 桡骨粗隆

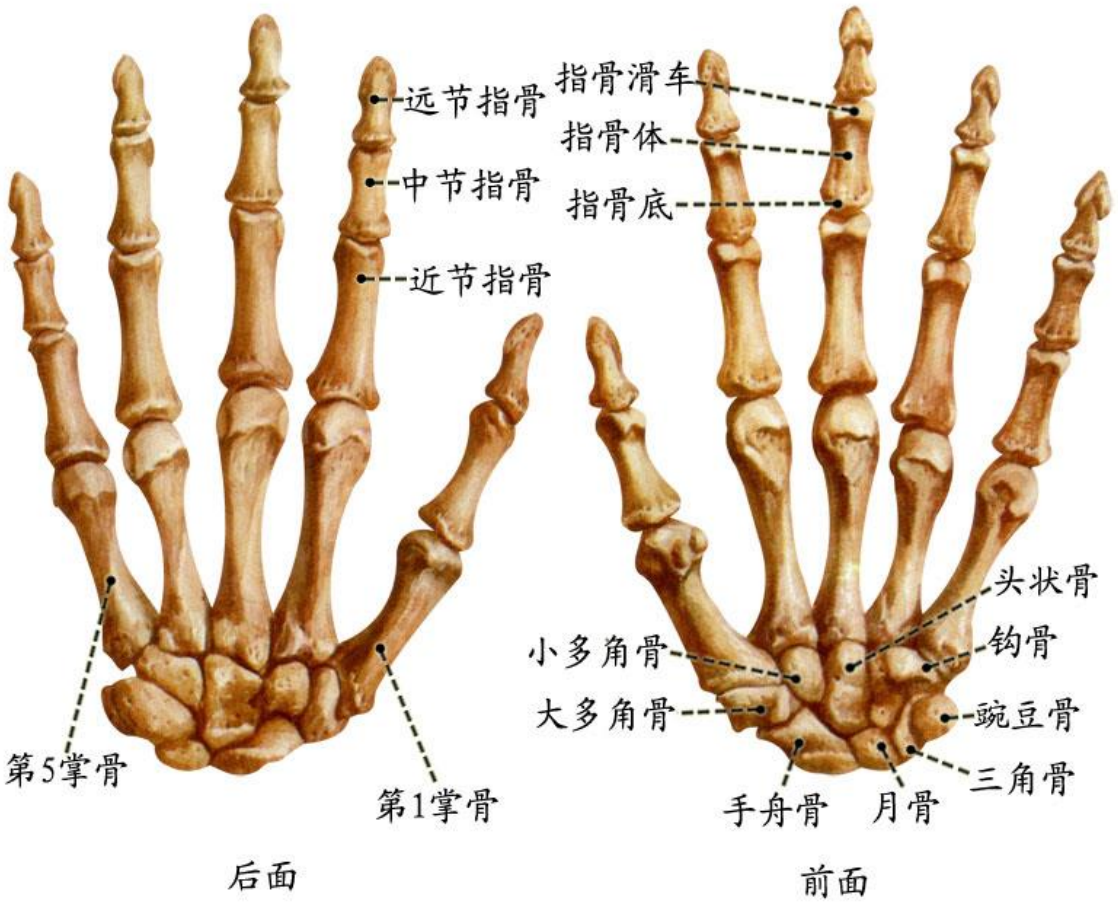
Ulnar tuberosity 尺骨粗隆

Ulnar notch 尺骨切迹

Styloid process 桡骨茎突

Head of ulnar 尺骨头

Hand bone 手骨



5th metacarpal bones 第5掌骨

Proximal phalanx 近节指骨

Middle phalanx 中节指骨

Distal phalanx 远节指骨

Trochear of phalanx 指骨滑车

Body of phalanx 指骨体

Base of phalanx 指骨底

Scaphoid 舟骨

Lunate月骨

Triquetral 三角骨

Pisiform 豌豆骨

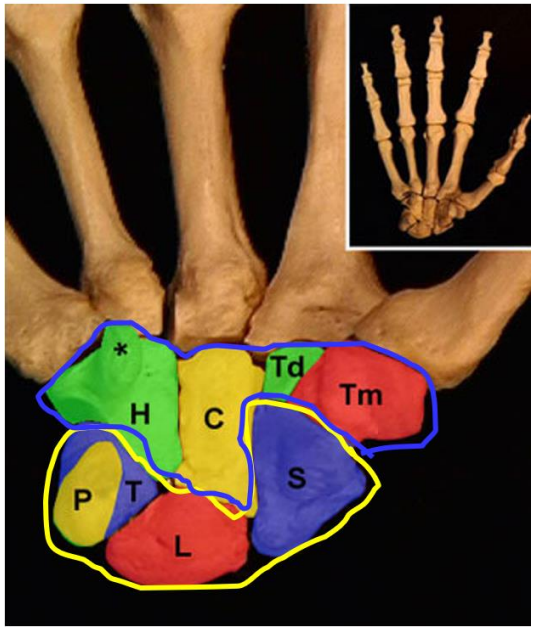
Trapezium 大多角骨

Trapezoid 小多角骨

Capitate 头状骨

Hamate 钩骨

Carpal bones & metacarpal bone 腕骨与掌骨



Proximal row

(from lateral to medial)

S- Scaphoid 舟骨

L- Lunate月骨

T- Triquetral 三角骨

P- Pisiform 豌豆骨

Distal row

(from lateral to medial)

Tm-Trapezium 大多角骨

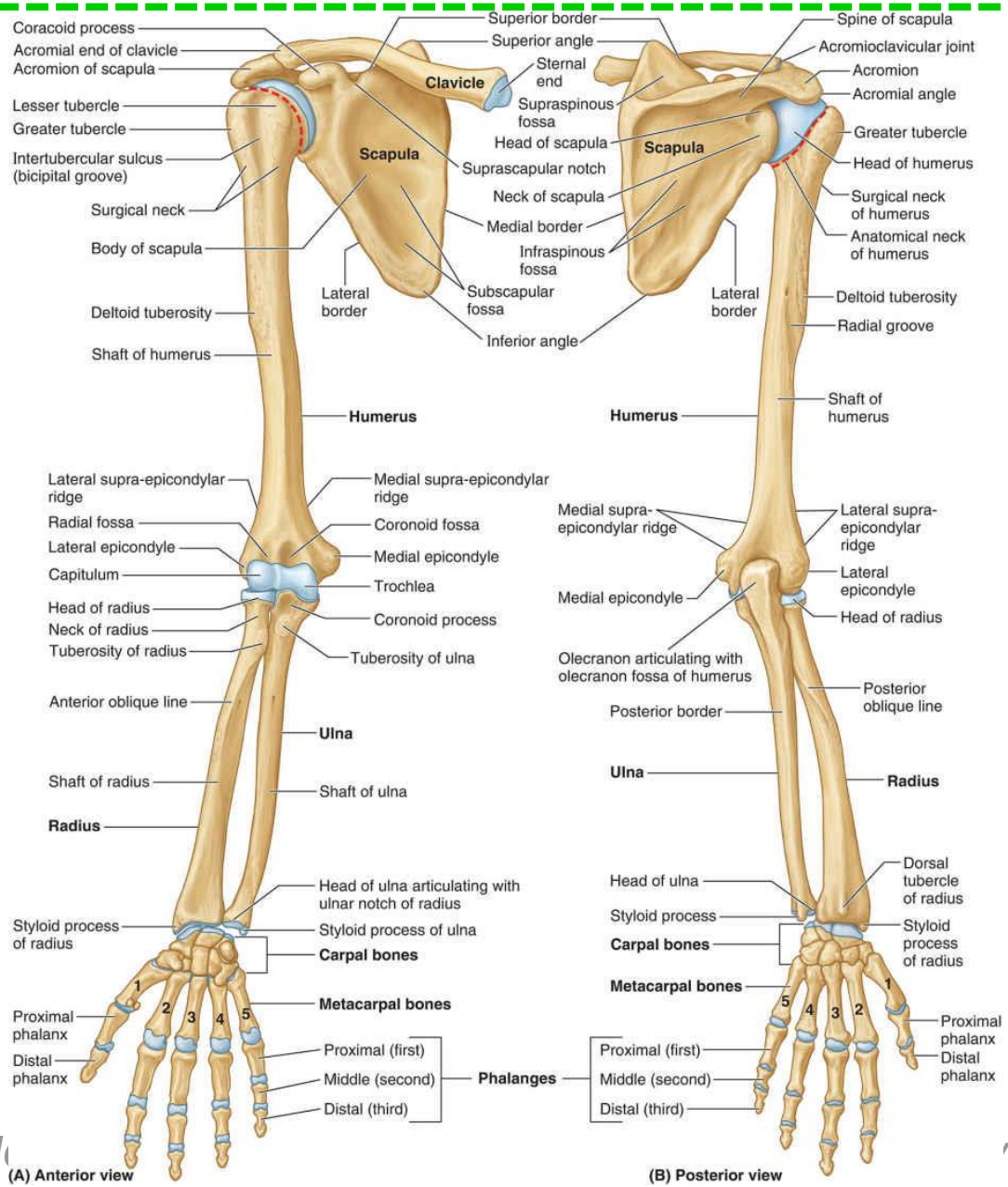
Td- Trapezoid 小多角骨

C- Capitate 头状骨

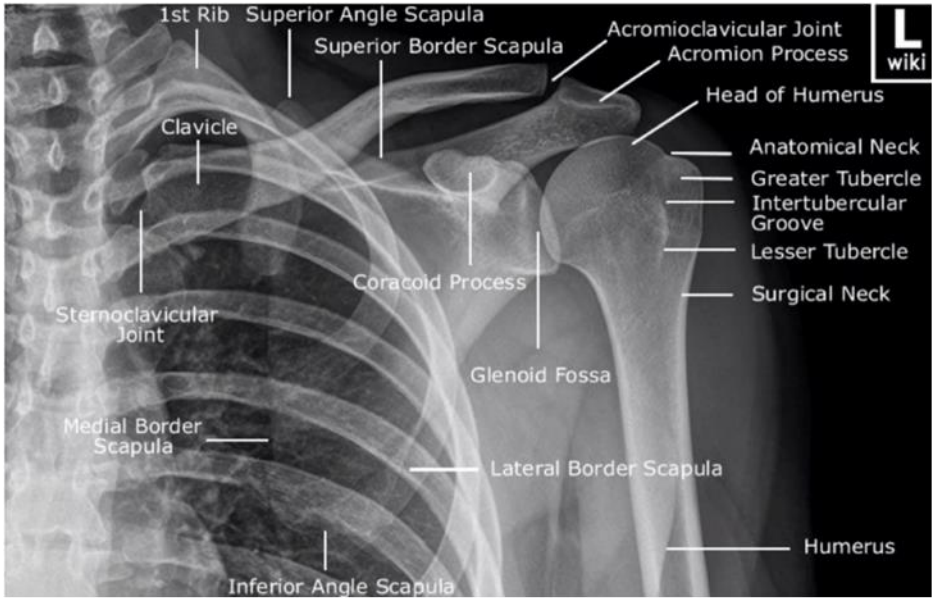
H- Hamate 钩骨

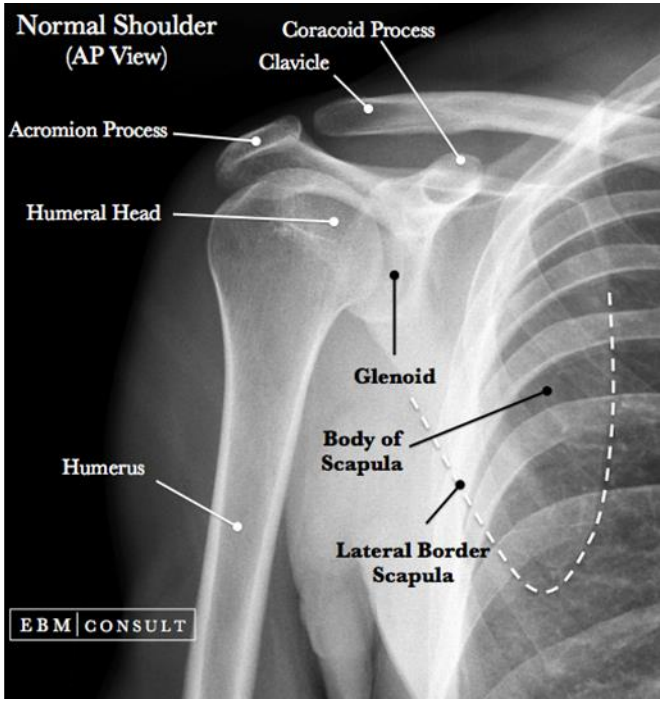
舟月三角豆
大小头状沟

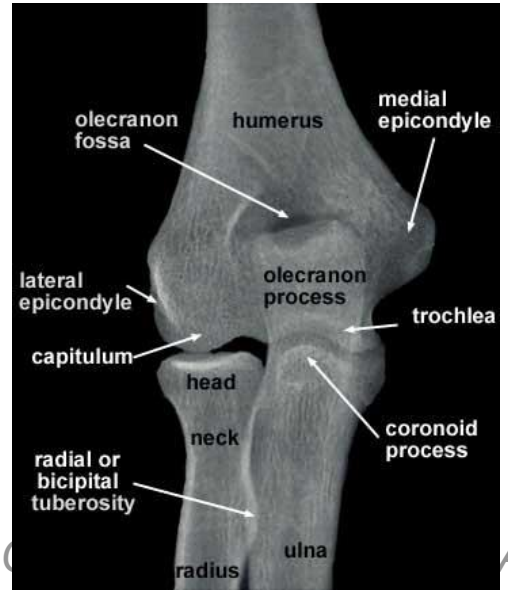
Upper limb bones 上肢骨

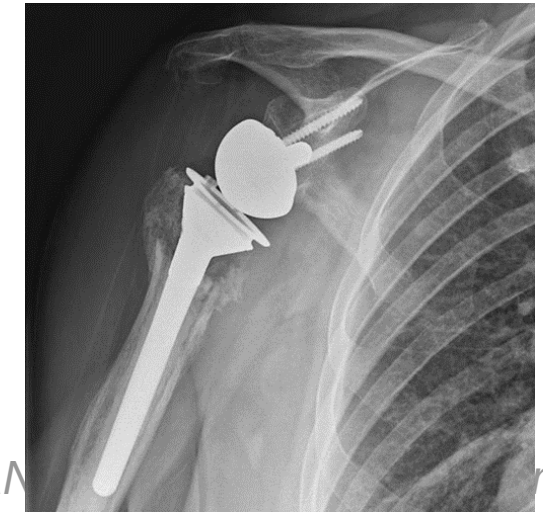


X-ray of upper limb bones









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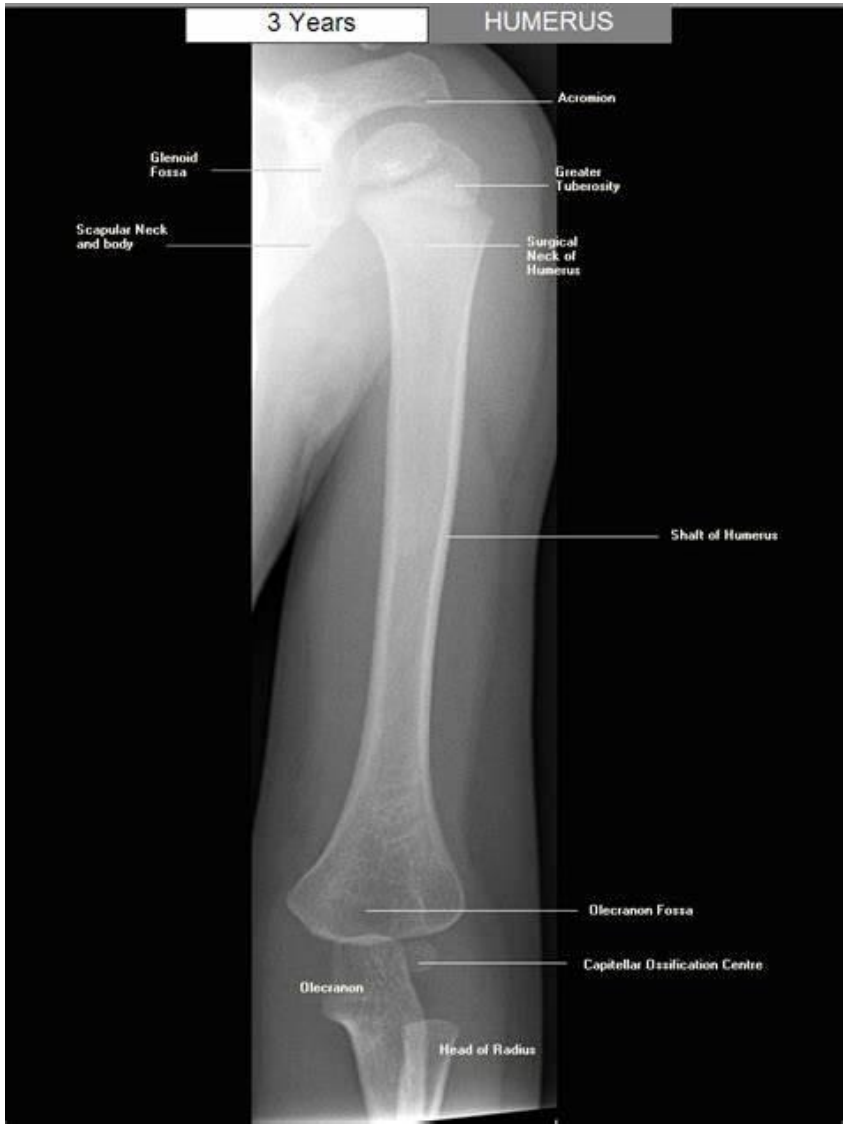

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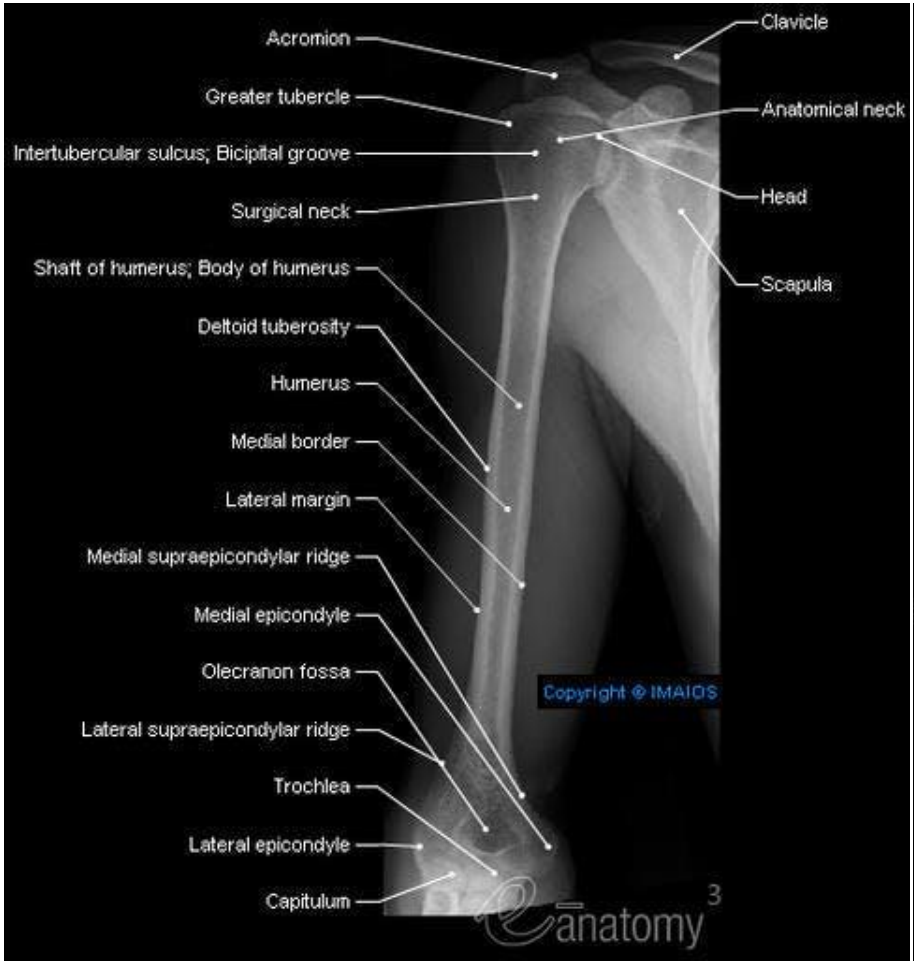
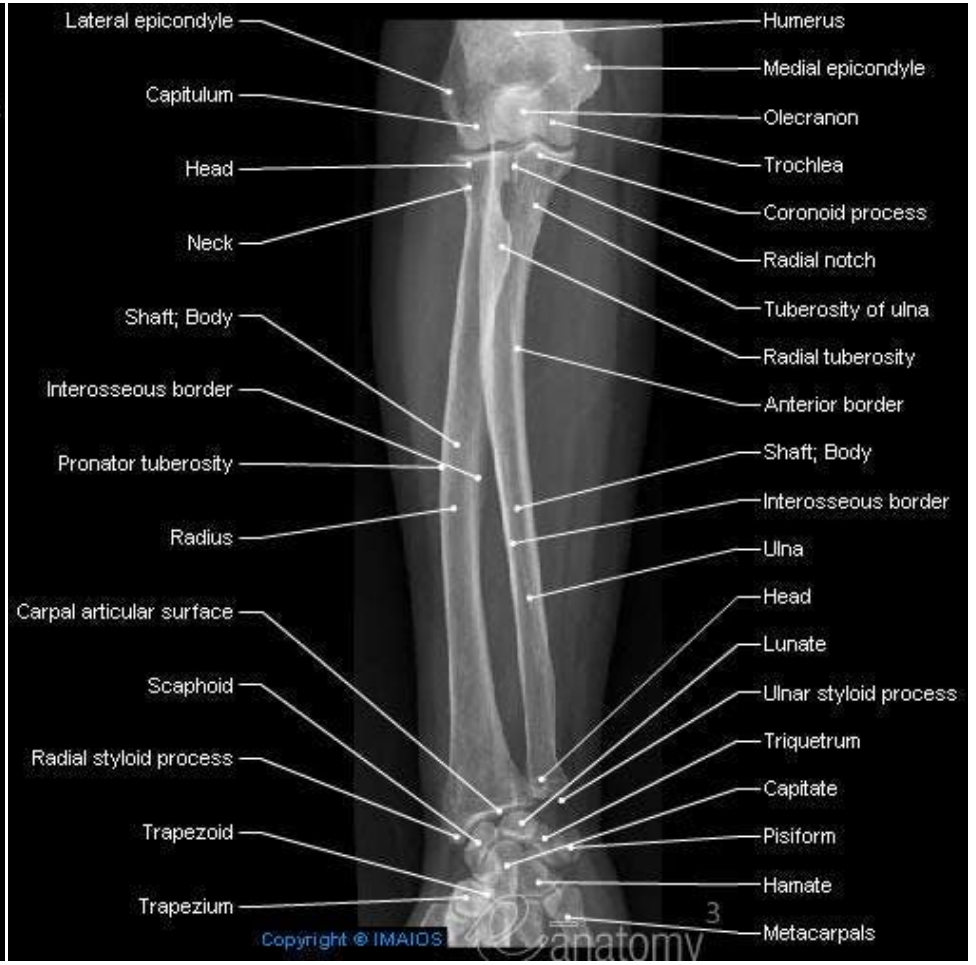
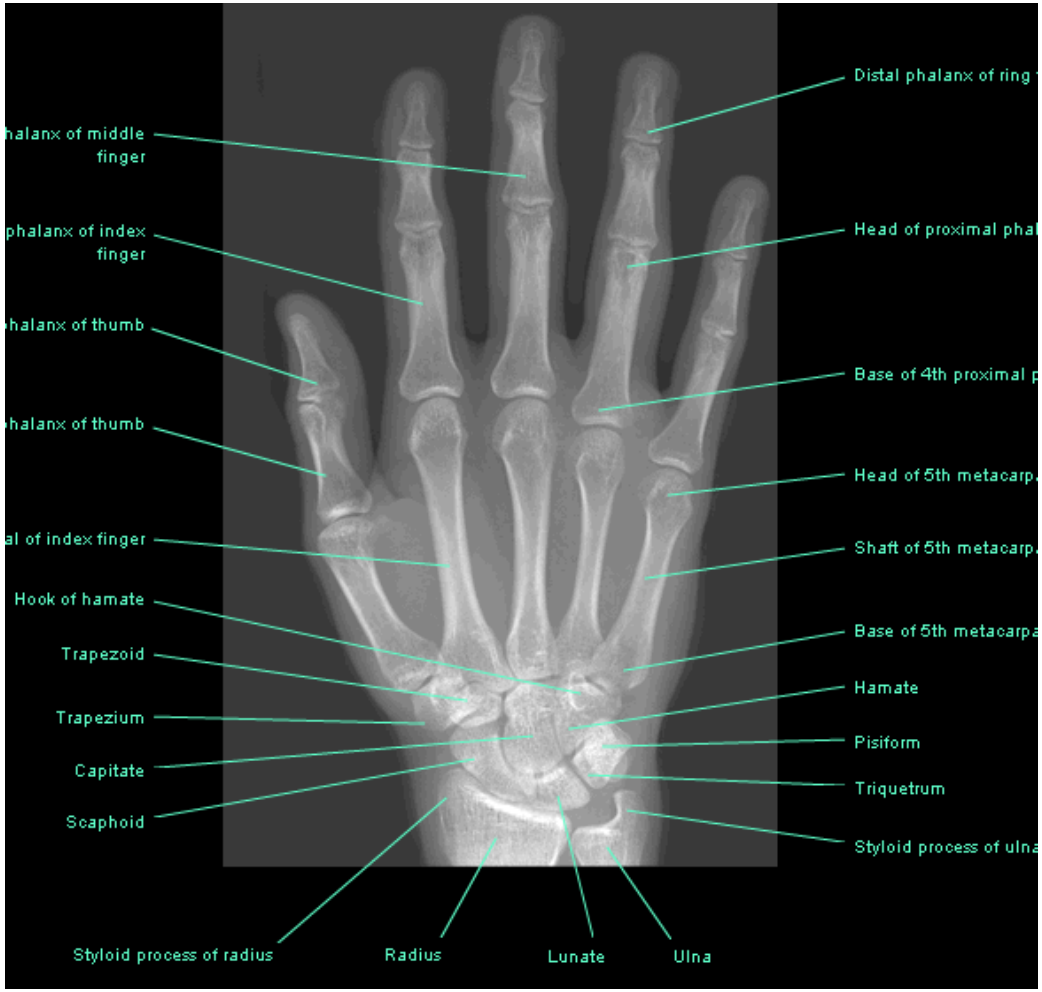




X-ray of hand bones-fracture

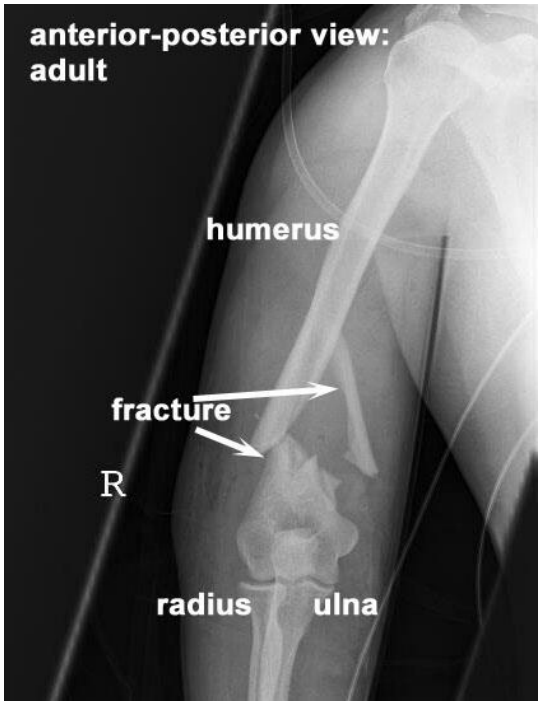


Wrist and hand;
anteroposterior radiograph

Three metacarpal fracture

X-ray of upper limb bones-fracture

Surgical neck fracture



The fracture
of the humerus

The fracture
of ulna & radius

X-ray of upper limb bones

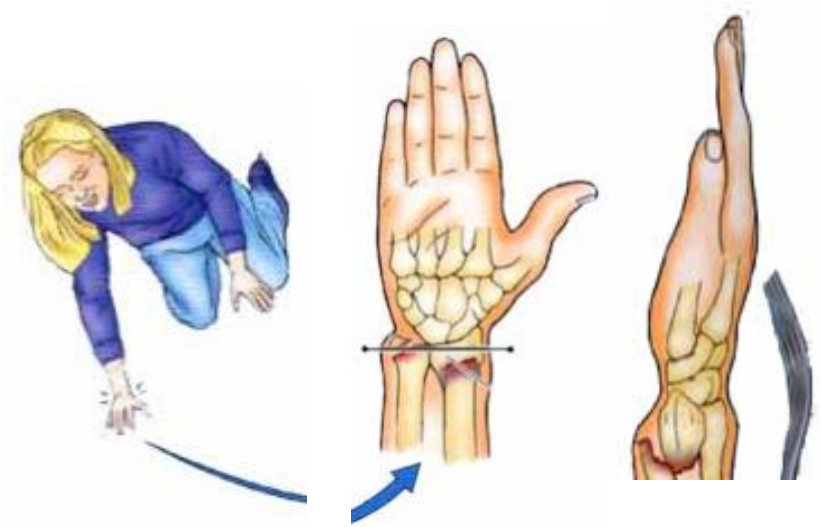
肩关节前后位

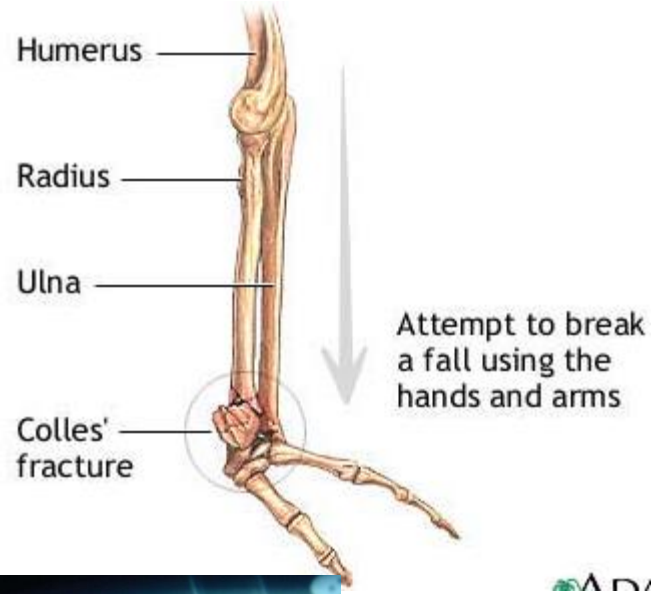
肘关节：正位（左图），侧位（右图）

腕关节侧位

腕关节正位

Fracture of the distal end of the radius





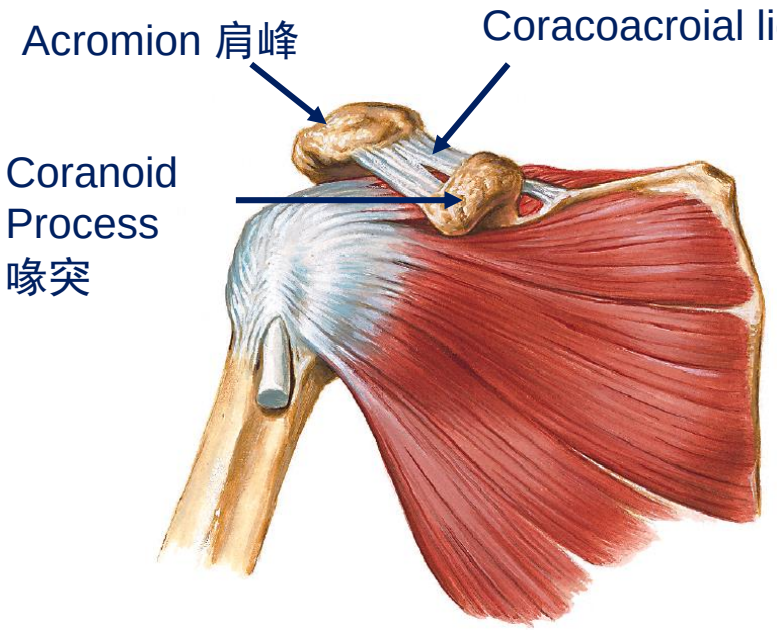
Colles'fracture

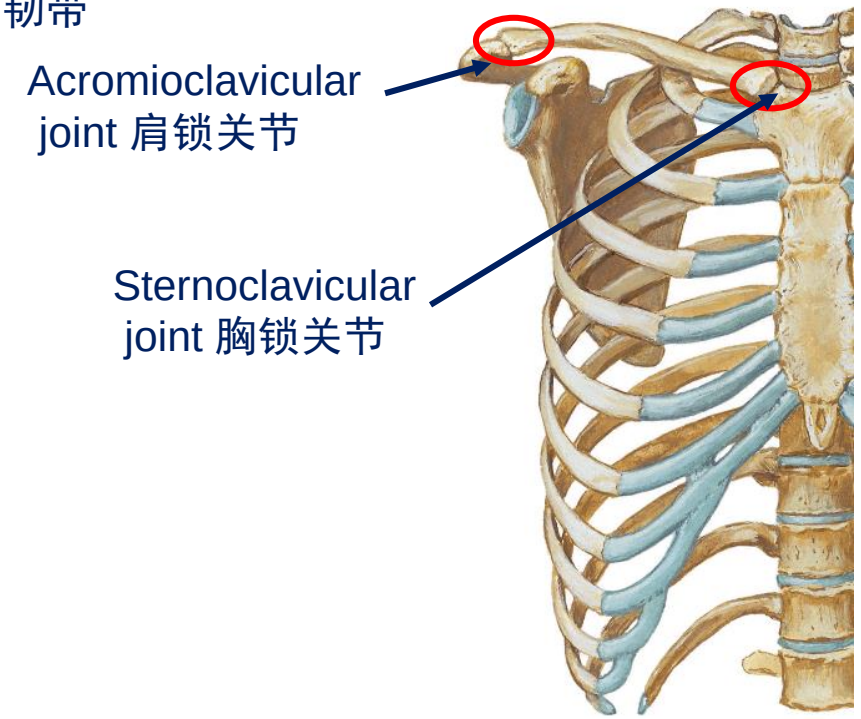
Within 2.5cm distal end of radius

Joints of the upper limb

- Joints of should girdle
- Joints of the free upper limb bone

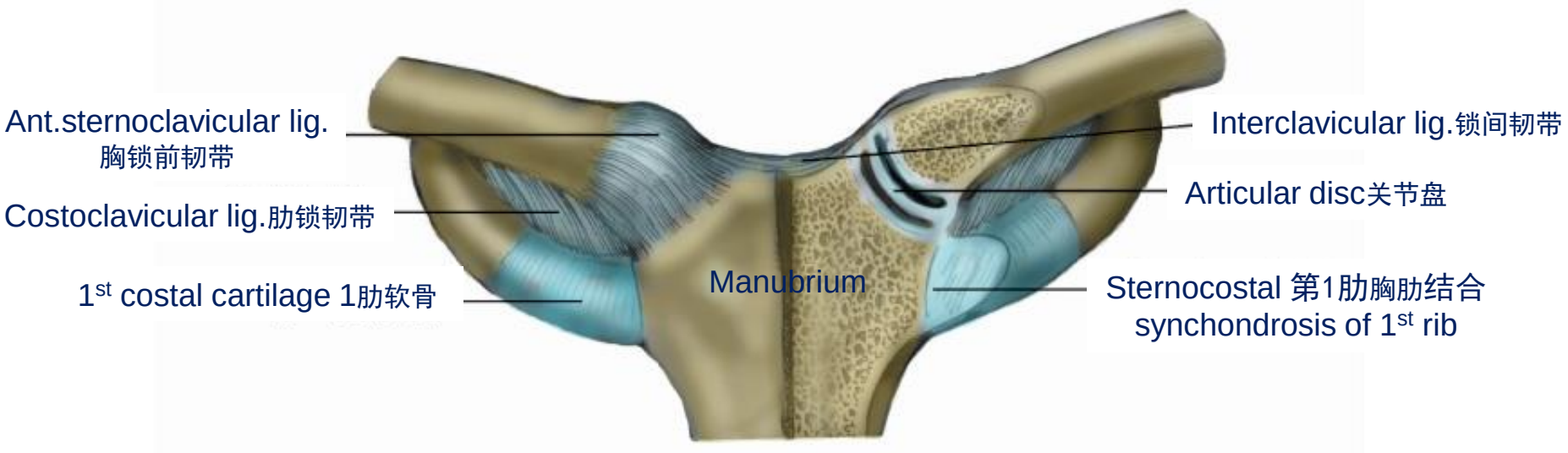
Joints between clavicle and trunk bones





The medial end of the clavicle articulate with the manubrium sterni and it is the only direct connection between the shoulder girdle & axial skeleton.the lateral end articulates with the acromion of the scapula.

Joints between clavicle and trunk bones



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Movements:

Elevation and depression

Forward and backward

Rotation and circumduction

Joints of free upper limb bone

1. The Shoulder joint
2. The Elbow joint
3. The Joint of the ulna & the radius
4. The Wrist joint
5. The Joints of the hand

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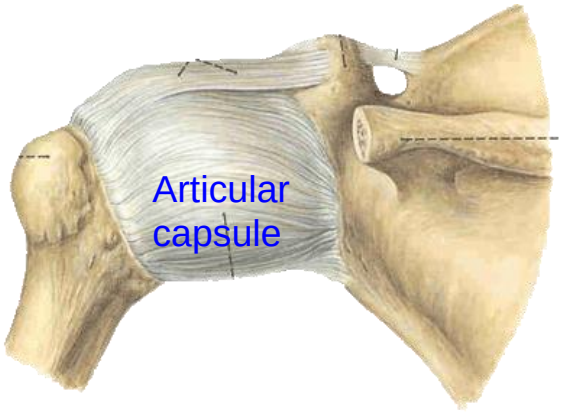
Shoulder joint-one of the most important ones

Classification:

- Ball and socket joint 球窝关节
- Multiaxial synovial joint 多运动轴关节
- The most flexible joint 全身最灵活的关节

Bones:

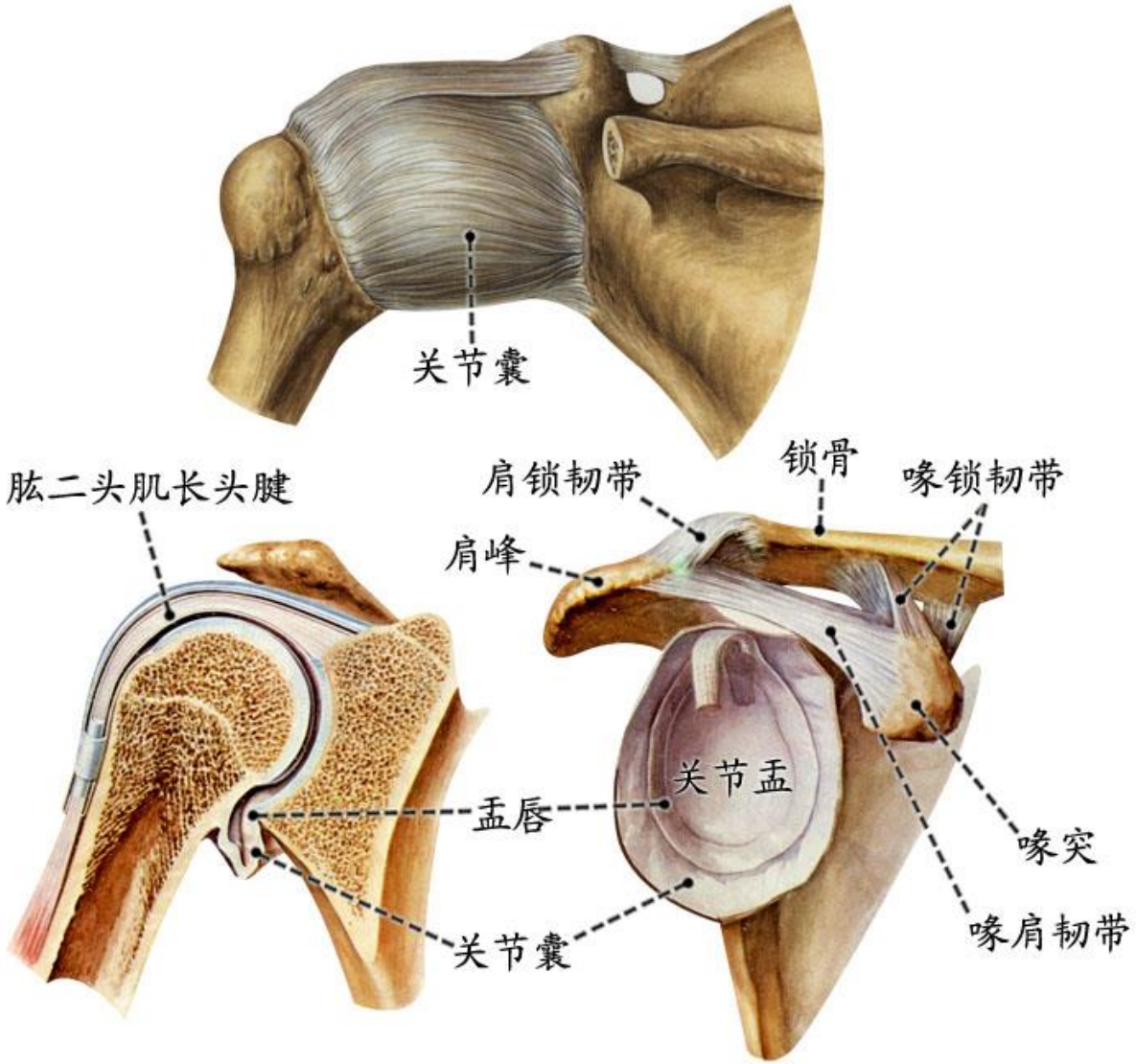
- Head of humerus 肱骨头
- Glenoid cavity of scapula 肩胛骨关节盂



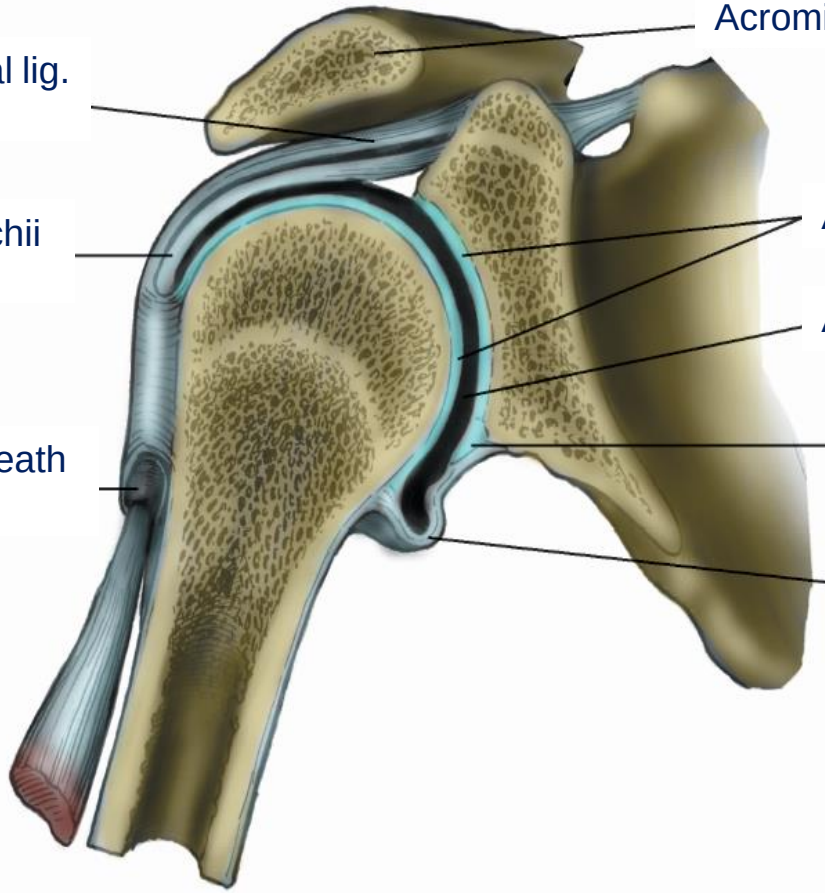
Capsule:

- Thin and lax, especially (ant. lower part)
- Attachments 附着点:
  - Proximal to glenoid labrum 近端至关节唇
  - Distal to anatomical neck 远端至解剖颈
  - Lower wall of capsule is lax 下壁松弛
  - Tendon of long head of biceps brachii 囊内有肱二头肌长头腱

Shoulder joint-one of the most important ones

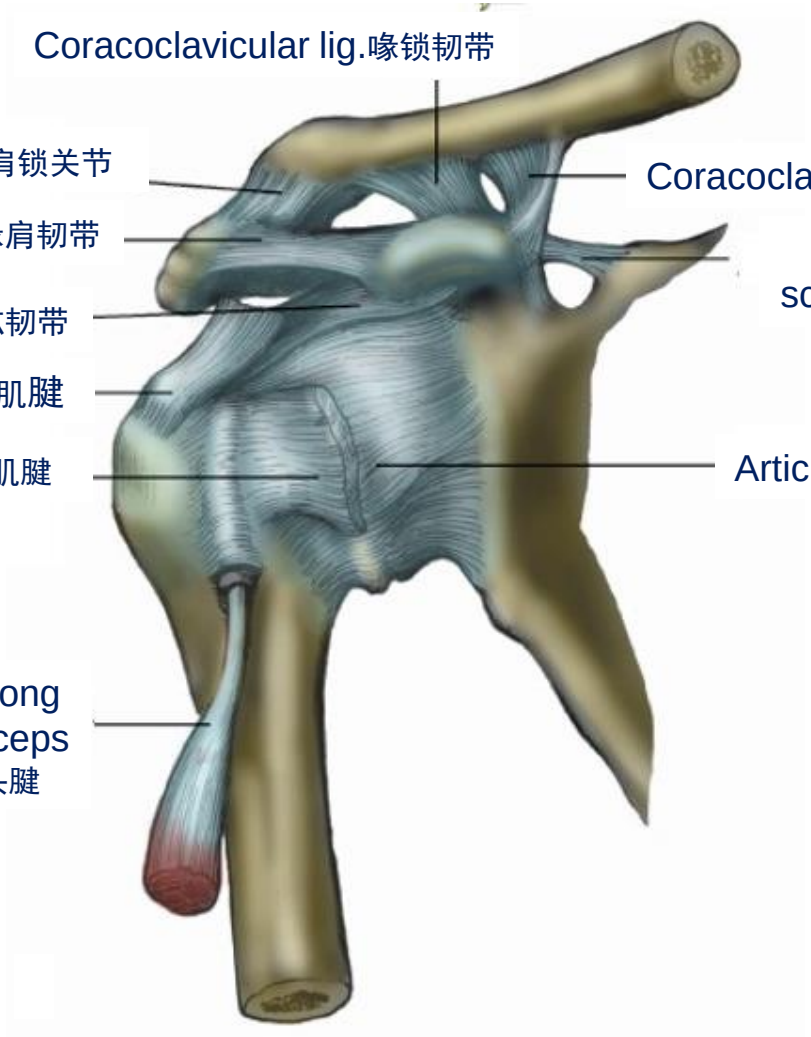


Shoulder joint-one of the most important ones



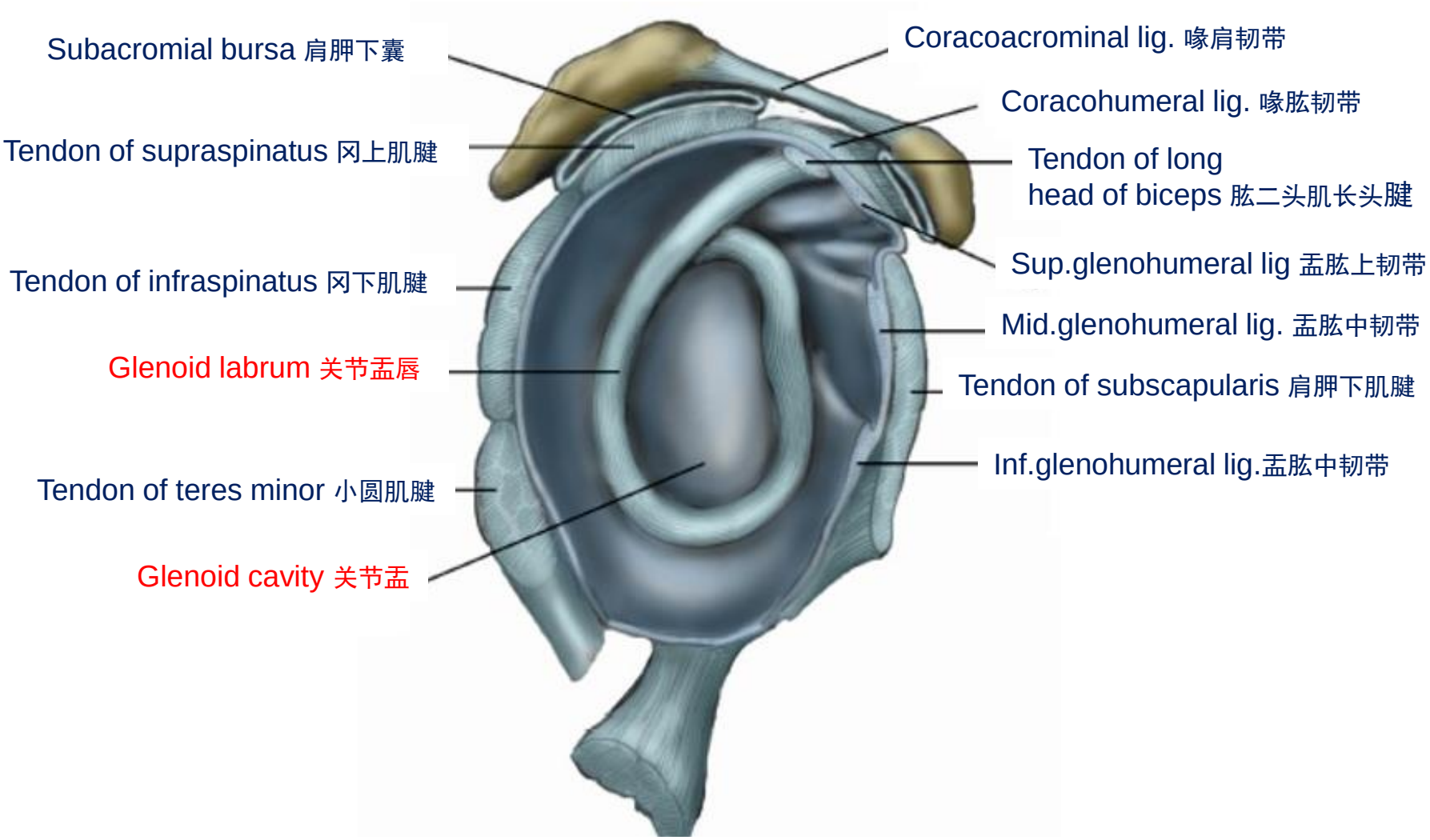
Coronary section of shoulder joint

Shoulder joint-one of the most important ones



Shoulder joint (anterior aspect)

Shoulder joint-one of the most important ones



Structuer of shoulder joint (sagittal section)

Shoulder joint-one of the most important ones

Accessory structures

- Glenoid labrum 关节盂

  Coracohumeral lig.喙肱韧带

Movements:

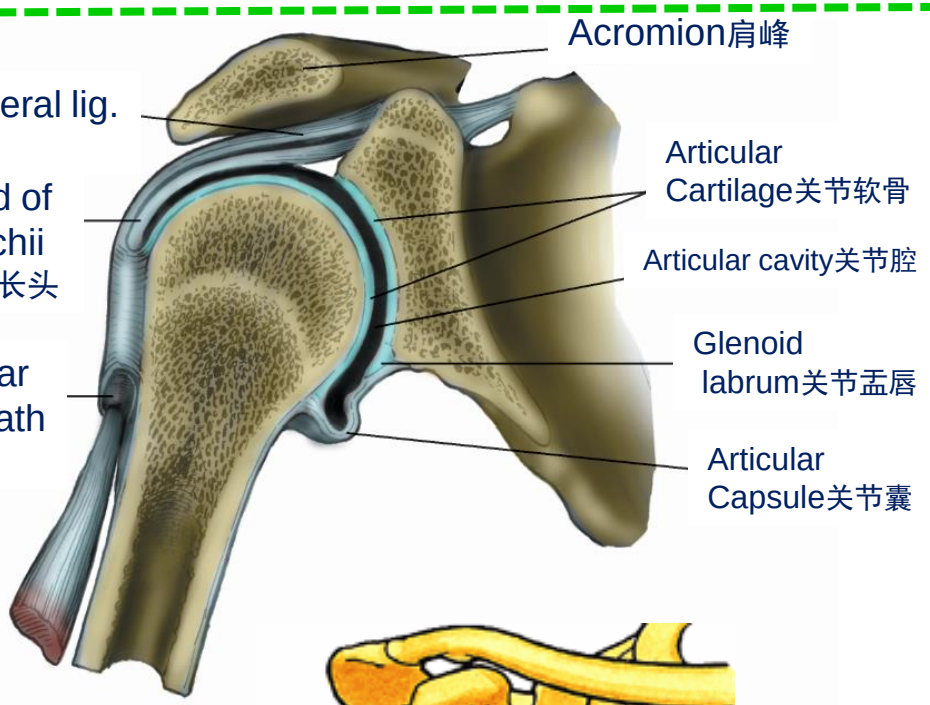
Flexion 屈, extension 伸,

Adduction 收, abduction 展,

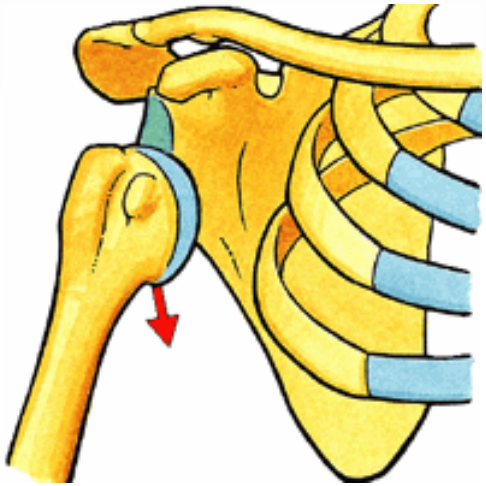
Medial rotation 旋内

Lateral rotation 旋外

Circumduction 环转



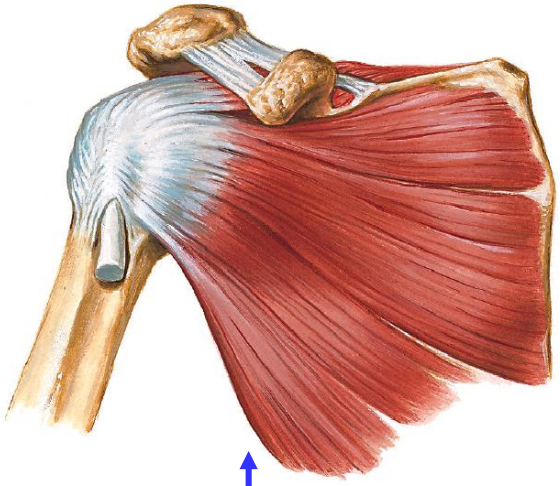
Easy to dislolcate to ant. and inferior direction



Anterior dislocation of right shoulder

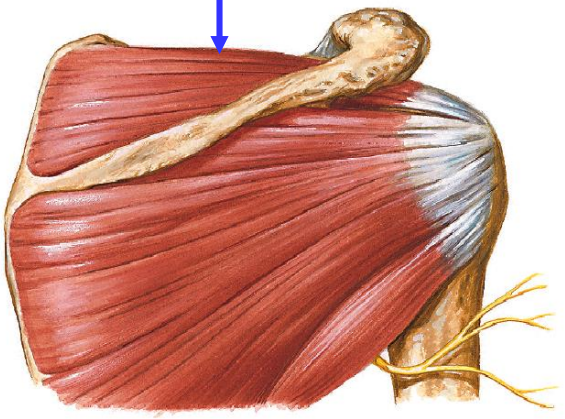
Specimen of shoulder joints

Shoulder joint –rotator cuff



Muscle of rotator cuff
Anterior view

Muscle of rotator cuff
posterior view



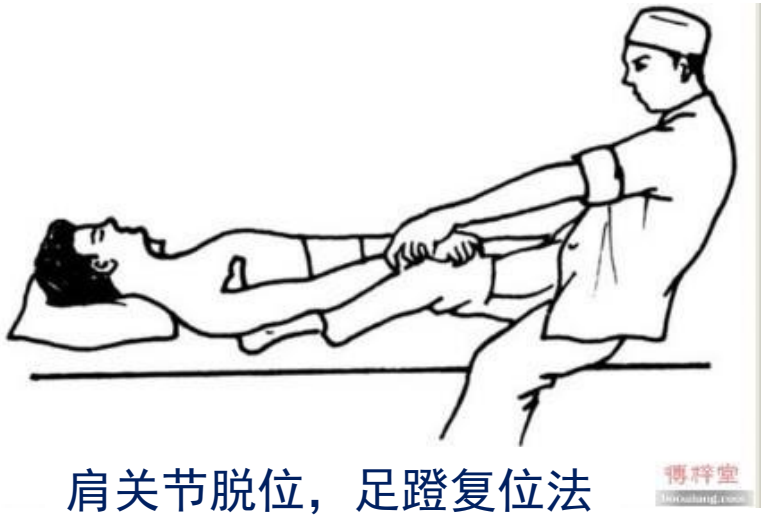
肩胛下肌、冈上肌、冈下肌和小圆肌的肌腱在经过关节囊前面，上面和后面时，与关节囊紧贴，且有许多腱纤维编入关节囊内，形成“肌腱袖” 。对肩关节的稳定起作用。

Dislocation of shoulder joints

肩关节脱位

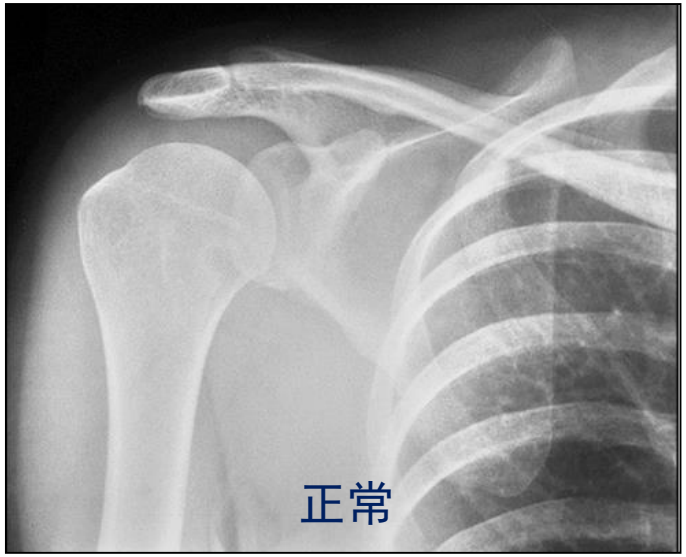
最常见，约占全身关节脱位的50%，这与肩关节的解剖生理特点有关，如肱骨头大，关节盂浅而小，关节囊松弛，其前下方组织薄弱，关节活动范围大，遭受外力的机会多等。肩关节脱位多发生在青壮年、男性较多。

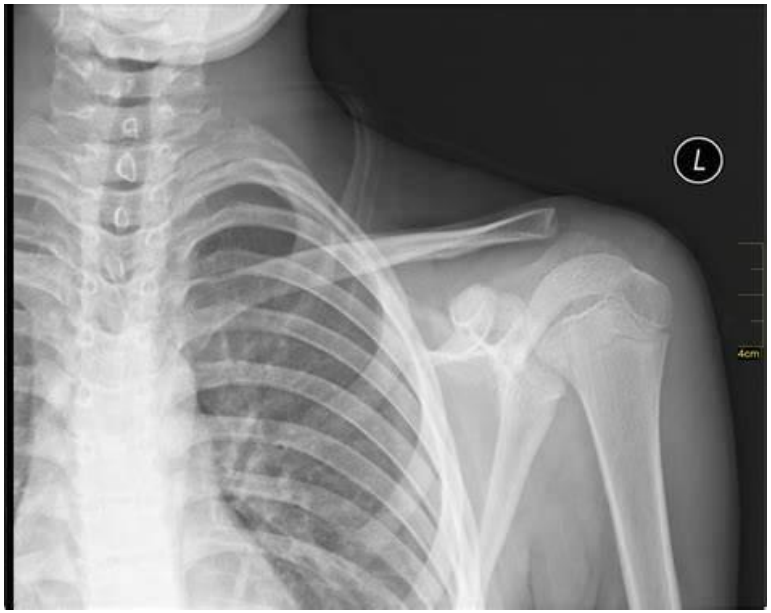
手法复位:脱位后应尽快复位，选择适当麻醉。 足蹬法患者仰卧，术者位于患侧，双手握住患肢腕部，足跟置于患侧腋窝，两手用稳定持续的力量牵引，牵引中足跟向外推挤肱骨头，同时旋转，内收上臂即可复位。复位时可听到响声。

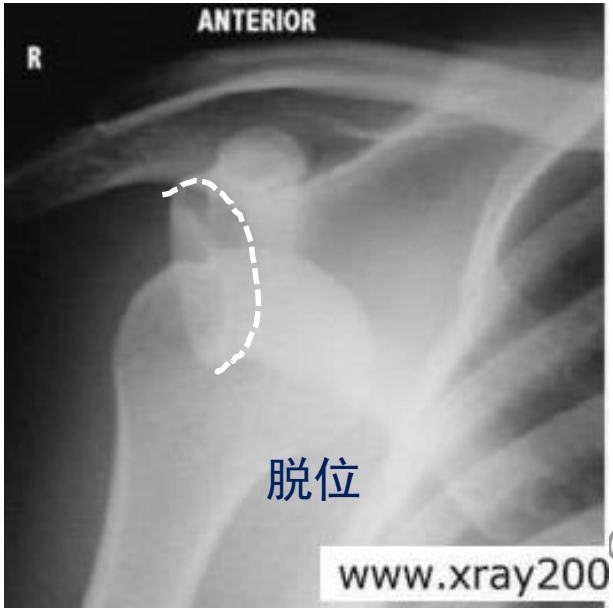


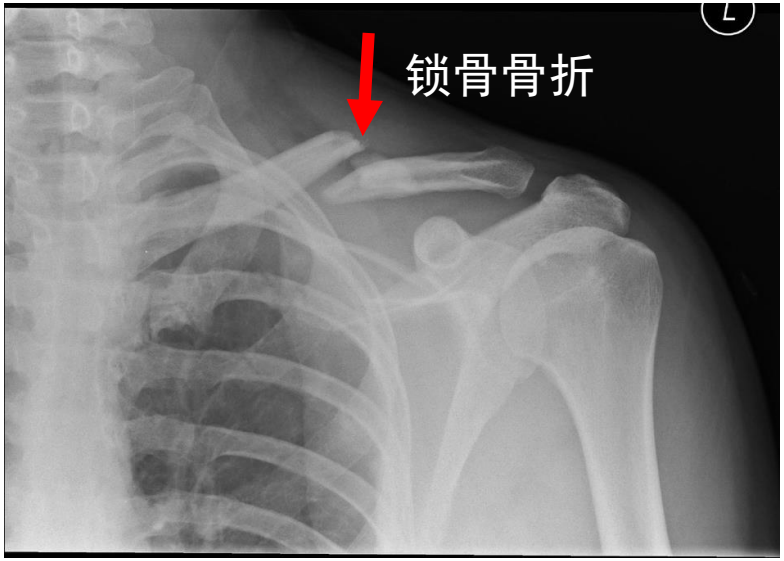
肩关节脱位，足蹬复位法

Upper Limb X-ray









Elbow joint 肘关节

Bones:

lower end of humerus,upper ends of radius and ulna

- Humeroulnar joint 肱尺关节-1

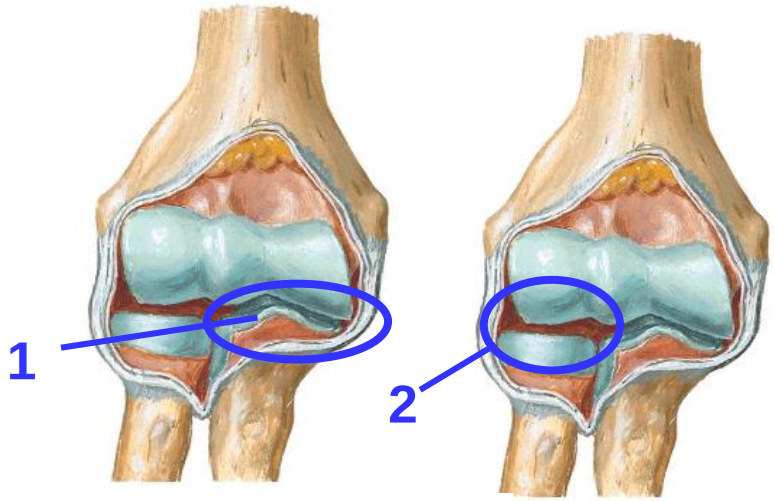
  Formed by trochlear of humerus & troclear notch (hinge)

- Humeroradial joint 肱桡关节-2

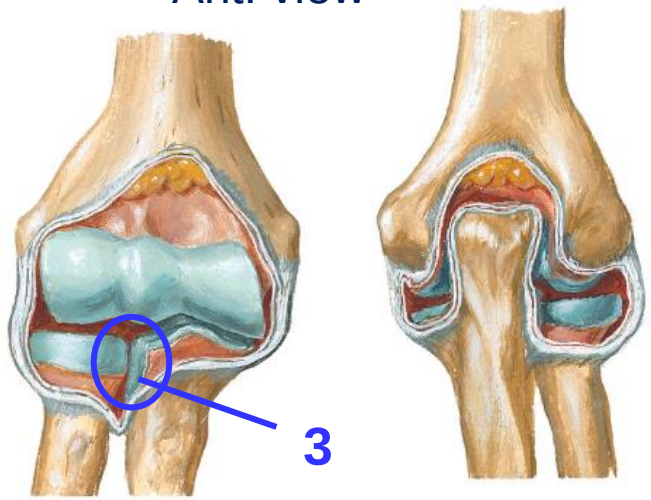
  Formed by capitulum of humerus & head of radius (ball and socket)

- Proximal radioulnar joint 桡尺近侧关节-3

- Formed by articular circumference of radius and radial notch of ulna

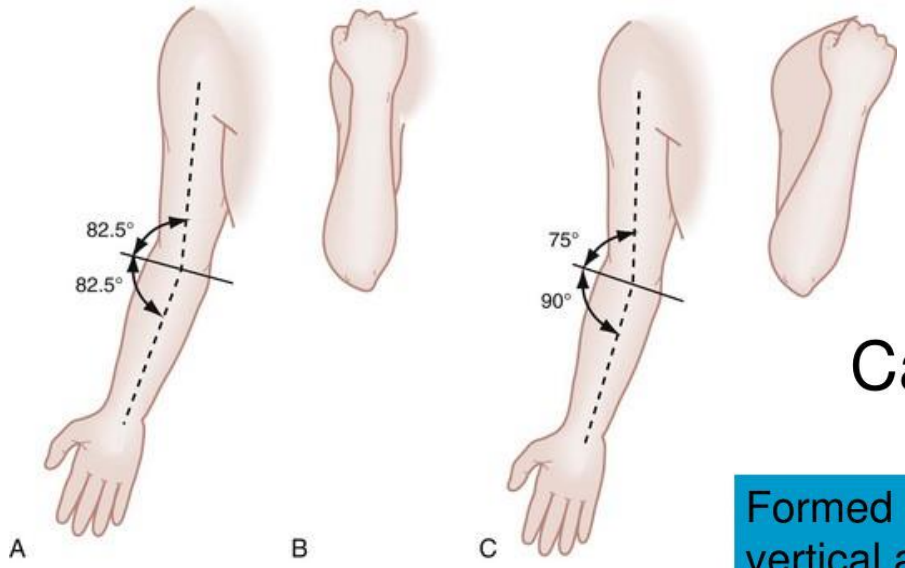


Ant. view



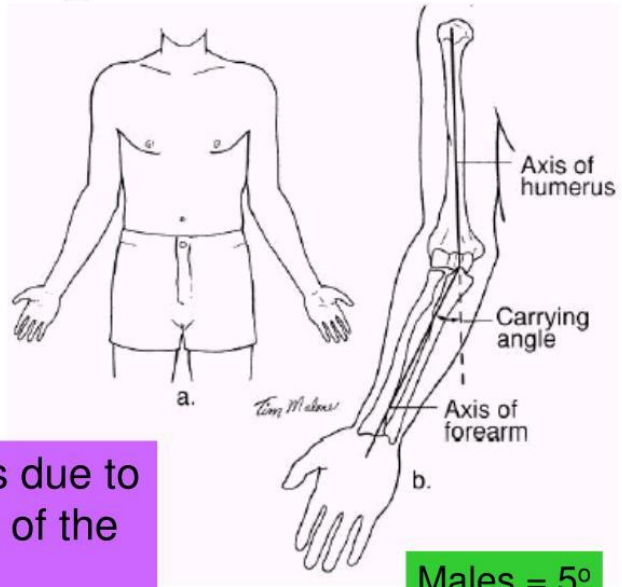
Ant. view Post. view

提携角 Carryng angle



Carrying Angle of the Elbow

Formed by the vertical axis of the humerus and the vertical axis of the forearm

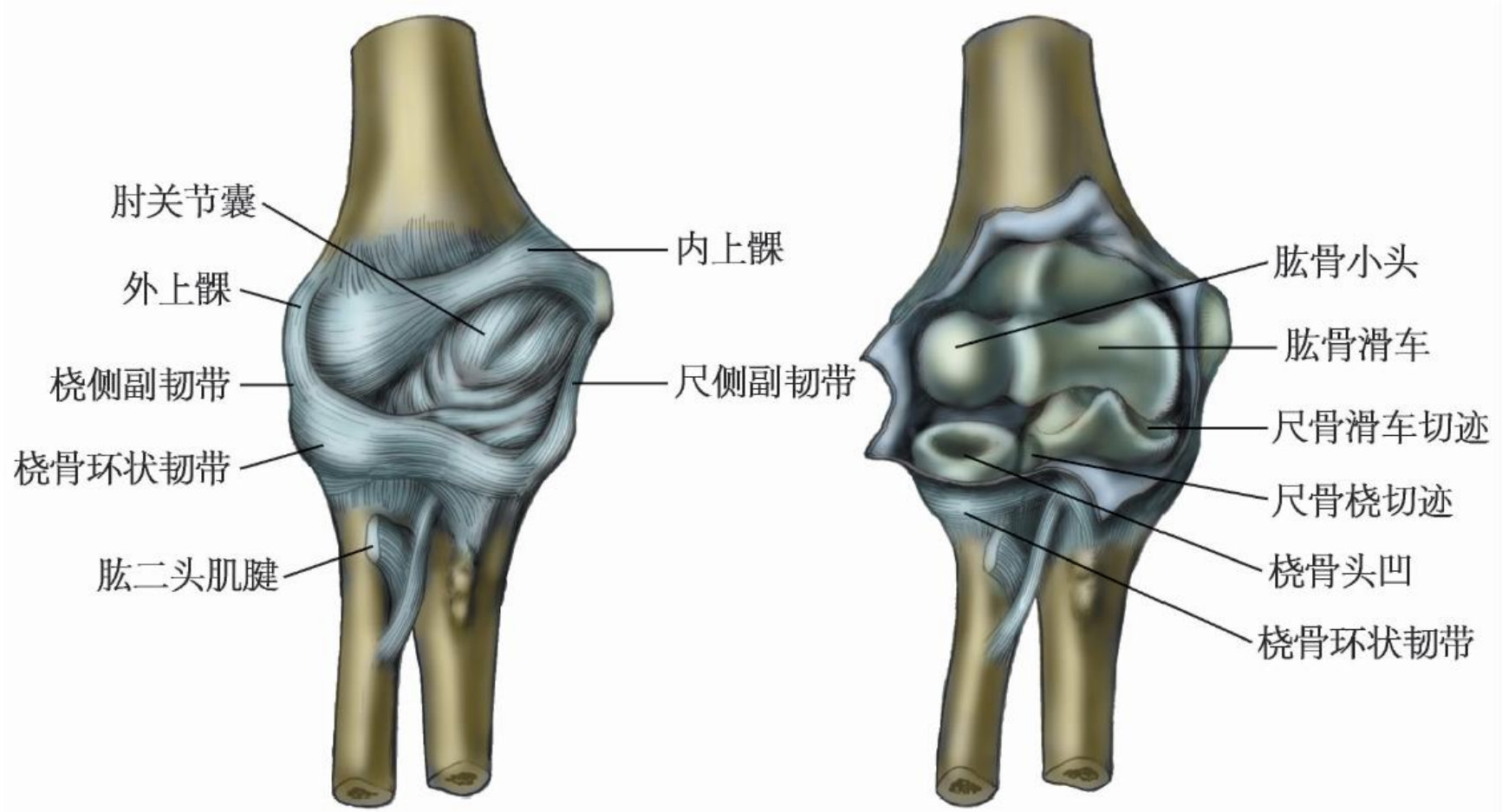


The angulation is due to the configuration of the bony articulating surfaces

Males = 5°

Females = 10° - 15°

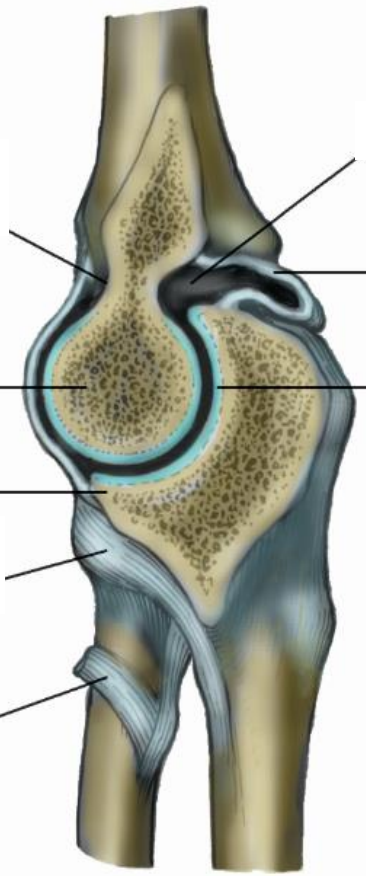
Elbow joint 肘关节



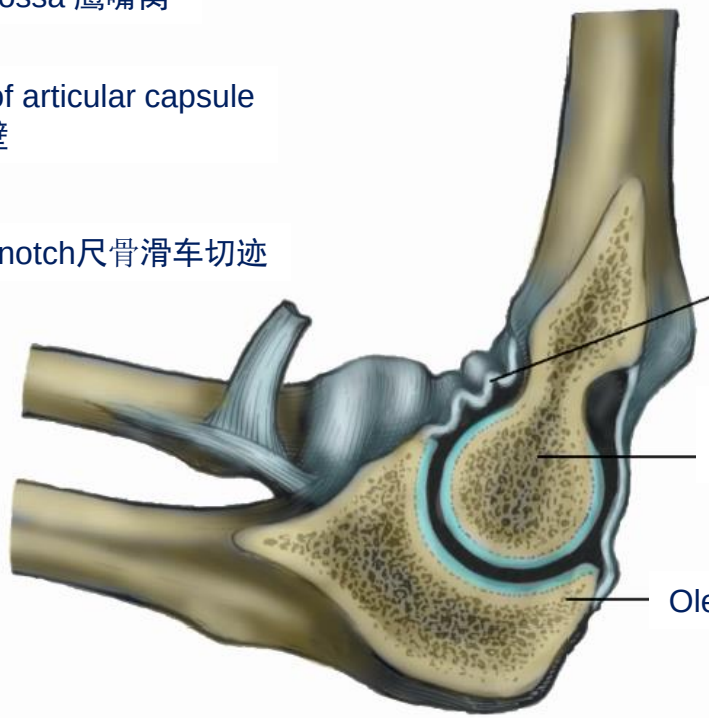
肘关节前面观

Elbow joint 肘关节

关节囊后壁最薄弱，常见尺骨桡骨向后脱位，移向肱骨的后上方。



Elbow in extension
肘关节伸



Elbow in flection
肘关节屈

Elbow joint 肘关节

Capsule: thin and lax

Ligaments

Radial collateral lig. 桡侧副韧带-**1**.

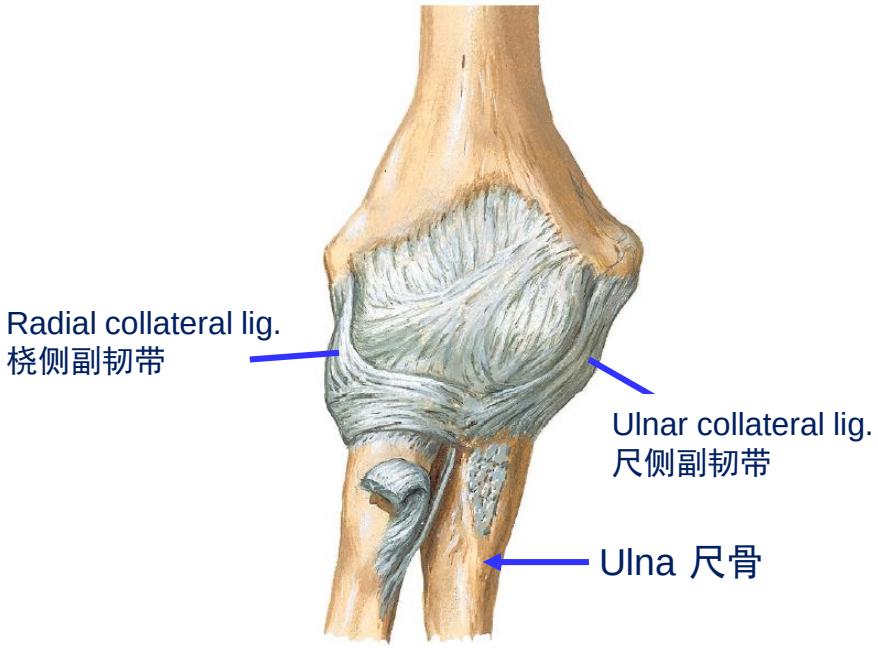
Attached to lateral epicondyle & annular ligament of radius

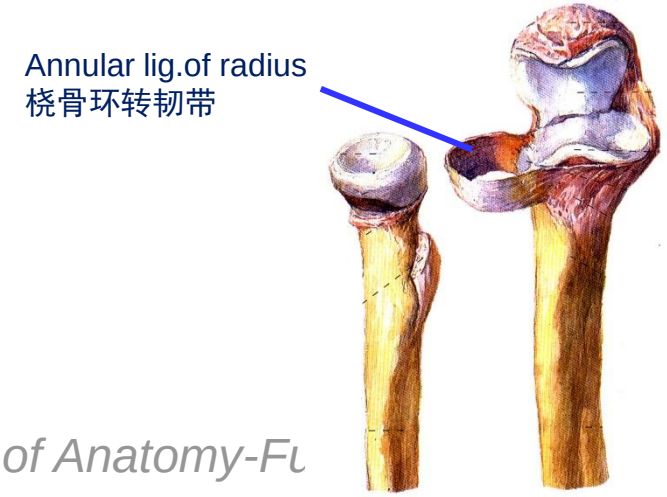
Ulnar collateral lig. 尺侧副韧带-**2**.

Attached to medial epicondyle to medial border of trochlear notch

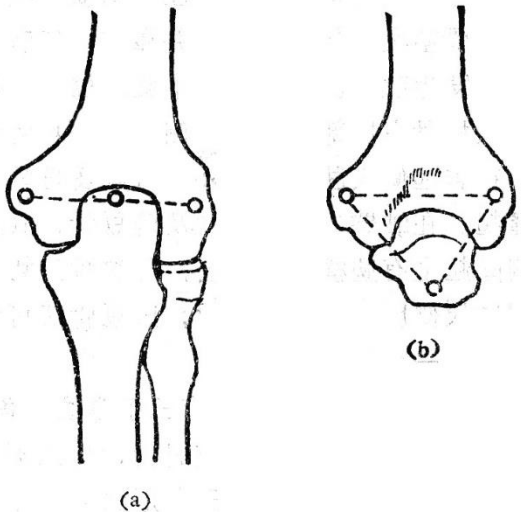
Annular lig.of radius桡骨环转韧带-**3**

Attached to ant. & post. margins of radial notch of ulna, surrounds the head of radius

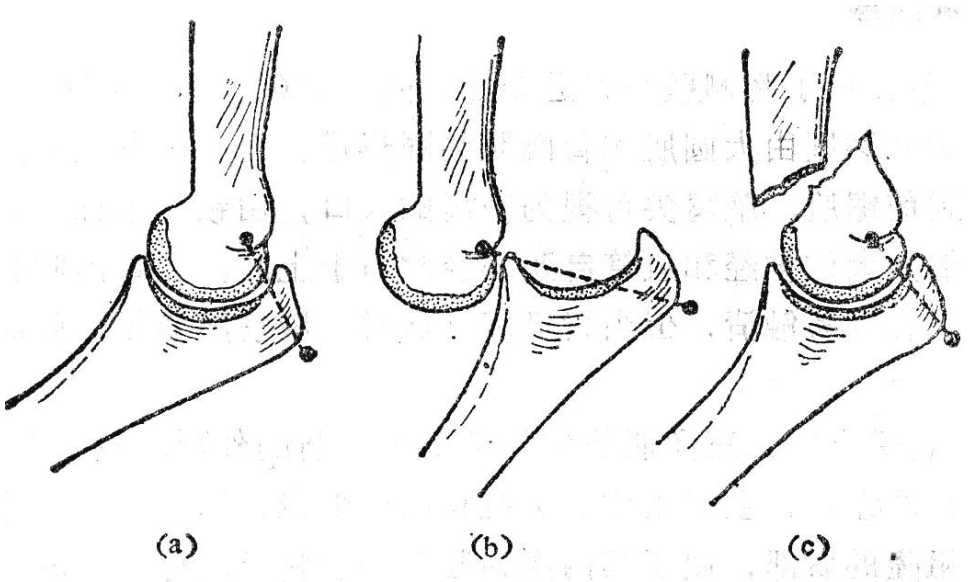




Elbow Joint & the clinic

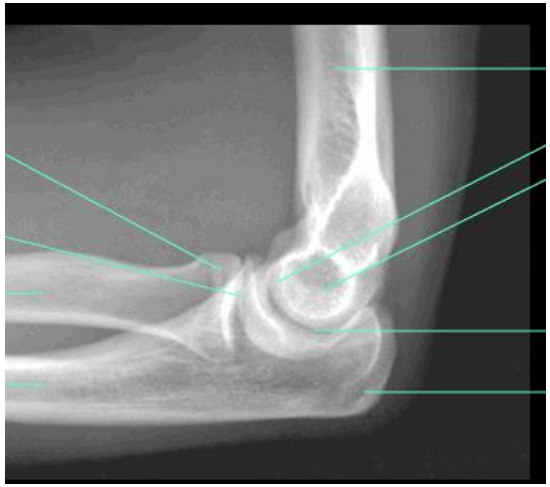


The relationship between olecranon of ulna and medial and lateral epicondyles of humerus:
(a): When to extend the elbow joint, three points in a line
(b). When to flex the elbow joint, three points form an isosceles triangle.



The relationship between olecranon of ulna and medial and lateral epicondyles of humerus:
(a) Normal
(b) while the elbow joint dislocation, this relationship changes.
(c) When humeral supracondylar fracture occurs, the relationship remains unchanged.

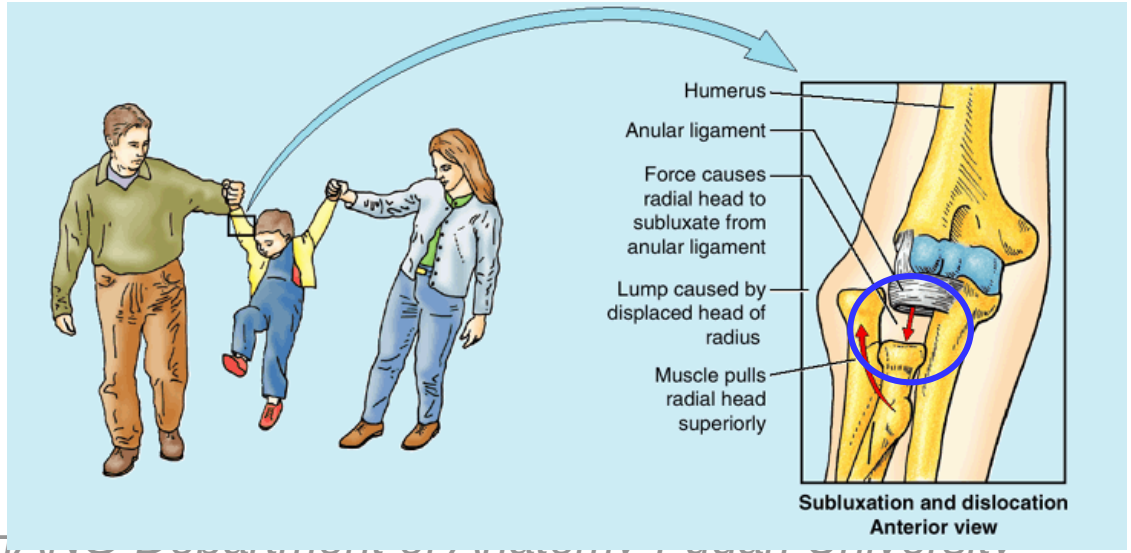
Elbow joint 肘关节



Elbow:lateral radiograph

Elbow:anteroposterior radiograph

Subluxation of radius capitulum 桡骨小头半脱位



Subluxation of radius capitulum 桡骨小头半脱位

桡骨小头半脱位 Subluxation of radius capitulum

1671年由Fournier首先描述。桡骨小头半脱位又称达拉肘，是婴幼儿常见的肘部损伤之一。发病年龄1～4岁，其中2～3岁发病率最高，占62. 5%。男孩多见，左侧多见。当肘关节伸直，前臂旋前位忽然受到纵向牵拉时容易引起桡骨小头半脱位，有时幼儿翻身时上臂被压在躯干下导致受伤引起脱位。常见的是大人领小儿上台阶、牵拉胳膊时出现。

本病治疗主要是手法复位，不用牵引，不恰当的牵引反而容易使复位失败。复位时不用麻醉，将肘关节从伸到屈的过程中旋转前臂，复位成功时可感觉到肱骨桡关节处的弹跳感。复位后肘部及前臂可活动自如，前臂上举无任何障碍，复位后用三角巾悬吊1周，无需石膏固定。

Joints between radius and ulna

Proximal radioulnar joint 桡尺近侧关节

Distal radioulnar joint 桡尺远侧关节

Formed by head of ulna,

Ulnar notch of radius

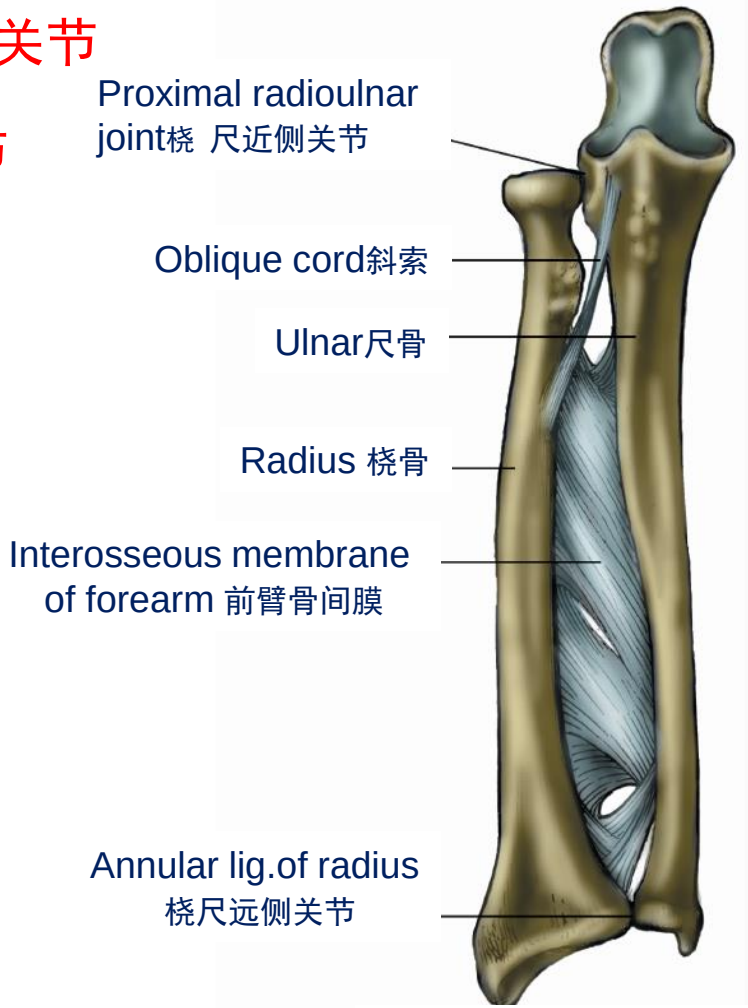
and an articular disc

Interosseous membrane

of forearm 前臂骨间膜

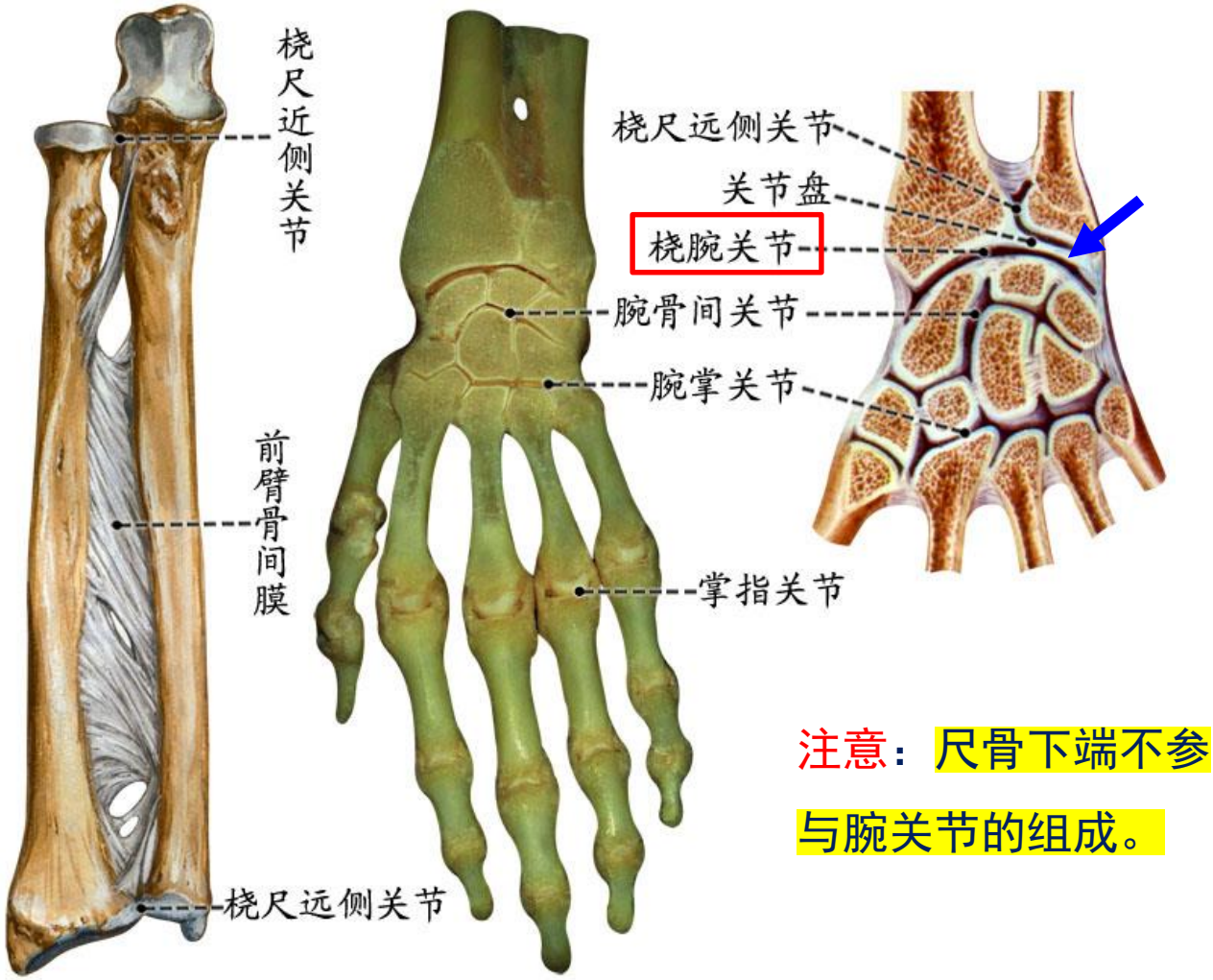
A fibrous membrane between

the shaft of radius and ulna



Ant.view of forearm

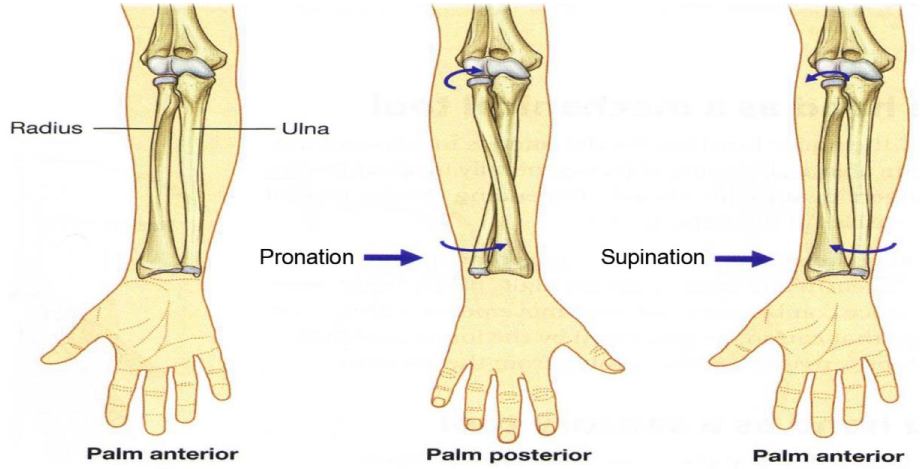
Articulation between radius and ulna

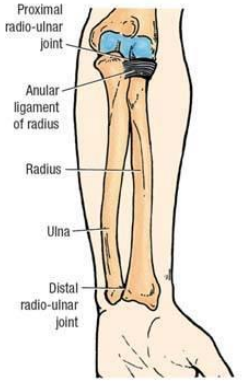


注意：尺骨下端不参与腕关节的组成。

Copy

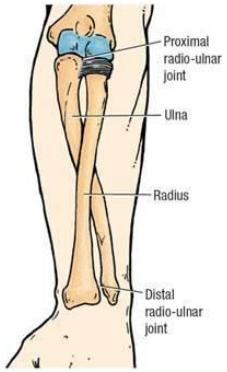
The movement of the forearm bones





A. Anterior View, Supination

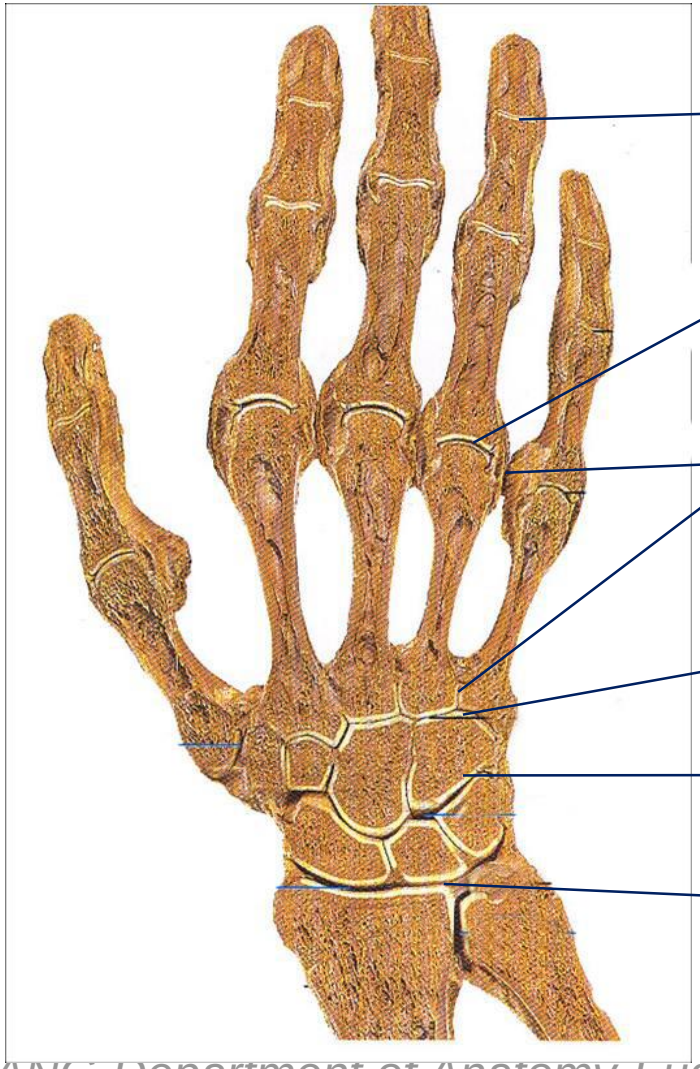
B. Anterior View, Pronation



Ant.view supination

Ant.view pronation

Joint of the hand



Interphalangeal joint
指骨间关节

Matacarpophalangeal joint
掌指关节

Intermetacarpal joint
掌骨间关节

Carpometacarpal joint
腕掌关节

Intercarpal joint
腕骨间关节

Radiocarpal joint
桡腕关节

Joints of hand

Radiocarpal joint (ellipsoid)

Bones

Carpal articular surface of radius & articular disc below the ulna

Proximal row of carpal:

Scaphoid,lunate,triquetral bones,but not pisiform

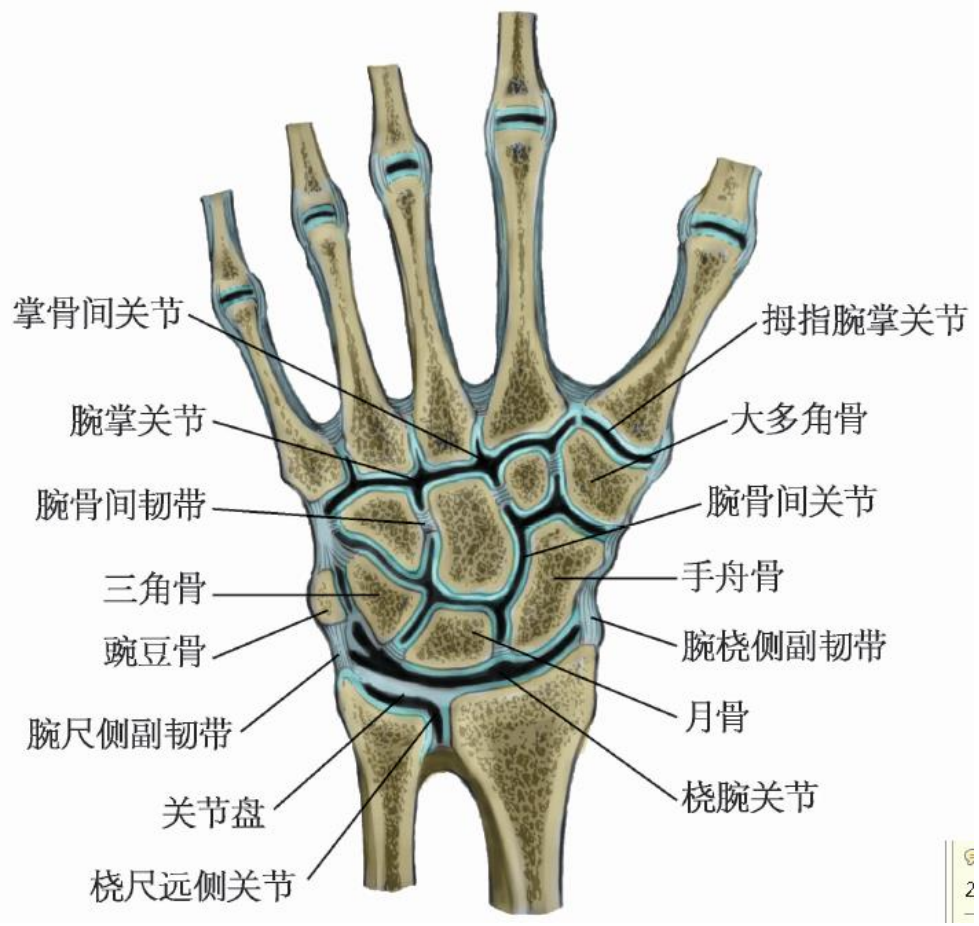
Capsule: Lax & strengthened by surrounding lig.

Movements:

Flexion & extension 屈和伸

Adduction & abduction 收和展

Circumduction 环转



Ligaments of wrist
coronal section-dorsal view

Joints of the hand

Intercarpal joints

Carpometacarpal joints:

★ Carpometacarpal joint of thumb Bones:
trapezium and base of first metacarpal

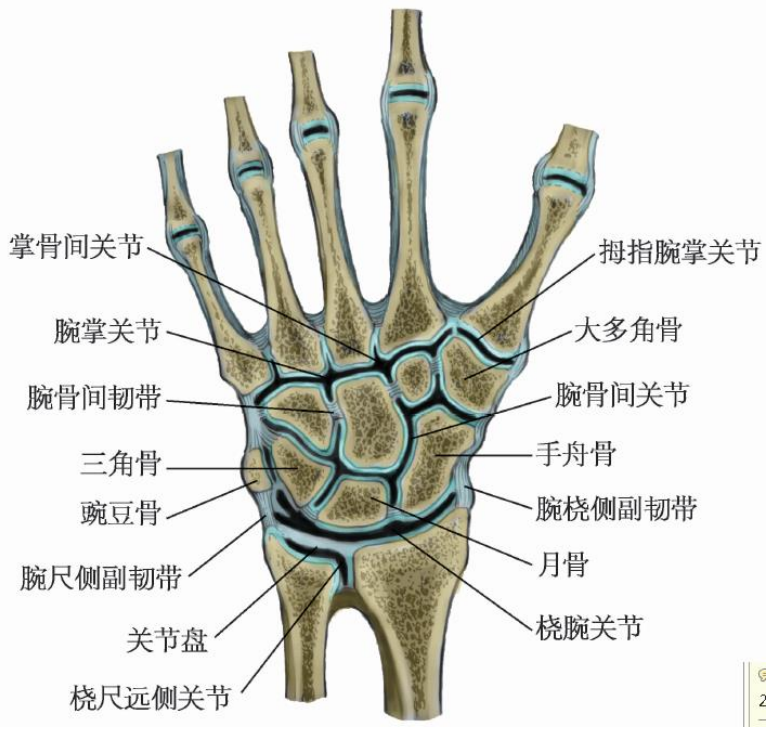
Movement:

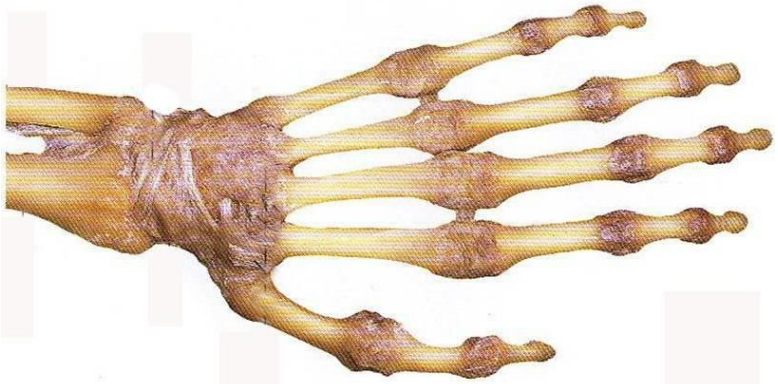
Flexion & extension,
Adduction & abduction
and opposition

Intermetacarpal joints

Metacarpophalangeal joints

Interphalangeal joints





Gout 痛风

Gout is a medical condition usually characterized by recurrent attacks of acute inflammatory arthritis—a red, tender, hot, swollen joint. The metatarsal-phalangeal joint at the base of the big toe is the most commonly affected (approximately 50% of cases). However, it may also present as tophi, kidney stones, or urate nephropathy. It is caused by elevated levels of uric acid in the blood which crystallizes and the crystals are deposited in joints, tendons, and surrounding tissues.

The deposits on the fingers are called tophi, and are a deposit of monosodium urate crystals in people with longstanding high levels of uric acid in the blood. Tophi are pathognomonic for the disease gout. Most people with tophi have had previous attacks of acute arthritis, eventually leading to the formation of tophi.

The important contents today

- Master the name, number and location of the upper limb bones.
- Master the morphological feature of the scapular, humerus, ulna and radius
- Master the arrangement of the hand bone
- Master the structure and movement of the shoulder joint.
- Master the structure and movement of elbow.
- Master the structure and movement of the wrist joint.

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knowledge related to the clinic

1. Fracture of clavicle
2. Fracture of scapula
3. Fracture of surgical neck of humerus
4. Fracture of shaft of humerus
5. Supracondylar fracture of the humerus
6. Fracture of ulna
7. Fracture of radius
8. Double fracture of both radius &ulna
9. Colle’s fracture
   Within 2.5 cm distal end of radius
10. Shoulder dislocation
11. Subluxation of capitulum radius

The words you have to master

1. Clavicle 锁骨
2. Scapular 肩胛骨
3. Glenoid cavity 关节盂
4. Acromion 肩峰
5. Spine of scapular 肩胛冈
6. Humerus 肱骨
7. Greater tubercle 大结节
8. Detoid tuberosity 三角肌粗隆
9. Capitulum of humerus 肱骨小头
10. Trochlea of humerus 肱骨滑车
11. Lateral epicondyle 外上髁
12. Radius 桡骨
13. Carpal bone 腕骨
14. Ulna 尺骨
15. Olecranon 鹰嘴
16. Metacarpal bone 掌骨
18. Sternoclavicular 胸锁关节
19. Acromioclavicular joint 肩锁关节
20. Shoulder joint 肩关节
21. Humeroulnar joint 肱尺关节
22. Humeroradial joint 肱桡关节
23. Annular ligament of radius桡骨环转韧带
24. Proximal radioulnar joint 桡尺近侧关节
25. Radiocarpal joint 桡腕关节
26. Carpometacarpal joints 腕掌关节
27. Metacarpophalangeal joint 掌指关节
28. Interphalangeal joint 指间关节
29. Interosseous membrane of forearm 前臂骨间膜

The end ! Good luck to you!