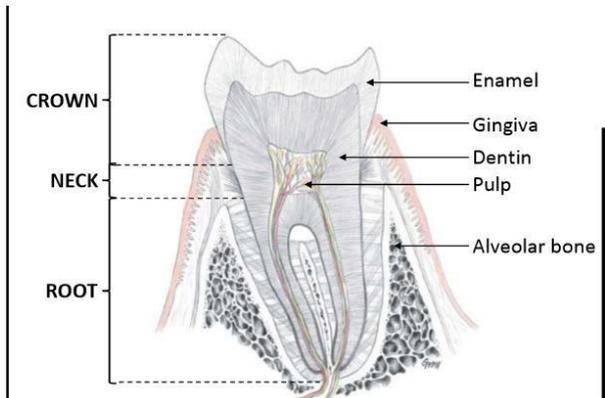
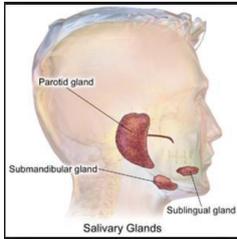


## 2017: Digestive system 1

- 1) What are the organs of GI tract?  
Oesophagus → Pharynx → oesophagus → stomach → small intestine → Large intestine
- 2) Name the accessory organs for the digestive system  
Pancreas, liver, sublingual (under the tongue) salivary glands, gall bladder
- 3) Name the 6 functions of digestive system (6 steps)
  - A. Ingestion (acquire nutrients)
  - B. Digest food – Mechanical and chemical break down of food
  - C. Peristalsis and segmentation moves the food through the GI tract
  - D. Secrete mucous, enzymes acid into the lumen of the digestive tract
  - E. Absorb nutrients transport the nutrients from the digestive system to the circulatory system
  - F. Eliminate feces (defecation)
- 4) What is peristalsis  
Process of moving food down the digestive tract via wave of muscular contractions
- 5) What is segmentation and where does it mainly occur?  
Segmentation allows for the moving back and forth churning of the food and it occurs mainly in the small intestine where its main function is the nutrient absorption
- 6) What epithelium lines the oral cavity?  
Non-keratinized stratified squamous epithelium
- 7) What are tonsils? Name 3 tonsils.  
Tonsils are patches of lymphatic tissues found at the entry of respiratory tract. (found at entrance of pharynx) It protects against the ingested and inhaled (airborne) pathogens
- 8) Define Enamel, dentin, pulp, crown, neck and root of the tooth  
Enamel- Harder than the bone and covers the exposed part of the teeth (crown)  
Dentin- Surface directly beneath the enamel and it is less calcified  
Pulp- Inner most part of the teeth houses nerves etc  
Neck- not locked in the alveolar bone  
Root- Housed in alveolar bone, number of roots depends on the teeth



- 9) What is the function of the tongue, what sensory analysis (what can it recognise?) does it have? Tongue- helps in the mechanical digestion of the food by moving the food around the oral cavity.  
Sensory analysis- well, the tongue responds to touch, to temperature, to taste
- 10) What enzyme does the tongue produce?  
It produces LINGUAL (relating to, near, or on the side towards the tongue.) LIPASE (ase- enzyme, breaks down triglycerides)
- 11) Name 3 salivary glands and its innervation  
Parotid, sublingual and submandibular



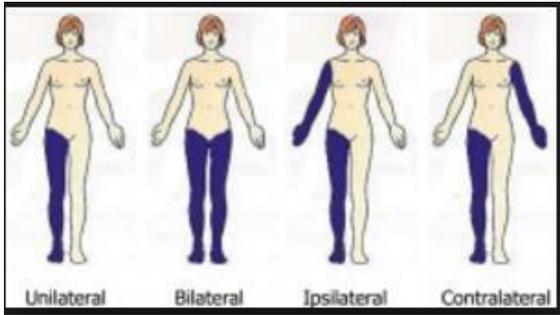
Parotid innervation: Glossopharyngeal nerve (IX) 25-30%

Submandibular innervation: Facial nerve (VII) 60-70%

Sublingual innervation: Facial nerve (VII) 3-5%

“Parotid is funny, because its big but it only accounts for 25-30% of salivary production and also it is right where facial nerve would be but its innervated by glossopharyngeal nerve” 12) Name the muscles that closes the Jaw

Muscle	Movement	
Temporalis	<ul style="list-style-type: none"> <li>Elevation</li> <li>Retrusion</li> <li>Ipsilateral deviation</li> </ul>	
Masseter	<ul style="list-style-type: none"> <li>Elevation</li> <li>Protrusion</li> <li>Ipsilateral deviation</li> </ul>	
Medial pterygoid	<ul style="list-style-type: none"> <li>Elevation, protrusion, contralateral deviation</li> </ul>	



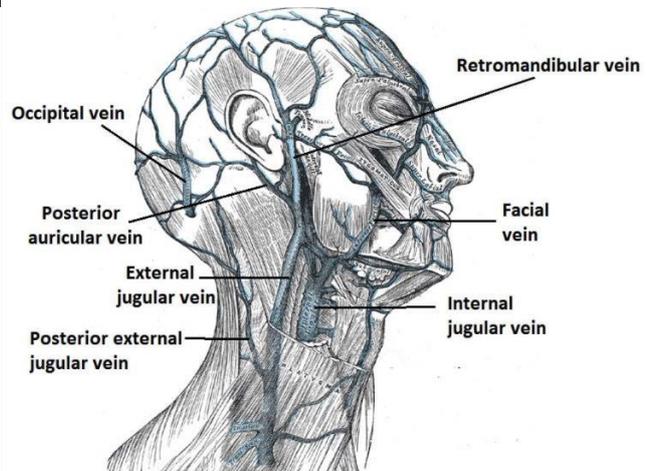
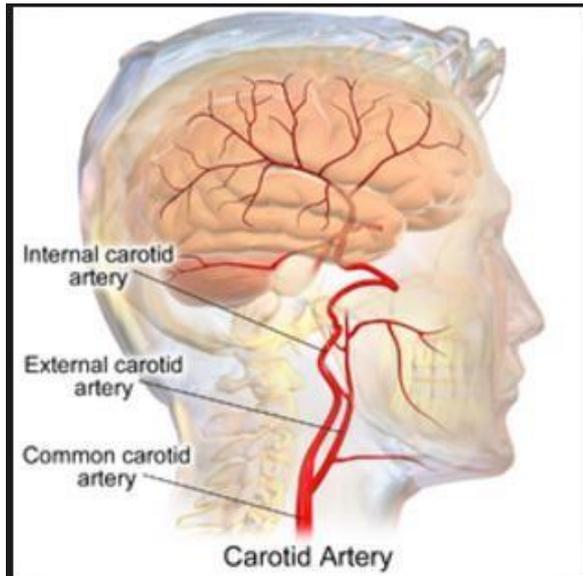
13) Name muscles that open the jaw?

Muscle	Movement	
Lateral pterygoid (most important)	<ul style="list-style-type: none"> <li>• Protrusion</li> <li>• Contralateral deviation</li> <li>• Depress Jaw</li> </ul>	
Digastric	<ul style="list-style-type: none"> <li>• Depress Jaw (open Jaw)</li> <li>• Elevate larynx</li> </ul>	
Mylohyoid	<ul style="list-style-type: none"> <li>• Opens jaw (depress)</li> <li>• Elevate floor of the mouth</li> <li>• Elevates hyoid</li> <li>•</li> </ul>	
Geniohyoid	<ul style="list-style-type: none"> <li>• Jaw opening (depression)</li> <li>• Larynx elevation</li> <li>• Hyoid retraction</li> </ul>	

14) Oropharynx and laryngopharynx is lined by...

Nonkeratinized stratified squamous epithelium

- 15) What is the blood supply of oropharynx and laryngopharynx and what vein is it drained by? Branches of external carotid artery



It is drained by internal jugular veins

- 16) What is the oesophagus and how long is it? Describe the location and what does the wall secrete?

The wall secretes Mucous

Oesophagus is a hollow conducting tube that connects pharynx to the stomach

It is 25 cm long

- 17) Name 2 sphincter of Oesophagus

Upper Oesophageal sphincter and lower Oesophageal sphincter

- 18) What is the function of stomach? What is the ingested food called once it is in the stomach?

The ingested food is called chyme.

Function of stomach is to chemically digest the food

Store digestive food

- 19) What is a mesentery? What is a Peritoneum?

Peritoneum- The peritoneum is the serous membrane that forms the lining of the abdominal cavity

The abdominal cavity (the space bounded by the vertebrae, abdominal muscles, diaphragm, and pelvic floor) should not be confused with the intraperitoneal space (located within the abdominal cavity, but wrapped in peritoneum). The structures within the intraperitoneal space are called "intraperitoneal" (e.g., the stomach and intestines), the structures in the abdominal cavity that are located behind the intraperitoneal space are called "retroperitoneal" (e.g., the kidneys), and those structures below the intraperitoneal space are called "subperitoneal" or "infraperitoneal" (e.g., the bladder).

TYPES of Peritoneum:

**Parietal Peritoneum**- attached to the abdominal wall and pelvic wall

**Visceral Peritoneum**- wrapped around the visceral organs, inside the intraperitoneal space for protection.

Thinner

**Mesentery**- Double layer of the visceral peritoneum that attaches to the GIT

Between the mesentery- blood vessel, artery, nerve "The space technically OUTSIDE of peritoneal cavity therefore retroperitoneal"

**peritoneal cavity** is a potential space between the parietal peritoneum (the peritoneum that surrounds the abdominal wall) and visceral peritoneum (the peritoneum that surrounds the internal organs). Both the parietal and visceral peritonea are not different but the same peritoneum given two names depending on their function/location.

- 20) Where does the lesser omentum attach to? And what does it do?

It attaches to the lesser curvature of the stomach and holds the stomach in place

21) Where does the greater omentum attach to and what does it do?

It attached to the greater curvature of the stomach and the adipose tissue protects the abdomen

22) What does the omentum house?

Blood vessel and nerves of the stomach

23) Name 3 components of small intestine

Duodenum, Jejunum, illium

24) What does small intestine digest and absorb?

Digests and absorbs carbohydrates, lipids, proteins

25) Small intestine receive secretions and buffers from A & B

A- Liver (gall bladder)

B- Pancreas

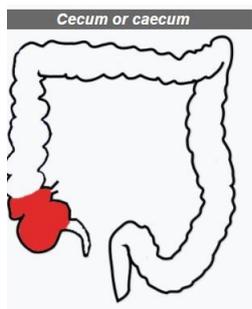
26) Small intestine begins at A and Ends at B

A- Pyloric spincter

Pyloric- relating to or affecting the region where the stomach opens into the duodenum.

B- Ileocecal valve

The cecum or caecum is an intraperitoneal pouch that is considered to be the beginning of the large intestine.

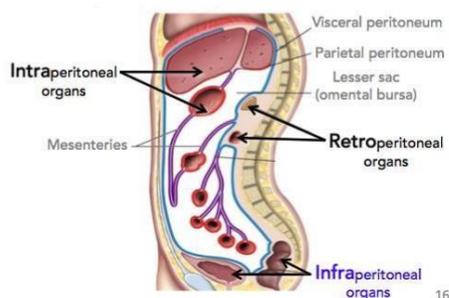


27) Where does duodenum originate from and what does it mix?

Duedenum originates from the Pyloric spincter and it mixes chime with bile and pancreatic secretions

28) Is the duodenum retroperitoneal or intraperitoneal?

Mostly retroperitoneal



29) How does the duodenum connect to the liver?

Via lesser omentum

30) Inside of duodenum is covered by a lining of

Mucous membrane that protects against the acidity of the chime

31) Bile and the pancreatic juice enters the duodenum via...

Duodenal papilla

Papilla- a small rounded protuberance on a part or organ of the body.

32) What is the Function of the Jejunum

To absorb nutrients

33) Wheredoes the Jejunum begin?

It begins at Duodeno-Jejunal flexure

34) Is Jejunum and ileum intraperitoneal or retroperitoneal?

They are both intraperitoneal and kept from falling apart by mesentery proper

35) What is the function of Ileum?

Function of the Ileum is to Absorb vitamin B12, Salts and all products of digestion not absorbed by the Jejunum

36) Ileum ends at a \_\_\_\_

Sphincter, the ileocecal valve which controls the flow of materials from the Ileum to the cecum of the large intestine

37) What does a plicae in a small intestine do? What is it?

It slows the passage for food, increases the SA for absorption, it is a duplicate of the membrane

38) Where is plicae prominent?

In the Jejunum

39) What is intestinal villi?

Finger-like projections that increases the surface area of the intestinal wall and contain intestinal cells

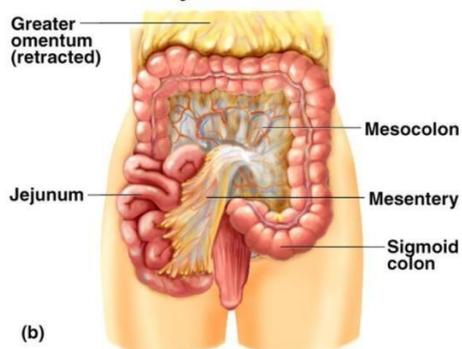
40) What is the 3 levels of enlargement of intestinal surface area for absorption? Plicae → Intestinal villi → Microvilli

41) The large intestine (colon). Where does it sit? What is it supported by?

It is supported by mesocolon

Lies around the edges of abdominal cavity

## Mesentery and Mesocolon



- Mesentery of small intestines holds many blood vessels
- Mesocolon anchors the colon to the back body wall

42) What are the four colons?

- Transverse colon
- Ascending colon
- Descending colon
- Sigmoid colon

43) What does the colon do? Absorbs water

Absorbs electrolytes

Solidify feces into food

44) What controls the movement of the large intestine (colon)?

Local reflexes in the autonomic nervous system

45) What cells make up the wall of the colon?

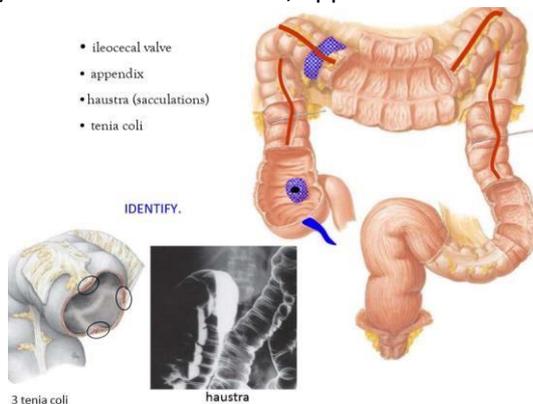
Simple columnar epithelial cells and goblet cells (which secrete mucous)

46) Name the seven regions of colon and state whether they are intraperitoneal or retroperitoneal

### Regions of the colon

- **Caecum**
  - Receives chyme from ileum
  - **Mostly Intra-peritoneal**
- **Appendix**
  - Contains lymph nodes
  - **Intra-peritoneal**
- **Ascending colon**
  - Origin: ileocecal valve of caecum
  - **Retro-peritoneal NO mesentery.**
- **Transverse colon**
  - Origin: hepatic flexure
  - Transverse mesocolon
  - **Intra-peritoneal**
- **Descending colon**
  - Origin: splenic flexure
  - **Retro-peritoneal Out side, no mesentery.**
- **Sigmoid colon**
  - Origin: sigmoid flexure
  - Sigmoid mesocolon
  - **Intra-peritoneal**
- **Rectum**
  - **Retro-peritoneal muscular tube**
  - Stores feces prior to defecation

47) What is ileocecal valve, appendix, haustra and Tenia coli?



48) Internal anal sphincter is composed of a ring of ... Smooth muscle

49) External anal sphincter is composed of a ring of ... Skeletal muscle

### Monday 15 May 2017- Heart

1) Describe the location of the heart

Fist on the left side of my heart (beneath the mediastinum), right side projecting forward.

The heart is located on the left side of the body midline, with the right side more anterior and left side more posterior. It is located posterior to the mediastinum of the sternum.

2) The heart is located within the A

Mediastinum: Space between the sternum (ventral) and vertebral column (dorsal) the lungs (side) and diaphragm

(inferior) 3) Describe the 2 pericardiums of the heart

So we have 2 pericardium of the heart. One is fibrous and one is serous. Fibrous pericardium attaches to the diaphragm and the great vessels coming out of the heart. It is made of fibrous connective tissue and it envelops the heart.

Serous pericardium is delicate and here we have parietal and visceral pericardium. And then there is the visceral pericardium which is directly connected to the heart. Between these two delicate serous pericardium is a space called Pericardial cavity and it contains fluid. This fluid helps reduce friction between the pericardium.

4) What comprises the heart wall?

There is Epicardium Myocardium and Endocardium which makes up the heart wall. Epicardium contains simple squamous epithelium and areolar connective tissue and fat. And THEN there is this super thick Myocardium which is the muscle tissue of the heart! And then we have areolar connective tissue and Endothelium which makes up the inside wall of the heart.

5) Describe the pulmonary circuit and the systemic circuit

Pulmonary circuit: Circulation of the blood between the heart and the lungs. Deoxygenated blood from the systemic circuit enters the right atrium from (coronary sinus, inferior and superior vena cava) and through tricuspid valve, enters the right ventricle. It then, through the pulmonary valve enters the pulmonary trunk to go to the lungs. From the lungs, the blood comes back via the 4 pulmonary veins.

Systemic circuit: From the Left atrium which received oxygenated blood from 4 pulmonary veins, the blood enters the left ventricle via the bicuspid valve. From the left ventricle the blood then goes through the aortic valve to enter the aorta and then to the rest of the body!

6) Atria is separated from each other by

Inter-atrial septa

7) Ventricles are separated from each other by

Within Inter-ventricular and Inter-atrial septa

8) Where is the fibrous skeleton of the heart and what type of tissue is it and what does it do?

Fibrous skeleton of the heart is in inter-ventricular septa. And it is Dense-irregular-connective tissue. Fibrous skeleton forms the rings of the heart valves, provides electrical insulation between the atria and the ventricle and provides frame work for the attachment of cardiac muscles

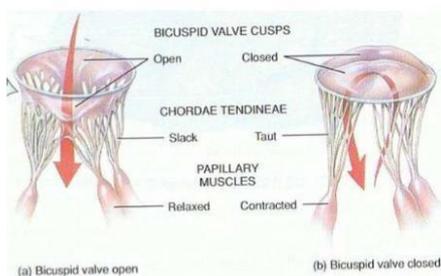
9) What type of valve is present between the atria and the ventricle?

Cuspid valves

Tri-cuspid (Right atrioventricular valve)

Bi-cuspid valve (Left atrioventricular valve)

10) What prevents valves from being pushed up to the atria? The papillary muscle and the chordae tendinae



11) The chordae tendinae is slack when valves are A. The chordae tendinae is taut when valves are B. A- Open B- Close

Think if the umbrella with hole in the middle analogy. The skeleton of the umbrella is the chordae tendinae.

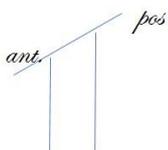


12) Name the 3 major sulci that separate the 4 chambers.

Atrioventricular sulcus (coronary sulcus) – coronary vein runs here

Anterior Interventricular sulcus

Posterior interventricular sulcus



13) Very first branches of the ascending aorta is the  
Coronary arteries!

14) What is systole and diastole?

Systole- Contraction- a Chamber ejects blood

Diastole-Relaxation- a chamber fills with blood

15) Lubb,dub. Describe what is happening at each sounds. At Lub,  
Ventricles contracts and forces the atrioventricular valves to shut. The pressure builds in the ventricle and  
forces semilunar valves to open and the blood is ejected At Dub,  
The pressure is low in the ventricles and all 4 chambers is relaxed (diastole) and then the blood flows from atria  
into ventricles (75%) passively. And then the atria contracts and push the rest of the 25% into the ventricle. 16)

What is atrial fibrillation? Cause? Diagnosis? Treatment?

Cause: the extra electrical impulses which disrupts the activity of SA node.

Diagnosis: via ECG

Treatment: Pacemaker

17) State the innervation for the heart and its effects

The heart is innervated by the Vagus nerve and the sympathetic trunk.

The vagus nerve is parasympathetic therefore decreasing the heart rate. It doesn't affect the force of  
contraction though.

The sympathetic trunk increases the heart rate and also increases the force of contraction

18) Describe the pathway of the muscle impulse throughout the heart

The muscle impulse starts at the sinoatrial (SA) node. The SA node is in the upper part of R atrium and is called the  
pacemaker due to controlling the pace for cardiac activity. The impulse from the SA node travels through the  
myocardium of the atrium which causes the 2 atria to contract simultaneously.

From the SA node the impulse then travels to the Atrioventricular AV node which is located in the floor of the R  
atrium and delays the contraction of the ventricles

From the AV node, which is in the floor of right atrium, between the atria and ventricles the impulse then travels  
through the AV bundle. The AV bundle branches into the left and right bundle branches in the interventricular  
septum. The AV bundle transmit signal through the through the Purkinje fibres throughout the ventricular  
myocardium which coordinates the ventricular contraction.

It is important for atrium to contract first and then the ventricle in order to stimulate uni-directional flow of the  
blood.

19) What does the fossa ovalis mark? What was this structure in foetal circulation?

Fossa ovalis is the depression in right atrium of the heart. During fetal development, the blood used to flow from  
the right atrium to the left atrium bypassing the non functional fetal lungs. Now, a thin fibrous sheet covers the  
foramen creating that slight depression.

20) There are 2 pumps of the heart. Left and Right. Which one is the high pressure and which one is the low  
pressure system?

The left- low pressure

The right- high pressure

21) Where do the coronary arteries arise?

Coronary arteries supply oxygen and nutrient to the heart muscle and they arrive from left and right main coronary  
arteries which exit ascending aorta just above aortic valve.

22) What is the function of the coronary sinus?

Well, coronary sinus is the biggest cardiac vein and it collects blood from all cardiac veins

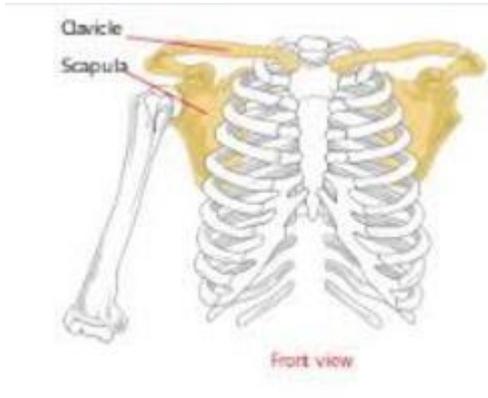
1) Skeletal muscles can be divided into...

Axial and appendicular muscles

2) Upper appendicular muscles can be divided into what 5 sections?

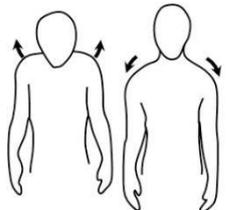
1. Muscles that move the Pectoral girdle
2. Muscles that move the GHJ (glenohumeral joint)
3. Muscles of the arm
4. Muscles of the forearm
5. Intrinsic muscles of the hand.

3) What are the movements of the pectoral girdle?

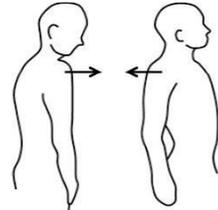


elevation

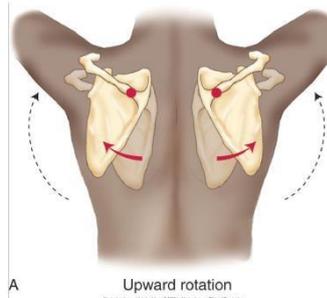
protraction



depression



retraction



A

Upward rotation

protraction, retraction, rotation (upward and downward) Protraction (pro-forward)

4) Name the muscles that move the pectoral girdle. Muscles seen anteriorly, and posteriorly

ANTERIORLY

Pectoralis minor	Scapula protraction , scapula depression
Serratus anterior	Scapula protraction
Trapezius, upper	Scapula elevation, upward rotation

POSTERIORLY

Rhomboid major	Scapula retraction, downward rotation
Rhomboid minor	Scapula retraction, downward rotation,
Trapezius upper	Scapula elevation, upward rotation
Trapezius middle	Scapula retrusion
Trapezius lower	Scapula depression
Levator scapulae	Scapula elevation

Rhomboid minor sits above rhomboid major

5) What are the movements of the glenohumeral joint?

Synovial ball and socket joint: Everything. Multiaxial diarthrosis

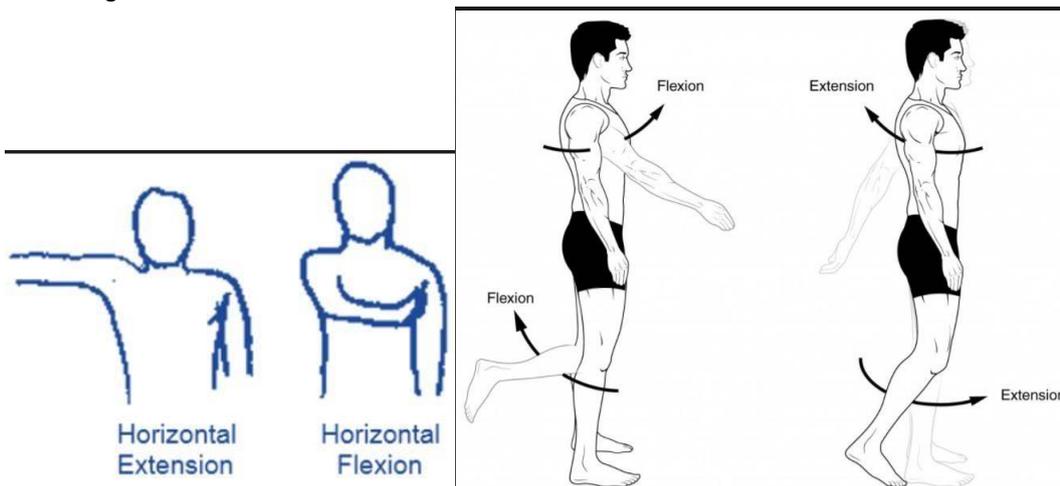
Abduction, adduction, flexion, extension, rotation

6) Name muscles that move the glenohumeral joint

Deltoid anterior fibre	Flexion, medial rotation
Deltoid middle fibre	Abduction
Deltoid posterior fibre	Extension
Pectoralis major	Horizontal flexion, medial rotation, flexion

Latissimus dorsi	Medial rotation, adduction (when not in anatomical), extension (when not in anatomical)
Coracobrachialis	Flexion, adduction
Biceps brachii	Flexion
Teres major (can be seen from posteriorly)	Medial rotation, adduction, extension
Supraspinatus	Abduction of arm
Infraspinatus	Lateral rotation, abduction
Teres minor	Lateral rotation, adduction
Subscapularis	Medial rotation

Orange is the rotator cuff muscles.



7) What are the characteristics of Pectoralis major?

Physiological cross sectional area	Large
What joint does it cross	Crosses the glenohumeral joint anteriorly
Moment arm	Large moment arm
Line of action (muscle fibre)	Convergent, muscle fibres converging towards the insertion (intertubercular sulcus)

8) What the rotator cuff muscles?

- Supraspinatus
- Infraspinatus
- Subscapularis
- Teres minor

9) The deep fascia encircles muscle groups and inserts into the A of the bone as an B septum

- A- Periosteum (a dense layer of vascular connective tissue enveloping the bones except at the surfaces of the joints.)
- B- Intermuscular

Septum- wall, dividing cavity, structure

10) What are the 2 muscular compartments of the arm?

Anterior and Posterior

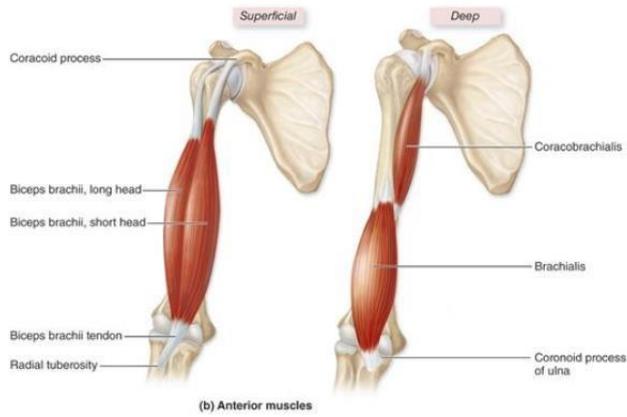
11) What is in each of them? What joint does it cross?

ANTERIOR-

Biceps brachii, coracobrachialis (right behind the biceps brachii), Brachialis

Note: Coracobrachialis is the only one that does not cross the Proximal HUJ and Proximal RUJ

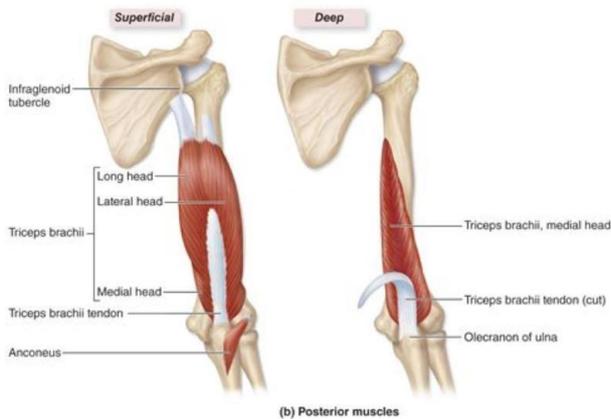
Biceps brachii	proximal HRJ (anterior)
Brachialis	proximal HUJ (anterior)



POSTERIOR:

Triceps brachii, Anconeus

Long head	Posterior GHJ and Posterior HUJ
Lateral head	Posterior HUJ
Medial head	Posterior HUJ
Anconeus	Crosses the posterior HUJ and attaches to the capsule



12) What are the 2 compartments of the forearm? What are the actions?

Anteromedial	Flexion (wrist, digit, pollex), pronate forearm
Anterolateral	Extension (Wrist, digit, pollex), supinate, abduct pollex

13) What are the two layers of anteromedial compartment of the forearm and name the muscles that each contain.

**SUPERFICIAL/INTERMEDIATE**

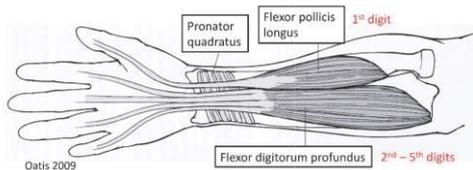
“PPPF” + The intermediate! Eliminate, brachioradialis

Pronator teres	Pronates arm
Flexor carpi radialis	Flexion, abduction
Palmaris longus	Tense palmar fascia
Flexor carpi ulnaris	Wrist flexion, wrist adduction (attach to hook of hamate)

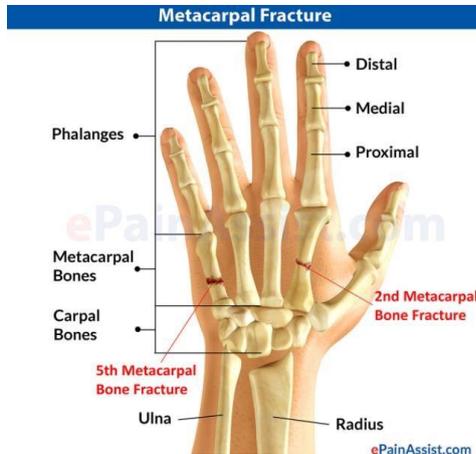
Intermediate: Flexor digitorum superficialis (digits 2-5) Makes the tunnel for flexor digitorum profundus **DEEP**

Flexor digitorum profundus (profound because digits super important!) + Flexor pollicis longus + Pronator quadratus

Note: Pronator muscle in each layers. Deep layer digits specialisation kind of.



14) What does flexor digitorum superficialis insert into? Base of middle phalanx digits 2-5



15) What does flexor digitorum profundus insert onto?

Inserts at the base of distal pharynx digits 2-5

16) What compartment is brachioradialis in?

Posterolateral compartment of the forearm

17) What is the superficial layer of posterolateral compartment of the forearm?

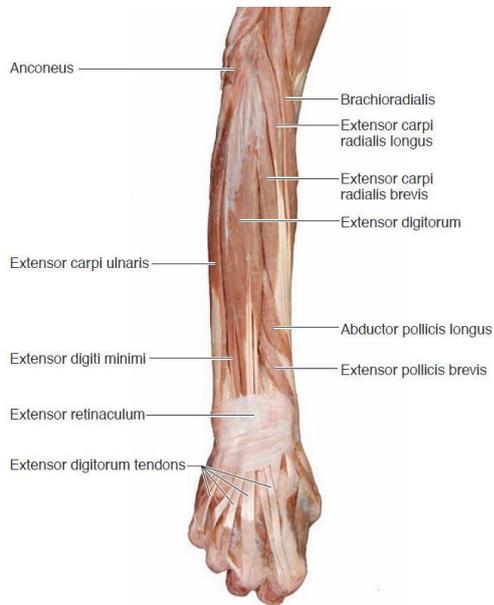
<b>Brachioradialis</b>	<b>Elbow flexion</b>
Extensor carpi radialis longus	Wrist extension abduction
Extensor carpi radialis brevis	Wrist extension abduction
Extensor digitorum	Finger extension
Extensor digiti minimi	5 <sup>th</sup> digit extension
Extensor carpi ulnaris	Wrist extension adduction

All of the insertions for the black says it is from the lateral epicondyle of the humerus but extensor carpi radialis longus is lateral supracondylar ridge of the humerus right below brachioradialis

Carpi, carpi, digiti, carpi. The third one, minimi, hides. CCDDC (second D hides)

Brachioradialis is special (different from the others because)

1. It has nothing to do with the wrist (moves the elbow joint)
2. The origin is lateral supraepicondylar ridge of the humerus Lets do the Dance!  
Anatomical position
  1. Flex elbow: **Brachioradialis action flexion**
  2. Extend digit 2 abduct: **Extensor carpi radialis longus attachment is base of second metacarpal**
  3. Extend digit 3 abduct: **Extensor carpi radialis brevis attachment base of third metacarpal**
  4. Extend all 4 digits: **extensor digitorum finger extension**
  5. Extend digit 5: Extensor digiti minimi action: extension of the little finger (5<sup>th</sup> phalryngeal) and insertion base of 5<sup>th</sup> digital pharyngeal
  6. Adduct wrist Touch the base of digit 5: Extensor carpi ulnaris

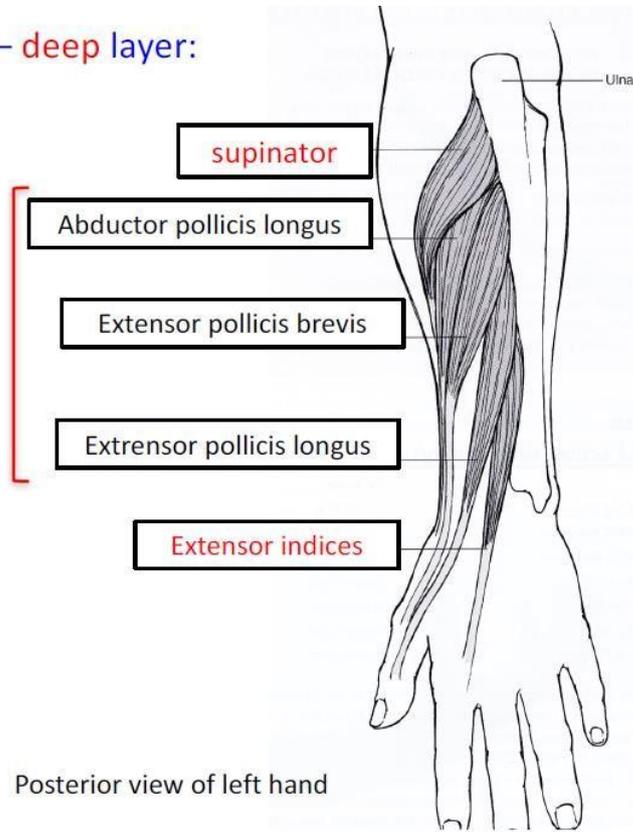


Tip: for the first 2 muscles, look proximally. For the rest, look distally. Be careful with extensor digitorum

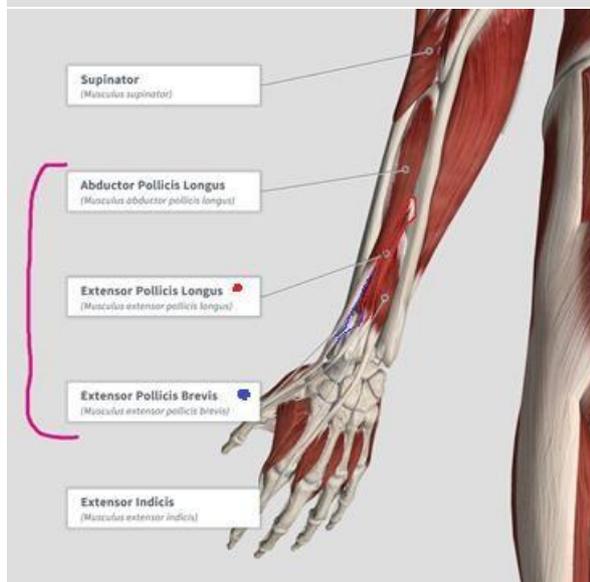
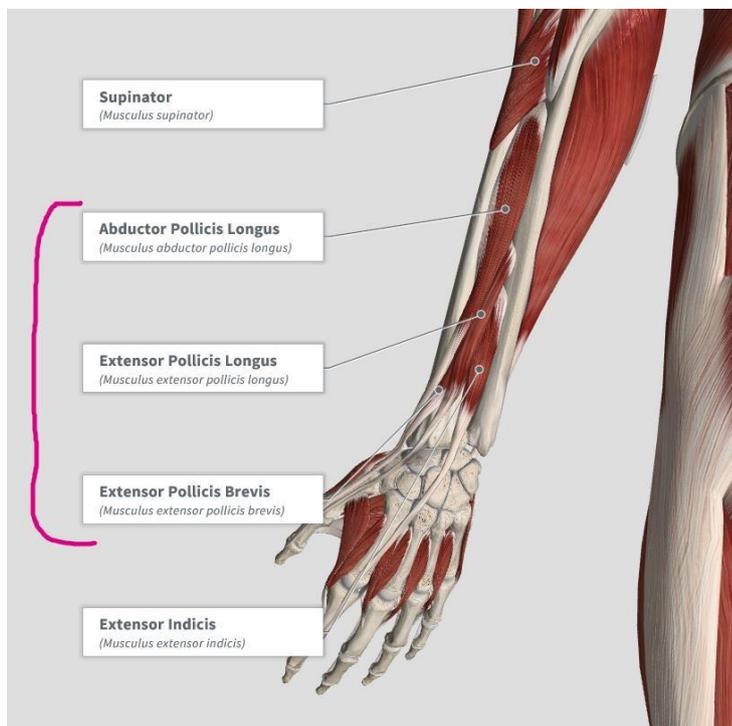
18) What is the deep layer of posterolateral compartment?

Posterolateral compartment – deep layer:

Pollicis muscles:

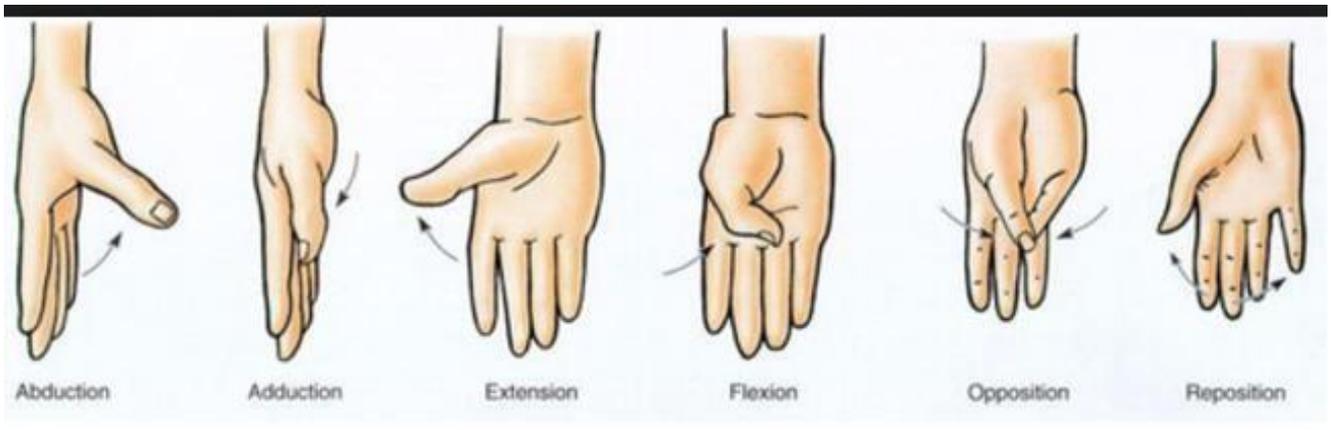


Posterior view of left hand



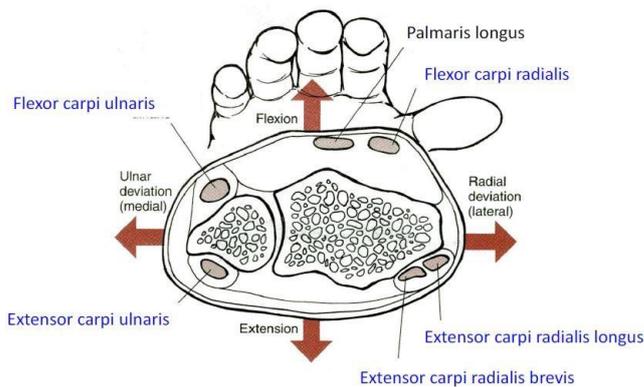
Mainly pollicis muscles: 3 pollicis. All comes from the ulnar border

Supinator	Supinates
Extensor pollicis brevis	
Abductor pollicis longus	Thumb abduction (L, thumb towards me)
Extensor pollicis brevis	Extension of thumb (First metacarpophalangeal extension) Thumb to the side, looks like abduction but its extension.
Extensor pollicis longus	First interphalangeal extension: extend the thumb digits!
Extensor indicis	Point finger up!



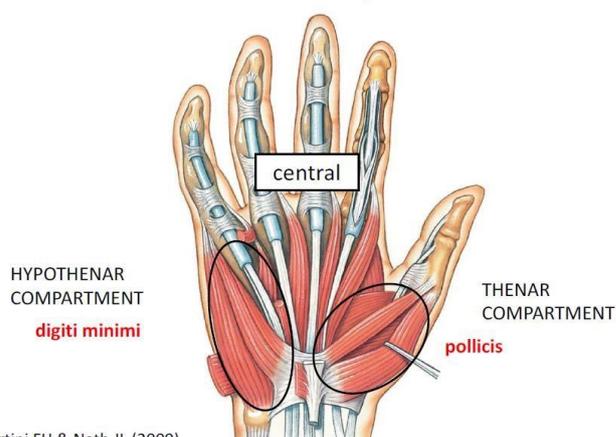
19) What are the 6 dedicated wrist muscles?

6 DEDICATED WRIST MUSCLES:



Flexor carpi ulnaris	Anteromedial compartment of forearm	Ulnar deviation, flexion
Flexor carpi radialis	Anteromedial compartment of forearm	Radial deviation, Flexion
Extensor carpi ulnaris	Posterolateral compartment of forearm	Ulnar deviation, extension
Extensor carpi radialis longus	Posterolateral compartment of forearm	Radial deviation, extension
Extensor carpi radialis brevis	Posterolateral compartment of forearm	Radial deviation, extension

20) What are the 2 compartments of intrinsic hand muscles?



Martini FH & Nath JL (2009)

Thenar compartment and Hypothenar compartment