

ANATOMY
SHEET NO.

5

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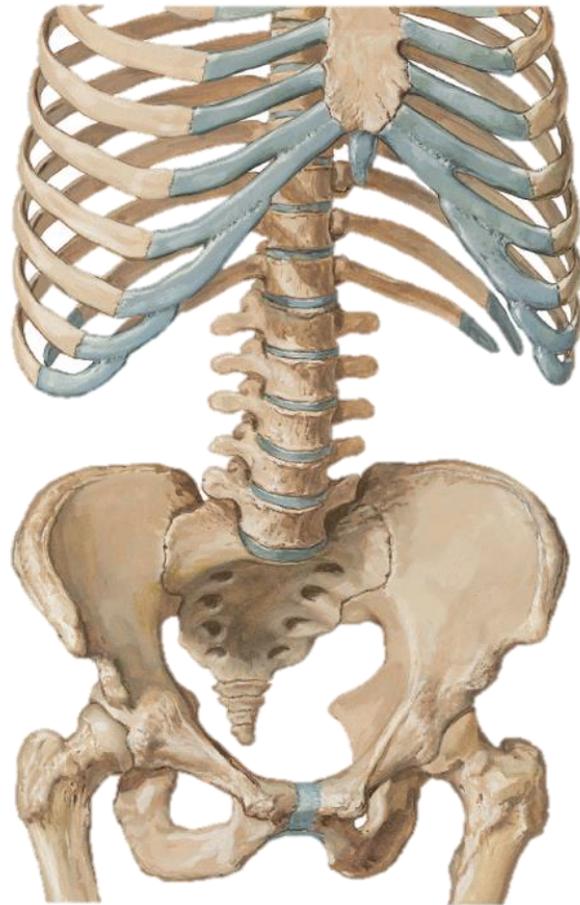
Grammatical correction: Huda baidoun

Doctor: Darwish badran

Introduction to anatomy of the abdomen

- **The region between the diaphragm and pelvis.**(The region between the diaphragm and the superior pelvic aperture is the abdomen)

- **Boundaries:**
- **Roof: Diaphragm**(The diaphragm was closing the lower part of the thoracic cavity almost completely except certain apertures and hiatus or openings to allow certain structures to pass like some major and minor openings
 - Major: aortic hiatus ,
esophageal hiatus, IVC hiatus
- Anything passing through the diaphragm either will go to the abdomen or to the thoracic cavity)
- **Posterior:**
 1. Lumbar vertebrae(L1,L2,L3,L4,L5),
 - 2.muscles of the posterior abdominal wall
- **Inferior: Continuous with the pelvic cavity at the superior pelvic aperture**(Sometimes when we describe the abdominal cavity we describe it as abdominal pelvic cavity because there is no separation between them)
- **Anterior and lateral: Muscles of the anterior abdominal wall**



Topography of the Abdomen (PLANES)..1/2

- the abdomen is the site for many medical and surgical emergencies (you will get a lot of patients complaining about their abdomen because there are a lot of organs in it)so we have to locate exactly where is the pain felt,SO we made the vertical and the horizontal planes .

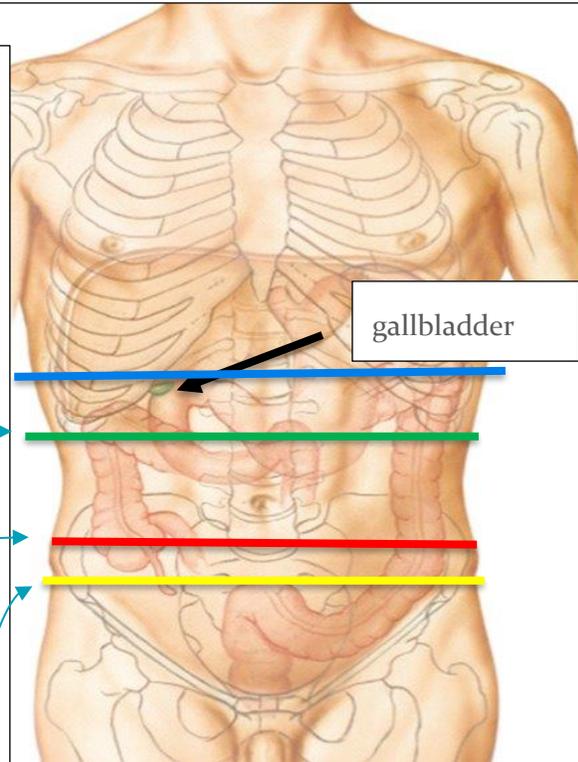
- Transpyloric plane** : tip of 9th costal cartilages; pylorus of stomach, L1 vertebra level.(there is a green dot on the tip of the 9th costal cartilage which is THE GALLBLADDER at the level of the transpyloric plane)

- Subcostal plane**: tip of 10th costal cartilages, L2-L3 vertebra.

Transtubercular plane: tubercles of the iliac crests; L5 vertebra level.(If you put your hand on the anterior superior iliac spine (the Sertorius muscle is attached to it) and go back 5 cm you will get the iliac tubercle on the iliac crest this is the place where transtubercular plane is located)

- Interspinous plane**: anterior superior iliac spines; promontory of sacrum (anterior part of S1)

the transpyloric plane and the transtubercular plane are the most commonly used



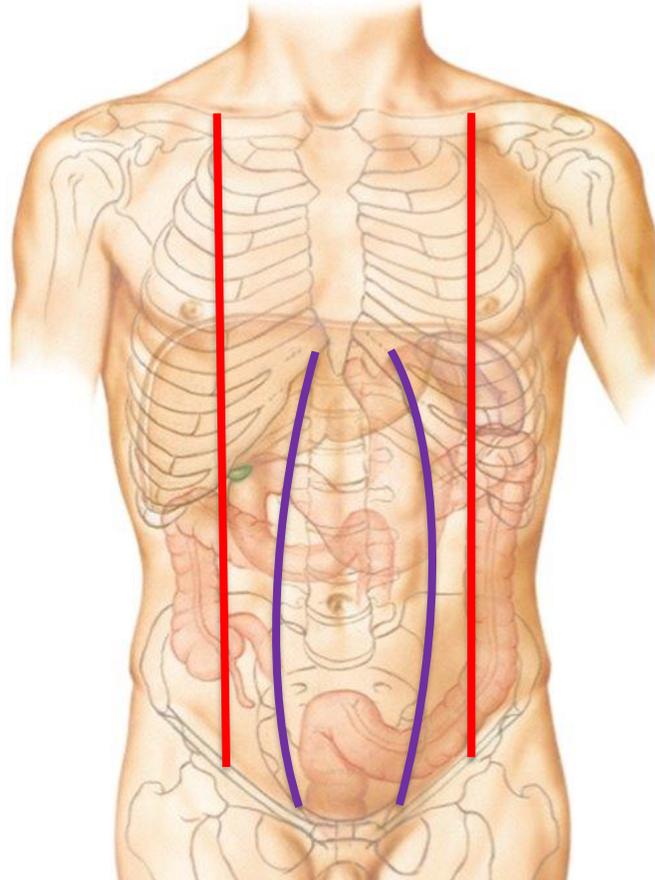
- Structurs that are between the blue and red lines(right kidney ,left kidney,ascending colon,descending colon ,transverse column,small intestine....)
- we now divided the abdominal region into 3 parts : 1. above the blue line 2. between the blue and the red line 3. under the red line.
- Because there are too many structures in them we had to put another vertical planes.

• VERTICAL PLANES

• VERTICAL PLANES

Right and left Mid-clavicular plane: midpoint of clavicle- mid-point of inguinal ligament.(We still didn't solve the problem we still have 3 parts and there are a lot of structures and organs between them)

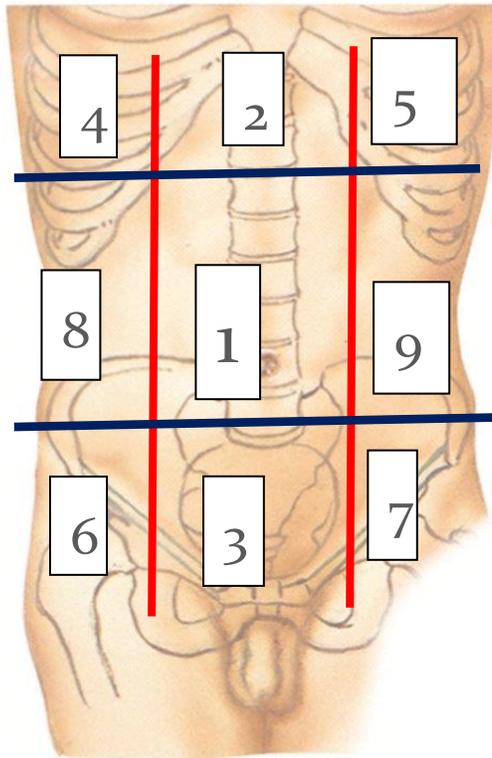
- Semilunar line: lateral border(margins) of rectus abdominis muscle.(We still didn't solve the problem , there are a lot of structures between them.)



These lines have surgical importance like: when surgeons open the abdomen beside the rectus muscle at the semilunar line it is called the pararectal incision.

the problem is still there , we are still dividing the abdomen into 3 parts so the best solution was to combine the vertical and the transverse planes.

- We put the med clavicular lines and the transpyloric line and the transtuberular line (now we have 9 parts).



- 9 regions:

Umbilical (1)(A lot of the stomach is located in this region)

Epigastric (2)

Hypogastric (Suprapubic) (3)

Right hypochondrium (4)(Located under the cartilage)

Left hypochondrium (5)

Right Iliac (Inguinal) (6)

Left Iliac (Inguinal) (7)

Right lumbar (8)

Left lumbar (9)

Things now are more specific when you say that the pain is in the right hypochondrium the first question I ask my self is what are the structures in there ?

For example

the right hypochondrium :

1.liver 2.gallbladder 3.right kidney 4.coils of the small intestine

The epigastric region:

1.part of the stomach 2.part of the liver(which is continuous in it) 3.panchreas
4.duodenum

The right lumbar region:

- 1.liver
- 2.ascending colon

The liver is in the right hypochondrium then the right lumbar region and then the epigastric region and even the left hypochondrium(passing extensively in the upper part of the abdomen .

In the umbilical region:

- 1.coils of small intestine
2. part of the stomach
3. Duodenum

In the left lumbar :

- 1.left kidney
- 2.left suprarenal gland
3. Descending colon

In the right iliac:(also called the right iliac fossa) (the most heard region because of the appendix pain ألم الزائدة it mainly in this region .

At first the pain is generalized all over the abdomen then it begins to be felt at the right ,after a while the pain is exactly at the right iliac fossa at the appendix):

- 1.appendix(الزائدة)
2. vermiform appendix
- 3.caecum

“never give up on a dream just because of the time it will take to accomplish .the time will just pass away”.

Another classification for the abdomen is deviding it into QUADRANTS by a vertical and an a horizontal line.

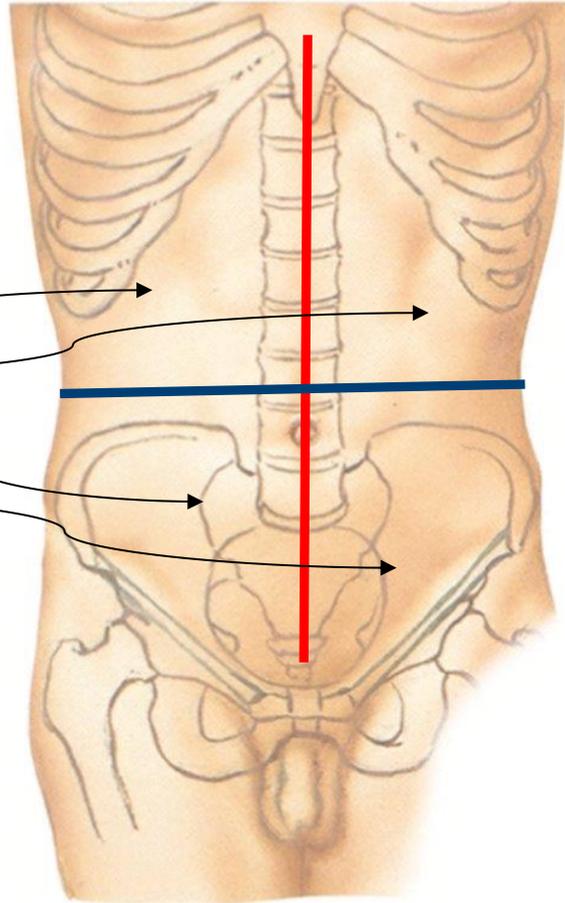
4 Quadrants:it significance comes when a patient is complaining about a pain in the gallbladder we say its on the right upper quadrant ...

Upper right quadrant (1)

Upper left quadrant (2)

Lower right quadrant (3)

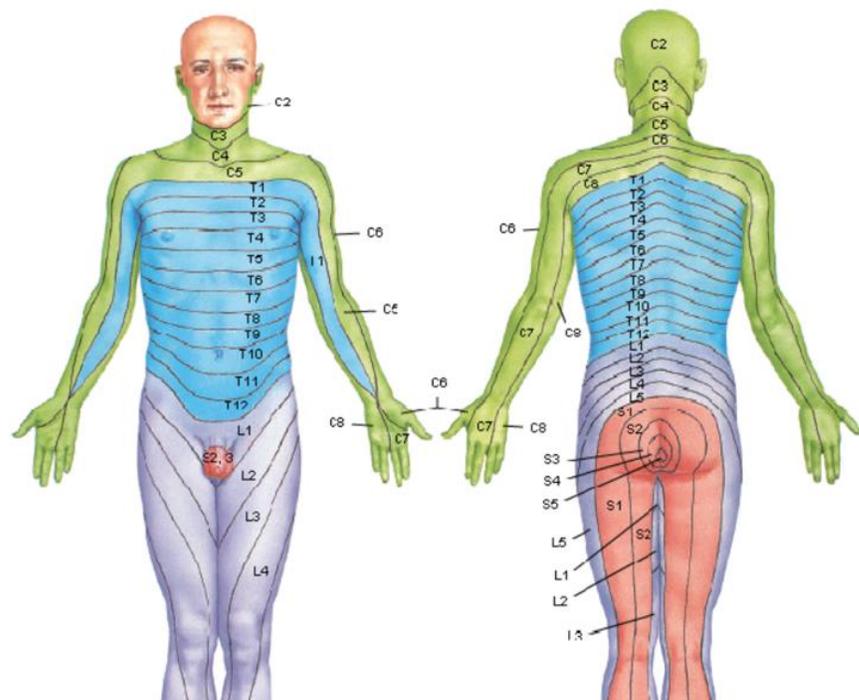
Lower left quadrant (4)



To revise (we either devide the abdomen to 9 parts or with just a horizontal and a vertical line to have 4 quadrants .

There are dermatomes in the abdomen but what are dermatomes?

Dermatome is a piece of skin supplied by a specific nerve and the root value for it is known.



Skin innervation for the anterior abdominal wall is:

1. lower 5 intercostal nerves (11,10,9,8,7)
2. Subcostal nerve (T12)
3. L1 spinal nerve (ilioinguinal+iliohypogastric nerves).

Umbilical region skin = T10 (at the level of T10 is the dermatome for the umbilical region, and L1 is for the pubic region, and T8 is really close to the xiphisternum). Almost anteriorly and posteriorly the abdomen and the back is divided into parts that are almost equal horizontally towards the top, so when we reach the Angle of the mouth there is C2 then C3, C4, C5, T1-6., L1 is in symphysis pubis then Lumbar and sacral divisions.

Sometimes an overlapping happens between them, so if one of the nerves is injured there will be no complete loss because of the overlapping.

Layers of Anterior Abdominal Wall

- 1)Skin
- 2)Fascia:
 - Superficial fascia:
 - Superficial fatty layer(CAMPER'S fascia)
 - Deep membranous layer (SCARPA'S fascia)
(both of these names are the names of the scientists who described them and the names are known clinically)
 - Deep fascia: a very thin layer underneath the deep membranous layer(some people think its not well developed)
- 3)External oblique muscle (1)
- 4)Internal oblique muscle (2)
- 5)Transversus abdominis muscle (3)

These three muscles make the anterolateral abdominal wall but the directions of fibers in them are different .

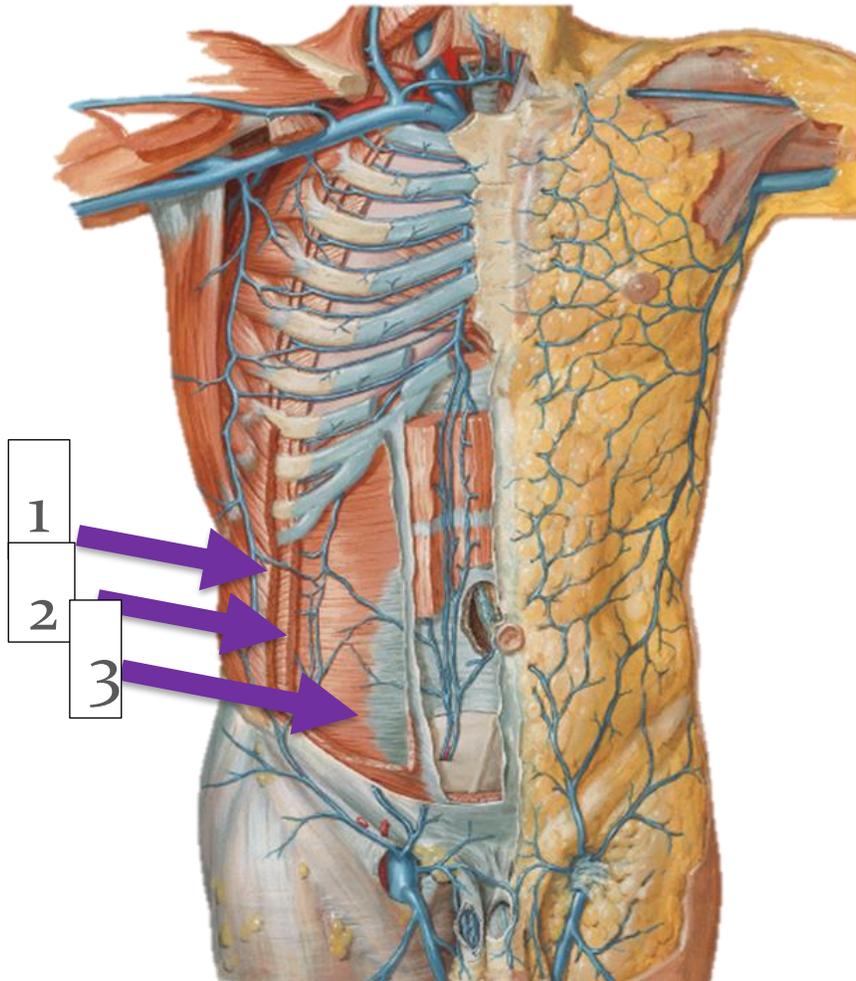
For example the external oblique reflects the external intercostal in the thorax ,internal oblique reflects internal intercostal on the thorax, and transversus abdominis fibers are running horizontally

they come to the anterior aspect of the abdomen and they form an aponeuroses then they make the rectus sheet where rectus abdominis muscle is located, there are veins on rectus abdominis muscle they are inferior epigastric and superior epigastric joining together.

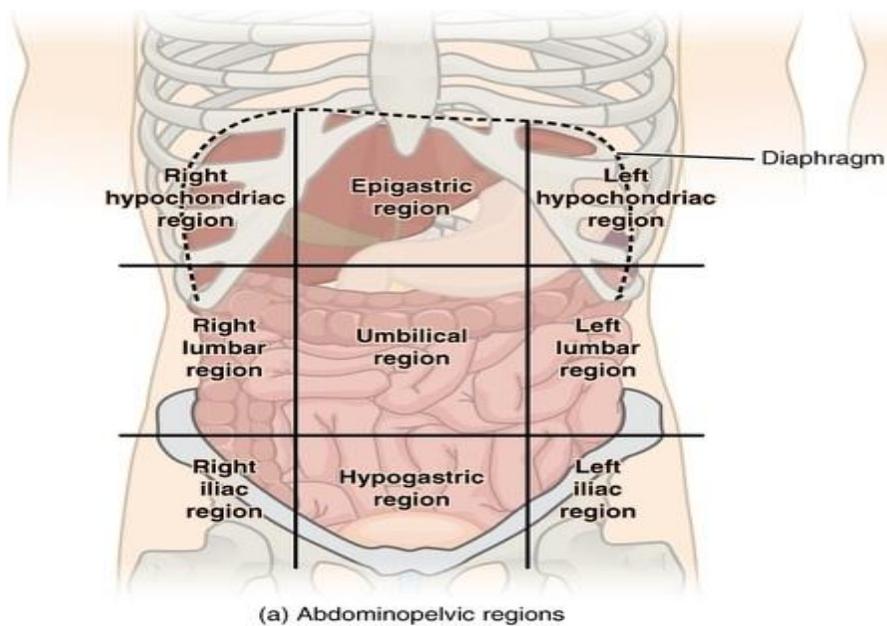
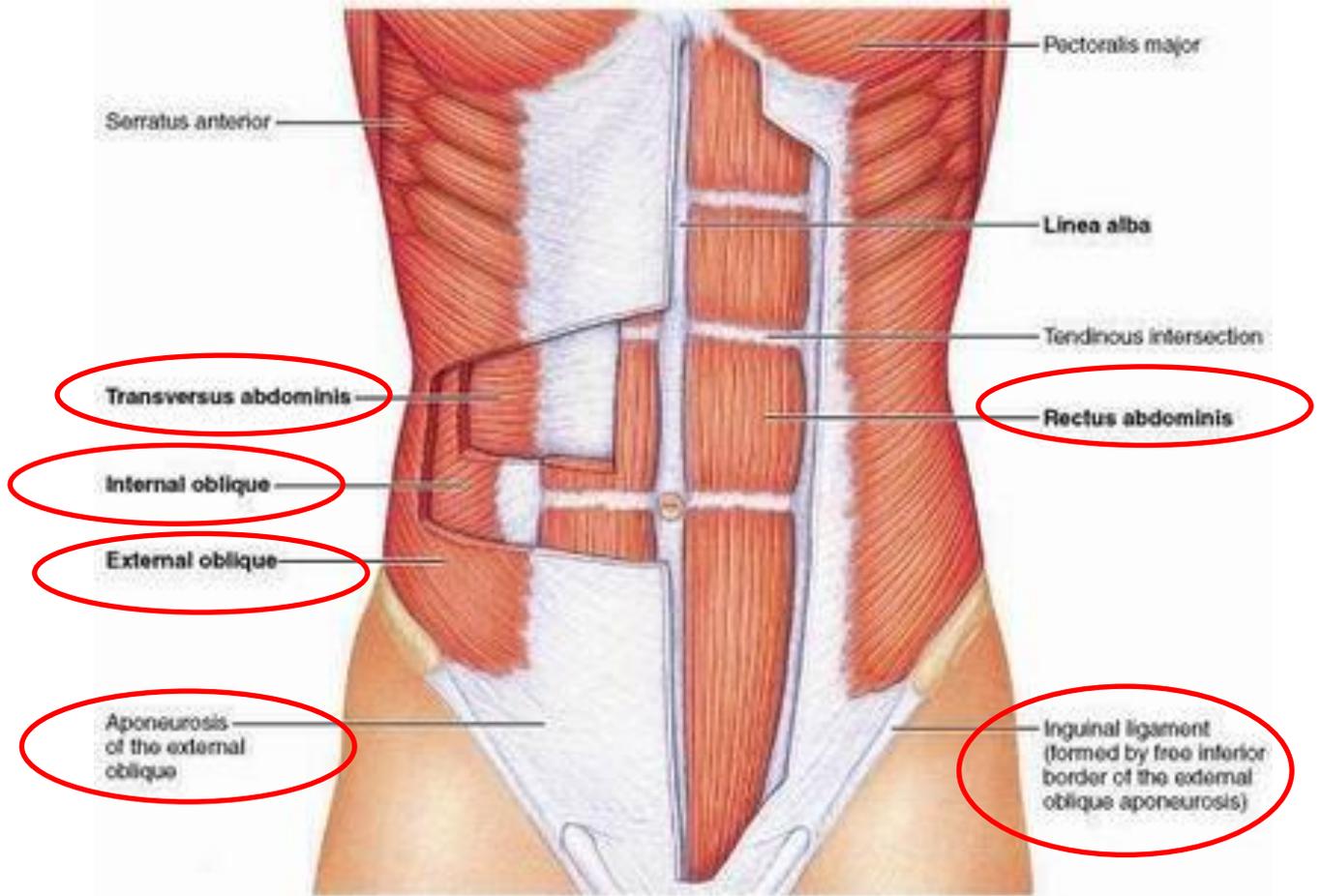
On the lower part of rectus abdominis muscle close to the symphysis pubes there is a muscle called **pyramidalis muscle** and its only found in males and it might be absent, it's function is to do tension on the spermatic cord and the lower part of rectus abdominis.

- 6)Transversalis fascia(layer of fascia on the inner aspect of Transversus abdominis muscle and it changes the name based on the muscle.

In the lower part of the abdomen the external oblique muscle reaches the anterior superior iliac spine and inserts into the pubic tubercle it becomes the **inguinal ligament** the tension of the fascia lata of the lower limb makes a dint in the ligament preventing it to be straight .



some pictures to make you understanding easier.



و عودا تكلم .