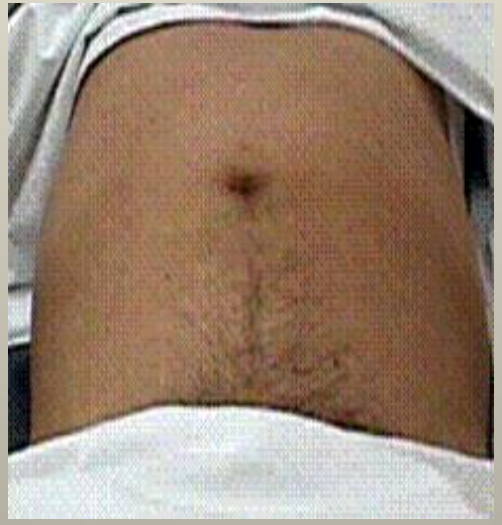
PERCUSSION OF THE ABDOMEN



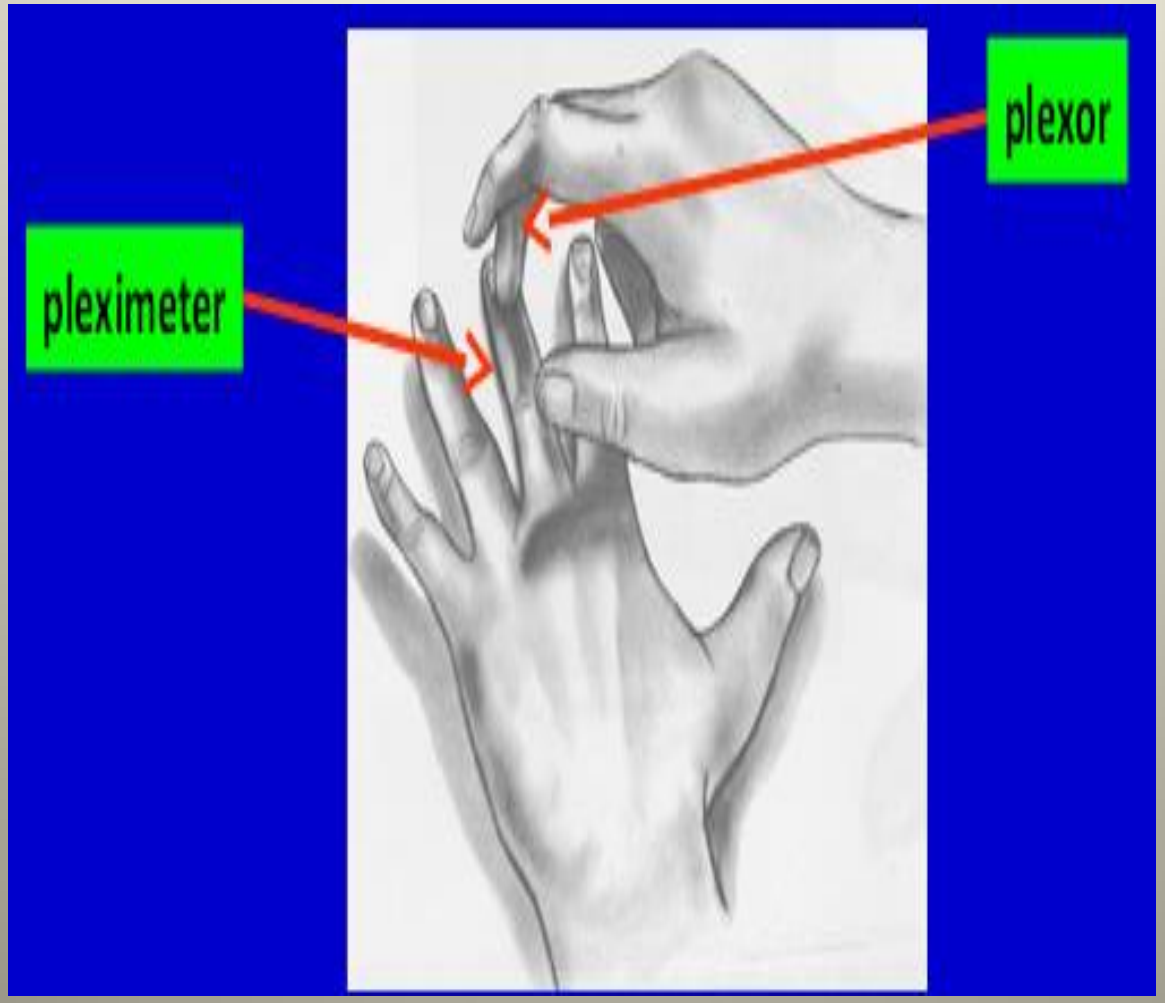
AHMED KHAIRY

ASSIS LECTURER OF GENERAL SURGERY

SOUTH VALLEY UNIVERSITY

PERCUSSION

- Percussion is a method of tapping on a surface to determine the underlying structure.


plexor
pleximeter

TECHNIQUE

- It is done with the middle finger of Rt. hand (plexor) tapping on DIP of the middle finger of the Lt. hand (pleximeter) using a wrist action.
- The non striking finger (pleximeter) is placed firmly on the abdomen.
- Remember that it is easier to hear the change from resonance to dullness – so proceed with percussion from areas of resonance to areas of dullness.

THERE ARE TWO BASIC SOUNDS :

- **Resonant sounds:** indicates hollow, air-filled structures. The abdomen gives resonant note which varies according to the amount of gas present in the intestine.

- **Dull sounds:** indicates the presence of a solid structure (e.g. liver) or fluid (e.g. ascites) lies beneath the region being examined.

IT IS A USEFUL TECHNIQUE FOR:

- Evaluating the size of the liver and sometimes the spleen.
- Evaluating gas in the abdomen versus solid or fluid-filled structures.
- Evaluating for focal areas of tenderness and peritoneal irritation.
- Evaluating for the presence of ascites.

SURFACE ANATOMY OF THE LIVER

Upper border is marked by joining the following points:

1st point: Lt. 5th intercostal space in the MCL “apex of the heart”

2nd point :Xiphisternal joint.

3rd point :Upper border of 5th rib in Rt. MCL .

4th point :7th rib at RT MAL.

5th point : 9th rib at RT scapular line.

Lower border is marked by curved line joining the following points:

1st point: Lt. 5th intercostal space in the MCL “apex of the heart”

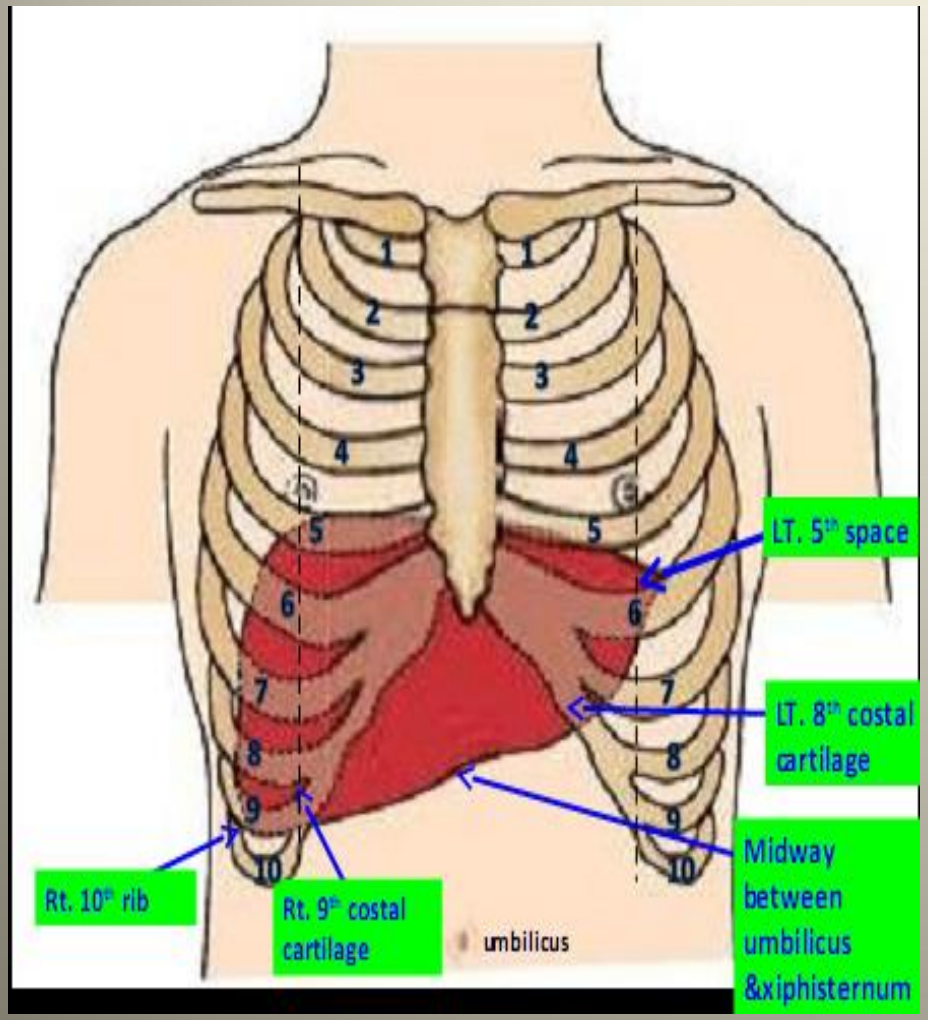
2nd point : 8th costal cartilage in the Lt. parasternal line.

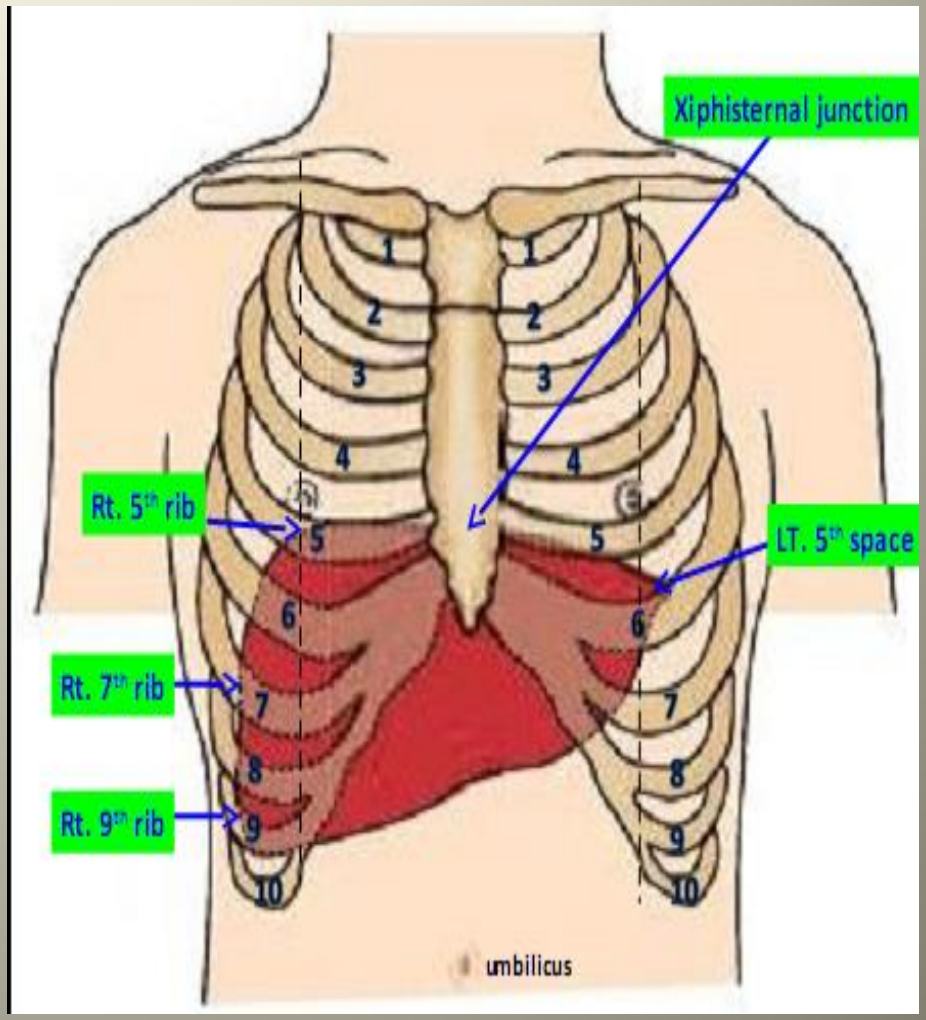
3rd point :midway between xiphisternal junction and the umbilicus.

4th point : 9th costal cartilage in the Rt. MCL.

5th point : 10th rib in the Rt. MAL.

6th point : 12th rib in Rt. Scapular line


LT. 5th space
LT. 8th costal cartilage
Midway between umbilicus &xiphisternum
Rt. 10th rib
Rt. 9th costal cartilage
umbilicus


Xiphisternal junction
Rt. 5th rib
LT. 5th space
Rt. 7th rib
Rt. 9th rib
umbilicus

PERCUSSION OF THE LIVER

- Upper border is detected by heavy percussion "hepatic dullness".
- Lower border is detected by deep palpation and light percussion .

UPPER BORDER(HEAVY PERCUSSION)

- starting from the Rt. 2nd intercostal space opposite (angle of Louis).
- When you reach the dullness of upper border, (normally at the 5th intercostal space Rt. midclavicular line) ask the patient to take a deep breath and hold it then percuss again,
- If it becomes resonant ⟹ previous dullness was the liver.

- If it remains dull → previous dullness due to supra-diaphragmatic causes other than liver.
- If it remains resonant below the 5th space :

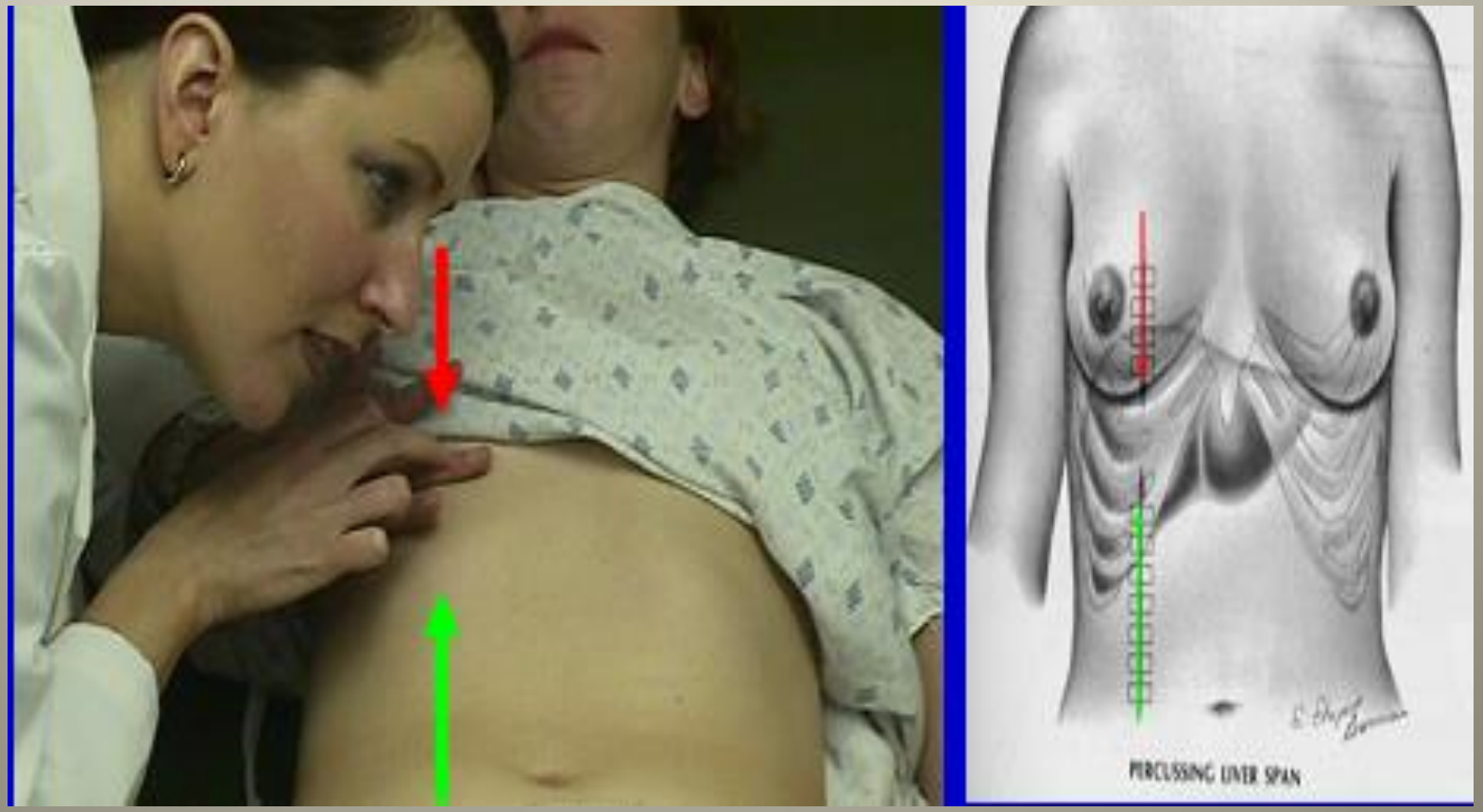
*__Shrunken liver__, if the lower border is not felt by palpation.

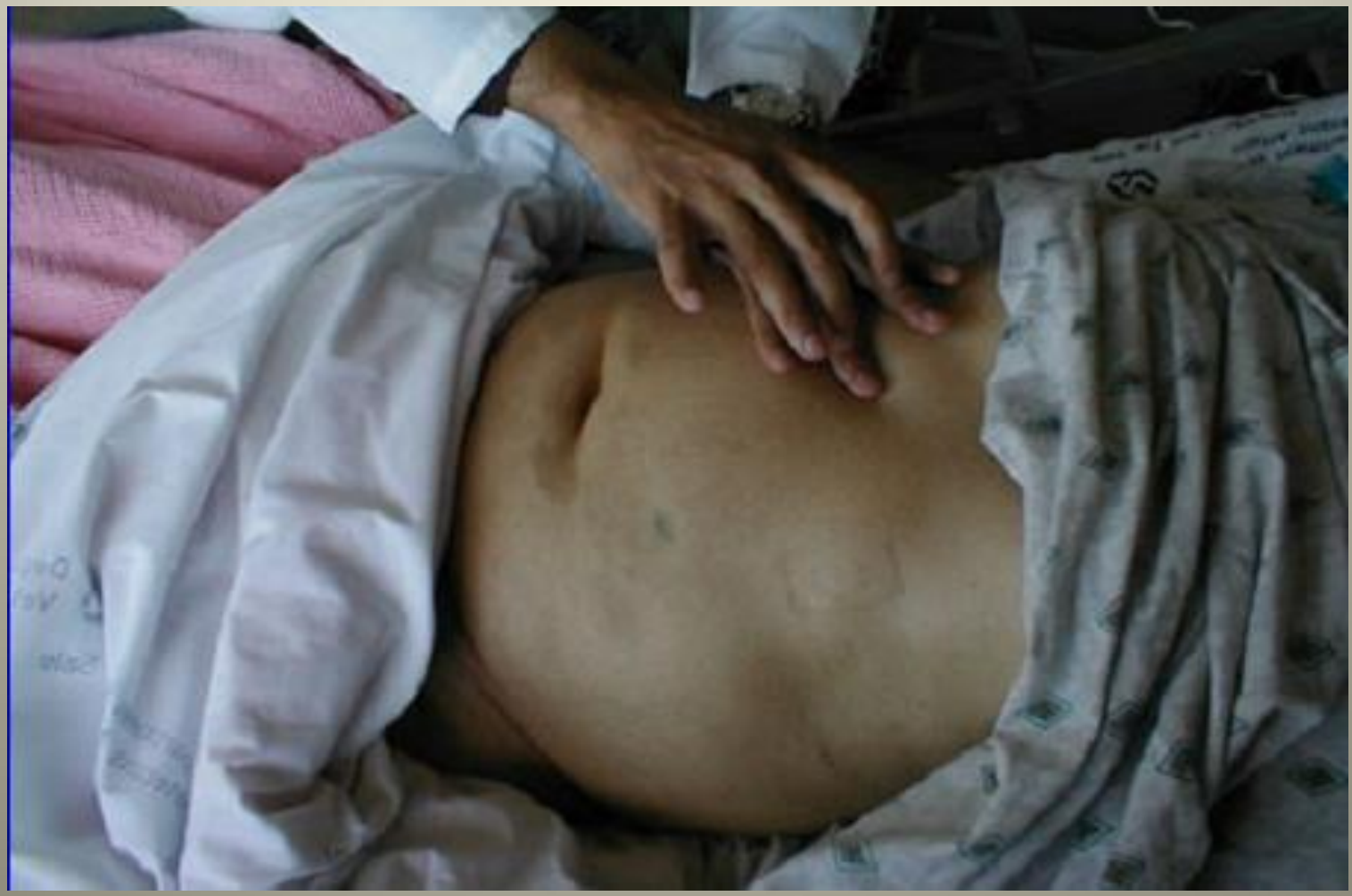
*__Ptosed liver__, if the lower border is felt by palpation.

LOWER BORDER(LIGHT PERCUSSION)

- Percuss the lower border if NOT defined by palpation in Rt. midclavicular line for Rt. Lobe.
- And middle line for left lobe.
- Liver span : Distance between the upper and lower borders of the liver; which is

- 4 – 8 cm in the middle line “represents the Lt. lobe”
- 9 – 14 cm in the Rt. MCL “represents the RT. lobe”

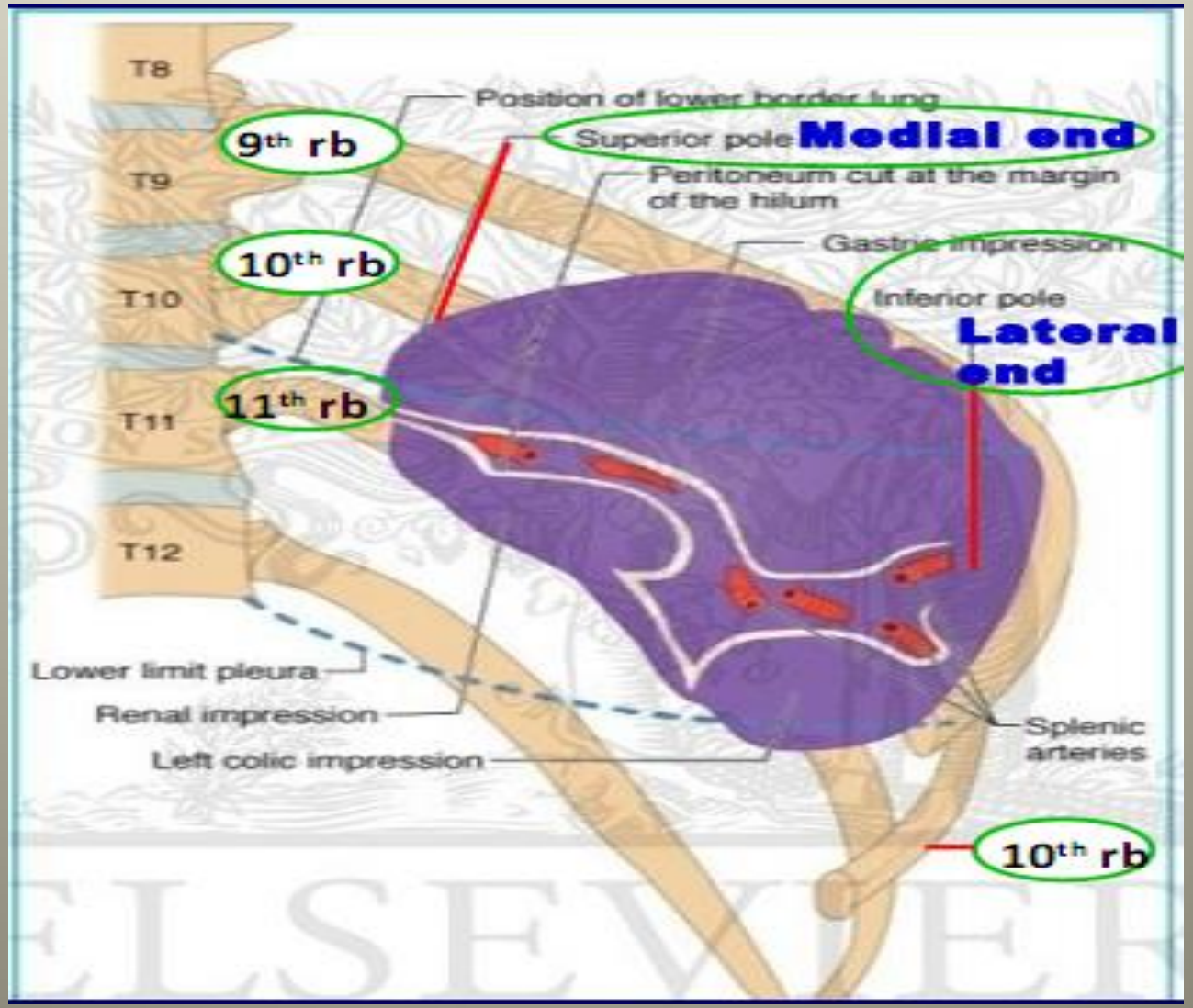

PERCUSSING LIVER SPAN



SURFACE ANATOMY OF THE SPLEEN

- **Normal splenic dullness extends:**
  - * Anteriorly to midaxillary line.
  - * Posteriorly to 4cm from the midline at T10.
  - * Above to the 9th rib.
  - * Below to the 11th rib.
- The spleen runs parallel to the 10th Rib.
- In huge spleen percussion start from Rt. iliac fossa towards Left hypochondrium .
- A If not palpable percuss **Traube's area**:

- **Harris's** odd numbers 1, 3, 5, 7, 9, and 11 is useful for remembering certain average dimensions of the spleen:
  - The spleen measures 1 x 3 x 5 inches (2.5 x 7.5 x 12.5 cm) .
  - The spleen weighs 7 oz (220 g).
  - The spleen relates to left ribs 9 through 11.


T8
T9
T10
T11
T12
9th rb
10th rb
11th rb
Position of lower border lung
Superior pole
Medial end
Peritoneum cut at the margin of the hilum
Gastric impression
Inferior pole
Lateral end
Lower limit pleura
Renal impression
Left colic impression
Splenic arteries
10th rb

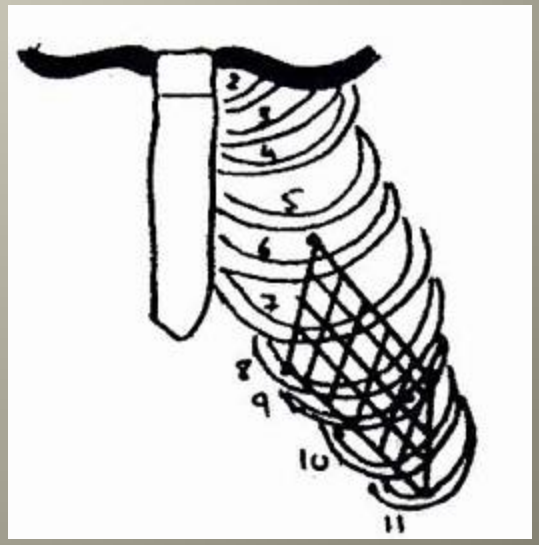
❑PERCUSSION OF THE SPLEEN

- ➢Percussion of Traube's area .
- ➢Splenic percussion sign "Castell's method" .
- ➢Nixon's method.

Boundaries of traub‘s area:

- Lt. 5th intercostal space in midclavicular line.
- Lt. 8th coastal cartilage.
- Lt. 11th rib in mid axillary line.
- Lt. 9th rib in mid axillary line.

- It is area of tympanic resonance overlying the fundus of stomach.



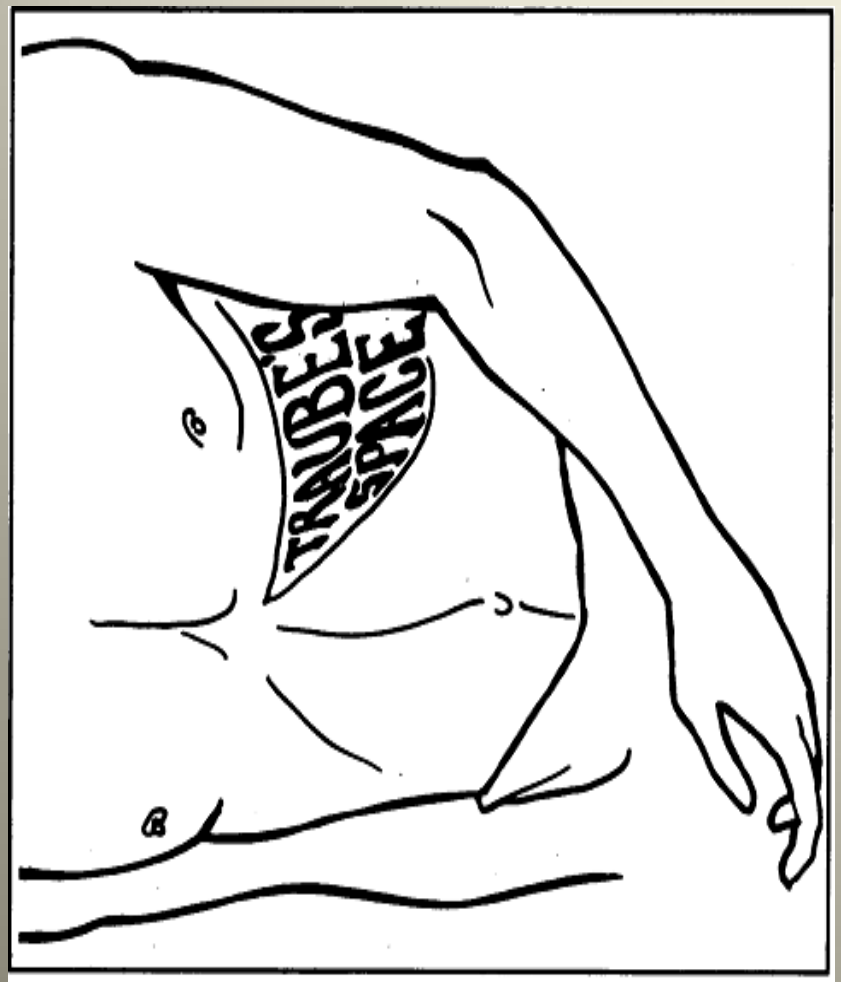
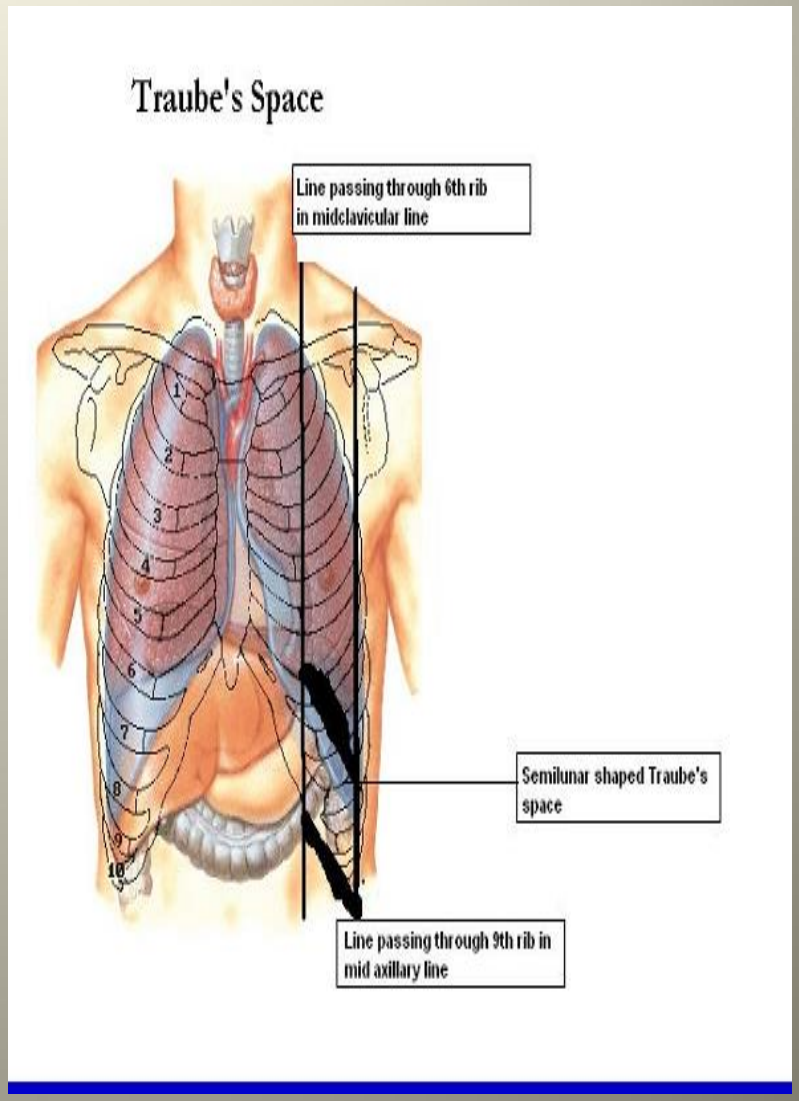


Figure 6.—Traube's space is shown, as defined by Barkun et al.[14]

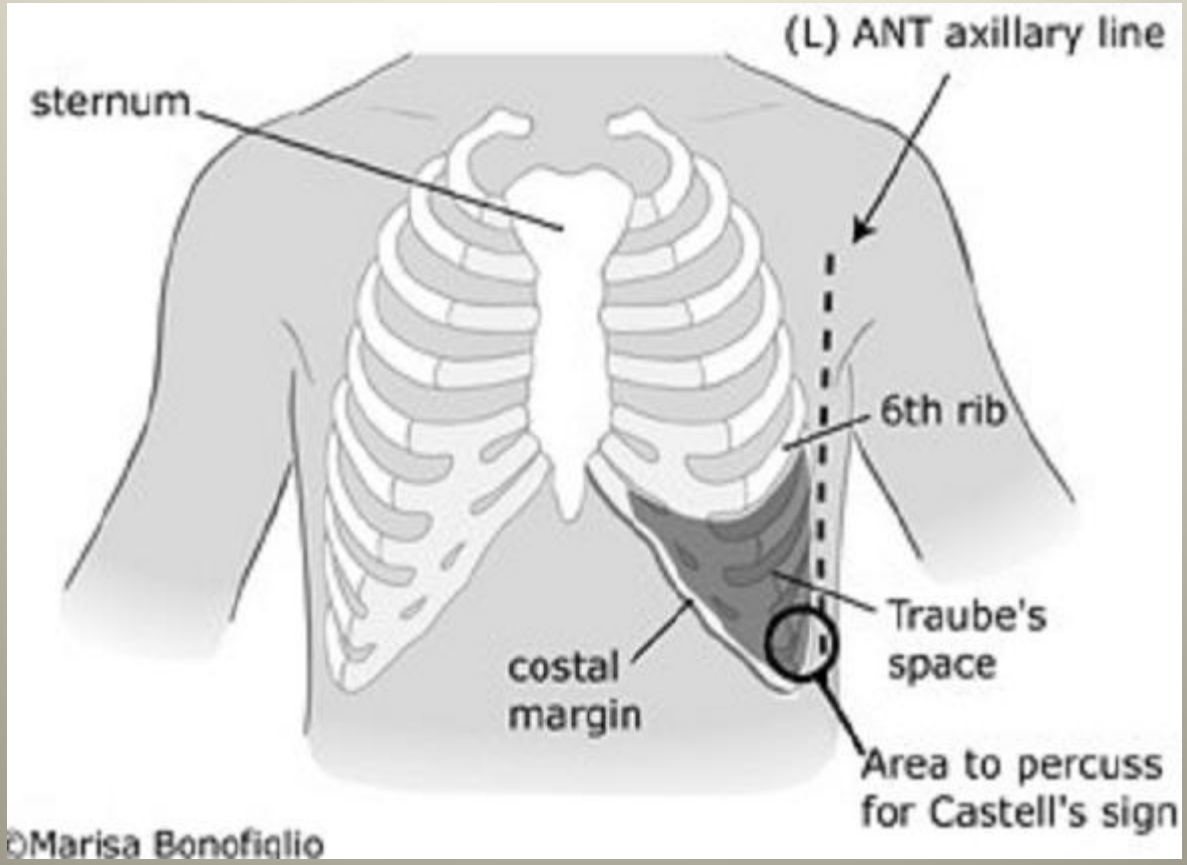


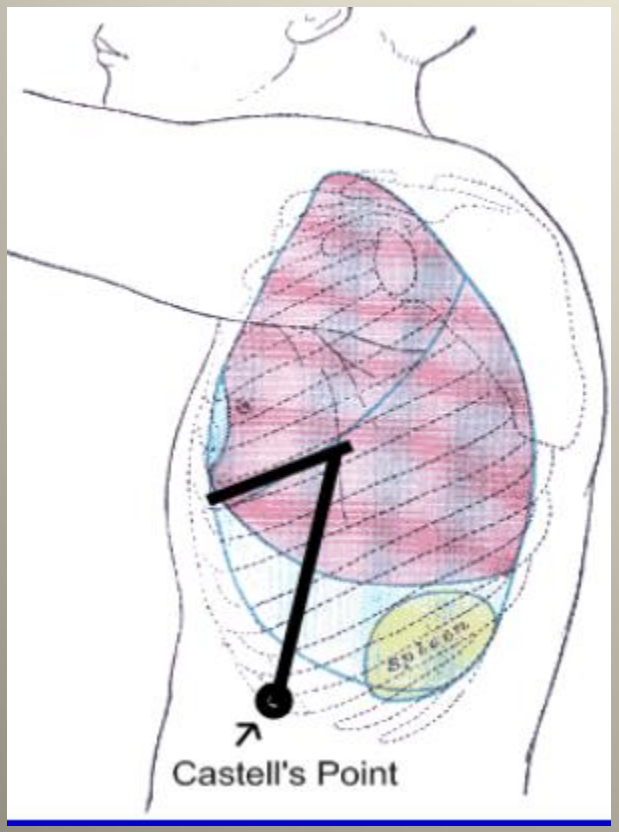
Causes of dullness of Traube's area:

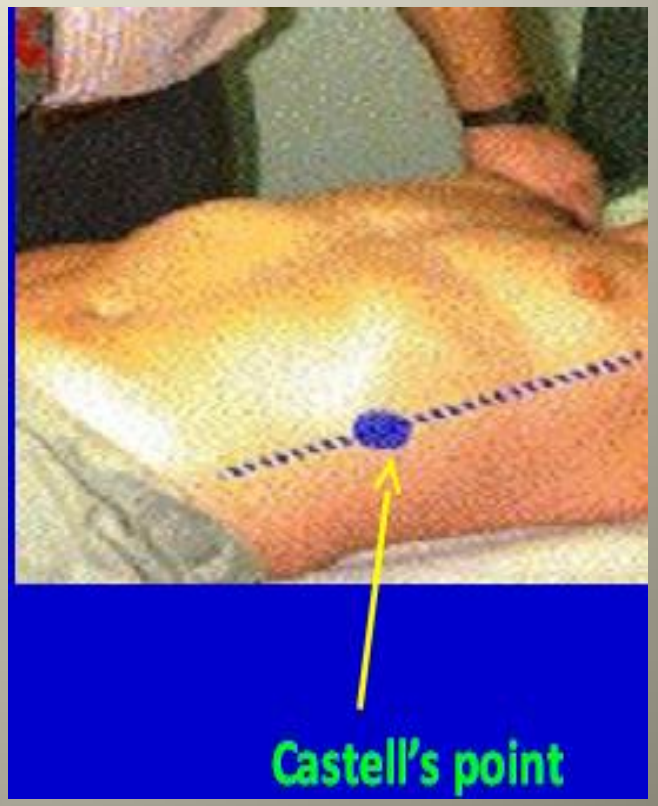
- Full stomach/ gastric tumors.
- Left sided Pleural effusion / pericardial effusion "from above"
- Ascites/abdominal tumor "from below"
- Splenomegaly "from left side".
- Enlargement of left lobe of liver "from the right side".

Castell's method "Splenic percussion sign":

- Put the patient in the supine position.
- Left anterior axillary line identified and Left lower costal margin identified.
- Percuss in the lowest Left intercostal space in the anterior axillary line (usually the 8th or 9th IC space) while patient taking deep breath.
- This space should remain resonant during full inspiration.
- Dullness on full inspiration indicates possible splenic enlargement (a positive Castell's sign).


(L) ANT axillary line
sternum
6th rib
Traube's space
costal margin
Area to percuss for Castell's sign
©Marisa Bonofiglio


spleen
Castell's Point

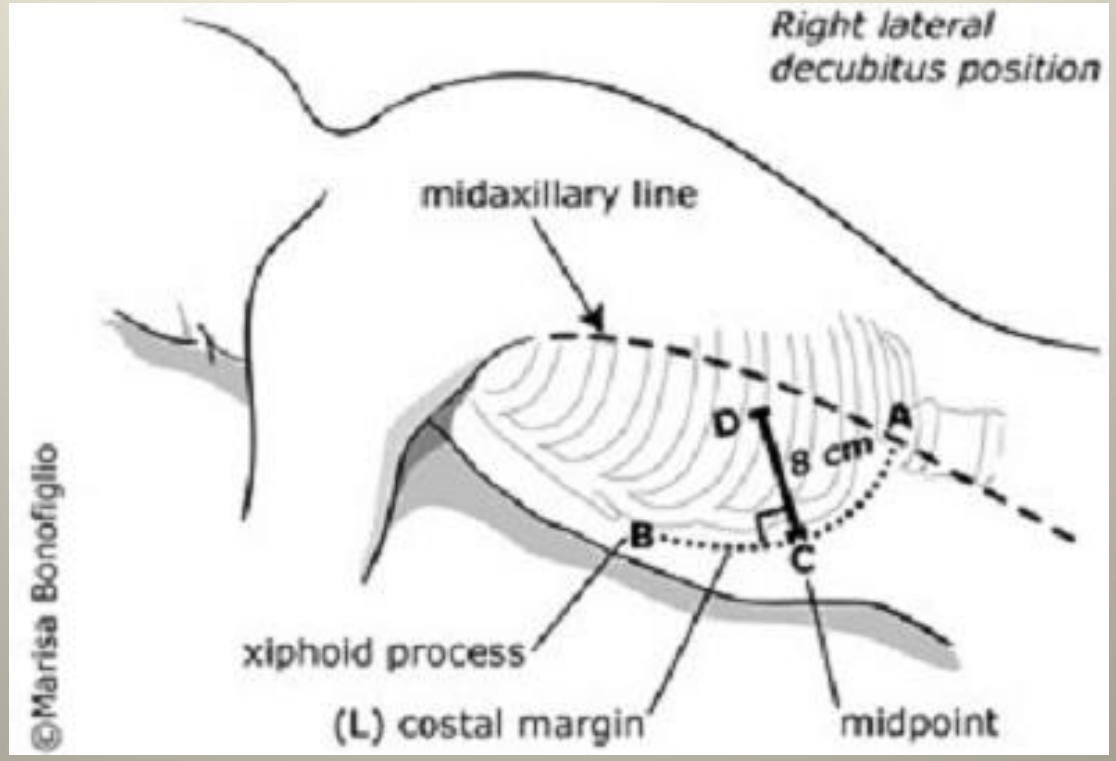

Castell's point

- **Nixon's method :**

➢ Place the patient in Right lateral decubitus Begin percussion midway along the Left costal margin.

➢ Proceed in a line perpendicular to the Left costal margin.

➢ If the upper limit of dullness extends >8 cm above the Left costal margin, this indicates possible splenomegaly.


Right lateral
decubitus position
midaxillary line
D
A
8 cm
B
C
xiphoid process
(L) costal margin
midpoint
©Marisa Bonofiglio

Kidney : while the patient is semi-sitting .

- A Normally the renal angle is resonant.
- A If renal swelling ⟹ dull

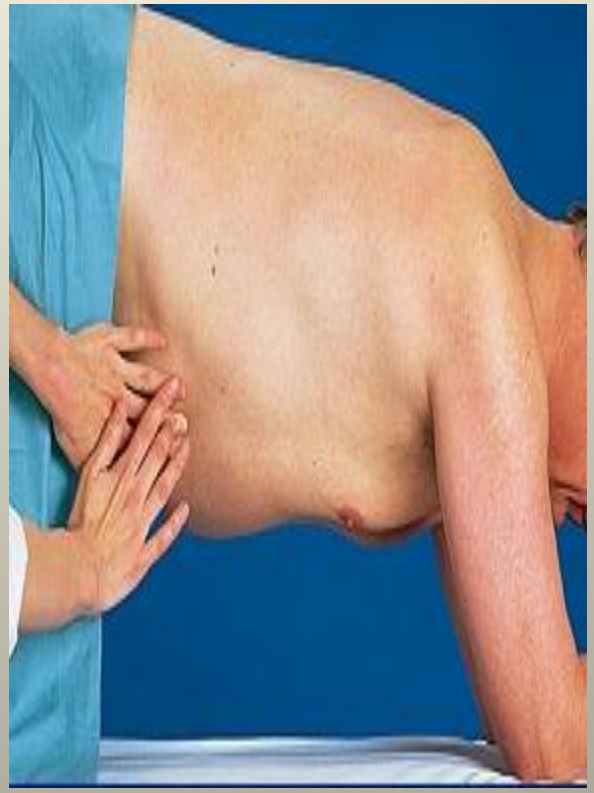
Splenomegaly	Left kidney swellings
1) Has a sharp anterior border with a notch on it.	1) Reniforn in shape
2) You can't insinuate your hand between it and the left costal margin. *(you can insinuate but you can't reach its upper border).*	2) You can insinuate your hand between it and the left costal margin.
3) It is dullness is continuous with the normal splenic fullness.	3) Its dullness is obliterated by a band of resonance (air in splenic flexure) over it
4) Gives +ve anterior ballottement.	4) Give +ve posterior ballottement.
5) Left renal angle is free	5) Fullness of the left renal angle.

Detection of ascities

- Ascites is free collection of fluid within the peritoneal cavity.

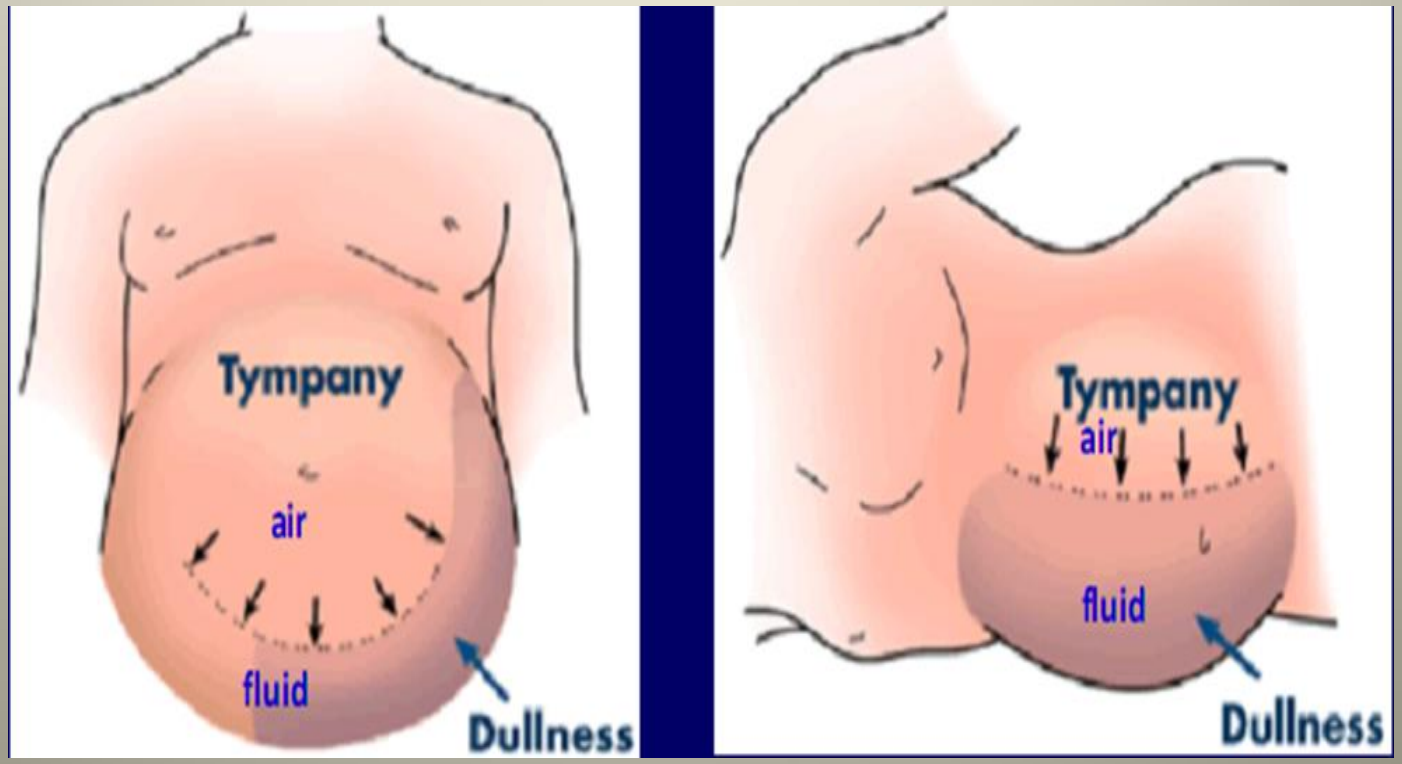
The classical signs of ascites include; abdominal distension, shifting dullness, fluid thrill.

- **Minimal ascites** (. lil):detected in the knee elbow position.
- **Moderate ascites** (> 1L): detected by the bilateral shifting dullness .
- **Tense ascites** : detected by transmitted fluid thrill "fluid wave".



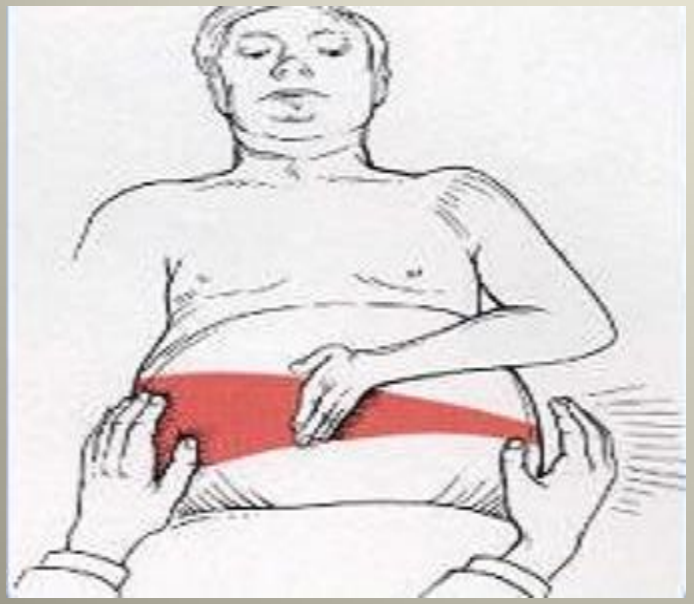
shifting dullness

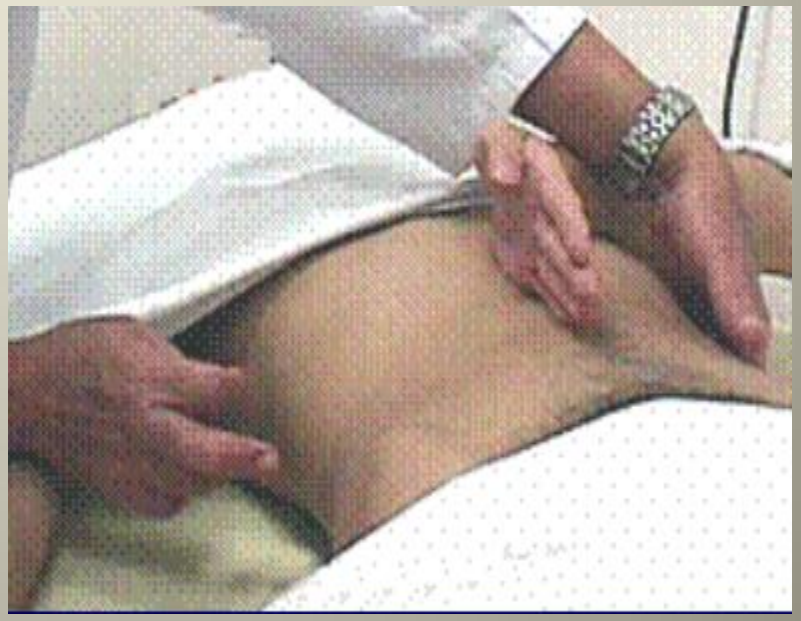
- The patient is examined in the supine position.
- Percussion is done over the abdomen, from the umbilicus to one flank.
- The spot of the transition from tympanic to dullness is detected.
- The patient is then turned to the opposite side, while the examiner keeps his hand unmoved.
- Percussion of the same spot (which is top now) gives a tympanic note.
- Note: The tympani over the umbilicus occurs in ascites because bowel floats to the top of the abdominal fluid.


Tympany
air
fluid
Dullness
Tympany
air
fluid
Dullness

Transmitted fluid thrill :

- The patient is examined in the supine position.
- The patient or an assistant places one hand in the midline and presses firmly with the ulnar border of the hand , so cut off any vibrations transmitted by the abdominal wall.
- The examiner places one palm on one flank, while giving a sharp tap with the finger tips on the opposite flank.
- Positive test: a definite wave “impulse” will be distinctly felt by the receiving hand.





THANK YOU!