

HEART SOUNDS

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INTRODUCTION

- There are four heart sounds S1, S2, S3 & S4.
- Two heart sound are audible with stethoscope S1 & S2 (Lub - Dub).
- S3 & S4 are not audible with stethoscope Under normal conditions because they are low frequency sounds. They are usually pathologic but can be physiologic.
- Ventricular Systole is between First and second Heart sound.
- Ventricular diastole is between Second and First heart sounds.

FIRST HEART SOUND (S1)

- It is produced due to the closure of Atrioventricular valves (Mitral & Tricuspid)
- It occurs at the beginning of the systole and sounds like LUB
- Frequency: 50-60 Htz
- Time: 0.15 sec

SECOND HEART SOUND (S2)

- It is produced due to the closure of Semilunar valves (Aortic & Pulmonary)
- It occurs at the end of the systole and sounds like DUB
- Frequency: 80-90 Hz
- Time: 0.12 sec
- It is short and sharp

THIRD HEART SOUND (S3)

- It occurs at the beginning of middle third of Diastole
- Cause of third heart sound – Rush of blood from Atria to Ventricle during rapid filling phase of Cardiac Cycle. It causes vibration in the blood.
- Frequency: 20-30 Htz
- Time: 0.1 sec

FOURTH HEART SOUND (S4)

- It occurs at the last one third of Diastole (just before S1).
- Cause of Fourth heart sound – Due to Atrial contraction which causes rapid flow of blood from Atria to Ventricle and vibration in the blood.
- Frequency: < 20 Htz

Note:

- Third and Fourth heart sound are low pitched sounds therefore not audible normally with stethoscope.
- S3 may be heard in children and young adults but usually pathological in old age.

HEART VALVES - SUPERIOR VIEW

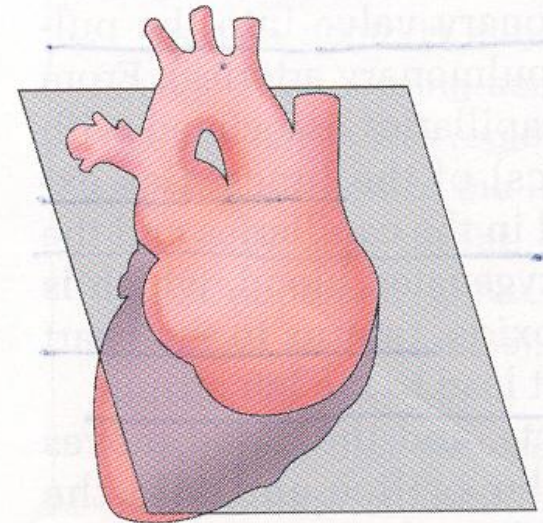
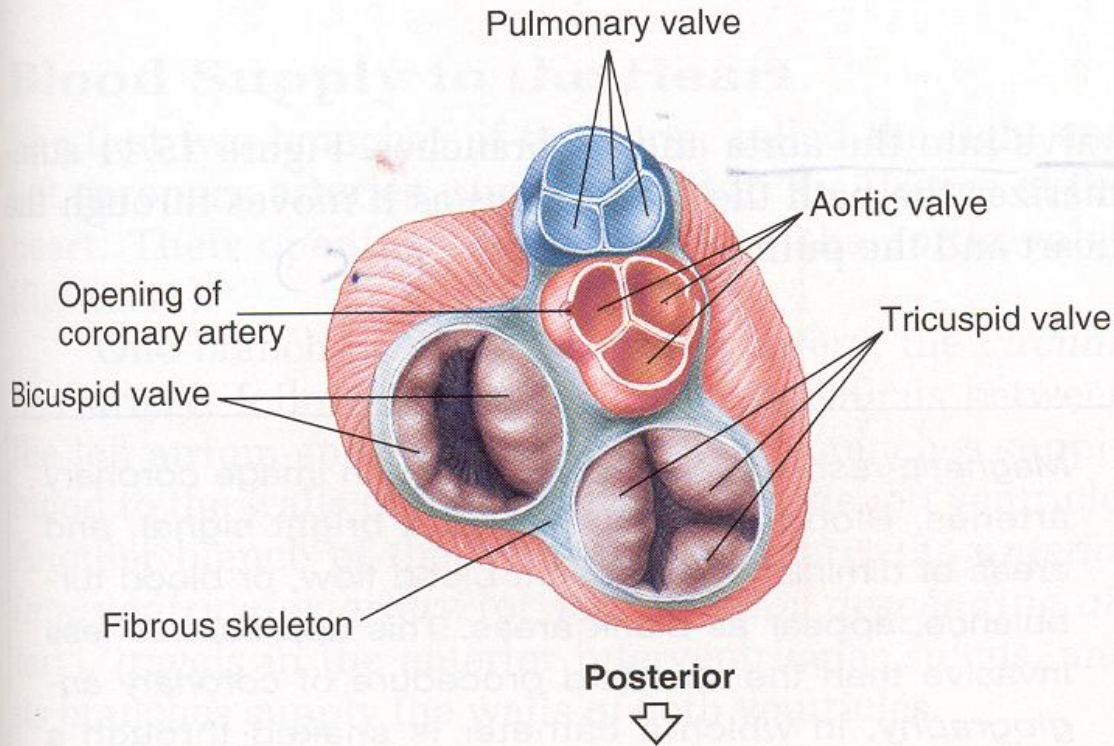
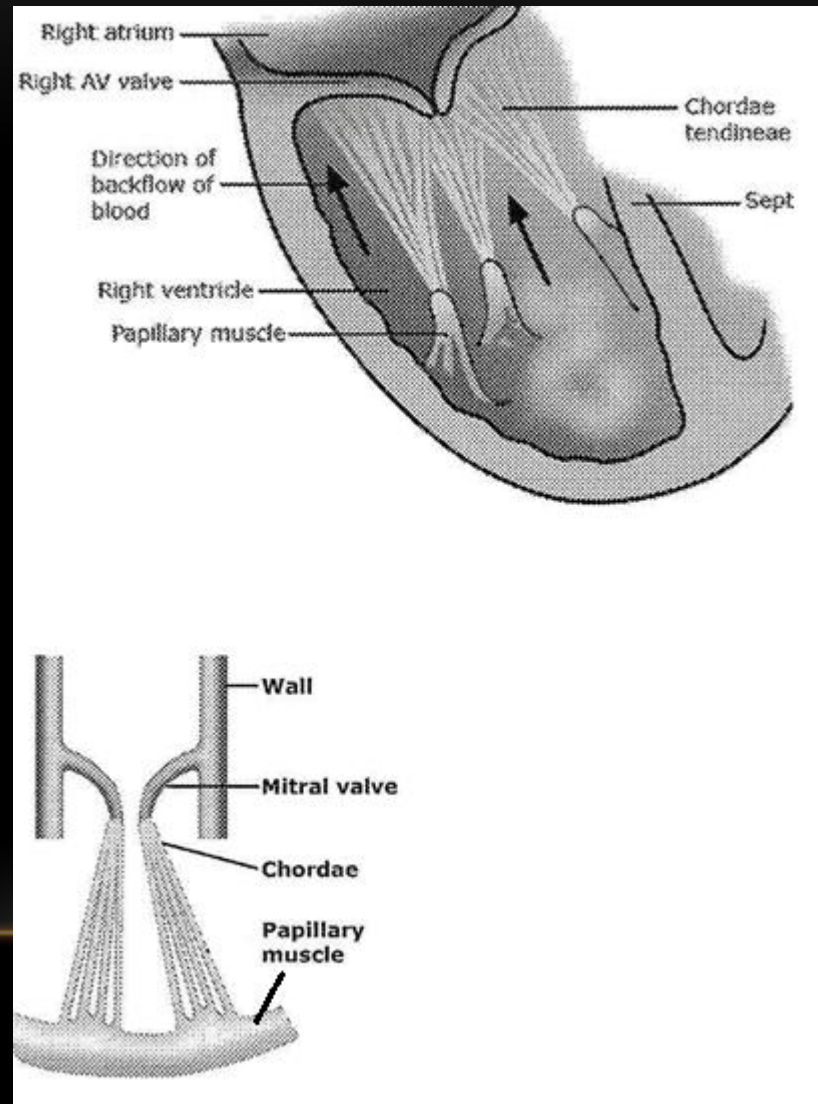


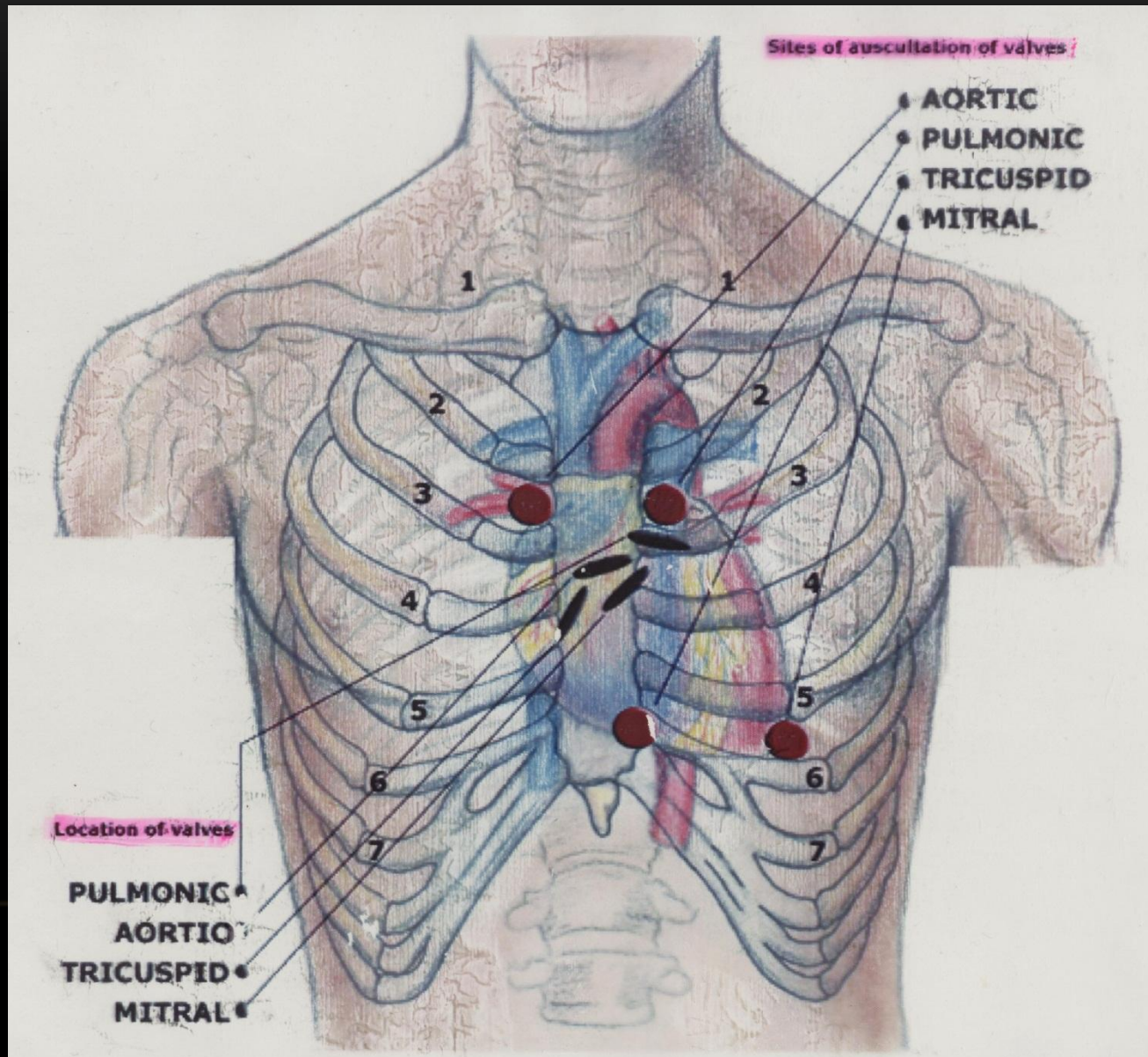
FIGURE 15.9

The skeleton of the heart consists of fibrous rings to which the heart valves are attached (superior view).

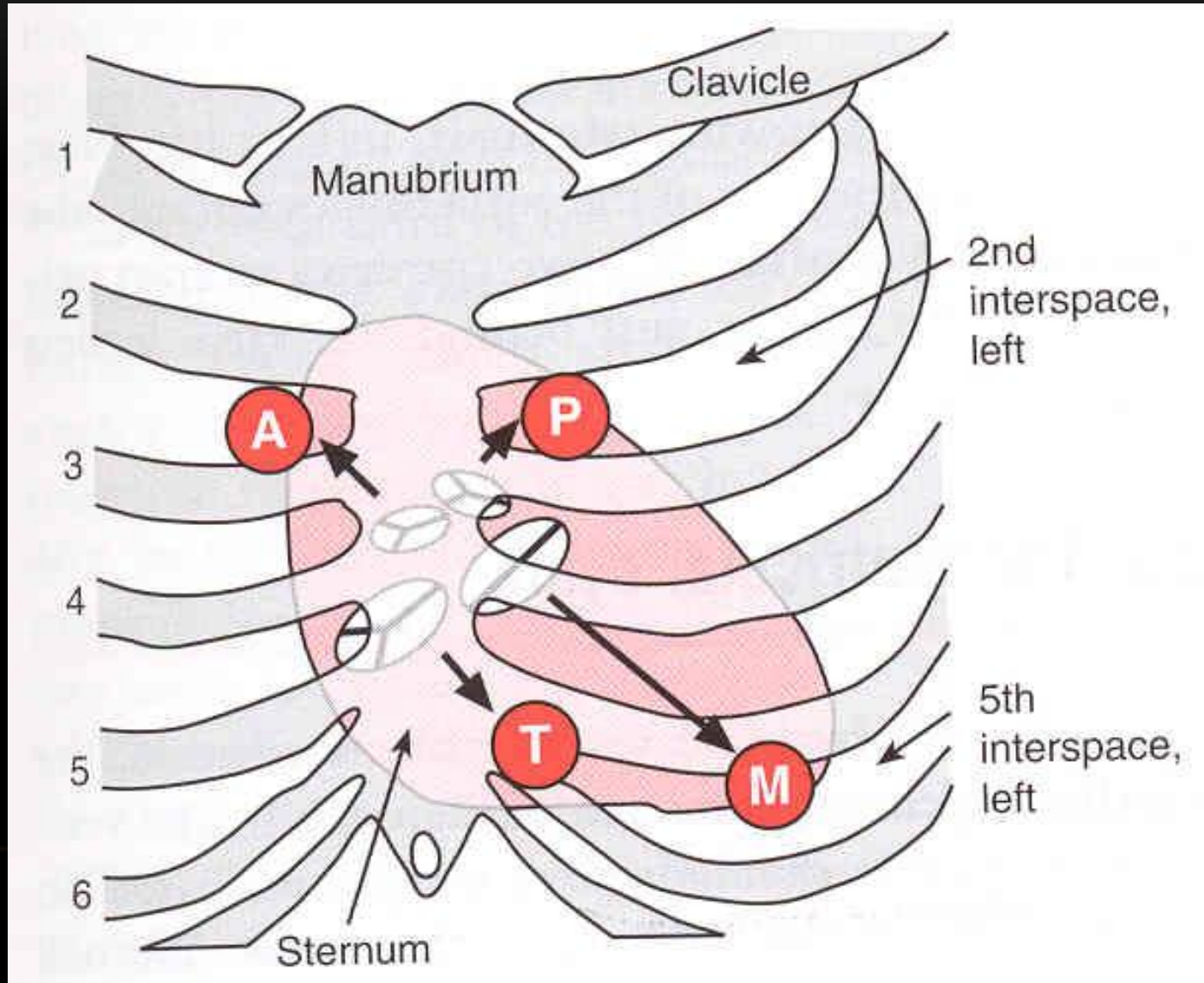
FUNCTION OF PAPILLARY MUSCLE & CHORDAE TENDINEAE

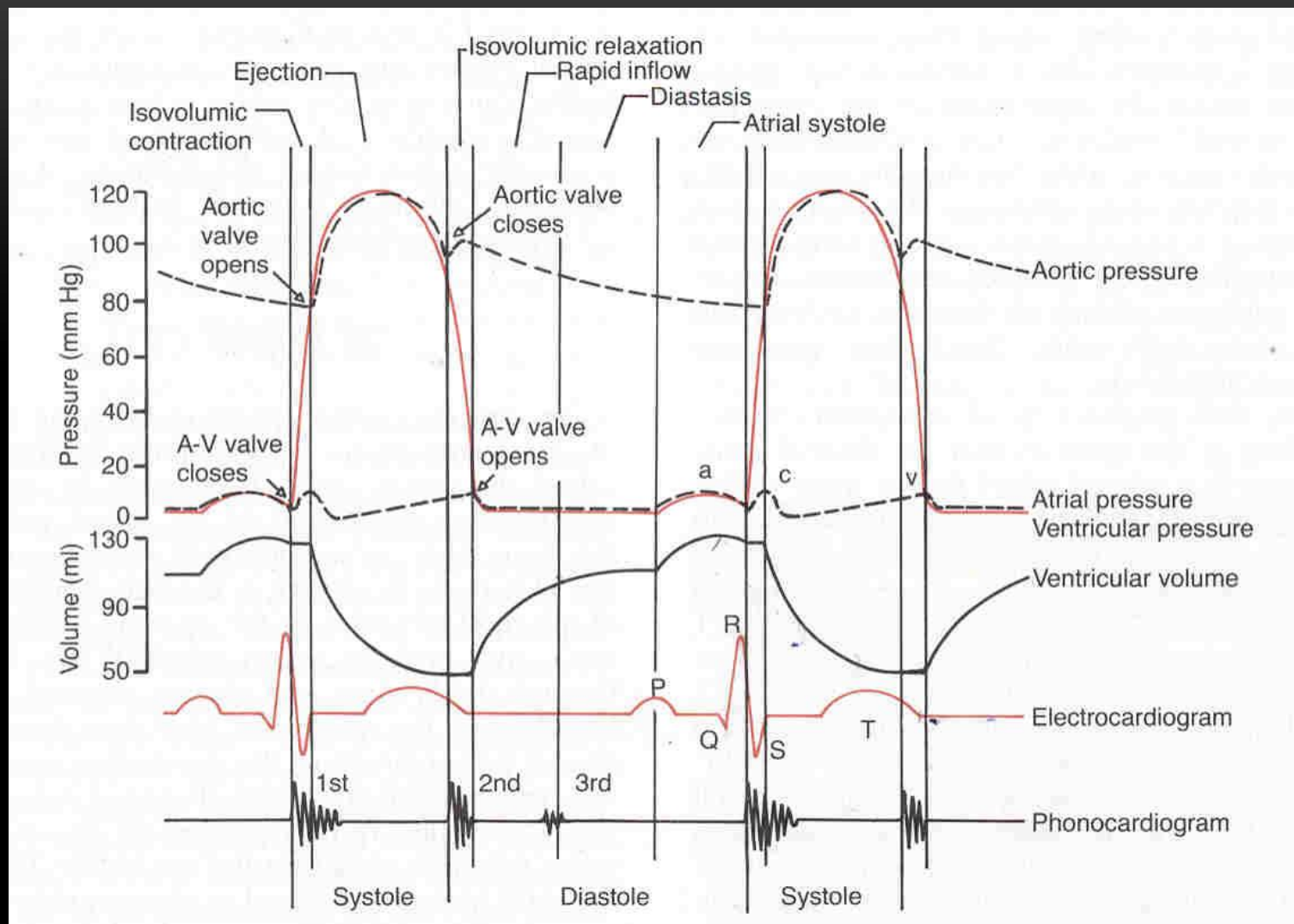


AREAS OF AUSCULTATION



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- **THE EVENTS OF THE CARDIAC CYCLE**

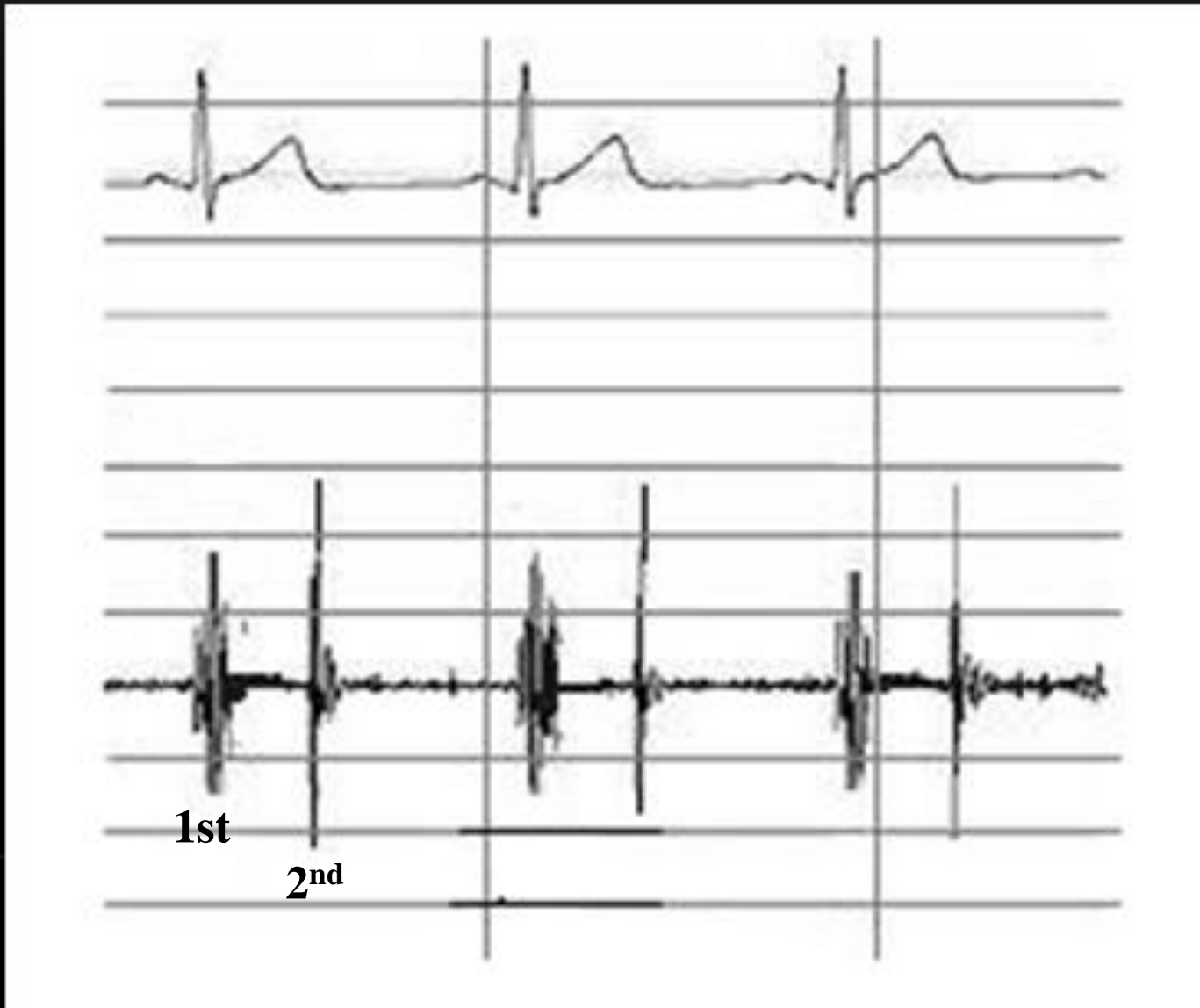
HEART MURMURS

- Murmurs are abnormal sounds produced due to abnormal blood flow e.g. (through abnormal heart valves) i.e. stenosis or incompetence (Regurgitation).

WHAT YOU SHOULD KNOW BY THE END OF THIS SEASON?

- Functions of A-V vales & Semilunar valves.
- Functions of papillary muscles.
- There are four heart sounds :
 S_1 , S_2 , S_3 , & S_4 .
- Audible with stethoscope are only S_1 & S_2 (Lub / Dub)
- Use of stethoscope.

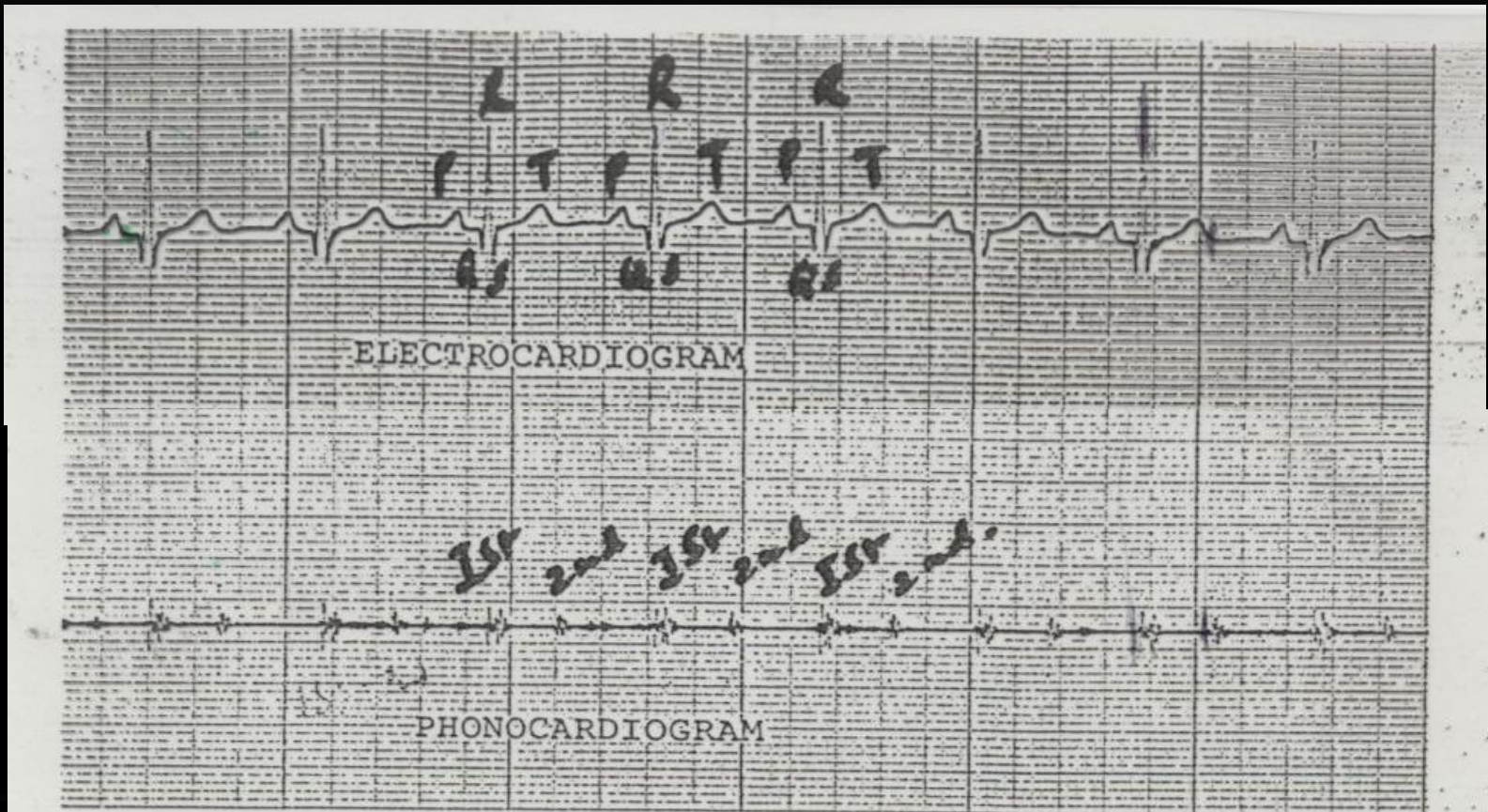
RELATIONSHIP OF HEART SOUND WITH ECG



WHAT YOU SHOULD KNOW BY THE END OF THIS SEASON? Cont...

- Places to be auscultated on the chest for heart sounds i.e. Aortic, pulmonary, Mitral & tricuspid area.
- Position of the subject while auscultation.
- Recording of heart sound – Phonocardiogram.
- Relationship of heart sound with ECG.
- Splitting of second heart sound A_2 - P_2 .
- Listening of S_3 & S_4 in physiological & pathological conditions
- Murmurs (abnormal heart sounds).

RELATIONSHIP OF HEART SOUND WITH ECG Cont...



SPLITTING OF SECOND HEART SOUND (A₂-P₂.)

- Physiologic splitting of the 2nd heart sound occurs during deep inspiration when the A₂ component splits from the P₂ component by more than 0.2 seconds.

THANK YOU
