

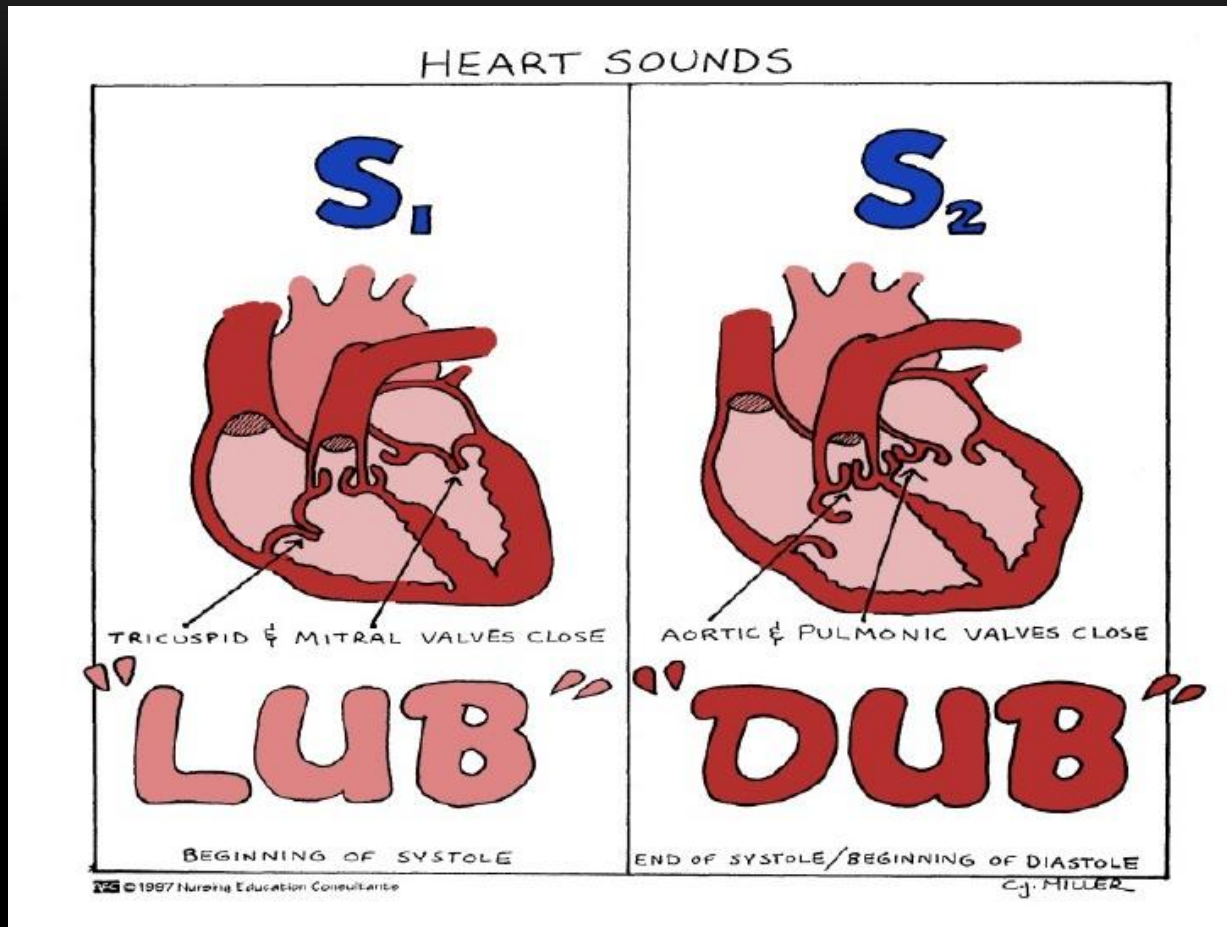
HEART SOUNDS

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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.

MAJOR HEART SOUNDS



- Beginning of systole.
- Long and Low frequency.

- Beginning of Diastole.
OR (End of Systole)
- Short and Sharp.

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
- S3 may be heard in children and lean young adults but usually pathological in old age.

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
- S4 may be heard in the elderly but usually pathologic in the young adults.

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- Note:
 - Third and Fourth heart sound are low pitched sounds therefore not audible normally with stethoscope.

HEART VALVES - SUPERIOR VIEW

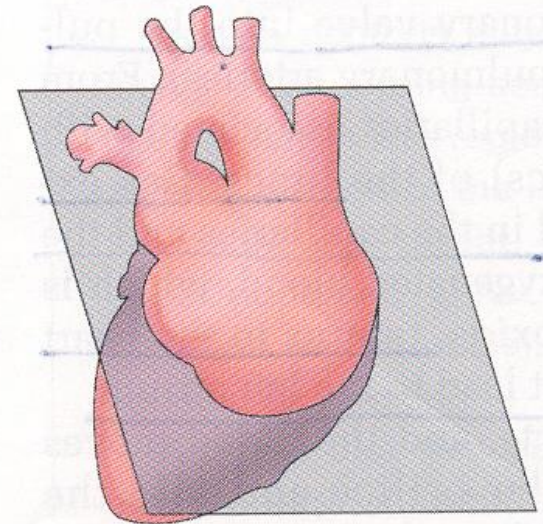
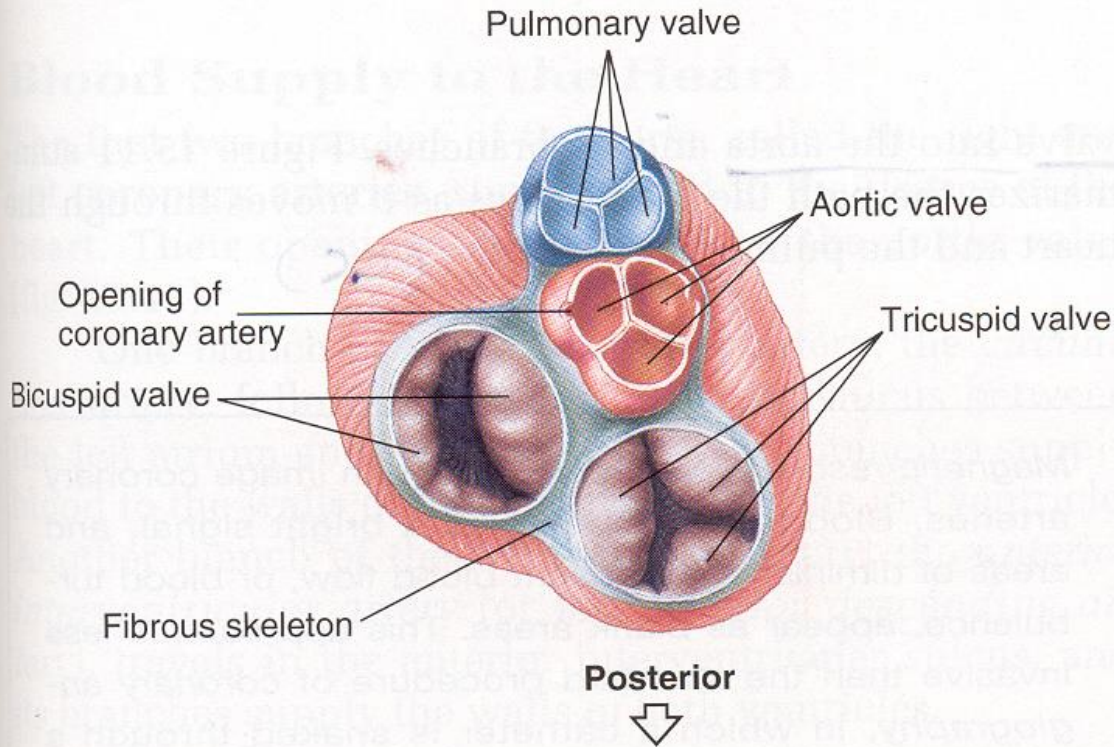
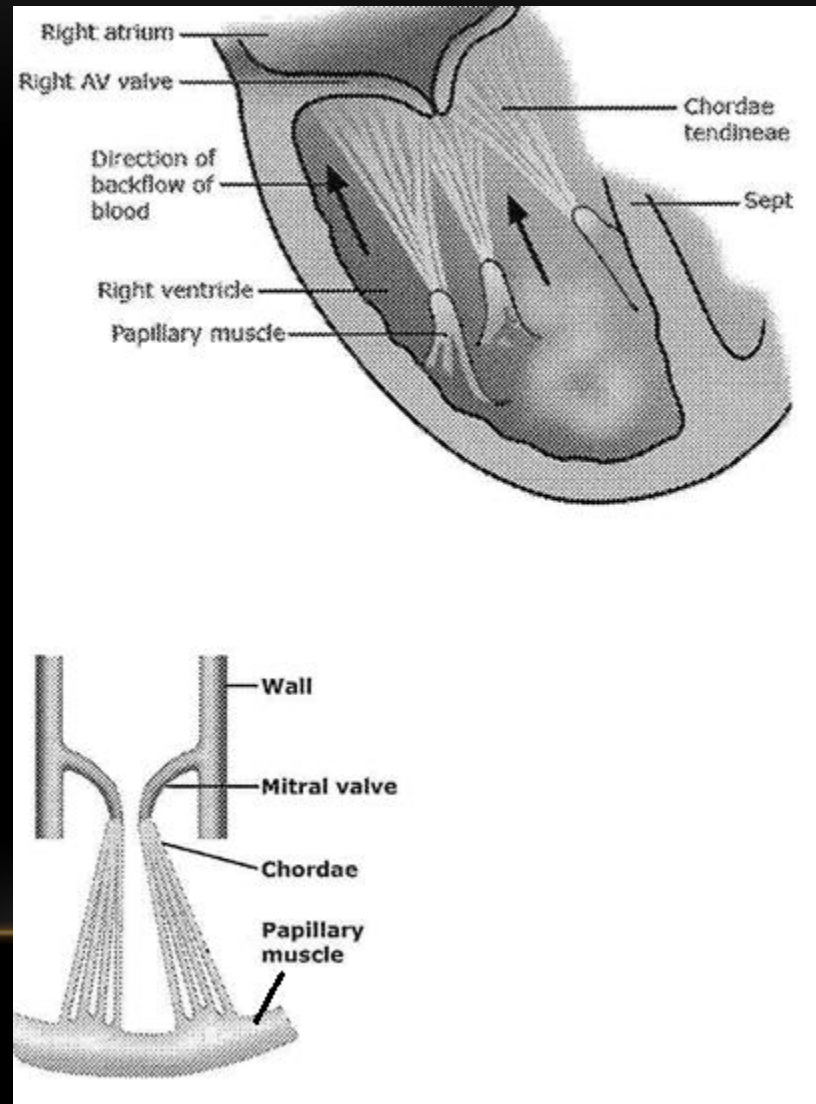


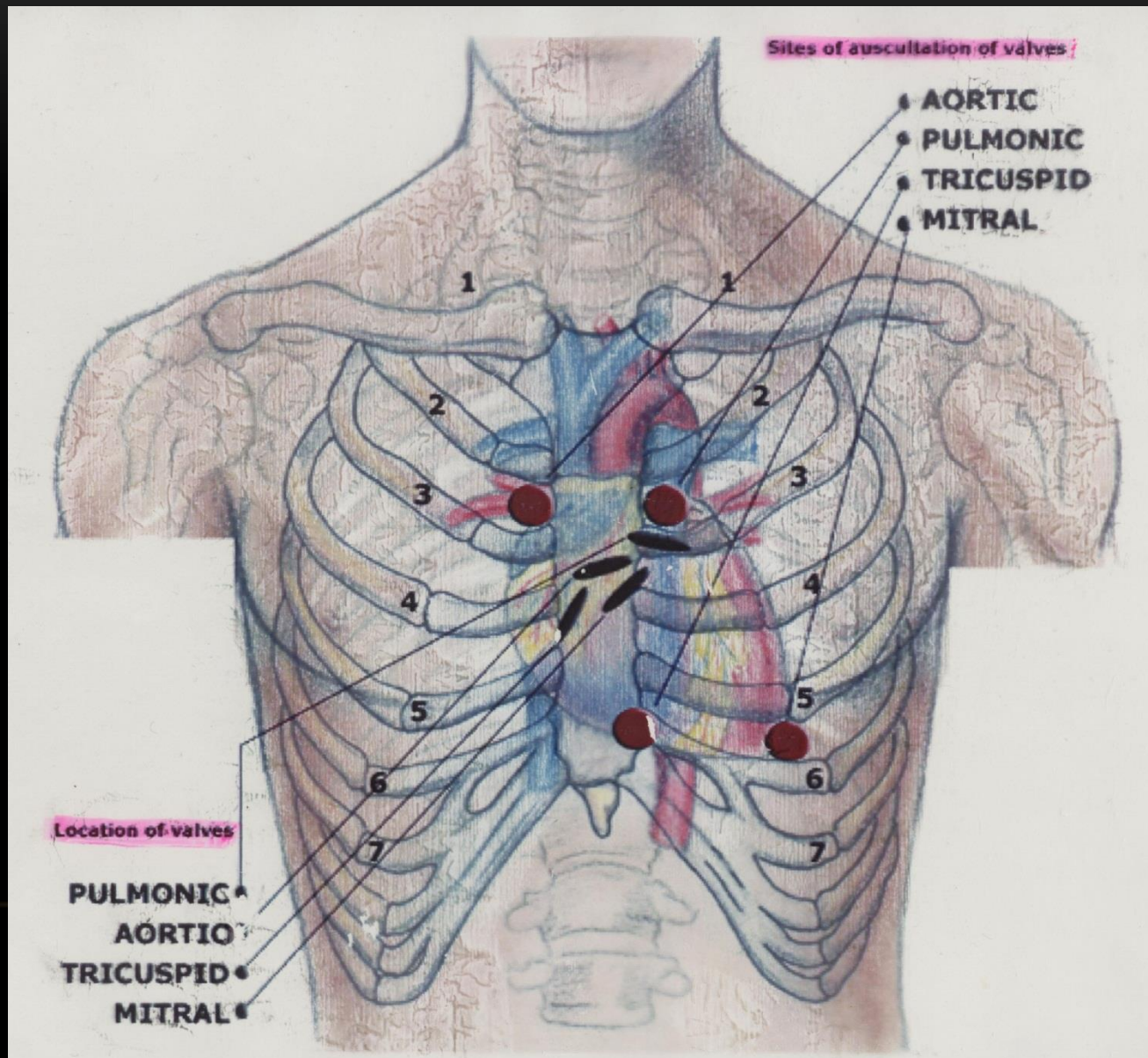
FIGURE 15.9

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

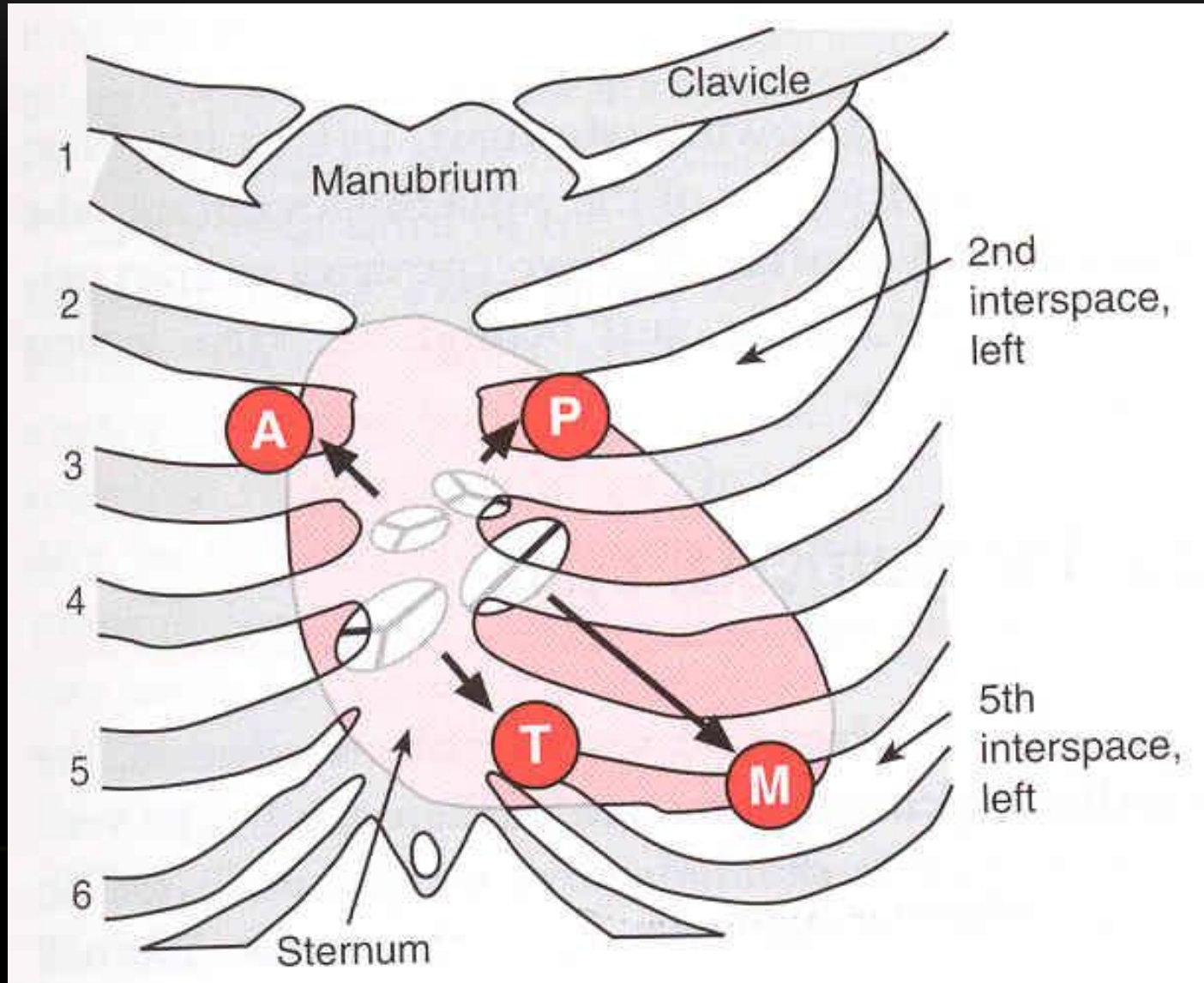
FUNCTION OF PAPILLARY MUSCLE & CHORDAE TENDINEAE

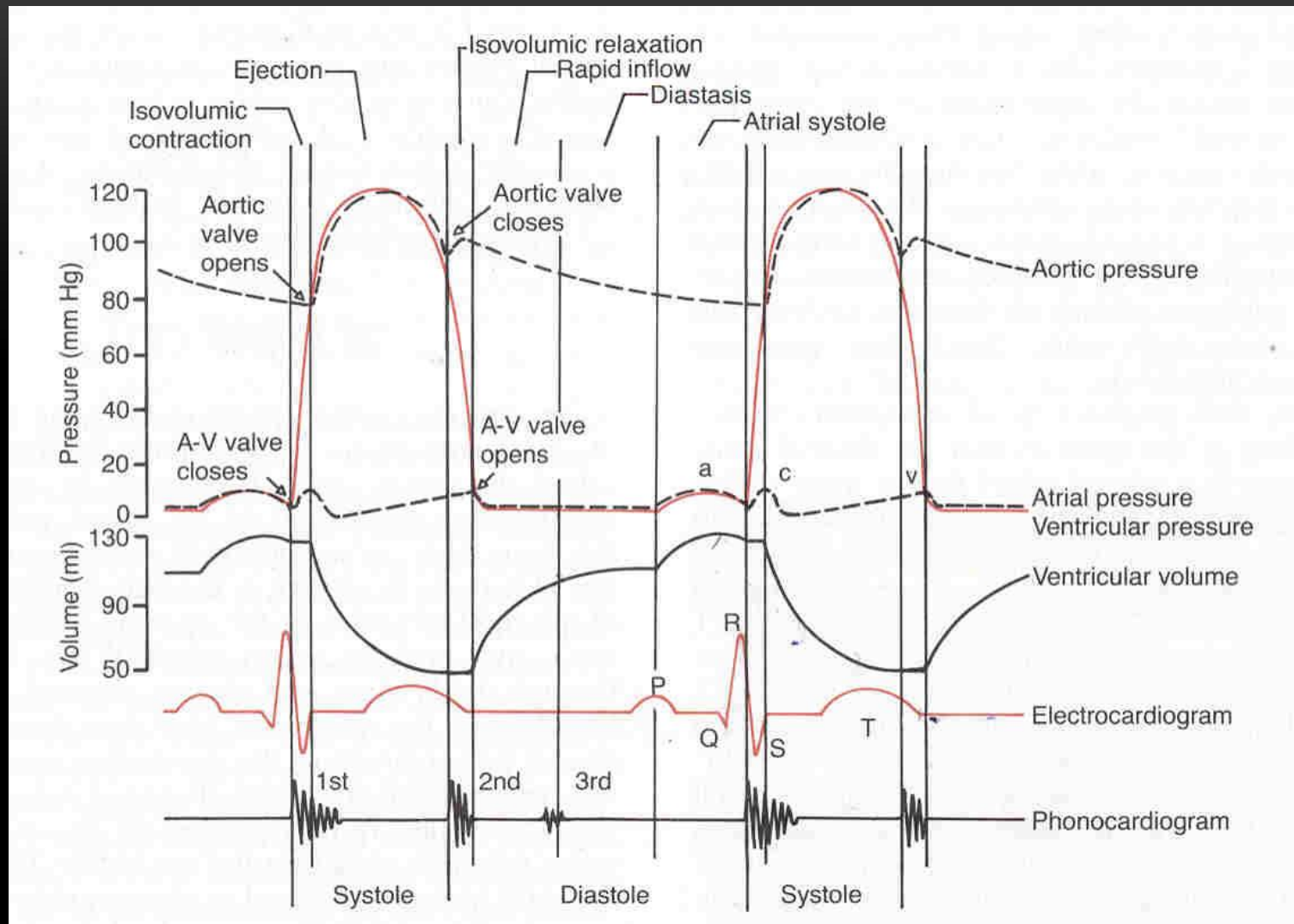


AREAS OF AUSCULTATION



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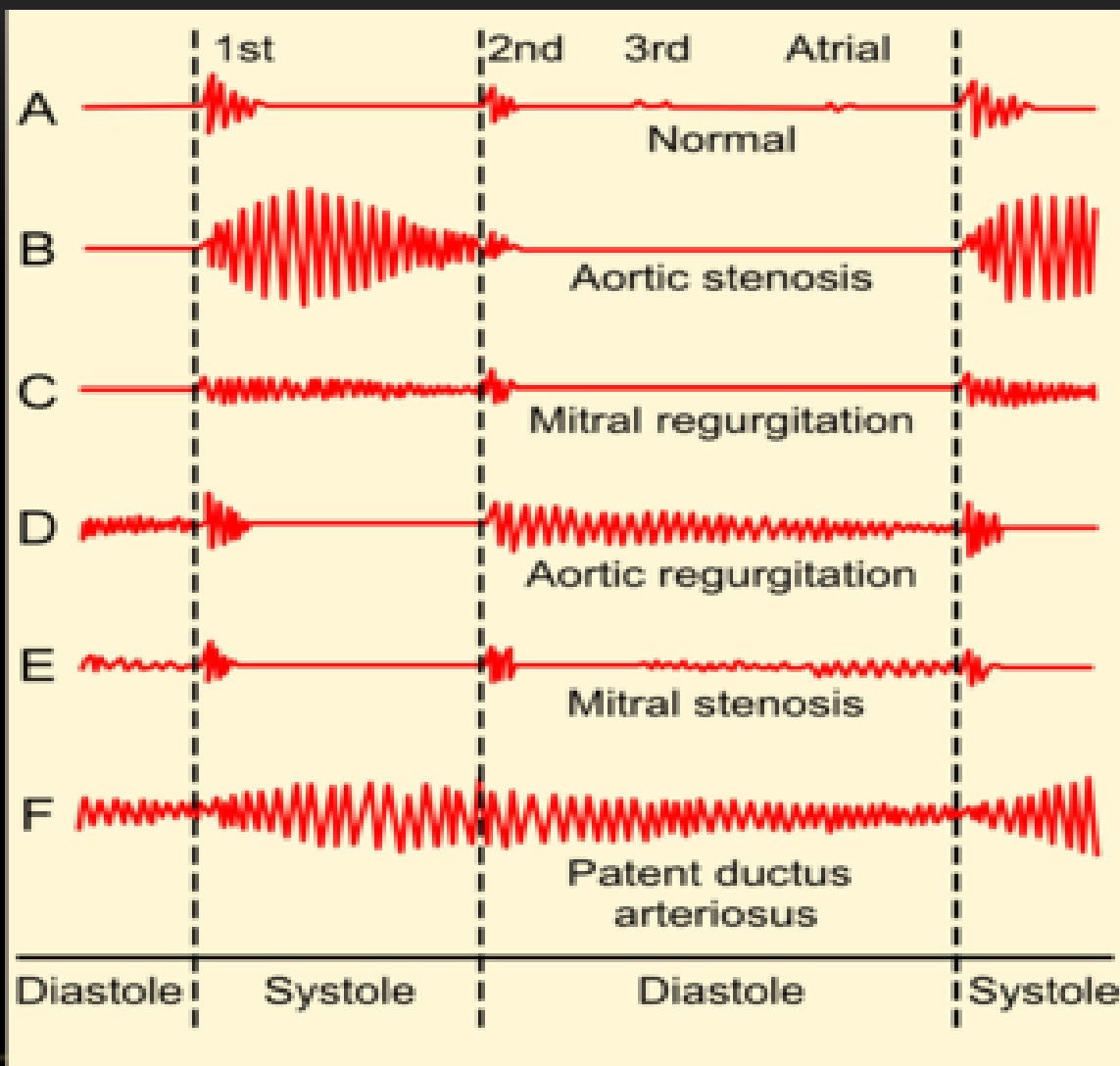


- **THE EVENTS OF THE CARDIAC CYCLE**

HEART MURMURS

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

MURMURS



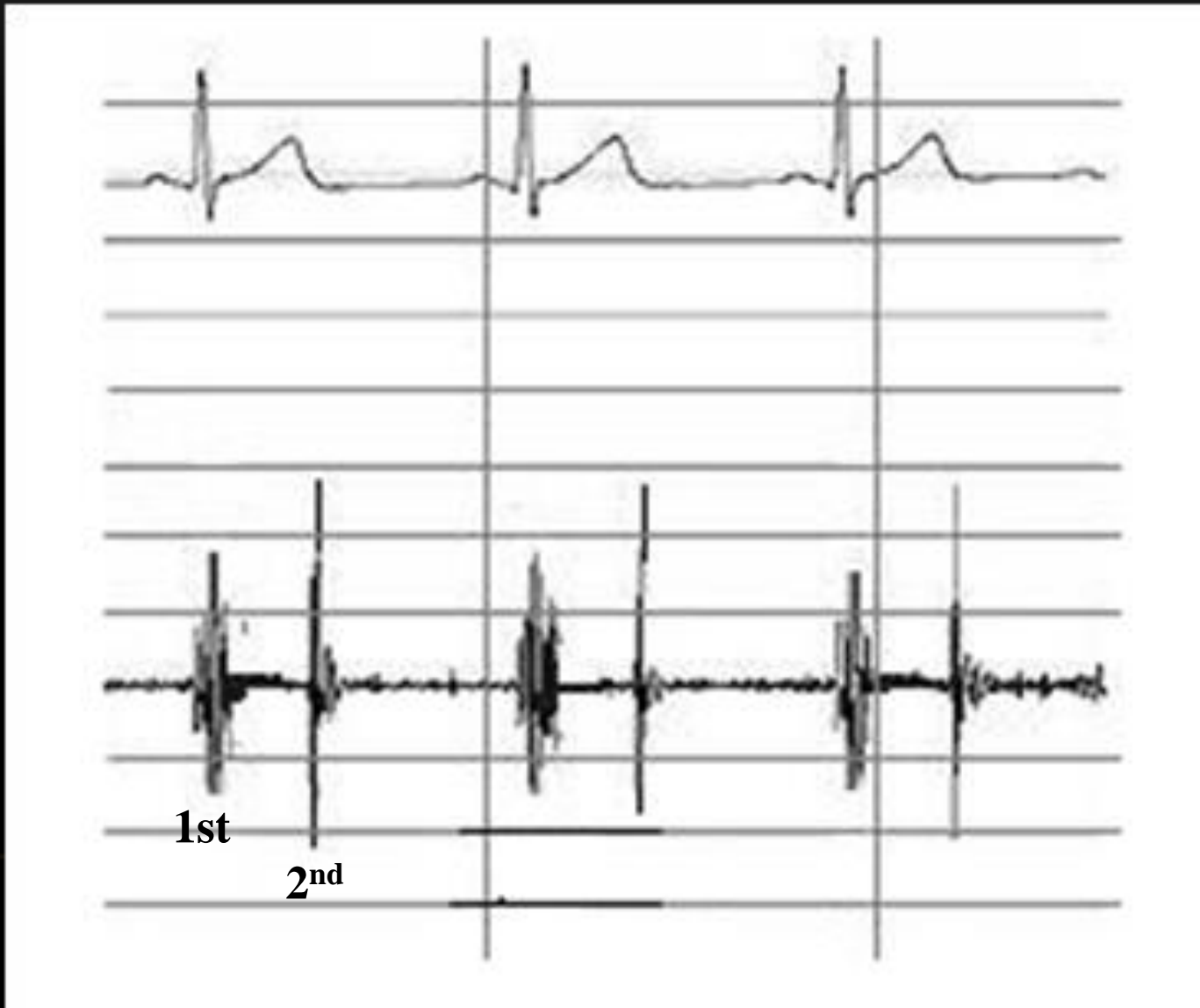
Phonocardiograms from normal and abnormal heart sounds

MURMERS IN VALVULAR LESSIONS

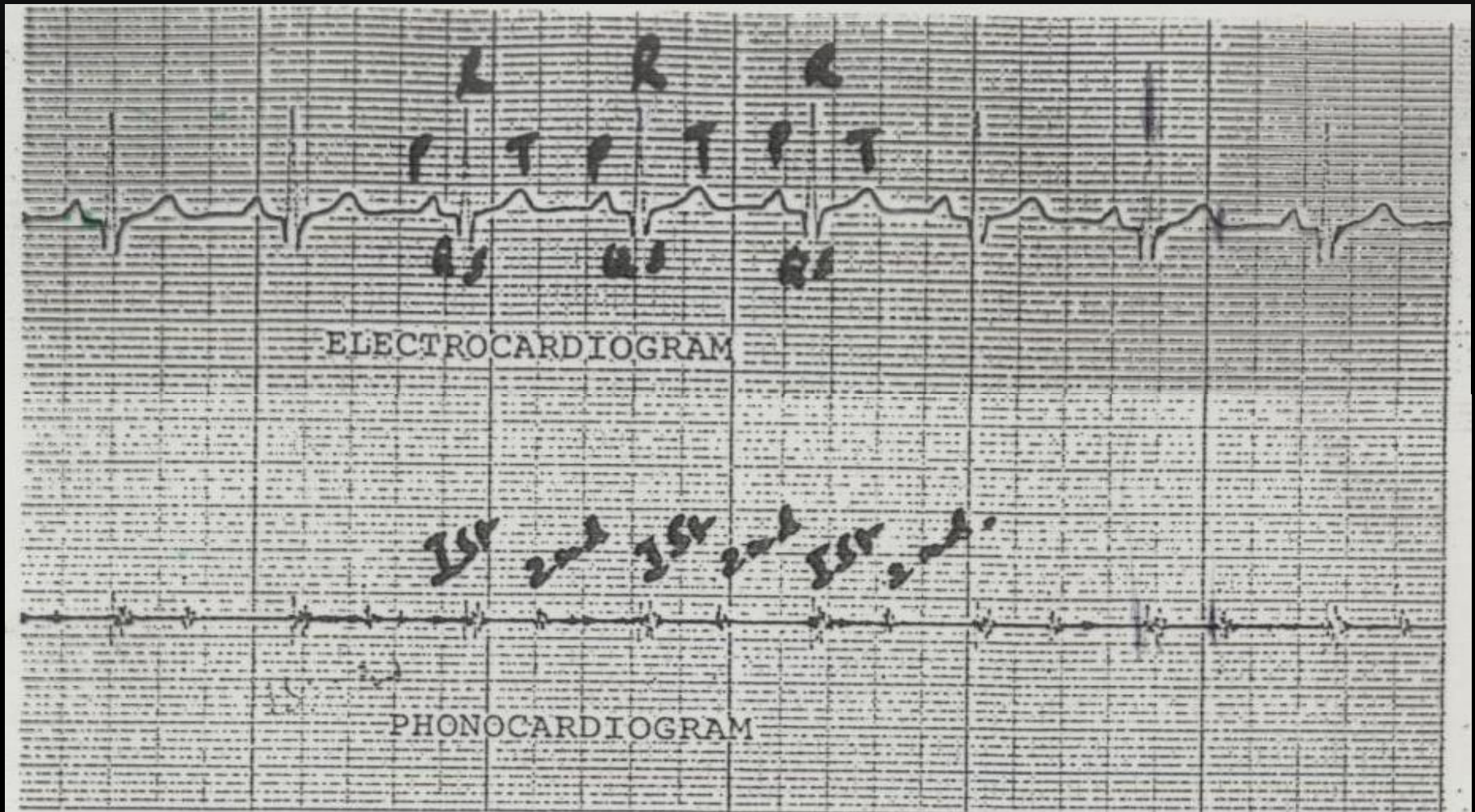
(AUSCULTATORY LOCALIZATION)

MURMERS	SYSTOLIC	DIASTOLIC
STENOSIS	AORTIC	MITRAL
	PULMONARY	TRICUSPID
REGURGITATION	MITRAL	AORTIC
	TRICUSPID	PULMONARY

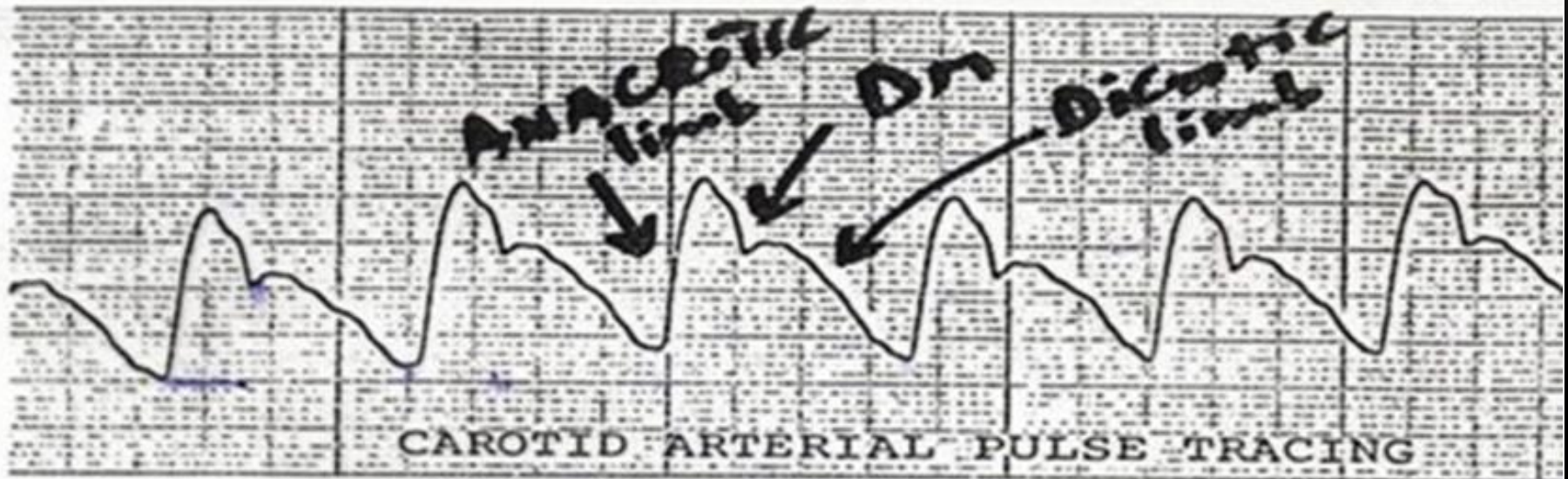
RELATIONSHIP OF HEART SOUND WITH ECG



RELATIONSHIP OF HEART SOUND WITH ECG Cont...



RELATIONSHIP OF HEART SOUND WITH THE PULSES



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.

WHAT YOU SHOULD KNOW BY THE END OF THIS SEASON?

- Functions of A-V valves & 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.

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 and the Pulses.
- Splitting of second heart sound A_2 - P_2 .
- Listening of S_3 & S_4 in physiological & pathological conditions
- Murmurs (abnormal heart sounds).

THANK YOU
