



Kazakh-Russian Medical University

Independent Work

Theme: The heart sounds

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# PLAN

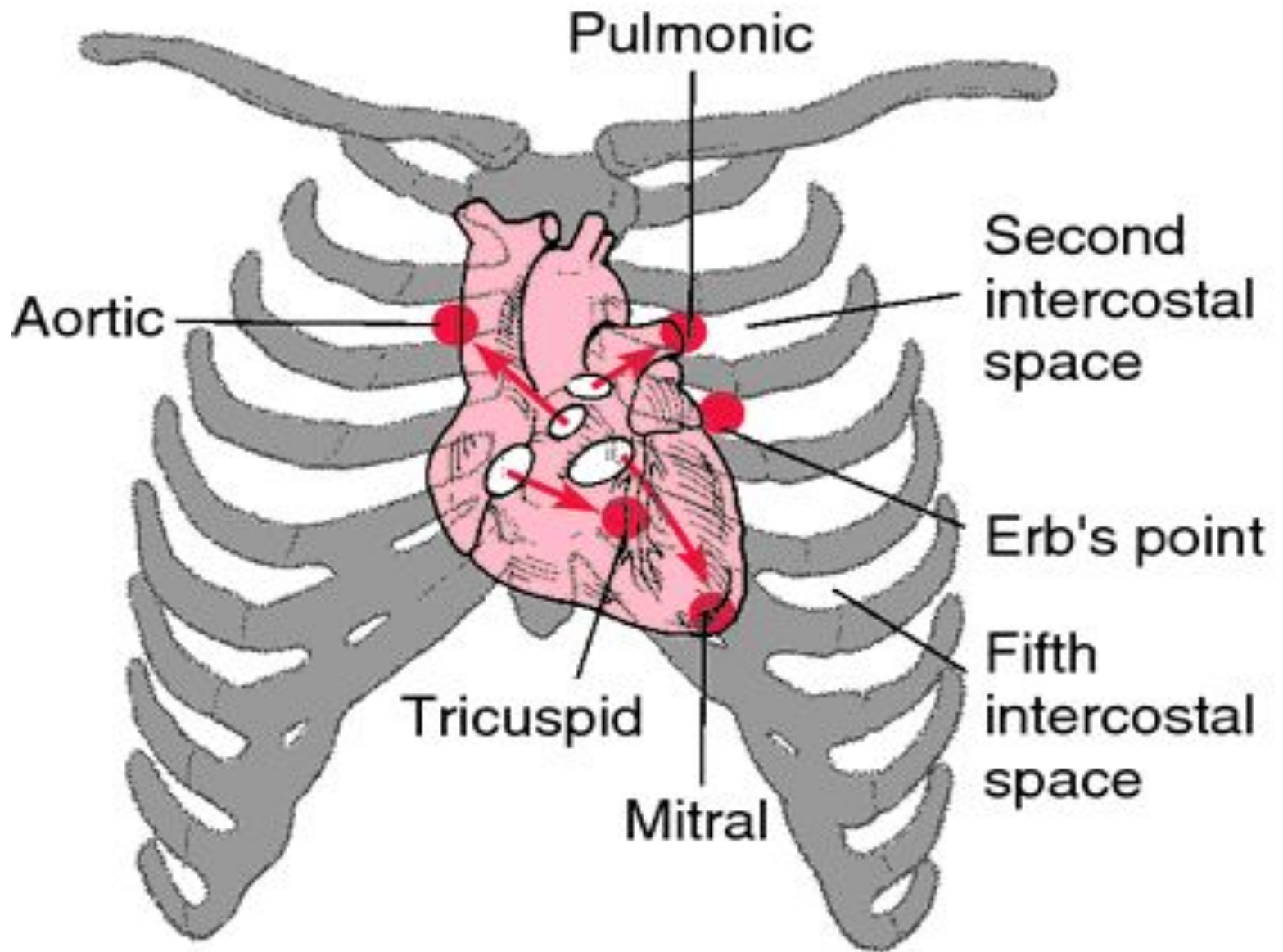
- The heart sounds
- The First Heart Sound (S1)
- The Second Heart Sound (S2)
- Extra Heart Sounds


# The heart sounds

Heart sounds are produced from a specific cardiac event such as closure of a valve or tensing of a chordae tendineae. Many pathologic cardiac conditions can be diagnosed by auscultation of the heart sounds. Note that heart sounds are discrete, short audible events from a specific cause which differs from a heart murmur.




A murmur is due to turbulence of blood flow and can at times encompass all of systole or diastole. The main normal heart sounds are the S1 and the S2 heart sound. The S3 can at times be normal, however may be pathologic. An S4 heart sound is almost always pathologic. Heart sounds can be described by their intensity, pitch, location, quality, and timing in the cardiac cycle.



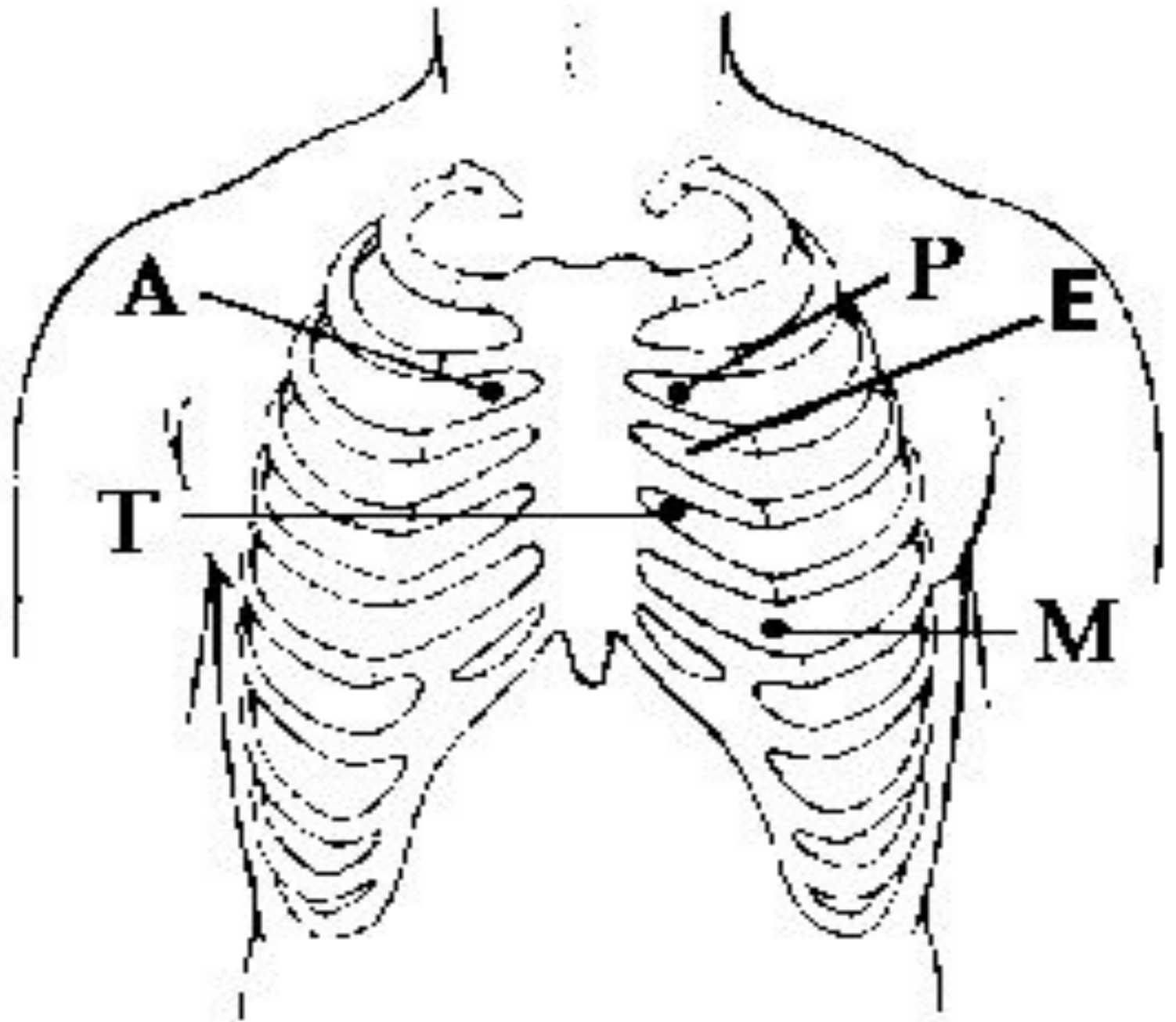


Intensity: Heart sounds can be described as increased in intensity (loud), decreased in intensity (soft) or absent.

Pitch: Heart sounds can be described as either high pitched (heard best with the diaphragm of the stethoscope).



Location: The location of the heart sound can help determine the etiology. The standard listening posts (aortic, pulmonic, tricuspid and mitral) apply to both heart sounds and murmurs. For example, the S1 heart sound which consists of mitral and tricuspid valve closure is best heard at the tricuspid (left lower sternal border) and mitral (cardiac apex) listening posts.



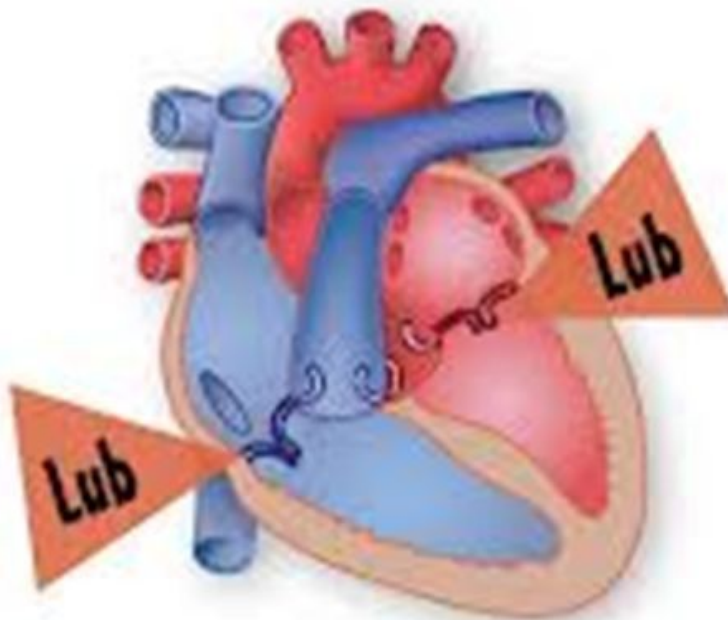


# The First Heart Sound (S1)

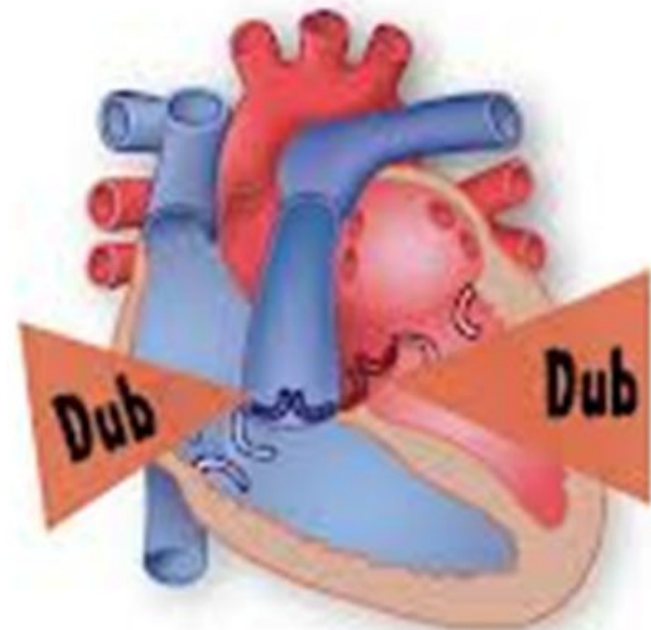
The first heart sound results from the closing of the mitral and tricuspid valves. The sound produced by the closure of the mitral valve is termed M1 and the sound produced by closure of the tricuspid valve is termed T1. The M1 sound is much louder than the T1 sound due to higher pressures in the left side of the heart, thus M1 radiated to all cardiac listening posts (loudest at the apex) and T1 is usually only heard at the left lower sternal border. The M1 sound is thus the main component of S1.

## Auscultate Heart Sounds: S1 & S2

Normal Heart "Lub"



Normal Heart "Dub"

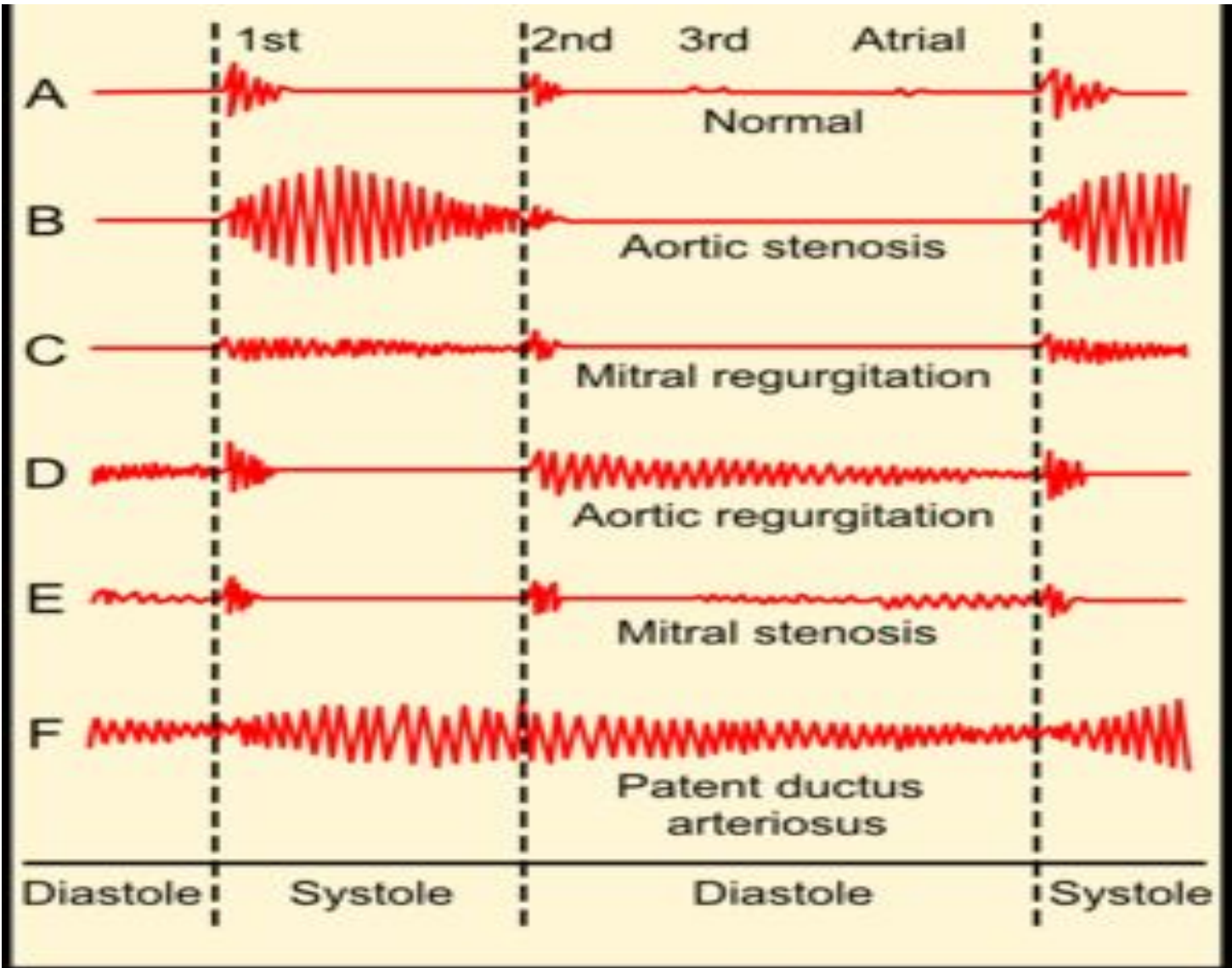


# The Second Heart Sound (S2)

The second heart sound is produced by the closure of the aortic and pulmonic valves. The sound produced by the closure of the aortic valve is termed A2 and the sound produced by the closure of the pulmonic valve is termed P2. The A2 sound is normally much louder than the P2 due to higher pressures in the left side of the heart, thus A2 radiates to all cardiac listening posts (loudest at the right upper sternal border) and P2 is usually only heard at the left upper sternal border. The A2 sound is thus the main component of S2.

# Extra Heart Sounds

There are a few common extra heart sounds that the clinician may encounter. These include ejection sounds that occur with pulmonic or aortic valve stenosis which are heard in early systole, "clicks" that are heard in mitral or tricuspid valve prolapse occurring later in systole, knocks and plops.



Phonocardiograms from normal and abnormal heart sounds

# Questions

1. With the help of what is diagnosed pathological heart disease?(listening to heart sounds)
2. As always it called abnormal heart sound?(S4)
3. What is the main and normal heart sounds?(S1 S2)
4. How to help the location of the sound of the heart?(determine the etiology)
5. What is the primary valves of the heart sounds?(It consists of the mitral and tricuspid)
6. What is the noise produced by the closing of the mitral valve?(M1 and sound)
7. What valves are made of the second heart sound?(aortic and pulmonary valves)
8. What sound is the main component for primary heart sounds?(S1)
9. What is the noise produced by closure of the aortic valve?(A2)
10. At what time extra heart sounds are heard?