جامعة ساوة الاهلية
كلية التقنيات الصحية والطبية
قسم التخدير - اللجنة العلمية

SAWA UNIVERSITY

PHYSIOLOGY APPLIED
HEART SOUNDS

جامعة ساوة

كلية التقنيات الصحية والطبية

قسم تقنيات التخدير

المرحلة (الثانية)

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The aim of this test

Heart sounds resulting from the opening and closing of the valves and the fluctuation of the walls of the heart and major blood vessels, as well as the strength, frequency and shape of the noise, help the doctor to conclude the presence of a special valve disease (stenosis, or insufficiency of the valve) to distinguish it, evaluate its severity, and in some cases evaluate the condition of the heart musclE

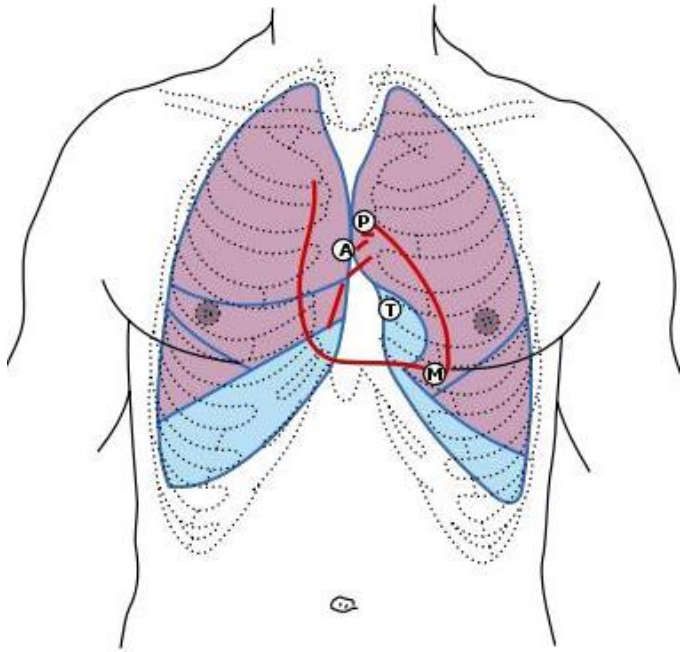
Heart sounds

Front of thorax, showing surface relations of bones, lungs (purple), pleura (blue), and heart (red outline). Heart valves are labeled with "M", "T", "A", and "P".

First heart sound: caused by atrioventricular valves - Mitral (M) and Tricuspid (T).

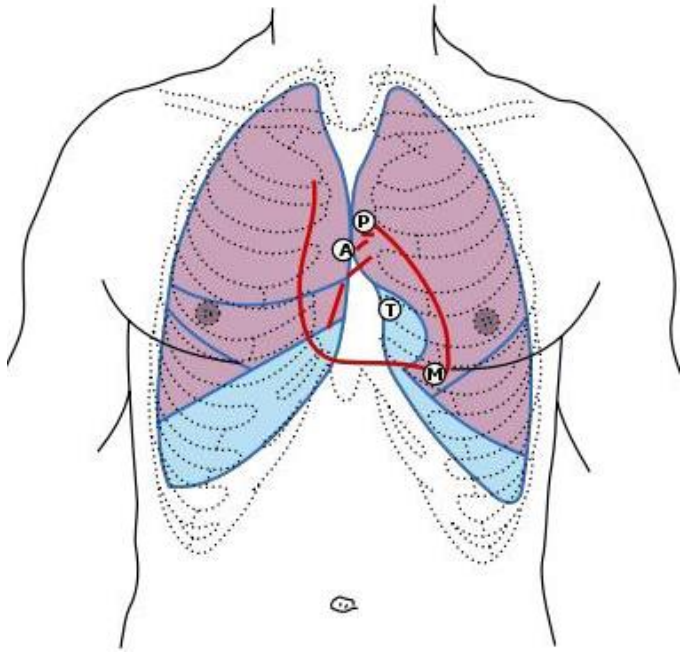
Second heart sound caused by semilunar valves -- Aortic (A) and Pulmonary/Pulmonic (P).

The heart sounds are the noises (sound) generated by the beating heart and the resultant flow of blood through it. This is also called a heartbeat. In cardiac auscultation, an examiner uses a stethoscope to listen for these sounds, which provide important information about the condition of the heart.



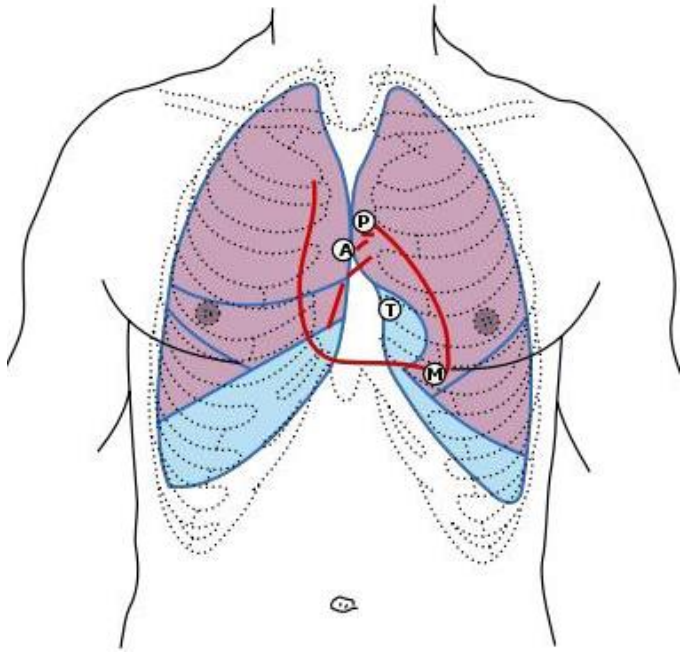
Heart sounds

In healthy adults, there are two normal heart sounds often described as a *lub* and a *dub* (or *dup*), that occur in sequence with each heart beat. These are the first heart sound (S_1) and second heart sound (S_2), produced by the closing of the AV valves and semilunar valves respectively. In addition to these normal sounds, a variety of other sounds may be present including *heart murmurs*, *adventitious sounds*, and gallop rhythms S_3 and S_4.



Heart murmurs

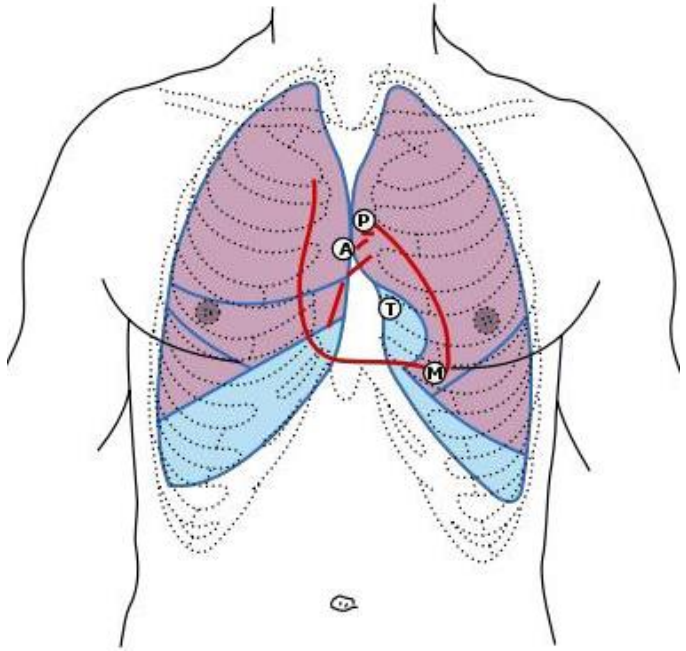
Heart murmurs are generated by turbulent flow of blood, which may occur inside or outside the heart. Murmurs may be *physiological* (benign) or *pathological* (abnormal). Abnormal murmurs can be caused by stenosis restricting the opening of a heart valve, resulting in turbulence as blood flows through it. Abnormal murmurs may also occur with valvular *insufficiency* (or *regurgitation*), which allows backflow of blood when the incompetent valve closes with only partial effectiveness. Different murmurs are audible in different parts of the cardiac cycle, depending on the cause of the murmur.



Normal heart sounds

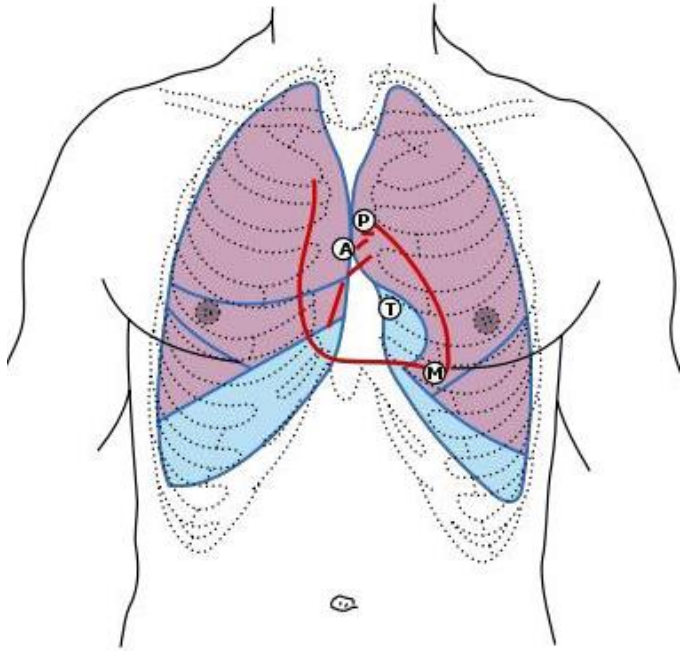
S_1

The first heart tone, or S_1, forms the "lubb" of "lubb-dub" or "lubb-dup" and is composed of components M_1 and T_1. Normally M_1 precedes T_1 slightly. It is caused by the sudden block of reverse blood flow due to closure of the atrioventricular valves, i.e. mitral and tricuspid, at the beginning of ventricular contraction, or systole. When the ventricles begin to contract, so do the papillary muscles in each ventricle. The papillary muscles are attached to the tricuspid and mitral valves via chordae tendineae, which bring the cusps of the valve closed (chordae tendineae also prevent the valves from blowing into the atria as ventricular pressure rises due to contraction).



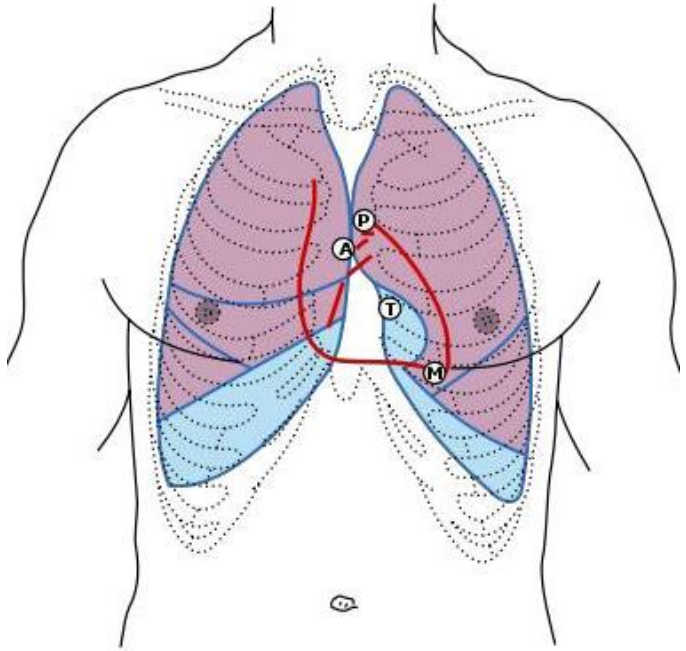
S_1

The closing of the inlet valves prevents regurgitation of blood from the ventricles back into the atria. The S_1 sound results from reverberation within the blood associated with the sudden block of flow reversal by the valves. If T_1 occurs more than slightly after M_1, then the patient likely has a dysfunction of conduction of the right side of the heart such as a Right bundle branch block.



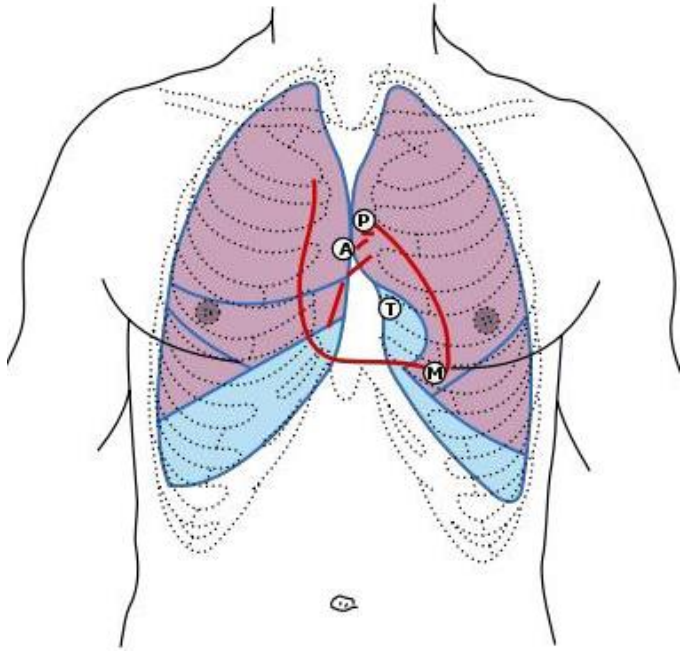
S_2

The second heart tone, or S_2, forms the "dub" of "lubb-dub" or "lubb- dup" and is composed of components A_2 and P_2. Normally A_2 precedes P_2 especially during inspiration when a split of S_2 can be heard. It is caused by the sudden block of reversing blood flow due to closure of the aortic valve and pulmonary valve at the end of ventricular systole, i.e. beginning of ventricular diastole.



S_2

the left ventricle empties, its pressure falls below the pressure in the aorta, aortic blood flow quickly reverses back toward the left ventricle, catching the aortic valve leaflets and is stopped by aortic (outlet) valve closure. Similarly, as the pressure in the right ventricle falls below the pressure in the pulmonary artery, the pulmonary (outlet) valve closes. The S_2 sound results from reverberation within the blood associated with the sudden block of flow reversal



THANK YOU

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