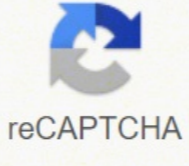




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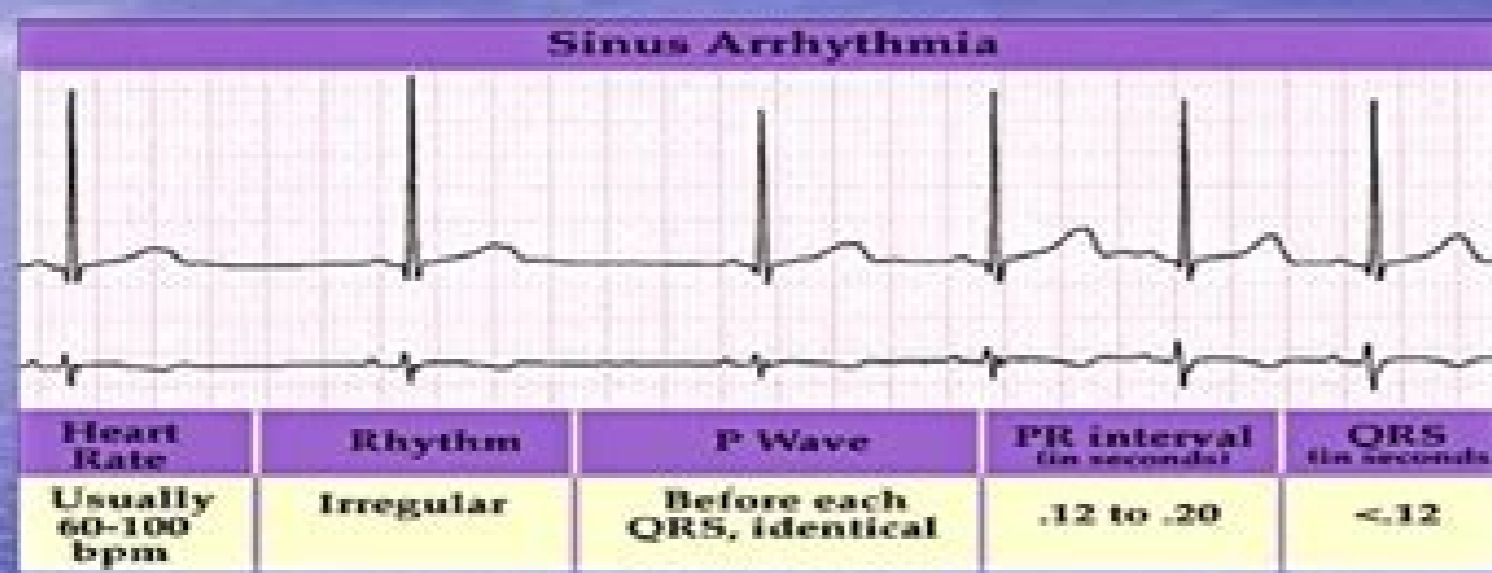
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## Cysticercosis

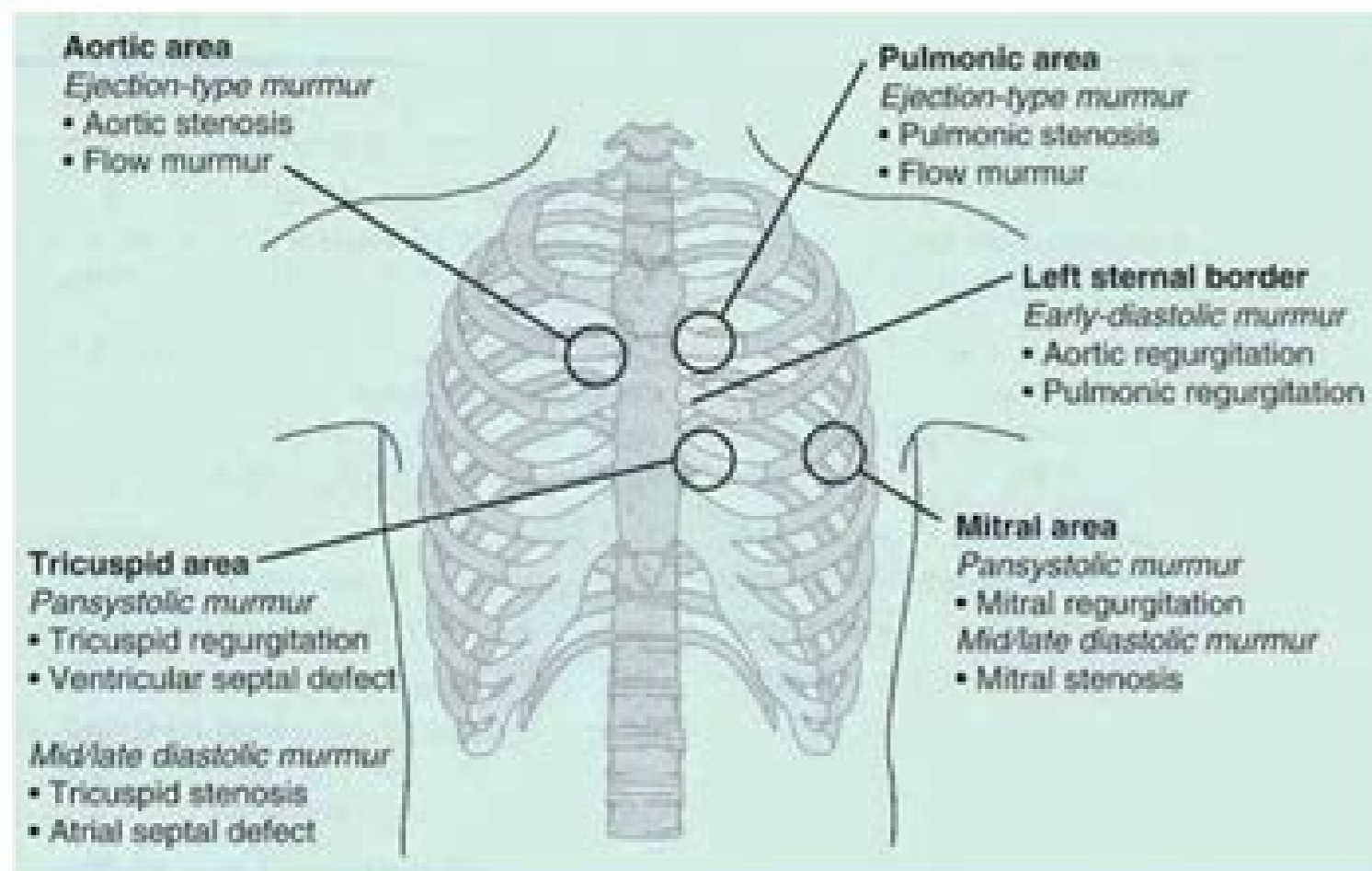


## Sinus Arrhythmia

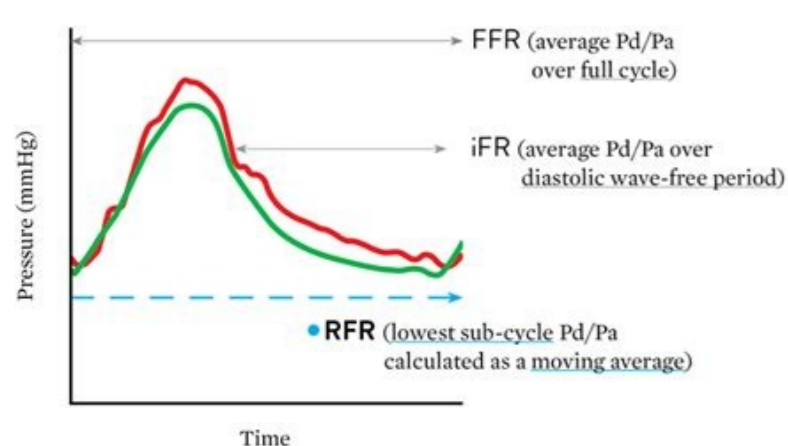


- Variations in the cycle lengths between p waves/ QRS complexes
- Will often sound irregular on exam
- Normal p waves, PR interval, normal, narrow QRS

## LOCATING CARDIAC VALVE MURMURS



The diagram above shows the optimal locations for hearing specific murmurs. Mitral and tricuspid valve murmurs are best heard in the apical region with the tricuspid valve adjacent to the sternum and the mitral valve more lateral. Aortic and pulmonic valve murmurs are heard best at the level of the 2nd or 3rd intercostal space, with the aortic valve on the right side of the sternum and the pulmonic valve on the left side of the sternum.



(normally, 10 to 15 mm Hg). • As more and more myofibers enter the contracted state, pressure development in the left ventricle proceeds. • In the low-resistance, high-capacitance pulmonary bed, however, this interval is normally much greater than on the left, varying between 43 and 86 ms. • This is because TDI can assess the degree of LV mechanical dyssynergy by precisely determining the time intervals between peak systolic contractions of different areas of the LV wall. • with age, this value decreases such that a single S2 during both phases of respiration can be normal in subjects older than 40 years of age. • The physiologic S3 is a benign finding commonly heard in children, adolescents, and young adults. • In reality mitral valve closure is delayed because the valve is kept open by the inertia of the blood flow. • a diminution in the second (Mi-E interval). 39. Most Relevant Reviews 2 Item(s) Easily Editable. 17. • An even greater delay between the occurrence of T1 and RV-right atrial pressure crossover has been shown. Your thoughts will create an electric atmosphere. The store will not work correctly in the case when cookies are disabled. • The three basic events are (1) LV contraction (2) LV relaxation (3) LV filling 7. • isovolumic relaxation time (IVRT) is also affected by LV function. • This is achieved by atrial systole (or the left atrial booster), which is especially important when a high cardiac output is required, as during exercise, or when the LV fails to relax normally, as in left ventricular hypertrophy. However, the interval from the R wave peak to the onset of mitral valve opening contains an interval of electromechanical delay, which can be pronounced in patients with left bundle branch block 22. • Atrial contraction must be present for production of an S4. • It yields important information on the temporal sequence of events in the cardiac cycle. 47. • The isovolumic index was considered more sensitive for cardiac dysfunction than the systolic time interval because it contains IVRT as well as IVCT. 14. • These changes are repeated during every heartbeat in a cyclic manner. Definition • Cardiac cycle is defined as the sequence of coordinated events which take place during heartbeat. • As LV pressure drops below that in the left atrium, just after mitral valve opening, the phase of rapid or early filling occurs, which accounts for most of the ventricular filling. Wiggers, M.D. • A Wiggers

diagram is a standard diagram used in cardiac physiology • The X axis is used to plot time, while the Y axis contains all of the following on a single grid: • Blood pressure Aortic pressure Ventricular pressure Atrial pressure • Electrocardiogram • Arterial flow (optional) 6. • Using Doppler echocardiography to identify the exact onset of isovolumic contraction. • Modification of the elastic properties of the myocardial fibres in left ventricular hypertrophy may lead to a delay in the transformation of the cardiac ovoid into a sphere. 5. • The aortic valve closes, creating the first component of the second sound, A2 (the second component, P2, results from closure of the pulmonary valve as the pulmonary artery pressure exceeds that in the right ventricle). • Thereafter, the ventricle continues to relax. The Third and Fourth Heart Sounds • S3 and S4 are low-frequency events related to early and late diastolic filling of the ventricles. • Various changes occur in different chambers of heart during each heartbeat. 29. cardiac cycle • Mitral valve closure is often thought to coincide with the crossover point at which the Lvpressure starts to exceed the left atrial pressure. LV and RV pressure waves • Right and left ventricular waveforms are similar in morphology. 33. • Active diastolic relaxation of the ventricle may also contribute to early filling ( "Ventricular Suction During Diastole"). • These correspond reasonably well, because mitral valve closure actually occurs only about 20 milliseconds after the crossover point of the pressures. The contraction and relaxation of ventricles are called ventricular systole and ventricular diastole respectively. • Weissler et al. • In contrast, cardiologic systole is demarcated by the interval between the first and second heart sounds, lasting from the first heart sound (M1) to the closure of the aortic valve(A2). 45. • These intervals are also influenced by many hemodynamic and electrical variables. External production theory • There is no feature of the LV pressure curve that consistently corresponds to the S3. • On the electrocardiogram (ECG), the advance of the wave of depolarization is indicated by the peak of the R wave . • Such rapid filling may cause the physiological third heart sound (S3), particularly when there is a hyperkinetic circulation. LV FILLING PHASES. • These hemodynamic data confirm the prime role played by the AV valves in the genesis of S1 40. • Its duration is felt to be a reflection of the impedance of the vascular bed into which the blood is being received. • hence the preisometric phase of contraction (Q-M) will be prolonged (Warembourg and Dubar, 1967). The Second Heart Sound • RV ejection begins prior to LV ejection, has a longer duration, and terminates after LV ejection, resulting in P2 normally occurring after A2. 4. Diastolic intervals(0.53) Proto diastole 0.04 Isometric relaxation 0.08 Rapid filling 0.11 Slow filling 0.19 Atrial systole 0.11 9. • The interaction of actin and myosin increases and cross-bridge cycling rises. • There are two theories: an external and an internal production theory. cardiac cycle • During this phase of contraction between mitralvalve and aortic valve opening, the LV volume is fixed (isovolumic contraction) because aortic and mitral valves are shut. Phono cardiogram 41. 51. • The contour of the central aortic and pulmonary artery pressure tracing consists of a systolic wave, the incisura (indicating closure of the semilunar valves), and a gradual decline in pressure until the following systole. • myocardial dysfunction prolongs PEP and shortens LVET. Seminar 2. Left ventricular rotation: a neglected aspect of the cardiac cycle • Rotation of the left ventricle around its longitudinal axis is an important but thus far neglected aspect of the cardiac cycle. • The cardiac cycle, fully delineated by Lewis but first conceived by Wiggers. • • During diastole, there is relaxation of cardiac muscle and filling of blood. 44. Definitions of Systole and Diastole • The start of systole can be regarded as the beginning of isovolumic contraction, when LV pressure exceeds the atrial pressure, or as mitral valve closure (M1). IVCT and IVCTindex in mitral stenosis • In severe pure or predominant mitral stenosis there is a prolongation in the first component (C-Mi interval). 46. • This is a low-frequency sound that follows A2 by 120 to 200 ms and occurs during rapid filling of the ventricle . 20. • This interval has been called the hangout interval, a purely descriptive term coined in Shaver laboratory more than 30 years ago. • The sum of IVCT and IVRT was measured by subtracting the LVET from the peak of the R wave on the electrocardiogram to the onset of mitral valve opening. • Another promising clinical area from measuring time intervals with TDI is to help identify patients who might benefit from cardiac resynchronization therapy. Normal Physiologic Splitting • Normally during expiration, A2 and P2 are separated by an interval of less than 30 ms and are heard by the clinician as a single sound • During inspiration, both components become distinctly audible as the splitting interval widens, primarily caused by a delayed P2, although an earlier A2 contributes to a lesser degree . • Each heartbeat consists of two major periods called systole and diastole. • Physiological diastole commences as calcium ions are taken up into the sarcoplasmic reticulum. 49. 11. • the pulmonary artery incisura is delayed relative to the aortic incisura, primarily a result of a larger interval separating the pulmonary artery incisura from the RV pressure compared with the same left-sided event. proposed a "myocardial performance index" (or "Tei index"). 16. • The pressure in the aorta exceeds the falling pressure in the left ventricle. • This sound probably reflects ventricular wall vibrations during rapid filling. 18. • As the cytosolic calcium ion concentration starts to decline because of uptake of calcium into the SR under the influence of activated phospholamban, more and more myofibers enter the state of relaxation and the rate of ejection of blood from the left ventricle into the aorta falls. • With the advent of Doppler echocardiography, it has become easier to determine cardiac time intervals more reliably. Hemodynamic Correlates of S1 • The first high-frequency component of M1 coincides with the downstroke of the left atrial c wave and is delayed from the LV-left atrial pressure crossover by 30 ms. 15. 26. In younger subjects, maximal splitting during inspiration averages 40 to 50 ms. • Shortly thereafter, pressure changes in the right ventricle, similar in pattern but lesser in magnitude to those in the left ventricle, cause the tricuspid valve to close.there by creatingT1, the second component of the first heart sound. Systolic intervals(0.27) Isometric 0.05 contraction Ejection period 0.22 8. Volume changes 36. Physiological Versus Cardiological Systole and Diastole 31. • For the cardiologist,protodiastole is the early phase of rapid filling, when the third heart sound (S3) can be heard. • Under pathologic conditions, forceful atrial contraction generates a low-frequency sound (S4) just prior to S1 . Tei et al. • The durations of systole and isovolumic contraction and relaxation are longer and the ejection period shorter in the left than in the right ventricle. • Normally, it is less than 15 ms in the systemic circulation and only slightly prolongs the LV ejection time. • The absolute value of inspiratory splitting varies with age and depth of respiration. • Opening of the aortic valve is followed by the phase of rapid ejection. Definitions of Systole and Diastole • Physiological systole lasts from the start of isovolumic contraction (whenLV pressure crosses over atrial pressure ) to the peak of the ejection phase, so that physiological diastole commences as LV pressure starts to fall. Cardiac cycle • followed about 20 milliseconds later by M1, the mitral component of the first heart sound. 30. • It seems possible that left ventricular hypertrophy may be responsible for the delay of the intraventricular spread of the electric stimulus. 42. 10. • It starts fractionally later than physiological systole and ends significantly later. 48. GREAT VESSEL PRESSURES. • In the 1960s, the duration of isovolumetric contraction (IVCT) and prejection period (PEP) were studied extensively as a measure of cardiac systolic function. • Mancini et incorporated IVRT into an index called the "isovolumic index" derived as (IVCT + IVRT)/LVET. 12. • LV rotation during systole maximizes intracavitary pressures, increases stroke volume, and minimizes myocardial oxygen demand. Because the mitral valve is closed during this phase, the LVvolume cannot change (isovolumic relaxation). 25. 37. • LV pressure rises to a peak and then starts to 13. • The apex cardiogram shows a peak of rapid early outward movementat the time of the S3. Your thoughts will flow in complete harmony. • During systole there is contraction of the cardiac muscle and pumping of blood from 3. 24. • As pressures in the atrium and ventricle equalize, LV filling virtually stops (diastasis). LEFT VENTRICULAR RELAXATION. Home 0714 Cardiac Cycle Medical Images For PowerPoint Our 0714 Cardiac Cycle Medical Images For PowerPoint allow you to compose freely. • Soon after, LV pressure in the early contraction phase builds up and exceeds that in the left atrium . 19. • When they are heard in disease states, they are called gallop sounds. • The rate of ejection is determined not only by the pressure gradient across the aortic valve, but also by the elastic properties of the aorta and the arterial tree, which undergoes systolic expansion. • It is named after Dr. Carl J. • When marked, this peak is palpable and is then accompanied by a loud S3. Great designs, Easily Editable. derived an index (PEP/LVET) called "systolic time interval". All Rights Reserved. • Forward flow continues for a short period following LV-left atrial pressure crossover as a result of the inertia of mitral flow, with M1 occurring 20 to 40 ms later. 21. Definitions of Systole and Diastole • The remainder of the cardiac cycle automatically becomes cardiological diastole. LV.contraction. • LV ejection time (LVET) was used as a measure of LV stroke volume. • This is less heart rate dependent as a measure of LV systolic function. Heart sounds in relation to cardiac cycle 38. • They differ mainly with respect to their magnitudes. • the total IVCT remains practically unaltered. Put the switch on with our 0714 Cardiac Cycle Medical Images For PowerPoint. cardiac cycle • When the pressure in the left ventricle exceeds that in the aorta, the aortic valve opens, usually a clinically silent event. 27. • LV pressure starts to build up when the arrival of calcium ions at the contractile proteins starts to trigger actin-myosin interaction. . ATRIAL PRESSURES 52. 43. Divisions of cardiac cycle • The contraction and relaxation of atria are called atrial systole and atrial diastole respectively. 1. Pressure volume loop in cardiac cycle 32. • T1 coincides with the downstroke of the right atrial c wave. • Hangout interval contributes significantly to the duration of ejection. • Shearing and restoring forces accumulated during systolic twisting are released during early diastole and result in diastolic LV untwisting or recoil promoting early LV filling. Thus,cardiologic systole, demarcated by heart sounds rather than by physiological events. ( phase of reduced ejection) • During this phase, blood flow from the left ventricle to the aorta rapidly diminishes but is maintained by aortic recoil—the Windkessel effect. LEFT VENTRICULAR FILLING PHASES. 2 Item(s) Copyright © 2022 SlideTeam. • In the internal production theory the S3 is due to a sudden "pullingshort" of the rapidly expanding ventricle by unknown myocardial forces at the end of the early rapid expansion phase. 50. In Aortic stenosis • the Q-Mi interval was moderately prolonged (mean= 66-3 msec). 23. • LV twist and untwist are disturbed in a number of cardiac diseases and can be influenced by several therapeutic interventions by altering preload, afterload, contractility, heart rate, and/or sympathetic tone. 34. • In external production theoryAn S3 often cannot be recorded inside the LV in a patient in whom it can be recorded externally on the chest wall. 35. • Their presence gives valuable information to the clinician regarding the status of ventricular function and compliance. • When the LV pressure falls to below that in the leftatrium, the mitral valve opens (normally silent) and the filling phase of the cardiac cycle restarts. 28. • It is absent in atrial fibrillation and in other rhythms in which atrial contraction does not precede ventricular contraction.

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