

Chapter 1 : What is Junctional Rhythm? (with pictures)

Junctional rhythm describes an abnormal heart rhythm resulting from impulses coming from a locus of tissue in the area of the atrioventricular node, the "junction" between atria and ventricles. Under normal conditions, the heart's sinoatrial node determines the rate by which the organ beats - in other words, it is the heart's "pacemaker".

Premature atrial complexes Occur as single or repetitive events and have unifocal or multifocal origins. Marriott, master ECG teacher and author, likes to say: This is illustrated in the "ladder" diagram where normal sinus beats P are followed by three possible PACs; in the diagram the refractory periods of the AV node and bundle branches are indicated by the width of the boxes: Nonconducted blocked ; i. Conducted with aberration; i. Therefore, the fate of a PAC depends on 1 the coupling interval from the last P wave and 2 the preceding cycle length or heart rate. The pause after a PAC is usually incomplete; i. The PJC focus, located in the AV junction, captures the atria retrograde and the ventricles antegrade. The retrograde P wave may appear before, during, or after the QRS complex; if before, the PR interval is usually short i. Atrial Fibrillation A-fib Atrial activity is poorly defined; may see coarse or fine undulations or no atrial activity at all. If atrial activity is seen, it resembles an old saw when compared to atrial flutter that often resembles a new saw. A regular ventricular response with A-fib usually indicates complete AV block with an escape or accelerated ectopic pacemaker originating in the AV junction or ventricles i. The differential diagnosis includes atrial flutter with an irregular ventricular response and multifocal atrial tachycardia MAT , which is usually irregularly irregular. The differential diagnosis may be hard to make from a single lead rhythm strip; the lead ECG is best for differentiating these three arrhythmias. Untreated A-flutter often presents with a 2: This is the most commonly missed supraventricular tachycardia because the flutter waves are often difficult to find when there is 2: Therefore, always think "atrial flutter with 2: Ventricular response may be 1: Ventricular response is irregularly irregular i. May be intermittent, alternating with periods of normal sinus rhythm. Seen most often in elderly patients with chronic or acute medical problems such as exacerbation of chronic obstructive pulmonary disease. These arrhythmias are circus movement or reciprocating tachycardias because they utilize the mechanism of reentry. The onset is sudden, usually initiated by a premature beat, and the arrhythmia also stops abruptly - which is why they are called paroxysmal. They are usually narrow-QRS tachycardias unless there is preexisting bundle branch block or rate-related aberrant ventricular conduction. There are several types of PSVT depending on the location of the reentry circuit. The diagram illustrates the probable mechanism involving dual AV nodal pathways, alpha and beta, with different electrical properties. In the diagram alpha is a fast AV nodal pathway with a long refractory period RP , and beta is the slow pathway with a short RP. During sinus rhythm alpha is always used because it conducts faster. An early PAC, however, finds alpha still refractory and must use the slower beta pathway to reach the ventricles. By the time it traverses beta, however, alpha has recovered allowing retrograde conduction back to the atria. AV Reciprocating Tachycardia Extranodal bypass pathway: This is a rare form of PSVT where the reentrant circuit is between the sinus node and the right atria. The ECG looks like sinus tachycardia, but the tachycardia is paroxysmal; i. Junctional Rhythms and Tachycardias Junctional Escape Beats These are passive, protective beats originating from subsidiary pacemaker cells in the AV junction usually in the Bundle of His. The ECG strip shows intermittent sinus slowing with two junctional escapes. Junctional Escape Rhythm A Junctional Escape Rhythm is a sequence of 3 or more junctional escapes occurring by default at a rate of bpm. The lead ECG shown below illustrates a junctional escape rhythm in a well-trained athlete whose resting sinus rate is slower than the junctional rate. Accelerated Junctional Rhythm This is an active junctional pacemaker rhythm caused by events that perturb pacemaker cells e. The rate is bpm. There may be AV dissociation, or retrograde atrial capture may occur. Ischemia usually from right coronary artery occlusion and digitalis intoxication are the two most common causes.

Chapter 2 : Junctional rhythm - Wikipedia

The junctional rhythm initiates within the AV nodal tissue. Accelerated junctional rhythm is a result of enhanced automaticity of the AVN that supersedes the sinus node rate. During this rhythm, the AVN is firing faster than the sinus node, resulting in a regular narrow complex rhythm.

Accelerated Junctional Rhythm Heart rhythms are a very important thing. They are the rhythms in which our heart beats every minute, every hour, of every day. Your heart is made up of muscle around the size of your fist clenched up. It pumps blood out to your body day in and day out. It keeps all the organs oxygenated and fed the right nutrients and helps clean toxins out of your body. This is a lot of work to do, but it all depends on a healthy heart rhythm. Sometimes things can go wrong. This article will help you understand more about the accelerated junctional rhythm, how it is diagnosed, treated, and any complications that may arise from this condition. What Is Accelerated Junctional Rhythm? In the heart, the SA node sinus node is the primary pacemaker of the heartbeat. Something happens and the node stops working correctly so the AV node takes over as a protective measure. The heart rate that comes from the AV node is often slower than the normal pace of the SA node. The AV node usually only beats at 40 to 60 beats per minute, but in accelerated junctional rhythm the rate is faster than 60 beats per minute, but still slower than beats per minute. There are a few other types of junctional rhythms caused by the same malfunction in the AV node. Junctional Escape Rhythm – In this junctional rhythm the heart beats 40 to 60 beats per minute. It is caused things like too much potassium in the blood, sinus bradycardia slow heart rate , digoxin poisoning, and drugs that slow the heart rate. Junctional Tachycardia – This is a type of tachycardia fast heart rate caused by heart failure, digoxin toxicity, and the drug theophylline. In this condition, the heart beats faster than bpm. Premature Junctional Complex – These are heart beats that happen too early. They are very rare and most often benign. What Causes Accelerated Junctional Rhythm? There are several causes of accelerated junctional rhythm.

Junctional rhythm is a heart rhythm originating in the atrioventricular node of the heart, instead of the sinoatrial node, the area normally responsible for regulating the heartbeat. It is not necessarily dangerous, but can be a sign of underlying pathology in need of treatment.

Related chapters Rhythms arising near the atrioventricular node: The most common rhythm arising in the AV node is junctional rhythm, which may also be referred to as junctional escape rhythm. Junctional tachycardia is less common. Basic knowledge of arrhythmias and cardiac automaticity will facilitate understanding of this article. However, impulses are occasionally discharged in the atrioventricular node or by cells near the node. The following must be noted: There are cells with pure automaticity around the atrioventricular node. These cells are capable of spontaneous depolarization i. The cells in the atrioventricular node itself may start discharging impulses under pathological circumstances, such as in ischemia. In both cases listed above the impulse will originate in the junction between the atria and the ventricles, which is why ectopic beats and ectopic rhythms originating there are referred to as junctional beats and junctional rhythms. In most cases the P-wave is not visible because when impulses are discharged from the junctional area, atria and ventricles are depolarized simultaneously and ventricular depolarization QRS dominates the ECG. If the normal sinus impulse disappears e. Less than three consecutive beats are referred to as junctional beats also called junctional escape beats. Three or more consecutive junctional beats are referred to as junctional rhythm also called junctional escape rhythm. Junctional escape rhythm is a regular rhythm with a frequency around 40â€”60 beats per minute. In case of sinus arrest or any scenario in which atrial impulses do not reach the atrioventricular node junctional escape rhythm may be life-saving. During complete heart block third-degree AV-block the block may be located anywhere between the atrioventricular node and the bifurcation of the bundle of His. If there are cells with automaticity distal to the block, an escape rhythm may arise in those cells. For example, consider a complete block located in the atrioventricular node. In such scenarios, cells in the bundle of His which possess automaticity will not be reached by the atrial impulse and hence start discharging action potentials and an escape rhythm. This will also manifest as a junctional escape rhythm on the ECG. This is asymptomatic and benign. ECG criteria for junctional rhythm Regular ventricular rhythm with rate 40â€”60 beats per minute. The QRS complex is generally normal, unless there is concomitant intraventricular conduction disturbance. Figure 1 below displays two ECGs with junctional escape rhythm. Two types of junctional escape rhythm. Treatment of junctional beats and rhythm Symptomatic junctional rhythm is treated with atropine. Doses and alternatives are similar to management of bradycardia in general. Junctional tachycardia Junctional tachycardia is caused by abnormal automaticity in the atrioventricular node, cells near the atrioventricular node or cells in the bundle of His. NPJT is caused by ischemia, digoxin overdose, theophylline, overdose catecholamines, electrolyte disorders and perimyocarditis. As true for the other junctional beats and rhythms, the P-wave is retrograde or invisible. This type of AV dissociation is easy to differentiate from AV dissociation due to third-degree AV-block , because in third-degree AV-block the atrial rhythm is higher than the ventricular; the opposite is true in this scenario.

Chapter 4 : Junctional rhythm (escape rhythm) and junctional tachycardia – ECG learning

A junctional rhythm occurs when the electrical activation of the heart originates near or within the atrioventricular node, rather than from the sinoatrial node. Because the normal ventricular.

A comprehensive overview Junctional Rhythm: The SA node generates an electrical impulse at a rate of bpm and sends it to both atria by way of the internodal tracts. This causes both atria to contract simultaneously and force blood into both ventricles. The electrical impulse then continues down to the AV node, which is located between the atria and the ventricles. The AV node slows down and regulates the impulse, then sends it through the bundle of His to the left and right ventricle. From the bundle of His, the impulse travels through the Purkinje fibers, which are inside the ventricular muscle, causing the ventricles to contract and pump blood throughout the body. Junctional Rhythm A junctional rhythm occurs when the AV node takes over as the primary pacemaker because either the SA node failed or the AV node blocked the atrial impulse. The AV node only generates an electrical impulse at a rate of bpm, so you typically see a much slower heart rate. There are some circumstances, however, where the AV node develops an abnormal automaticity and exceeds the SA node rate. This is defined as either an accelerated junctional rhythm or junctional tachycardia, depending on the rate. A junctional rhythm is protective – the AV node serves as a backup for the SA node – so it should not be suppressed. The reason being is it would be more dangerous for a lower pacemaker site, such as the bundle of His, to assume the role of pacing the heart. Generally, the lower or more distal the pacemaker site, the less reliable and effective the pacing is. How to Identify a Junctional Rhythm A junctional rhythm can be identified by having a regular R-R interval and one of the following P wave characteristics: This occurs when the AV node sends an electrical impulse to the atria and ventricles at the same time. This occurs when the AV node sends an electrical impulse to the atria first. This occurs when the AV node sends an electrical impulse to the ventricles first. The absence or change of the P wave indicates the primary pacemaker has shifted from the SA node to the AV node. Junctional Rhythm Types Junctional Rhythm: The AV node is the primary pacemaker with a rate of bpm. Visit the Junctional Rhythms page to learn more about the different types of junctional rhythms. Junctional Rhythm Symptoms Junctional rhythms can be completely asymptomatic or accompanied by any of the following:

Chapter 5 : Junctional Escape Rhythm – LITFL – ECG Library Diagnosis

Rhythms arising near the atrioventricular node: junctional rhythm (escape rhythm) and junctional tachycardia. In this article you will learn about rhythms arising in, or near, the atrioventricular (AV) node.

Chapter 6 : Junctional Rhythms - Introduction

A junctional rhythm is a protective heart rhythm that occurs when the atrioventricular node (AV node) takes over as the heart's pacemaker. To fully understand a junctional rhythm, let's first take a look at the cardiac conduction system and see how it operates in a normal, healthy heart.

Chapter 7 : Accelerated Junctional Rhythm EKG, Causes, Symptoms and Treatments | New Health Advisor

Accelerated junctional rhythm (AJR) occurs when the rate of an AV junctional pacemaker exceeds that of the sinus node. This situation arises when there is increased automaticity in the AV node coupled with decreased automaticity in the sinus node.

Chapter 8 : Junctional escape beat - Wikipedia

In this chapter atrial/AV nodal and junctional rhythms will be discussed. Atrial/AV nodal rhythms are also known as supra

ventricular because they occur above the ventricles. Atrial rhythms arise from an area within the atria that is different than the SA node.

Chapter 9 : Junctional Rhythm: A comprehensive overview

Overview. This page provides an introduction to junctional rhythms and links to training materials on this website.. The SA node is the normal origin of the electrical impulse for a heart beat.