S-A Node Encyclopedia Article

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Contents

S-A Node Encyclopedia Article.....1

Contents.....2

S-A Node.....3

S-A Node

The S-A node or sino-atrial node (also spelled unhyphenated as the sinoatrial node) is a specialized area of **tissue** located along the upper margin of the right atrium of the **heart** that acts to regulate the contractions of the heart. The S-A node is often referred to as the pacemaker of the **cardiac cycle**.

It is important to note that the signals from the S-A node are not required in order for cardiac muscle to contract. Cardiac muscle is inherently contractile (can contract on its own). S-A node contractions serve only to stimulate and coordinate cardiac muscular contractions. In effect, the S-A node is the cardiac rhythm regulator.

The S-A node is composed of Purkinje fibers that spontaneously contract. This contraction generates a nerve impulse that then propagates (travels) throughout the cardiac tissue of the heart and results in the contraction of both atria. The contraction of the right atria forces **blood** from the right atrium into the right ventricle where it is then pumped into the pulmonary **circulatory system**. The contraction of the left atrium forces blood into the left ventricle that then pumps the blood into the **systemic circulation**.

Along with the atrioventricular node (A-V node), the S-A node is an area of specialized tissue (nodal tissue) located in the cardiac subendothelium that has the capacity to functionally act as both muscular and neural tissue. The contraction of nodal tissue generates nerve impulses. The A-V nodal tissue, also a part of the **Purkinje system**, serves to dampen or delay the signal to contract from the S-A node so that the atria have time to fully contract and empty their contents into their respective ventricles.