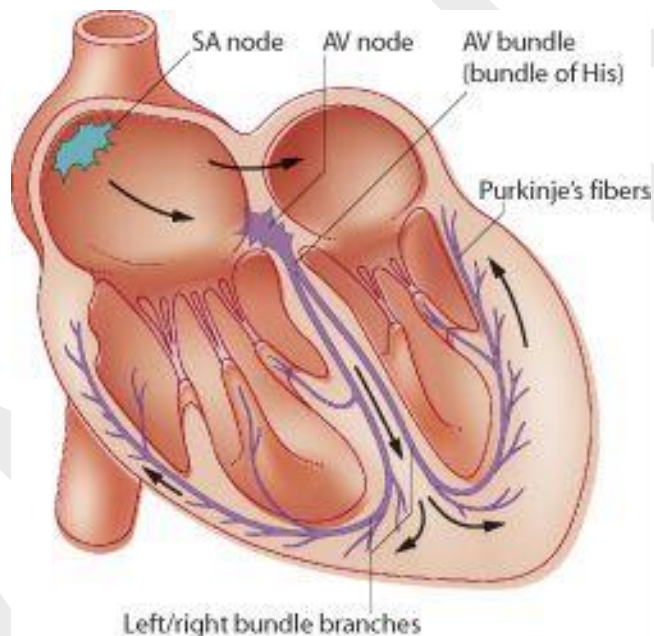


CARDIAC CONDUCTION SYSTEM

The cardiac muscle fiber junctions contains intercalated discs, which contains Desmosomes - to hold fibers together, Gap Junctions - to conduct action potential from one fiber to another.

An inherent and rhythmical electrical activity is mainly conducted through a network of specialized cardiac muscle fibers known as AUTO RHYTHMIC FIBERS.

These fibers are self excitable and generate action potential that triggers heart contractions.



Cardiac excitation normally begins in SA node (Sino Atrial node). So, SA node is also known as a PACEMAKER.

Location of SA node - Right Atrial Wall,

- Inferior to opening of Superior Venacava.

The SA node has no resting membrane potential. So, they repeatedly depolarize to threshold potential spontaneously for every 0.6 second or 100times/minute. This depolarization Potential is known as Pacemaker Potential.

When Pacemaker potential becomes threshold



Triggers action potential



Passes to all fibers via gap junctions



Reaches to Atrial muscle fibers



Right and Left Auricle



AV node (Atrio ventricular node)

Location - Inter atrial septum, anterior to opening of coronary sinus.



Bundle of His



Right and left Bundle branches

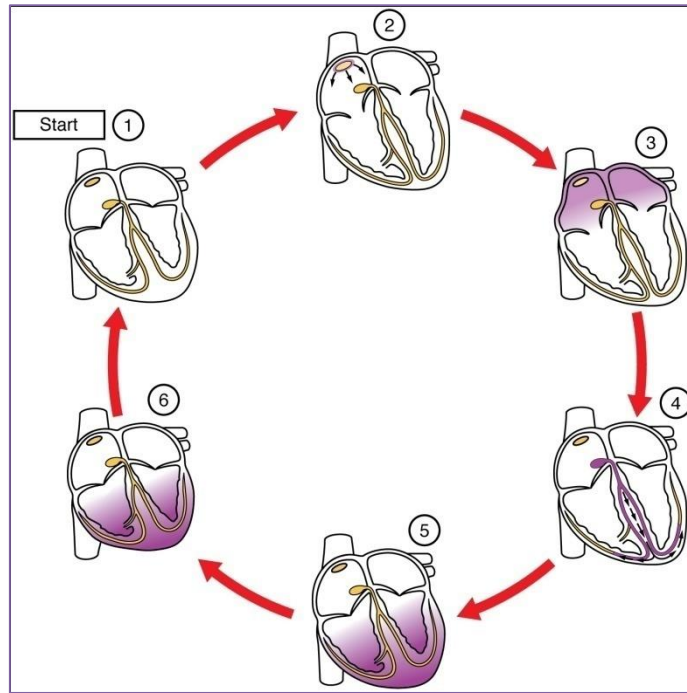


Purkenji fibers



Right and left Ventricle

ANS supply and blood hormones modify the timing and strength of each heart beat but do not establish fundamental rhythm.



ARTIFICIAL PACEMAKER:

When SA node damage or dies, AV node can pick up the pacemaker task but the rate is 40-60times/min.

If both SA and AV nodes damage or dies, heart beat may still due to auto rhythmic fibers in ventricles, bundle of his, and Purkenji fibers, but the rate is 20-35 times/min.

So in order to get normal rate (100times/min), we have to implant an artificial pacemaker which contains a battery and impulse generator beneath the skin, inferior to clavicle. Two flexible wires are run from the impulse generator through the superior vena cava and finally enter into right auricle and to ventricles.

