Mastery Series: Conduction System of the Heart

1. Name the 5 components of the conduction system.
2. What is considered the "pacemaker" of the heart?
3. Which chamber is the "pacemaker" found in?
4. Describe parasympathetic stimulation of the SA node.
5. Describe sympathetic stimulation of the SA node.
6. What does it mean for cells to be "autorhythmic"?
7. What "pace" would the SA node set the heart at without sympathetic or parasympathetic stimulation?
8. What pace would the AV bundle set the heart at without input from above?
9. What is heart block?
10. What is WPW and how is it treated?
11. What are ectopic foci? At what point do you think these generally benign areas could become dangerous?
12. How does understanding the conduction system of the heart allow you to understand why the ventricles pump blood UP and OUT of the heart?
13. What are the three prominent parts of an ECG?
14. What does ECG stand for? How does EKG mean the same thing?

Conduction System of the Heart Mastery Series Answers

1. Sinoatrial Node; Atrioventricular Node; Atrioventricular Bundle; Bundle Branches; Purkinje Fibers
2. SA node
3. right atrium
4. a branch of the vagus nerve innervates the SA node and releases ACh onto muscarinic cholinergic receptors. This binding opens K+ channels on the muscle cells, which hyperpolarizes the cells and makes the time between action potentials (and thus beats) longer.
5. An autonomic nerve from the spinal cord synapses in the sympathetic chain ganglia. The postsynaptic fiber synapses on the SA node and releases NE which binds to beta 1 adrenergic receptors. This binding increases calcium availability which increases the number and strength of contractions.
6. They are able to generate an action potential and a contraction without a nerve telling them to!
7. 75 beats/minute
8. 40-60 beats/minute
9. When the AV node is damaged and the signal cannot reach the AV bundle.
10. renegade autorhythmic cells cause the heart to beat too rapidly. It is usually treated with a laser that destroys the inappropriately autorhythmic cells.
11. Renegade groups of cells that cause occasional extra beats. They could become dangerous if the cells made a complete circuit within one atria and didn't let the signal continue down to the ventricles.
12. atria pump first, pushing blood downward. The ventricles begin contracting upward from the bottom, squeezing blood upward and out of the heart.
13. P wave represents atrial depolarization and causes the atria to contract. The QRS complex represents ventricular depolarization and causes the ventricles to contract. The T wave represents ventricular repolarization.
14. Electrocardiogram; kardio = heart in German