Name: Date:

ECG Lab

*Last updated: 10/18/22*

# Part 1: Introduction

An ECG (or EKG) is a noninvasive method of measuring the heart’s \_\_\_\_\_\_\_\_\_\_ during the cardiac cycle.

1. Name two things doctors can see in an ECG that [can help them figure out whether a patient’s heart rate is normal or abnormal, and whether the heart is pumping in a coordinated and efficient manner.](https://www.heart.org/en/health-topics/heart-attack/diagnosing-a-heart-attack/electrocardiogram-ecg-or-ekg)
2. A single round of the cardiac cycle shows 3 main waves. They include:

# Part 2: Heart Conduction System Discussion Questions

* Launch Physiology & Pathology.
* Navigate to the Cardiovascular unit. Under Physiology select **6. Heart Conduction**. Read about how the cardiac conduction system delivers electrical impulses to the heart and stimulates contractions.
1. Trace the path that electrical impulses take in order to contract and relax the heart. Number the structures below by the order in which the impulse travels.

\_\_\_\_ Atrioventricular (AV) node

\_\_\_\_ Sinoatrial (SA) node

\_\_\_\_ Atrioventricular bundle (bundle of His)

\_\_\_\_ Purkinje fibers

\_\_\_\_ Right and left bundle branches

* In the image below, label the components of the cardiac conduction system. (Note: The atrioventricular bundle is not visible in this image.)



# Part 3: Cardiac Cycle

* In the Cardiovascular unit of the app, under Physiology select **5. Cardiac Cycle.** Read about the rhythmic sequence of myocardial contractions and relaxations stimulated by the conduction system.
1. The cardiac cycle includes all blood flow events the heart accomplishes in one complete heartbeat.
2. Describe the events that occur during ventricular diastole.
3. Describe the events that occur during ventricular systole.
4. Describe the events that occur during atrial diastole.
5. Describe the events that occur during atrial systole.

# Part 4: Components of an ECG

* Review the ECG waves and intervals (or segments) that measure the cardiac conduction system’s electrical activity using the [“Decoding the Heart: What is an ECG?”](https://www.visiblebody.com/blog/decoding-the-heart-what-is-an-ecg) blog post.
1. Using the knowledge you’ve gained, match the following terms to the appropriate description:

\_\_\_\_ P wave

\_\_\_\_ PR interval

\_\_\_\_ QRS wave complex

\_\_\_\_ ST interval

\_\_\_\_ T wave

a. The wave caused by ventricular depolarization.

b. The time between the P wave and the start of the QRS complex.

c. The wave caused by depolarization of the atria.

d. The time between the QRS complex and the start of the T wave.

e. The wave caused by ventricular repolarization.

1. Label the ECG components in the image below.



# Part 5: ECG Discussion Questions

* Navigate to the Cardiovascular unit in the app. View the different cardiovascular conditions in the Pathology section.
1. What conditions might a medical professional be able to diagnose from looking at an ECG?
2. Atrial fibrillation is an arrhythmia in which the atria beat irregularly. Where in an ECG would you expect to see a discrepancy caused by this condition?