Level 1

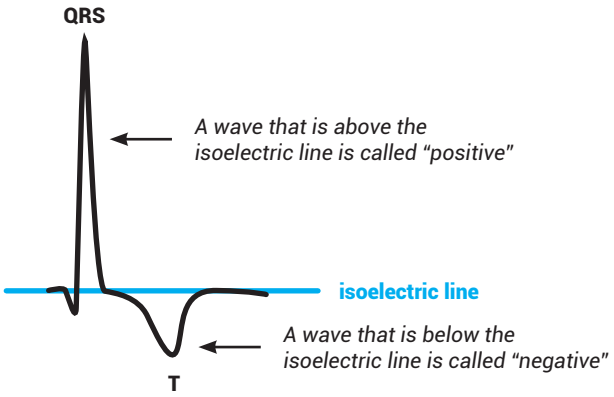
Deconstructing the ECG curve—the components of the tracing

In this first chapter, you will learn about the different waves on the ECG and how to recognize them.

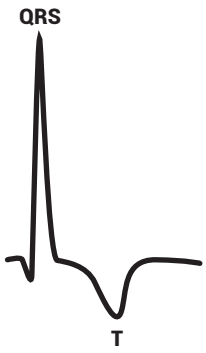
Key concepts

Your first step is to learn how to identify QRS complexes, T waves, and P waves on a tracing.

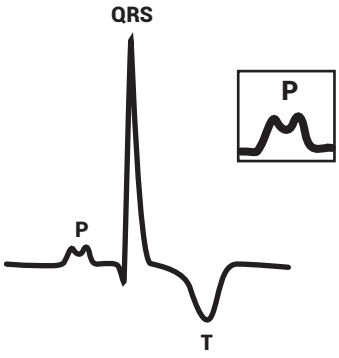
The **isoelectric line** is the baseline of the ECG. By definition, it's the line on the ECG during which electrical activity is absent—look for the flat line that connects a T wave to the following P wave. Anything above is positive, anything below is negative.



Electrical depolarization of the ventricles leads to sharp deflections in the ECG called **QRS complexes**. Every depolarization is followed by a phase of repolarization. Repolarization of the ventricles is represented by the so-called **T waves**. The T wave can be positive or negative.

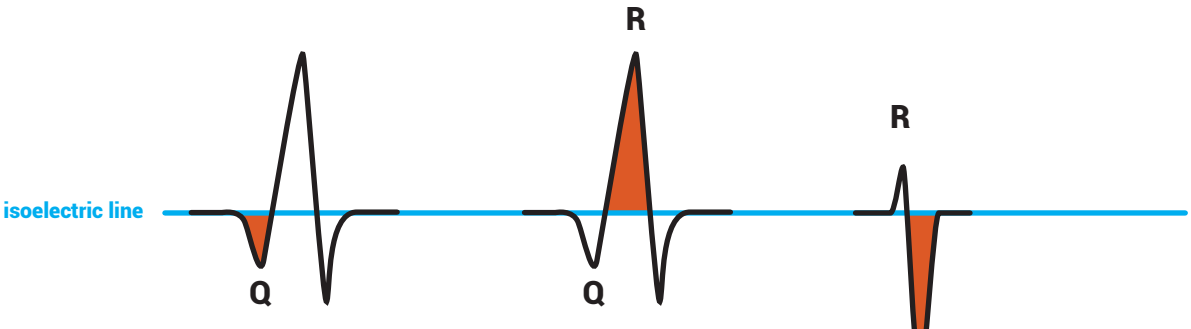


Atrial depolarization is depicted by the **P wave**, which is steeper than the T wave but flatter than the QRS complex. We said that every depolarization is followed by a phase of repolarization. But since atrial repolarization happens at the same time as the QRS complex, it cannot be recognized on the ECG.



Identifying the components of the QRS complex

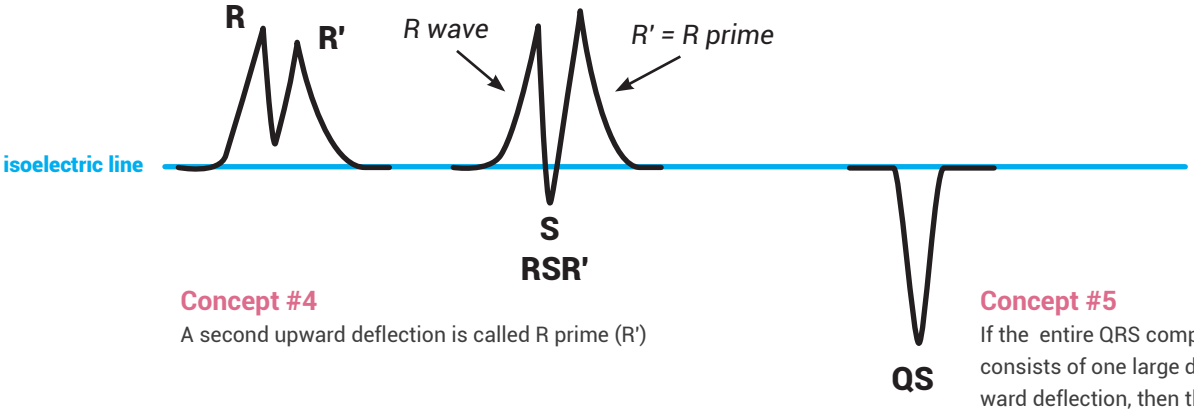
There are five concepts that will help you to identify the different components of the QRS complex.



Concept #1
The first downward deflection is called a Q wave.

Concept #2
Any upward deflection is called an R wave.

Concept #3
Any downward deflection that comes after an R wave and crosses the isoelectric line is called an S wave.

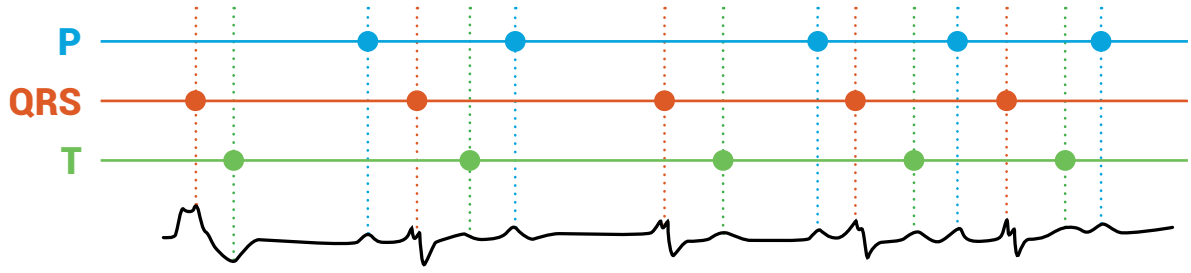


Concept #4
A second upward deflection is called R prime (R')

Concept #5
If the entire QRS complex consists of one large downward deflection, then this is called a QS complex.

Example: identifying P waves, QRS complexes, and T waves

Based on the concepts outlined above, we can now identify the P waves, QRS complexes, and T waves in an example exercise. Notice that the second wave is steep and edgy; it has sharper deflections than the other curves and therefore has to be the QRS complex.



Dotted vertical lines originate from the different waves of the ECG. They intersect with horizontal lines identifying P, QRS, and T. In this example we have already identified the different waves for you.