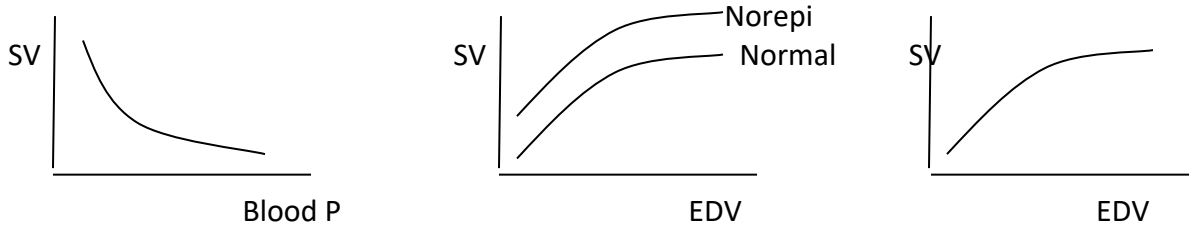
BIO 26 PAL Worksheet
Week 4 (#1): Regulation of Cardiac Output

Cardiac output is defined as the amount of blood pumped by the left ventricle in one minute. A normal cardiac output is about 5L/min. During exercise, this number can increase to about 30L/min. Today we will explore the two main factors that help regulate cardiac output: Heart rate and stroke volume.

CO = HR x SV

1. What are the two branches of the autonomic nervous system?
   Draw a heart that shows the innervation via the two branches.
   Include neurotransmitters and receptors.

2. Define the terms preload, afterload, contractility in your own words.
   Decide which of the graphs goes with which term and explain how you know.



3. What is venous return? In a healthy person, how do you think venous return and CO are related?
   List all factors that can influence venous return and explain how they work.

4. Now create one big concept map that shows an overview of all the factors regulating cardiac output. Be sure to label your arrows (increase/decrease etc).
   Add neurotransmitters and receptors where appropriate.

5. Think about which of the factors listed in your overview could be influenced by exercise and how they would change. What is the overall effect of exercise on CO?