BIO 26 PAL Worksheet
Week 5 (#1): Mean Arterial Pressure

The mean arterial pressure (MAP) is the main driving force that propels the blood to the tissues. It is the average pressure in the arteries over one cardiac cycle.
Recall that the pressure in the arteries is not constant, but rather pulsatile during the heart's contraction (systole) and relaxation (diastole). MAP can be calculated with the following formula: MAP = 1/3 systolic P + 2/3 diastolic P

1. Explain why diastolic pressure takes a bigger weight in this formula.

2. Explain why it is important to tightly regulate MAP. What would happen if MAP was too high/too low?

3. Make an overview of all factors that help regulate MAP. Include neurotransmitters and receptors where you can.

4. Which of the following would be a <u>recommended</u> <u>treatment</u> for a <u>hypertensive</u> patient? More than one can be TRUE. Explain your reasoning.

    Beta-1 receptor blocker (antagonist)
    IV of isotonic saline
    Low-salt diet
    Vasoconstrictor (alpha-1 receptor agonist)
    Diuretic (increases urine output)
    Nicotine (stimulates the sympathetic nervous system)

5. Administration of drug X leads to dilation of arterioles locally at the site of injection. Explain how this would influence overall MAP, assuming that there are no other changes to the cardiovascular system. Explain what would happen to capillary exchange in the capillary beds where X was injected. Why might edema develop locally at the injection site?

Artery   Arteriole   Capillary
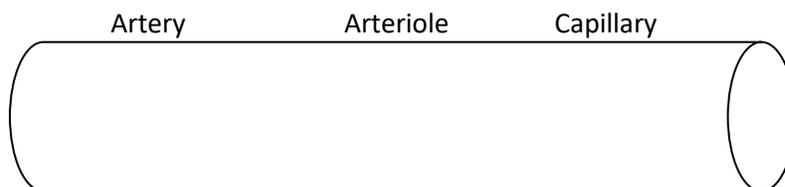
BONUS: Write two questions that involve the concept of MAP regulation and share with the class.