

Bio 160 Exam 4 Study Guide

Exam 4 will cover the basics of cardiovascular, immune, respiratory, digestive and urinary systems. I know that is a lot of information, focus on your class material, this review guide and the review puzzle.

- Know what the three components make up the cardiovascular system.
- Be familiar with the components of blood and what their general purposes are (i.e. globulins for transport and protection, albumin for osmotic balance, erythrocytes for transportation of gases...)
- Know the types of formed elements and where they are formed.
- Understand how a single cell (hemocytoblast) is capable of forming all blood cells.
- Specifically, understand the link between the kidney, blood oxygen levels and rbc production rates.
- Know the blood flow through the heart, including chambers, valves and major vessels.
- Know the terms systole and diastole and how they relate to the cardiac cycle.
- Be familiar with the term cardiac output, and the mechanisms to control cardiac output (recall that cardiac output = stroke volume x heart rate, so controlling cardiac output has more to do with controlling stroke volume and changes in heart rate)
- Understand that there is a link between cardiac output, blood vessels and blood pressure and there are homeostatic mechanisms to maintain blood pressure (atrial stretch reflex, baroreceptor reflex and the chemoreceptor reflex).
- Know the differences in structure and function between arteries and veins.
- Understand why veins: are more numerous than arteries, have larger diameters than equivalent arteries and have valves.
- Know why the largest arteries have the highest amount of elastic tissue and what this means to blood flow (hint... diastolic blood pressure)
- Understand the dynamics of exchange at the capillary level.
- Know what happens to the "excess" fluid (~3.5L/day) that is filtered out of the capillaries and not reabsorbed.
- Know the difference between specific and non-specific defenses.
- Be familiar with the different types of non-specific defenses.
- Know the difference between B-cell mediated immunity and T-cell mediated immunity.
- Understand the benefits that are provided by specific immunity.
- Know the basic functions of the respiratory system.
- Be familiar with the processes involved with pulmonary ventilation, the importance of the pleural cavity and the coordination with the nervous system.
- Know how oxygen and carbon dioxide are transported in blood.
- Know what goes on during external respiration and internal respiration and why.
- Understand why (and how) carbon dioxide is the primary gas for controlling ventilation rates.
- Know the basic structure (layers) of the GI tract.
- Understand why the changes in the layers of the GI tract from the oral cavity to the anus occur where they do.
- Be familiar with the effects the cephalic phase, gastric phase and intestinal phase have on the stomach.
- Know the effects of GIP, Secretin, Gastrin, and CCK have on the digestive system.
- Understand why the digestive system has so much nervous tissue and lymphatic tissue
- Know what happens to the major nutrient molecules as they make their way through the GI tract.
- Understand the role sphincters play in the digestive system.
- Describe the role of the pancreas in digestion (chemical).
- Describe the role of the liver in digestion (chemical & mechanical).
- Understand the role of the kidney with respect to fluids in the body (the golden rule).
- Know how the anatomy of the nephron makes the physiology of the nephron possible.
- Understand how blood flows through the kidney and why there is so much vascular tissue (blood vessels) in the kidney.
- Know the three basic steps in urine production.
- Be familiar with the process of concentrating (or diluting) urine.
- Understand why someone with diabetes mellitus could produce large quantities of urine (up to 20L/day) if their disease is not controlled?
- Follow a drop of urine from the collecting duct to the external urethral orifice.
- Be familiar with the effects of the renin-angiotensin pathway, and be familiar with the integration of this pathway with other organ systems.