

*Faculty of pharmacy, Nursing and Health Professions*

NURS 130 Assignment

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**SID: 1202109 Section: 2**

Q1. How does the motor pathway of the autonomic nervous differ from that of the somatic nervous system? (2)

The Answer:

 First of all, the Nervous system conists of CNS & PNS, the motor division of PNS splits into two motor divisions: ANS & SNS, and for ANS there is two divisions: Sympathetic division & Parasympathetic division, So there are differences of the motor pathway between ANS & SNS.

In the ANS there are three regions: preganglionic neuron , ganglia , & postganglionic neuron

For Sympathetic division, there are short preganglionic neuron has a lightly myelinated axon and it release ACh that induce the release of NE and epinephrine, & it has a long postganglionic neuron that extends to the effector organ. For parasympathetic division, there are long preganglionic neuron , & short postganglionic neuron, both release ACh neurotransmitter.

ANS controls the Subconscious movement , because its neurons innervate the smooth & cardiac muscle & glands.

For Somatic nervous system, There is no ganglia , the motor neurons cell bodies are in the CNS , and their axons extend in spinal or cranial nerves all the way to the skeletal muscles they activate, Somatic motor fibers are typically thick , heavily myelinated fibers that conduct nerve impulses very rapidly , & it releases just ACh , & it controls the conscious movement because it innervates the skeletal muscles.

Q2. Explain the cardiac cycle, and tell me what is the effect of each of these hormones on the blood pressure and on the heart performance in general

Thyroid hormone, ACTH, ANP? (10)

The Answer of the first section:

 First of all, cardiac cycle describes what is happening in each heart beat, & it composed of five phases:

1. Ventricular filling: mid to late diastole, pressure in the heart is low, blood returning from the circulation is flowing passively through the atria and the open AV valves into the ventricles, and the aortic & pulmonary semilunar valves are closed.

2. Atrial Systole: atrial contraction forces a small amount of additional blood into ventricles ( P wave begin to appear ) .

3. Isovolumic ventricular contraction: First phase of ventricular contraction pushes AV valves closed but does not create enough pressure to open semilunar valves

In this phase, the four valves are closed.

4. Venticular ejection: during this phase , blood rushes from the ventricles into the aorta and pulmonary trunk, so the AV valves are closed and semilunar valves are opened, the pressure in the aorta normally reaches about 120mmHg .

5. Isovolumic ventricular relaxation: early diastole, following the peak of the T wave , the ventricles relax , because the blood remaining in their chambers ,referred to as the end systolic volume (ESV), is no longer compressed , ventricular pressure drops rapidly and blood in the aorta and pulmonary artery flows back toward the semilunar valves, and also in this phase the four valves include: SL valves & AV valves are closed.

The answer of the second section:

The effect of these hormones on the blood pressure & on the heart performance:

Thyroid hormones ( T3&T4) :

It promotes normal functioning of the heart, but if the hyposecretion occurred , it will decrease the heart efficiency of heart’s pumping action , low heart rate and blood pressure. But if the hypersecretion occurred, it will increase the sensitivity to catecholamines and it can lead to rapid heart rate, palpitations, high blood pressure, and ultimately heart failure.

Adrenocorticotropic hormone (ACTH ) :

It is the stimulation For the releasing of aldosterone from zona glomerulosa of adrenal cortex, ACTH acts on the heart rate and performance in directly via Aldosterone hormone that is increases the reabsorption of Na+ ions into the blood and the concentration of sodium ions will increase and the water will be shifted toward it , and as result the blood volume will increase thus the blood pressure will increase , & it works just under the stress ( under the sympathetic nervous system effect ), and heart rate will increase.

Atrial natriuretic peptide (ANP):

 It’s a cardiac hormone and it’s the only hormone that decrease the blood pressure , and it inhibits activity of the zona glomerulosa, and the heart rate will be increased.

Q3. What property of the RBCs make them unable to live more than 120 days? (3)

The property of not containing a nucleus, with this property it becomes unable to manufacture proteins, therefore it cannot divide or multiply and also does not have cellular organelles such as : ribosomes, ER, mitochondria , that would enable it to repair itself if part of it is damaged or old, red blood cells do not regenerate and do not live longer than 120 days, but new red blood cells are manufactured by the bone marrow in a process called Erythropoiesis.