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DEPARTMENT: MEDICINE AND SURGERY

ASSIGNMENT

1. Discuss the long term regulation of mean arterial blood pressure

Kidneys play an important role in the long-term regulation of arterial blood pressure. When blood pressure alters slowly in several days/months/years, the nervous mechanism adapts to the altered pressure and looses the sensitivity for the changes. It cannot regulate the pressure any more. In such conditions, the renal

mechanism operates efficiently to regulate the blood pressure. Therefore, it is called long-term regulation. Kidneys regulate arterial blood pressure by two

ways:

1. By regulation of ECF volume

2. Through renin angiotensin mechanism.

1. Write short notes on the following

Pulmonary circulation: Pulmonary circulation is otherwise called lesser Circulation. Blood is pumped from right ventricle to lungs Through pulmonary artery. Exchange of gases occurs Between blood and alveoli of the lungs at pulmonary Capillaries. Oxygenated blood returns to left atrium Through the pulmonary veins. Thus, left side of the heart contains oxygenated or Arterial blood and the right side of the heart contains Deoxygenated or venous blood.

 Circle of Willis: The Circle of Willis is the joining area of several arteries at the bottom (inferior) side of the brain. At the Circle of Willis, the internal carotid arteries branch into smaller arteries that supply oxygenated blood to over 80% of the cerebrum.

Splanchnic circulation: splanchnic circulation is composed of gastric, small intestinal, colonic, pancreatic, hepatic, and splenic circulations, arranged in parallel with one another. The three major arteries that supply the splanchnic organs, cellac and superior and inferior mesenteric, give rise to smaller arteries that anastomose extensively. The circulation of some splanchnic organs is complicated by the existence of an intramural circulation. Redistribution of total blood flow between intramural vascular circuits may be as important as total blood flow.

Coronary circulation: This is part of the systemic circulatory system that supplies blood to and provides drainage from the tissues of the heart. In the human heart, two coronary arteries arise from the aorta just beyond the semilunar valves; during diastole, the increased aortic pressure above the valves forces blood into the coronary arteries and thence into the musculature of the heart. Deoxygenated blood is returned to the chambers of the heart via coronary veins; most of these converge to form the coronary venous sinus, which drains into the right atrium.

Cutaneous circulation: The cutaneous circulation is the circulation and blood supply of the skin. The skin is not a very metabolically active tissue and has relatively small energy requirements, so its blood supply is different to that of other tissues. Some of the circulating blood volume in the skin will flow through will flow through arteriovenous anastomoses (AVAs) instead of capillaries. AVAs serve a role in temperature regulation. In this article we shall consider the different adaptations of the cutaneous circulation, and its role in body temperature control.

3)Discuss the cardiovascular adjustment that occurs during exercise

The cardiovascular system, composed of the heart, blood vessels, and blood, responds predictably to the increased demands of exercise. With few exceptions, the cardiovascular response to exercise is indirectly proportional to the skeletal muscle oxygen demands for any given rate of work, and oxygen uptake increases linearly with increasing rates of work. Cardiac Output is the total volume of blood ˙pumped by the left ventricle of the heart per minute. It is the product of heart rate and stroke volume. The arterial-mixed venous oxygen difference is the difference between the oxygen content of the arterial and mixed venous blood. A person’s maximum oxygen uptake is a function of cardiac output multiplied by the ˙A--vO2 difference. Cardiac output thus plays an important role in meeting the oxygen demands for work. As the rate of work increases, the cardiac output increases in a nearly linear manner to meet the increasing oxygen demand, but only up to the point where it reaches its maximal capacity. Other changes include blood flow; At rest, the Skin and skeletal muscles receive about 20 percent of the cardiac output. During exercise, more blood is sent to the active skeletal muscles, and, as body temperature increases, more blood is sent to the skin. Also, Mean arterial blood pressure increases in response to dynamic exercise, largely owing to an increase in systolic blood pressure, because diastolic blood pressure remains at near-resting levels