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**MEDICINE AND HEALTH SCIENCES**

**MEDICINE AND SURGERY**

**PHYSIOLOGY ASSIGNMENT**

**18/MHS01/001**

1. Discuss the long-term regulation of 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 or years, the nervous mechanism adapts to the altered pressure and looses the sensitivity for the changes. It cannot regulate the pressure anymore. In such conditions, the renal mechanism operates efficiently to regulate the blood pressure. Therefore it is called long term regulation. There are several mechanisms that regulate blood pressure in the long term:

* 1. By regulation of ECF volume
	2. Through renin-angiotensin mechanism
	3. Anti-Diuretic Hormone
1. **-Pulmonary circulation**

Pulmonary circulation moves blood between the heart and the lungs. It transports deoxygenated blood to the lungs to absorb oxygen and release carbon dioxide. The oxygenated blood then flows back to the heart

**-Cutaneous circulation**

Cutaneous blood flow performs two functions :

1. Supply of nutrition to skin
2. Regulation of body temperature by heat loss

Cutaneous blood flow is regulated mainly by body temperature. Hypothalamus plays an important role in regulating Cutaneous blood flow.

When body temperature increases, the hypothalamus is activated. Hypothalamus in turn causes Cutaneous vasodilation by acting through medullary vasomotor center. Now blood flow increases in skin, increase in Cutaneous blood flow causes the loss of heat from the body through sweat. When body temperature is low vasoconstriction occurs in the skin.

**-Splanchnic circulation**

Splanchnic or visceral circulation constitutes three portions :

1. Mesenteric circulation supplying blood to GI tract
2. Splenic circulation supplying blood to spleen
3. Hepatic circulation supplying blood to liver

Unique feature of Splanchnic circulation is that the blood from Mesenteric bed and spleen forms a major amount of blood flowing to liver. Blood flows to liver from GI tract and spleen through portal system.

**-Coronary circulation**

Heart muscle is supplied by two coronary arteries namely right and left coronary arteries, which are the first branches of aorta. Arteries encircle the heart in the manner of a crown, hence the name coronary arteries. Right coronary artery supplies whole of the right ventricle and posterior portion of left ventricle. Left coronary artery supplies mainly the anterior and lateral parts of the ventricle. There are many variations in diameter of coronary arteries.

**-Circle of Willis**

Circle of Willis begins to form when the right and left internal carotid artery enters the cranial cavity and each one divides into two main branches: the anterior cerebral artery and middle cerebral artery. The anterior cerebral arteries are then united and blood can cross flow by the anterior communicating artery. The ACAs supply most midline portions of the frontal lobes and superior medial parietal lobes. The MCAs supply most of the lateral surface of the hemisphere, except the superior portion of the parietal lobe(via ACA) and the inferior portion of the temporal lobe and occipital lobe.

1. Discuss the cardiovascular adjustment that occurs during exercise:

During exercise, there is an increase in metabolism needs of body tissues, particularly the muscles. Various adjustments in the body during exercise are aimed at supplying of various metabolic requisites like nutrition and oxygen to muscles and other tissues involved in exercise and prevention of increase in body temperature.

Exercise is generally classified into two types depending upon the type of muscular contraction:

1. Dynamic exercise

Primarily involves the isotonic muscular contraction. It keeps the joints and muscles moving. Examples are swimming, bicycling, walking etc. Dynamic exercise involves external work which is the shortening of muscle fibers against load. In this type of exercise the heart rate force of contraction, cardiac output and systolic blood pressure increase. However the diastolic blood pressure is unaltered or decreased. It is because during dynamic exercise peripheral resistance is unaltered or decreased depending upon the severity of exercise.

1. Static exercise

Static exercise involves isometric muscular contraction without movement of joints. Example is pushing heavy object. Static exercise does not involve external work. During this exercise apart from increase in heart rate, force of contraction, cardiac output and systolic blood pressure, the diastolic blood pressure also increases. It is because of increase in peripheral resistance during static exercise.