Physiology

Health & Medicine

Physiology behind Pulse Rate, Temperature, Respiration and Control Mechanisms of Peripheral Resistance. Submission:

Physiology behind Pulse Rate, Temperature, Respiration and Control Mechanisms of Peripheral

Heat has to be related to the skin’s surface in order to maintain a constant body temperature. After the evaporation, the cooled blood returns to the core of the body this regulating the temperature. Blood flowing through the dermis is regulated when one’s body heat is stable depending on the changes in ambient temperature. This is to ensure that differences in temperature between the environment and the skin remain constant thus preventing heat loss and attaining a constant temperature (Yagiela, 1995). When sick, body temperature rises to about 20 degrees higher to kill the pathogens. In high temperatures, the body can be cooled off through sweating and wearing of a jacket and when temperatures are low, they can be heated by wearing a jacket and through shivering.

The pulse is the periodic dilation of the artery that is produced by the rhythmic opening and closing of the aortic valve in the heart. It can be felt through the application of pressure by firm fingertips to the skin where the arteries travel near the surface of the skin. The common pulse points are the radial artery in the wrist, the brachial artery inside the elbow and the carotid artery of the neck (Yagiela, 1995). Pulse rates differ from one person to another and it decreases with age. Alterations between normal and weak pulses indicate heart failure while rapid pulses indicate serious cardiac diseases, vigorous exercises or a relatively mild fever. Head injuries may result in slow pulse rates though this is exceptional in highly trained athletes who were slow pulse rate is considered normal. The maximal heart rate is

that of 200 beat/min which is in young people. The maximal heart rate is determined genetically and cannot be modified by exercise or by external factors.

According to Yagiela (1995) respiration is the process through which the body acquires oxygen and in turn removes carbon dioxide through the nasal cavity into the lungs (Lombardi, Lown and Verrier, 2005). This simple exchange of gases occurs through a process known as diffusion which requires a concentration gradient. Oxygen concentration has to be kept at higher levels in the alveoli than in the blood and the carbon dioxide concentration in the blood has to be kept at higher levels than in the alveoli. This is done through the active process of breathing that calls for contraction of the skeletal muscles including the diaphragm and the external intercostals muscles. The intercostals muscles are located in between the ribs while the diaphragm is muscle sheet between the abdominal cavity and the thoracic cavity.

The contraction of the external intercostals muscles entails elevation of ribs and sternum leading to an increased front to back thoracic cavity dimension that lowers air pressure in the lungs hence letting air into the lungs while the contraction of the diaphragm entails a downward movement of the diaphragm increasing thoracic cavity’s vertical dimension hence lowering pressure in the lungs and letting air into the lungs too.

According to Beverley J. Hunt in 2002, total peripheral resistance is the sum of all peripheral vasculature in the systematic circulation (Lombardi, Lown and Verrier, 2005). Peripheral resistance is the resistance to the passage of blood via small blood vessels and is controlled by two mechanisms known as vasoconstriction which includes the narrowing of blood arteries (large

arteries and small arterioles) and vasodilation that refers to the widening / increase in the diameter of blood vessels to escalate the flow of blood. Vasodilation decreases peripheral resistance by increasing blood flow by decreasing vascular resistance . vasoconstriction increases peripheral resistance in people who have hypocapnia on arteries and peripheral blood vessels.

References

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