The Cardiorespiratory System:

The major anatomical structures of the cardiorespiratory system include the heart and lungs. The heart is considered to be the powerhouse of the circulatory system, its function is to pump blood around the body. Each time the heart contracts, blood is pumped around the body. The heart is comprised of:

- **Atria** - the two upper chambers: right and left atrium.
- **Ventricles** - the two lower chambers: right and left ventricle.
- **Bicuspid valve** - a valve that separates the left atrium from the left ventricle.
- **Tricuspid valve** - a valve that separates the right atrium from the left ventricle. *(Mullan & Bizley, The Working Body, 2007)*

Another vital anatomical structure of the cardiorespiratory system is the body’s blood vessels. Blood vessels are a network of tubes that carry blood around the body. There are different types of blood vessels including: Arteries, veins and capillaries. Each different type of blood vessel has a different function.

- **Arteries** - carry blood away from the heart.
- **Veins** - carry blood to the heart.
- **Capillaries** - “network of tubes around tissue that allow particles to pass from the blood into the tissue and vice versa” *(Mullan & Bizley, The Working Body, 2007)*

The other main component of the cardiorespiratory system is the lungs. The lungs are comprised of three main components: bronchi, bronchioles and alveoli. Where the trachea divides into two passageways is known as Bronchi, these passageways lead into the lungs. These passageways then divide again into smaller bronchi and then again into small tubes known as bronchioles. Alveoli are tiny air sacs that branch off from the bronchioles. All together these components make up the lungs. *(Mullan & Bizley, The Working Body, 2007)*

Oxygen and a mix of other gases including nitrogen and carbon dioxide enter the body through both the buccal and nasal cavity (mouth and nose). Both cavities join together at the top of the mouth where oxygen passes through into the pharynx (throat). These gases then pass down through the network of passageways before entering the alveoli *(Mullan & Bizley, The Working Body,*
Gas exchange occurs in two sites of the body, the first being in the alveoli. External respiration: here an exchange of oxygen and carbon dioxide takes place within the lungs, with the carbon dioxide being exhaled and the oxygen inhaled (Toro, 2013). Oxygen enters the bloodstream via the millions of tiny blood vessels known as capillaries, and vice versa for carbon dioxide exiting the body from the bloodstream (Mullan & Bizley, The Working Body, 2007). Internal respiration: the gas exchange of oxygen and carbon dioxide between cells of the body and blood. For example in a muscle where red blood cells exchange carbon dioxide for oxygen (University, 2017).

“In Healthy people, predictable physiologic changes occur during exercise.” (Milani, Lavie, Mehra, & Ventura, 2006) During exercise many acute responses occur in the body as a result of working muscle needing a greater supply of oxygen to increase energy production. Because the body is producing more energy, “more carbon dioxide is produced and exhaled from the lungs” (Mullan & Bizley, The Working Body, 2007).

- An increase in heart rate- blood is circulated around the body at a faster rate.
- Higher blood pressure- as you exercise your heart pumps more blood and blood pressure increases.
- Increase in body temperature- during exercise the body generates more heat, this extra heat exits the body through the skin as sweat.
- Increase in stroke volume- the amount of blood pumped by the left ventricle is increased.

Bibliography


University, T. P. (2017). Gas Exchange. Retrieved from online.science.psu.edu: https://online.science.psu.edu/bisc004_activeup002/node/5331