

The Human body

Extract from Anatomy course lecture

Welcome to today's lecture. Last week we looked at the **respiratory system** and how the **lungs** separate oxygen from other gasses which we breathe. Today, we will be looking at co-dependence within three of the body's most important systems: the central nervous system (CNS), the **cardiovascular system** and the **digestive system**.

The nervous system can be divided into two parts: the central nervous system and the peripheral nervous system. The central nervous system is comprised of the **brain** and the **spinal cord**, and is responsible for processing the information which is sent to or received from the peripheral nervous system which is made up of the body's **nerves**. The brain processes information while the spinal cord acts as a delivery system for the information and impulses.

Information transmitted through the central nervous system tells our bodies how to react in a certain situation, such as when we want to take a step the brain tells our knee **joint** to bend, or when we touch something hot we receive information giving us a burning sensation. The CNS also sends information about infection so that the appropriate organ e.g. the **spleen** can fight certain types of bacteria. It is a common misconception that the brain is the largest organ in the human body, when in fact it comes in at third largest after the skin and the **liver** respectively.

The central nervous system also controls our second system of the day, the cardiovascular system (also known as the circulatory system) which delivers **blood** and oxygen to the various parts of the body. The relationship between these two systems is quite complicated as each has an effect on the other. If we take the **heart** for example which is a key organ in the cardiovascular system, we can think that it feeds the brain and as such the CNS with oxygen and blood, but at the same time it is the brain that controls the heart telling it how often to beat.

In fact the cardiovascular system is not only responsible for delivering blood and oxygen, but also for transporting nutrients, hormones and waste throughout the body. All of these are carried in the blood, of which an average adult has about 5 liters. The heart acts as a pump which circulates the blood through the capillaries, **arteries** and **veins**. It is interesting to note that if these were laid end-to-end, the estimated length would be 100,000 KM.

Our next system, the digestive system is closely linked to the cardiovascular system as on the one hand it requires about 30% of all cardiac output. And on the other, the digestive system separates nutrients from food before they can be distributed via the cardiovascular system. Thus, as with the relationship between the CNS and the cardiovascular system, each system needs the other to work.

When thinking about the digestive system, the first organ that comes to mind is usually the stomach but surprisingly, this is not the largest organ in this system. That is, in fact the liver which is actually the largest solid organ in the body. The liver performs several functions among which are cleaning the blood, producing digestive liquids (**bile**) and storing energy. Again, we can see examples of cross system relationships here.

As well as the liver and stomach, the digestive system is made up of the **pancreas** and the **intestine**. The pancreas, like the liver, aids in digestion of food. After food has passed through the stomach and has been 'ground' into tiny pieces, it enters the intestine where the bile is added and the nutrients are extracted from the food. Waste products then move further down the intestine. Now, don't forget to join me next week when we will examine the **tonsils** and other **glands**.