**3.2 – Interdependent Organ Systems**

* Organs are grouped together into organ systems because the organs in question have a related function.
  + For example, the trachea, diaphragm, bronchi, and lungs all work together to perform the function of breathing, but each does something slightly different.
* Although often studied individually, organ systems are not independent of one another; they are quite interdependent.
  + For example, the digestive system functions to break down food, the circulatory system delivers these nutrients throughout the body, and the excretory system eliminates the waste products left after the food has been used for energy.
* Your organs do not work in isolation.
  + Lungs deliver oxygen to your blood
  + But without blood vessels and a heart it would be difficult to keep the muscle cells in your foot alive.
  + They would not get enough oxygen to survive.
* Organs must be linked to other organs in order to carry out all of the functions required within an organism.
* The linking of organs to form organ systems is the next level of biological organization (P. 67, Fig. 3.9)
* **Organ systems**
  + These are made up of more than one organ and perform one or more specific functions in the body.
  + The organs in an organ system work together.
  + Over the course of your life, these systems work very closely with each other.
* **Skeletal system**
  + This is made up of bones and cartilage (p. 68, Fig. 3.10)
  + Provides
    - Support for movement
    - Attachment points for other tissues
    - Protection for other organs
      * Example – Spine protects the spinal cord
* **Muscular system**
  + This is made up of skeletal muscles including tendons and ligaments (p. 68, Fig. 3.11)
  + Enables you to move from place to place
  + Moves substances through your body
    - Example – Swallowing food involves a series of muscle contractions to force food down the esophagus and into the stomach.
* **Circulatory system**
  + This is made up of the heart (an organ) plus blood vessels and blood (p. 68, Fig. 3.12)
  + Its main purpose is to deliver nutrients, move gasses, and remove waste products.
* **Respiratory system**
  + This is made up of the nose, trachea, and lungs (p. 68, Fig. 3.13)
  + Allows oxygen from the air to enter the body and waste carbon dioxide to exit the body.
    - This process is called respiration
* **Nervous system**
  + This is made up of the brain, spinal cord and nerves that exist in every part of the body (p. 69, Fig. 3.14)
  + Sends and receives nerve messages throughout the body.
  + Controls
    - Behaviour
    - Movement
    - Processes such as digestion and circulation
* **Digestive system**
  + This is made up of the mouth, salivary glands, esophagus, stomach, liver, gall bladder, pancreas, small and large intestines (p. 69, Fig. 3.15)
  + Breaks food down so that nutrients can be absorbed by the blood and transported to all cells.
  + The colon expels all solid waste from the body.
* **Excretory system**
  + This is made up of the kidneys, ureters, bladder and urethra (p. 69, Fig. 3.16)
  + Filters the blood and removes liquid waste and extra water from the body.
* **Integumentary system**
  + This is made up of skin, hair, nails and sweat glands (p. 69 , Fig. 3.17)
  + Skin, hair and nails cover and protect the body
  + Sweat glands are involved in maintaining normal body temperature.
* **Endocrine system**
  + This is made up of several glands that produce hormones.
  + Hormones are chemicals that regulate every bodily function
  + Glands such as the pituitary, thyroid, and pancreas all produce hormones that carry messages to other parts of the body.
  + In the brain the hypothalamus acts as the control centre for the endocrine and nervous systems.
* **Lymphatic system**
  + This is made up of lymph, lymph nodes, lymph vessels and lymphoid tissue.
  + Protects the body
  + Responsible for destroying and removing any invading organisms and abnormal cells
* **Reproductive system**
  + This is made up of organs for producing offspring
* This unit requires us to integrate both the levels of organization (cells, tissues, organs, and organ systems) and the interrelationships between the different organ systems in the body.
  + When classifying interconnected systems it is inevitable that different correct classification schemes will occur.
    - Examples
      * The circulatory system is also known as the cardiovascular system.
      * The muscular system and the skeletal system are also known as the musculoskeletal system.