Session 5

The Human Body as a Working System

A. Introduction

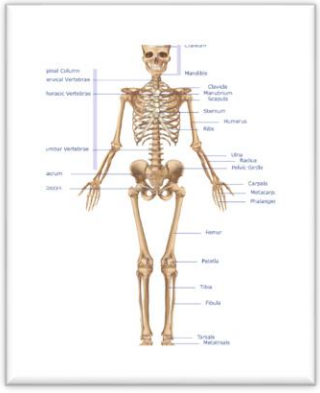
Our body is full of connective tissues. When we intend to work on a single part of the body, the system plays a domino-effect where all the connected and connective parts are working together to successfully deliver the intended action or movement. In teaching physical activities or exercise, we consider the capability of each part and as well as its limitations in terms of movements.

B. Session Objectives

- ✓ Define proper terms in referring to connective tissues in the human body.
- ✓ Identify the importance and proper care of the human body parts and how they are working as a system in relation to physical activities.
- ✓ Apply the learned issues and topics to real life situations.

C. Session Content

1. Topic 1: TISSUE TYPES AND TERMS



BONES

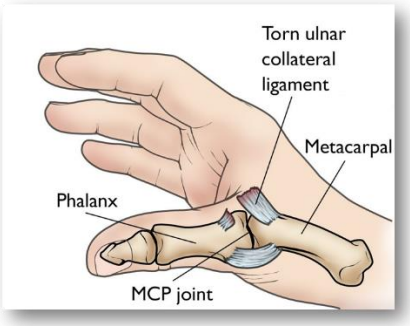
Basic Framework of the body

Figure 2: Skeletal System: Bones, Joints, Cartilage, Ligaments, Bursae (Source: Chung, A. 2019:Online)

TENDON

Attaches muscle to bones

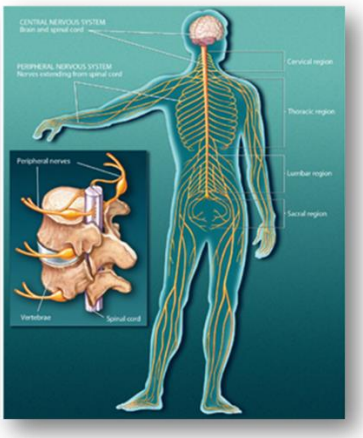
Figure 3: Why do Tendon Injuries take so long to Heal?
(Source: Ashton, T. 2021:Online)



LIGAMENT

Attaches bone to bone

Figure 4: Sprained thumrb.
(SourcePidgeon, T.et.al. 2022:Online)



NERVE

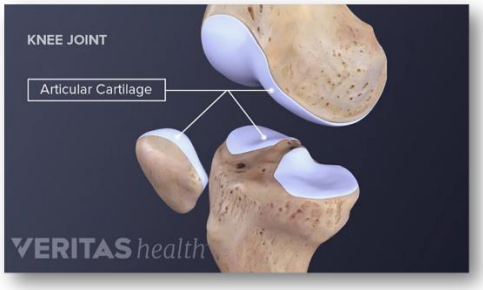
Sensation, pain and motor power

Figure 5: Parts of the Nervous System
(Source: Baltimore, I. 2012:Online)

JOINT

Where two bones meet and move

Figure 7: Structure and Types of Joints in the Human Body.
(Source: Humagain, S. 2012:Online)



CARTILAGE
Covers the ends of bones
:smooth

Figure 7: What is Cartilage?
(Source: Konstantakos, E. 2016:Online)

2. Topic 2: SYSTEMS of the BODY

1. Integumentary System

The skin contains receptors for pain and temperature sensation as well as hair follicles, sweat or and oil glands.

The skin is divided into two (2) layers each serving a particular function in the body's defense.

Figure 8: Why do fingers go wrinkly after a swim.
(Source: Ocean swim. 2015:Online)

1. EPIDERMIS

A thick, tough layer of dead skin cells that function to protect the lower areas from trauma and water loss.

2. DERMIS

It is the living tissue supporting the upper dead layer skin. It contains the hair follicles, the sweat and oil glands, the muscles within the skin, the small blood vessels and the nerve endings.

Its functions are:

1. Covers and protects the body.
2. Regulate body temperature
3. Reduces water loss and keeps the body from drying out!
4. Houses sensory receptors.

2. Skeletal System

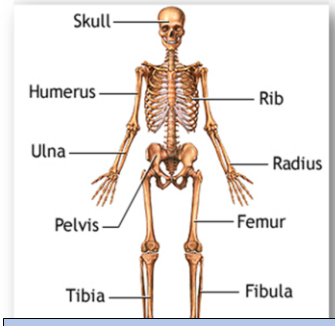


Figure 9: Anterior Skeletal Anatomy..
(Source: Kaneshiro, N.. 2023:Online)

- Framework of the body
- facilitates movement
- protects internal organs
- stores and releases minerals and fat
- The adult human body has 206 bones
- The femur, or thighbone, is the longest bone of the human skeleton
- Bones stop growing in length during puberty.
- Bones function as the skeleton of the human body, allow body parts to move and protect organs from impact damage.

3. Muscular System

Figure 10: Human Muscles
(Source: Walden, M.. 2024 Online)

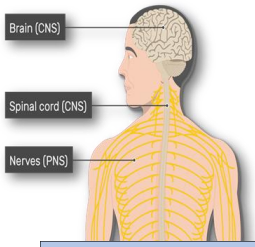
- **Three types**: skeletal, cardiac and smooth.
- The human body has about 600 muscles in various parts of the body.
- The **largest muscle** of the body is called *gluteus maximus.*
- One of the strongest muscles of the body is in the *jaw, gluteus maximus etc.*
- The motion provided by the muscles comprises only of the "pulling" motion and not the "pushing" motion.
- The longest muscle in the body is the sartorius muscle.

4. Nervous System

A system that controls all of the activities of the body.

The nervous system is made of:

The brain



The spinal cord

The nerves

The senses

Figure 11: Major Organs and Divisions of the Nervous System
(Source: Sheffield, S. 2022 Online)

- The Central Nervous System is made of the *brain and the spinal cord.*
- The Outer Nervous System is made of the *nerves and the sense organs.*

1. The cerebellum controls you **balance.**
2. The cerebellum controls your **posture.**

1. The cerebrum controls your **thinking.**
2. The cerebrum controls your **memory.**
3. The cerebrum controls your **speaking.**
4. The cerebrum controls your movement and identifies the information gathered by your sense organs.

5. Respiratory System

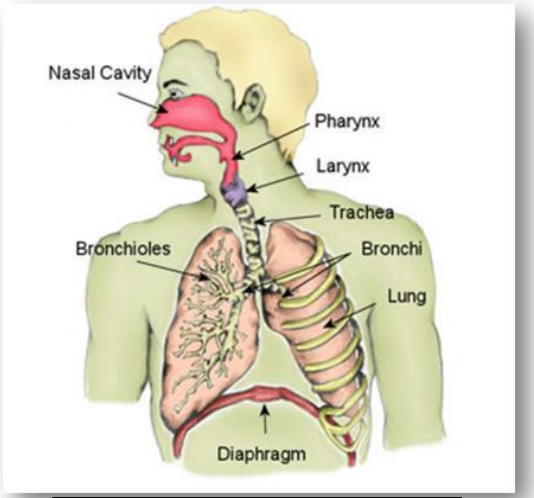


Figure 12: The Respiratory System
(Source: Walden, M.. 2024 Online)

The main organ of the respiratory system is the lungs.

Through breathing, inhalation and exhalation, the respiratory system facilitates the exchange of gases.

The respiratory system also helps us to smell and create sound.

6. Circulatory System

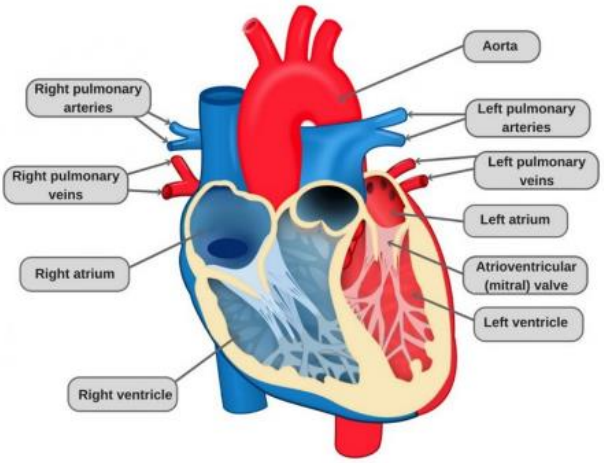


Figure 13: How Does The Human Circulatory System Work? (Source: Jalan, M.. 2023 Online)

The primary components in the circulatory system are the heart, the blood vessels, and the blood.

The circulatory system is made up of blood vessels that carry blood away from and towards the heart.

D. Conclusion

In teaching Physical Education, there is a higher risk in injuries that is why teachers must be aware of the movement requirement of the task given to students. We, teachers should carefully select appropriate activities for the grade level of the learners. Understanding the body as a system allows us to understand its limitations, thus, preventing injuries to take place.

E. References

Ashton, T. (2021). Who do tendon injuries take so long to heal? [Online Image] [Accessed April 17, 2024] https://physiodirectnz.com/author/taryn/page/2/

Baltimore, L. (2012). Parts of the Nervous System. [Online Image] [Accessed April 17, 2024]

https://www.brainfacts.org/brain-anatomy-and-function/anatomy/2012/parts-of-the-nervous-system

Canoli, J. (2023). Anatomy: 4 Types of Tissues Explained for Kids. [Online Image] [Accessed April 17, 2024] https://www.joliecanoli.com/blog/anatomy-4-types-of-tissues-explained-for-kids

Chung, A. (2019). Skeletal System: Bone, Joints, Cartilage, Ligaments, Bursae. [Online Image] [Accessed April 17, 2024] https://www.healthpages.org/anatomy-function/musculoskeletal-system-bones-joints-cartilage-ligaments/

Gelfand, J. (2007). The Seven most common sports injuries. [Online Article] [Accessed on April 17, 2024] https://www.webmd.com/men/features/seven-most-common-sports-injuries

Humagain, S. (2021). Structures and Types of Joints in Human Body. [Online Image] [Accessed April 17, 2024] https://onlinesciencenotes.com/structure-and-types-of-joints-in-the-human-body/

Jalan, M. (2023). How does the human circulatory system work? [Online Image] [Accessed April 17, 2024] https://www.scienceabc.com/humans/circulatory-system-definition-diagram-and-functioning.html

Kaneshiro, N, (2023) Anterior Skeletal Anatomy. [Online Image] [Accessed April 17, 2024]https://medlineplus.gov/ency/imagepages/9065.htm

Morisson, W. and Heitz, D. (2018). Everything you need to know about sports injuries and rehab. [Online Article] [Accessed on April 17, 2024] https://www.healthline.com/health/sports-injuries

Ocean Swim (2023). Why do fingers get wrinkly after a swim. [Online Image] [Accessed April 17, 2024] https://oceanswims.com/healthandfitness/why-your-fingers-go-wrinkly-after-a-swim/

Paddock, C. (2012). Young athletes: Injuries and prevention. [Online Article] [Accessed on April 17, 2024] https://www.medicalnewstoday.com/articles/248796

Pidgeon, T. et.al. (2022). Sprained Thumb. [Online Image] [Accessed April 17, 2024] https://orthoinfo.aaos.org/en/diseases--conditions/sprained-thumb

Quinn, E. (2020). Scientific rules that lead to fitness. [Online Article] [Accessed on April 17, 2024] https://www.verywellfit.com/the-6-scientific-rules-you-must-follow-to-get-fit-3120111

Sheffield, S. (2022) Major Organs and Divisions of the Nervous System. [Online Image] [Accessed April 17, 2024] https://www.getbodysmart.com/organization/nervous-system-organization/

Singh, G. (2019). Athletic taping and its implications in sports. International Journal on Integrated Education, 2(4), 1-7. [Online Article] [Accessed on April 17, 2024] http://www.journals.researchparks.org/index.php/IJIE/article/view/96

Sports Injuries A-Z. [Online Article] [Accessed on April 17, 2024] https://www.webmd.com/fitness-exercise/sports-injuries-a-to-z

Walden, M. (2024). Human Muscles. [Online Image] [Accessed April 17, 2024]https://www.teachpe.com/anatomy-physiology/skeletal-muscles