Understand the Anatomy and Physiology of the Hypodermis

DID YOU KNOW that body fat is actually part of your skin? The hypodermis is where the majority of body fat is stored. Of course, some people carry more body fat than others, but everyone has this layer of skin. In this unit, you will learn more about the hypodermis and its function in your body.



Objective:

Identify the components and functions of the hypodermis, and compare the subcutaneous layer in babies versus adults and in men versus women.

Key Terms:

adipose tissue
bursae
deep fascia
hypodermis
lymph vessels
Pacinian corpuscles
subcutaneous layer
superficial fascia

Hypodermis

The **hypodermis**, also called the **subcutaneous layer**, is the lowest layer of the skin. It lies below the epidermis and the dermis.

COMPONENTS OF THE HYPODERMIS

The hypodermis is mostly **adipose tissue**, or fat lobules. It also contains loosely arranged fibrous tissue, or **superficial fascia**, composed of elastic fibers. The fibrous bands bind the skin to the **deep fascia**, the membranes that surround the muscles.

The hypodermis also contains blood vessels; **lymph vessels**, which are thin tubes used to carry fluid that surrounds tissues and organs; the bases of hair follicles; and sweat glands.

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EXPLORING OUR WORLD...

SCIENCE CONNECTION: Injections

Injections can be administered to patients in several ways. Intramuscular injection delivers medication directly to a muscle. This delivery results in the fast absorption of the medication. Subcutaneous injection is administered into the fatty tissue of the hypodermis rather than into a muscle. This method is very effective for delivering many vaccines and some medications, such as insulin. The rate of absorption is slightly slower than with an intramuscular injection, but that is preferable with some medications. The upper arms, upper thighs, abdomen (avoiding the belly button), and upper buttocks are all body parts commonly used for subcutaneous injections.

Other components of the hypodermis are free nerve endings and **Pacinian corpuscles**, which are oval-shaped pressure receptors.

Specific structures are found in the hypodermis in certain areas of the body. **Bursae** are small cushion-like sacs that facilitate movement of the skin overlying joints. There are also thin sheets of muscle in the scalp, face, nipple, scrotum, and hands.

FUNCTIONS OF THE HYPODERMIS

The loose connective tissue of the hypodermis binds the skin to underlying organs and allows the skin to move somewhat independently. As mentioned earlier, the hypodermis contains adipose tissue, which serves several functions. Adipose tissue provides padding and shock absorption for structures beneath it. It insulates against the loss of body heat and stores body fat as an energy reserve. Adipose tissue serves as an ideal place for injections because it contains many blood vessels and lacks vital organs.

SUBCUTANEOUS FAT

Babies have more "baby fat" in the hypodermis than adults to insulate them against heat loss. The smaller body of a baby has a greater surface area relative to its mass. Because heat is lost from the body surface, babies need more insulation to maintain their temperature.

Women generally have a greater proportionate share of body fat than men. It is generally distributed in the subcutaneous layer more evenly and more thickly. Therefore, women are better insulated than men and tend to survive starvation conditions longer than men.



FIGURE 1. Babies have more "baby fat" in the hypodermis than adults to insulate them against heat loss.

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Summary:

The hypodermis, also known as the subcutaneous layer, is the lowest layer of the skin. It contains adipose tissue, as well as blood vessels, lymph vessels, the bases of hair follicles, and sweat glands. Adipose tissue provides padding and shock absorption for structures beneath it and insulates the body. The amount of this tissue varies among people. Babies tend to have more body fat than adults, and women tend to have more body fat than men.

Checking Your Knowledge:

1. What are the components of the hypodermis?
2. What are Pacinian corpuscles?
3. What are bursae?
4. What are the functions of the adipose tissue?
5. Why do babies need more body fat than adults?

Expanding Your Knowledge:

Body fat is often expressed as a percentage of the total body weight. An athlete may have a very low body fat percentage, while an obese person may have a dangerously high body fat percentage. Invite a doctor to visit your classroom, or interview one privately. Find out how much body fat is healthy. Are the recommendations the same for men and women? Ask whether the recommendations are the same for young adults and seniors. Make a chart to display your findings. Ask the doctor how to test your own body fat percentage.

Web Links:

Body Fat Calculator
http://lowcarbdiets.about.com/library/blbodyfatcalculator.htm

How Subcutaneous Tissue Works
http://health.howstuffworks.com/skin-care/information/anatomy/subcutaneous-tissue.htm

Hypodermis
http://plasticsurgery.about.com/od/glossary/g/hypodermis.htm

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