



Chapter 12: Age-Related Changes of the Integumentary System

What You Will Learn

- Normal changes in the integumentary system that occur in the elderly
- Risks associated with integumentary changes in the elderly

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Key Terms

Epidermis — Superficial outer layers of the skin that contain nerve endings but no blood vessels

Dermis — Layer of skin below the epidermis that consists of several layers and contains blood vessels, lymph vessels, hair follicles, glands, and nerves

Adipose — Fatty; composed of fat

Connective Tissue — Materials that supports and binds other tissues and parts of the body; includes skin, bone, tendons, ligaments, and interlacing fibers; collagen

Cellulitis — Infection of the dermis and subcutaneous tissue

Cutaneous — Pertaining to the skin

Herpes zoster — Infection with herpes zoster virus, usually occurring in adults, characterized by blister-like eruptions along the course of an inflamed nerve

Candidiasis — Fungal infection

Collagen — Protein of connective and other tissues

The skin, hair, nails, and glands form the integumentary system. The skin is the largest organ of the body and accounts for approximately 20 percent of the body's weight. The primary function of the skin is to protect the body by serving as a barrier against microorganisms, ultraviolet radiation, loss of body fluids, and the stress of mechanical forces. The skin also regulates the body temperature and is involved in the production of Vitamin D. See figure 12.1 on the next page for a drawing of the skin.

The skin is composed of two major layers (see figure 12.1 below). The thinner outer layer is called the **epidermis**. The primary function of the epidermis is to be a protective barrier. The thicker, inner layer is called the **dermis**. The dermis is the most important part of the skin and is sometimes referred to as “true skin.” The dermis contains capillaries, sweat and sebaceous glands, hair follicles, and nerves. The primary function of the dermis is to provide strength, support, moisture, blood, and oxygen to the skin. The dermis also protects the muscles, bones, and organs. Beneath the skin is the fatty layer called the subcutaneous tissue. It is composed of **adipose** and **connective tissue**, which provides a cushion between skin layers, muscles, and bones. The subcutaneous tissue also contains major blood vessels, nerves, and lymphatic vessels. This layer facilitates an ongoing blood supply to the dermis for regeneration of skin. The subcutaneous tissue layer provides skin mobility and body contours, insulates the body, and stores calories.

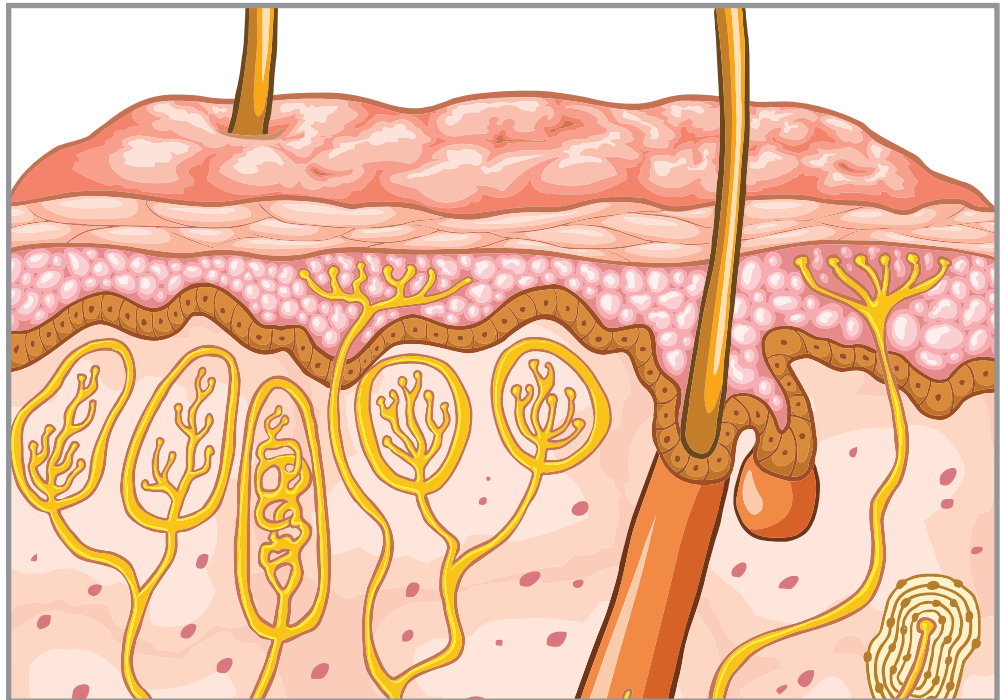


Figure 12.1. Skin Layers.

The aging integumentary system is predisposed to many changes, such as wrinkles, moles, age spots, dryness, thinning, and pigment changes in the hair and skin. Some of these natural changes create risks that may resolve easily, while others are severe and could be life threatening. These associated risks include injury, infection, illness, and temperature control.

With the aging process, the epidermal cells change shape, and the barrier function is reduced, gradually causing the epidermis to thin and become more susceptible to trauma and infection. **Cutaneous** infections are common in the elderly, especially in the presence of certain chronic medical conditions. These infections can be bacterial, viral, or fungal and can include **cellulitis**, **herpes zoster**, and **candidiasis**.

The decrease in dermal cells results in a reduced number of blood vessels, nerve endings, and collagen, leading to altered or reduced sensation. This reduced sensation is a great danger to the elderly for serious injury due to burns from heating pads, hot beverages, and even baths or showers. They may not be aware of an injury to the skin that can have serious risk of infection. Burns can be very minor to life threatening, depending on the severity.

Elderly people are also more prone to heat stress than younger people. The elderly can not adjust to sudden changes in temperature and are more likely to have a chronic medical condition that upsets normal body responses to heat. The body's ability to warm itself is also impaired in the elderly. Their blood flow is usually impaired, and there is less subcutaneous fat to insulate the body. Many older adults wear layers of clothing to compensate for inadequate temperature regulation. In other words, they are extremely vulnerable to extremes in outdoor temperature.

Blood vessels become thinner and more fragile with age. This impairs circulation in the elderly patient and predisposes aging skin to bruising, tears, and trauma. Reduced circulation can also slow the rate of absorption of topical medications. Because of these age-related changes in the skin structure, wound healing time is prolonged. A decrease in sebum secretion by the sebaceous glands makes the skin more susceptible to drying and cracking. Openings in the skin allow bacteria to enter, resulting in cellulitis. Skin tears are a significant problem for the elderly. Thinning of the epidermis, decreased production of collagen and elastin (the component in connective tissue that makes it stretch), and dermis degeneration makes the skin less forgiving to injury. A skin tear involves the destruction of the epidermis and sometimes the dermis. Studies show 80 percent of skin tears are on the upper extremities.

The skin layers and underlying adipose tissue serve as a unique outer shield of protection against the environment. It is easy to see that the changes caused by aging alter the effectiveness of its protection, thus increasing risk for infection and injury.

Chapter 12 Review Questions

Define the following terms:

1. Epidermis—
2. Dermis —
3. Adipose —
4. Connective Tissue —
5. Cellulitis —
6. Cutaneous —
7. Herpes Zoster —
8. Candidiasis —
9. Collagen —

Complete the following:

14. List four changes that commonly occur as the integumentary system ages.
 - a.
 - b.
 - c.
 - d.

Circle “True” or “False” as appropriate for the following statements:

10. (*True/False*) — The skin is the smallest organ of the body and accounts for approximately 7 percent of the body’s weight.
11. (*True/False*) — The elderly patient’s blood flow is usually impaired.
12. (*True/False*) — The elderly patient has more subcutaneous fat to insulate the body.
13. (*True/False*) — The skin layers and underlying adipose tissue serve as a unique outer shield of protection against the environment.