

Lecture 5
Integumentary System
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Integumentary system

The skin and its accessory organs (hair, nails, and glands) are known as the Integumentary system of the body.

Integument means covering, and the skin is the outer covering for the body.

The skin covers and protects all outer surfaces of the body and performs many vital functions, including the sense of touch

Skin

- important functions of the skin include protecting the body against ultraviolet rays, regulating body temperature, and preventing dehydration.
- The skin also acts as a reservoir for food and water
- It also synthesizes vitamin D when exposed to sunlight

The skin consists of two distinct layers:

- 1) the epidermis – a thin cellular membrane layer
- 2) the dermis - dense, connective tissue layer
- 3) subcutaneous layer of tissue - thick, fat-containing tissue

Epidermis

The epidermis is the outermost, totally cellular layer of the skin

It is composed of :

- 1) **squamous epithelium.** Epithelium is the covering of both the internal and the external surfaces of the body. Squamous epithelial cells are flat and scale-like
- 2) the epidermis is composed of several sublayers called strata
- 3) the stratum corneum and the basal layer, which is the deepest layer, are of greatest importance.

The stratum corneum is composed of dead flat cells that lack a blood supply and sensory receptors

The basal layer is the only layer of the epidermis that is composed of living cells where new cells are formed

In the basal layer:

- 1) Keratin: a hard protein material, The relatively waterproof characteristic of keratin prevents body fluids from evaporating and moisture from entering the body.
- 2) special cells called melanocytes produce a black pigment called melanin

Melanin

Characteristics of melanin:

1. provides a protective barrier from the damaging effects of the sun's ultraviolet radiation
2. Moderate sun exposure increases the rate of melanin production and results in a suntan
3. Differences in skin color are attributed to the amount of melanin in each cell.
4. Dark-skinned people produce large amounts of melanin and are less likely to have wrinkles or skin cancer
5. An individual who cannot produce melanin has a marked deficiency of pigment in the eyes, hair, and skin and is known as an **albino**.

Dermis

The second layer of the skin, the dermis, also called **corium**, lies directly beneath the epidermis.

It is composed of:

1. living tissue
2. Contains numerous capillaries, lymphatic vessels, and nerve endings.
3. Hair follicles
4. **sebaceous** (oil) glands
5. sudoriferous (sweat) glands

The subcutaneous layer

also called hypodermis, binds the dermis to underlying structures

It is composed of

1. loose connective tissue
2. **adipose** (fat) tissue interlaced with blood vessels

The subcutaneous layer stores fats, insulates and cushions the body, and regulates temperature

The amount of fat in the subcutaneous layer varies with:-

- 1) the region of the body
- 2) sex, and age
- 3) nutritional state

Accessory Organs of the Skin

1. Hair
2. Nails
3. Glands
 - a. Sebaceous Glands
 - b. Sweat Glands

جدا مهم فقط التاشيرات مطلوبه في الرسم

Touch receptor
مستقبل اللمس

(8) Hair shaft
رمح الشعر (الجزء الخارجي من الشعر)

Sweat gland pore

مسام الغده العرقيه

(2) Stratum corneum
الطبقة العليا للبشره

(3) Basal layer
الطبقة السفلى للبشره

(1) Epidermis

البشره

(7) Sebaceous (oil) gland
الغده الدهنيه

(4) Dermis

الادمه

(9) Hair follicle
بويصلات الشعر

(5) Subcutaneous tissue

الانسجه تحت الجلد

Adipose tissue
الانسجه الدهنيه

الحليمه

(10) Papilla

Arteriole
شريان صغير

Venule
وريد صغير

Nerve
عصب

(6) Sudoriferous (sweat) gland
الغده العرقيه

Figure 5-1. Structure of the skin and subcutaneous tissue.

This section introduces combining forms, suffixes, and prefixes related to the integumentary system

adip/o - fat

adiposis - is an abnormal accumulation of fatty tissue in the body.

derm/o, cutane/o - skin

Hypodermic - pertaining to under the skin

dermatoplasty - surgical repair of the skin

hidr/o - sweat

Hidradenitis - inflammation of the sweat glands

ichthy/o - dry, scaly

Ichthyosis - abnormal condition of dry or scaly skin

melan/o - black

Melanoma - black tumor

py/o/derma - pus in the skin

onych/o - nail

pil/o , trich/o - hair

trichopathy	-	disease involving the hair
scler/o	-	hardening; sclera (white of eye)
Scleroderma	-	hardening of the skin
xen/o	-	foreign, strange
xenograft	-	skin transplantation from a foreign donor
xer/o	-	dry
Xeroderma	-	dry skin
Lipocyte	-	fat cell
dermatologist	-	specialist in treatment of skin disorders
Dermatology	-	study of the skin (and its diseases)
Cryotherapy	-	use of cold in the treatment (of disease)
an/hidr/osis	-	abnormal condition of absence of sweat
dia/phoresis	-	excessive or profuse sweating
epi/derm/is	-	above the skin
hyper/hidr/osis	-	excessive or profuse sweating
sub/ungu/al	-	pertaining to beneath the nail of a finger or toe

DISORDERS OF THE SKIN

basal cell carcinoma –

malignant tumor of the basal layer of the epidermis. It is a slow-growing tumor and usually occurs on the upper half of the face, near the nose
سرطان الطبقة السفلى للبشرة وهو اكثر انواع سرطان الجلد انتشارا وينشا في الطبقة السفلى للبشرة



psoriasis –

a discrete pink or dull red lesion surmounted by characteristic silvery scaling
مرض التهاب الجلد وهو مرض مزمن غير معدي



impetigo –

Common contagious superficial skin infection

Marked by a fluid filled blister that becomes pustular, ruptures, and form a yellow crust
مرض معدي يصيب الطبقة الخارجية من الجلد تتكون بثرة مملوءة بالخراجات والتي يمكن ان تكبر وتنفجر ويخرج منها قيح اصفر



acne-

a chronic inflammatory disease of the sebaceous glands and hair follicles of the skin

acne vulgaris (ordinary) –

is the common variety of acne. It is characterized by the formation of blackheads
مرض التهاب البشرة يصيب الغدد الدهنية
وبويصلات الشعر



Abscess

Localized collection of pus at the site of an infection



Ecchymosis

Skin discoloration consisting of a large, irregularly formed hemorrhagic area with colors changing from blue-black to greenish brown or yellow; commonly called a bruise



Grading and Staging Systems

The TNM system stages tumors according to three basic criteria:

- T—size and invasiveness of the primary tumor
- N—nodal involvement
- M—spreading of the primary tumor to remote regions of the body (metastasis).

Table 5-1 Tumor Grading	
<i>The table below defines the four tumor grades and their characteristics.</i>	
Grading	Tumor Characteristics
Grade I Tumor cells well differentiated	<ul style="list-style-type: none">• Close resemblance to tissue of origin, thus, retaining some specialized functions
Grade II Tumor cells moderately differentiated	<ul style="list-style-type: none">• Less resemblance to tissue of origin• More variation in size and shape of tumor cells• Increased mitoses
Grade III Tumor cells poorly to very poorly differentiated	<ul style="list-style-type: none">• Only remotely resembles tissue of origin• Marked variation in shape and size of tumor cells• Greatly increased mitoses
Grade IV Tumor cells very poorly differentiated	<ul style="list-style-type: none">• Little or no resemblance to tissue of origin• Extreme variation in size and shape of tumor cells

Table 5-2

TNM System of Staging

The table below outlines the tumor, node, metastasis (TNM) system of staging, including designations, stages, and degrees of tissue involvement.*

Designation

Stage

Tissue involvement

Tumor

T0

No evidence of tumor

لا يوجد سرطان

Tis

Stage I

Carcinoma in situ indicates the tumor is in a defined location and shows no invasion into surrounding tissues

سرطان موضعي

T1, T2, T3, T4

Stage II

Primary tumor size and extent of local invasion, where T1 is small with minimal invasion and T4 is large with extensive local invasion into surrounding organs and tissues

سرطان انتشر ولم يعد موضعيا

Node

N0

Regional lymph nodes show no abnormalities

طبيعي

N1, N2, N3, N4

Stage III

Degree of lymph node involvement and spread to regional lymph nodes, where N1 is less involvement with minimal spreading and N4 is more involvement with extensive spreading

انتشر الى العقد اللمفاويه الموقعيه

Metastasis

M0

No evidence of metastasis

لم ينتشر في الجسم

M1

Stage IV

Indicates metastasis

انتشر في الجسم