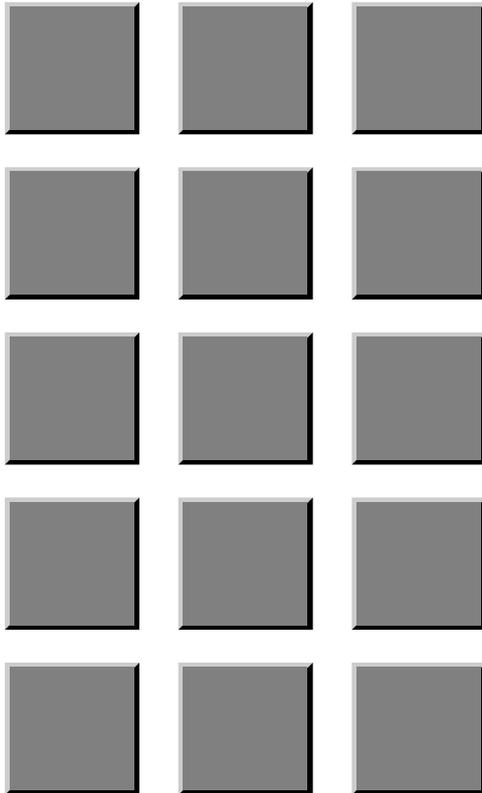


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Dermatovenereology

Modules



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as a manual for students of
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IV accreditation level

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The manual has been compiled in accordance with the credit module system, requirements of the Bologna Process, demands and normative directions of the Ministry of Public Health of Ukraine.

The manual aims to increase the efficiency of theoretical and practical dermatovenereology studying.

The manual contains up-to-date information on the etiology, pathogenesis, clinical manifestations, diagnosis, treatment and prevention of skin and venereal diseases. It also covers modern methods of clinical investigation and dermatovenereologic patient examination.

The educational material in the manual is divided into thirteen thematic modules according to the syllabus of the dermatovenereology discipline.

The manual is recommended for students of higher medical institutions of the III–IV accreditation levels of the specialities Medical Business and Pediatrics. The textbook will also be useful for interns, dermatovenereologists, and general practitioners.

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PREFACE

The topicality of dermatovenereology study is determined by considerable prevalence of skin and venereal diseases over the last decades and an increasing number of patients with infectious skin pathologies and atypical clinical courses of dermatoses. At the same time, skin changes often have clinical presentations of somatic pathologies. The knowledge of such clinical presentations is necessary for general practitioners and doctors of different specialization to give a timely diagnosis and provide treatment for an internal pathology. Professional training of different medical specialists (surgeons, obstetricians-gynecologists, pediatricians, infectionists, neurologists, etc.) cannot be of high quality and efficiency without a thorough study of skin manifestations of many diseases, their prevention and treatment.

The manual aims to increase the efficiency of theoretical and practical dermatovenereology studying taking into account self-study training and classroom work.

The manual contains up-to-date information on the etiology, pathogenesis, clinical manifestations, diagnosis, treatment and prevention of skin and venereal diseases. It also covers modern methods of clinical investigation and dermatovenereologic patient examination. Special attention is paid to the questions of preventive health care.

The educational material is divided into thirteen thematic modules according to the syllabus of the dermatovenereology discipline. The manual has been compiled in accordance with the credit module system, requirements of the Bologna Process, demands and normative directions of the Ministry of Public Health of Ukraine.

In addition, the manual covers the etiopathogenesis, clinical presentation, diagnosis and treatment for leprosy and tropical treponematoses (yaws, bejel, pinta disease) spread in countries with hot climates. The knowledge of these diseases will be particularly useful for foreign students, who will have medical practice in countries with tropical and subtropical climates.

Preface

The modern data on the etiopathogenesis, classification, diagnosis and treatment for dermatoses, as well as sexually transmitted diseases, were used by the authors in the educational topics of the manual.

The content of each education topic is clearly structured and comprehensible. At the end of each thematic module there are tests and clinical tasks, which help to control how students master the material.

Thorough mastering of dermatovenereology will contribute to the training of qualified doctors, including those working in countries with hot climates.

The manual is recommended for students of higher medical institutions of the III–IV accreditation levels, internship doctors and general practitioners.

The authors will appreciate any remarks or suggestions that will contribute to further improvement of the manual.

Module 1

INTRODUCTION TO DERMATOLOGY

Objectives:

- to learn the physiological and morphological characteristics of the human skin and mucous tunics under normal and pathological conditions;
- to define the notion of rash and its role in dermatological diagnostics;
- to analyze the stages of dermatovenereology development as a separate subject and the role of scientists in its progress.

- Dermatology (from Gr. *dermato* — skin, *logos* — word) is the branch of medicine concerned with the skin and its diseases.
- Venereology (from Latin *venus* — sexual love) is the branch of medicine concerned with the study of the etiology, epidemiology, clinical picture, diagnosis, treatment, and prophylaxis of sexually transmitted diseases.

1.1. Anatomy, histology and physiology of the human skin

The skin is a highly underestimated organ. It performs many vital functions and has a complex structure, which most people are unaware of.

The skin is an organ because it consists of different tissues that are joined to perform specific activities. It is one of the largest organs of the body in surface area and weight. In adults, the skin covers an area of about 2 square meters, and weighs from 4.5 to 5 kg. It ranges in thickness from 0.5 to 4.0 mm depending on location. The skin consists of: keratinocytes (90 %), melanocytes (8 %), Langerhans' cells, Merkel's cells, etc.

Structurally, skin consists of (Fig. 1):

1. Epithelium — epidermis (the most superficial).
2. Dermis.
3. Hypodermis (subcutaneous tissue).

Epidermis layers, their description:

I. Stratum germinativum (the basal layer).

- The closest layer to the dermis.
- Separated from the underlying dermis by a basement membrane.
- Contains cuboid cells, with large nuclei and distinct cell content, particularly ribosomes for keratin production.
- Mitotic activity is most evident in this layer, replacing cells in the upper layers.
- It takes cells approximately 14 days to move through this layer.
- As the cells hit the upper part of this layer, they increase the amount of keratin in them in the form of keratin granules.
- Melanocytes scattered throughout this layer synthesize the black pigment melanin.

II. Stratum spinosum (the prickly layer).

- This second layer is sometimes considered to be part of the stratum germinativum.
- Polyhedral cells are held together by intercellular bridges (or prickles), but become flattened towards the top.
- Prominent nuclei and cytoplasmic basophilia indicate active protein synthesis.
- Fibrillar protein aggregates in these cells to form intracellular fibrils known as tonofibrils, which converge upon the desmosomes of the prickles. These tonofibrils become more prominent toward the stratum granulosum.

III. Stratum granulosum (the granular layer).

- The third layer. Contains melanocytes and basophilic granules, which are thought to be keratin precursors.
- Flattened and diamond-shaped cells, which are characterized by numerous dense basophilic granules crowding the cytoplasm and tending to obscure the tonofibrils.

IV. Stratum lucid (the lucid layer).

- The questionable fourth layer, which is often so thin that it is sometimes considered not to be a transitional layer between the stratum granulosum and the stratum corneous.
- The stratum lucid is so thin that it is currently debated if the layer is an artefact of the electron microscope and does not actually exist.
- Supposedly most pronounced in the palms of the hands and the soles of the feet.
- Cells show signs of disintegration and have lost their nuclei and organelles.

V. Stratum corneous (the horny layer).

- The final layer.
- Its cells are non-nucleated, disintegrated, fused, flattened squamous cells filled with keratin fiber (matured keratin).
- Contains little water.
- Forms the protective barrier for the skin.
- As the junctions become interrupted, the cells are desquamated.

The dermis contains two layers:

I. Papillary layer (which is closest to the epidermis).

- Consists of loose connective tissue with fine collagen and elastin fibers.
- Folded into ridges or papillae which extend into the epidermis.
- Especially noticeable in the palms and soles.
- Contains nerve fibers and blood vessels, which extend into the folds, supplying the epidermis, which is the vascular plexus.

II. Reticular layer.

- No defined boundary between the two layers.
- Contains denser connective tissue and many thick collagen fibers.

Technically **the hypodermis** is not part of the skin. It is composed of loose connective tissue; contains lots of adipose tissue for metabolism and insulation.

Skin appendages

Sebaceous glands:

- are of alveolar type (from 4 to 380 on 1cm²);
- small saccular glands;
- their ducts open into the hair follicles;
- they are absent in the palms and soles.

Sweat glands:

- long blind tubules of two varieties:
 - small glands (eccrine) — have only watery secretion and are distributed over practically entire integument (143–330 on 1 cm², in the palms and soles — 400–500);
 - large glands (apocrine) — their secretion contains cellular debris. These are present only in the axilla, near the nipples, in the umbilicus, in the genital and anal region.

Hair is present on all parts of the human skin, except the palms, soles, red portions of the lips, ungual phalanges, and glans penis. There are three principal varieties of hair:

- soft long hairs — on the scalp, beard, mustache, axillae and pubis, and exceptionally on the trunk midline;

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