Ministry of Health of the Republic of Belarus

Educational Establishment

«Vitebsk State Order of Peoples` Friendship Medical University»

Chair of Propedeutics of Internal Diseases

 It predicated on methodical

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 The report № \_\_\_\_\_\_

**Information Block for lesson N3**

for the practical training

on Propaedeutics of Internal Diseases

for specialty 1-79 01 01 "General medicine"

2 course of medical faculty

full-time form of higher education

**THEME:** General survey of a patient with diseases of internal organs, examination of separate parts of the body

Vitebsk, 2025

**Questions for classroom knowledge control.**

1. Assessment of general condition of the patient: types, evaluation criteria. Levels of impaired consciousness. The patient’s position.

2. Body build. Assessment of the body build type. BMI (body mass index).

3. Face examination. Assessment of condition of the skin and visible mucous membranes. Hair-covering assessment, examination of nails. The degree of development of subcutaneous fat. Diagnostic value.

4. Edema: localization, prevalence, severity. Methods of detection. The difference between renal and cardiac edema.

**Information block of the topic**

Objective examination (physical examination) includes general and local survey (inspection), and internal organs examination (palpation, percussion, and auscultation).

***Technique of general inspection (general survey).***

Inspection often precedes taking anamnesis, and begins with the first sight of the doctor on the patient. The examination data, combined with the questioning data, make it possible to construct a sufficiently substantiated di-agnostic hypothesis.

Examination of the patient is the simplest and most natural method of research. To obtain reliable results, it requires compliance with certain rules: lighting, in which the inspection is performed, inspection technique, inspec-tion plan.

General inspection must be carried out with scattered daylight or white artificial light. Lighting can be direct or lateral. The patient should be wholly or sometimes partially exposed.

*Inspection can be divided into* ***general survey*** which is made at the beginning of the study, and ***local survey*** of parts of the body, organs and systems (chest, heart area and large blood vessels, abdomen, and others).

***General survey includes assessment of:***

(1) Consciousness (mental state);

(2) Posture (position) of the patient;

(3) Habitus, including body-build (constitution) type, height, and body weight, facial appearance.

(4) Skin and mucosa examination

(5) Lymph nodes examination

(6) Thyroid gland examination

(7) Musculoskeletal system examination

(8) Body temperature

(9) General condition of the patient

***General condition (general state) of the patient*** is determined as a result of the general survey by a number of features that include:

- state of consciousness;

- position of the patient;

- habitus;

- gait;

- face;

- state of skin, visible mucosa, and subcutaneous tissue;

- constitutional type and nutritional state;

- musculoskeletal system;

- vital signs, such as body temperature, heart rate, blood pressure, respiratory rate, daily diuresis.

The severity of the patient's condition is determined by, first of all, the state of consciousness, position and changes of vital signs.

*General state (general condition) of a patient can be estimated in following degrees:* ***satisfactory, moderate severity, and grave (serious) state***.

**Оценка состояния сознания**

**Consciousness (mental state) assessment**

Assessment of consciousness (mental state) begins simultaneously with the patient's inquiry. Use the following headings:

* Appearance and behavior of patient
* Speech
* Mood
* Thought content
* Abnormal beliefs
* Abnormal experiences
* Cognitive state
* Intelligence
* Insight and rapport
* Specific tests of cerebral function

***Consciousness (mental state)*** can be ***clear or deranged***(clouded) consciousness.

*Normally, a person has a clear consciousness; he correctly orients himself in enviroment, time and his own personality.*

*Twilight consciousness* is a violation of consciousness in the form of confusion is characterized by mild disorientation of the patient, and it is not so easy to notice. Comparison of questioning data with examination, carrying out simple logical or mathematical tests allow to reveal even the lightest violation of activity of the central nervous system.

*Stupor (obtundation)* - a state of stun, when the patient is poorly oriented in the environment, answers the questions, but sluggish and not quite clearly.

*Sopor* - a hibernation (pathologic sleep condition), from which a patient may be derived only a loud shout or mechanical stimulus, but then returns to its previous state. The patient answers to questions poorly, with great difficulty.

*Coma* is characterized by complete loss of consciousness, lack of reflexes, possibly involuntary urination and defecation. Only the functions of breathing and blood circulation are preserved. Coma occurs in diabetes (diabetic comas), renal failure (uremic coma), liver encephalopathy (hepatic coma), respiratory failure (hypoxic coma), cerebrovascular disorders (cerebral coma).

The patient's condition on the *Glasgow Coma Scale* is evaluated on three features. Scores are summed.

*Eye opening:*

- spontaneous - 4 points

- in response to voice: 3 points

- in response to pain - 2 points

- absent - 1 point

*Speech Reaction:*

- patient is oriented, gives quick and correct answer to question asked - 5 points

- patient is disoriented, confused speech - 4 points

- answer does not make sense to the question (verbal mixture) - 3 points

- unintelligible sounds in reply to the question - 2 points

- no speech - 1 point

*Motor reaction*

- performance of movements on command - 6 points

- appropriate movement in response to painful stimulus (pushing away) - 5 points

- releasing a limb in response to painful stimulus - 4 points

- abnormal flexion in response to painful stimulus - 3 points

- abnormal straightening in response to painful stimulus - 2 points

- No motion - 1 point.

*Interpretation of the results on Glasgow Coma Scale:*

- 15 points - clear consciousness

- 13-14 points - stunned

- 9-12 points - somnolence

- 4-8 points - coma

- 3 - cortical death

Due to lack of oxygen or severe illness that damages the brain, a person may have a ***vegetative state***. The person falls asleep and wakes up relatively normally, breathes and swallows independently, and may have a motor response to loud noises. At the same time, the patient loses the ability to think and behave consciously.

***Locked-in syndrome*** is a rare condition in which the person is conscious and able to think, but as a result of severe paralysis is only able to communicate with others by opening or closing his eyes as a sign that he understands the questions addressed to him. This condition occurs in severe peripheral paralysis and in some variants of stroke.

**Assessment of patient's position (posture).**

***A patient's position may be active, passive and forced***.

***Normally, a person has an active position*** - the most natural under these conditions, easily changed depending on the desire. In most cases, the patient's position also remains active. If it is impossible to get out of bed, the situation is assessed as active in bed when the patient could change it.

In the *passive position*, a patient can not spontaneously change it because of the severity of the condition (with loss of consciousness, tetraparesis, fracture of the spine).

*Forced position* is a certain position that takes the patient to facilitate his state of health.

*Forced position of the patient may be vertical (sitting, standing) and horizontal (recumbent, lying down).*

*Forced sitting position* (*orthopnea*) occurs when patients have dyspnea in heart failure and acute lung diseases (bronchial asthma attack, pneumothorax). *Lying (recumbent) forced position* can be on the back, on the stomach, on one or another side. *Forced position on the back* is observed in the onset of severe abdominal pain (in perforated stomach ulcer, appendicitis, peritonitis). *Position on the back with the half-bent limbs in the elbow and knee joints* is characteristic for acute rheumatic polyarthritis. *Forced position on the abdomen* is observed in diaphragmatic pleurisy, tuberculosis of the spine, solaritis (inflammation of the solar plexus). *Position on the affected side of chest* is most often in patients with lobar pneumonia, pleurisy, suppurative process in the lungs.

The patient stops and freezes with a painful attack of angina pectoris (a “*symptom of the shop-window*”) stopping physical activity.

**Constitution (body-build type) type**

***Constitution*** of a human (a ***body-build type***) is a certain complex of signs of morphological and functional character. There is a certain correlation between the external forms of the body and its internal structure, as well as between the physiological and morphological properties of the body.

Classification adopted by M. Chernorutsky and W. Sheldon differentiates between the following ***three main constitutional types: asthenic*** *(ectomorph, oligomorph****), hypersthenic*** *(endomorph*, brachymorph)***, and normosthenic*** *(mesomorph)*.

Well proportioned body-build is characterized by normal weight and height that roughly equals to the fingertip-to-fingertip measurement of the outstretched arms, and twice the leg length from pubis to heel in.

Assessment of a body-built type of the patient is based on body mass index (a ratio of height and weight), lengths of limbs, shape of the head, neck, and chest, development of muscle mass and subcutaneous fat tissue (Fig.2-1).

***Hypersthenic type*** characteristics are transverse dimensions over prevail longitudinal ones, wide and short body, medium or short height, often increased weight, strong muscles, wide shoulders, relatively short limbs, rounded head, short and thick neck, wide chest, evenly protruding abdomen. These individuals have slightly increased function of gonads (sex glands) and reduced – of thyroid gland. More often, there is a violation of lipid metabolism, a tendency to arterial hypertension and coronary artery disease, gallstone and urolithiasis.

***Asthenic type*** has a narrow and elongated body, above average height, thin and narrow shoulders, long limbs, oblong head, elongated and thin neck and chest, weak muscles. Abdomen is drawn in the upper part, and is protruding slightly in the lower one. Often there is a lowering kidneys, liver, and stomach (visceroptosis, or enteroptosis). These people are easily excitable. They may be with an increase in thyroid function, and some decrease in the function of the gonads. Asthenic type predisposes to diseases of the lungs and gastrointestinal tract.

***Normosthenic type*** occupies an intermediate position between the hypersthenic and asthenic constitutional types.

***Body Mass Index (BMI)*** is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in meters (kg/m2). BMI values are age-independent and the same for both sexes (Table 2-3) (WHO, 1995).

BMI is not a reliable criterion for age under 20 years and over 65 years, pregnant women, and athletes with developed musculature.

With adequate trophic status (euthrophy) in adults, the index is 20-24.9 kg/m².

Higher numbers indicate overweight, lower numbers indicate underweight.

Diagnostic criteria for underweight, overweight and obesity depending on BMI:

- Underweight. BMI is less than 18.5 kg/m2 . The risk of comorbidities associated with obesity is low.

- Normal weight range. BMI 18.5-24.9 kg/m2. The risk of obesity-related diseases is average in the population.

- Excess body weight. BMI 25.0-29.9 kg/m2. The risk of obesity-related diseases is slightly increased.

- Grade I obesity. BMI 30.0-34.9 kg/m2. The risk of obesity-related diseases is moderately elevated.

- Grade II (severe obesity). BMI 35.0-39.9 kg/m2. The risk of obesity-related diseases is high.

- III degree (severe, morbid obesity). BMI over 40.0 kg/m2. The risk of obesity-related diseases is very high.

***Methods for assessing the component composition of the human body*** (muscular, fat, bone) and fat distribution are the caliperimetric, circumferential, and combined (circumferential-caliperimetric) methods.

The *caliperimetric method* is based on measuring with the help of a *caliper* the thickness of skin and fat folds:

- at the level of the middle third of the shoulder above the biceps and triceps,

- at the angle of the right scapula,

- on the chest under the xiphoid process and 5 cm to the left of the sternal line,

- in the right inguinal area 2-3 cm above the pouparticular ligament.

After determining the total thickness of the skin-fat folds, find the percentage of fat in the body using the appropriate formula and table.

*Circumferential and circumferential-caliperometric methods* include calculating, using the appropriate formulas, the % of body fat after determining

- arm circumference,

- abdominal circumference at waist level,

- hip and buttock circumference,

- calf circumference and wrist circumference.

*Waist circumference* (the narrowest part of the torso or at 2.5 cm above the navel) to *94 cm in men* and to *80 cm in women indicates a low risk for obesity-related diseases.*

This *risk increases with a waist circumference greater than 102 cm in men and 88 cm in women.*

*Waist circumference (WC)* is measured midway between the lower edge of the rib cusp and the iliac bone with a tape. Hip circumference (HC) is measured at the widest point. An *OT/OB ratio* of less than 0.72 is considered ideal.

There is an *increased health risk when the OT/OB ratio is more than 0.9 in men and more than 0.85 in women*.

**Skin examination**

A study of the skin and mucous membranes (conjunctiva, oral mucosa) is produced in parallel, assessed:

*- colour,*

*- humidity (moistness),*

*- elasticity (turgor),*

*- temperature,*

*- subcutaneous fat,*

*- presence of edema, focal lesions (rashes, scars),*

*- dermal appendages (hairs and nails).*

*The color of the skin and mucous membranes in individuals of the Caucasian (europoid) race is estimated as pale-pink*. It depends on the thickness of the skin, transparency, blood filling, and the amount of pigment.

The skin is felt dry or slightly moist, warm, smooth, elastic (collected by two fingers fold quickly straightens). Mucous membranes should be moist, their surface smooth. Constitutional pale skin is combined with normal pale pink color of mucous membranes. With anemia, the skin and mucous membranes become pale.

***Pale skin*** color is associated with insufficient filling of the cutaneous blood vessels (due to spasm of blood vessels of the skin or emptying them in massive bleeding, collapse, and acute vascular insufficiency). It is observed in anemia, kidney disease, aortic heart valves diseases. In B12-(folate)-deficiency anemia, pale skin becomes yellowish, in iron-deficiency anemia - greenish, in cancer patients - earthy, malaria - ash or brown, in infective endocarditis - the color of "coffee with milk".

In anemia, the pallor of the skin is combined with the pale color of the mucous membranes (conjunctiva of the eyes, soft and hard palate, gums, tongue).

Pronounced pallor of the skin occurs in the development of subcutaneous edema, squeezing the capillary network and pushing it away from the surface of the skin (in renal origin of edema).

***Yellow color***of skin and mucous membranes - *jaundice (icterus*). Icterus firstly appears on the mucous membranes of the hard palate and eyes with an increased bilirubin in the blood up to 30 mcmol/l), and only at a higher level of bilirubin – on the skin. Inspection for discovering icterus is carried out only in daylight.

Cause of jaundice is accumulation of bile pigments in the skin and mucuos membranes due to (1) *posthepatic (mechanic, obstructive) jaundice* as a result of blockage of the common bile duct (by stone in gallstone disease, by cancer of the pancreas head), (2) *hepatic (parenchymatous) jaundice* as a result of disordered bilirubin metabolism and secretion in hepatitis, cirrhosis of the liver; (3) or in *prehepatic (hemolytic jaundice)* as a result of hemolysis (destruction) of red blood cells in hemolytic anemia.

A pale lemon-yellow tint is a characteristic of prehepatic jaundice. There is a dark-yellow or orange tint in hepatic jaundice. In posthepatic jaundice there are green tint and scratch marks from itching evoked by bile salts.

In rare cases, yellowness may be due to carotenemia (elevated blood serum concentration of vitamin A). Yellow skin color can be the result of taking in large doses of certain drugs (quinine, etc.), as well as food products (carrots, citrus). However, the sclera of the eyes are not stained in these conditions.

***Cyanosis*** (blue shade of skin and mucous membranes) may be diffuse and local.

*Central (or diffuse) cyanosis* depends on insufficient arterialization of the blood in diseases of the lungs. In respiratory failure, mild cyanosis appears only with exercise. Permanent cyanosis with a purple tint (due to compensatory erythrocytosis) is characteristic of respiratory failure of II-III degree. It is evident from the moderate cyanosis of face and upper part of the chest up to the diffuse cyanosis.

*Peripheral cyanosis (acrocyanosis)* is associated with impaired blood circulation in heart failure. It is detected on the tip of the nose, ears, fingers, lips. The skin in these places is cold to the touch.

*Local limited cyanosis* appears on one part of the body: on the face and neck – in a mediastinal tumor, on one limb – in thrombosis of the corresponding vein).

***Red skin color (hyperemia)*** can occur under the influence of mental excitement, excessively high air temperature, fever, alcohol intake, carbon monoxide poisoning. The face is hyperemic in patients with arterial hypertension. In chronic alcoholism, it is constantly marked crimson-red color due to persistent dilation of the capillary network, especially on the back and tip of the nose, and cheeks.

In *polycythemia* (a disease characterized by high levels of red blood cells and hemoglobin), face is red, with a cherry tint, blood vessels of the eye conjunctiva rea dilated.

***Pigmentation*** is most commonly racial. The pigmentation of *Addison's disease (adrenal insufficiency)* affects the buccal mucous membranes as well as exposed skin and parts subject to friction. Dark red or brown skin is characteristic of adrenal insufficiency. Hyperpigmentation of the breast nipples and the areola in women, pigmented patches on the face and the white line on the abdomen are signs of pregnancy. Foci of depigmentation of the skin (*vitiligo*) also occur.

***Turgor (elasticity)*** of the skin depends on: the degree of development of fatty tissue, moisture content, blood supply, the presence of elastic fibers. Preserved elasticity (turgor) of skin is defined when taken by fingers a skin fold is quickly smoothed. Skin turgor decreases in elderly persons (over 60 years), with a sharp depletion, dehydration (vomiting, diarrhea), circulatory disorders.

***Moistness of skin*** is detected on the touch. High moistness is physiological in the summer in the heat, with increased muscle work, excitement) and pathological in with severe pain, attacks of suffocation, fever, severe intoxication, thyrotoxicosis, tuberculosis, lymphogranulomatosis, heart failure).

Dry skin is noted with the loss of a large amount of fluid (in vomiting, diarrhea, diabetes mellitus and diabetes insipidus, myxedema, scleroderma, chronic nephritis).

***Hair.*** Violation of hair growth often indicates a pathology of the function of the genitalia and other endocrine glands. Deficient hair growth or absence of hairs (alopecia) is characteristic of myxedema, liver cirrhosis (hypothyroidism), eunuchoidism, and infantilism. Hair growth by male type (hirsutism) is observed in women with Cushing's disease and adrenal tumors. Hair is also affected in some skin diseases.

***Nails.*** Normal nails are smooth and pink. Thin, brittle, flaking nails, with depressions, transverse and longitudinal striations on them are observed in iron-deficiency and vitamin B12 –deficiency anemias, hypo- and hyperthyroidism. Spoon-like deformation of nails (koilonychia) is typical in severe iron-deficiency anemia. Nails are deformed in the form of «watch glasses" in chronic suppurative lung diseases (abscesses, bronchiectasis) and in chronic circulatory failure.

**Facial appearance**

During general survey, it is important to assess the expression of the patient's face. The expression, and particularly the eyes, indicates real feelings better than words. Some diseases, for example Parkinson's disease, depression, hypothyroidism, thyrotoxicosis, acromegaly, produce characteristic facial appearances. In a number of diseases a facial expression is an important diagnostic feature. Among the most common are the following:

*"Mitral face"* (*facies mitralis*) is the characteristic of patients in mitral stenosis: red-cyanotic" blush» cheeks against the background of pallor skin of face, and cyanosis of the lips, nose and ears;

*"Corvisart's face* " (*facies Corvisari*) - a sign of severe chronic heart failure: yellow-pale facial skin with a blue tint, puffy, dull eyes, cyanosis of the lips, half-open mouth, and pronounced dyspnea;

*Face in Itsenko-Cushing syndrome* (hypercorticism): round, moon-shaped, red skin, shiny face, and hirsutism (growth of facial hair in women);

*"Facies Basedovica*" in a person with Graves disease (thyrotoxicosis, or hyperthyroidism): lively, rich by facial expressions the face, marked exophthalmos (protrusion of eyes), eyes glittering and expresses fright or surprise, sometimes "frozen horror";

*Myxedamatous face* in myxedema (hypothyroidism): blunt, puffy, with sluggish facial expressions, edematous, indifferent look, eye slit narrow;

*"Facies acromegalica*" – is the face of patients in acromegaly (increased production of growth hormone of the anterior pituitary gland): sharply increased size of the nose, lips, brow, mandible, tongue;

*"Facies nephritica*" is the face in kidney diseases: pale, puffy, swelling of the eyelids, "bags" under the eyes;

*Face in tetanus (risus sardonicus)*: a violent, "sardonic smile" - lips stretched in a smile, and forehead creases, as if sorrow;

*"Facies Hippocratica"* - is typical for patients in peritonitis (inflammation of the peritoneum) or agonal condition: pale with a blue tint, sharpened cheekbones and nose, sunken eyes, expression of suffering, drops of sweat on the forehead;

*"Facies febrilis"* is a face in lobar pneumonia and high fever - one-sided redness on the side of the inflamed lung, the wings of the nose participate in the act of breathing, the eyes are shiny, the expression is agitated, and herpetic eruptions may be;

*"Facies phthisica"* is a face in pulmonary tuberculosis: pale, thin face with a bright blush on the cheeks, shiny eyes;

*Face in chronic alcoholism* - red with dilated veins on the cheeks and nose, "empty" look.

*Parotid swelling* in the region of the parotid glands(lies wedged between the sternocleidomastoid muscle and the mandible bone) are obvious on inspection of the face. It is typical in acute infectious parotitis and Syogren’s syndrome.

***Development of subcutaneous fat*** layer may be normal, increased or decreased. The fat layer can be distributed equally, or its deposition occurs only in certain areas. The thickness of the subcutaneous fat layer (degree of fatness) can be judged by palpation or caliper measuring skin-fold.

For these purposes, two fingers of the hand take a fold of skin with subcutaneous tissue on the outer edge of the rectus abdominis muscle at the level of the navel, the lateral surface of the shoulder or at the angle of the shoulder blade and measure its thickness with a caliper. Traditionally, the thickness of the skin fold should be within 2 cm, the thickness less than 1 cm is regarded as a decrease, and more than 2 cm – as an increase in the development of the subcutaneous fat layer.

***Edema*** is an accumulation of non-inflammatory fluid (transudate) in tissues and interstitial spaces. Edema may be local and generalized.

*Local edema* may be associated with difficulty in the outflow of venous blood during compression or thrombosis of the vein. “*Angioedema*” is caused by violation of vegetative innervation and capillary permeability.

*Generalized edema* develops due to venous congestion ("warm" edema) or disordered the colloid-osmotic equilibrium (renal and hungry edema). Edema, and on the face, and especially paraorbital, clearly indicate renal pathology. On the legs edema often appear in heart failure. In severe cases, edematous fluid accumulates in serous cavities: pleural (*hydrothorax*), pericardial cavity (*hydropericardium*), abdominal cavity (*ascites*).

*Anasarca* is a generalized edema in combination with accumulation of fluid in serous cavities.

Edema can be recognized by the pallid and glossy appearance of the skin over the swollen part, by its doughy feel, and by the fact that it pits on finger pressure

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