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## 6. PHYSICAL EXAMINATION DATA

After collecting the medical history of the patient proceed to a physical examination that starts with a check-up.

The examination of the gravida shall be performed by an obstetrician-gynecologist, dentist, otolaryngologist, ophthalmologist and, if necessary, endocrinologist, urologist, surgeon, cardiologist, etc. Should an extragenital pathology be identified in the gravida, the therapist or medical specialist gives opinion on the possibility of carrying of the pregnancy and, if necessary, performing additional tests or referring to the in-patient facility. Repeated examinations by a therapist shall be performed at the 30th and 37th–38th weeks of gestation, and by a dentist — at the 24th and 33th–34th weeks.

The dentist should not only examine, but also sanitize the oral cavity. The obstetrician-gynecologist monitors the implementation of expert recommendations at each visit to the clinic by the gravida. For example, should there be a high degree of myopia, especially complicated, one shall obtain the ophthalmologist opinion report on the management and exclusion of the second delivery period (delivery method).

Should there be any indications, a medical genetic consulting shall take place. Gravidas with a high risk of delivering children with chromosomopathy and hereditary pathologies, the geneticist may offer non-invasive and invasive examinations. Risk factors include:

- ▶ age of the gravida over 35;
- ▶ aggravated history (history of delivering children with a chromosomal pathology or monogenic diseases, subject to prenatal diagnosis);
- ▶ families in which one spouse is a carrier of a chromosome rearrangement or both spouses are carriers of a gene mutation;
- ▶ markers of a chromosomal pathology (e.g., collar space widening), identified by ultrasonography;
- ▶ deviations of the blood serum markers at screening biochemical studies;
- ▶ intermarriage.

The first thing to start with is the evaluation of objective status, i. e. characteristics of the patient's state. Currently, it can be classified as satisfactory, moderately severe, severe, extremely severe (preagonal) and terminal (agonal) states, catatony, sopor, coma. An inexperienced doctor is not always able to easily make a conclusion about the patient's state. Therefore, we consider it necessary to give a description of each severity grade. The assessment shall take into account the data of physical examination and laboratory-instrumental diagnostic. Special attention shall be paid to the cardiovascular and respiratory systems.

During practical classes students usually supervise gravidas in a satisfactory state, at which functions of vital organs are compensated. As a rule, this state is observed at milder forms of extragenital pathology and complications of gestation. Subjective and objective manifestations of the disease in these patients are not evident, their consciousness is clear, position is active, nutrition is without deviations, temperature is normal or subfebrile, pulse is 60–90 beats per minute (BMP), blood pressure is 110–140/60–90 mm Hg, respiratory rate (RR) is within the normal range (16–20 min). The state can also be satisfactory in the period of recovery after acute diseases and at a decline of aggravations of chronic processes.

At a moderately severe state, the functions of vital organs are sub-compensated. The disease poses no immediate danger to the life of the patient, for example in patients with early toxicosis or mild preeclampsia. This state of patients is usually observed in case of diseases accompanied by pronounced subjective and objective symptoms. Such patients may complain of intense pain of different localization, pronounced weakness, shortness of breath at moderate physical activity, dizziness. Their consciousness is usually clear, sometimes stunned. The motor activity is often limited: position patients in bed is active or forced, but they can take care of themselves.

In a number of cases fever with chills, common edema of subcutaneous tissue, pronounced pallor or icteritiousness of skin and sclera, mild cyanosis or extensive hemorrhagic lesions are observed. In such patients tachycardia (heart rate HR at rest is  $\geq 100$  beats per minute) or bradycardia (heart rate  $\leq 40$  beats per minute), heart rhythm disturbances, arterial hyper- ( $> 140/90$  mm Hg) or hypotension ( $< 100/60$  mm Hg) can be identified. Disorders of the respiratory system may include shortness of breath (RR  $\geq 20$  breaths per minute), obstruction of bronchial or up-

per respiratory tract patency. Repeated vomiting, severe diarrhea, mild gastrointestinal bleeding are possible. Upon physical examination signs of local diffuse peritonitis are identified. These patients require emergency medical assistance and emergency hospitalization due to a risk of rapid progression of the disease and development of fatal complications.

This state is assessed as severe in case of decompensation of vital organs' functions, which represents an immediate danger to the patient's life or leads to severe disability. The severe state can be observed at early toxicosis, hemorrhagic shock (ectopic pregnancy, impaired according to fallopian rupture type; premature detachment of the placenta), uterine rupture, severe preeclampsia, eclampsia and a complicated course of other disease with pronounced and rapidly progressing clinical manifestations.

In addition, patients in a severe state can complain of unbearable long persistent pain in the heart or abdomen, pronounced shortness of breath at rest, long anuria. Often the patient is moaning, asking for help, facial features are sharp. In other cases, the consciousness is significantly depressed (catatony or sopor), delirium, pronounced meningitis symptoms are possible. The position of the patient is passive or involuntary; as a rule, patients cannot take care of themselves, need constant care. There may be significant psychomotor agitation or general convulsions.

The patient's severe state is manifested by the increasing cachexia, anasarca combined with dropsy of cavities, acute signs of dehydration (decreased skin turgor, dry mucous membranes), «chalk» pale skin or pronounced diffuse cyanosis at rest, hyperpyretic fever or significant hypothermia. Examination of the cardiovascular system reveals thready pulse, pronounced expansion of heart borders, sharp weakening of the first tone over the top, significant arterial hypertension or, vice versa, hypotension, impaired patency of major arterial or venous trunks. On the part of the respiratory system, tachypnea above 40 per minute, pronounced obturation of the upper respiratory tract, prolonged attack of bronchial asthma, pulmonary edema is observed. The severe state is also manifested by uncontrollable vomiting, profuse diarrhea, signs of diffuse peritonitis, massive ongoing gastrointestinal («coffee grounds» vomiting, melena), intra-abdominal, uterine or nasal hemorrhage.

The degree of hemorrhagic shock is determined by Allgower index, that is, the ratio of heart rate to systolic blood pressure value. Normal index is 0.54; 1.0 — transitional state; 1.5 — severe shock.

At the first degree shock (blood loss of 10% of the circulating blood volume), the shock index equal to 0.8, at the second degree shock (blood loss of 20% of the circulating blood volume) — from 0.9 to 1.2, at the third degree shock (blood loss of more than 30% of the circulating blood volume) — 1.3 and more.

All patients whose condition is described as severe, are in an urgent need of hospitalization. The treatment is carried out, as a rule, in the intensive therapy ward.

Extremely severe (preagonal) state is characterized by such a dramatic disturbance of basic vital functions of the body that in the absence of urgent and intensive therapeutic measures the patient may die within hours or even minutes. This state is observed in patients with complicated preeclampsia and eclampsia, amniotic fluid embolism, severe multiple organ failure. Usually consciousness is sharply depressed, up to coma, although in some cases remains clear. The position is often passive, sometimes motor agitation, general convulsions involving respiratory muscles are seen. Face is ashen, with sharp features, covered with drops of cold sweat («hippocratic face»). The pulse is only felt on carotid arteries, blood pressure is not detected, heart tones are barely perceived. The number of breaths is 60 per minute. In case of total pulmonary edema breathing becomes choking, pink albuminoid sputum effuses from the mouth, slight heterogeneous moist rales are perceived over the whole lung surface.

Respiratory sounds over the lungs are not perceived in patient in the asthmatic status. Breathing disorders in the form of Kussmaul breathing or periodic breathing of Cheyne—Stokes or Grocco's type can be identified. Treatment of patients in the extremely severe state is carried out in the intensive therapy department.

In terminal (agonal) state, there is a complete extinction of consciousness, muscles are relaxed, reflexes including blinking disappear. The cornea becomes turbid, the lower jaw drops. The pulse is not palpable even on carotid arteries, blood pressure is not identified, heart tones are not perceived, but electrical activity of the myocardium is still recorded by the electrocardiogram. Rare regular respiratory motions ac-

According to Biot's respiration pattern are noted. The agony may last a few minutes or hours. Appearance of the isoelectric line or waves of fibrillation on the ECG and cessation of breathing indicate the onset of clinical death. Immediately before death the patient may develop convulsions, involuntary urination and defecation. The duration of clinical death is only a few minutes; however, promptly initiated resuscitation can bring the patient back to life.

After the state of the patient is determined indicate the height, weight, temperature, pronouncement of subcutaneous fat, colour of skin and mucous membranes, edema and its localization. The height of the gravida shall be accurately measured. In case of a short stature (less than 150 cm) women often have signs of infantilism (narrowing of the pelvis, hypoplasia of the uterus, etc.), which can be an indication for cesarean section. Whereas dwarfism (less than 140 cm) and typical for it anatomically narrow pelvis of the 3rd–4th degree is an absolute indication for transabdominal delivery. A high stature can also be accompanied by changes in the structure of pelvis (for example, in women with hyperandrogenism). Definition of the height and weight is a prerequisite for diagnosis of obesity and identification of hidden edema. The sooner anthropometry is performed, the more reliable will be the data for comparison during the gestation. When determining the body weight, one should take into account not only absolute values but also calculate the body mass index according to the following formula: body weight in kilograms (height in meters)<sup>2</sup>, which normally is 18–25 kg/m<sup>2</sup>. The deficit of body weight is often accompanied by miscarriage and placental insufficiency. While obesity can lead to such complications as gestational diabetes, preeclampsia and premature delivery, labor in these women is often accompanied by weakness of labor forces and hypoxia of the fetus, and uterine hypotony and bleeding in the postnatal period.

**Body build.** Body build type is one of the optional norms of the human body type. As the body build type characterizes only one of the optional norms of the human body type, the number of body build types depends on the norm identification method. Most frequently the following types are singled out: asthenic (or hyposthenic), normosthenic, hypersthenic.

Hyposthenic body build type is characterized by a relatively low position of the diaphragm, elongated top-down chest (and relatively reduced

circumference), elongated neck, narrow shoulders, long thin limbs, the height is usually above the median value. Muscle mass is underdeveloped. The amount of fat tissue is usually below average. Features of the internal structure are determined by elongated thorax; the heart is usually small, of an elongated shape, drop-shaped, lungs are also elongated, absorptive capacity of the gastrointestinal tract is reduced.

Normosthenic body build type is characterized by satisfactory (which is much better than in the hyposthenic body build type) development of muscle mass and, as a consequence, durable and developed bony skeleton. The amount of fat tissue approximately corresponds to the average value. Features of the internal structure — convex thorax, broad shoulders, proportional length of the limbs. All characteristics comply with the average values.

Hypersthenic body build type is characterized by highly placed diaphragm, relatively large-sized heart, usually height-weight ratio below the average value, rounded thorax tapered from top to bottom, usually short neck. Features of the internal structure are determined by the rounded chest. The amount of fat tissue is usually above the average value. Blood is characterized by a high content of cholesterol. Absorptive capacity of the gastrointestinal tract is high.

Skin. Pigmentation of face, white line, nipples and areola circles, striae gravidarum at the initial examination of a woman at an early gestational age suggest the presence of a pregnancy. Pale skin and visible mucous membranes, cyanosis of lips, yellowness of skin and sclera, edema are signs of some serious diseases. Scratching, ulcers on skin require special examination. Objective signs of previous gestation and labor include decreased muscle tone of the anterior abdominal wall, presence of striae gravidarum. Hormonal disorders of the reproductive system regulation can lead to underdevelopment of mammary glands, lack of body hair growth in the armpits and on the pubis, or, vice versa, excessive hair growth on the face, lower limbs, in the midline of the abdomen. Apart from hirsutism, an examination can reveal features of masculinization — wide shoulders, male pelvic structure. One should assess the pronouncement of subcutaneous fat tissue. Both alimentary and endocrine obesity of the second-third degree adversely affect the course of gestation and delivery.



In addition, one should pay attention to deformation of the spine and lower limbs, ankylosis of joints and other changes in the skeletal system, which can indicate possible changes in the shape of the pelvis and its narrowing. Changes in bones and joints often occur as a result of rachitis, poliomyelitis, tuberculosis, which could have a negative impact on other organs and systems. During examination additional visible signs of infantilism can be identified (underdevelopment of mammary glands, lack of hair development of the vulva), lack of sexual differentiation (broad shoulders, narrow pelvis, hair growth according to the male type) and other features of the development, in the presence of which gestation often develops with complications. Pronounced weight loss or obesity are often a sign of metabolic disorders, endocrine and other diseases. Occurrence of these disorders may be due to a poor diet and regime. Complications of gestation and delivery occur in such women more often.

One should assess development of mammary glands, state of nipples (normal, flat, inverted, eroded). Thus, the presence of long nonhealing ulcers is one of the signs of Paget's disease (breast cancer). Strip (colostrium) from nipples shall also be evaluated. One needs to pay attention to the shape, colour (redness), particular features of skin (a symptom of «orange skin»), structure of the mammary glands and presence/absence of indurations.

### **Physical Examination Data of Cardiovascular, Respiratory, Digestive, Urinary, Nervous, Endocrine Systems and Organs of Vision**

Obstetric history shall contain data, which allows to identify/exclude severe somatic pathology (cardiovascular, respiratory and renal failure, peritonitis, insult, etc.). It shall be noted that the measurement of blood pressure in pregnant women should be carried out on both hands and as early as possible during gestation because at late gestational age diagnostics can be complicated by differential hypertension and preeclampsia. Be sure to identify the value of the arterial pressure before gestation (the so-called «working» blood pressure), as diagnosis of arterial hypertension during gestation is based on comparing data with the baseline values (before gestation or at its onset). Thus, the increase in systolic blood

pressure by 30 mm Hg and more in comparison with the baseline values and the increase in diastolic blood pressure by 15 mm Hg indicate arterial hypertension. This is especially important in women with low blood pressure before gestation, when absolute values of arterial blood pressure at preeclampsia are low.

We would also like to draw the attention of students performing examination to specific features of topography of the abdominal cavity organs at late gestational age. Thus, the description of palpation of the spleen and kidney in a full-term gestation suggests either a student's complete lack of knowledge on anatomy and topography of organs of abdominal cavity or thoughtlessly copied delivery history.