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ХАРКІВСЬКИЙ НАЦІОНАЛЬНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ

GUIDELINES FOR STUDENTS 5-6 COURSE OF MEDICAL FACULTY

RECOMMENDATIONS FOR THE ANSWER OF THE KROK-2 STUDENTS OF THE MEDICAL FACULTY

МЕТОДИЧНІ ВКАЗІВКИ ДЛЯ СТУДЕНТІВ 5-6 КУРСІВ МЕДИЧНИХ ФАКУЛЬТЕТІВ

РЕКОМЕНДАЦІЇ ЩОДО РОЗВ'ЯЗАННЯ ТЕСТОВИХ ЗАВДАНЬ ЛІЦЕНЗІЙНОГО ІСПИТУ КРОК-2 СТУДЕНТАМИ МЕДИЧНИХ ФАКУЛЬТЕТІВ

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Рекомендації щодо розв'язання тестових завдань ліцензійного іспиту КРОК- 2 студентами медичних факультетів: Метод. вказівки для студентів 5-6 курсів медичних факультетів/ складачі: Гончарь М.О., Кузнєцов С.В., Макєєва Н.І., та ін. - Харків, ХНМУ, 2018. – 42 с.

Упорядники: Гончарь М.О.,
Кузнєцов С.В.,
Макєєва Н.І.,
Фролова Т.В.,
Пащенко Ю.В.
Омельченко О.В.,
Дриль І.С.,
Маліч Т.С.,
Уриваєва М.К.,
Логвінова О.Л.,
Черненко Л.М.,
Саніна І.О.
Онікиенко О.Л
Пугачова К.А.,
Тесленко Т.О.,

Дані методичні вказівки створено для студентів медичних ВУЗІВ 5-6 курсів для підготовки до складання ліцензійного іспиту КРОК-2. В методичні вказівки увійшли тестові завдання з педіатричного профілю, в тому числі дитяча гематологія, дитячі інфекційні захворювання, дитяча гінекологія та питання педіатричної пропедевтики, що були вибрані з буклету КРОК-2 за 2017 навчальний рік.

До всіх тестових завдань вказано вірні відповіді А з коротким обгрунтуванням та поясненням, а також тезисно наведено інформацію щодо невірних відповідей. До кожної задачі підготовлено резюме з поясненням згідно умов завданнь та запитаннь ліцензійного іспиту КРОК-2.

The list of test tasks for the preparation of 6th year students of KhNMU to the standardized state licensing exam (CRIC-2) in Russian, which are recommended by the testing center under the Ministry of Health of Ukraine (2016-2017 academic year).

1. A 12-year-old girl after a case of respiratory infection developed dyspnea at rest, paleness of skin. Heart rate is 110/min, BP is 90/55 mm Hg. Heart sounds are muffled. Borders of relative heart dullness: right - the parasternal line, upper - the III rib, left 1,0 cm outwards from the midclavicular line. Make the provisional diagnosis:

A. Infectious myocarditis
B. Functional cardiopathy
C. Somatoform autonomic dysfunction
D. Hypertrophic cardiomyopathy
E. Exudative pericarditis

Correct answer - **Infectious myocarditis**

Infectious myocarditis - inflammatory disease of myocardium. Patients may present with mild symptoms of chest pain, fever, sweats, chills, tachycardia and dyspnea and a history of recent (within 1-2 wk) flulike syndrome of fevers, arthralgias, and malaise or pharyngitis, tonsillitis, or upper respiratory tract infection.

Functional cardiopathy - is a heart disease, associated with functional change in the myocardium, in which there is no pathology of the coronary arteries, hypertension, lesions of the valve apparatus.

Somatoform autonomic dysfunction - is a group of psychological disorders in which a patient experiences physical symptoms that are inconsistent with or cannot be fully explained by any underlying general medical or neurologic condition.

Hypertrophic cardiomyopathy - is a genetic cardiovascular disease. It is defined by an increase in left ventricular wall thickness that is not solely explained by abnormal loading conditions. Signs and symptoms of HCM can include the following: sudden cardiac death (the most devastating presenting manifestation), dyspnea, syncope and presyncope, angina, palpitations, orthopnea and paroxysmal nocturnal dyspnea.

Exudative pericarditis - is an inflammation of the pericardium characterized by chest pain, pericardial friction rub. Main symptom is chest pain, usually precordial or retrosternal with referral to the trapezius ridge, neck, left shoulder, or arm. A pericardial friction rub is pathognomonic for acute pericarditis; the rub has a scratching, grating sound similar to leather rubbing against leather. Associated signs and symptoms include low-grade intermittent fever, dyspnea/tachypnea, cough, dysphagia, and Ewart sign (dullness and bronchial breathing between the tip of the left scapula and the vertebral column)

In this task 12-year-old girl with the history of infection has symptoms of heart failure (tachycardia, hypotension, dyspnea), heart dilation and diminished heart sounds. These symptoms are pathognomonic for myocarditis.

2. A 15-year-old teenager has undergone medical examination in military recruitment center. The following was revealed: interval systolic murmur at the cardiac apex, accent of the II heart sound over the pulmonary artery, tachycardia. What additional examination method will be the most informative for determining diagnosis?

A. Echocardiography
B. Electrocardiography
C. X-ray
D. Phonocardiography
E. Rheography

Correct answer - **Echocardiography**

Echocardiography - is a diagnostic test which uses ultrasound waves to make images of the heart chambers, valves and surrounding structures. It can be used to detect abnormal anatomy of the heart. It can also measure cardiac output and is a sensitive test for fluid around the heart (pericardial effusion).

Electrocardiography - is the process of recording the electrical activity of the heart over a period of time using electrodes placed on the skin. Some indications for ECG making are suspected myocardial infarction (heart attack) or new chest pain; suspected pulmonary embolism or new shortness of breath; findings to suggest structural heart disease; perceived cardiac dysrhythmias either by pulse or palpitations; monitoring of known cardiac dysrhythmias.

X-ray - chest radiography is useful to evaluate the size of heart chambers and the pulmonary consequences of cardiac disease. Alterations in chamber size are reflected by changes in cardiac silhouette. Heart borders adjacent to a lung are depicted clearly because the heart and air-filled lung have different densities.

Phonocardiography - is the graphic recording of heart sounds and murmurs; phonocardiography involves picking up, through a highly sensitive microphone, sonic vibrations from the heart which recorded on paper. The procedure is most useful when there is evidence of heart murmurs or unusual heart sounds, such as gallops, that are difficult to discern by the human ear.

Rheography - is a non-invasive medical test that measures small changes in electrical resistance of the chest, calf or other regions of the body. These measurements reflect blood volume changes, and can indirectly indicate the presence or absence of venous thrombosis.

According to presence of murmur and tachycardia the primary investigation should be targeted for abnormal heart anatomy detection. That is why the most informative test is echocardiography.

3. During last several weeks an 11-year old girl has been complaining of dyspnea and edema of shins and feet after physical exercise. After a long rest or sleep through the night her edemas diminish significantly. On clinical examination there are enlarged liver and rasping systolic murmur over the cardiac area. Blood and urine analyses are without changes. What is the most likely cause of the child's edema?

A. Heart failure
B. Angioneurotic edema
C. Acute pyelonephritis
D. Hepatocirrhosis
E. Nephrotic syndrome

Correct answer - **Heart failure**

Heart failure - is inability of the heart to keep up with the demands on it and failure of the heart to pump blood with normal efficiency. Patients may present with left-sided venous congestion (tachypnea, respiratory distress, and wheezing) and/or right-sided congestion (hepatosplenomegaly, jugular venous distention, low extremities edema, ascites, pleural effusions). Symptoms intensity may vary due to physical exercises and usually less intensive after bed rest.

Angioneurotic edema - is the swelling of deep dermis, subcutaneous, or submucosal tissue. Visible swelling is common in peripheral angioedema. It is often associated with local burning sensation and pain without pronounced itchiness or local erythema. Edema is constant and doesn't depend on daytime or physical activity.

Acute pyelonephritis - is urinary tract infection (UTI). School-age children present with fever for greater than 48 hours and complaints on abdominal pain or flank pain. Vomiting, diarrhea, and anorexia may be present. Their urine is typically malodorous, and hematuria may be noted. Voiding-related symptoms including enuresis, dysuria, urgency, and frequency, may occur but need not be present.

Hepatocirrhosis - represents the final common histologic pathway for chronic liver diseases. Common signs and symptoms may stem from decreased hepatic synthetic function, portal hypertension, or decreased liver detoxification. Hepatomegaly may be present, however end-stage disease associated with decreased size of liver.

Nephrotic syndrome - is defined as protein excretion of more than 40 mg/m^2/h or a first-morning urine protein/creatinine of 2-3 mg/mg creatinine or greater. Pitting edema is the presenting symptom in about 95% of children. It is typically found in the lower extremities, face and periorbital regions, scrotum or labia, and abdomen (ascites). Edema is constant and doesn't diminish after night sleeping.

In this task patient presents with symptoms of left-sided venous congestion (dyspnea) and right-sided venous congestion (hepatosplenomegaly, low extremities edema) which reduced after night sleeping. Normal CBC and urinalysis suggest that there is no renal disease in this patient.

4. From urine of a 14-year-old boy with the exacerbation of secondary obstructive pyelonephritis Pseudomonas aeruginosa was isolated with a titer of 1000000 microbes per 1 ml. What antibiotic is the most advisable in this case?

A. Ciprofloxacin
B. Ampicillin
C. Cefazolin
D. Azithromycin
E. Chloramphenicol

Correct answer – **Ciprofloxacin.**

Ciprofloxacin - is quinolone. The volume of distribution of quinolones is high, with concentrations of quinolones in urine, kidney, lung and prostate tissue, stool, bile, and macrophages and neutrophils higher than serum levels. Ciprofloxacin is active against P. aeruginosa.

Ampicillin - is β-Lactam antibiotic. Ampicillin is active against S. pyogenes and many strains of S. pneumoniae and H.influenzae, which are major respiratory bacterial pathogens.

Cefazolin - belongs to the cephalosporins. Cefazolin has an antibacterial spectrum that is typical of other first-generation cephalosporins (Streptococci; Staphylococcus aureus) except that it also has activity against some Enterobacter spp.

Azithromycin - is an antibiotic useful for the treatment of a number of bacterial infections. This includes middle ear infections, strep throat, pneumonia, traveler's diarrhea, and certain other intestinal infections. It may also be used for a number of sexually transmitted infections including chlamydia and gonorrhea infections. Biliary excretion of azithromycin, predominantly unchanged, is a major route of elimination. Over the course of a week, about 6% of the administered dose appears as unchanged drug in urine.

Chloramphenicol - an antibiotic produced by Streptomyces venezuelae. Chloramphenicol is now reserved for treatment of life-threatening infections (e.g., meningitis, rickettsial infections) in patients who cannot take safer alternatives because of resistance or allergies. Resistance to chloramphenicol usually is caused by a plasmid-encoded acetyltransferase that inactivates the drug.

In this task boy has pyelonephritis caused with P. aeruginosa. This organism shows a remarkable capacity to resist antibiotics (expression of β-lactamases, resistance genes (e.g., genes for β-lactamases, or enzymes inactivating aminoglycosides or modifying their target). So it will be resistant to most presented antibiotics except Ciprofloxacin. And the main feature of Ciprofloxacin is high urine concentration, which other presented antibiotics don't have.

5. A 9-year-old girl complains of fever up to 37,5 oC, headache, inertness, weakness, loss of appetite, stomachache, and frequent painful urination. Provisional diagnosis of acute pyelonephritis is made. Clinical urine analysis: specific gravity – 1018, no protein, leukocytes – 10-15 in the vision field. What investigation method can verify the diagnosis of urinary system infection?

A. **Bacteriological inoculation of urine**
B. Rehberg test (creatinine clearance test)
C. Zimnitsky test (measurement of daily diuresis)
D. Complete blood count
E. Clinical urine analyses, dynamic testing

Correct answer – **Bacteriological inoculation of urine.**

Bacteriological inoculation of urine - is a test that detects and identifies bacteria and yeast in the urine, which may cause a urinary tract infection.

Rehberg test - demonstrates level of renal filtration function.

Zimnitsky's test - allows to define concentration of the substances dissolved in urine, i. e. concentration function of kidneys.

Complete blood count - is a blood test that measures red blood cells, white blood cells, and blood platelets.

Clinical urine analyses - is the examination of urine for certain physical properties, solutes, cells, casts, crystals.

In this task girl has provisional diagnosis - acute pyelonephritis. Acute pyelonephritis results from bacterial invasion of the renal parenchyma, and it is necessary to use a bacteriological study of urine to identify the microorganism that caused the infection.

6. An infant is 3 weeks old. Since birth there has been observed periodical vomiting within a few minutes after feeding. The amount of vomitive masses does not exceed the volume of previous feeding. The infant has age-appropriate body weight. What is the most likely cause of this symptom?

A. **Pylorospasm**
B. Esophagealchalasia
C. Adrenogenital syndrome
D. Pylorostenosis
E. Esophagealchalsia

The correct answer – **Pylorospasm.**

The **pylorospasm** - is a pathological condition that manifests in early childhood. Pylorospasm is characterized by sympathetic type of autonomous dysfunction due to not fully matured nervous system. The main clinical manifestations of a pylorospasm is vomiting after feeding. The amount of vomitive masses is less than amount of the milk during feeding or is the same. Physical development usually corresponds to age.

Esophagealchalasia - is a primary esophageal motility disorder characterized by the absence of esophageal peristalsis and impaired relaxation of the lower esophageal sphincter (LES) in response to swallowing. Symptoms of achalasia include food and liquid dysphagia, regurgitation, vomiting, choking and coughing episodes, a sense of "food getting stuck," a gurgling noise coming from the chest, postprandial and nocturnal chest pain, recurrent episodes of pneumonia, and loss of weight.

Adrenogenital syndrome - is the disorder characterized by defective adrenal steroid synthesis; accumulation of androgenic steroid intermediates; and variably, cortisol and mineralocorticoid deficiency. This syndrome classically presents as a salt-wasting adrenal crisis (dehydration, poor feeding, diarrhea, vomiting, arrhythmias, low blood pressure, very low blood sodium levels, hypoglycemia, metabolic acidosis, weight loss, shock) during the second week of life.

Pylorostenosis - is the congenital obstruction of the pylorus. The classic presentation of pylorostenosis is a 3- to 4-week-old infant with persistent nonbilious projectile vomiting after each feed. Infants with pylorostenosis appear irritable and hungry with physical development retardation.

In this task an infant is 3 weeks old and since birth there has periodical vomiting within a few minutes after feeding. The amount of vomitive masses does not exceed the volume of previous feeding. The infant has age-appropriate body weight and doesn't have any other symptoms

7. Mother of an 8-year-old girl complains that the child is too short and has excessive body weight. Objectively: obesity with fat deposits on the torso and face (round moonlike face), acne, striae on the thighs and lower abdomen, hirsutism. What hormone can cause such symptoms, when in excess?

A**. Cortisol**
B. Thyroxine
C. Testosterone
D. Insulin
E. Glucagon

Correct answer - **Cortisol**.

Cortisol - is a steroid hormone, which produced in adrenal glands cortex. The effects of high cortisol levels: rapid weight gain in the face, abdomen, and chest; flushed face; high blood pressure; thin and fragile skin that is slow to heal; acne; striae on the thighs and lower abdomen; for women, facial hair and irregular menstrual periods; anxiety and depression; excessive body hair in men and women on parts of the body where hair is normally absent or minimal (on the chin or chest in particular, or the face or body in general).

Thyroxine - is produced by the thyroid gland. The effects of high thyroxine levels: hyperactivity, irritability, altered mood, fatigue, tachycardia, poor sleeping, nervousness, weight loss with increased appetite, increased stool frequency, thirst and polyuria, hair loss, muscle weakness, warm and moist skin, palmar erythema, ophthalmopathy.

Testosterone - is the primary male sex hormone and an anabolic steroid. The effects of high testosterone levels: well-being (reduction in depression and mild euphoria); confidence (reduced social anxiety and greater assertiveness); energy improvements and greater work capacity; motivation (greater ambition); sex drive/libido and response times heightened (shorter refractory period); concentration (greater ability to complete complex mental tasks); strength and muscle mass increases; body fat reduction and higher basal metabolic rate.

Insulin - is hormone produced by pancreas. The effects of high insulin levels: temporary muscle weakness; brain fog; fatigue, temporary thought disorder; inability to concentrate; visual problems such as blurred vision or double vision; headaches; shaking/trembling; thirst; obesity; fatty liver; arteriosclerosis; acanthosis nigricans; skin tags and reproductive abnormalities in women.

Glucagon - is hormone produced by pancreas. The effects of high glucagon levels: dermatosis (rashes appear around oral and genital area, spread across fingers and legs, necrotic migratory erythema, dark pigmented, fragile blisters or skin crusting); diabetic symptoms; deep vein thrombosis; depression.

In the presented task, a 8-year-old girl has weight gain (in the face and chest), short stature, changes of skin (acne, striae on the thighs and lower abdomen), hirsutism (excessive body hair on parts of the body where hair is normally absent or minimal).

8. An infant has been born at the 41st week of gestation. The pregnancy was complicated with severe gestosis of the second semester. The weight of the baby is 2400 g, the height is 50 cm. Objectively: the skin is flabby, the layer of subcutaneous fat is thin, hypomyotonia is observed, neonatal reflexes are weak. The internal organs are without pathologic alterations. This newborn can be assessed as a:

A. Full-term infant with prenatal growth retardation

B. Premature infant

C. Immature infant

D. Postmature infant

E. Full-term infant with normal body weight

The correct answer is **"Full-term infant with prenatal growth retardation".**

Full-term infant with prenatal growth retardation - means baby born between the 37th and the 42nd weeks of gestation with the body weight less than 2500 g with or without signs of immaturity due to prenatal factors (e.g. gestosis).

Premature infant - means baby born before the 37th week of gestation.

Immature infant - means baby born with signs of immaturity (flabby skin, thin layer of subcutaneous fat, hypomyotonia, weak neonatal reflexes) due to prenatal factors.

Postmature infant - means baby born after the 42nd week of gestation.

Full-term infant with normal body weight - means baby born between the 37th and the 42nd weeks of gestation with body weight from 2500 to 3999 g.

In our task 41 week of gestation age infant with weight 2400 g has flabby skin, thin layer of subcutaneous fat, hypomyotonia, weak neonatal reflexes.

9. A newborn with gestational age of 31 weeks presents with hypotonia and depressed consciousness. Hematocrit is 35%, general cerebrospinal fluid analysis shows increased content of erythrocytes and protein, and low glucose. These data correspond with the clinical presentation of:

A. Intracranial hemorrhage

B. Meningitis

C. Sepsis

D. Anemia

E. Prenatal infection

Correct answer is **- Intracranial hemorrhage**

Intracranial hemorrhage - is hypoxic or traumatic birth injury. Premature babies (born before the 37th week of gestation) are at a higher risk for intracranial hemorrhages due to the fragility of their underdeveloped blood vessels. Clinical symptoms include hypotonia, hyporeflexia, seizures and depressed consciousness. In case of subarachnoid or intraventricular localization of the intracranial hemorrhage cerebrospinal fluid is characterized by the presence of erythrocyte cytosis, increased protein and low glucose.

Meningitis - is an inflammation of dura mater due to infection. It is characterized by the presence of leukocyte cytosis, increased protein and low glucose in the cerebrospinal fluid.

Sepsis - is a severe infection that spreads throughout the body. It is usually characterized by multiple organs failure, changes in CBC such as anemia, thrombocytopenia and leukopenia/leukocytosis.

Anemia - is a disease followed with decreased level of erythrocytes, hemoglobin and hematocrit. Cerebrospinal fluid analysis has no changes in case of anemia.

In case of **prenatal infection -** there is a history of maternal infection and specific for each infection symptoms.

In our task 31 week of gestation age infant suffers from hypotonia and depressed consciousness. Cerebrospinal fluid contents erythrocytes, increased protein and low glucose.

10. A full-term newborn (born with the body weight of 3900 g at gestational age of 39 weeks) on the first day of his life developed respiratory disturbances: dyspnea, arrhythmic respiration, cyanosis attacks. On examination there is paradoxical respiration observed and left side of the chest lags behind in the act of breathing. On auscultation the respiration is weakened in the lungs on the left. Neurologist diagnosed the patient with left-sided Erb-Duchenne's palsy. Complete blood count shows no changes. What is the most likely diagnosis?

A. Left-sided diaphragm paresis
B. Congenital pneumonia
C. Left-sided pneumothorax
D. Respiratory distress syndrome
E. Transient tachypnea of the newborn

Correct answer - **Left-sided diaphragm paresis**

Left-sided diaphragm paresis - is a birth injury of C_3-C_4 spinal cord segments. It is characterized by signs of respiratory dysfunction from the left side. Newborns with body weight more than 3500 g are at a higher risk for birth injury.

Congenital pneumonia - is an inflammatory pulmonary process due to infection. CBC in case of pneumonia is characterized by signs of inflammation.

Left-sided pneumothorax - is a condition of air appearance in the pleural cavity. It is characterized by diminished or absent respiratory sounds on the injured side.

Respiratory distress syndrome - is more common for preterm newborns (due to lack of surfactant) and characterized by respiratory dysfunction from the both sides.

Transient tachypnea of the newborn - is a diagnosis of exclusion. It is characterized by a period of rapid breathing (normal respiratory rate for newborns is from 30 to 60 per minute) during 24-48 hours after birth due to due to amniotic fluid retention in the lungs.

In our task term infant with weight 3900 g suffers from the left-sided respiratory dysfunction which is associated with the same side Erb's palsy and has no changes in CBC.

11. An 8-year-old boy developed a temperature of 37,5oC two days after his recovery from the case of URTI. He complains of suffocation, heart pain. Objectively: the skin is pale, tachycardia, the I heart sound is weakened, short systolyc murmur in the 4th intercostal area near the left edge of the breastbone. What heart disorder such clincal presentation is characteristic of?

A. **Nonrheumatic myocarditis**
B. Primary rheumatic carditis
C. Myocardiodystrophy
D. Fallot's tetrad
E. Cardiomyopathy

Correct answer - **Nonrheumatic myocarditis**

Nonrheumatic myocarditis - Inflammatory disease of the myocardium diagnosed by established histological (histological evidence of inflammatory infiltrates within the myocardium associated with myocyte degeneration and necrosis of non-ischaemic origin), immunological and immunohistochemical criteria (≥14 leucocytes/mm^2 including up to 4 monocytes/mm^2 with the presence of CD 3 positive T-lymphocytes ≥7 cells/mm).

Rheumatic heart disease - is the most serious complication of rheumatic fever. Rheumatic fever (RF) is a systemic illness that may occur following group A beta hemolytic streptococcal (GABHS) pharyngitis in children. Clinical manifestations of acute rheumatic fever are polyarthritis, carditis, erythema marginatum, chorea.

Myocardiodystrophy - is a type of noninflammatory heart disease that affects the myocardium. It is characterized by cardiac pain that occurs in the morning and that cannot be stopped even with normal treatments of nitroglycerin, along with other occurrences of heart rhythm disturbances, dyspnea, and various types of heart failure.

Tetralogy of Fallot - which is one of the most common congenital heart disorders, comprises right ventricular outflow tract obstruction, ventricular septal defect, aorta dextroposition, and RV hypertrophy. Infants often display the following: difficulty with feeding, episodes of bluish pale skin during crying or feeding (ie, "Tet" spells), exertional dyspnea, usually worsening with age. Physical findings include the following: most infants are smaller than expected for age, cyanosis of the lips and nail bed is usually pronounced at birth, after age 3-6 months, the fingers and toes show clubbing, a systolic thrill is usually present anteriorly along the left sternal border, a harsh systolic ejection murmur (SEM) is heard over the pulmonic area and left sternal border.

Cardiomyopathies - are diseases of heart muscle. A contemporary definition for cardiomyopathy is a myocardial disorder in which the heart muscle is structurally and functionally abnormal in the absence of coronary artery disease, hypertension, valvular disease, and congenital heart disease sufficient to explain the observed myocardial abnormality.

Clinical presentations in this task such as acute chest pain, suffocation, pale skin, tachycardia, the I heart sound is weakened, short systolyc murmur in the 4th intercostal area near the left edge of the breastbone, onset after viral infection are usual for nonrheumatic myocarditis.

12. A 10-year-old boy with symptoms of arthritis and myocarditis was delivered into a hospital. Based on clinical examination the preliminary diagnosis of juvenile rheumatoid arthritis was made. What symptom is the most contributive for the diagnostics of this disease?

A. Reduced mobility of the joints in the morning
B. Regional hyperemia of the joints
C. Affection of the large joints
D. Enlarged heart
E. Increased heart rate

Correct answer - **Reduced mobility of the joints in the morning**

Reduced mobility of the joints in the morning - is the main clinical sign of juvenile idiopathic arthritis (JIA), combined with persistent swelling and pain in the small and large joints, which usually decrease during the day with physical activity.

Regional hyperemia - of the joints is common sign for all arthritis, not only for JIA.

Affection of the large joints - is more usual for reactive arthritis. It is a painful form of inflammatory arthritis. It occurs in reaction to an infection by certain bacteria.

Enlarged heart - it's could be a symptom of carditis, that can be an integral part of systemic JIA

Increased heart rate - is nonspecific symptom which is commonly present in patients with various conditions (fever, anxiety, etc.). However it could be a sign of pericarditis, that is a part of systemic JIA.

In this task juvenile idiopathic arthritis is a collection of chronic idiopathic autoimmune non-infectious arthritides. By definition, disease onset is prior to 16 years of age and includes joint inflammation that is present for 6 weeks or more. Systemic JIA accompanied by one or more of the following: evanescent erythematous rash, generalized lymphadenopathy, hepatomegaly or splenomegaly, and serositis (pericarditis).

13. A 3-year-old girl is being treated at a resuscitation unit with diagnosis ”acute kidney failure, oligoanuric stage”. ECG: high T wave, extended QRS complex, displacement of S-T interval downwards below the isoline. What electrolyte imbalance is it?

A. **Hyperkalemia**
B. Hypokalemia
C. Hypocalcemia
D. Hypercalcemia
E. Hyperphosphatemia

Correct answer - **Hyperkalemia**

ECG changes of **hyperkalemia -** include the following: tall, peaked T waves with a narrow base, best seen in precordial leads, ST-segment depression, widening of the QRS, amplified R wave.

ECG changes of **hypokalemia -** include the following: QT prolongation, appearance of U waves that may mimic atrial flutter, T-wave flattening, or ST-segment depression.

Hypocalcaemia - causes QT prolongation and shortened QRS duration.

Hypercalcemia - may produce ECG abnormalities such as short QT interval, long PR interval, the QRS interval may lengthen, T waves flatten or invert, and a variable degree of heart block.

ECG changes of **hyperphosphatemia -** includes prolonged QT interval and ST segment.

Acute kidney failure, oligoanuric stage is the most primarily reason of hyperkalemia that may presented on ECG by high T wave, extended QRS complex, displacement of S-T interval downwards below the isoline.

14. A 1,5-month-old child on breastfeeding presents from birth with daily vomiting, irregular liquid foamy feces, and meteorism, which are resistant to antibacterial and probiotic therapy; no increase of body mass is observed. The child's condition improved, when breastmilk was substituted with "NAN low lactose" formula. What pathology is it?

A. Lactase deficiency
B. Intestinal lambliasis (Giardiasis)
C. Infectious enteritis
D. Drug-induced enteritis
E. Functional dyspepsia

Correct answer - **Lactase deficiency.**

Congenital **lactase deficiency -** is rare autosomal recessive disorder and is associated with symptoms occurring on exposure to lactose in milk due to very low or complete absence of brush border lactase-phlorizin hydrolase activity. Clinical manifestation: diarrhea after the introduction of breast milk or any lactose-containing formula, flatulence, cramps, regurgitation, delay in physical development. Antibacterial and probiotic therapy without effect. A presumptive diagnosis can be made if osmotic diarrhea in a neonate resolves by introduction lactose-free formula.

Intestinal lambliasis (Giardiasis) - the main symptoms: nausea, anorexia, foulsmelling diarrhea, mid-epigastric cramps, malaise, low-grade fever and chills fatigue, headaches, myalgia. Allergy syndrome presents as urticaria. Giardiasis manifests in children after 6-8 months of age.

Infectious enteritis - main symptoms are diarrhea, fever, emesis, loss of appetite, weakness, abdominal pain and dehydration. Stool frequency from 5 to 20 times a day and it contains undigested food particles with an admixture of mucus. Reduction of symptoms and improvement of condition with the use antibacterial therapy.

Drug-induced enteritis - nausea, diarrhea, vomiting followed by reuse of the drugs. Commonly responsible drugs: antacids, magnesium, antibiotics, antihelminthics, cytotoxics, colchicine, digoxin, laxatives and radiation therapy.

Functional dyspepsia - persistent or recurrent pain or discomfort in upper abdomen, bloating, belching, early satiety, nausea, retching or vomiting. These symptoms appear mostly after meal. There may be present neurotic disorders, anorexia, sleep disorders, sweating, dizziness.

In the submitted task 1,5-month-old child on breastfeeding has vomiting, irregular liquid foamy feces, and meteorism. Antibacterial therapy and prescription of probiotic had no effect. There is no fever, intoxication. There is no information about long-term using of drugs, that lead to development of drug-induced enteritis. Prescription of the lactose-free diet lead to positive dynamics and improvement of condition.

15. A 12-year-old child had three attacks of acute rheumatic fever accompanied by carditis. Examination revealed the symptoms of chronic tonsillitis, mitral insufficiency, and carious teeth. What is the optimal method of secondary prophylaxis?

A. Year-round bicillin prophylaxis until the age of 25

B. Course of cardiotrophic drugs twice a year

C. Year-round bicillin prophylaxis for 3 years

D. Tonsillectomy

E. Oral cavity sanitation

Correct answer - **Year-round bicillin prophylaxis until the age of 25**

Year-round bicillin prophylaxis until the age of 25 - prevention of recurrent Group A streptococcus (GAS) pharyngitis is the most effective method of preventing severe rheumatic heart disease. Therefore, prevention of recurrent rheumatic fever requires continuous antimicrobial prophylaxis rather than recognition and treatment of acute episodes of GAS pharyngitis. Continuous secondary prophylaxis is recommended in patients with documented histories of rheumatic fever and in those with evidence of rheumatic heart disease. Secondary prophylaxis should be initiated as soon as acute rheumatic fever or rheumatic heart disease is diagnosed. To eradicate residual GAS, a full course of penicillin should be given to patients with acute rheumatic fever, even if a throat culture is negative. In patients with carditis duration of prophylaxis is at least 10 years since last episode, sometimes lifelong. The regimen of choice for secondary prevention is a single intramuscular injection of benzathine penicillin 1.2 million IU every 4 week.

Course of cardiotrophic drugs twice a year -cardiotrophic drugs are not the part of secondary prophylaxis according to American Heart Assosiation (AHA) Guidelines on prevention of rheumatic fever.

Year-round bicillin prophylaxis for 3 years - 3 years duration of the year-round bicillin prophylaxis is too short and inadequate duration of prophylaxis, that can't prevent of recurrent Group A streptococcus pharyngitis.

Tonsillectomy - tonsillectomy is not the part of AHA - recommended secondary prophylaxis of acute rheumatic fever. Only tonsillectomy without year-round bicillin prophylaxis is not enough for the prevention.

Oral cavity sanitation - single oral cavity sanitation can't prevent recurrent Group A streptococcus pharyngitis. Only the year-round bicillin prophylaxis is relevant and can provide sufficient protection against recurrent Group A streptococcus (GAS) pharyngitis.

In the submitted task 12-year-old child had three attacks of acute rheumatic fever with carditis, chronic tonsillitis and mitral insufficiency needs secondary prophylaxis of acute rheumatic fever. According to American Heart Assosiation Guidelines on prevention of rheumatic fever only the year-round bicillin prophylaxis at least 10 years since last episode is enough and relevant for prevention in rheumatic fever patients with rheumatic heart disease.

16. A 3-month-old child presents with saffron-yellow coloring of the skin, sclera, and mucous membranes. The abdomen is enlarged, hepatomegaly and splenomegaly are observed. In blood there is conjugated bilirubin-induced hyperbilirubinemia. On intravenous cholangiocholecystography: opacified bile is discharged into the intestine. Transaminase activity is normal. What is the most likely diagnosis?

A. Biliary atresia
B. Physiologic jaundice
C. Hemolytic disease of newborn
D. Crigler-Najjar syndrome
E. Congenital hepatitis

Correct answer - **Biliary atresia.**

Biliary atresia – is a rare neonatal disease usually manifesting in the first months of life, when ascending obstruction of the biliary tree causes severe cholestasis and rapidly progressing biliary cirrhosis. Most patients are normal at birth and have a postnatal progressive obliteration of bile ducts. Symptoms of biliary atresia include yellow colour of the skin, itchiness, poor absorption of nutrients, pale stools, dark urine, and enlarged abdomen. Biochemical liver function tests include elevated levels of total and conjugated bilirubin, gamma-glutamyl transpeptidase and normal transaminases.

Physiologic jaundice - appears in the first 24-36 hours of life and disappears until the end of the first - the beginning of the second week. It is caused increased bilirubin production from the breakdown of fetal red blood cells accompanied with transient limitation in the conjugation of bilirubin due to immatureneonatal liver.

Hemolytic disease of newborn - is due to the incompatibility of the mother and the fetus with erythrocytic antigens (Rh factor, ABO). Most cases are mild, with jaundice being the only clinical manifestation. The infant is not generally affected at birth; pallor is not present, and hydrops fetalis is extremely rare. The liver and spleen are not greatly enlarged, if at all. Jaundice usually appears during the 1st 24hr. Rarely, it may become severe, and symptoms and signs of kernicterus develop rapidly. Symptoms: normochromic anemia with reticulocytosis (10-15%), enlargement of the liver and spleen, growth of free indirect bilirubin, positive direct Coombs test result.

Crigler-Najjar syndrome – is an autosomal recessive disorder characterized by an inability to properly convert and clear bilirubin from the body due to a hepatic deficiency of bilirubin glucuronosyltransferase activity. The physical examination shows isolated jaundice severe unconjugated hyperbilirubinemia with normal liver function tests.

Congenital hepatitis - this is a group of heterogeneous diseases that arise as a result of the intrauterine effect of pathogenic factors on the fetal liver. Clinically, such pathologies can be manifested by cholestatic syndrome, hepatosplenomegaly, lag in psychophysical development, neurological symptoms.

In this task disease presents at the age of 3 y.o with saffron-yellow coloring of the skin, sclera, mucous membranes, enlargment of abdomen, hepatosplenomegaly and with increased conjugated bilirubin levels but normal transaminase levels, and specific for biliary atresia cholangiocholecystography changes (opacified bile is discharged into the intestine) improve the diagnosis biliary atresia.

17. An 8-year-old child with a 3-year-long history of diabetes was hospitalized in hyperglycemic coma. Specify the initial dose of insulin to be administered:

A. 0,1-0,2 U/kg of body weight per hour
B. 0,05 U/kg of body weight per hour
C. 0,2-0,3 U/kg of body weight per hour
D. 0,3-0,4 U/kg of body weight per hour
E. 0,4-0,5 U/kg of body weight per hour

Correct answer - **0,1-0,2 U/kg of body weight per hour.**

0,1-0,2 U/kg of body weight per hour - the continuous low-dose intravenous infusion method, in which a priming dose of 0,1 U/kg of regular insulin is followed by a constant infusion of 0,1 U/kg/hr.

0,005 U/kg of body weight per hour - is low dose. It is not administered for the patients with hyperglycemic coma.

0,2 – 0,3 U/kg of body weight per hour - is not recommended because there might be the risk of cerebral edema, hypoglycemia and low serum potassium.

0,3 – 0,4 U/kg of weight per hour - is not recommended because there might be the risk of cerebral edema, hypoglycemia and low serum potassium.

0,4 – 0,5 U/kg of weight per hour - is not recommended because there might be the risk of cerebral edema, hypoglycemia and low serum potassium.

The main complication of diabetic ketoacidosis is cerebral edema. In order to prevent it continuous low-dose intravenous insulin infusion method should be followed.

18. 10 days after birth a newborn developed sudden fever up to 38,1 oC. Objectively: the skin in the region of navel, abdomen and chest is erythematous; there are multiple peasized blisters with no infiltration at the base; isolated bright red most erosions with epidermal fragments are observed on the periphery. What is the provisional diagnosis?

A. Epidemic pemphigus of newborn
B. Syphilitic pemphigus
C. Streptococcal impetigo
D. Vulgar impetigo
E. Atopic dermatitis

Correct answer - **Epidemic pemphigus of newborn.**

Epidemic pemphigus of newborn - flaccid, transparent bullae develop most commonly on the skin of the face, buttocks, trunk, perineum, and extremities. Rupture of bullae occurs easily, leaving narrow rim of scale at the edge of shallow, moist, erosion. Suppounding erythema is generally absent.

Syphilitic pemphigus - the early manifestation of congenital syphilis involves affection of multiple organs and systems. Hepatosplenomegaly, jaundice, mucocutaneous rash with erythematous rash with erythematous maculopapular or bullous lesions, followed by desquamation, involving hands and feet, are common.

Streptococcal impetigo - the most common form of skin infection due to group A β-hemolytic streptococci is superficial impetigo.

Vulgar impetigo - tends to affect the vulva and periumbilical areas, causing lesions or blistors that later become crusted.

Atopic dermatitis - the earliest lesions are erythematous, weepy patches on the cheeks, with subsequent extension to the reminder of the face, neck, wrists, hands, abdomen, and extensor aspects of the extremities. Symptoms of intoxication and fever are absent.

The most common bacterial skin infection of newborn is impetigo, which makes up approximately 10% of all skin problems. Staphylococcus aureus is predominant organism of impetigo.

Epidemic pemphigus of newborn is the single most common diagnosis among those with skin problems. A tiny vesicle or pustule, bullous forms initially on the skin n the region of navel, abdomen and chest is erythematous. Later occurs erosions with epidermal fragments.

19. A 13-year-old girl complains of fatigability, frequent headaches, cardialgia. Eight years ago she had a case of pyelonephritis. Urine analyses periodically revealed leukocyturia. The child has undergone no further treatment. On examination: increased BP up to 150/110 mm HG. Ultrasound investigation revealed significant reduction of the right kidney. What process is leading in arterial hypertension pathogenesis in this case?

A. Hyperactivity of renin-angiotensin system

B. Disturbance of water-electrolytic balance

C. Disturbance of renal circulation

D. Hyper sympathicotonia

E. Increased cortisol level

Correct answer - **Hyper activity of renal-angiotensin system.**

Hyper activity of renal-angiotensin system - significant reduction of the right kidney, untreated pyelonephritis lead to impair renal perfusion and stimulate renin production by the juxtaglomerular apparatus. Renin is proteolytic enzyme that converts angiotensinogen to angiotensin I. Renin secretion is affected by afferent arterioral perfusion pressure in the kidney. Angiotensin I rapidly converted to angiotensin II. This process is also responsible for the metabolic degradation of vasodilating kinines.

Disturbance of water-electolytic balance - is more typical for glomerulonephritis. To reduced glomerular filtration rate in patients with nephritis results in salt and water retention

Disturbance of renal circulation - patient who has a chronical pyelonephritis doesn't have disturbance of renal circulation.

Hypersympathicotomia - activation of sympathetic nervous system is secondary, because renin secretion is affected by afferent arteriolar perfusion pressure in the kidney, sodium concentration in plasma and tubular urine, and other factors, such as prostaglandins, potassium intake, and atrial natriuretic peptides.

Increased cortisol level - several endocrinopathies are associated with hypertension, usually those involving the thyroid, parathyroid, and adrenal glands. Adrenocortical disorders may produce hypertension if there is an increase in mineralocorticoid secretion.

Systemic hypertension occurs commonly in adults, adolescent and if untreated there is a major risk factor for renal failure, myocardial infarction and stroke. Blood pressure is the product of the cardiac output and the peripheral vascular resistance. Hypertension in childhood is defined as a blood pressure reaching greater than the ninety-fifth percentile for age, sex and height percentile obtained on three separate occasions. The hypertension may be primary and secondary, transient or persistent.

Renal hypertension accounts for the majority of children with secondary hypertension. A history of urinary tract infection is present in 25-50% of these patients and is often related to an obstructive lesion of the urinary tract.

20. A 9-month-old child presents with fever, cough, dyspnea. The symptoms appeared 5 days ago after a contact with a person with URTI. Objectively: the child is in grave condition. Temperature is 38°C, cyanosis of nasolabial triangle is present. RR- 54/min, nasal flaring during breathing is observed. There was percussion dullness on the right below the scapula angle and tympanic sound over the other areas of lungs. Auscultation revealed bilateral fine moist crackles predominating on the right. What is the most likely diagnosis?

A. Pneumonia
B. URTI
C. Acute laryngotracheitis
D. Acute bronchitis
E. Acute bronchiolitis

Correct answer - **Pneumonia**

Pneumonia - is an inflammatory condition of the lung affecting primarily the small air sacs known as alveoli. Typically symptoms include some combination of or dry cough, chest pain, fever, and trouble breathing. Pneumonia is usually caused by infection with bacteria, viruses or other microorganisms. Diagnosis is often based on the symptoms and physical examination. Chest X-ray, blood and sputum tests help to confirm the diagnosis.

URTI - upper respiratory tract infections are group of disease caused by an infection which involves the upper respiratory tract. Symptoms of URTI may be nonproductive cough, chest pain, dispnea with no changes in lung percussion or significant changes in auscultation.

Acute laryngotracheitis - acute laryngotracheitis is URTI. The classic symptoms of acute laryngotracheitis is "barking" cough, stridor, and a hoarse voice. Dullness and moist crackles are absent in clinics features of acute laryngotracheitis.

Acute bronchitis - acute bronchitis is inflammation of the bronchi. The differential symptoms: dullness and moist crackles are absent in acute bronchitis.

Acute bronchiolitis - acute bronchiolitis s a clinical syndrome produced by inflammation of the trachea, bronchi, and bronchioles. Specific for acute bronchiolitis features are dyspnea, tachypnea and moist diffuse crackles but absent dullness and local crackles that presents in 9-month-old child.

So, in this task child has specific for pneumonia features (fever, cough, dyspnea), grave condition, cyanosis of nasolabial triangle, tachypnea (RR- 54/min), dullness on the right below the scapula angle and moist crackles in same area.

21. The mother of a 3-month-old child came to a family doctor with complaints of her child being physically underdeveloped and suffering from cough attacks and dyspnea. Anamnesis: the child is the result of the second full-term pregnancy with the risk of miscarriage (the first child died of pulmonary pathology at the age of 4 months, according to the mother). Body mass at birth is 2500 g. Cough attacks were observed from the first days of life, twice the child was treated for bronchitis. Considering the severity of the child's condition the doctor made the referral for hospitalization. What diagnosis was most likely stated in the referral?

A. Mucoviscidosis (Cystic fibrosis)
B. Acute obstructive bronchitis
C. Recurrent obstructive bronchitis
D. Pertussis
E. Acute obstructive pneumonia

Correct answer - **Mucoviscidosis (Cystic fibrosis)**

Mucoviscidosis (Cystic fibrosis (**CF**)) - is a genetic disorder that affects mostly the lungs, but also the pancreas, liver, kidneys, and intestine. Long-term issues include difficulty breathing and coughing up mucus as a result of frequent lung infections. Other signs and symptoms may include sinus infections, poor growth, fatty stool, clubbing of the fingers and toes, and infertility in most males. Different people may have different degrees of symptoms. CF is inherited in an autosomal recessive manner. It is caused by the presence of mutations in both copies of the gene for the cystic fibrosis transmembrane conductance regulator (CFTR) protein. Those with a single working copy are carriers and otherwise mostly normal. CFTR is involved in production of sweat, digestive fluids, and mucus. When CFTR is not functional, secretions which are usually thin instead become thick. The condition is diagnosed by a sweat test and genetic testing.

Acute obstructive bronchitis - the acute obstructive bronchitis is common for elder children (> 2 yr.) generally caused by viral infection (bacteria also may cause obstruction). Patient presents with expiratory dyspnea, wheezing. History of disease is not associated with physical development retardation (underweight) or family history of respiratory disorders.

Recurrent obstructive bronchitis - this diagnosis is absent in modern classification and in some case replaced for the recurrent wheezing syndrome.

Pertussis. Severe coughing fits and apnea are distinctive for the pertussis. Following a fit of coughing, a high-pitched whoop sound or gasp may occur as the person breathes in. The 3-month-old child has not coughing fits.

Acute obstructive pneumonia - wrong answer. This diagnosis is absent in modern classification.

So, in this task the child has specific for cystic fibrosis features such as physically underdeveloped and suffering from cough attacks and dyspnea. In family history: the first child has pulmonary pathology and died at the age of 4 months (congenital etiology).
References:

22. A boy was born at 32 weeks of gestation. 2 hours after the birth he developed respiratory distress (RD). The RD severity assessed by Silverman score was 5. The respiratory disorders progressed, respiratory failure could not be eliminated by Martin-Bouyer CPAP (continuous positive airway pressure). X-ray of lungs shows reticular and nodular pattern, air bronchogram. What is the most likely cause of respiratory distress syndrome?

A. Hyaline membrane disease
B. Segmental atelectasis
C. Bronchopulmonary dysplasia
D. Congenital pulmonary emphysema
E. Edematous hemorrhagic syndrome

Correct answer - **Hyaline membrane disease**

Infant respiratory distress syndrome (IRDS), also called respiratory distress syndrome of newborn and previously called **hyaline membrane disease (HMD**) - is a syndrome in premature infants caused by developmental insufficiency of pulmonary surfactant production and structural immaturity in the. The characteristic histopathology are waxy-appearing layers of hyaline membrane line the collapsed alveoli of the lung. The lungs of infants with respiratory distress syndrome are developmentally deficient surfactant. The diagnosis is made by the clinical picture and the chest x-ray, which demonstrates decreased lung volumes (bell-shaped chest), "ground glass" appearance that involves all lobes of the lung, reticular and nodular pattern and air-bronchograms. In severe cases, this becomes exaggerated until the cardiac borders become in apparent (a 'white-out' appearance).

Segmental atelectasis - segmental atelectasis refers to collapse of one or several segments of a lung lobe. In case X-ray of lungs shows reticular and nodular pattern. Segmental atelectasis are absent.

Bronchopulmonary dysplasia - bronchopulmonary dysplasia is diagnosed after 28 days. The child is 2 hours old.

Congenital pulmonary emphysema - congenital lobar emphysema is a developmental anomaly of the lower respiratory tract that is characterized by hyperinflation of one or more of the pulmonary lobes. In case patient has reticular and nodular pattern in X-ray.

Edematous hemorrhagic syndrome - edematous hemorrhagic syndrome is absent in modern classification.

So, in this task the child has specific features for hyaline membrane disease: the child was premature and developed respiratory distress so he has respiratory distress syndrome (get 5 by Silverman score); X-ray of lungs shows reticular and nodular pattern, air bronchogram.

23. On the 3rd day of life a newborn, who had suffered birth asphyxia, developed hemorrhage from the umbilical wound. Laboratory analysis reveals hypocoagulation, thrombocytopenia, and hypothrombinemia. What is the cause of such clinical developments?

A. Disseminated intravascular coagulation

B. Hemorrhagic disease of newborn

C. Congenital angiopathy

D. Thrombocytopenic purpura

E. Umbilical vessel trauma

Correct answer - **Disseminated intravascular coagulation**

Disseminated intravascular coagulation - is the generalized coagulation of blood in the vessels of the microvasculature with the formation of a large number of microthrombi and aggregates of blood cells. At the same time, normal blood circulation is blocked in most organs and systems, leading to the development of deep dystrophic changes in them. Following intensive blood clotting, hypocoagulation develops (decreased blood clotting ability), thrombocytopenia (decrease in the number of platelets per unit volume of blood), and hemorrhage (bleeding). DIC-syndrome is always secondary, develops in severe course of some pathological conditions in newborns.

Hemorrhagic disease of the newborn - acquired or congenital neonatal disease, manifested by increased bleeding due to inadequate coagulation factors, the activity of which depends on vitamin K. The classical form develops on day 2-5, bleeding occurs from the internal organs. The level of platelets does not decrease.

Congenital angiopathy - group of congenital vascular disorders, usuallu manifested with bleeding due to focal thinning of the walls of microvessels, the expansion of their lumen and the appearance of arteriovenous aneurysms (subendothelial underdevelopment, collagen deficiency) or a reduction in collagen and elastin fibers in the blood vessels

Thrombocytopenic purpura - a disturbance of the hemostasis system in newborns, which is characterized by a significant decrease in the number of platelets in the peripheral blood (<150,000 in 1 μl). It manifests with intradermal hemorrhages, mucous membranes bleedings.

Umbilical vessel trauma - occurs before birth or during labor and is characterized by the appearance of bleeding at the site of damage to the umbilical vessel. Diagnosed immediately after birth.

In the presented task the newborn suffered from birth asphyxia. Bleeding from the umbilical wound appeared only on the 3rd day of life. The laboratory data of hypocoagulation, thrombocytopenia, hypothrombinemia is sprcific for the second stage of DIC syndrome, which developed on the background of asphyxia.

24. Postureofan11-year-oldboywasdetermined during preventive examination. The child presents with curled forward rounded shoulders, the head is bowed forward, the thorax is flattened, the stomach is bulging. In the vertebral column there are deepened cervical and lumbar flexures. What posture does the child have?

A. **Kyphosis**
B. Lordosis
C. Stooping
D. Corrected
E. Normal

Correct answer - **Kyphosis**.

Kyphosis - is the deformation of the spine in the thoracic region sagittally. It can be both physiological and pathological. Kyphosis can be called **roundback.** In pathological kyphosis "roundness" of the upper spine increases past 45. The main manifestations: head is tilt forward, the thorax is flattened, the stomach is bulging. Unfavorable conditions are created for the work of the cardiovascular, respiratory and digestive systems. Diagnosis is confirmed by the radiography of the spine, as well as computer or magnetic resonance imaging.

Lordosis - excessive lumbar concavity, pain syndrome in the lumbar region, an increase of the pelvic incline forward, an increase in the deviation of the sacrum back, protruding abdomen, stretched, weakened abdominal muscles, a defance of the longitudinal muscles in the lower thoracic-lumbar region, limitation of mobility in the lumbar region, mostly when tilting forward.

Stooping posture - is characterized by an increase of thoracic kyphosis and a smoothness of the lumbar lordosis, lowered shoulders and winged scapula. This is the initial form of kyphosis, develops as a result of incorrect posture in a sitting position.

Corrected posture - correct posture after correction of stooping posture.

Normal (correct) posture - characterized by the same level of the shoulder, nipples, the angles of the shoulder blades, equal to the length of the cervico-brachial lines, the depth of the triangles of the waist, the straight vertical line of the spinous processes of the spine, the uniformly expressed physiological curves of the spine in the sagittal plane, the same relief of the thorax and lumbar region (when tilting forward).

In the presented case of an 11-year-old boy, his shoulders are curled forward, the head is tilted forward, the thorax is flattened, the stomach is bulging. In the vertebral column there are deepened cervical and lumbar flexures, and the form of the posture of kyphosis is determined.

25. During examination of a healthy infant, the child takes a toy into his hands, turns from the back to the side; when lying on the stomach he can firmly prop himself up on his forearms; the child laughs and makes joyful exclamations. The age of the child is:

A**. 4 months**
B. 2 months
C. 5 months
D. 1 month
E. 6 months

Correct answer - **4 months**

At 4 months - the child takes toy and holds it, shifts from side to back, lying on his stomach. In prone position, lifts head and chest well up, supporting self on extended arms and flattened palms, laughs loudly, makes exclamations of joy. Movements in the child become more clear, looks at the toys in his hand.

At the age of 2 months - the child holds his head well in the prone position, starts to hold his head for several minutes in upright position; turns his head in different directions. He lies on his back, does not turn over. Starts to hold the objects with the whole hand, fixes the sight, watches the objects, looks at the toys hanging above him, listens, smiles, the child laughs and makes joyful exclamations.

At 5 months - the child can roll over from abdomen to back and usually from back to abdomen, stands on toes with support under the arms. In prone position, lifts head and chest well up, supporting self on extended arms and flattened palms, turning in different directions. Immediately stares at interesting small objects or toys. Distinguishes relatives from strangers. Vocalizes tunefully to self and others, laughs loudly.

At the age of 1 month - a child's movements of the arms and legs are uncoordinated. When lifted from cot, head falls loosely unless supported. In ventral suspension, head is in line with body and hips semi-extended. Placed on abdomen, head immediately turns to side; arms and legs are flexed, elbows are away from body. The limb muscles are in a state of physiological hypertonus. He tries to lift his head and hold his head for several seconds on the prone position. The child fixes his eyes on bright objects. Turns head and eyes towards light source.

At 6 months - the child turns from the abdomen to the back, can sit without support with a rounded back, trying to crawl. Freely takes the toy from different positions. Follows the falling toy. He shifts toys from hand to hand, eats from a spoon, taking off food with his lips. Laughs loudly. Appears babble and primary understanding of speech. All these elements of stato-motor, sensory and speech development, are not yet expressed at 4 months.)

In presented case, the child's neuro-psychic development corresponds to the age of a 4th month: child holds his head well in the prone position, starts to hold his head for several minutes in upright position; turns his head in different directions. Shifts from side to back, lying on his stomach. Starts to hold the objects with the whole hand, fixes the sight, watches the objects, looks at the toys hanging above him, listens, smiles, the child laughs and makes joyful exclamations.

26. A 17-year-old young man complains of general weakness, trismus, twitching of the muscles in his left shin. 7 days ago he pierced his foot with a nail. Objectively: at the sole of the foot there is a wound, 0,3x0,2 mm in size, with small amount of serous-purulent discharge, the skin around the wound is hyperemic. What is the most likely diagnosis?

A. Tetanus
B. Phlegmon
C. Osteomyelitis
D. Infected wound
E. Erysipelas

Correct answer - **Tetanus**

Tetanus - is acute fatal infectious disease that is caused by the bacterium Clostridium tetani, which usually enters the body through a puncture, a cut, or an open wound. Manifestation of the symptoms can start since 8 day of contamination till few months. Tetanus leads to profound painful spasms of muscles, as a result of it can appear stop of the breathing and death. The C. tetani bacteria releases a toxin that affects the motor nerves, which stimulate the muscles.

Phlegmon - is acute purulent infiltrate in a subcutaneous tissue without certain borders. At this case will determine oedema, redness, pain locally, at patient will be increased fever, but sometimes can appear headache, vomiting, tachycardia. Neurological symptoms are usually absent.

Osteomyelitis - can be generalized and localized. Oedema, pain and redness at affected area, high fever, impossible movements are common symptoms for it and tetanus. Such symptoms get worse at generalized form. Trismus, twitching of the muscles are absent.

Infected wound - At this case will determine edematous, red, painful wound with purulence on it, at patient will be increased febral fever, trismus, twitching of the muscles are absent, but sometimes can appear headache, vomiting, tachycardia.

Erysipelasis - is cause by Streptococcus hemolyticus Group A. Typical clinical picture characterizes by appearing of erythema on arms, fingers, itching locally and lymphadenopathy. Trismus, twitching of the muscles are absent.

At this clinical case patient has wound with small amount of serous-purulent discharge, general weakness, trismus, twitching of the muscles of the shin, incubation period during 7 days what is typical for tetanus.

27. An infant is 2,5 months old. The onset of the disease was gradual, the child had normal body temperature but presented with slight cough. Within a week the cough intensified, especially at night; on the 12th day the child developed cough fits occurring up to 20 times per day and followed by vomiting. There was one instance of respiratory arrest. Make the diagnosis:

A. Pertussis

B. Parainfluenza

C. Congenital stridor

D. Respiratory syncytial infection

E. Adenovirus infection

Correct answer - **Pertussis**

Pertussis - is infectious disease with gradual onset of the disease and leads to the appearing of frequent spasmotic repeated cough with whoop after cough. Severe form of pertussis characterized by more than 25 attacks of cough per day, apnea, vomiting, hemorrhages surrounding eyes, pneumonia. Attack of cough usually appears at night.

Parainfluenza - Catarrhal syndrom appears from 1 day of parainluenza. Main clinical symptoms of the disease are hoarse of voice, dry barking cough and dyspnea.

Congenital stridor characterized by pathological noisy breathing because of abnormal congenital structure of larynx and trachea. Dyspnea increases during cough and crying of a baby.

Respiratory syncytial viral infection - is common for of early years children (especially younger than 1 year old). The most typical for RS-infection is high fever, signs of bronchiolitis, paroxysmal cough and quick developing of respiratory insufficiency with expiratory dyspnea.

Adenoviral infection - is acute infectious disease. For it typical catharal syndrome with signs of hyperemia of pharynx, serous mucose from nose and conjunctivitis, lymphadenopathy. Sometimes gastrointestinal tract (GIT) can be affected too.

At this clinical case at the 2.5 months old kid appeared slight catarrhal signs at the beginning of the disease. Then cough stayed more frequent and paroxysmal, especially at night, with apnea, what is typical for pertussis.

28. An 9-year-old child was hospitalized for fever up to 39,8°C, inertness, moderate headache, vomiting. Examination revealed meningeal symptoms. Lumbar puncture was performed. The obtained fluid was characterised by increased opening pressure, was transparent, with the cell count of 450 cells per 1 mcL (mainly lymphocytes - 90%), glucose level of 3,6 mmol/l. What agent could have caused the disease in the child?

A. **Enterovirus**
B. Neisseria meningitidis
C. Mycobacterium tuberculosis
D. Staphylococcus aureus
E. Streptococcus pneumonia

Correct answer - **Enterovirus**

Enteroviruses - cause affection of GIT, mucous membrane of upper respiratory tract, skin and nervous system with developing of serous meningitis. There are some changes in the cerebrospinal fluid (CSF) at this case: slightly increased pressure, CSF transparent, lymphocytic pleocytosis (mainly lymphocytes - 90%), protein level is normal or increased, glucose and chlorides level is normal.

Neisseria meningitides - causes acute severe purulent meningitis. CSF flows with increased pressure (300-500 mm H_2O), it is turbid and purulent, considerable protein content, neutrophylic pleocytosis determines; glucose content is lowered.

Mycobacterium tuberculosis - Tuberculous meningitis starts gradually from appearance of the slight pyrexia. Cerebrospinal fluid is transparent or slightly opalescent, fibrinose films present on its surface, pressure of CSF is increased; lymphocytic cytosis is typical, glucose and chlorides level is decreased.

Staphylococcus aureus - causes purulent meningitis on a background of the local or generalized staphylococcal infection with formation of the plural abscesses of the brain. CSF is turbid, level of protein is considerably increased, neutrophylic pleocytosis determines, glucose level is decreased.

Streptococcus pneumonia - causes purulent meningitis with quick developing of the brain oedema and focal neurological symptoms. Hemorrhagic rash and sepsis can appear. CSF is turbid, level of protein is considerably increased, neutrophylic pleocytosis determines, glucose level is decreased.

At this clinical task at 9 years old patient is sick by serous meningitis because of such pathological changes of CSF: increased opening pressure, transparent, with the cell count of 450 cells per 1 mcL (mainly lymphocytes - 90%), glucose level of 3,6 mmol/l what tells for enteroviral etiology of the meningitis.

29. A 3-year-old child has been delivered to a hospital with complaints of pain in the legs, fever, and loss of appetite. Objectively: pale skin and mucosa, hemorrhagic rash. Lymph nodes are enlarged, painless, dense and elastic, not matted together. Bones, joints, and abdomen are painful. The liver and spleen are enlarged. Hemogram: Hb – 88 g/l, color index – 1.3, platelets – 80 * 10^9/l, leukocytes – 25.8 * 10^9/l, lymphoblasts – 70%, ESR – 52 mm/hour. Make the provisional diagnosis:

A. Acute leukemia

B. Thrombocytopenic purpura

C. Acute rheumatic fever

D. Infectious mononucleosis

E. Hemorrhagic vasculitis (Henoch-Schonlein purpura)

Correct answer **- Acute leukemia**.

Acute leukemia - diagnosis is based upon complaints (pain in the legs, fever, and loss of appetite), data of objective examination (pale skin and mucosa, hemorrhagic rash, enlargement of lymph nodes, liver and spleen, painful bones, joints and abdomen) and data of laboratory examinations (anemia, thrombocytopenia, leucocytosis, markedly increased ESR, and the most important – presence of 70% lymphoblasts). Nevertheless, for confirmation of final diagnosis puncture of bone marrow will be necessary.

Thrombocytopenic purpura - due to presence of decreased quantity of platelets in peripheral blood it is possible to think about thrombocytopenic purpura, but taking into account clinical and paraclinical picture in a whole, especially enlargement of lymph nodes, liver and spleen, leucocytosis, increased ESR and lymphoblasts in peripheral blood the only one correct diagnosis is acute leukemia.

Acute rheumatic fever - acute rheumatic fever can be accompanied by pallor of skin and mucosa, painful joints and abdomen, leucocytosis and increased ESR, but lymphoproliferative syndrome and hemorrhagic rash are not typical for this disease, and, moreover, lymphoblasts are never seen in peripheral blood of patients suffering from acute rheumatic fever, it is pathognomonic sign of leukemia.

Infectious mononucleosis - such clinical manifestations as loss of appetite, hemorrhagic rash, enlargement of lymph nodes, hepatomegaly and splenomegaly, and fever are mutual for both of acute leukemia and infectious mononucleosis. In CBC leucocytosis and increased ESR are also mutual symptoms, but in a case of infectious mononucleosis there are increased concentration of erythrocytes and atypical mononuclear cells in peripheral blood, and in a case of leukemia there are anemia, thrombocytopenia and presence of blasts.

Hemorrhagic vasculitis (Henoch-Schonlein purpura) - manifestations of the disease depend on what organs and systems they are covered. The disease can manifest itself by one or more groups of symptoms. The main of the following: skin lesions, joint damage, lesions of the gastrointestinal tract, and renal syndrome. The most characteristic is the acute onset of the disease, accompanied by fever to febrile numbers. Fever and symptoms of intoxication are mutual symptoms for both diseases, but enlargement of lymph nodes, liver and spleen, leucocytosis, increased ESR and lymphoblasts in peripheral blood is presented, that gives an opportunity to diagnose acute leukemia.

There are typical syndromes of acute leukemia in the 3-year-old child: toxic (fever, and loss of appetite), anemic (pale skin and mucosa, Hb – 88 g/l), hemorrhagic (hemorrhagic rash, thrombocytopenia - 80 * 10^9/l), pain (pain in the legs), proliferative (lymph nodes are enlarged, painless, dense and elastic, not matted together, liver and spleen are enlarged) with leucocytosis (25.8 * 10^9/l), lymphoblasts – 70%, and ESR – 52 mm/hour.

30. A 14-year-old girl came to a general practitioner with complaints of weakness, loss of appetite, headache, and rapid fatigability. Her last menstruation was profuse and lasted for 14 days after previous delay of 2 months. Objectively: the skin is pale, heart rate is 90/min., BP is 110/70 mm Hg, Hb is 88 g/l. Rectal examination: the uterus and its appendages are without changes, no discharge from the genital tracts. What complication occurred in the patient?

A. Posthemorrhagic anemia
B. Somatoform autonomic dysfunction of hypotonic type
C. Migraine
D. Gastritis
E. Dysmenorrhea

Correct answer **- posthemorrhagic anemia**.

P**osthemorrhagic anemia -** the diagnosis is based on complaints of weakness, loss of appetite, headache, and rapid fatigability, anamnesis (profuse menstruation during 14 days), data of clinical examination (pallor of skin, tachycardia) and data of CBC (Hb 88 g/l).

Somatoform autonomic dysfunction of hypotonic type - somatoform disorder (autonomic dysfunction), which occurs on the background of the body's endocrine rearrangements in adolescence, is clinically inadequate vegetative regulation. The objective symptoms of somatoform disorder (autonomic dysfunction) are: the lability of heart rate (tachycardia with little physical exertion), tendency to decrease blood pressure (100/50-90/45 mm Hg), lability vasomotors (persistent red, or, on the contrary, white dermographism, sharply positive inverse or orthostatic test), cold hands and feet. In addition, there may be a so-called "respiratory syndrome", which is a feeling of "respiratory corset," shortness of breath, shallow breathing with a restriction inhalation. There are no disorders in blood test, and in our case marked anemia is present.

Migraine - according to statistics, about 10% of teenagers suffer from migraine. At girls attacks happen in 4 times more often, than at boys. There are two main types of migraine: migraine without an aura or an ordinary migraine and migraine with aura or classic or associated migraine. In adolescents, migraine with aura is more common. Pain in the head of a splitting character that can be localized in the temples, frontal lobe, eyes, one half of the skull is the most characteristic symptom; also, frequent change of mood, the appearance of anxiety, aggressiveness, tearfulness, lack of strength, nausea, weakness, and vomiting are typical. In our case complaint of headache are absent, other symptoms are due to anemia.

Gastritis - typical clinical symptoms of gastritis are the following: painful sensations, discomfort and heaviness in the stomach, heartburn, belching with air or a small amount of food eaten, poor appetite and child's refusal to eat, nausea and vomiting, disturbance of

digestion processes, and palpatory tenderness of the epigastric region. Headache and rapid fatigability can be sometimes present as well, but they are never accompanied by tachycardia and – even less – by decrease of hemoglobin as in presented case.

Dysmenorrhea - neurovegetative (sensation of heat, sweating, frequent urination, bloating, nausea, dry mouth), vegetative-vascular (headache, dizziness, tachycardia, bradycardia, edema of the eyelids, face), emotional-psychic (irritability, anorexia, depression, drowsiness, insomnia, bulimia, intolerance to smells), and metabolic-endocrine (vomiting, general weakness, joint pain) disorders are typical for this pathology. In described case this disease probably stipulated such complication as posthemorrhagic anemia because primary dysmenorrhea in adolescents in the vast majority of observations occurs against the background of dysfunction of the hypothalamic-pituitary complex in the period of the formation of the reproductive system.

Symptoms of anemia in the 14-year-old girl (weakness, loss of appetite, headache, and rapid fatigability, tachycardia – 90/min, Hb is 88 g/l) appeared after profuse menstruation which lasted for 14 days.

31. A 6-year-old girl came to a general practitioner with her mother. The child complains of burning pain and itching in her external genitalia. The girl was taking antibiotics the day before due to her suffering from acute bronchitis. On examination: external genitalia are swollen, hyperemic, there is white deposit accumulated in the folds. The most likely diagnosis is:

A. Candidal vulvovaginitis
B. Trichomoniasis
C. Nonspecific vulvitis
D. Helminthic invasion
E. Herpetic vulvitis

Correct answer - **Candidal vulvovaginitis.**

Candidal vulvovaginitis - is an inflammation of external genitalia mucous membranes due to fungal infection. It is characterized by itching, burning pain, edema and hyperemia of external genitalia. Discharge is white and thick. Taking antibiotics can be as a trigger factor for candidal vulvovaginitis.

Trichomoniasis - is specific inflammatory infection disease of the urogenital system caused by Trichomonas vaginalis. It is characterized by swelling and redness of external genitalia. Skin hyperemia can spread on the perineum.

Nonspecific vulvitis - is caused by opportunistic microorganisms, which are founded in the vagina. Episodes of nonspecific vulvitis can be present in girls with chronic diseases (e.g. Diabetes mellitus, hypothyroidism, blood diseases, etc.).

Helminthic invasion - of the genital tract develops in girls as a secondary. Helminths transfer to vagina from anus when the baby is sleeping. Clinical presentation usually consists of gastrointestinal tract disorders, itching and burning in genitalia region.

Herpetic vulvitis - is caused by herpes virus (usually type II). It is characterized by specific rash on the skin and mucous membranes: small vesicles on the hyperemic surface filled with liquid.

In the task, the girl complains of burning pain and itching in her external genitalia about burning, itching in the area of the external genitalia. On examination: external genitalia are swollen, hyperemic, there is white deposit accumulated in the folds. The girl was taking antibiotics the day before.

32. A 14-year-old girl has been delivered to a gynecological department with complaints of profuse blood discharge from her genital tract for 2 weeks. Anamnesis: menstruation since 13, irregular, painful, profuse; the last one was 2 months ago. Objectively: pale skin and mucosa, BP - 100/60 mm Hg, Hb - 108 g/l. The abdomen is soft and painless on palpation. Rectal examination revealed no pathologies of reproductive organs. What condition is it?

A. Juvenile uterine hemorrhage (Dysfunctional)
B. Hypomenstrual syndrome
C. Inflammation of uterine appendages (Pelvic inflammatory disease)
D. Pelviperitonitis
E. Endometritis

Correct answer - **Juvenile uterine hemorrhage (Dysfunctional)**

Juvenile uterine hemorrhage (Dysfunctional) - is a bleeding of pubertal period without organic etiology. It usually occurs after delay in the menstrual cycle. Posthemorrhagic anemia symptoms (weakness, dizziness, pale skin, low hemoglobin level etc.) can be present in case of exceed blood loss volume.

Hypomenstural syndrome - is a menstrual disorder with reduction of menstruation, reducing its duration or decreasing blood loss compared with physiological norm. It is characterized by rare, short or poor menstruation.

Inflammation of the uterine appendages - is an inflammatory disease of the ovaries and fallopian tubes caused by infectious agents. Gynecological examination: purulent discharge from the cervical canal is observed, palpation of appendages area is painful, appendages are enlarged, mobility is limited.

Pelvioperitonitis - is a local inflammatory lesion of the pelvic peritoneum. It is characterized by high grade fever (38-39 °C), nausea, vomiting, sharp pain in the lower abdomen. Symptoms of peritoneum irritation are positive; bowel peristalsis is reduced.

Endometritis - is an inflammatory process in the inner mucous layer of the uterus - endometrium. Clinical presentation includes lower abdominal pain, purulent discharge from the genitalia.

In this task, a 14-year-old girl has been delivered to a gynecological department with complaints of profuse blood discharge from her genital tract for 2 weeks. Anamnesis: menstruation is irregular and profuse; the last one was 2 months ago. Objectively: pale skin, Hb - 108 g/l. The abdomen is soft and painless. Rectal examination revealed no pathologies of reproductive organs.

33. A 9-year-old boy has been suffering from multiple bronchiectasis since he was 3 years old. Exacerbations occur frequently (34 times a year), after conservative therapy there are short remission periods. The disease progresses, the child is physically underdeveloped, presents with pale skin, acrocyanosis, deformed nail plates in the shape of ”clock-face”. Bronchography reveals saccular bronchiectases in the lower lobe of the right lung. What further treatment tactics should be chosen?

A. **Surgical intervention**
B. Continuation of conservative therapy
C. Physio therapy
D. Sanatorium-and-spatreatment
E. Physical training

Correct answer - **Surgical intervention**

A. Surgery is an important adjunct to therapy in some patients with advanced or complicated disease. Surgical resection for bronchiectasis can be performed with acceptable morbidity and mortality in patients of any age. Single- or double-lung transplantation has been used as treatment of severe bronchiectasis, predominantly when related to CF. In general, consider patients with CF and bronchiectasis for lung transplantation when FEV_1 falls below 30% of the predicted value. Female patients and younger patients may need to be considered sooner. In general, surgery should be reserved for patients who have focal disease that is poorly controlled by antibiotics. The involved bronchiectatic sites should be completely resected for optimal symptom control.

B. Some patients with chronic bronchial infections may need regular antibiotic treatment to control the infectious process. Some clinicians prefer to prescribe antibiotics on a regular basis or for a set number of weeks each month. Potential oral antibiotics regimens include daily antibiotics for 7-14 days of each month, alternating antibiotics for 7-10 days with antibiotic-free periods of 7-10 days, or a long-term daily dose of antibiotics. For patients with severe CF and bronchiectasis, intermittent courses of intravenous antibiotics are sometimes used.

C. Good bronchial hygiene is paramount in the treatment of bronchiectasis, because of the tenacious sputum and defects in clearance of mucus in these patients. Postural drainage with percussion and vibration is used to loosen and mobilize secretions. Devices available to assist with mucus clearance include flutter devices, intrapulmonic percussive ventilation devices, and incentive spirometry. Although consistent benefits from these techniques are lacking and vary with patient motivation and knowledge, a review did report improvement in patients’ cough-related quality of life scores. One form is a high-frequency chest wall oscillation vest to help clear lungs of mucus. The vest gently compresses and releases chest, creating the same effect as a cough. This dislodges mucus from the walls of the bronchial tubes.

D. In general, sanatorium treatment indicated for mild to moderate illness and for patients in remission period. Benefits from this treatment is lacking and vary with patient condition.

E. Physical training is a part of adjuncts that improves mucus clearance.

The goals of therapy are to improve symptoms, to reduce complications, to control exacerbations, and to reduce morbidity and mortality. Early recognition is essential in

bronchiectasis and associated conditions. Thus, presented case requires surgical intervention.

34. An infant cries during urination, the foreskin swells and urine is excreted in drops. What approach to treatment should be chosen?
A. **Create an opening into the foreskin cavity**
B. Prescription of α-adrenergic blocking agents
C. Prescriptionof antispasmodic agents
D. Urinarybladder catheterization
E. Epicystostomy

Correct answer - **Create an opening into the foreskin cavity**

A. **Create an opening into the foreskin cavity.** Balanoposthitis describes inflammation of the glans penis and the foreskin in uncircumcised males. Although the etiology is multifactorial in children, balanoposthitis typically results from poor hygiene that is sometimes complicated by secondary infection. Patients presenting with balanitis but without phimosis should receive gentle retraction of the foreskin daily and soak in warm water to clean penis and foreskin. Patients presenting with phimosis and severe urinary obstruction as a complication of balanitis should receive steroid cream and gentle retraction of the foreskin, if the phimosis is too tight, may be used dorsal slit incision by cutting the foreskin over the dorsal shaft of the penis to enlarge the foreskin opening or perform a formal circumcision.

B. **Prescription of α-adrenergic blocking agents** is not indicated in case of balanoposthitis.

C. **Prescription of antispasmodic agents** is not indicated in case of balanoposthitis.

D. **Urinary bladder catheterization** is not indicated in case of balanoposthitis.

E. **Epicystostomy** is not indicated in case of balanoposthitis.

Correct answer is create an opening into the foreskin cavity. The goal of therapy is draining and lavage of preputial sac that improve urination.

35. After a case of purulent otitis a 1-year-old boy has developed pain in the upper third of the left thigh, body temperature up to 39oC. Objectively: swelling of the thigh in its upper third and smoothed out inguinal fold. The limb is in semiflexed position. Active and passive movements are impossible due to severe pain. What diagnosis is the most likely?
A. **Acute hematogenous osteomyelitis**
B. Acute coxitis
C. Intermuscular phlegmon
D. Osteosarcoma
E. Brodie’s abscess

Correct answer - **Acute hematogenous osteomyelitis**

A. Osteomyelitis is strictly defined as any form of inflammation involving bone and/or bone marrow, but it is almost exclusively the result of infection. Acute hematogenous osteomyelitis typically arises in the metaphysis of long tubular bones, with approximately two-thirds of all cases involving the femur, tibia or humerus Most children and adolescents with AHO present with a history of bone pain for several days. The hallmark of AHO pain is its constant nature, with the level of pain increasing gradually. In young children, it is often difficult to elicit pain location, while in older children it is typically more localized. Pain generally leads to restricted use of the involved limb. As the sites most often involved are the long bones of the lower limbs, children frequently present with a limp. In all cases, localized bone pain and fever should raise the clinical suspicion of AHO. Exaggerated immobility of the joint and lack of point tenderness over the metaphysis suggest septic arthritis rather than (or in addition to) osteomyelitis. The classic signs of inflammation (redness, warmth and swelling) do not appear unless the infection has progressed through the metaphyseal cortex into the subperiosteal space. Such progression is more common in infants and young children who have a thinner bone cortex.

B. Postinfectious arthritis is a relatively often encountered in pediatric practice. Clinical cases bring to attention the most common forms of postinfectious arthritis (reactive arthritis, postinfectious arthritis bacterial, viral, spirochete, and so on). Although highly studied and commonly found in current pediatric practice, arthritis occurring after infections remains controversial entities, especially regarding terminology. Arthritis is presented as a restriction of joint movement, associated with swelling, heat, redness and pain at mobilization.

C. The main cause of **phlegmon** development is usually microorganisms that enter the cell area directly through the wound cavity or from infections localized near the foci (furunculosis , caries, lymphadenitis, etc.) lympho- and circulatory system. Most often, the golden staphylococcus is isolated, after it there is streptococcus on its frequency.

D. Osteosarcoma is the third most common cancer in adolescence. It is thought to arise from a primitive mesenchymal bone-forming cell and is characterized by production of osteoid. Osteosarcoma most commonly involves the distal femur and proximal tibia. In case of uncomplicated osteosarcoma SIRS is negative.

E. Subacute osteomyelitis is characterized by mild to moderate pain, usually described as a persistent ache; intermittent symptoms; insidious onset; and, often, a long delay between the onset of pain (the most common presenting symptom) and the diagnosis. Usually, symptoms are present for 2 weeks or longer. The course is generally marked by few or no constitutional symptoms and no known previous acute disease. A systemic reaction is absent, and supportive laboratory data are inconsistent. Subacute osteomyelitis may mimic various benign and malignant conditions, resulting in delayed diagnosis and treatment. The most frequently made incorrect diagnosis is that of tumor.

Correct answer is acute hematogenous osteomyelitis has poor prognosis and could be life- or limb-threatening condition. All patients with articular or bone pain must be admitted to the surgical department.