MINISTRY OF HEALTH OF UKRAINE

ODESA NATIONAL MEDICAL UNIVERSITY

Departments of Pediatrics №2

CONFIRMED by

Vice-rector for research and educational work

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METHODOLOGICAL RECOMMENDATIONS ON PRACTICAL CLASSES FOR STUDENTS

International Medical Faculty, course 6

Educational discipline "**PEDIATRICS**"

Approved
at the meeting of the department of Pediatrics №2
Protocol No. 11 dated 28/08/2022

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1. Topic №2:
Anaphylactic shock in children. Definition, causes, clinical manifestations, diagnosis, emergency care, prevention. Acute urticaria and angioedema in children. Causes, classification, diagnosis, differential diagnosis, treatment. Emergency care for angioedema in life-threatening areas in children.

2. Relevance of the topic.
Primary health care provides for a holistic approach to medical care by a general practitioner - a family doctor, and in the transition period also by a general practitioner and a district pediatrician in a medical outpatient clinic or at the patient's place of residence and includes the provision of consultation, diagnosis and treatment of the most common diseases. injuries, poisoning, pathological, physiological (during pregnancy) conditions, the implementation of preventive measures; referral in accordance with the medical indications of a patient who does not need emergency medical care to provide him with secondary (specialized) or tertiary (highly specialized) medical care; provision of emergency medical care in the event of an acute disorder of the patient's physical or mental health, which does not require emergency, secondary (specialized) or tertiary (highly specialized) medical care.
Clinical signs, diagnosis, emergency care for emergency conditions caused by the action of external factors in children (entry of a foreign body into the respiratory tract, insect bites, snake bites, electric shock, burns, poisoning with drugs, household chemicals).

3. Objectives of the lesson
3.1. Common goals
Familiarization with the organization of emergency care for children in Ukraine in accordance with the current legislation. Improving the training of pediatricians, family medicine on topical issues of emergency medicine, determining the level of knowledge and skills of the student in accordance with the qualification requirements.

3.2. Educational purposes:
To form students' basic ideas about the peculiarities of the clinical course of emergency conditions in children, carrying out medical and diagnostic manipulations (taking into account the nature of the disease and the individual characteristics of the child).

3.3. Specific goals:
-know:
• various clinical options and complications of the most common emergency conditions in children
• patient management tactics for the most common emergency conditions in children
• planning examination of a sick child and interpretation of the results obtained in the most common emergency conditions in children
• differential diagnosis and formulation of a preliminary clinical diagnosis in emergency conditions in children
• emergency care for emergency conditions in children

3.4. Based on theoretical knowledge on the topic:
- be able to:
• conduct a survey and objective examination of children;
• assess the condition of the child;
• assess the need for hospitalization of the child after an emergency
• draw up an emergency plan;

- to master practical skills:
• providing emergency care for the most common emergency conditions in children - hyperthermia, convulsions, anaphylactic shock, etc .;

• counseling the parents of patients on the prevention of emergencies in the future
• moral and deontological principles of a medical specialist and principles of professional subordination in pediatrics.

4. Classroom self-study materials (interdisciplinary integration)

№	Disciplines	To know	To be able to do
1	Anatomy	Anatomical features of children of different ages	
2	Physiology	Normal indicators of the functioning of a healthy body	Evaluate the results of body studies
4	Pathophysiology	Pathogenesis of the pathology of the most common chronic diseases	Analyze the main links of the pathogenesis of the disease
5	Propedeutics of internal diseases and propedeutics of childhood diseases	Typical complaints in the most common emergency conditions, main clinical symptoms, examination methods, differential diagnosis of diseases	Substantiate the diagnosis according to the classification
6	Pharmacology	Pharmacological action of the necessary drugs	Prescribe appropriate treatment based on age dose
7	Organization of health care and social hygiene	Principles and organization of hospital and specialized care in case of emergency in a child	Draw up a treatment plan for the prehospital and hospital stages.

5. Topic content
Emergency conditions are pathological changes in the human body that lead to a sharp deterioration in health, can threaten life and require emergency treatment. These include pathological conditions that do not directly threaten life, but such a threat can become real at any time; conditions in which the lack of timely medical care can lead to permanent changes in the state of the body, in which it is necessary to alleviate the suffering of the patient in a short time; conditions requiring immediate medical intervention in the interests of others in connection with the patient's behavior.

Emergency care for anaphylactic shock in children. Anaphylactic shock (AS) is the most severe manifestation of an immediate allergic reaction. AS is an acute and life-threatening condition, accompanied by a violation of hemodynamics, which leads to circulatory failure and hypoxia in all vital organs. AS is characterized by the rapid development of predominantly general manifestations of anaphylaxis: a decrease in blood pressure, body temperature, and dysfunction of the central nervous system, increased vascular permeability, spasm of smooth muscle organs, and the like. AS occurs after a patient's contact with an allergen to which he is sensitive: medications, vaccines, serums, food products, body cooling, insect poison and other reasons.

Anaphylactic shock is an immediate allergic reaction, accompanied by life-threatening clinical manifestations (a sharp drop in blood pressure, disruption of the central and peripheral nervous systems, endocrine disorders, respiratory failure, etc.).
The most common causes of anaphylactic shock are drug, insect and food allergies.

Diagnostics.
The main clinical manifestations of anaphylactic shock are:
- *violation of hemodynamics*

- *breathing disorder (shortness of breath, bronchospasm, choking)*
- *disruption of the gastrointestinal tract (nausea, vomiting, diarrhea);*
- *skin rash (urticaria, other exanthema, Quincke's edema).*

The clinical picture of anaphylactic shock in some cases may be similar to psychopathological conditions (fainting, loss of consciousness, etc.), anaphylactoid reactions caused by the release of allergy mediators without a preliminary immunological reaction, due to excessive consumption of food, foods high in histamine. Very rarely, various coma, cold allergy, aspiration, heart attack, embolism, spontaneous pneumothorax, orthostatic collapse, hyperventilation syndrome can simulate shock.

Anaphylactic drug shock (ADSH) is the most severe generalized manifestation of ADSH, caused by the course of type 1 immunological reaction with the release of a large number of cytokines, accompanied by severe disturbances in the activity of various organs and systems (cardiovascular, nervous, respiratory, etc.).
Most often, ADSH develops on the introduction of X-ray contrast diagnostic drugs, penicillins, pyrazolone derivatives, vitamins of group B. With parenteral administration of drugs, ADSH develops immediately, with oral administration - after 30-60 minutes.
Due to the predominant involvement of certain pathogenetic mechanisms, the course of ADSH may vary. A.S. Lopatin identifies the typical form of ADSH, as well as the options: hemodynamic, asphytic, cerebral and painful. In the structure of all forms of ADSH, the frequency of these variants is, respectively, 55.4%, 20.0%, 51.5%, 8.1%, 5.0%.

Algorithm for providing emergency care in AS

First-line treatment	Epinephrine intramuscularly in the middle of the outer thigh 0.01 mg / kg solution 1: 1,000 (1 mg / ml) maximum 0.5 mg (adult) or 0.3 mg (child). Repeated doses of epinephrine are given every 15 minutes. When using an autoinjector with epinephrine, patients weighing 7.5 kg to 25 kg should receive 0.15 mg 25-30 kg - 0.3 mg. The dose can be repeated after at least a 5 minute interval. With stridor from laryngeal edema, epinephrine (2-5 ml, 1 mg / ml) can be inhaled in addition to epinephrine intramuscularly.
Secondary treatment	The anaphylactic trigger should be suspended. Giving the correct position to the patient's body: - put on your back with raised lower limbs, if there is an instability of blood circulation - transfer to the "sitting" position if there are signs of respiratory failure - saving position on the side if the patient has lost consciousness. All patients with anaphylaxis should be administered a high concentration of oxygen through a mask - up to 6-8 liters per minute Use standard techniques to restore airway patency and prevent aspiration. Quickly inject 10 ml / kg of 0.9% sodium chloride solution through the catheter. To alleviate the symptoms of bronchospasm, additionally administer inhaled beta-2-agonists. According to indications - CPR.
Tertiary treatment	For relief of skin symptoms - blockers of H1 and H2-receptors of systemic action. In order to reduce the risk of developing respiratory symptoms of the late phase - the introduction of systemic corticosteroids. Monitoring the patient's condition (in case of respiratory failure - within 6-8 hours, with instability of blood circulation - within 12-24 hours).

Be sure to control the state of the pulse, respiration and blood pressure!

Theoretical minimum. Anaphylaxis is a severe, life-threatening, generalized or systemic hypersensitivity reaction characterized by a rapid onset with life-threatening respiratory and circulatory disorders and is usually associated with skin and mucosal manifestations. **The main triggers** are food, drugs and hymenoptera venom, and in 20%, the trigger cannot be identified.
In patients with anaphylaxis, airway, respiratory, and circulatory functions should be assessed immediately. Death occurs because of damage to the upper respiratory tract, lower respiratory tract and / or due to cardiovascular disorders.

Clinical criteria for the diagnosis of anaphylaxis.
Anaphylaxis is very likely if one of three clinical symptoms is present

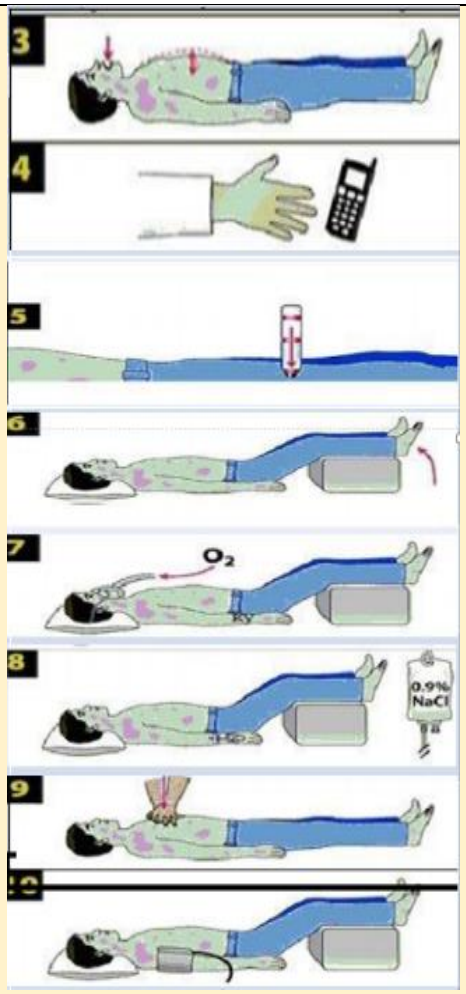
Option A: acute onset (from a few minutes to several hours) with the following 3 criteria: 1) damage to the skin, mucous membrane, or skin and mucous membrane at the same time (for example, generalized urticaria, itching, swelling of the lips, tongue, uvula) 2) respiratory failure (eg, shortness of breath, remote dry wheezing, bronchospasm, stridor, decreased maximum expiratory flow rate, hypoxemia) 3) a decrease in blood pressure or concomitant symptoms of target organ dysfunction (eg, hypotension, fainting, urinary incontinence).	**Option B:** immediately after contact with the suspected allergen (from several minutes to several hours), 2 or more of the following criteria are determined: 1) lesions of the skin, mucous membrane (for example, generalized urticaria, itching, swelling of the lips, tongue, uvula) 2) respiratory failure (eg, shortness of breath, remote dry rales, bronchospasm, stridor, decreased maximum expiratory flow rate, hypoxemia) 3) decrease in blood pressure; 4) accompanying symptoms of target organ dysfunction (eg, hypotension, fainting, urinary incontinence) 5) persistent gastrointestinal symptoms (eg, spastic abdominal pain, vomiting).	**Option C:** lowered blood pressure after exposure to a known allergen for this patient (from several minutes to several hours): a) infants and children: low systolic blood pressure (adjusted for age) or more than 30% reduction in systolic blood pressure * ** Low systolic blood pressure for children is defined as less than 70 mm Hg. for children from 1 month to 1 year; less than (70 mm Hg + [2 * age]) for children from 1 to 10 years less than 90 mm Hg. for children from 11 to 17 years old.* b) adults: systolic blood pressure less than 90 mm Hg. or more than 30% reduction from baseline pressure.

	Action plan depending on the patient's condition	**Steps to take on the exam**
	First-line treatment	
1	**The first line of treatment with intramuscular epinephrine** is recommended.	Take a syringe with adrenaline and say loudly "I inject a solution of adrenaline in a dose of 0.3 ml intramuscularly into the anterolateral region of the thigh" and loudly announce the time of the dose
	Secondary treatment	
2	**Anaphylaxis patient pose:**	Place the pillow under your feet / move the foot end of the bed to an elevated position

	- circulatory instability: on the back with raised lower limbs - respiratory failure: sitting position - unconscious patients: rescue position on the side	
3	**Oxygen** All patients with anaphylaxis should be administered a high concentration of oxygen through a mask up to 6-8 liters per minute. The mask must be of the appropriate size. It must be put on the patient's face correctly and tightly.	Put an oxygen mask on the patient's face and say loudly: "100% oxygen flow 6-8 l / min."
4	**Infusion support** Intravenous fluids should be given to patients with cardiovascular instability. The solutions to be chosen in this case are electrolytes and should be given in boluses of 20 ml / kg (5-10 ml / kg in the first 5-10 minutes for an adult, **10 ml / kg for a child**).	Take a saline solution in a soft vial, attach it to the infusion system and say loudly: "For a quick injection of 0.9% sodium chloride solution at a dose of 10 ml / kg, I squeeze the vial"
Tertiary treatment		
5	**Glucocorticosteroids** are widely used for anaphylaxis**.** Parenteral administration of **GCS** can be prescribed as soon as the first and second lines of treatment have been carried out.	Take a syringe with GCS and say loudly: "I inject intravenous hydrocortisone 2 mg / kg (or methylprednisolone 1 mg / kg)"
6	**Monitoring.** Patients with anaphylaxis need constant monitoring of vital functions and transfer to the intensive care unit. Duration of monitoring for anaphylaxis in the intensive care unit with subsequent transfer to the allergology department: - patients with respiratory failure - 6-8 hours; - patients with circulatory instability - 12-24 hours	Say it out loud: • Next, I check the vital functions according to the ABCDE algorithm • Hospitalization in the intensive care unit
A source: https://dec.gov.ua/wp-content/uploads/images/dodatki/2015_916_MA/2015_916_YKPMD_MA.pdf pp.53-58		

It is forbidden to use skin and other provocative tests with medications to diagnose anaphylactic reaction due to their low information content and danger to the life of patients.
ICD-10 codes:
T 8.2 - anaphylactic shock, unspecified.
T 8.0 - anaphylactic shock caused by a pathological reaction to food.
T 78.5 - anaphylactic shock associated with the administration of serum.
T88.6 - anaphylactic shock associated with a pathological reaction to an adequately prescribed and correctly applied drug.

It is necessary to have an emergency protocol with you to recognize and treat anaphylaxis, to regularly review the contents of the protocol	
Terminate the trigger	

Assess blood circulation, respiration, mental status and patient weight **Perform steps 4, 5 and 6 quickly and simultaneously**	
Seek help from an emergency (emergency) service	
<u>Epinephrine</u> IM in the anterolateral thigh, 0.01 mg / kg 1: 1,000 solution (1 mg / ml), maximum 0.5 mg (adults) or 0.3 mg (children), record dosing time and repeat after 5-15 minutes, if necessary.	
Put the patient on his back or place in another comfortable position; if the patient rises or sits abruptly, death may come	
If indicated, introduce an additional high oxygen concentration (6-8 l / min) through a mask or air duct	
Establish intravenous access using wide cannula catheters (14-16 gauge). **Quickly inject 10 ml / kg of 0.9% sodium chloride solution within the first 5-10 minutes.**	
If indicated, at any time, carry out cardiopulmonary resuscitation with closed heart massage.	
Monitor the patient's blood pressure, pulse, respiration and oxygenation at frequent, regular intervals (should be monitored continuously if possible).	

Prevention of anaphylactic shock: there is no specific prophylaxis.

Precautions to reduce the risk of anaphylactic shock	
Primary prevention	**Secondary prophylaxis (in persons with anaphylactic shock)**
Carefully collected allergy, personal and family history. In patients with aggravated allergic anamnesis, the stamp "allergy" is put on the signal sheet of the medical history and the medications that cause the allergy are listed; When using medications - if possible, prescribe the medication by mouth. Observing the patient for 30-60 minutes after administering a drug that can cause anaphylaxis.	Avoid triggers (medicines, food) and behaviors that create such a risk (insects)
For allergy diagnostics: • preference for prick tests • patients with plant pollen allergy should not prescribe skin tests during dusting	Desensitization, if possible (specific immunotherapy in patients with allergy to Hymenoptera venom or specific desensitization to drugs) or tolerance

• provocative tests with drugs used internally or endotracheally, only in stationary conditions • in patients with a history of anaphylaxis, determination of specific IgE in serum instead of performing skin tests.	development (in case of hypersensitivity to drugs, e.g. ASA, chemotherapy drugs, monoclonal antibodies, antibiotics).
Providing medical procedures associated with an increased risk of anaphylaxis: • stethoscope • tonometer • harness • syringes, needles for syringes, vascular catheters 14 G or 16 G; epinephrine for injection (1 mg / ml); • equipment for oxygen therapy - oropharyngeal air duct and an Ambu bag with a face mask; • 0.9% NaCl (bottles or packages of 500 ml) • sets for intravenous infusion • antihistamine for intravenous administration • GCS for intravenous administration (eg methylprednisolone, hydrocortisone); • nebulizer / spacer and short-acting β-mimetic for nebulization (eg salbutamol) The medical staff should be specially trained to provide emergency medical care for drug-induced AS and the treatment of similar conditions.	Self-administration of adrenaline (autoinjector with adrenaline). Wearing a medical bracelet / pendant / note with relevant medical information along with ID.
The risk associated with the introduction of an allergen, drug or diagnostic substance can be reduced by using a p / o or i / v antihistamine and / or corticosteroids (prednisone 50 mg p / o 12, 7 and 1 h before the administration of the drug or diagnostic substance can cause anaphylaxis)	Pharmacological prophylaxis: long-term use of an antihistamine in patients with frequent episodes of idiopathic anaphylaxis or urgent use of corticosteroids (p / o or i / v) and an antihistamine drug before expected contact with a provoking factor (for example, before a radiological study using a contrast medium). Not effective in post-exercise anaphylaxis.

Emergency care for hyperthermic syndrome.

High temperature and fever in pediatric patients is usually a manifestation of the disease and in the initial period is often the only clinical symptom. According to some authors, in children of preschool age (3-6 years), episodes of illness with an increase in body temperature occur from 3 to 6 times a year.

Usually, fever is defined as an internal (rectal) temperature ≥ 38.0 °C (axillary temperature is 0.5-0.8 °C lower than the rectal one). Normal body temperature can be different in different people, and at different times of the day: when measured in the axillary region, it is 36-37 °C (36.6 ± 0.4 °C). In newborns, possible fluctuations in body temperature during the day up to ± 0.3 °C, at the age of 2-3 months - up to ± 0.6 °C, 3-5 years - 0.8-1 °C. The lowest body temperature is at 3-6

o'clock in the morning, the highest is between 17 and 19 o'clock. In healthy children aged 18-24 months the temperature can reach 38.3 °C.
The significance of fever depends on the clinical context, not the peak temperature; some minor illnesses cause a high fever, while with serious pathologies, only a slight increase occurs. A temperature ≥ 39 ° C in children < 2 years of age indicates a high risk of latent bacteremia (although many cases of high fever are the result of self-resolving viral infections). Although parental judgment is often distorted by anxiety before fever, the history of body temperature measurements must be taken into account, as well as the temperature measured in the hospital.

Pathophysiology. Fever occurs in response to the release of cytokines, which stimulate the production of prostaglandins by the hypothalamus, increasing the physical body temperature. Fever plays an important role in fighting infections, and while it can be uncomfortable, it does not require treatment in a child and has no other medical conditions. Some studies even show that lowering fever can prolong certain illnesses. However, fever increases the metabolic rate and stress on the cardiopulmonary system.

Some common causes of fever in children		
Type	**Examples**	
Acute		
Viral infections	**under 1 month:** TORCH infections - toxoplasmosis, syphilis, chickenpox, Coxsackie virus, HIV, parvovirus B19, rubella, cytomegalovirus (CMV), herpes simplex virus (HSV)	
	≥ 1 month: Enterovirus, respiratory syncytial virus, parainfluenza virus, adenovirus, influenza virus, rhinovirus, metapneumovirus, CMV, Epstein-Barr virus (EBV), HSV, herpes simplex virus type 6	
Bacterial infections	**≥ 1 month:**	
	group B streptococci	bacteremia, pneumonia, pyelonephritis, meningitis, and / or sepsis
	Escherichia coli other intestinal pathogens	
	Listeria monocytogenes	
	Salmonella *Staphylococcus aureus*	outbreaks in children's groups, bacteremia and sepsis, infections of soft tissues, bones and joints
	1-3 months	
	Streptococcus pneumoniae group B streptococci *Neisseria meningitidis* *L. monocytogenes*	bacteremia, pneumonia, meningitis and / or and sepsis
	S. pneumoniae *Haemophilus influenzae* *Moraxella catarrhalis*	bacteremia, pneumonia, meningitis and / or and sepsis, otitis media
	E. coli other intestinal pathogens	UTI
	type of *Salmonella*, *Shigella* and other	enteritis
	S. aureus group A and B streptococci	infections of the skin and soft tissues
	S. aureus *type Salmonella*	infections of bones and joints
	3-24 months	
	S. pneumoniae *N. meningitidis*	bacteremia, pneumonia, meningitis and / or and sepsis
	S. pneumoniae	otitis media and pneumonia

	Haemophilus influenzae *Moraxella catarrhalis*	
	E. coli other intestinal pathogens	UTI
	Salmonella, Shigella and others	enteritis
	S. aureus group A streptococci	infections of the skin and soft tissues
	S. aureus *Salmonella* *Kingella kingae*	infections of bones and joints
	> 24 months	
	S. pneumoniae *N. meningitidis*	bacteremia, pneumonia, meningitis and / or and sepsis
	S. pneumonia *H. influenza* *M. catarrhalis* mycoplasma	otitis media, sinusitis and pneumonia
	group A streptococci	pharyngitis or scarlet fever
	E. coli and other intestinal pathogens	UTI
	type *Salmonella, Shigella* and others	enteritis
	S. aureus group A streptococci	infections of the skin and soft tissues
	S. aureus *Salmonella* *Kingella kingae*	infections of bones and joints
	Mycobacterium tuberculosis	in contact or in high-risk populations
	Rickettsial infection	in corresponding geographic locations
	Other vector-borne infections	e.g. Lyme disease
Non-infectious	• Kawasaki disease • Acute rheumatic fever • Heatstroke • Violations of thermoregulation (autonomic dysfunction, diabetes insipidus, anhidrosis) • Poisoning with toxins (anticholinergics) • Vaccines • Medications	

Fungal infections	type *Candida*	Newborns or immunocompromised individuals: UTI, meningitis, and / or sepsis
Acute recurrent		
Viral infections	Frequent or minor viral infections, one after the other, in young children	
Intermittent fever syndrome	• Cyclic neutropenia • Recurrent fever with aphthous stomatitis, pharyngitis, lymphodenitis (PFAPA) syndrome • Familial Mediterranean Fever (FMF) • Intermittent TNF Receptor Associated Syndrome (TRAPS) • Hyperimmunoglobulinemia D (HIDS)	
Chronic (fever of unknown origin)		
Infectious lesion (the list is not exhaustive)	• Viral infection (Epstein-Barr virus, Cytomegalovirus, hepatitis viruses, arboviruses) • Sinusitis • Pneumonia • Intestinal infection (salmonella) • Abscesses (intra-abdominal, hepatic, renal) • Infection of bones and joints (osteomyelitis, septic arthritis) • Endocarditis • HIV infection (rare) • Tuberculosis (rare) • Parasitic infections (eg, malaria — rare) • Cat scratch disease • Lyme disease (rare)	
Non-infectious	• Inflammatory bowel disease • Disorders of connective tissue (JIA, SLE, ARF) • Lymphoreticular malignant neoplasms: lymphoma, leukemia; neuroblastoma, sarcoma • Medications • Thermoregulatory disorders (autonomic dysfunction, diabetes insipidus, anhidrosis) • False fevers of unknown origin • Simulatory fever (delegated Munchausen syndrome)	

Clinical examination of a child with fever

Anamnesis		
It should be noted	**Important symptoms associated with serious illnesses**	**Symptoms that may indicate the cause of the fever**
• the degree and duration of the fever • method of measuring body temperature • the dose and frequency of taking antipyretics (if taken) •previous fevers or infections	• poor appetite • irritability • lethargy •changes in crying (duration, character) •headache • convulsions	•vomit • diarrhea (including blood or mucus) •cough • difficulty breathing • involvement of limbs or joints • a stiff neck or neck pain •earache • pain when urinating, copious or foul-smelling urine •skin rash

•known conditions predisposing to the development of infections • a family history of autoimmune disorders or other hereditary conditions (familial vascular dystonia, familial Mediterranean fever) •vaccination history to identify the risk of developing infections that can be prevented by vaccination.		• drug history should be reviewed for signs of drug fever **In newborns:** • prematurity • late rupture of membranes • maternal fever •positive prenatal tests (group B streptococcal infection, cytomegalovirus infection, sexually transmitted diseases)
Predisposing factors (for all children)	• recent exposure to an infection (including in the family and with caregivers) • long-term medical devices (catheters, ventriculoperitoneal shunts) • recent transactions • travel and environmental influences (eg endemic regions, ticks, mosquitoes, cats, farm animals or reptiles) • immunodeficiencies identified or suspected •congenital heart defect • sickle cell anemia	

Symptoms and suspected causes of fever:
• runny nose and congestion (viral infections of the upper respiratory tract),
• headache (sinusitis, Lyme disease, meningitis),
• ear pain or waking up at night with signs of discomfort (otitis media),
• cough or wheezing (pneumonia, bronchiolitis),
• abdominal pain (pneumonia, streptococcal pharyngitis, gastroenteritis, urinary tract infections, abdominal abscess),
• back pain (pyelonephritis),
• a history of swelling and redness of the joints (Lyme disease, osteomyelitis),
• the presence of repeated infections (immunodeficiency),
• symptoms indicating chronic diseases - poor weight gain or weight loss (tuberculosis, cancer),
• heart palpitations, sweating and heat intolerance (hyperthyroidism),
• recurrent or cyclical symptoms (rheumatoid, inflammatory or hereditary disease).

Objective examination
Determination of vital signs: deviations in temperature, respiratory rate, heart rate, blood pressure; any child with a cough, tachypnea, or shortness of breath requires pulse oximetry.
Vital signs are essential:
- with hypotension, one should beware of hypovolemia, sepsis or myocardial dysfunction
- in the absence of hypotension, tachycardia may be due to fever (↑ heart rate by 10 - 20 beats / min for each degree above normal) or hypovolemia.
- An increase in RR may be a response to fever, indicate a pulmonary source of the disease, or be respiratory compensation for metabolic acidosis.
The general appearance of the child and his reaction to the examination: drowsiness or impaired consciousness, irritability (it is not possible to calm down) pallor or cyanosis of the skin, or lymphadenopathy. An overly compliant or lethargic child with fever should be very anxious. A child with a fever who looks ill, especially after a decrease in temperature, requires in-depth

assessment and constant monitoring. However, children who feel more comfortable after antipyretic therapy do not always have benign disorders.

Fever less than 7 days	**Fever lasting more than 7 days**
Physical examination	
General state: - drowsiness or impaired consciousness - pallor or cyanosis of the skin - or lymphadenopathy	- drowsiness or impaired consciousness - pallor or cyanosis of the skin - or lymphadenopathy - jaundice or external signs of anemia (malaria, hepatitis, leptospirosis or sepsis); Some illnesses that cause lingering fever may have no local symptoms, such as sepsis, salmonella infections, miliary tuberculosis, HIV infection, or urinary tract infection
Head and neck: - bulging fontanelle - stiff neck discharge from the ear or a hyperemic immobile tympanic membrane on otoscopy, swelling or tenderness on palpation in the mastoid process	- bulging fontanelle - stiff neck - discharge from the ear or a hyperemic immobile tympanic membrane on otoscopy, swelling or tenderness on palpation in the mastoid process - sore throat and deposits on the pharyngeal mucosa (infection)
Breast: - rapid breathing (pneumonia, sepsis, malaria)	- rapid breathing or retraction of the compliant places of the chest (pneumonia)
Stomach: - enlarged spleen (malaria) enlarged liver	- tenderness of the abdomen on palpation (above the pubis or in the lumbar region with a urinary tract infection)
Extremities: - difficulty in movement in the joint or the entire limb (abscess, septic arthritis, osteomyelitis, rheumatic fever)	- a reddened, painful joint (septic arthritis or rheumatic fever) - pain in the spine and in the hip or other joints (septic arthritis)
Skin rash: - pustular rashes or signs of infection: redness, fever, swelling, soreness (staphylococcal infection) - hemorrhagic rash: purpura, petechiae (meningococcal infection, dengue fever) - maculopapular rash (measles, other viral infections)	- petechial rash (meningococcal infection or dengue fever) - maculopapular rash (viral infection or drug reaction)

Further objective examination

Zone	**Signs**	**Possible cause of an attack**
Skin	Non-fading rash (petechiae or purpura)	Various infections: enterovirus  Meningococcemia

		 Rocky Mountain spotted fever (RMSF)  DIC syndrome with sepsis 
	Vesicular lesions	Varicella zoster virus, herpes simplex virus
	Lacy maculopapular rash on the trunk and limbs with redness of the cheeks (slap effect)	Infectious erythema (parvovirus infection) 
	Focal erythema with edema, induration, soreness	Cellulite, skin abscess
	A short-lived erythematous measles-like rash on the trunk and proximal extremities	Juvenile idiopathic arthritis 
	Rounded erythematous rash, one or more lesions	Lyme disease 
	Erythematous, sandpaper-like rash	Scarlet fever (group A streptococcus infection)

		
	Erythroderma	Toxic shock syndrome, a toxic mediated disease 
Fontanelle	Bulging	Meningitis or encephalitis
Ears	Red, bulging tympanic membrane, loss of orientation and movement	Otitis media
Nose	Congestion, detachable	Upper respiratory tract infections Sinusitis
	Burning sensation in the nasal passages when inhaling	Lower respiratory tract infections
Pharynx	Redness Sometimes exudate or swelling Sometimes drooling	Pharyngitis (upper respiratory tract infection or streptococcal infection) Retropharyngeal abscess Peritonsillar abscess
Neck	Local lymphadenopathy with overlying redness, local fever; possibly torticollis	Lymphadenitis secondary to infection with Staphylococcus aureus or group A streptococcus
	Local lymphadenopathy with little or no redness, localized fever, or tenderness	Cat scratch disease (bartonellosis)
	Generalized cervical lymphadenopathy	Lymphoma Viral infection (especially Epstein-Barr virus)
	Pain or resistance to flexion (meningismus *)	Meningitis (* not always present in children <2 years of age with meningitis)
Lungs	Cough, rapid breathing, wheezing, diminished breathing sounds, wheezing	Lower respiratory tract infections (pneumonia, bronchitis, chronic foreign body aspiration)
Heart	New murmur, especially mitral or aortic regurgitation	Acute rheumatic fever Endocarditis
Examination of the abdomen	Soreness, bloating Lack of intestinal murmurs	Gastroenteritis Appendicitis Pancreatitis Abdominal abscess
	Weight	Tumor
	Hepatomegaly	Hepatitis
	Splenomegaly	In newborns, Epstein-Barr virus infection, TORCH infection (toxoplasmosis, syphilis,

		chickenpox, Coxsackie virus, HIV, parvovirus B19) Leukemia, lymphoma
Genitourinary system	Costal-vertebral tenderness (less significant in younger children)	Pyelonephritis
	Soreness of the testicles	Epididymitis, orchitis
Limbs	Edema, erythema, increased local temperature, joint tenderness, limited range of motion	Septic arthritis (very painful) Lyme arthritis Rheumatoid or inflammatory disease
	Focal bone tenderness	Osteomyelitis
	Swelling of hands or feet	Kawasaki disease

Alarming symptoms of fever:

• Age <1 month

• Lethargy, apathy, or inconsolability

• Respiratory failure

• Petechiae or purpura

Acute fever in most cases is of an infectious nature, mainly viral. History taking and examination is an adequate approach for diagnosis in children> 2 years of age who do not have other medical conditions or signs of intoxication. As a rule, it is a viral respiratory illness (recent contact with a sick person, runny nose, wheezing or cough), or a gastrointestinal illness (contact with a sick person, diarrhea and vomiting). Other results also suggest specific causes. However, in infants under 24 months of age the possibility of latent bacteremia, as well as the frequent absence of focal symptoms in newborns and young children with serious bacterial infections, require a different approach.
The assessment depends on the age group: newborns (≤ 28 days) - regardless of clinical symptoms, require immediate hospitalization and research to rule out dangerous infections; young infants (1-3 months), older infants and young children (3-24 months) - may require hospitalization depending on laboratory screening results and are likely to be followed up.
Acute relapsing and intermittent fever (fever of unknown origin) requires special attention, as it can be caused by a variety of reasons. Some symptoms suggest the presence of specific diseases: aphthous stomatitis, pharyngitis and lymphadenitis - PFAPA syndrome; intermittent headaches with a runny nose or nasal congestion — sinusitis; weight loss, high risk of contact with the source of infection and night sweats — tuberculosis; weight loss or difficulty gaining weight, heart palpitations and sweating - hyperthyroidism; weight loss, lack of appetite and night sweats are cancer.

In the Ukrainian professional literature, it is customary to conventionally distinguish two types of fever according to clinical manifestations, (according to the characteristics of heat transfer): "pink" and "pale". "Pink" fever is accompanied by adequate microcirculation and heat transfer from the body. In case of "pale" fever, there is a spasm of capillaries, a violation of microcirculation, and, as a result, a decrease in heat transfer from the body, metabolic disorders in internal organs, including the brain. Therefore, "pale" fever can lead to seizures and requires close attention from doctors.

Clinical manifestations of "pink" and "white" fever

Indicator	"Pink" fever	"Pale" fever

General state	Moderate or severe, due to underlying medical condition	Very severe, severe intoxication
Complaints	Feeling hot	Feeling cold, chills
Increased body temperature	Gradual	Swift
Mucous membranes	Pink	Pale, cyanotic
Skin	Pink, warm	Pale, cyanotic, cold
Nail beds	Pink	Cyanotic
Consciousness	Saved, rarely broken	Stunning, stupor, convulsive readiness
Pulse	Accelerated, tense	Filiform, severe tachycardia
Blood pressure	Within normal limits	Reduced to shock indicators
Breath	Accelerated	Superficial, often forced

Diagnostics

Laboratory diagnosis depends on the child's age, appearance, and whether the fever is acute or chronic.

Diagnostic tests	
Fever less than 7 days	**Fever lasting more than 7 days**
• level of blood oxygen saturation; • blood smear; • microscopic examination of urine and bacteriological culture of urine; • clinical blood test; • lumbar puncture, if there are signs suggestive of meningitis; • bacteriological blood culture.	• a blood smear or rapid test to detect malaria plasmodia; • a clinical blood test, including counting the number of platelets, as well as a blood smear to determine the morphology of cells; • urine analysis, including microscopy; • Mantoux test (Note: a child with miliary tuberculosis, severe malnutrition or HIV infection often has a negative result); • chest x-ray; • bacteriological blood culture; • HIV testing (if the fever persists for more than 30 days and there are other reasons to suspect HIV infection); • lumbar puncture (to exclude meningitis, if any).
Fever of unknown origin: • Complete blood count, carried out by the "manual" method • ESR and CRP • Blood cultures (patients with any manifestations of infective endocarditis should have three blood cultures within 24 hours.) • General analysis and urine culture • Chest X-ray • Serum electrolytes, AMK, creatinine, albumin, and liver enzymes • Serological testing for HIV • Mantoux test • The results of these studies, combined with the history and physical examination, can focus further diagnostic tests.	
Other studies for fever of unknown origin are randomized based on symptoms: • Stool examination • Bone marrow examination (in children with hepatosplenomegaly, lymphadenopathy or cytopenia of unknown etiology) • Serological testing for specific infections (children> 5 years of age with a family history of rheumatologic disease)	

• Testing for connective tissue diseases and immunodeficiencies • Imaging research methods (ultrasound, CT, and MRI, radiography)
In chronic fever, laboratory diagnosis and imaging should be directed towards identifying probable causes of fever, based on the patient's age, history and physical examination. **The indiscriminate conduct of laboratory tests is unlikely to be beneficial and can be harmful.** **The speed of the assessment is dictated by the condition of the child.**

Visualization research methods:
- GI tract: children with increased ESR or CRP, anorexia and weight loss, gastrointestinal complaints with or without anemia; the fever persists without any other explanation.
- CNS: Generally useless when examining children with fever of unknown origin. Lumbar puncture may be warranted in children with persistent headache, neurologic symptoms, or a ventriculoperitoneal shunt.
- Other imaging techniques, including bone scans or the labeled leukocyte assay, may be helpful in selected children when the fever persists with no other explanation if a source is suspected that could be detected with these tests.
- Slit lamp ophthalmic examination in some patients with fever of unknown origin: confirmation of uveitis (JIA) or leukemic infiltration.
- Biopsy (eg, from lymph nodes or liver) should be used when there is evidence of specific organ involvement.

Analysis changes	Possible cause of fever
Anemia	malaria, infective endocarditis, inflammatory bowel disease, SLE, TB.
Thrombocytosis	non-specific sign of the acute phase of inflammation
• Total white blood cell count and formula • atypical lymphocytes • immature leukocytes • eosinophilia	• neutrophils> 10,000 - high risk of serious bacterial infection • probable viral infection (EBV) • further testing for leukemia is needed • a sign of parasitic, fungal, neoplastic, allergic or immunodeficiency diseases
ESR and CRP	• nonspecific signs of the acute phase and general indicators of inflammation; • may be normal for non-inflammatory causes of fever of unknown origin
Positive blood culture, in particular for *S. aureus*	• suspicion of latent skeletal / visceral infection or endocarditis; • a basis for performing a bone scan and / or echocardiography
ANA +	systemic connective tissue diseases, in particular SLE
IgG, IgA и IgM	• low levels may indicate immunodeficiency • increased levels may indicate a chronic infection or autoimmune disease

In acute fever, the direction of testing for infectious causes depends on the age of the child. Children <36 months require careful examination to rule out serious bacterial infections (eg, meningitis, sepsis). In this age group, early follow-up (by phone and / or during an outpatient visit) is essential for everyone receiving treatment at home.

Tactics of examination and management of sick children <36 months with fever

Age category	Diagnostic methods	Determination of tactics of conduct
Children <1 month	KLA, counting leukocytes with differentiation under a microscope OAM Sowing blood Culture of urine (obtained by catheterization, not in an open reservoir) Laboratory evaluation of cerebrospinal fluid with culture Appropriate PCR testing Determination of leukocytes in stool and stool culture (if diarrhea is present) Chest x-ray (if there is respiratory manifestation)	• Hospitalization is compulsory • Providing empiric antibiotic therapy with drugs that are active against the most common pathogens of neonatal infections (eg ampicillin and gentamicin or ampicillin and cefotaxime) • Antibiotic therapy is continued until blood, urine, and CSF cultures are negative for 48–72 hours. • It is also necessary to prescribe acyclovir if there are vesicles on the skin and mucous membranes, a history of genital herpes (HSV) or seizures; taking acyclovir is discontinued if a negative PCR result is obtained - analysis of cerebrospinal fluid for HSV.
Children aged 1 to 3 months	KLA, counting leukocytes with differentiation under a microscope general urine test Sowing blood Culture of urine (obtained by catheterization, not in an open reservoir) Laboratory evaluation of cerebrospinal fluid with culture Appropriate PCR testing Determination of leukocytes in stool and stool culture (if diarrhea is present) Chest x-ray (if there is respiratory manifestation)	• Hospitalization is required for children at risk of serious bacterial infection, regardless of initial laboratory findings: - painful appearance - abnormal crying - rectal temperature ≥ 38.5 ° C Prescribing empirical antibiotic therapy pending culture results for blood, urine, and cerebrospinal fluid samples: - age group 29-60 days - ampicillin and cefotaxime - age group 61–90 days - ampicillin and ceftriaxone • If cerebrospinal fluid pleocytosis, changes in urinalysis or chest X-ray, or peripheral blood leukocyte count ≤ 5000 / μl or ≥ 15000 / μl are present, hospitalization for empiric antibiotic therapy is appropriate for age. CSF analysis should be performed prior to empiric antibiotic therapy (if not already done). • With an increase in rectal temperature <38.5 °C, white blood cell count and urinalysis within normal limits (as well as normal CSF and chest x-ray, if done) there is no high risk of serious bacterial infection - outpatient management, if follow-up is established during 24 hours by phone / follow-up visits until culture results are received. • If 24-hour follow-up is problematic, infants should be hospitalized for follow-up. • If the child is discharged home, for any worsening of clinical condition, worsening of fever, positive blood culture or positive urine culture with continued fever, immediate

		hospitalization is necessary with repeated cultures and empiric antibiotic therapy appropriate for age.
Febrile children aged 3-36 months	It is carried out on the basis of anamnesis and examination data. In this age group, the child's response to serious illness is sufficiently developed to be clinically detectable in such a way that empirical diagnostics (eg, white blood cell count screening, urine and blood cultures) are not indicated. KLA, counting leukocytes with differentiation under a microscope general urine test Sowing blood Culture of urine (obtained by catheterization, not in an open reservoir) Laboratory evaluation of cerebrospinal fluid with culture Chest x-ray (if there is respiratory manifestation, tachypnea, or white blood cell count> 20,000 / mcL)	• **The probable cause of the fever is** detected during the examination, there are no alarming symptoms, no symptoms of intoxication - the appointment of therapy is based on the clinical diagnosis. • **Children with alarming symptoms should be screened for a serious bacterial infection.** Hospitalization pending examination results, prescribing parenteral antibiotic therapy (usually using ceftriaxone) active against pathogens characteristic of their age group (S. pneumoniae, Staphylococcus aureus, Neisseria meningitidis, H. influenzae type B). • Temperature is > 39 °C, no cause of fever found on examination, not fully vaccinated - leukocyte CBC, blood culture, culture and urinalysis should be performed. If the white blood cell count is ≥ 20,000 / mcL, a chest x-ray should be performed. Children with a white blood cell count ≥ 15,000 / mcL should receive parenteral antibiotics pending blood and urine culture results. Ceftriaxone (50 mg / kg intramuscularly) is the drug of choice due to its long-lasting action and broad spectrum of antimicrobial activity. Children who have received parenteral antibiotics should be monitored for 24 hours until preliminary culture results are available. Observation can be carried out by telephone / in the form of repeated visits. If, based on the social situation, 24-hour follow-up is problematic, children should be hospitalized. If fever persists (≥ 38 °C), children who are not treated with antibiotics should be reevaluated 48 hours later (or sooner if they get worse or develop new symptoms or signs). • Temperature is > 39 °C, no cause of fever found on examination, no alarming symptoms, fully immunized - most laboratory tests and empiric antibiotic therapy are not indicated. - UTI can be a hidden source of infection in fully immunized children in this age group. Girls < 24 months, circumcised boys < 6 months, and uncircumcised boys < 12 months analysis and culture of urine (obtained from catheterization) and appropriate treatment should be performed, if UTI is confirmed.

		- For other fully vaccinated children, urinalysis is performed only when they have symptoms or signs of a UTI, a history of UTI, or urogenital abnormalities, and when the fever lasts > 48 hours. If the fever persists (≥ 38 ° C), children should get re-evaluated 48 hours later (or sooner if they get worse or new symptoms or signs develop).

To assess the condition of children under 2 years of age with fever, the Yale Observation Scale (YOS), developed in the United States, is used. According to it, six symptoms are assessed, which make it possible to objectively characterize the child's condition and diagnose diseases that threaten the child's life. According to the points received, tactics are built regarding the further treatment of the child (outpatient or inpatient). But in a large, modern, well-founded multicenter study (The Yale Observation Scale Score and the Risk of Serious Bacterial Infections in Febrile Infants / Lise E. Nigrovic et al. // Pediatrics Jul 2017, 140 (1) e20170695; DOI: 10.1542 / peds. 2017-0695) the authors compare the YOS score and the estimated risk based on physician's suspicion in predicting serious bacterial infections (sepsis, bacterial meningitis) in infants <60 days of age). The study found that neither YOS score nor unstructured clinical suspicion can reliably distinguish infants with fever and severe bacterial infection from infants without them.

Yale observation scale, 1982

Symptoms	Norm (1 point)	Moderate disorder (3 points)	Significant disorder (5 points)
Crying character	Loud or missing	Sobbing or whimpering	Moan, high-pitched, prolonged cry that does not change when trying to calm the child
Reaction to the presence of parents	Little or no crying, baby looks satisfied	Crying stops and starts again	Crying for a long time, despite trying to calm the baby
Behavior	Does not sleep, if asleep, then wakes up quickly	Closes eyes quickly when awake or wakes up after prolonged stimulation	Hard to wake up, sleep disorder
Skin clour	Pink	Pale limbs or acrocyanosis	Pale, cyanotic, mottled, or ashy
State of hydration	Skin and mucous membranes are moist	Skin and mucous membranes are moist but the mucous membrane of the mouth is dry	The skin is dry and flabby, the mucous membranes are dry, the eyes are sunken
Communication	Smiling or alert	Quickly fading smile or alertness response	There is no smile, indifference, lethargy, lack of feedback to others

In acute recurrent or recurrent fever, laboratory diagnosis and imaging should be aimed at identifying probable causes based on the history and examination.

PFAPA syndrome is a relatively common recurrent fever in children; genetic causes are not determined; usually begins in early childhood (2–5 years) and is more common in men; febrile episodes last 3–6 days and recur approximately every 28 days. The syndrome causes fatigue, chills and sometimes abdominal pain and headache, as well as fever, pharyngitis, aphthous ulcers, and lymphadenopathy; patients feel healthy between episodes, growth is normal. Criteria for diagnosis are 6 months of stereotyped episodes, negative throat cultures during episodes, and exclusion of other causes (eg, specific viral infections).
Hyperimmunoglobulinemia Syndrome D (HIDS). In patients with fever, arthralgia, skin lesions, mouth ulcers, diarrhea, IgD levels should be measured. Laboratory signs of HIDS include elevated C-reactive protein (CRP) and ESR, and significant elevations in IgD (and often IgA).
Genetic testing is available to diagnose inherited periodic fever syndromes, including familial Mediterranean fever (FMF), periodic TNF receptor associated syndrome (TRAPS), and HIDS.
Empiric therapy with anti-inflammatory drugs or antibiotics should not be used for diagnostic purposes, unless JIA is suspected (NSAID test is the recommended first-line treatment). The response to anti-inflammatory drugs or antibiotics does not help distinguish infectious from non-infectious etiology. Antibiotics can cause false negative culture results and mask manifestations or delay the diagnosis of important infections (eg, meningeal and parameningeal infections, endocarditis, osteomyelitis).

The practitioner who cares for a child with a fever faces the following challenges:
1. Assess the general condition of the child.
2. Establish a preliminary diagnosis.
3. Decide on the possibility of treatment at home or the need for hospitalization.
4. Provide parents with clear instructions on the principles of supervision and child care.

According to the recommendations of the World Health Organization and the National Program for the Correction of Fever in Young Children with ARVI, antipyretics should be prescribed:

• children > 3 months with a body temperature> 39.0 °C and / or discomfort, muscle aches, headache;

• children with a history of febrile seizures at body temperature > 38.0-38.5 °C;

• children suffering from severe diseases of the heart, lungs, central nervous system at a body temperature > 38.5 °C;

• children <3 months at a body temperature > 38.0 °C.

Treatment is focused on eliminating the underlying disease.
Fever in a child with no other medical conditions does not necessarily require treatment. Fever is an integral part of the inflammatory response to infection and can help a child fight it. An antipyretic can provide comfort but does not alter the course of the infection. Antipyretics are most commonly used to relieve discomfort and stress in children with a history of cardiopulmonary, neurological, or febrile seizures.
Antipyretic drugs commonly used:
• **Acetaminophen.** The dose is 10-15 mg / kg orally or rectally, intravenously up to 10 kg - 7.5 mg / kg, ≥ 10 kg - 15 mg / kg every 4-6 hours.
Epidemiological studies have shown an association between acetaminophen use and the prevalence of asthma in children and adults; therefore, some doctors believe that children with asthma or a family history of asthma should avoid using acetaminophen.
• **Ibuprofen**. The dose is 10 mg / kg orally every 6 hours. It should be remembered that the drug reduces the protective effect of prostaglandins in the stomach and, if used
for a long time, can lead to the development of gastritis.

It is preferable to use only one antipyretic at a time. Some doctors alternate 2 drugs to treat a fever (eg, acetaminophen at 6 am, 12 pm, and 6 pm and ibuprofen at 9 am, 3 pm, and 9 pm); this approach is not recommended because caregivers can become confused and inadvertently exceed the recommended daily dose.

The use of aspirin in children under 14 should be avoided as it increases the risk of Reye's syndrome in the presence of certain viral diseases such as influenza and chickenpox.

In practical work, one should take into account the typical mistakes that parents make when prescribing antipyretics to children, despite the fact that the child's body temperature is subfebrile or not at all elevated. This intake of antipyretics creates an unnecessary burden of drugs on the child's body. In some cases, a false impression of a picture of clinical well-being may form, which leads to an untimely diagnosis of severe bacterial infections.
Non-drug approaches to fever include placing the baby in a warm or cool bath, applying cool compresses, and undressing the baby. Maintenance personnel should be warned not to use the cold water bath, which is uncomfortable and which, by causing shivering, can paradoxically raise the body temperature. As long as the water temperature is slightly colder than the baby's temperature, the bath provides temporary relief.

Rubbing your body with isopropyl alcohol should be avoided because alcohol can be absorbed through the skin and cause toxicity. There are many folk remedies available, ranging from harmless (such as putting onions or potatoes in socks) to uncomfortable (such as scratching the skin with a coin and placing cans).

Therapeutic tactics for the withdrawal of children from the "pink" fever:
1. Freeing the body from excess clothing, opening. Providing fresh air access, ventilation of the room.
2. Reception of a sufficient amount of liquid (warm tea, fruit drink, decoctions). The required amount of fluid for a child with fever is determined by the formula: volume = physiological requirement + 10 ml / kg for each degree of increase in body temperature.
3. Application of methods of physical body cooling (blowing, rubbing with cool water (with a body temperature of 24-28 ° C), cooling the head, cold on the main vessels (cervical and axillary) enemas with water at a temperature of 10-20 ° C.
4. The use of antipyretics (paracetamol in a single dose of 10-15 mg / kg or ibuprofen in a single dose of 5-10 mg / kg (for children ≥3 months and weighing> 5 kg).
If, after taking antipyretics per os for 30-40 minutes, the body temperature does not decrease, then intramuscularly (or intravenously) is administered:
• 50% metamizole sodium solution (children <1 year old - at a dose of 0.01 ml / kg,> 1 year old - 0.1 ml / year);
• 2.5% pipolfen solution (children <1 year old - at a dose of 0.01 ml / kg,> 1 year old - 0.1-0.15 ml / year).

Therapeutic tactics for "pale" fever in children:

1. Antipyretics are prescribed already at a body temperature> 38 ° C, in children at risk - 37.5 ° C

2. Prescribe vasodilators:

• papaverine, drotaverine per os at a dose of 1 mg / kg

• 2% papaverine solution (children <1 year old - 0.02 ml / kg,> 1 year old - 0.1-0.2 ml / year) or drotaverine solution at a dose of 0.1 ml / year or 1% bendazole solution in a dose of 0.1 ml / year intramuscularly or intravenously;

• 0.25% droperidol solution at a dose of 0.1-0.2 ml / kg intramuscularly or intravenously.

3. In severe clinical condition and stable blood pressure - antipsychotics and vasodilators - chlorpromazine, promethazine.

4. It is necessary to control body temperature every 20-30 minutes until it drops to 37.5 ° C.

Intensive stage of treatment for hyperthermic syndrome:

Suppression of heat production and enhancement of heat transfer, replenishment of the BCC, energy supply, normalization of microcirculation, adequate oxygen therapy, prevention of cerebral edema.

1. Neuroplegic and antipyretic therapy: analgin (50%) - 10 mg / kg; pipolfen (2.5%) - 0.25 / kg, IV, slowly every 6-8 hours until the effect is achieved. Physical methods of cooling: cold to the head and on large vessels, rubbing the limbs with an alcohol solution (30%).

2. Decrease in general peripheral resistance, increase in myocardial contractility. Euphyllin (2.4%) - 4-6 mg / kg IV drip (pentamine replacement drug), in case of ineffectiveness - dopamine - 6-9 mg / kg. (kg x min).

3. Normalization of oxidative phosphorylation. Nicotinic acid or nicotinamide in an age dosage of 1-6 months - 5 mg, 7-12 months - 8 mg, 1-2 years - 10 mg, 3-4 years - 25 mg, 7-9 years - 30 mg.

4. Infusion therapy aimed at replenishing the circulating blood volume, replacing pathological fluid flow, energy supply of the brain with glucose, treatment of transmineralization: Glucose (10%) - a single volume of 10-15 ml / kg intravenously, drip, calcium chloride (10%) 0, 25-15 ml / kg / day, potassium chloride (7.5%) 2-3 mg / min / day and 1 IU of insulin per 5 g of glucose dry matter.

5. Normalization of rheological properties of blood and microcirculation: Trental - 10 mg / kg body weight IV.

Providing emergency care for convulsive syndrome. Convulsive syndrome is a pathological condition that is manifested by sudden, frequent, involuntary muscle contractions, often accompanied by disorders of consciousness.

Diagnostic criteria		
Anamnestic: - the presence of anatomical and physiological factors	*Clinical:* **- Convulsive readiness** **- Localized seizures**	*Paraclinical:* - complete blood count - signs of inflammation;

that determine a predisposition to generalized reactions of the child's brain (high tone of the pallidary system, increased activity of the hippocampus, hydrolability of nervous tissue) - hypoxia (the degree and duration matter) circulatory disorders, hydroionic metabolism disorders, - changes in glucose metabolism - ARVI, neuroinfection, epilepsy	- **Generalized convulsions** (convulsive seizure): sudden onset, change in consciousness, motor excitement with local or general convulsive jerks: A) tonic phase: lost contact with others, wandering gaze with subsequent fixation of the eyeballs up and to the side, the head is thrown back, the upper limbs are bent in the hands and elbows, the lower limbs are extended, trismus, the pulse is slow, breathing stops, after which it can be noisy, wheezing. B) clonic phase: first, shuddering of the muscles of the face, then with the transition to limbs with rapid generalization, pale skin, tachycardia. - Convulsive status - these are seizures that are repeated one after another, in the interval between which consciousness is NOT renewed. - Tetania	- biochemical blood test - hypocalcemia, hypoglycemia, hypomagnesemia, hyperphosphatemia, increased alkaline phosphatase activity, metabolic acidosis or alkalosis - electroencephalography - changes in the bioelectrical activity of the brain, the presence of epileptogenic zones - X-ray of the skull - "digital impressions" with intracranial hypertension, fractures and (or) cracks in the bones of the skull with traumatic head injuries brain - EchoEG - the presence of signs of edema of the brain, bones, tumors - lumbar puncture - cytosis, increased intracranial pressure - study of the fundus - congestion of the optic nerve.

Febrile seizures:

- diagnosed in 2–5% of children under 6 years of age, the majority at the age of 6–36 months
- body temperature> 38 ° C
- without prior afebrile seizures
- no other causes have been identified and there are no developmental and neurological disorders
- occurs during a bacterial or viral infection, sometimes occurs after certain vaccinations (MMR)
- genetic and familial factors can increase the predisposition to febrile seizures.

Simple febrile seizures (> 90%): <15 min and no focal symptoms.
Complex febrile seizures: > 15 minutes continuously or intermittently, accompanied by focal symptoms or recurring within 24 hours.

Clinical manifestations

- Occur during an initial rapid rise in temperature and develop within 24 hours of the onset of fever.
- As a rule, convulsions are generalized; most of them are tonic-clonic, rarely atonic or tonic.
- The postictal period usually lasts several minutes, but sometimes several hours. The period lasts longer than an hour or children develop focal symptoms (for example, unilateral movement disorders), it is important to immediately exclude concomitant acute disorders of the central nervous system.

Febrile status epilepticus is continuous or recurring seizures that last ≥ 20 minutes (previously ≥ 30 minutes) with no neurological recovery in between.

Neurological complications
Simple febrile seizures alone cannot cause neurological damage. However, in some children with an undiagnosed neurological disorder, febrile seizures may be the first manifestation of the disease. Prolonged febrile status epilepticus may be associated with damage to the most vulnerable areas of the brain, such as the hippocampus.

The overall recurrence rate of febrile seizures is about 35%. The risk of relapse is higher if the primary seizure occurs in children <1 year of age or if the children have a first-degree relative who has had a febrile seizure. The risk of developing afebrile seizures after ≥ 1 episode of simple febrile seizures is about 2–5% — slightly higher than the normal risk of developing epilepsy (about 2%). The greatest risk occurs in children who have additional risk factors - up to 10%.

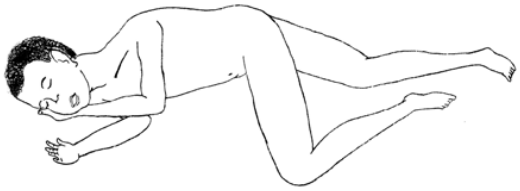
Diagnostics
Ruling out other causes of seizures is done clinically or sometimes by research.
Seizures are considered febrile after all other causes have been ruled out. Fever can provoke seizures in children with prior afebrile seizures; these seizures are not called febrile seizures.
If there are severe seizures, neurological impairment, or signs of a serious underlying medical condition (eg, meningitis, metabolic disorders), testing should be done.

Tests to rule out other diseases	
Examination	**Indications**
CSF analysis to rule out meningitis and encephalitis	• age < 6 months. • meningeal signs or signs of CNS depression • convulsions occurred after several days of febrile illness • incomplete immunization or taking antibiotics
Serum glucose, sodium, calcium, magnesium and phosphorus levels, liver and kidney tests to rule out metabolic disorders	• a history of recent vomiting, diarrhea, or poor fluid intake • there are signs of dehydration or swelling • complex febrile seizures
MRI of the head	• focal disorders • focal symptoms were observed during seizures or in the postical period
EEG (does not help predict recurrent seizures; this test may be omitted after primary simple febrile seizures in children with normal neurological status)	• focal symptoms • recurrent seizures

Treatment of convulsive syndrome. General Provisions.
1. Administration of anticonvulsants: diazepam rectally (0.1 ml / kg), intravenously, intramuscularly (0.25-0.5 mg / kg). If the seizures persist after 10 minutes, give a second dose of diazepam. Do not administer more than two doses of diazepam.
2. If the seizures continue after 10 minutes, the child may be having an epileptic seizure. Enter:
- phenobarbital intramuscularly or intravenously at a dose of 15 mg / kg for 15 minutes, or
- phenytoin intravenously at a dose of 15-18 mg / kg for 1:00 (into another intravenous system that was used to administer diazepam). Phenytoin must be injected very carefully because it is corrosive and can cause tissue damage if not injected directly into a vein.

3. For seizures in neonates < 2 weeks of age, use phenobarbital (200 mg / ml solution) at 20 mg / kg:
- body weight 2 kg - initial dose - 0.2 ml, if convulsions continue, inject another 0.1 ml after 30 minutes
- body weight 3 kg - initial dose - 0.3 ml, if convulsions continue, enter another 0.15 ml after 30 minutes.
4. If there is no suspicion of neck injury, roll the baby onto its side to reduce the risk of aspiration. The neck should be slightly extended; fix this position by placing one hand of the child under his cheek. Bend one of the baby's legs to stabilize the torso.
5. Do not give your child any oral medications until the seizures are completely relieved. (aspiration hazard).
6. Assess the child's condition using the ABCDE system. Maintain an airway, provide a constant supply of oxygen from oxygen cylinders or an oxygen concentrator.

Treatment for febrile seizures:



• Antipyretic therapy
• Symptomatic therapy if seizures last <15 minutes
• Anticonvulsants and sometimes intubation if seizures last ≥ 15 minutes
• All children require antipyretic therapy; lowering the temperature can help prevent a recurrence of febrile seizures during the period of the underlying illness or facilitate the relief of febrile status epilepticus.

Medication for febrile seizures lasting ≥ 15 minutes:

• short-acting benzodiazepines IV: lorazepam 0.05–0.1 mg / kg intravenously for 2–5 minutes, repeated every 5–10 minutes for up to 3 injections

• phosphenytoin, 15–20 mg PE (phenytoin equivalents) per 1 kg intravenously for 15–30 minutes if convulsions persist

• children under 5 years of age - diazepam in the form of a rectal gel (if such a dosage form is available) 0.5 mg / kg once, repeated every 4-12 hours, if intravenous lorazepam cannot be used

• midazolam intranasally

• phenobarbital, valproate, or levetiracetam can also be used to treat long-term or frequently recurring seizures

Differential therapy depending on the type of seizure	
Type of seizures	**Urgent action**
Febrile convulsions	Antipyretics, dehydration and detoxification therapy, diazepam, phenobarbital (after a second attack).
Affective-respiratory convulsions	Reflex breathing restoration, strengthening of the nervous system, sedatives. The appointment of phenobarbital is with frequent and severe attacks.
Hypocalcemic convulsions	10% solution of calcium gluconate i / v - 1.0 mg / kg, slowly in a twofold dilution of glucose solution, physiological solution - 50 100 ml slowly, at once, ammonium chloride 0.5% solution, inside

	- citrate mixture, vitamin D, c therapeutic dose of 5% solution of magnesium sulfate, 0.5 - 0.4 mg / kg orally.
Hypoglycemic convulsions	Intravenous jet 10% glucose solution 5 ml / kg body weight, every 30 minutes under the control of blood glucose.
Hypomagnesemic convulsions	25% solution of magnesium sulfate 0.2 ml / kg intravenously, slowly, orally is at a dose of 3-10 mmol / kg per day.
Pyridoxine-dependent seizures	Pyridoxine is 50-100 mg / kg per day parenterally, then by mouth 100 mg per day NOT less than 3 to 8 weeks, under control.
Convulsive seizure with epilepsy	Seduxen is 0.3-0.5 mg / kg intravenously, slowly, magnesium sulfate IM, specific treatment for epilepsy.

Intensive care for convulsive syndrome

Intensive stage	*Recovery stage*
1. Anticonvulsant therapy: Seduxen - a single dose for internal administration - 0.25 0.5 mg / kg, and in severe cases, it is administered finely up to 0.7 mg / kg of body weight. The duration of the action is from 6 to 8 hours. Sodium oxybutyrate -80-100 mg / kg, in severe cases - 120 - 140 mg / kg. If ineffective - hexenal and / or muscle relaxants and artificial ventilation of the lungs. **2. Maintaining adequate breathing.** **3. Support for cardiac and systemic.** hemodynamics. **4. Infusion therapy:** replenishment of the BCC, correction of hydroionic exchange and reactions of the internal environment, energy supply. **5. Normalization of microcirculation and rheological properties of blood.** **6. Decrease in intracranial pressure.**	Treatment of the underlying disease; Substances that suppress seizure activity: phenobarbital - 3 mg / kg for the first 2 weeks, 3 times a day, the next 2 months - 2 times a day, another month - once at night.

Prevention of febrile seizures

Parents of a child who has had a febrile seizure should be advised to carefully monitor the child's temperature during illness and to give antipyretics at a high temperature in a timely manner (even if controlled studies have not proven that such treatment can prevent the recurrence of febrile seizures). Supportive anticonvulsant drug therapy to prevent recurrence of febrile seizures or the development of afebrile seizures is usually not indicated unless multiple or prolonged episodes have developed.

6. Materials of methodological support of the lesson

6.1. Tests

1. After an injection of insulin, a 12-year-old girl's condition was changed, her skin is pale, covered with cold, sticky sweat, and suddenly convulsions began. Provide emergency care:

A. + glucose solution 20% - 20 ml intravenous jet
B. isotonic sodium chloride solution 100 ml intravenously
C. insulin 15-20 IU subcutaneously
D. intravenous drip 4% sodium bicarbonate solution 100 ml
E. prednisolone intravenously

2. Choose a drug that is included in the emergency care for seizures against a background of spasmophilia:
A. + calcium gluconate
B. Videhol
C. analgin
D. ergocalciferol
E. aminophylline
3. Child, 2 years old, was bitten by an insect on the right palm. Redness appeared at the site of the bite, tissue edema spread. The body temperature is risen to 38 °C.
This situation is diagnosed in the case of:
A. * Quincke's edema
B. urticaria
C. anaphylactic shock
D. hay fever
E. milk scab

4. Parents with a 5-year-old child turned to the FOS paramedic, complaining of a headache, severe general weakness. Objectively: mucous nasal discharge, hyperemia of the conjunctiva and skin, temperature 39 °C. To reduce body temperature from physical methods, it is necessary to apply:
A. * Cool enema
B. Warm heating pad
C. Hot drink
D. Alkaline inhalation
E. Oxygen therapy

5. The FOS paramedic, with the permission of the doctor, administered the DTP vaccine intramuscularly after injections, the child's condition suddenly worsened, the skin is pale, the pulse is weak, the blood pressure is lowered. The child has lost consciousness. What kind of emergency does this symptomatology correspond to?
A. * anaphylactic shock
B. laryngospasm
C. Collapse
D. Fainting
E. cardiac asthma

6. A 2-year-old child with hyperthermic syndrome has pallor of the skin, chills, limbs cold to the touch. What should be used to improve vascular microcirculation?
A. * Papaverine 2% intramuscularly
B. Vinegar wraps
C. Analgin 50% intramuscularly
D. Cold on the projection of large vessels
E. Paracetamol, oral

7. The FOS paramedic gave a 3-year-old child an injection of cefazolin intramuscularly. The child's condition deteriorated sharply, a feeling of heat appeared, an allergic rash spread on the skin of the trunk, blood pressure dropped, the child lost consciousness. Determine the diagnosis.
A. * Anaphylactic shock
B. Polymorphic erythema
C. urticaria
D. Angioedema
E. Atopic dermatitis

8. Calling a FOS paramedic to a 1-year-old child with parainfluenza. At night, the child's condition worsened: there was shortness of breath, noisy breathing with the participation of auxiliary muscles in the act of breathing, a “barking” cough, and a hoarse voice. How is parainfluenza more complicated?
A. * stenosing laryngotracheitis
B. laryngospasm
C. focal pneumonia
D. Heart failure
E. attack of bronchial asthma

9. A five-year-old boy, 10 minutes after a bee sting, anxiety, flushing and itching of the facial skin, nausea, wheezing, rhinorrhea, then loss of consciousness, pallor, sweating were developed. You diagnosed anaphylactic shock. Determine the drug to be administered to the child in case of anaphylactic shock.
A. * Prednisolone
B. Analgin
C. Euphyllin
D. Korglikon
E. Furosemide

10. The child developed convulsions against the background of meningococcal meningitis. What urgent care does the child need?
A. * Ensure airway patency and administer 0.5% seduxen solution
B. Place the baby on his stomach and inject 50% analgin solution
C. Provide distraction therapy
D. Perform tracheotomy
E. Introduce lytic formula to the child

6.2. The information necessary for the formation of knowledge - skills can be found in literary sources.
-basic:

1. Volosovets O.P, Snisar V.I. Recommendations for cardiopulmonary resuscitation in children. Methodical manual. Dnepropetrovsk: ART-PRESS, 2015. 48 p.

2. Zubarenko A.V, Aryaev N.L, Starets E.A etc. Pediatric skills in the practice of family doctor and pediatrician: textbook. - Odessa: Printing House Print South, 2014. - 232p.

3. Differential diagnosis of the most common diseases of childhood. Textbook / ed. V.M. Dudnyk, 1st edition. Vinnytsia: Nilan Ltd., 2017. 560 p.

4. Karen J. Markdante, Robert M. Kligman. Fundamentals of Pediatrics according to Nelson: translation of the 8th English. edition: in 2 volumes. Volume 1. Kyiv: VSV "Medicine", 2019. XIV, 378 p.

5. Karen J. Markdante, Robert M. Kligman. Fundamentals of Pediatrics according to Nelson: translation of the 8th English. edition: in 2 volumes. Volume 2. Kyiv: VSV "Medicine", 2019. XIV, 426 p.

6. Kryuchko TA, Abaturov AE, Kushnereva TV Pediatrics: textbook (University IV level. A); under ed. AND. Kryuchko, A.E. Abaturov. Kiev: VSI "Medicine", 2020. 224 p.

7. Emergencies in pediatric practice: A textbook for medical students of higher education institutions, interns. - 2nd type. Recommended by the Ministry of Education and Science, Recommended by the Academic Council of NMU. O.O. Bogomolets / Marushko Y.V, Chef G.G etc. Kyiv: VSV "Medicine", 2020. 440 p.

8. Pediatrics: a national textbook: in 2 volumes / Ed. prof. Berezhny V.V Kyiv, 2013. Vol.1. Kyiv, 2013. 1040 p.

9. Pediatrics: a national textbook: in 2 volumes / Ed. prof. Berezhny V.V Kyiv, 2013. Vol.2. Kyiv, 2013. 1024 p.

10. Pediatrics: a textbook for students. higher education institutions of the IV level of accreditation / ed. prof. O.V Tyazhka. View. 5th, ed. and add. Vinnytsia: Nova Kniga, 2018. 1152 p .: ill.

11. Maidannyk V.G, Yemchynska E.A. Clinical guidelines for the diagnosis and treatment of community-acquired pneumonia in children from the standpoint of evidence-based medicine. - K., 2014.- 43 p. http://pediatrics.kiev.ua/library/metod/5.pdf

12. Pediatrics in two volumes, edited by Aryaev M.L, Kotova N.V. T2, Diseases of young children. Pulmonology. Allergology. Cardiology. Gastroenterology. Nephrology. HIV infection. Primary health care textbook - Odessa .: ONMedU. - 2014. - P. 205-211, 212-218

13. Order of the Ministry of Health of Ukraine dated 20.03.2008 № 149 "On approval of the Clinical Protocol of medical care for a healthy child under 3 years of age".

-additional:

1. Order of 31.08.2004 № 437 On approval of clinical Protocols for the provision of medical care in emergencies in children at the hospital and pre-hospital stages
2. Order of 03.07.2006 № 432 On approval of protocols for providing medical care in the specialty "Allergology"
3. Order of the Ministry of Health of Ukraine dated 15.01.2014 № 34 "On approval and implementation of medical and technological documents for standardization of emergency medical care"
4. Georgians M.A, Korsunov V.A (2012). Fever and hyperpyrexia in children. Tactics of emergency care and modern treatment options. Emergency medicine, 5 (44)
5. Hesdorffer D.C, Shlomo S, Lax DN, et al: Risk factors for subsequent febrile seizures in the FEBSTAT study. Epilepsy 57 (7): 1042–1047, 2016. doi: 10.1111 / epi.13418.
6. Order of the Ministry of Health of Ukraine December 30, 2015 № 916 Unified clinical protocol of emergency, primary, secondary (specialized) and tertiary (highly specialized) medical care drug allergy, including anaphylaxis
7. Neonatal Resuscitation Textbook 6th Edition (English version) Edited by: American Academy of Pediatrics American Heart Association Book | Published in 2011 Page Count: 329. - http://ebooks.aappublications.org/content/nrp-neonatal-resuscitation-textbook-6th-edition-english-version
8. WHO Library: Pocket book of hospital care for children: guidelines for the management of common childhood illnesses - 2nd ed.World Health Organization. ISBN 978 92 4 454837 0 (NLM classification: WS 29)

6.3. Orientation card for independent work with literature

№	Basic tasks	Instructions	Answers
1	2	3	4

1.	Reading literature and the purpose of study	Get acquainted with modern ideas about etiopathogenesis, classification, clinical course and additional methods for diagnosing emergency conditions in children	Know the risk factors for the development of emergency conditions, the modern classification, the clinical picture of the manifestations of diseases, hematological, immunological, radiological and functional signs of diseases and conditions.
2.	Epidemiology	To know the prevalence among children.	Know: the prevalence of the most common diseases and pathological conditions in child populations.
3.	Etiopathogenesis	Know the causes and mechanism of anaphylactic shock, fever, seizures in children	Know that these conditions can be caused by the action of food, medical, allergens, pathogens of infectious diseases, malformations, acquired and traumatic injuries
4.	Clinic	Describe the clinical picture	Remember the leading clinical symptoms of emergencies in children
5.	Diagnosis	Know the schemes of diagnosis and emergency treatment of emergency conditions	Use diagnostic and emergency treatment schemes for emergency conditions in children

7. Materials for self-control over the quality of training.

A. Questions for self-control.

1. The main orders of the Ministry of Health of Ukraine, regulating the provision of emergency care to children.
2. Features of subjective and objective examination of children in an unconscious state
3. Diagnostic criteria and emergency care for anaphylactic shock
4. Diagnostic criteria and emergency care for hyperthermic syndrome
5. Diagnostic criteria and emergency care for seizures

B. Tests for self-control:

1. For a 7-year-old boy, an SMP was caused. There are complaints about a sharp deterioration in the child's condition. On examination, the child is agitated, forced sitting position, expiratory dyspnea, at the end of an attack of vitreous sputum discharge. Indicate the diagnosis.

A. * Bronchial asthma
B. Pneumonia
C. Stenosing laryngitis
D. Acute bronchitis
E. Whooping cough

2. A 9-year-old child with diabetes mellitus has no consciousness, general tremor, increased muscle tone, paleness to skin moisture. What should you suspect?

A. * Hypoglycemic coma
B. Hepatic coma
C. Renal coma
D. Hyperglycemic coma
E. Cerebral coma

3. With a sharp drop in body temperature, weakness, pallor of the skin are developed in the child, the limbs became cold, the skin became covered with cold clammy sweat. The child lost consciousness, blood pressure dropped sharply. Which drug should be administered first?
A. * 0.1% solution of epinephrine hydrochloride
B. 0.5% seduxen solution
C. Insulin
D. 40% glucose
E. 1% diphenhydramine solution

4. A 5-month-old baby has whooping cough. During a coughing attack, cyanosis of the skin, mucous membranes occurred, and breathing stopped. What kind of help does a child need?
A. * tease the root of the tongue, if mechanical ventilation is ineffective
B. Carry out alkaline inhalations
C. Distraction therapy
D. Tracheal intubation
E. Suck mucus from the upper respiratory tract

6. A 7-month-old child was diagnosed with ARVI, hyperthermic syndrome. The body temperature is 39.4 °C, the skin is pale, marbled, and the limbs are cold to the touch. Should the drug be administered to a child to reduce vasospasm?
A. * Papaverine hydrochloride
B. Seduxen
C. Suprastin
D. Magnesium sulfate
E. Calcium gluconate

7. The child is 3 months old. After the introduction of the Pentaxim vaccine, anaphylactic shock occurred. What drug should be administered immediately?
A. * 0.1% adrenaline solution
B. 1% lasix solution
C. 0.06% corglikon solution
D. 2% solution of aminophylline
E. 0.5% seduxen solution

8. A 12-year-old child has a mild bronchial asthma attack. What metered-dose aerosol inhalation should I use?
A. * Salbutamol
B. Ingalipt
C. Orasept
D. Cameton
E. Chlorophyllipt

9. A 1.5-year-old child who suffers from adenovirus infection has a body temperature of 39 °C. An attack of tonic-clonic seizures was begun. What drug should you start with in emergency care?
A. * sibazon
B. analgin
C. diphenhydramine
D. No-shpa
E. korglikon

10. An eight-month-old baby is bottle-fed. After the cry, there was a cessation of breathing, cyanosis, exophthalmos; the child became covered with sticky sweat, the attack ended with a deep

noisy breath. Objectively: the skin is pale, pronounced frontal tubercles, no teeth, beads on the ribs, O-shaped curvature of the limbs. What kind of emergency care needs to be provided to the child?

A. * Remove to fresh air; tease the root of the tongue.
B. Prednisolone 1 mg. For 1 kg. intramuscular mass
C. Vitamin D 2000 internally
D. Analgin 0.1 intramuscularly
E. Diphenhydramine 0.1 intramuscularly

B. Self-control tasks:

<table>
<tr><td colspan="2">Objective 1.
A 4-month-old child was given the second DPT vaccine in the treatment room of the children's polyclinic. Suddenly the child became restless, turned pale, shortness of breath appeared, rashes on the skin such as urticaria, lost consciousness.</td></tr>
<tr><td>Question:
1. Determine the patient's condition.
2. Make an algorithm for providing emergency care.</td><td>Answers:
1. Anaphylactic shock. Hives.
2. Algorithm of actions:
- Take a syringe with adrenaline and say loudly: "I am injecting an adrenaline solution in a dose of 0.3 ml intramuscularly into the anterolateral region of the thigh" and loudly name the time of drug administration.
- Call for help.
- Move the pillow under your feet / move the foot end of the bed to an elevated position.
- Put on an oxygen mask on the patient's face and say loudly: "100% oxygen flow 6-8 l / min."
- Take a saline solution in a soft bottle and say loudly: “I provide venous access, I start the infusion of 0.9% sodium chloride solution at a dose of 10 ml / kg. I squeeze the bottle for quick injection of the solution "
- Take a syringe with corticosteroids and say loudly: “I inject intravenously hydrocortisone 2 mg / kg (or methylprednisolone 1 mg / kg)
- Take a syringe and say loudly: "I am injecting diphenhydramine at a dose of 1 mg / kg (maximum 50 mg)"
- The team of the Emergency Medical Center for the hospitalization of the child in the intensive care unit is called.
- I assess ABCDE and stabilization of the child's condition before the arrival of the CEMP team.</td></tr>
<tr><td colspan="2">Task 2
A boy, 8 months old, was admitted to the hospital due to febrile fever up to 39.8 °C and severe agitation. From the anamnesis, it is known that the child became acutely ill 2 days ago, when catarrhal phenomena from the nasopharynx appeared, the body temperature was risen to 37.4-37.7 °C, lethargy appeared, the child began to refuse to eat and drink. On the third day from the onset of the disease, the body temperature increased to 39.8 °C.
On examination, there is a pallor of the skin, a sharp excitement of the child, the limbs are cold; reacts negatively to inspection. Mucous discharge from the nose, the pharynx is brightly hyperemic, loosened, plaque comments. BH is 48 per minute. Over the entire surface of the lungs percussion - the sound is pulmonary. Auscultatory - hard breathing, carried out on both sides, wheezing in the lungs is not heard. Heart sounds are rhythmic, moderately muffled, heart</td></tr>
</table>

<table>
<tr><td colspan="2">rate is138 beats / min. The abdomen is soft, painless on palpation in all parts. The liver protrudes 2 cm below the costal margin. Meningeal and focal symptoms are not detected. Stool, urination are not disturbed.</td></tr>
<tr><td>Question:
1. Formulate a preliminary diagnosis.
2. Your actions.</td><td>Answers:
1. ARVI, acute rhinopharyngitis. Hyperthermic syndrome.
2. The child is hospitalized. Undress the child, provide fresh air, prescribe ibuprofen (10 mg / kg) or paracetamol (15 mg / kg).</td></tr>
<tr><td colspan="2">Problem 3
A 10-month-old girl was admitted due to a sudden onset of a seizure attack. From the anamnesis, it is known that the child was treated on an outpatient basis for bronchitis for 3 days. During the examination, she actively resisted, shouted. Suddenly the cry subsided, breathing stopped, diffuse cyanosis, loss of consciousness appeared. Then there were convulsions of a tonic nature with their spreading from top to bottom: a frowning face, stretching the lips, arms, and then legs. Tonic convulsions were replaced by clonic ones, snoring breathing appeared. After 3 minutes, the seizures stopped spontaneously. The body temperature is 39.6 °C, the skin is pale, clear. The upper respiratory tract is filled with mucus. Above the lungs, breathing is harsh, single dry rales are heard on both sides. Heart sounds are loud, rhythmic.</td></tr>
<tr><td>Question:
1. Formulate a preliminary diagnosis.
2. Make an algorithm for providing emergency care.</td><td>Answers:
1. ARVI. Acute rhinitis. Acute (simple) bronchitis. Convulsive syndrome (complex febrile convulsions).
2. Algorithm of actions:
- I take a syringe with diazepam, say: "I inject: diazepam 0.5% 0.5 mg / kg intravenously slowly or intramuscularly"
- I put the baby on its side in a safe position
- Removing mucus from the upper respiratory tract with a rubber aspirator
- I put on a mask on the patient's face, I say loudly: "The flow of 100% oxygen is 6-8 l / min."
- Take a bottle with a solution of Paracetamol (10 mg / ml), attach it to the infusion system and say loudly: "I inject a solution of paracetamol intravenously drip at a dose of 15 mg / kg"
- The team of the Emergency Medical Center for the hospitalization of the child in the intensive care unit is called.
- I conduct an ABCDE assessment before the arrival of the emergency medical center team</td></tr>
</table>

8. Materials for classroom self-study.

8.1. The list of educational practical tasks that must be completed during practical exercises.

1. Collect anamnesis, highlight the data that indicate the disease.
2. To identify the most informative signs of the disease during an objective and laboratory and instrumental examination of the patient.
3. To establish a clinical diagnosis according to the modern classification.

9. Instructional materials for mastering professional skills.

9.1. Methodology for performing work, stages of implementation

1. Evaluate the data obtained from the anamnesis of life and illness, highlight risk factors
2. Conduct a clinical examination of the patient.
3. Draw up a plan for additional examination.
4. Evaluate the results of laboratory and instrumental examination.
5. Formulate a clinical diagnosis according to the classification.
6. Prescribe treatment that is appropriate for the specific situation

10. Materials for self-control of mastering knowledge, abilities, skills

Tests

1. In a child under 2 years of age who suffers from focal pneumonia, t - 39.50 C. What antipyretic drug and in what dose should be administered?
A. * 50% solution of analgin; 0.2 ml
B. 0.5% seduxen solution; 1 ml
C. 2.0% aminophylline solution; 1 ml
D. 2% papaverine hydrochloride solution 0.2 ml
E. 50% solution of analgin; 0.1 ml

2. On call for a 10-year-old child with a diagnosis of ARVI, hyperthermic syndrome. A lytic mixture was introduced. After 40 minutes the child abruptly got out of bed and fell. Objectively: t - 35.2 C, the skin is pale, covered with cold sticky sweat, tachycardia, blood pressure is 70/40 mm Hg. Assess the child's condition and the effectiveness of the care provided.
A. * Acute vascular insufficiency, collapse; violation of bed rest
B. Acute vascular insufficiency, fainting; lack of physical methods of cooling
C. Anaphylactic shock rapid drug administration
D. Drug poisoning; violation of bed rest
E. Hypoglycemic coma diet disorder

3. A 5-month-old child with a history of intracranial birth trauma has a sudden attack of seizures. What drug should be administered?
A. * Sibazon
B. Paracetamol
C. Analgin
D. Diphenhydramine
E. Calcium chloride

4. Call to a 5-year-old child with diabetes mellitus. After the injection of insulin, there were complaints of lethargy, trembling of the limbs, dizziness, increased appetite. On examination: the skin is moist, pale. What are your top priorities?
A. * Give warm sweet tea to drink
B. Inject intravenous glucose
C. Apply ascorbic acid, cocarboxylase
D. Apply 0.5% glucagon 1 ml.
E. Inject intramuscularly lasix 1% 2.5 mg per 1 kg of body weight

5. Call to a child of 8 months. According to the mother, the child suddenly lost consciousness, breathing stopped, the child turned blue, after 1 min. there was a loud breath, like a rooster's cry. From the anamnesis: a child from 1 month is on artificial feeding. He holds his head from 3 months, no teeth, does not sit on his own. Indicate the probable diagnosis.
A. * Hypocalcemic syndrome, laryngospasm

B. Stenosing laryngotracheitis
C. Hypocalcemic syndrome, carpopedal spasm
D. Attack of bronchial asthma
E. Hypocalcemic syndrome, eclampsia

11. Topic for next lesson №63 “Pediatric palliative care. Organization of palliative care for children with incurable diseases”

12. Tasks for research independent student work on the topic of the next lesson: “Ethical and Legal Issues in Children's Palliative Care”