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CONFIRMED by

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METHODOLOGICAL RECOMMENDATIONS ON PRACTICAL CLASSES FOR STUDENTS

International Medical Faculty, course 6

Educational discipline "**PEDIATRICS**"

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Topic 9. Practical lesson 24 - 26 . Fever in children. Fever in children: a problem-oriented approach in pediatrics. Causes and types of fever. Differential diagnosis of diseases accompanied by fever in children. Therapeutic approaches to fever in childhood. Indications for prescribing antipyretics in pediatrics. Emergency care for febrile convulsions.

Purpose: To know the definition of fever, its types. Be able to measure the body temperature of children of different ages. Know the causes, main pathogenetic links and clinical symptoms of fever in children. Learn the risk factors for the development of complications with fever in children. Be able to collect anamnesis, clinically examine a child with fever; determine the scope of diagnostic manipulations; interpret the data of clinical, laboratory and instrumental studies; carry out differential diagnosis of diseases accompanied by fever in children. Be able to determine management tactics and a treatment plan for a child with fever; provide emergency care for various types of fever in children. Demonstrate the ability to maintain medical records in the clinic of children's diseases.

Basic concepts:

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.

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

Diagnostic criteria		
Anamnestic: - the presence of anatomical and physiological factors that determine a predisposition to generalized reactions of the child's brain (high tone of the pallidary	*Clinical:* **- Convulsive readiness** **- Localized seizures** - **Generalized convulsions** (convulsive seizure): sudden onset, change in consciousness, motor excitement with local or general convulsive jerks: A) tonic phase:	*Paraclinical:* - complete blood count - signs of inflammation; - biochemical blood test - hypocalcemia, hypoglycemia, hypomagnesemia, hyperphosphatemia, increased alkaline phosphatase activity,

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	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	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.

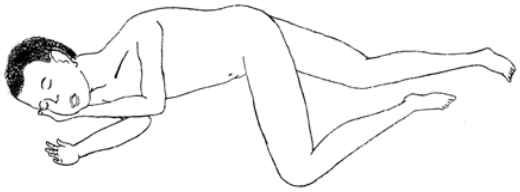
Tests to rule out other diseases	
Examination	**Indications**
CSF analysis to rule out meningitis and encephalitis	• age < 6 months. • meningeal signs or signs of CNS depression • convulsions occurred after several days of febrile illness • incomplete immunization or taking antibiotics
Serum glucose, 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	25% solution of magnesium sulfate 0.2 ml / kg intravenously,

convulsions	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.

Equipment: a laptop, an Infant auscultation simulator auscultation trainer and smartscope LF01201 W44743 (Inv . No. 101475072), multi-purpose pediatric care simulator (S157) W45178 (Inv . No. 101475075), multimedia presentation on the topic of practical training, educational videos

Plan:

1. Organizational measures (greetings, inspection those present, message of the topic, purpose of the lesson, motivation acquirers higher education of studying the topic).
2. Control of the reference level knowledge (written work, written testing, frontal poll etc.) is not foreseen.
3. Formation professional ability, skills (mastery skills, conducting curation , definition schemes treatment , laboratory research etc.):
   a) Oral survey, conversation, collective discussion and discussion on the subject of the lesson;

b) List of educational practical tasks, which it is necessary to perform during practical classes: on the basis of the proposed clinical situations, perform the main steps to ensure the effective management of a sick child

c) Solving a clinical task, for example:

<table>
<tr><td colspan="2">Task 1
month-old boy was hospitalized due to febrile fever up to 39.8 ° C and severe violation _ It is known from the anamnesis that child got sick sharply 2 days ago, when they appeared catarrhal phenomena from the side of the nasopharynx, was noted lift temperature bodies up to 37.4-37.7 °C appeared lethargy , the child began to refuse from food and drink . Body temperature on the third day from the onset of the disease rose to 39.8 ° C. During the inspection are noted pallor skin , sharp excitation child , limbs cold ; for review reacts negatively. Mucous discharge from the nose allocation , zyv brightly hyperemic, loose , plaques there is no ChD - 48 per minute . Above all the surface lungs percussion - lung sound . Auscultatively - breathing hard , made from both sides , rales in the lungs are not heard . Tones of the heart rhythmic , moderately muffled , heart rate -138 beats/ min . Stomach soft , painless on palpation in all departments . Liver protrudes 2 cm below the edge of the costal arch. Meningeal and focal symptoms are not detected . Stool , urination are not disturbed .</td></tr>
<tr><td>Question :
1. Formulate the previous one diagnosis .
2. Your actions .</td><td>Answers :
1. SARS, acute rhinopharyngitis . Hyperthermic syndrome.
2. A child subject to hospitalization . A child undress , provide access to fresh air , appoint ibuprofen (10 mg/kg) or paracetamol (15 mg/kg).</td></tr>
<tr><td colspan="2">Task 2.
10- month-old girl , delivered in connection with a sudden the occurrence of a seizure. It is known from the anamnesis that child within 3 days was treated on an outpatient basis for bronchitis . During the examination , she actively resisted and screamed. Suddenly there was a cry of poetry , a stop came breath appeared _ diffuse cyanosis , loss consciousness _ Then arose convulsions tonic character with spread their from top to bottom: gloomy face , stretching lips, hands, then legs _ Tonic convulsions have changed clonic , snoring appeared . _ In 3 minutes convulsions stopped spontaneously . Body temperature 39.6 ° C, skin pale , clean. Upper the airways are full slime _ Above the lungs the breath is harsh, they are listened to single dry rales from both parties _ Tones of the heart loud , rhythmic .</td></tr>
<tr><td>Question :
1. Formulate the previous one diagnosis .
2. Make a provisioning algorithm urgent help _</td><td>Answers :
1. SARS. Acute rhinitis _ Acute (simple) bronchitis . Seizure syndrome (complex febrile convulsions).
2. Action algorithm :
- I take a syringe with Diazepam, say "Inject: Diazepam 0.5% 0.5 mg/kg intravenously slowly OR intravenously"
- I put the child on his side in a safe position
- I remove mucus from the upper respiratory tract using a rubber aspirator
- I put the mask on the patient's face, say loudly: "Flow of 100% oxygen 6-8 l/min"
- Take a bottle with a solution of Paracetamol (10 mg/ml), connect it to the infusion system and say</td></tr>
</table>

	loudly: "I am injecting a solution of Paracetamol intravenously at a dose of 15 mg/kg " - The team of the Emergency Medical Assistance Center was called to hospitalize the child in the intensive care unit. - I am conducting an assessment of AVSDE before the arrival of the CEMD brigade
Nelson Textbook of Pediatrics, 2-Volume Set, 20th Edition, 2016 by Robert M. Kliegman , Joseph St. Geme , Nathan J. Blum, Samir S. Shah, Robert C. Tasker, Karen M. Wilson, Richard E. Behrman - r . 1277-1287 (Ch/176-177).	

Recommendations (instructions) for the performance of tasks (professional algorithms, orientation maps for the formation of practical skills and abilities, etc.):

a) Questions for self-control:

1. Definition of fever in children . Options temperature curve _
2. The most common causes of fever in children .
3. Pathogenesis of fever.
4. Hyperthermic syndrome. Complications of fever.
5. The causes of fever are unknown or unrecognizable of nature
6. Infectious and non-infectious fever _
7. Fevers with petecheal rash and hemorrhagic fevers.
8. Fever in children the first months life , the first years life _
9. Action algorithm a doctor for fever in a child .
10. Laboratory research in fever .
11. Problem- oriented approach to fever management .
12. Management tactics patient with fever .
13. Use antipyretics for fever in children .

b) Orientation map for independent work with literature

No	Main tasks	Instructions	Answers
1	2	3	4
1.	Familiarize yourself with the literature and the purpose of the lesson	Get acquainted with modern concepts of etiopathogenesis , classification , clinical course and additional methods of diagnosis of diseases accompanied by fever in children	Know the development factors, classification , clinical picture of disease manifestations, hematological , immunological , radiological and functional signs of diseases and conditions.
2.	Epidemiology	To know the prevalence of diseases accompanied by fever among children.	Know: the prevalence of the most frequent diseases and pathological conditions in the children's population .
3.	Etiopathogenesis	To know the causes and mechanism of diseases that are accompanied by fever in children	Know that these conditions can be caused by the action of medical factors, pathogens of infectious diseases
4.	Clinic	Describe the clinical picture of diseases accompanied by fever in children	Remember the leading clinical symptoms ′of the main conditions in children with fever

5.	Diagnostics	Know the schemes of diagnosis and treatment of diseases accompanied by fever in children	Use diagnostic and treatment schemes for diseases accompanied by fever in children

in) In terms of results work , including preparation : the written work must be written or printed, have a neat appearance, the date, topic, task number, name of the performer must be indicated at the beginning, the text must be legible, structured ;

4. Beating results : announcement of grades based on the results of the lesson. The grade for one practical lesson is the arithmetic average of all components and can only have a whole value (5, 4, 3, 2), which is rounded according to the statistical method.

5. List of recommended literature :

- *main:*

1. Volosovets O.P., Snisar V.I. Recommendations for cardiopulmonary resuscitation in children. Methodical guide . Dnipropetrovsk : ART-PRESS, 2015. 48 p.
2. Urgent conditions in pediatrics practice : Teaching . help _ for students honey _ ZVO, intern doctors . — 2nd edition. Recommended by the Ministry of Education and Science, Recommended by the Academic Council of NMU named after . O.O. Bogomoletsa / Yu.V. Marushko , Chief G.G. etc. _ _ Kyiv : VSV "Medicine", 2020. 440 p.
3. Differential diagnosis most common diseases children's age _ Educational manual / under the editorship V.M. Dudnyk, 1st edition . Vinnytsia : " Nilan -LTD" LLC, 2017. 560 c.
4. Karen J. Marcdante , Robert M. Kligman . Foundations pediatrics according to Nelson: translation of the 8th Eng. edition : in 2 volumes. Volume 1. Kyiv : VSV "Medicine", 2019. XIV, 378 p.
5. Karen J. Marcdante , Robert M. Kligman . Foundations pediatrics according to Nelson: translation of the 8th Eng. edition : in 2 volumes. Volume 2. Kyiv : VSV "Medicine", 2019. XIV, 426 p.
6. Kryuchko T.O., Abaturov A.E., Kushneryova T.V. Pediatrics : a textbook (University IV level . a.); under the editorship AND. Kryuchko , O.E. Abaturova Kyiv : VSI "Medicine", 2020. 224 p.

- *additional:*

1. Order dated August 31, 2004 No. 437 On the approval of clinical Protocols for the provision of medical care in emergency situations in children at the hospital and pre-hospital stages
2. Hesdorffer DC, Shlomo S, Lax DN, et al: Risk factors for subsequent febrile seizures in the FEBSTAT study. Epilepsia 57(7): 1042–1047, 2016. doi : 10.1111/epi.13418.
3. 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
4. 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)

- *electronic information resources* :

1. http://moz.gov.ua – Ministry of Health of Ukraine
2. www.who.int - World Health Organization