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THE INFECTIOUS DISEASES DEPARTMENT INFECTIOUS DISEASES IN CHILDREN

(a practical guideline for international students)

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The guideline is intended for international students in the 6th year of studies, Faculty of Medicine for practical work in the discipline infectious diseases in children

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CONTENTS

ABBREVIATIONS

ALT - alanine aminotransferase
ARI - acute respiratory infections
AST - aspartate aminotransferase
BCG - tuberculosis vaccine
BP - blood pressure
CDC - Centers for Disease Control
CNS - central nervous system
CRS - congenital rubella syndrome
CSF - cerebrospinal fluid
CT - computed tomography
DTP - diphtheria, tetanus and pertussis vaccine
EA - epidemiological anamnesis
ECG (EKG) - electrocardiogram
EEG - electroencephalography
EI - enteroviral infection
ESR - erythrocyte sedimentation rate
GAS - group A streptococcus
Hb - hemoglobin
HFMD - hand, foot and mouth disease
HRSVI - human respiratory syncytial virus infection
HSV - herpes simplex virus
HSVI - herpes simplex virus infection
ICU - intensive care unit
IFA - indirect immunofluorescence assay
IM (i.m.) - intramuscular
IV (i.v.) - intravenous
IVIG - intravenous immunoglobulin
MI - meningococcal infection
MRI - magnetic resonance imaging
OPV - oral polio vaccine
ORS - oral rehydration salts
RBCs - red blood cells
VZV - varicella-zoster virus
WBC - white blood cells
WHO - World Health Organization

INTRODUCTION

The early childhood is the most vulnerable period when children tend to be more affected by infectious diseases, in particular, by acute intestinal infections and by upper respiratory tract infectious diseases. Although in recent years the morbidity and mortality caused by infectious diseases has decreased, their high incidence remains an actual problem in medicine. On average, from 10 visits to the family doctors, in about 7-8 cases the infectious diseases are revealed.

Most of the children with infectious diseases are treated at home. It is the family doctor's duty to timely diagnose the diseases and prescribe the necessary treatment, and when required, to apply the outbreak antiepidemic measures, and to plan and carry out the vaccination.

The study program for the students of the faculty of Medicine includes the study of infectious diseases in children according to their age, the severity of the diseases, the related complications, and the premorbid conditions. During the academic year the students will acquire the necessary knowledge in this field which will allow them to perform their daily activity as a physician.

Students will enrich their theoretical knowledge in the field of infectious diseases in children and also, they will learn more deeply the particularities of the epidemiology of the infectious diseases during their individual study of the recommended material and additional literature, as well as during lectures.

The medical practice and the necessary practical skills required by every doctor in the field of infectious diseases in children are learned during the practical lessons which take place at the profile hospital and clinic.

During the practical lessons and lectures, attention is drawn to deontological and ethical issues, and the peculiarities of the medical professional activity, in the detection of acute infectious diseases. This practical guide is intended as a set of self-activities for medical students and includes:

- Motivation of the subject;
- Frequently questions for self-training (in the field of fundamental knowledge and on the subject of lesson);
- Classification of clinical forms of infectious diseases in children;
- Clinical cases;
- Annexe;
- Practical skills;
- Glossary;
- References.

RULES AND BEHAVIOR GUIDLINES IN THE INFECTIOUS DISEASES DEPARTMENT FOR MEDICAL STUDENTS

Medical staff and medical students are constantly in contact with infected and contagious patients, as well with contaminate air, hands, hair, objects, clothes, waters, and so on. Not only doctors are at risk of contamination but also their families and others hospitalized patients. Because of the permanent risk of spreading the infection outside the hospital, there are several strict rules to consider for medical staff and students, as follows:

- ✓ Once getting to the hospital, it is compulsory to change usual clothes to special medical clothes (white gown, medical suit), and medical shoes.
- ✓ Clothes, medical uniform and shoes must be stored in special places as dressing rooms.
- ✓ Nails should be cut short and taken care of, neat and tidy hair, medical gown and cap must be changed at least 1-2 times per week.
- ✓ After each contact with the patients and his personal belongings, it is mandatory to be washed with soap and disinfected.
- ✓ Washing hands is absolutely indicated before eating and at the end of the work day.

While providing medical assistance for patients with respiratory infectious diseases or in epidemic periods, there is need to wear special disposable masks and to change them every four hours.

Medical students and medical stuff with symptoms of respiratory infections are not admitted to work. In case their family members are suffering from an infectious disease, medical stuff and students must inform the head of the department about the situation.

In case of transfer of the patient from one department to another, the attendant (nurse, medical student, medical assistant) must wear a second gown that is disinfected after the transfer is done.

While entering de salon or isolating room of patients suffering

from scarlet fever, diphtheria, salmonellosis, medical staff and students must wear a mask and a second gown and to leave them at the special place before leaving.

Medical staff providing care to patients with diphtheria or meningococcal disease are investigated for carrier status.

For medical staff and students is prohibited:

- ✓ Entering the infection disease department without special medical uniform
- ✓ To sit on the patient's bed
- ✓ To leave the hospital in uniform or to take the uniform at home
- ✓ To use patient personal belongings and toilet
- ✓ To take the meals in the laboratory, corridor or other places that are not specially arranged
- ✓ To move from one department to another unnecessarily.

Diphtheria

Diphtheria is a severe and widespread infectious disease. It has epidemic potential, but due to the vaccinations it is currently rarely met. However, sporadic cases may occur in both unvaccinated and vaccinated children. Localized forms of the diseases are common. Spread forms and toxic forms, causing central nervous system and cardiovascular complications or even death is rare. The control of diphtheria is based on the following three measures:

1) Primary prevention of the disease by ensuring high population immunity through immunization (vaccination).

2) Secondary prevention of the disease spreading by rapid investigation of close contacts, ensuring a proper treatment to the patients.

3) Tertiary prevention of complications and deaths by early diagnosis and proper management.

What illustrated above confirm the need for students to acquire knowledge about early diagnosis of the disease, its specific treatment and prophylaxis.

Questions for self-training:

1. Etiology of diphtheria.
2. Epidemiology, route of transmission and source of infection in diphtheria.
3. Pathogenesis of diphtheria.
4. Classification of diphtheria.
5. Clinical features of localized forms in diphtheria.
6. Clinical features of toxic forms in diphtheria.
7. Clinical features of diphtheria in children.
8. Complications of diphtheria.
9. Diagnostic plan of diphtheria.
10. Differential diagnosis of diphtheria.
11. Treatment of diphtheria.
12. Specific and nonspecific prophylaxis of diphtheria.

Classification of diphtheria

Frequent clinical forms:

1. Diphtheria of tonsils and pharynx;
2. Diphtheria of larynx and trachea;
3. Diphtheria of nose.

Rare forms of diphtheria (which nowadays are no longer met):

1. Diphtheria of eyes;
2. Diphtheria of skin;
3. Diphtheria of mouth;
4. Diphtheria of reproductive organs;
5. Diphtheria of wounds.

Classification of tonsillar and pharyngeal diphtheria

1. *Localized form:*
   - catarrhal (atypical),
   - patch (island),
   - membrane (film).
2. *Widespread form;*
3. *Toxic form:*
   - Subtoxic,

- I degree,
- II degree,
- III degree.

4. *Hypertoxic form;*
5. *Haemorrhagic form.*
6. *Associated* (diphtheria of pharynx+eyes+nose+larynx and others).

Clinical cases

Task nr.1

A ten-years-old child became ill, he has a low fever of 37.5 °C and complains of moderate sore throat, difficult and painful swallowing. On the second day of illness, the temperature is 37.8 °C, and there is a moderate hyperaemia of the pharyngeal isthmus. Tonsils are enlarged and on their surface are detected thick fibrous membranes which are difficult to detach. After their enforced detachment, the surface of the tonsil's bleeds. Membranes do not deform due to friction between the two glass slides and growing in the glass of water. The submandibular lymph nodes are swollen. Other pathological signs are not detected.

1. Establish the diagnosis.
2. Which clinical symptoms may confirm the diagnosis?
3. Which laboratory tests may confirm the diagnosis?
4. Indicate the treatment.

Task nr.2

A four-year-old child became suddenly ill with a fever of 39.0°C, he has a headache and moderate painful swallowing. On the second day of the disease, he visits the doctor. During the examination the child appears pale and adynamic. Present the cervical oedema to the clavicles. The pharyngeal isthmus and the tonsils are moderate hyperaemic, covered by a thick fibrous membrane which extends on the uvula, the pillars and the posterior wall of the pharynx. Heart sounds are muffled. Other pathological symptoms are not detected.

1. Establish the diagnosis.

2. List the clinical symptoms which may confirm the diagnosis.
3. Define an investigation plan.
4. Indicate the treatment.

Task nr.3

A 18-months-old toddler became suddenly ill, had a fever 37,8 °C, a dry cough and hoarseness. Gradually, the baby becomes agitated, irritated, has frequent barky cough and loss of voice. During examination perioral cyanosis and intercostal retractions are detected. The respiratory frequency is 60 per minute. The cardiac contraction frequency is 140 per minute. The auscultation of the lungs detects harsh breathing. The cardiac sounds are clear and rhythmic. The liver and spleen are normal. The child has no difficulty with urination and the stool is normal.

Epidemiological anamnesis: he was in contact with an adult with angina six days ago. He is not vaccinated.

1. Establish the preliminary/presumptive diagnosis.
2. Define the investigation plan.
3. Indicate the treatment.

Scarlet fever

Scarlet fever is a common childhood infection caused by Streptococcus pyogenic (also known as group A Streptococcus [GAS]). These bacteria may be found on the skin, throat and other sites where they can live without causing problems. Under some circumstances, GAS can cause non-invasive infections such as pharyngitis, impetigo and scarlet fever. On rare occasions they can cause severe disease, including streptococcal toxic shock syndrome, necrotizing fasciitis, and sepsis. Nowadays, as a result of using antibiotics in the treatment of this infectious disease, there are low cases of scarlet fever, without early or late complications and with mild and atypical forms of illness.

Questions for self-training:

1. Etiology of scarlet fever.

2. Epidemiology, route of transmission and source of infection in scarlet fever.
3. Pathogenesis of scarlet fever.
4. Classification of scarlet fever.
5. Clinical features of typical forms of scarlet fever.
6. Clinical features of atypical forms of scarlet fever.
7. Clinical features of scarlet fever in infants.
8. Complications of scarlet fever.
9. Diagnostic plan of scarlet fever.
10. Differential diagnosis of scarlet fever.
11. Treatment of scarlet fever.
12. Prophylaxis of scarlet fever.

Classification of scarlet fever

Based on the clinical form:

1. Typical;
2. Atypical:
   - Attenuated;
   - Extrapharyngeal (extrabuccal);
   - Malignant: hypertoxic; haemorrhagic.

Based on the level of severity:

- mild;
- moderate;
- severe: toxic, septic, toxico-septic.

Criteria of severity:

- ***General:***
  - Neurotoxic syndrome;
  - Metabolic-vegetative syndrome;
  - Haemorrhagic syndrome;
  - Early septic manifestations.
- ***Local:***
  - Streptococcal tonsillitis - follicular or necrotic;
  - Adenophlegmon;
  - Haemorrhagic rash, epistaxis.

Based on the evolution of the disease:

- without complications and allergic episodes;
- with complications and allergic episodes.

Complications:

- Toxic;
- Septic;
- Allergic.

Clinical cases

Task nr.1

A 5-year and 5-month-old child who attends kindergarten was hospitalized on the second day of the disease. The first complaints were a fever of about 39 °C, a sore throat and a headache. He also vomited about 3 times in a 24-hour period. When admitted to the hospital, the child's condition appears serious due to his sleepy and inhibited state and the fever of 39 °C. His cheeks are very red, but the area around the mouth is pale. In the inguinal area, on his upper and lower limbs and in body folds are detected eruptions (roseola) that join together to form pink/red areas. The child has petechial rash. We also observe a marked and delimited erythema of pharyngeal mucosa and tonsils. His tongue presents abundant deposits that desquamate/exfoliate at the apex and the edges. The other body systems show no pathological features.

1. Establish clinical diagnosis.
2. On the basis of which clinical symptoms have you established the diagnosis?
3. Mention severity signs of the disease.
4. Prescribe treatment.

Task nr. 2

A 8-year-old child became suddenly ill with fever 40.0 °C, vomited many times in 24 hours, slept badly and has felt delirious. At the hospital admission, fever was 40.0 °C, mental confusion, cyanotic skin, especially on lower limbs. On the cyanotic teguments are

detected abundant punctiform rash. Marked delimitated erythema of pharyngeal mucosa with cyanotic shade, dry lips, and tongue with abundant white deposits. Pulse - 160/min, heart sounds are muffled. Blood pressure - 110/70 mmHg. The other body systems show no pathological features. Meningeal signs are absent.

1. Establish clinical diagnosis addicted to illness classification.
2. Indicate treatment at the pre-hospital stage.
3. Make differential diagnosis.
4. Prescribe treatment.

Task nr.3

A 7-years-old patient who underwent appendectomy in the surgery department of the children's hospital was transferred into infectious diseases hospital for children because of clinical local signs which appeared after 2 days on the postoperative wound: inflammation, hyperaemia and small maculopapular rashes around it, that spread moderately to the trunk. Right inguinal lymph nodes are enlarged, about 1.0 x 1.5 cm and painful. Other systems - without pathological features.

1. Establish diagnosis and indicate the clinical form of the disease.
2. List the peculiarities of this case.
3. Indicate treatment.

Measles

Measles is a highly contagious viral disease. It remains an important cause of death among young children globally, despite the availability of a safe and effective vaccine. Under the Global Vaccine Action Plan, measles is targeted for elimination in five WHO Regions by 2020. WHO is the lead technical agency responsible for coordination of immunization and surveillance activities supporting all countries to achieve this goal. Measles is transmitted via droplets from the nose, mouth or throat of infected persons. Initial symptoms, which usually appear 10-12 days after infection, include high fever, a runny nose, bloodshot eyes, and tiny white spots on the inside of

the mouth. Several days later, a rash develops, starting on the face and upper neck and gradually spreading downwards. While global measles deaths have decreased by 84 percent worldwide in recent years - from 550.100 deaths in 2000 to 89.780 in 2016 - measles is still common in many developing countries, particularly in parts of Africa and Asia. An estimated 20.4 million people were affected by measles in 2016. The overwhelming majority (more than 95 %) of measles deaths occur in countries with low per capita incomes and weak health infrastructures. Measles so far remains a globally spread disease and a considerable medical and public health care problem. Measles occurs rarely, at intervals of decades, because of an import contagious case and spreads very fast and covers all the susceptible population including the elders and young children, and has a high incidence of lethality.

Considering the abundant migration of the population, the negative epidemiological impact of measles and rubella, Republic of Moldova is at a permanent risk of having an import case which will rapidly spread the disease and devastate de public health system. During 2018, in our country were recorded 340 confirmed import cases of disease. Measles is in the process of the global elimination (total absence of the virus circulation during 12 months), but according to anti-vax movements and protests, there is a constant risk of an epidemiological decline all over the world.

Questions for self-training:

1. Etiology of measles.
2. Epidemiology, route of transmission and source of infection of measles.
3. Pathogenesis of measles.
4. Classification of measles.
5. Clinical features of measles.
6. Clinical features of measles in infants, adults, pregnant.
7. Complications of measles.
8. Diagnostic plan in measles.

9. Differential diagnosis in measles.
10. Treatment of measles
11. Specific and non specific prophylaxis of measles.

Classification of measles

Based on the clinical form:

1. Typical;
2. Atypical:
   - asymptomatic;
   - abortive;
   - mitigated;
   - toxic;
   - haemorrhagic;
   - bronchial dyspnoea.

Based on the level of severity:

- mild;
- moderate;
- severe.

Criteria of severity:

- General:
  - central nervous system damage (general poisoning signs, repeated vomiting, hallucinations, consciousness disorders);
  - Croup syndrome - laryngotracheal stenosis;
  - Broncho-obstructive syndrome.
- Local:
  - The number of eruptive elements and their size;
  - The nature of the eruptions (haemorrhagic, cyanotic shade).

Clinical cases

Task nr.1

A 5-year-old child is considered sick for 5 days, with fever, rhinitis with serous discharges, dry cough. At the 4th day of the disease a maculopapular rash appeared on the face and neck. At the 5th day, the rash expanded on the thorax and the child's general status was

severe, with fever 39.2 °C, dyspnoea, edematous face, eyelids, hyperaemic conjunctiva, mucopurulent secretions from the nose, productive cough.

On the skin of face and trunk are detected abundant, confluent, red maculopapular exanthema, on the normal colour of the skin. Hyperaemic and oedematous mouth mucosa is present. On the posterior wall of the pharynx and uvula are observed petechiae, gums hyperaemia and oedema. Lung's auscultation - harsh breathing, diffuse rales. There aren't pathological modifications from the cardiovascular and digestive system. Meningeal signs are negative.

Epidemiological anamnesis: he had the contact with a child with the same symptoms two weeks ago. The child is not vaccinated.

1. Establish and justify the presumptive diagnosis.
2. Indicate investigation plan.
3. Make differential diagnosis.
4. Indicate necessary treatment.

Task nr.2

The 2-year-old child went to the doctor on the 3rd day of illness. After the examination, the diagnosis of measles was established.

1. Argue on what basis the diagnosis was established?
2. Which investigations may confirm the clinical diagnosis?
3. With which diseases can we make the differential diagnosis?

Task n.3

A 10-year-old child has been ill for about 4 days, with a fever of 38.0 °C, cough and rhinitis with serous discharges. On the third day of the disease on the skin appeared a small maculopapular rash, non-confluent, on the normal colour of the skin. The submandibular and cervical lymph nodes are slightly enlarged. The lungs auscultation detects dry rales. The abdomen is soft and painless. The liver is not enlarged.

Epidemiological anamnesis: a month ago the child was into contact with a patient with hepatitis A and received Gamma-Globulin.

1. Argue on what basis the diagnosis was established?

2. Which investigations may confirm the clinical diagnosis?
3. With which diseases can we make the differential diagnosis?

Rubella

Rubella is a contagious disease spread across the world, particularly affecting children. The virus tends to peak during the spring in countries with temperate climates. Before the vaccine against rubella was introduced in 1969, widespread outbreaks usually occurred every 6-9 years in the United States and 3-5 years in Europe, mostly affecting children in the 5-9 years-old age group. Since the introduction of vaccine, occurrences have become rare in those countries with high uptake rates. The symptoms of this disease might easily be confused with the symptoms of other diseases such as measles, scarlet fever, mononucleosis or allergy. Most frequently, rubella tends to affect the heart, the eyes, the brain, and the ears. The mechanism of teratogenic of rubella is apparently related to the direct virus infection of certain tissues in the developing fetus.

During the last major rubella epidemic in the United States from 1964 to 1965, an estimated 12.5 million people got rubella, 11.000 pregnant women lost their babies, 2.100 new-borns died, and 20.000 babies were born with congenital rubella syndrome (CRS).

The infection source represents an infected human with clinical features or without any symptoms. Rubella is spread by direct contact with nasal or throat secretions of infected individuals. Rubella can also be transmitted by breathing in droplets that are sprayed into the air when an infected person sneezes, coughs or talks.

The contagious status begins 7 days before the onset of the disease and 7 days after the rash appears. In the congenital form of rubella, the contagion lasts months, even up to 1 year.

Rubella affects all the receptive population, especially children and teenagers. The morbidity is unknown because of 30-50 % of asymptomatic and inapparent cases. If serological tested, then 30 % of children under 5 years, and 80 % of persons between 13-20 years have antibodies against the virus.

The immunity after the infection is long lasting, but reinfections are still possible, because the primary immune response is immature and not sufficient to provide a lifelong defence.

Questions for self-training:

1. Etiology of rubella.
2. Epidemiology, route of transmission and sources of infection of rubella.
3. Pathogenesis of rubella.
4. Classification of rubella.
5. Clinical features of acquired (postnatal) rubella.
6. Clinical features of rubella in pregnancy and congenital rubella.
7. Complications of rubella.
8. Diagnostic plan of rubella.
9. Differential diagnosis of rubella.
10. Treatment of rubella.
11. Specific and nonspecific prophylaxis of rubella.

Clinical cases

Task nr.1

A 5-year-old child who attends kindergarten is considered ill about 3 days with general symptoms of: feverish, mild rhinitis and cough. During the examination, the family doctor observed small pink macula-papular rash, non-confluent, preponderance on the thorax, buttocks and extensor parts of limb surfaces. Occipital and lateral cervical lymph nodes are enlarged, mobile, painless. The oropharyngeal mucosa is with mild diffuse hyperaemia. Other systems - without pathological features.

1. Establish the diagnosis.
2. Make the differential diagnosis.
3. Make an investigation plan.
4. Prescribe the treatment.

Task nr.2

Child 9-year-old during of 6 days had feverish, mild rhinitis, cough and pink macula-papular rash, non-confluent, preponderance

on the thorax, buttocks and extensor parts of limb surfaces.

At the 10 days, appear headache, fever of 39.0 °C, vomited and generalized seizures. Occipital and lateral cervical lymph nodes are enlarged, mobile, painless. Meningeal signs are positive. The child was transported by ambulance to the hospital.

1. Establish the presumptive diagnosis.
2. Indicated emergency care at the prehospital stage.
3. Make an investigation plan.
4. Prescribe the treatment in the hospital.

Task nr.3

After examining a 7-year-old child, the family doctor diagnosed him with rubella. The child's mother is now in the first trimester of pregnancy. The mother does not know whether she was vaccinated or sick with rubella in childhood.

1. Explain which signs helped to diagnose the rubella.
2. What is the correct approach the doctor should suggest regarding the patient and his mother in this case?
3. Make an investigation plan.

Herpes Simplex Virus Infection

The herpes simplex virus or herpes is categorized into 2 types: herpes simplex virus type 1 (HSV-1) and herpes simplex virus type 2 (HSV-2). HSV-1 is mainly transmitted by oral-to-oral contact to cause oral herpes (which can include symptoms known as "cold sores"), but can also cause genital herpes. HSV-2 is a sexually transmitted infection that causes genital herpes. Both HSV-1 and HSV-2 infections are lifelong. An estimated 3.7 billion people under age 50 (67 %) have HSV-1 infection genital herpes infections are asymptomatic. Symptoms of herpes include painful blisters or ulcers at the site of infection. Herpes infections are most contagious when symptoms are present but can still be transmitted to others in the absence of symptoms. Infection with HSV-2 increases the risk of acquiring and transmitting HIV infection.

Questions for self-training:

1. Etiology in HSVI.
2. Epidemiology, route of transmission, source of infection, receptivity and immunity in HSVI.
3. Pathogenesis in HSVI.
4. Classification of HSVI.
5. Clinical picture of HSVI.
6. Clinical forms of HSVI.
7. Complications in HSVI.
8. Diagnostic plan in HSVI.
9. Differential diagnosis in HSVI.
10. Treatment in HSVI.
11. Prophylaxis in HSVI.

Classification of the herpes simplex virus infection

By etiology:

- Herpes simplex virus - type 1 (HSV-1);
- Herpes simplex virus - type 2 (HSV-2).

By clinical course:

- First episode or primary HSVI;
- Herpetic recurrence;
- Latency HSVI.

Based on the localization of the process:

- Mucocutaneous HSVI;
- Urogenital HSVI;
- HSVI of the upper respiratory tract;
- Ocular HSVI;
- HSVI with neurological disorders, namely encephalitis and meningoencephalitis;
- Visceral HSVI, namely hepatitis esophagitis and colitis;
- Generalized HSVI, namely visceral or disseminated;
- Neonatal HSVI.

Mucocutaneous HI:

- Gingivostomatitis;

- Herpes labialis;
- Perioral and nasal HSVI;
- Herpetic rhinitis;
- Gluteal HSVI;
- HI involving the temporal or frontal lobe.

Rare forms:

- Herpetic eczema Kaposi-Juliusberg (Kaposi syndrome);
- Herpetic associated erythema multiform;
- Herpetic panaritium;
- Herpes gladiatorum.

Based on the clinical form:

- Typical;
- Atypical:
  a) haemorrhagic;
  b) haemorrhagic necrosis;
  c) edematous;
  d) abortive1;
  e) disseminated;
  f) migratory;
  g) zosteriform.

Based on the disease's severity:

- mild;
- moderate;
- severe.

Criteria of severity:

- Related to the severity of the intoxication;
- Depending on the presence of neurological disorders (encephalitis, meningoencephalitis);
- If there is a form of generalized herpetic infection.

Clinical cases

Task nr.1

A 1-year-old child suddenly became ill. The onset of the disease

was acute, with fever of 38-39 °C, alteration of the condition general, dysphagia, anorexia. The mucosa is hyperaemic, edematous, with multiple vesicles, located on the jugal, palatine, gingival, lingual, tonsillar mucosa. Some of blisters were covered with grey deposits. Presented intense pain, hypersalivation, foul breath, chewing disorders. Presented submandibular and latero-cervical adenopathy. The other body systems present no pathological features.

Epidemiological anamnesis: his mother had a herpetic eruption on her lips a week ago.

1. Establish diagnosis, indicate the clinical form.
2. Make the differential diagnosis.
3. Indicate the treatment.

Task nr.2

An 8-month-old infant suddenly became ill. He has a fever of 39 °C and anorexia. A week ago, he caught an acute respiratory infection from his mother. On the second day of the disease, as a result of hyperthermia he developed seizures. The seizures lasted from 1 to 3 minutes. The baby was hospitalized in the Infectious Disease Children's Hospital in the Intensive Care Department.

Epidemiological anamnesis: in the same period his grandmother developed a herpetic eruption on her lips.

On the fourth day of illness his complete blood count showed the presence of leucocytosis, neutrophilia and lymphopenia. The cerebrospinal fluid is clear, pleocytosis 250 per cm3, all lymphocytes, the protein level is 1,5 g/l, unit erythrocytes, glucose and chloride levels were normal. The PCR of cerebrospinal fluid (CSF) detected DNA HSV type 1. On the fifth day of disease, the CT scan showed low-intensity herpes outbreaks in the temporal and frontal lobes.

1. Establish the clinical diagnosis.
2. Make differential diagnosis with other neurological infections.
3. Prescribe the antiviral and pathogenic treatment.

Chickenpox (Varicella) and Herpes Zoster (Shingles)

Varicella-zoster virus (VZV) is one of eight herpes viruses that infects humans. It causes chickenpox (varicella), a disease most commonly affecting children, teens, and young adults, and herpes zoster (shingles) in older adults; shingles is rare in children. VZV is a worldwide pathogen known by many names: chickenpox virus, varicella virus, zoster virus, and human herpesvirus type 3 (HHV-3). VZV infections are species-specific to humans, but can survive in external environments for a few hours, maybe a day or two.

VZV multiplies in the lungs, and causes a wide variety of symptoms. After the primary infection (chickenpox), the virus goes dormant in the nerves, including the cranial nerve ganglia, dorsal root ganglia, and autonomic ganglia. Many years after the patient has recovered from chickenpox, VZV can reactivate to cause neurologic conditions.

Primary varicella zoster virus infection results in chickenpox (varicella), which may result in complications including encephalitis, pneumonia (either direct viral pneumonia or secondary bacterial pneumonia), or bronchitis (either viral bronchitis or secondary bacterial bronchitis). Even when clinical symptoms of chickenpox have resolved, VZV remains dormant in the nervous system of the infected person (virus latency), in the trigeminal and dorsal root ganglia.

In about 10-20 % of cases, VZV reactivates later in life, producing a disease known as shingles or herpes zoster. VZV can also infect the central nervous system. Other serious complications of varicella zoster infection include postherpetic neuralgia, Mollaret's meningitis, zoster multiplex, and inflammation of arteries in the brain leading to stroke, myelitis, herpes ophthalmic, or zoster sine herpete.

Questions for self- training:

1. Etiology of chickenpox.
2. Epidemiology, route of transmission, source of infection, receptivity and immunity to chickenpox.

3. Pathogenesis of chickenpox.
4. Classification of chickenpox.
5. Clinical picture of chickenpox.
6. Clinical forms of chickenpox.
7. Complications of chickenpox.
8. Diagnostic plan of chickenpox.
9. Differential diagnosis of chickenpox.
10. Treatment of chickenpox.
11. Prophylaxis of chickenpox.

Classification of chickenpox

Based on the clinical form:

1. Typical;
2. Atypical:
   - rudimentary;
   - haemorrhagic;
   - generalized;
   - bullous;
   - gangrenous.

Based on the level of severity:

- mild;
- moderate;
- severe.

Based on the evolution of the disease:

- without complications;
- with complications.

Criteria of severity:

- General:
  - CNS disorders (symptoms for intoxication, repeated vomiting, consciousness disorders, seizures);
  - Croup syndrome (stenosing laryngotracheitis).
- Local:
  - the number of eruptive elements and their size.

Clinical cases

Task nr.1

A 3-years-old child who attends kindergarten presents with fever of 37.2 °C. He has maculopapular and vesicular rashes on the normal colour of the skin. The next day the fever 37.8 °C and the number of eruptions on skin increased. More eruptions were observed on the child's scalp and on the buccal mucosa, tongue, conjunctiva.

1. Establish the clinical diagnosis.
2. Make a differential diagnosis.
3. Prescribe the treatment.
4. Where you recommend treating the patient, at home or in hospital?

Task nr. 2

A 4-year-old child was admitted to the Cardiology Department with an increased temperature of 37.5 °C. The doctor working in the night shift noticed on the child's scalp, trunk, upper and lower limbs pink macule, papule and vesicles with clear fluid.

Epidemiological anamnesis: it is not known if the child has ever contracted infectious diseases.

1. Establish the clinical diagnosis.
2. Make a differential diagnosis.
3. Complications of chickenpox.
4. Indicate the treatment.

Task nr.3

A 10-years-old child was hospitalized in the Infectious Disease Children's Hospital with Viral Hepatitis A. On the five-day appeared fever 39.0 °C, headache, weakness, pain in the left intercostal region and itching. On the next day, the general condition of the child became more severe. He had the groups herpetiform vesicles of about 3-5 mm developing on an erythematous base.

1. Establish the clinical diagnosis.
2. Make an investigation plan.
3. Make differential diagnosis.
4. Prescribe the treatment.

Task nr.4

A 16-year-old teenager was hospitalized in the Therapy Department with herpes zoster diagnosis.

1. Which are the main signs that made it possible to establish this diagnosis?
2. Indicate the treatment.
3. During his stay in the hospital, the patient interacted with other children. What is the correct medical attitude in this case?

Mumps

Mumps is an infection caused by a virus. It is spread through human-to-human contact or by airborne droplets. It is sometimes called infectious parotitis, and it primarily affects the salivary glands. Initial symptoms are typically non-specific, such as headache, malaise and fever, followed within a day by the characteristic swelling of the parotid (salivary) glands. Mumps is generally a mild childhood disease, most often affecting children between five and nine years old. However, the mumps virus can infect adults as well, and when it does, possible complications are more likely to be serious. Complications of mumps can include meningitis (in up to 15 % of cases), orchitis and deafness. Very rarely, mumps can cause encephalitis and permanent neurological damage. Safe and effective vaccines against mumps have been available since the 1960 s. The vaccine is most often incorporated into national immunization programs in a combined measles-mumps-rubella (MMR) vaccine.

Questions for self-training:

1. Etiology of mumps.
2. Epidemiology, route of transmission and source of infection of mumps.
3. Pathogenesis of mumps.
4. Classification of mumps.
5. Clinical features of parotitis in patients with mumps.

6. Clinical features of pancreatitis in patients with mumps.
7. Clinical features of orchitis in patients with mumps.
8. Clinical features of meningitis in patients with mumps.
9. Clinical features of mumps in pregnant women, infants and adults.
10. Complications of mumps.
11. Diagnostic plan of mumps.
12. Differential diagnosis of mumps.
13. Treatment of mumps.
14. Specific and nonspecific prophylaxis of mumps.

Classification of mumps

Based on the clinical form:

- Typical:
  - Glandular: that affects only glandular tissue (parotid gland, pancreatitis, swelling of the submaxillary gland, orchitis);
  - With the CNS disorder: (meningitis, serous meningoencephalitis);
  - Neuroglandular (associated): with salivary glands affection and CNS, or with parotitis, pancreatitis, orchitis, serous meningitis, occurring at the same time).
- Atypical
  - asymptomatic;
  - attenuated.

Based on the level of severity:

- mild;
- moderate;
- severe.

Criteria of severity:

- General:
  - ✓ CNS disorder (intoxication syndrome, with affection of the meninges and encephalic tissue);
  - ✓ Height and duration of the fever
- Local:
  - ✓ Damage not only of the salivary glands but also other

organs such as the pancreas, or gonads;

✓ The degree of parotid gland swelling:
- I degree – the swelling of the parotid gland is assessed only by palpation;
- II degree - the swelling of the parotid gland is assessed visually and by palpation;
- III degree - the swelling of the parotid gland is accompanied by cervical oedema.

Clinical cases

Task nr.1

A 7-years-old child had a fever of 38.0 °C, tiredness, retromandibular pain during mastication.

On the second day of illness, a painful swelling in the left parotid salivary gland appeared and on the next day, another swelling appeared in the right parotid salivary gland. During the examination, the doctor observed that parotid salivary glands were swollen, elastic and sensible. The skin affected by the painful swelling was bright (or shiny), of a normal colour. Oral mucosa is dry, the orifice of Stenson's duct edematous and erythematous. The other body systems present no pathological features.

1. Establish the presumptive diagnosis.
2. Indicate another localization of the infection.
3. Make a differential diagnosis.
4. Can the child be treated at home?
5. Prescribe treatment.

Task nr.2

A 5-year-old child was hospitalized on the seventh day of illness with a fever of 39.0 °C, headache, fatigue and repeating vomiting.

Anamnesis Morbi: infection started with a fever of 38.0 °C and tiredness. On the second day appeared a swelling in the right parotid gland and on the third day – in the left parotid gland. He also had painful mastication. The child started to receive treatment at home, but

some days later his state become more severe and he was hospitalized.

During the hospital admission the general state of the child appeared severe, he was sleepy and pale. The parotid glands are swollen on both sides of the face, elastic and mild painful. The skin in this region is of a normal colour. Oral mucosa is dry, the orifice of Stenson's duct edematous and erythematous. The abdomen is soft painful in the left hypochondrium and the epigastric region. The liver and spleen are not enlarged. The child has been constipated for the last three days. Brudzinski's sign is positive.

Epidemiological anamnesis: the child attends a kindergarten where in last 3 weeks a case of mumps was detected.

1. Establish the presumptive diagnosis.
2. List the necessary investigations.
3. Prescribe the treatment.

Task nr. 3

A 10-year-old child presents with fever of 39 °C, fatigue, headache and repeating vomiting. The patient was transported by ambulance to the hospital. General state was severe, present phonophobia and photophobia. The oral mucosa is normal and there are no deposits on the tonsils. The nasal breathing and the lymph nodes are normal. The lungs auscultation showed vesicular respiratory sounds without rales. The cardiac sounds are rhythmic but weakened. The abdomen is soft and painless. The liver and spleen are normal. Meningeal signs are positive: the Kernig's sign and neck stiffness. The lumbar puncture detected a clear and colourless cerebrospinal fluid and an elevated opening pressure. Pleocytosis 325 cells/mm3, the lymphocytes – 90 %, the neutrophils – 10 %. The levels of glucose and chlorine are normal. The proteins level is 0.33 g/l.

Epidemiological anamnesis: there were cases of mumps at school.

1. Establish the presumptive diagnosis.
2. Name other localizations in this infection.
3. Indicate the treatment.

Pertussis (Whooping Cough)

Pertussis or whooping cough is an acute bacterial infection caused by Bordetella pertussis, an exclusively human pathogen which can affect people of all ages. Whilst adolescents and adults tend to present mild symptoms, infants are the most vulnerable group with the highest rates of complications and mortality. Transmission of the organism occurs as a result of close direct contact with an infected person. It is highly contagious, with up to 90 % of susceptible household contacts developing the disease. Patients with pertussis are most infectious in the initial catarrhal stage and during the first three weeks after the onset of cough. Many factors determine the disease severity, including the age of the patient and the time since the vaccination or the previous infection. Complications including hospitalization are significantly more frequent in infants.

Questions for self-training:

1. Etiology of pertussis.
2. Epidemiology, route of transmission and source of infection of pertussis.
3. Pathogenesis of pertussis.
4. Classification of pertussis.
5. Clinical picture of pertussis.
6. Clinical picture of pertussis in infants, vaccinated children and adults.
7. Complications of pertussis.
8. Diagnostic plan of pertussis.
9. Differential diagnosis of pertussis.
10. Treatment of pertussis.
11. Specific and nonspecific prophylaxis of pertussis.

Classification of pertussis

Based on the clinical form:

- Typical;
- Atypical:
  - asymptomatic;
  - attenuated;

- abortive.

Based on the level of severity:

- mild;
- moderate;
- severe.

Based on the evolution of the disease:

- Without complications;
- With complications.

Criteria of severity:

- Coughing fits in 24 hours:
  - *Mild: 10-15 coughing fits, 3-5 reprises;*
  - *Moderate: 15-25 coughing fits, 10 reprises;*
  - *Severe: 25-30 and more, more than 10 reprises.*
- Cyanosis and face oedema during coughing fits and during sleep;
- In prodromal period – cyanosis of the face in the first week of the illness;
- The intensity of respiratory changes;
- The frequency and duration of the apnoea;
- The intensity of cardiovascular modifications;
- The presence of encephalopathy;
- Complications;
- A general severe state when coughing fits did not occur;
- Vomiting after coughing fits or independently from them;
- Severe haematological modifications.

Clinical cases

Task nr.1

A 4-month-old baby was hospitalized on the seventh day of illness with the following symptoms: loss of appetite, coughing fits (about 14 times in the last 24 hours), face hyperaemia, accumulation of viscid sputum in pharynx, and a fever of 38 °C. Before manifesting these symptoms, he developed cyanosis and apnoea. At the moment of the hospital admission, it is observed that the child is in a severe state. He developed cyanosis around the mouth, his res-

piration frequency is 60 breathes per minute and he is apathetic. His rhythmic cardiac contraction is 140 beats per minute, the blood pressure is 100/60 mm Hg. He has a bulging anterior fontanelle and a soft abdomen. His liver is normal.

1. Establish the presumptive diagnosis.
2. Indicate the necessary laboratory investigations.
3. Make the differential diagnosis.
4. Indicate the treatment.

Task nr.2

A 4-year-old child presents a frequent dry cough. His general state is normal and has a low-grade fever 37.5 °C. During the first 7 to 10 days of the disease his mother gave him antitussive medication and the cough did not progress. After 12 days the cough become more frequent, the child developed coughing fits, but his temperature was normal (36.5 °C). After visiting the child, the family doctor thought he developed a bronchitis. and prescribed him Ampicillin for 7 days. Consequently, the coughing accesses become more and more frequent, especially during the night and they often finished with vomiting.

The child was vaccinated DTP 1 vaccines only at 1 year old.

1. Establish and justify the presumptive diagnosis.
2. Indicate the necessary laboratory investigation that may confirm etiologic diagnosis.
3. Indicate the treatment.

Task nr.3

An -1-year -5-months toddler becomes ill with a fever of 37.5 °C. Six days later; he has an acute cough. He had 30 to 35 coughing fits in 24 hours. Other observed symptoms are hyperaemia of the face, epistaxis, subconjunctival haemorrhage and seizures lasting a short period. The clinical assessment of the patient shows that the general status of the patient is severe. Paleness and a bilateral subconjunctival haemorrhage are observed. The lungs auscultation detects harsh breathing, and multiple dry and wet rales. The cardiac sounds are muffled, the pulse is 120 beats per minute, the BP (blood pressure)

is 100/60 mm Hg. The abdomen is soft, painless. Diuresis is normal.

The patient is not DTP-vaccinated.

1. Establish the presumptive diagnosis.
2. Decide a plan of investigation.
3. Note any changes in the patient's blood analysis during the course of the disease.
4. Indicate the treatment.

FLU (Influenza) and Acute Viral Respiratory Infections (ARI)

Flu-like illnesses and acute viral respiratory infections are among the most common childhood diseases. They share common epidemiology, pathology and possible complications. Affecting a large number of people, the flu-like illnesses and the acute respiratory infections damage the health, diminish the productivity, and cause economic losses. The application of prophylactic anti-epidemic measures in children's communities appears to be quite inefficient.

Clinical manifestations in children with influenza (flu) are more varied than the ones we find in adults with the same disease, making it difficult to diagnose. These diseases are dangerous especially for infants. Their weak immune resistance leads to complications and superinfections that can cause death. Thus, the ability to timely diagnose influenza and an acute respiratory infection, implement the outbreak measures and prescribe home or hospital treatment continues to be utterly relevant.

Questions for self-training:

Influenza

1. Etiology of influenza.
2. Epidemiology, route of transmission, source of infection, receptivity, seasonality and immunity to influenza.
3. Pathogenesis of influenza.
4. Classification of influenza.
5. Clinical picture of influenza.
6. Clinical syndromes of influenza.

7. Clinical picture of influenza in infants.
8. Complications of influenza.
9. Diagnosis plan of influenza.
10. Differential diagnosis of influenza.
11. Treatment of influenza.
12. Specific and nonspecific prophylaxis of influenza.

Parainfluenza

1. Etiology of parainfluenza.
2. Epidemiology, route of transmission, source of infection, receptivity and immunity to parainfluenza.
3. Pathogenesis of parainfluenza.
4. Classification of parainfluenza.
5. Clinical picture of parainfluenza
6. Clinical syndromes in parainfluenza.
7. Complications in parainfluenza.
8. Diagnostic plan in parainfluenza.
9. Differential diagnosis in parainfluenza.
10. Treatment of parainfluenza.
11. Prophylaxis for parainfluenza.

Adenoviral infection

1. Etiology of adenoviral infection.
2. Epidemiology, route of transmission, source of infection, receptivity and immunity to adenoviral infection.
3. Pathogenesis of adenoviral infection.
4. Classification of adenoviral infection.
5. Clinical picture of adenoviral infection.
6. Clinical syndromes of adenoviral infection.
7. Complications of adenoviral infection.
8. Diagnostic plan of adenoviral infection.
9. Differential diagnosis of adenoviral infection.
10. Treatment in adenoviral infection
11. Prophylaxis for adenoviral infection.

Human Respiratory Syncytial Virus Infection (HRSVI)

1. Etiology of HRSVI.
2. Epidemiology, route of transmission, source of infection, receptivity and immunity to HRSVI.
3. Pathogenesis of HRSVI.
4. Classification of HRSVI.
5. Clinical picture of HRSVI.
6. Clinical syndromes of HRSVI.
7. Clinical picture of HRSVI in new-borns and premature infants.
8. Complications of HRSVI.
9. Diagnostic plan of HRSVI.
10. Differential diagnosis of HRSVI.
11. Treatment of HRSVI.
12. Prophylaxis for HRSVI.

Classification of acute respiratory infections (ARI)

According to etiology:

- ✓ Influenza viruses;
- ✓ Parainfluenza viruses;
- ✓ Adenoviruses;
- ✓ Human Respiratory Syncytial Virus;
- ✓ Rhinoviruses;
- ✓ Reovirus;
- ✓ Enteroviruses;
- ✓ Coronaviruses;
- ✓ Mycoplasma;
- ✓ Bacterial ARI (pneumococcus, streptococcus, haemophilus influenzae);
- ✓ Associated ARI (virus-bacteria, virus-viral, virus-mycoplasma).

Based on the clinical form:

1. Typical;
2. Atypical:
   - subclinical;
   - attenuated.

Based on the severity of the disease:

- mild;

- moderate;
- severe.

Criteria of Severity:

- toxic syndromes;
- respiratory insufficiency syndrome;
- local manifestations.

Classification of influenza

According to etiology:

- Type A;
- Type B;
- Type C.

Based on the clinical form:

1. Typical;
2. Atypical:
   - subclinical;
   - attenuated;
   - hypertoxic.

Main flu syndromes:

- neurotoxic syndrome;
- catarrhal respiratory syndrome;
- asthmatic (bronchial obstruction syndrome);
- croup syndrome;
- abdominal syndrome;
- haemorrhagic syndrome;
- primary pulmonary segmental changes.

Based on the severity of the disease:

- mild;
- moderate;
- severe;
- hypertoxic.

Criteria of severity:

- The severity of the disease is determined by the degree of:
  - neurotoxicity;

- laryngeal stenosis;
- respiratory insufficiency;
- multiorgan damage.

- The course of the flu:
  - without complications;
  - with complications (such as pneumonia, otitis, encephalitis, serous meningitis, myocarditis, neuritis, polyradiculoneuropathy, purulent laryngotracheitis).

Classification of parainfluenza

Based on the clinical form:

1. Typical;
2. Atypical.

Main Clinical Syndromes:

- Upper catarrhal respiratory syndrome;
- Acute subglottic laryngitis;
- Croup syndrome;
- Asthmatic (bronchial obstruction syndrome);
- Pneumonia.

Based on the severity of the disease:

- mild;
- moderate;
- severe.

Based on the evolution of Parainfluenza:

- Without complications;
- With complications (such as pneumonia, otitis, sinusitis, laryngotracheitis, tonsillitis).

Classifications of adenoviral infection

Based on the clinical form:

1. Typical (with conjunctivitis);
2. Atypical (without conjunctivitis).

Clinical Syndromes of the adenoviral infection:

- Neurotoxic syndrome;
- Catarrhal upper respiratory syndrome;

- Rhino- pharyngo-conjunctivitis;
- Pseudomembranous conjunctivitis;
- Conjunctivitis and adenoviral keratoconjunctivitis;
- Pharyngoconjunctival fever;
- Pharyngotonsillitis.

Other syndromes:

✓ Croup syndrome;
✓ Bronchial obstruction syndrome;
✓ Abdominal or diarrhoeic syndrome;
✓ Interstitial adenoviral pneumonia.

Based on the evolution of the disease:

- With complications;
- Without complications.

Classification of human respiratory syncytial virus infection

Based on the clinical form:

1. Typical;
2. Atypical.

Clinical syndromes:

- Acute rhinopharyngitis;
- Bronchial obstruction syndrome;
- Acute bronchiolitis;
- Interstitial pneumonia;
- Croup syndrome;
- Diarrheic syndrome.

Based on the severity of the disease:

- mild;
- moderate;
- severe.

Based on the evolution of the disease:

- Without complications;
- With complications.

Clinical cases

Task nr.1

A 2-years and 5-month-old toddler who attends kindergarten,

has been ill for about 3 days. The first symptoms to appear were a 37.5 °C-38.0 ℃ fever, rhinitis, productive cough, oedema and hyperaemia of the left eyelid. The child's general state is considered medium. He has a face oedema and conjunctivitis. The pharyngeal isthmus and his tonsils are hyperaemic, and there also hyperaemia on the posterior pharynx and the lymphoid follicles are swollen. The lymph nodes are a enlarged. The lungs auscultation showed harsh breathing with wet rales. The liver is +2.0+2.5 +2.5 cm, and the spleen +1.5 cm. The patient had diarrhoea 4 times in the last 24 hours without inclusions.

1. Establish the presumptive diagnosis.
2. Make a differential diagnosis.
3. Create an investigation plan.
4. Indicate the treatment.

Task nr.2

A 3-years-old child who attended school the day before the first illness symptoms appeared, has a fever of 37.5-38.0 °C, apathy, dry to hoarse barky cough, runny nose and hoarseness. Rhinoscopy detects oedema and hyperaemia of the nasal mucosa and of the pharynges. Immunofluorescence detected parainfluenza virus antigens.

1. Establish the presumptive diagnosis.
2. Make a differential diagnosis.
3. Which clinical and laboratory data may confirm the diagnosis?
4. Indicate the treatment.

Task nr. 3

A five years old child suddenly becomes ill, he has a fever of 39.6 ºC, he is adynamic and has a headache. Three hours later, the child starts vomiting and his general condition goes worse. He loses consciousness and he develops seizures. The child is transported by ambulance to the hospital. During the hospital admission the general condition of the child is very severe. The patient is unconscious, presents a fever of 40.0 °C, has pale skin without a rash, and cyanotic lips.

Seizures occur regularly. The nasal secretion is absent, but the

patient shows scleral injection. The pharynx is hyperaemic. Also, the child has a very pronounced dyspnoea, from 50 to 60 breaths per minute. The lungs at auscultation shows a rough breathing and bullous small rales. The heart sounds are frequent but muffled. The heart rate is 165 beats per minute, BP is 75/50 mm Hg. Meningeal signs are positive.

Epidemiological anamnesis: He was in contact with patients with acute respiratory infection.

1. Make a presumptive diagnosis.
2. Explain the diagnosis.
3. With which disease we need to make a differential diagnosis?
4. What are the necessary laboratory tests to confirm the diagnosis?
5. Indicate the treatment plan.

Task nr.4

A three months old child has been ill for 3 days developing acute symptoms such as fever 37.5 °C, rhinitis, cough. General condition aggravated: apathy, vomiting, dry to hoarse barky cough, runny nose and hoarseness. The child was hospitalized.

General condition severe: restless, agitated. Pale skin, acrocyanosis. Expiratory dyspnea, whizzing. The heart sounds are frequent but muffled. The lungs at auscultation shows attenuated vesicular murmur, crackling wet rales.

1. Make a presumptive diagnosis.
2. Justify the diagnosis.
3. What laboratory tests do you need to perform?
4. With which disease it is necessary to make the differential diagnosis?
5. Indicate the treatment plan.

Meningococcal Infection

Meningococcal disease describes infections caused by the bacterium Neisseria meningitidis (also termed meningococcus). It carries a high mortality rate if untreated, but is a vaccine-preventable

disease. While best known as a cause of meningitis, widespread blood infection can result in sepsis, which is a more damaging and dangerous condition. Meningitis and meningococcaemia are major causes of illness, death, and disability in both developed and under-developed countries. Meningococcal vaccines have importantly reduced the incidence of the disease in developed countries.

Questions for self-training:

1. Etiology of meningococcal infection.
2. Epidemiology, route of transmission and source of infection of meningococcal infection.
3. Pathogenesis of meningococcal infection.
4. Classification of meningococcal infection.
5. Clinical features of localized forms of meningococcal infection.
6. Clinical features of generalized forms of meningococcal infection (meningococcaemia).
7. Clinical features of generalized forms in meningococcal infection (meningococcal meningitis).
8. Clinical features of generalized forms in meningococcal infection (meningococcal meningoencephalitis).
9. Clinical features of rare forms of meningococcal infection (endocarditis, arthritis, iridocyclitis, pneumonia).
10. Clinical features of meningococcal infection in infants.
11. Complications and sequelae of meningococcal infection.
12. Diagnostic plan of meningococcal infection.
13. Differential diagnosis of meningococcal infection.
14. Treatment of meningococcal infection.
15. Prophylaxis for meningococcal infection.

Classification of Meningococcal Infection

According to clinical peculiarities:

Localized form:

1. Carriers of Neisseria meningitidis
2. Meningococcal rhinopharyngitis

Generalized form:

1. Meningococcaemia;

2. Meningitis, meningoencephalitis;
3. Meningitis and meningococcaemia (mixt form).

Rare forms:

- ✓ Meningococcal endocarditis;
- ✓ Meningococcal arthritis;
- ✓ Meningococcal pneumonia;
- ✓ Meningococcal iridocyclitis.

Based on the duration of the disease:

- fulminant;
- acute (1.5-2 months);
- subacute (3 months);
- chronic (more than 3 months in meningococcaemia in adults).

Based on the evolution of the disease:

- Without complications;
- With complications.

Clinical cases

Task nr.1

A 1-year and 6-months old baby is hospitalized on the second day of illness. A day before his hospital admission he presented a 39.4 °C fever, agitation, bad sleeping. In the morning of the same day, he vomited 4 times. He is transported to hospital by ambulance due to the high fever and seizures.

The clinical assessment shows that the general state of the patient is severe. He is sleepy, his skin is pale, and his neck is stiff (nuchal rigidity). The respiratory frequency is 44 breathes per minute. Kernig's sing and Brudzinski's sign are positive.

Epidemiological anamnesis: The sister goes to the kindergarten where there are cases of meningococcal infection, and during the bacteriological examination of the nasopharynx, meningococcus type B was detected.

Blood test results	CSF analysis results
Hb - 110 g/l	Opening pressure – elevated
RBC – 4.5 $\cdot 10^{12}$/l,	Appearance - cloudy and turbid
WBC- 25.0 $\cdot 10^{9}$/l,	Pleocytosis – 15000 cells/cm^3
SEG - 55 %,	Neutrophils - 99 %
Non-Segmented - 15 %,	Lymphocytes - 1 %
Eosinophils - 1 %,	Proteins – 9.9 g/l
Lymphocytes - 25 %,	Glucose – 1.5 mmol/l
Monocytes - 5 %,	Chloride – 105 mmol/l
ESR - 45 mm/h	

1. Establish and justify the diagnosis.
2. Which are the necessary examinations in order to correctly diagnose the disease?
3. Make a treatment plan for this patient.

Task nr.2

A 4-year-old child is transported by ambulance to the hospital from the kindergarten as during 4 hours he suddenly develops the following symptoms: fever of 39.5 °C, headache, anxiety, photophobia, hyperesthesia. He also has vomited, but this didn't ameliorate his general state. The patient has hyperactive deep tendon reflexes and he presents positive meningeal signs.

1. Which infectious disease do you suspect the patient has? Indicate the first aid measures to be adopted.
2. Create an investigation plan.
3. Prescribe the hospital treatment.

Task nr. 3

On the first day of illness, a 10 months old child presents fever, anxiety, loss of appetite and has vomited 3 times. In the evening the child's fever went up to 38.5 °C and his mother gave him paracetamol. Consequently, the fever went down to 37.8 °C, but on his skin appeared a rash of small bright red and purple spots. The

family doctor assumed that child had developed the same acute respiratory infection as his brother, and the dermatitis was an allergic reaction to paracetamol, thus he prescribed some medications. But during the night the child's general state worsened, the fever went up again, and he had disturbed sleep. In the morning the parents called the ambulance. During the hospital admission his is conscious and presents a fever of 39.5 °C, he is adynamic and has skin hyperesthesia. The cardiac contractions are 92 beats per minute and the BP is 100/60 mm Hg. On the skin of lower limbs and buttock were detected multiple haemorrhagic rashes. The spots have irregular borders varying between 2 to 3 mm and are about 5 to 10 mm in diameter. The meningeal signs are positive. The other body systems present no pathological features.

Epidemiological anamnesis: the patient interacted with his brother who had an acute respiratory infection and is now on the fifth day of disease.

1. Establish and justify the presumptive diagnosis.
2. Make a differential diagnosis.
3. Create an investigation plan.
4. Indicate the treatment.

Task nr. 4

Two days ago, a 6-year-old child who attends kindergarten became ill. He had a fever 38.5 - 39.0 °C, discomfort, sore throat, nasal congestion and a dry cough. On the second day of the disease, he was examined by the family doctor who observed a flushing pharynx and mucopurulent secretions flowing from his nose into the pharyngeal mucosa. The general health state of the child appears severe, presenting loss of appetite, headache, apathy, hyperesthesia, and hypodynamic. The clinical examination shows that the child's general conditions are moderate to severe. He is conscious and has no skin eruptions. The pharyngeal mucosa is hyperaemic presenting a granular appearance. The tonsils are slightly increased, but without deposits. Mucopurulent secretions are running from the nose. The

peripheral lymph nodes, the heart, and lungs are without peculiarities. The liver and the spleen are not palpable. The child's diuresis and stools are normal. He shows neck rigidity, but other meningeal signs are negative.

Epidemiological anamnesis: Six days ago, she was in contact with a child who was hospitalized with diagnosis of meningococcal infection.

Blood test results	**CSF analysis results**
Hb - 120 g/l	Opening pressure – normal
RBC – 3.8 ·10^{12}/l,	Appearance - clear
WBC – 13.0 ·109/l,	Pleocytosis - 6 cells/cm^3 – all are lymphocytes
SEG - 68 %,	Proteins - 0.33 g/l
Non-Segmented - 5 %,	Glucose – 2.5 mmol/l
Eosinophils - 1 %,	Chloride – 120 mmol/l
Lymphocytes - 25 %,	
Monocytes - 6 %,	
ESR - 16 mm/h.	

1. Establish the diagnosis.
2. Create a supplementary investigation plan.
3. Indicate the treatment.

Enterovirus Infection

The human enteroviruses are ubiquitous viruses that are transmitted from person to person via direct contact with virus shed from the gastrointestinal or upper respiratory tract. The nonpolio viruses (group A and B coxsackie viruses, echoviruses, enteroviruses) are responsible for a wide spectrum of diseases in persons of all ages, although infection and illness occur most commonly in infants. Symptoms and signs of non-polio enterovirus infection depend on the virus type and host immune response. Severe infections with non-polio enteroviruses are less common but may cause pericarditis, myocarditis, encephalitis and paralysis.

Questions for self-training:

1. Etiology of enterovirus infection.
2. Epidemiology, route of transmission, source of infection, receptivity and seasonality of enterovirus infection.
3. Pathogenesis of enterovirus infection.
4. Classification of enterovirus infection.
5. Clinical features of meningitis in enterovirus infection.
6. Clinical features of herpangina in enterovirus infection.
7. Clinical features of exanthema in enterovirus infection.
8. Other clinical forms of enterovirus infection.
9. Complications in enterovirus infection.
10. Diagnostic plan of enterovirus infection.
11. Differential diagnosis of enterovirus infection.
12. Treatment of enterovirus infection.

Classification of enterovirus infection

EI affecting the CNS:

- paralytic form (spinal, bulbar, bulbospinal, pontin form);
- aseptic (serous) meningitis;
- encephalitis, meningoencephalitis.

EI affecting the skin and mucosa:

- Herpangina;
- Enteroviral exanthema;
- Vesicular stomatitis;
- Hand-foot-mouth disease;
- Acute haemorrhagic conjunctivitis;
- Catarrhal form (acute rhinitis, laryngitis, pneumonia).

With involvement of muscular system:

- Myocarditis;
- Myalgia;
- Encephalomyocarditis of the new-born.

Other forms:

- Nonspecific febrile illness (summer griper);
- Acute diarrhoea;

- Hepatitis;
- Pancreatitis;
- Orchitis;
- Glomerulonephritis.

Based on the level of severity:

- mild;
- moderate;
- severe.

Clinical cases

Task nr.1

A 6-years-old boy is seen by a doctor at the 3th day of the disease with following complaints: a high fever of 39 °C, loss of appetite, pain when swallowing, general weakness and an episode of vomiting. At the inspection of the skin there are some small macular and pink rashes localised mainly on the face, chest and back. The oropharynx is flushed. On the tonsils and soft palate there are 6 small vesicles and 2 erosions. The submandibular lymph nodes are slightly swollen and sensitive at the palpation. The lung auscultation reveals wheezes. The cardiac sounds are muffled. The pulse is 120/min. The abdomen is painless and soft. The meningeal signs are negative.

1. Formulate the presumptive diagnosis
2. What is your judgment about the differentiated diagnosis?
3. Which laboratory findings are needed to confirm the diagnosis?
4. Elaborate a treatment plan.

Task nr.2

A-8 months-old baby became ill about 3 days ago, and was hospitalized after a visit to the family doctor. The family doctor established the following diagnosis: acute gastroenteritis; acute respiratory infection and allergic dermatitis. During the anamnestic data collection, no peculiarities were to be found. It is known that from the age of 2 months he was fed with artificial milk formulas. We also have found that the baby became ill suddenly, presenting a 39.5 °C fever,

short time seizures, cough and repeated vomiting. He had about 4 or 5 watery stools, but without pathological inclusions. The clinical examination shows that the patient's general condition is severe. He is adynamic and has pale teguments, pale pink maculopapular rash on the face, thorax and abdomen, and rhinitis. The lungs auscultation shows harsh respiration, without rales.

The cardiac sounds are muffled but rhythmic, and the patient has tachycardia. The mouth mucosa is pink and dry. The child also has hyperaemia of the pharyngeal isthmus and two vesicles on the palatine arches. The abdomen is bloated but painless. The liver is 3 cm enlarged, but elastic, smooth, and painless. The spleen is normal. The meningeal signs are negative.

1. Establish the presumptive diagnosis.
2. Make the differential diagnosis.
3. Create an investigation plan.
4. Indicate pre-hospital first aid measures to be put in place.

Task nr.3

During the last 5 days, a-5-years-old child with a Herpangina diagnosis received treatment at home following the family doctor's indications. On the sixth day he developed a fever of 39.0 °C and a headache, he vomited 2 times and he had diarrhoea 5 times without mucus. The mother called the family doctor.

1. Establish the diagnosis.
2. Describe the first aid measures that you would implement if you were the patient's family doctor.
3. Make an investigation plan and describe what results you looking for.
4. Prescribe the patient treatment.

Task nr.4

The patient is an-8-year-old child who grows up and develops normally. He contracted measles at the age of 3 and varicella at the age of 5 years. Currently he is hospitalized with a „flu" diagnosis and he is going through the third day of illness. The main symptoms

he presents are fever, headache, vomiting and sore throat. During the examination, the teguments are hyperaemic, and he has granulations and hyperaemia of the posterior pharynx wall. On the palatoglossal arch can be observed 3 vesicles and 2 erosions. The meningeal signs are positive. During the lumbar puncture the CSF opening pressure was elevated, pleocytosis -326 cells/cm^3, all lymphocytes, glucose and chloride are normal. After the lumbar puncture, the headache and the vomiting disappeared. On the fifth day of illness, the body temperature was normal and meningeal signs were negative.

1. Establish diagnosis and mention the clinical form of the infectious disease.
2. Indicate an investigation plan.
3. Make a differential diagnosis.
4. Indicate the treatment.

Poliomyelitis

Poliomyelitis (polio) is a highly infectious viral disease that largely affects children under 5 years of age. In 1988, the World Health Assembly adopted a resolution for the worldwide eradication of polio, marking the launch of the Global Polio Eradication Initiative. Wild poliovirus cases have decreased by over 99 % since 1988, from an estimated 350.000 cases in more than 125 endemic countries then to 175 reported cases in 2019. Of the 3 strains of wild poliovirus (type 1, type 2 and type 3), wild poliovirus type 2 was eradicated in 1999 and no case of wild poliovirus type 3 has been found since the last reported case in Nigeria in November 2012. Both strains have officially been certified as globally eradicated. As at 2020, wild poliovirus type 1 affects two countries: Pakistan and Afghanistan. In Republic of Moldova the last reported case was in 1991, and in 2000 WHO declared our country free of poliomyelitis.

After the infection a specific immunity is acquired an it lasts the whole life. There is no across immunity between the 3 types of polioviruses. Reinfections are possible because of another type of virus.

In countries with vaccinated population, cases of poliomyelitis may be the following:

1. Poliomyelitis with the wild virus to the not vaccinated children
2. Post-polio syndrome.

The total eradication of the virus is possible if only the vaccination covers 90 % of children under 7 years, with following revaccination according to the national calendar.

Questions for self-training:

1. Etiology of poliomyelitis.
2. Epidemiology, route of transmission, source of infection, receptivity and immunity to poliomyelitis.
3. Pathogenesis of poliomyelitis.
4. Classification of poliomyelitis.
5. Clinical features of poliomyelitis.
6. Clinical forms of poliomyelitis.
7. Clinical features of poliomyelitis in infants and teenagers.
8. Complications of poliomyelitis.
9. Diagnostic plan of poliomyelitis.
10. Differential diagnosis of poliomyelitis.
11. Treatment of poliomyelitis.
12. Specific and nonspecific prophylaxis of poliomyelitis.

Classification of poliomyelitis:

Based on the clinical form:

1. Typical (with CNS disorders):
   - Paralytic polio (1 %);
   - Nonparalytic polio (meningitis) (1 %).
2. Atypical:
   - Asymptomatic (90-95 %);
   - Abortive (4-8 %).

Classification of the paralytic form of poliomyelitis:

- Spinal;
- Bulbar;
- Encephalitic;
- Associated: (bulbo-spinal; ponto-spinal).

Clinical cases

Task nr.1

A 2 years-old boy, not vaccinated, became suddenly ill with high fever of 39.2 °C, nausea, vomiting and being quite restless and capricious. The child was consulted by a family doctor and he received a treatment for a respiratory infectious disease. After 3 days the temperature became normal but some movement problems appeared - the child stopped standing. At the 4th day of the disease the patient was admitted to infectious disease department with an average general condition. The child's conscience was clear. At the inspection of the oral cavity and oropharynx there was a flushing of tonsils and palatal pillars. At the auscultation there was a normal lung sound. The cardiac sounds were muffled. The stools and urination were normal. At the nervous system examination, it was revealed that the active movements of the lower limbs were absent but the passive movements were possible. The muscular tonus was evidently decreased. The tendon reflexes of the legs and the abdominal ones were absent. Sensitivity present in the affected limb. The child needed support while siting. The child was discharged from the hospital at the 50th day of the diseases with a modest and insignificant improvement of his state, this is the reason why the child was transferred to the neurological hospital.

The patient was not VPO vaccinated.

1. Formulate the presumptive diagnosis.
2. Plane of investigation.
3. Make a differential diagnosis.
4. Principals of treatment.

Task nr.2

A 5-month-old baby had the following symptoms: fever of 38 °C for 2 days, psychomotor agitation and cortical hyperexcitability. After 1-week hypotonia and hypokinesia of the right leg appeared. He was hospitalized with the diagnosis of poliomyelitis. The patient was hospitalized on twentieth day of illness. He was active, but had

hypertrophy of right lower limb, areflexia of the right patellar. Meningeal signs were negative.

Epidemiological anamnesis: The child had no contact with poliomyelitis patients, but 20 days ago he was vaccinated with DTP-2.

Results of investigations:

- Hb - 101 g/l; RBC - $4{,}1 \cdot 10^{12}$/l; WBC - $11{,}7 \cdot 10^{9}$/l, SEG - 39 %, Non-Segmented - 2 %; Eosinophils - 1 %; Lymphocytes - 49 %; Monocytes - 9 %; ESR - 12 mm/h.
- *Stool culture for polioviruses - negative.*
- *Serologic analysis:*
  - on the first days: type I- 1:8; type II- 1:8; type III- 1:8.
  - two weeks later: type I- 1:8; type II- 512; type III- 1:8.
- *Neurologist:* the patient has paresis in the right lower limb.
- *X-ray* - normal vertebral column.
- *Electromyography* - anterior spinal cord damage signs.

1. Establish diagnosis.
2. Make a differential diagnosis.
3. Principals of treatment.

Shigellosis

In the pathology of intestinal diseases in children, shigellosis occupies an important place, it affects children of different ages, it is characterized by increased contagiousness and spread, especially in groups for children, giving rise to outbreaks of infection.

Shigellosis is characterized by a complicated etiological structure, it has many ways of spreading, acute, protracted and chronic evolution is possible. The problem of early diagnosis, effective treatment, preventive measures, both in hospital and at home, determines the importance of studying this disease.

Questions for self-training:

1. Etiology of shigellosis.
2. Epidemiology, route of transmission, source of infection of shigellosis.

3. Pathogenesis of shigellosis.
4. Classification of shigellosis.
5. Clinical picture of shigellosis.
6. Atypical forms of shigellosis
7. Clinical features of shigellosis in infants and young children.
8. Complications of shigellosis.
9. Diagnostic plan of shigellosis.
10. Differential diagnosis of shigellosis.
11. Treatment of shigellosis.
12. Prophylaxis for shigellosis.

Classification of shigellosis

Based on the clinical form:

1. Typical;
2. Atypical:
   - asymptomatic;
   - attenuated;
   - food poisoning like;
   - dyspeptic (in infants);
   - hypertoxic.

Based on the level of severity:

- mild;
- moderate;
- severe:
  - ✓ with predominance of toxic syndrome;
  - ✓ with predominance of colitic syndrome;
  - ✓ mixt form.

Criteria of severity:

General:

- Neurotoxic syndrome
- Metabolic syndrome;
- Cardiovascular changes;
- Dehydration syndrome.

Local:

- The appearance of the stool (without feces, with mucus

and blood);
- Permanent abdominal pain, tenesmus;
- Rectal prolapse;
- Frequency of the stool in 24 hours:
  a) mild form - up to 10 stools in 24 hours;
  b) moderate form - up to 10-20 stools in 24 hours;
  c) severe form - more than 20 stools in 24 hours.

Based on the duration of the disease:

- Abortive (2 days);
- Acute (1 month);
- Protracted (prolonged) (2-3 months);
- Chronic (more than 3 months):
  ✓ continued;
  ✓ recurrent.

Based on the evolution of the disease:

- Without complications;
- With complications.

Clinical cases

Task nr.1

A 4-year-old child was admitted to the hospital on the third day of illness presenting a fever of 38.0 °C, fatigue, loss of appetite, repeated vomiting, abdominal pain, tenesmus and 15 episodes of diarrhoea. The patient's skin is pale and presents no rush. He has a coated tongue. His skin pinch goes back quickly. The eyes are normal. He drinks normally, not thirsty. During the lung auscultation the vesicular breathing appears without rales. The cardiac sounds are normal, rhythmic but muffled. The abdomen is soft, painful, sigmoid colon spasms. The liver and the spleen appear normal. The stools are greenish, poor, with blood streaks. The diuresis is normal. Meningeal signs are negative.

1. Establish the presumptive diagnosis.
2. Make an investigation plan.
3. Indicate the treatment.

Task nr.2

A 4-year and 2-month-old child who lives in a community going through a dysentery outbreak, was hospitalized. Shigella sonnei was detected in his stools. About ten days ago, the child had three mushy stools per day. The stools presented no pathologic inclusions. He was afebrile and his general condition was satisfactory general condition. He did not received treatment. Today, the complete blood count and the urinalysis show no peculiarities.

The serologic exam detected on the eighth and sixteenth day of illness Indirect Hemagglutination Reaction (IHR) and Shigella sonnei at 1:200 and 1:400.

1. Establish the diagnosis.
2. Make a differential diagnosis.
3. Indicate the treatment.

Task nr.3

A 2-year-old baby was hospitalized on the first day of illness. The symptoms were a fever of 39.7 °C, chills, nausea, repeated vomiting, abdominal pain and watery stools (16 stools in a 24-hour period). Initially the stools had no pathological inclusions, and only later mucus and blood streaks appeared in the stool. The baby appears apathetic, sleepy and has a suffering face. His skin is pale and cyanotic. His skin pinch goes back slowly, to 2 seconds. The eyes are sunken. He drinks eagerly. The tongue is dry and presents white deposits. The abdomen is soft, but painful during palpation. The sigmoid colon is spasming. The diuresis is normal. Meningeal signs are negative.

1. Establish the presumptive diagnosis.
2. Make a differential diagnosis.
3. Make an investigation plan.
4. Indicate the treatment.

Salmonellosis

In the pathology of small children, salmonellosis occupies an important place, because it is frequently encountered. Salmonellosis is characterized by a very complex etiological structure, multiple ways of contamination and various clinical forms: inapparent, without clinical manifestations, localized and generalized, very severe, with long evolution, especially in young children, in whom they can often cause death.

It is the duty of every doctor to know deeply this disease, its particularities in small children, the prophylaxis of nosocomial salmonellosis.

Questions for self-training:

1. Etiology of salmonellosis.
2. Epidemiology, route of transmission, source of infection of salmonellosis.
3. Pathogenesis of salmonellosis.
4. Classification of salmonellosis.
5. Clinical features of salmonellosis.
6. Atypical forms of salmonellosis.
7. Clinical picture of salmonellosis in new-borns and infants.
8. Complications of salmonellosis.
9. Diagnosis plan of salmonellosis.
10. Differential diagnosis of salmonellosis.
11. Treatment of salmonellosis.
12. Prophylaxis for salmonellosis.

Clinical classification of the Salmonellosis

Based on the clinical form:

1. Typical:
   - **Gastrointestinal forms:**
     - gastritis;
     - gastroenteritis;
     - gastroenterocolitis.
   - **Generalized forms:**
     - septic form;

- typhoid fever.

- **Salmonella carriers:**
  - healthy carriers;
  - temporary and chronic convalescence carriers.

2. Atypical:
   - attenuated;
   - asymptomatic.

Based on the level of severity:

- mild;
- moderate;
- severe.

Criteria of severity:

Depend on:

- the intensity of the general status of the patient and toxic syndrome;
- the degree of the gastrointestinal system disorder;
- the intensity of dehydration syndrome.

Based on the duration of the disease:

- Abortive (7 days);
- Acute (1-1.5 months);
- Protracted (prolonged) (2-3 months);
- Chronic (continues to carry salmonella).

Clinical cases

Task nr.1

A 12-year-old child was admitted to the hospital on the first day of illness with the following symptoms: fever of 39.0 °C, headache, confusion, repeated vomiting (7 episodes), pain in the epigastric region. He had two watery greenish stools, abundant, without mucus and streaks of blood. During examination the child is passive, the skin pale. The tongue coated with white deposit. The cardiac sounds were weakened. The pulse - 136 beats per minute, the BP -70 over 40 mm Hg. He had abdominal distension.

Epidemiological anamnesis: he ate meatballs six hours ago.

Other family members had the same complaints.

1. Establish and explain the presumptive diagnosis, indicate the gravity of the disease.
2. What clinical examinations are required in order to confirm the diagnosis?
3. With which diseases we should make the differential a diagnosis?
4. Indicate the pre-hospital treatment.

Task nr.2

A 3-months-old baby presented a fever of 39.0 °C, vomiting (10 episodes), watery greenish stool with mucus and streaks of blood (12 stools in the last 24 hours). The patient appears aphetic and pale. He has cyanosis of the nasolabial triangle, low skin elasticity. Skin pinch goes back 2 seconds. The eyes sunken. He has dry mouth mucosa and coated tongue. He also had abdominal distension. Hepatosplenomegaly present.

Epidemiological anamnesis: A week ago, in the Infectious Diseases Hospital, the baby interacted with a patient suffering from salmonellosis.

1. Establish and explain the presumptive diagnosis.
2. What clinical examinations are necessary in order to confirm the diagnosis?
3. Prescribe the treatment.

Task nr.3

A 5-month-old child was admitted to the hospital with an acute respiratory infection, bronchopneumonia. He received treatment and his general condition seemed to be normal. On the eighth day of illness, a fever of 38.00 °C appeared, vomiting was 2 times. In the evening of the same day, the child developed diarrhoea with mucus and streaks of blood up to 8 times. The child became restless and lost his appetite.

Epidemiological anamnesis: He shared a hospital room with three other babies. All children under 12 months old.

1. Establish and explain the presumptive diagnosis.

2. What examinations are necessary for confirming the diagnosis?
3. Prescribe the treatment.

Escherichiosis

Escherichiosis are acute infectious diseases caused by diarrheagenic escherichia. It often develops with clinical manifestations of gastroenteritis or enterocolitis and toxic syndrome. Generalized septic forms and extraintestinal localizations (meningitis, pyelonephritis, pneumonia, etc.) are less common. Escherichia have an important place in the series of acute diarrheal diseases, especially in infants and young children. Pathogenic escherichia can determine, depending on the pathogenic properties of the various strains, multiple clinical forms - from mild to very serious forms with severe dehydration and reserved prognosis. For the correct and early establishment of the diagnosis, therapeutic conduct and prophylaxis, every doctor needs deep knowledge of this disease.

Questions for self-training:

1. Etiology of escherichiosis.
2. Epidemiology, route of transmission, source of infection of escherichiosis.
3. Pathogenesis of escherichiosis.
4. Classification of escherichiosis.
5. Clinical features of escherichiosis.
6. Clinical forms of escherichiosis.
7. Clinical picture of escherichiosis in new-borns and infants.
8. Complications of escherichiosis
9. Diagnostic plan of escherichiosis
10. Differential diagnosis of escherichiosis.
11. Treatment of escherichiosis.
12. Prophylaxis for escherichiosis.
13. Signs of dehydration and plan of rehydration:
    - ✓ rehydration plan A;
    - ✓ rehydration plan B;

✓ rehydration plan C.

Classification of Escherichiosis

According to clinical syndromes:

➢ **Gastrointestinal:**

✓ gastroenteritis;
✓ gastroenterocolitis;
✓ enterocolitis.

➢ **Generalized:**

✓ septic,
✓ typhoid,
✓ meningitis,
✓ pyelonephritis,
✓ pneumonia.

Degrees of the severity of the disease:

- mild;
- moderate;
- severe.

Criteria of severity:

General:

- Neurotoxic syndrome;
- Metabolic disorders;
- Cardiovascular;
- Severe dehydration;
- Generalized forms.

Local:

a) stool frequency in a 24-hour period:
   - mild form (5-10 stools);
   - moderate form (10-20 stools);
   - severe form (>20 stools).
b) stool aspect (watery, with mucus/blood);
c) pneumatosis intestinalis;
d) permanent abdominal pain.

Based on the evolution of the disease:

- Without complications;

- With complications;

Clinical cases

Task nr.1

During the same day, a 5-month-old baby has been having 6 or 7 watery and bright-yellow stools. He has a fever of 37.8 °C, vomited 2 times, loss of appetite. He is fussy and thirsty. The objective examination shows a pale skin, sunken eyes, coated tongue, a bloated abdomen. His skin goes back less than 2 seconds.

1. Establish and explain the diagnosis.
2. Indicate the necessary laboratory analysis to be ordered.
3. Indicates appropriate treatment and diet for the patient.

Task nr.2

An 8-month-old baby presents the following symptoms: he has vomited 3 times, temperature of 37.5°C, stools watery, yellowish, 10 times without mucus. During the examination his teguments appear pale but without a rash. The child has sunken eyes and skin pinch goes back less than 2 seconds.

Epidemiological anamnesis: We know that the family has another 3-years-old baby who attends kindergarten. About 3 days ago, this other child, has had 2 or 3 semiliquid stools in a 24-hour period.

1. Establish and explain the presumptive diagnosis.
2. Make a differential diagnosis.
3. In your opinion, where should the patient be treated?
4. Indicate an investigation plan and a treatment plan.

Task nr.3

A 1-year-old baby that was brought to the hospital in a very serious state. He has vomited 2 times and is having watery stools (about 5 or 6 per day). The child's mother gave him probiotic and Paracetamol without the doctor's prescription. On the second day of illness the general condition of the baby became serious. He was sleepy, he had abdominal pain, a fever of 39.0 °C, and poor stools with streaks of blood.

1. Indicate pre-hospital first aid measures to be applied.
2. Establish the presumptive diagnosis. Which anamnestic and objective data may help you to diagnose the disease?
3. Make an investigation plan.
4. Prescribe the treatment.

Acute viral hepatitis in children

Viral hepatitis is a group of diseases which are mainly accompanied with affection of liver. All these human hepatitis viruses are RNA viruses, except for hepatitis B, which are a DNA virus. These viruses cause different clinical forms of hepatitis, from inapparent to the most severe forms. Viral infections are the most important causes of acute hepatic diseases in the world. They consist of systemic infections in which the predominant manifestations are due to hepatic lesion and dysfunction. The term viral hepatitis generally refers to hepatic lesion caused by hepatotropic viruses. Currently known types are A, B, C, D, E, G. Hepatitis viruses cause a diversity of clinical features, which range from a state of asymptomatic infection to acute or fulminant hepatitis; some of the hepatotropic viruses (B, C, and may evolve to chronic disease, hepatic cirrhosis, or hepatocellular carcinoma. Acute viral hepatitis is an important cause of child morbidity. Non-hepatotropic viruses such as mumps, mononucleosis, cytomegalovirus, herpes virus, varicella, rubella, measles, and others can also cause hepatitis. Nowadays, acute viral hepatitis treatment in children is supportive: good hydration, symptom relief, and bed rest, according to the patient's state of health.

Questions for self-training:

1. Etiology of acute viral hepatitis
2. Epidemiology, route of transmission, source of infection and receptivity to acute viral hepatitis.
3. Pathogenesis of acute viral hepatitis.
4. Classification of acute viral hepatitis.
5. Clinical features of acute viral hepatitis

6. Atypical forms of acute viral hepatitis.
7. Clinical picture of acute viral hepatitis in new-borns and infants.
8. Complications of acute viral hepatitis.
9. Diagnostic plan of acute viral hepatitis.
10. Differential diagnosis of acute viral hepatitis.
11. Treatment of acute viral hepatitis.
12. Specific and nonspecific prophylaxis of acute viral hepatitis.

Classification of the acute hepatitis

According to the etiology: A, B, C, D, E, F, G, TTV, SEN-virus.

Based on the clinical form:

1. **Typical;**
2. **Atypical:**
   - anicteric;
   - attenuated;
   - asymptomatic.

Based on the level of severity:

- mild;
- moderate;
- severe;
- malignant.

Based on the duration of the disease:

- acute (3 months);
- protracted (prolonged) (3-6 months);
- chronic (more than 6 months).

Based on the evolution of the disease:

- Benign (cyclic);
- With complications;
- With aggravation and recurrency.

Clinical cases

Task nr.1

At a 5-year-old child, became suddenly ill, with a fever of 37.8 °C and headache. After two days, other symptoms such as the loss of appetite, fatigue, and pain in the epigastric region appeared. The child

was hospitalized on the seventh day of illness. His general conditions were satisfactory. The liver was enlarged by +3.0+3.5+4.0 cm. The sclerae and teguments were moderately icteric. On the eighth day of disease the jaundice disappeared. We know that in the kindergarten he attends has been detected a case of viral hepatitis.

1. Justify and establish the clinical diagnosis.
2. Which laboratory investigations may confirm the diagnosis? Describe which results are you expecting to see?
3. Define the serological profile of viral hepatitis.
4. Indicate the treatment.

Task nr.2

A 4-year-old child was hospitalized on the 4th day of the illness. The disease started acutely with a fever of 39 ºC, which persisted for 3 days. The child complains of headache, nausea, lost appetite, repeated vomiting. On the 4th day of the disease, jaundice of the skin and sclera appeared. Upon admission and during the first 3 days in the hospital, the child was passive and refused food. Jaundice of the skin and sclera with pronounced jaundice, fever 37.5 ºC, repeated vomiting, abdominal pain, hepatomegaly - 3.0+3.0+3.5 cm below the costal edge. Common bilirubin − 127 mmol/l.

1. Establish and justify the clinical diagnosis.
2. Examination plan. Serological profile.
3. Differential diagnosis in the preicteric period.
4. Indicate the treatment.

Task nr.3

An 8-year-old child was hospitalized during his second week of illness. The infectious disease began with fatigue and decreased appetite. After 2 days of illness, other symptoms appeared: abdominal pain, nausea, repeated vomiting and dark urine. Three months ago, the child underwent appendectomy. At the moment of the hospital admission his general state was moderate. He presented apathy, decreased appetite and vomiting. His body temperature was 37.3 °C. The sclera and teguments show a normal colour. The abdomen is

soft and painless. The liver enlarged +2.5+3.0+3.0 cm and firm, the spleen is enlarged by +1.5 cm. The urine has a dark colour.

Biochemical analysis of blood: Bilirubin level - 21 mmol/l; ALAT - 440 U/l: ASAT - 202 U/l: AgHBs - positive.

1. Establish and justify the clinical diagnosis.
2. Evaluate the serological profile.
3. Make a differential diagnosis.
4. Indicate the treatment.

Task nr.4

A 4-month-old child became acutely ill when the mother noticed undigested, whitish liquid stools 4 times a day. Jaundice of the sclera appeared, the intensity of which progressed rapidly.

The mother's pregnancy proceeded normally. The child was born with body mass - 3600 gr. On the 4th day jaundice appeared, which on the 8th day disappeared. He grows and develops according to his age; he was not sick. There is another child in the family, 4 years old, who suffered viral hepatitis (severe form) at the age of 3 months. The patient is incomplete vaccinated.

In the hospital: the child's condition is severe, the consciousness is clear, he is breastfeeding satisfactorily, he vomits 1-2 times a day, he has haemorrhagic eruptions on the lower limbs. The liver is enlarged by +2.5+3.0+3.5 cm, painful, the spleen +2.5 cm.

1. Establish and justify the clinical diagnosis.
2. What other anamnestic data is required?
3. Draw up the laboratory exam schedule and indicate the expected results.
4. Indicate the treatment.

Task nr.5

Child aged 3 months, body weight - 5200 gr, hospitalized in severe condition on the 3rd day of the disease, with complains of: vomiting with „coffee grounds", jaundice of the skin, loss of appetite, fever 38 ºC.

From the life anamnesis: the child had haemolytic disease of the

new-born, in connection with which he received blood transfusions. The child was not vaccinated.

On physical examination: child sleepy, periodically restless. The skin, sclera and buccal mucosa are moderately jaundiced, there are some petechiae on the chest. Vesicular breathing in the lungs. Muffled heart sounds, CF -156/min, BF - 42/min. Abdomen soft, moderately bloated. On palpation, the liver is enlarged by +5.0+5.0+6.0 cm, elastic, painful, the spleen - by 2.0 cm. Liquid stools, greenish, with mucus. Hyperchromic urine.

In the evening: fever 39.6 ºC, haemorrhages appeared at the injection site. Through the nasogastric tube - haemorrhagic elimination. The smell of „raw liver" appeared. Obsessed, poorly reaction to physical examination. Miotic papillae, photoreaction absent. Muscle hypertonia. The size of the liver has decreased till 2 cm, the edge is soft. Bloated abdomen. The stool absent.

- *Biochemical blood analysis:* ALAT - 580 U/l, AST - 420 U/l, Bilirubin - 142 mmol/l.
- *Serological markers:* HBsAg - positive, HBeAg - positive, anti-HBcor IgM - positive.

1. Establish the clinical diagnosis, argue.
2. Specify the clinical form of the disease.
3. What additional investigations are urgently required?
4. Principles of treatment.

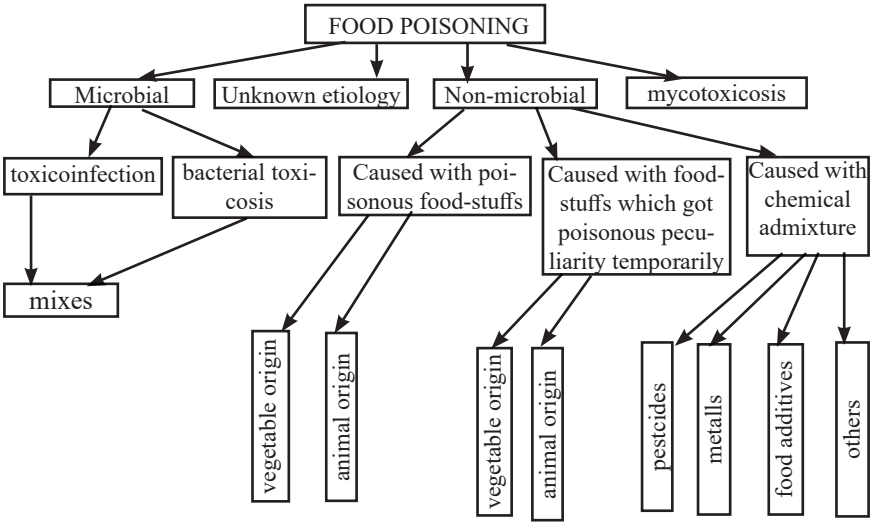
ANNEX 1.

EMERGENCIES IN INFECTIOUS DISEASES IN CHILDREN

1. Neurotoxicosis (Toxic Infectious Encephalopathy)
2. Septic shock (toxic)
3. Severe dehydration (hypovolemic shock)
4. Stenotic laryngotracheitis (viral croup, diphtheria croup)
5. Acute respiratory failure (bronchoobstructive syndrome)
6. Disseminated intravascular coagulation syndrome
7. Gasser haemolytic-uremic syndrome
8. Febrile convulsive syndrome

ANNEX 2

CLASSIFICATION OF FOOD POISONING



Conditionally pathogenic enterobacteria: *Proteus, Cl.perfringhens, Citrobacter, Klebsiella, Edwardsiela, Pseudomonas aeruginosa.*

Bacteria: *Clostridium botuliniim, Stafilococcus aureus.*

Mycotoxicosis: *fungi Fusarium, Asperghillus, Penicilium and others.*

THE USE OF DRUGS IN DIARRHOEA

The antibiotics can be used ONLY in the treatment of patients with dysentery and in case of suspected cholera. In other cases, antibiotics must not be used.

Antiparasitic drugs may be used ONLY in case of: amoebiasis, inefficient treatment in shigellosis, or when trophozoite of *E. histolyticum* are found in stool, including erythrocytes. Also, this type of drugs is used when diarrhoea lasts more than 14 days and cysts or trophozoites of Giardia are found in stool.

Antidiarrheal or antispastic drugs must never be used. None of them represents a valuable practical approach in the treatment of diarrhoea and some of them may be dangerous.

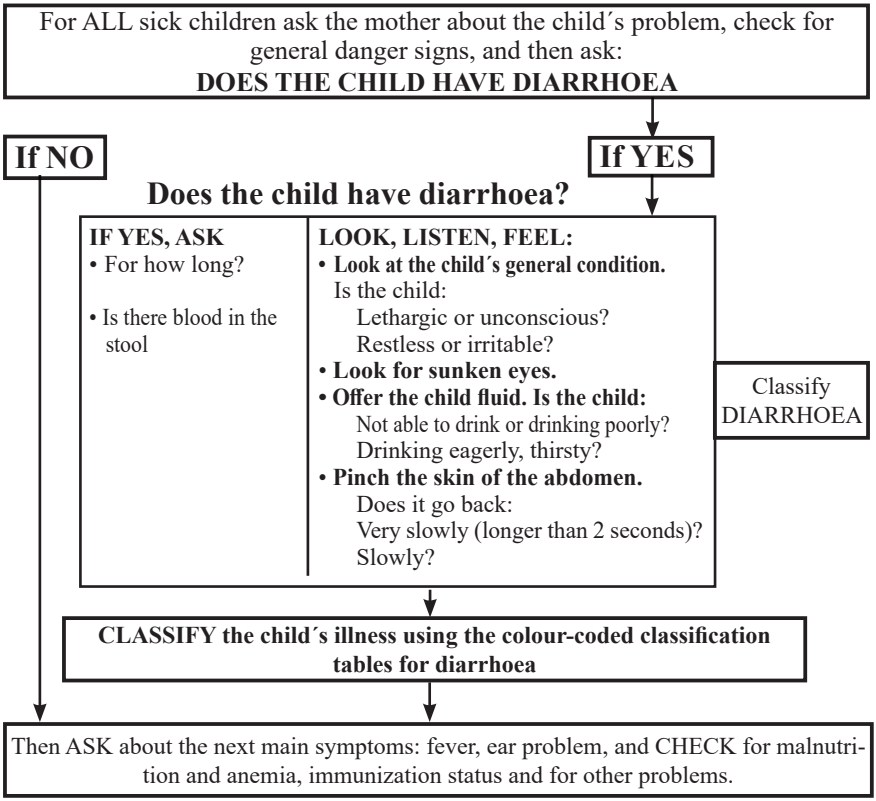
ANNEX 3

CLASSIFICATION OF DIARRHEAGENIC ESCHERICHIA

Category of Escherichia	Variants
Enteropathogenic (EPEC)	(I) - $O_{55,}$ $O_{86,}$ $O_{111,}$ $O_{119,}$ $O_{125,}$ $O_{126,}$ $O_{128ab,}$ $O_{142,}$ (II) - $O_{18,}$ $O_{44,}$ $O_{112,}$ O_{114}
Enteroinvasive (EIEC)	O_{32}; O_{124}; O_{129}; O_{135}; O_{136}; O_{139}; O_{143}; O_{144}; O_{151}; O_{164}; O_{167}
Enterotoxigens (ETEC)	O_1; O_6; O_7; O_8; O_9; O_{15}; O_{20}; O_{25}; O_{27}; O_{63}; O_{78}; O_{80}; O_{85}; O_{115}; O_{139}; O_{148}; O_{159}
Enterohemorrhagic (EHEC)	O_{157}: H_7; O_{103}; O_{111}; O_{145}; O_{26}
Enteroaggregates (EAEC)	O_{78}:H_2; O_{156}

ANNEX 4.

DOES THE CHILD HAVE DIARRHOEA?



Diarrhoea occurs when stools contain more water than normal. Diarrhoea is also called loose or watery stools. It is common in children., especially those between 6 months and 2 years of age. It is more common in babies under 6 months who are drinking cow's milk or infant formulas. Frequent passing of normal stools is not diarrhea. The number of stools normally passed in a day varies with the diet and age of the child. In many regions diarrhea is defined as three or more loose or watery stools in a 24-hour period.

Mothers usually know when their children have diarrhoea. They may say that the child's stools are loose or watery. Mothers may use a local word for diarrhoea. Babies who are exclusively breastfed often have stools that are soft; this is not diarrhoea. The mother of a breastfed baby can recognize diarrhoea because the consistency or frequency of the stools is different than normal.

ASSESSMENT OF THE DIARRHOEA PATIENT FOR DEHYDRATION

1.	**LOOK AT:**			
	CONDITION	Well, alert	***Restless, irritable***	***Lethargic or unconscious; floppy***
	EYES	Normal	Sunken	Very sunken and dry
	TEARS	Present	Absent	Absent
	MOUTH and TONGUE	Moist	Dry	Very dry
	THIRST	Drinks normally, not thirsty	***Thirsty, drinks eagerly***	***Drinks poorly or not able to drink***
2.	**FEEL:**			
	SKIN PINCH	Goes back quickly	***Goes back slowly (<2 sec.)***	***Goes back very slowly (>2 sec.)***
3.	**DECIDE:**			
		The patient has **NO SIGNS OF DEHYDRATION**	If the patient has two or more signs, including at least **one *sign***, there is **SOME DEHYDRATION**	If the patient has two or more signs, including at least **one *sign***, there is **SEVERE DEHYDRATION**
4.	**TREATED**	**Plan A**	**Plan B**	**Plan C**

In adults and children older than 5 years, other *signs* for severe dehydration are *absent radial pulse* and *low blood pressure*. The skin pinch may be less useful in patients with marasmus (severe wasting) or kwashiorkor (severe malnutrition with oedema), or obese patients. Tears are a relevant sign only for infants and young children.

ANNEX 6

CLASSIFICATION TABLE FOR DEHYDRATION AND IDENTIFY TREATMENT

SIGNS	CLASSIFY AS	IDENTIFY TREATMENT **(Urgent pre-referral treatments are in bold print.)**
Two of the following signs: **• Lethargic or unconscious** **• Sunken eye** **• Not able to drink or drinking poorly** **• Skin pinch goes back very slowly**	**SEVERE** DEHYDRATION	➢ If child has no other severe classification: - Give fluid for severe dehydration (Plan C). OR **If child also has another severe classification:** **- Refer URGENTLY to hospital with mother giving frequent sips of ORS on the way.** **Advise the mother to continue breastfeeding** ➢ **If child is 2 years or older and there is cholera in your area, give antibiotic for cholera.**
Two of the following signs: **• Restless, irritable** **• Sunken eyes** **• Drinks eagerly, thirsty** **• Skin pinch goes back slowly**	**SOME** DEHYDRATION	➢ Give fluid and food for some dehydration (Plan B). ➢ **If child also has a severe classification:** **- Refer URGENTLY to hospital with mother giving frequent sips of ORS on the way.** **- Advise the mother to continue breastfeeding** ➢ Advise mother when to return immediately ➢ Follow-up in 5 days if not improving.
Not enough signs to classify as some or severe dehydration	**NO** DEHYDRATION	➢ Give fluid and food to treat diarrhea at home (Plan A). ➢ Advise mother when to return immediately. ➢ Follow-up in 5 days if not improving.

If an episode of diarrhoea lasts less than 14 days, it is **acute diarrhoea**. Acute watery diarrhoea causes dehydration and contributes to malnutrition. The death of a child with acute diarrhoea is usually due to dehydration.

ANNEX 7

CLASSIFICATION TABLE FOR PERSISTENT DIARRHOEA

SIGNS	CLASSIFY AS	IDENTIFY TREATMENT **(Urgent pre-referral treatments are in bold print.**
• **Dehydration present**	**SEVERE ERSISTENT DIARRHOEA**	➢ Treat dehydration before referral unless the child has another severe classification ➢ Refer to hospital
• **No dehydration**	**PERSISTENT DIARRHOEA**	➢ Advise the mother on feeding a child who has PERSISTENT DIARRHOEA ➢ Follow-up in 5 days.

If the diarrhoea lasts 14 days or more, it is persistent diarrhoea. Up to 20 % of episodes of diarrhoea become persistent. Persistent diarrhoea often causes nutritional problems that contribute to deaths in children who have diarrhoea.

ANNEX 8

CLASSIFICATION TABLE FOR DYSENTERY

SIGNS	CLASSIFY AS	IDENTIFY TREATMENT (Urgent pre-referral treatments are in bold print.)
•**Blood in the stool**	**DYSENTERY**	➢ Treat for 5 days with an oral antibiotic recommended for Shigella in your area. ➢ Follow-up in 2 days.

Diarrhoea with blood in the stool, with or without mucus, is called ***dysentery***. The most common cause of dysentery is *Shigella* bacteria. Amoebic dysentery is not common in young children. A child may have both watery diarrhoea and dysentery.

ANNEX 9

PLAN A: TREAT DIARRHOEA AT HOME

Counsel the mother on the 4 Rules of Home Treatment:
Give Extra Fluid, Give Zinc Supplements, Continue Feeding, when to Return

1. GIVE EXTRA FLUID (as much as the child will take**)**

➢ **TEL THE MOTHER:**

- breastfeed frequently and for longer at each feed.
- if the child is exclusively breastfed, give ORS or clean water in addition to breastmilk
- if the child is not exclusively breastfed, give one or more of the following: ORS solution, food-based fluids (such as soup, rise water, and yoghurt drinks). or clean water.

It is especially important to give ORS at home when:

- the child has been treated with Plan B or Plan C during this visit.
- the child cannot retum to a clinic if the diarrhoea gets worse.

➢ **TEACH THE MOTHER HOW TO MIX AND GIVE ORS. GIVE THE MOTHER 2 PACKETS OF ORS TO USE AT HOME.**

➢ **SHOW THE MOTHER HOW MUCH FLUID TO GIVE IN ADDITION TO THE USUAL FLUID INTAKE:**

- Up to 2 years - 50 to 100 ml after each loose stool and between them
- 2 years or more - 100 to 200 ml after each loose stool and between them

Tell the mother to:

- Give frequent small sips from a cup.
- if the child vomits, wait 10 minutes. Then continue, but more slowly.
- Continue aivina extra fluid until the diarrhoea stops.

2. GIVE ZINC SUPPLEMENTS

➢ **TELL THE MOTHER HOW MUCH ZINC TO GIVE:**

- Up to 6 moths - $^1/_2$ tablet per day for 14 days
- 6 months or more - 1 tablet per day for 14 days

➢ **SHOW THE MOTHER HOW TO GIVE ZINC SUPPLEMENTS**

- infants - dissolve the tablet in a small amount of expressed breastmilk, ORS or clean water, in a small cup or spoon
- Older children - tablets can be chewed or dissolved in a small amount of clean water in a cup or spoon

➢ **REMIND THE MOTHER TO GIVE THE ZINC SUPPLEMENTS FOR THE FULL 14 DAYS**

3. CONTINUE FEEDING

4. WHEN TO RETURN

PLAN B - TREAT SOME DEHYDRATION WITH ORS

Give in clinic recommended amount of ORS over 4-hour period

➢ **DETERMINE AMOUNT OF ORS TO GIVE DURING FIRST 4 HOURS.**

AGE*	**Up to 4 months**	**4 months up to 12 months**	**12 months up to 2 years**	**2 years up to 5 years**
WEIGHT	<6 kg	6 - <10 kg	10 - < 12 kg	12-19 kg
ln ml	200-400	400-700	700-900	900-1400

**Use the child's age only when you do not know the weight. The approximate amount of ORS required (in mi) can also be calculated by multiplying the child's weight (in kg) times 75*

- If the child wants more ORS than shown, give more.
- For infants under 6 months who are not breastfed, also give 100-200 ml clean water during this period.

➢ **SHOW THE MOTHER HOW TO GIVE ORS SOLUTION.**

- Give frequent small sips from a cup.
- If the child vomits, wait 10 minutes. Then continue, but more slowly.
- Continue breastfeeding whenever the child wants.

➢ **AFTER 4 HOURS:**

- Reassess the child and classify the child for dehydration.
- Select the appropriate plan to continue treatment.
- Begin feeding the child in clinic.

➢ **IF THE MOTHER MUST LEAVE BEFORE COMPLETING TREATMENT:**

- Show her how to prepare ORS solution at home.
- Show her how much ORS to give to finish 4-hour treatment at home.
- Give her enough ORS packets to complete rehydration. Also give her 2 packets as recommended in Plan A.
- Explain the 4 Rules of Home Treatment:

1. GIVE EXTRA FLUID
2. GIVE ZINC SUPPLEMENTS
3. CONTINUE FEEDING
4. WHEN TO RETURN

} See Plan A for recommended fluids

PLAN C - TREAT SEVERE DEHYDRATION QUICKLY

➢ **FOLLOW THE ARROWS. IF ANSWER IS „YES", GO ACROSS. IF „NO", GO DOWN**

START HERE

Can you give intravenous (IV) fluid immediately? **YES** →

Start IV fluid immediately, If the child can drink, give ORS by mouth while the drip is set up. Give 100 ml/kg Ringer's Lactate Solution (or, if not available, normal saline), divided as follows:

Age	**First give 30 ml/kg in:**	**Then give 70 ml/kg in:**
Infants (under 12 months)	1 hour*	5 hours
Children (12 months up to 5 (years)	30 minutes*	2 ½ hours

** Repeat once if radial pulse is still very weak or not detectable.*

- Reassess the child every 1-2 hours. If hydration status is not improving, give the IV drip more rapidly.
- Also give ORS (about 5 ml/kg/hour) as soon as the child can drink: usually after 3-4 hours (infants) or 1-2 hours (children).
- Reassess an infant after 6 hours and a child after 3 hours.

Classify dehydration. Then choose the appropriate plan (A, B or C) to continue treatment.

NO

Is IV treatment available nearby (within 30 minutes)? **YES** →

- Refer URGENTLY to hospital for IV treatment.
- If the child can drink, provide the mother with ORS solution and show her how to give frequent sips during the trip.

NO

Are you trained to use a naso-gastric (NG) tube for rehydration? **YES** →

- Start rehydration by tube (or mouth) with ORS solution: give 20 ml/kg/ hour for 6 hours (total of 120 ml/kg).
- Reassess the child every 1-2 hours:
- If there is repeated vomiting or increasing abdominal distension, give the fluid more slowly.
- If hydration status is not improving after 3 hours, send the child for IV therapy.
- After 6 hours, reassess the child. Classify dehydration. Then choose the appropriate plan (A, B or C) to continue treatment.

NO

Can the child drink?

NO

Refer URGENTLY to hospital for IV or NG treatment

NOTE:

- If possible, observe the child at least 6 hours after rehydration to be sure the mother can maintain hydration giving the child ORS solution by mouth.

ANNEX 12

Urgent assistance of the patient with generalized MI at the prehospital stage (National clinical protocol „Meningococcal infection in children" in RM)

Suspected case of generalized MI

Meningococcaemia:
fever, signs of general intoxication, haemorrhagic lesions, stellate formations varying in size on the body

(and/or)

Meningitis:
hyperthermia, psychomotor agitation or drowsiness, repeated vomiting, pronounced headache, convulsions, positive meningeal signs

Emergency assistance at the pre-hospital stage performed by the family doctor and/or the ambulance doctor

MI, septic shock, I-II degree:
1. Prednisolone 5-10 mg/kg;
2. Chloramphenicol 25 mg/kg, or Cefotaximum 50 mg/kg per dose;
3. Furosemidum (septic shock I degree) – 1-2 mg/kg;
4. Sol. Metamizoli natrium 50% - 0.1 ml/year of life+sol. Diphenhydraminum 1% - 0.1 ml/year life+sol. Papaverinum 2% - 0.2 ml/year life;
5. Diazepam 0.5% - 0.5-1 mg/kg (in case of convulsions);
6. Oxygen.

MI, acute cerebral edema, I-II degree:
1. Dexamethasone 1-1.5 mg/kg;
2. Chloramphenicol 25 mg/kg, or Cefotaximum 50 mg/kg per dose;
3. Furosemidum – 1-2 mg/kg;
4. Sol. Metamizoli natrium 50% - 0.1 ml/year of life+sol. Diphenhydraminum 1% - 0.1 ml/year of life+sol. Papaverinum 2% - 0.2 ml/year life;
5. Diazepam 0.5% - 0.5 - 1.0 mg/kg (in case of convulsions);
6. Oxygen.

MI, septic shock, III degree and acute cerebral edema, III degree:
1. Prednisolone 10-15 mg/kg up to 20 mg/kg i/v;
2. Dexamethasone 1-1.5 mg/kg (in case of cerebral edema);
3. Intravenous infusions: Sol. Glucosum 10%; Sol. Sodium chloride 0.9%;
4. Dopaminum 5-10 μcg/kg/min (until the stabilization of hemodynamic indices);
5. Chloramphenicol 25 mg/kg per dose every 6 hours;
6. Diazepam 0.5% - 0.5-1.0 mg/kg (in case of convulsions);
7. Furosemidum – 1-2 mg/kg (as needed);
8. Oxygen.

All drugs are administered IV (in the absence of access to the vein – IM)

Urgent transport to the hospital by ambulance (paediatric team resuscitation) after improving the patient's condition

ANNEX 13

SPECIFICATION OF THE HEPATITIS VIRUSES A, B, C, D, E, G

Hepatitis	A	B	C	D	E	G
Family	Picornavirus	Hepadnavirus	Flavivirus	Viroid	Calicivirus	Flavivirus?
Ø	27-32 nm	42 nm	?	36 nm	27-32 nm	?
Nucleic acid	RNA single strand, linear	DNA double strand, circular	RNA single strand, linear	RNA single strand, circular	RNA single strand, linear	RNA single strand, linear
Incubation period (mean)	14-45 d (30 d)	30-180 d (70 d)	14-180 d (50 d)	---[1]	14-60 d (40 d)	?
Transmission - fecal-oral route	yes	no	no	no	yes	no
-blood	no[2]	yes	yes	yes	no[3]	
-vertically	no[2]	yes	yes	yes	no[3]	?
-sexually	no[4]	yes	yes[4]	yes	no[3]	?
Antigens	HAAg	HBsAg, HBeAg	---	HDAg	HEAg	---
Antibodies	Anti-HAV Anti-HAV, IgM	Anti-HBs Anti-HBe Anti-HBc	Anti-HCV Anti-HCV, IgM	Anti-HDV Anti-HDV, IgM	Anti-HEV	---
Fulminant hepatitis	0.001-0.5 %	0.5-1.0 %	0.5-1.0 %	1-3-25%	2% (25%?)	?
Healing acute hepatitis	>99 %	>90 %	10-40 %	50-80 %	>95 %	?
Chronic active hepatitis	0 %	<10 % (0.5%?)	30-90 % (<10 %)	20-50 %	? (<5 %)	yes (?%)
Liver cirrhosis	<0,1%	1%	5-30 %?	10 %?	?	yes (?%)
Active immun.	yes	yes	no	no	no	no
Passive immun.	yes	yes	no	no	no (?)	no

1. The incubation period cannot be ascertained with simultaneous infections because the virus is dependent on HBV-replications. Data on the incubation period with superinfection are inadequate.
2. Parenteral transmission is very rare since only donor's blood contains HAV during a short period of the prodromal phase.
3. No epidemiologic evidence is available here.
4. There has been no proof of sexual transmission so far, but it cannot be ruled out owing to the frequent rate of occurrence in partners of patients with hepatitis A and C.

ANNEX 14

SEROLOGIC MARKERS OF VIRAL HEPATITIS A, B, C, D, E

Hepatitis A	**(Hepatitis A virus, HAV)**
HAAg	Hepatitis A antigen
Anti-HAV	Antibody against HAV
Anti-HAV, IgM	Antibody against HAV (acute infection)
Hepatitis B	**(Hepatitis B virus, HBV)**
HBsAg	Hepatitis B surface antigen
Anti-HBs	Antibody against HBsAg
HBeAg	Hepatitis B antigen (part of the core protein, marker for active replication)
Anti-HBe	Antibody against HBeAg (marker of virus elimination)
Anti-HBc	Antibody against HBcAg (HBcAg: core protein, not demonstrable in the serum)
Anti-HBc, IgM	IgM antibody against HBcAg, signals acute infection. Persistence >6 months indicate chronic hepatitis
HBV-DNA	Hepatitis B virus-DNA (determined with „spot-hybridization" or polymerase chain reaction. Proves active replication)
Hepatitis C	**(Hepatitis C virus, HCV)**
HCAg	Hepatitis C antigen (cannot be measured on account of the low concentration of the viruses in the serum)
Anti-HCV	Antibodies against various proteins of the hepatitis C virus (no uniform nomenclature exists to date)
HCV-RNA	Hepatitis C virus-RNA (measured with polymerase chain reaction and a „pre-linked" reverse transcription - proves active replication of the virus)
Hepatitis D	**(Hepatitis D virus, HDV)**
HDAg	Hepatitis D antigen
Anti-HDV	Antibody against HDV
Anti-HDV, IgM	Antibody against HDV (in acute infection)
Hepatitis E	**(Hepatitis E virus, HEV)**
Anti-HEV	Antibody against HEV

MANAGEMENT ALGORITHM OF HAND

Assessment

Presumptive Diagnosis:
o HFMD
- Fever or history of fever
- Papulovesicular rash on hand and foot with or without oral ulcers

o Herpangina
- Fever or history of fever
- Oral ulcers

Warning Signs of CNS Involvement:
- Fever ≥ 39°C or ≥ 48 hours
- Vomiting
- Lethargy
- Agitation/irritability
- Myoclonic jerks

Absent

Diagnosis

Uncomplicated HFMD/Herpangina Stage (May be sent home

Criteria:
Patients with any of the following and no warning signs:
- o Skin rash
- o Oral ulcers

Laboratory Test:
- o Optional

Treatment:
- o Paracetamol
- o Adequate fluid intake

Monitoring:
- o Educate parents to watch out for warning signs
- o Clinic follow up every 1 – 2 days for the next 7 days (if possible)

HFMD with CNS Involvement Stage (Aseptic Meningitis/Brainstem Encephalitis/Encephalomyelitis) * (Pediatric Ward)

Criteria:
Patients with HFMD/Herpangina and any of the following:
- o Meningism
- o Myoclonic jerks
- o Ataxia, tremors
- o Lethargy
- o Limb weakness

Laboratory Test:
- o Full blood count
- o Blood glucose
- o CSF examination
- o Echocardiography (May be considered)
- o MRI, if needed (CT scan is not recommended)

Treatment:
- o Paracetamol
- o Oxygen
- o Intravenous immunoglobulin (IVIG) * (Recommended in patients with encephalitis plus acute flaccid paralysis; may be considered in patients with brainstem encephalitis)

Monitoring
- o Vital signs
  - To transfer to ICU if resting heart rate >150/min and/or hypertension
- o Myoclonic jerks

Treatment

Monitoring and Reassessment

Laboratory:
Samples for virological investigation (for CNS Involvement Stage, Autonomic Nervous System Dysregulation Stage and Cardiopulmonary Failure Stage):
- Throat Swab
- Vesicles
- Rectal Swab/Stool
- CSF

* Patients with aseptic meningitis generally have a good prognosis, IVIG is not indicated

FOOT AND MOUTH DISEASE

(one or more of the following)

- Limb weakness
- Truncal ataxia
- „Wandering eyes"
- Dyspnea/tachypnea
- Mottled skin

Special Consideration:
- Anxious parents
- From remote area/poor access to healthcare

Present

HFMD with Autonomic Nervous System (ANS) Dysregulation Stage (Pediatric ICU)	HFMD with Cardiopulmonary Failure Stage (Pediatric ICU)
Criteria: Patients with CNS Involvement and any of the following: o Resting Heart rate 150- 170/min o Hypertension o Profuse sweating o Respiratory abnormalities (tachypnea, labored breathing) **Laboratory Test:** o Full Blood Count o Blood glucose o CSF examination o Arterial blood gas o Echocardiography o Chest X-ray **Treatment:** o Judicious intravenous fluid therapy o Consider early intubation** o IVIG o Inotropes: • Dobutamine • Milrinone **Monitoring** o Vital signs o Central venous pressure o Arterial blood gases o Echocardiography	**Criteria:** Patients with ANS Dysregulation and any of the following: o Hypotension/Shock o Pulmonary edema/hemorrhage o Heat failure **Laboratory Test:** o Full blood count o Blood glucose o Arterial blood gas o Echocardiography o Chest X-ray o Blood culture (if septicemic shock cannot be excluded) **Treatment:** o Judicious intravenous fluid therapy o Mechanical ventilation o Inotropes: Milrinone, Dobutamine, (Dopamine or epinephrine is not recommended) o IVIG may be considered if not previously used **Monitoring** o Vital signs o Central venous pressure o Arterial blood gases o Echocardiography

**Indications: Persistent and frequent myoclonus, persistent tachycardia, respiratory abnormalities, hypoxemia, fluctuating oxygen saturation level, poor tissue perfusion, altered sensorium

ANNEX 16

CLASSIFICATION OF ENTEROVIRUS INFECTION (by Harrison's)

MANIFESTATIONS COMMONLY ASSOCIATED WITH ENTEROVIRUS SEROTYPES		
MANIFESTATION	**SEROTYPE(S) OF INDICATED VIRUS**	
	COXSACKIEVIRUS	**ECHOVIRUS (E) AND ENTEROVIRUS (Ent)**
Acute hemorrhagic conjunctivitis	A24	E70
Aseptic meningitis	A2, 4, 7, 9, 10; B1-5	E4, 6, 7, 9, 11, 13, 16, 18, 19, 30, 33; Ent70, 71
Encephalitis	A9; B1-5	E3, 4, 6, 9, 11, 25, 30; Ent71
Exanthem	A4, 5, 9, 10, 16; B1, 3-5	E4-7, 9, 11, 16-19, 25, 30; Ent71
Generalized disease of the newborn	B2-5	E4-6, 7, 9, 11, 14, 16, 18, 19
Hand-foot-and- mouth disease	A5, 7, 9, 10, 16; B1, 2, 5	Ent71
Herpangina	A1-10, 16, 22; B1-5	E6, 9, 11, 16, 17, 25; Ent71
Myocarditis, pericarditis	A4, 9, 16; B1-5	E6, 9, 11, 22
Paralysis	A4, 7, 9; B1-5	E2, 4, 6, 9, 11, 30; Ent70, 71
Pleurodynia	A1, 2, 4, 6, 9, 10, 16; B1-6	E1-3, 6, 7, 9, 11, 12, 14, 16, 19, 24, 25, 30
Pneumonia	A9, 16; B1-5	E6, 7, 9, 11, 12, 19, 20, 30; Ent68, 71

ANNEX 17

CLINICAL STAGES AND CHARACTERISTIC OF PARALYSIS IN POLIOMIELITIS

Clinical stages of poliomyelitis (incubation period – 5-35 days)
1. Minor illness (2-3 days) 2. Latency period (3-5 days) 3. Mayor illness: ✓ preparalytic phase (1-2 days) ✓ paralytic phase 4. Recovery stages 5. Stage of sequelae 6. Post poliomyelitis syndrome (20-40 years after initial episode of poliomyelitis.
Characteristic of paresis/paralysis in poliomyelitis:
➢ damage of the peripheral motoneurons; ➢ are flaccid; ➢ diminution or absence of tendon reflexes; ➢ diminution or loss of muscle tone; ➢ are usually asymmetrical and predominantly affects the proximal parts of the extremities; ➢ decline or no active movement (partial or complete degeneration reaction); ➢ the affected limbs are usually cold and cyanotic; ➢ muscular atrophy of definite muscular groups, and contractures and deformities of the limbs and trunk; ➢ disturbance of sensitivity is not characteristic!!!

ANNEX 18

PRACTICAL SKILLS

1. Examination of the child with infectious diseases
2. Determination of meningeal signs in children
3. Rash characteristic in various eruptive infectious diseases
4. Pharyngeal changes in various infectious diseases
5. The nature of feces in children with in acute diarrheal diseases, viral hepatitis and other infectious diseases
6. Degree of dehydration in infants and young children in acute diarrheal diseases
7. Establishing and argumentation of the early diagnosis of infectious diseases in children
8. Formation of the home health care plan
9. Laboratory investigations plan for children with infectious diseases main (specific) methods of diagnosis
10. Interpretation of the results of biological blood tests, CSF, bacteriological examination, virological examination, serological reactions
11. Treatment of the patient with infectious diseases at home and in the hospital
12. Emergency care at the pre-hospital stage in infectious diseases in children (hyperthermic syndrome, convulsive syndrome, acute cerebral edema, septic shock, viral croup, diphtheria croup, bronchoobstructive syndrome)
13. Oral rehydration therapy (plan A, B), intravenous (plan C)
14. Gastric lavage in children
15. Duration of isolation of children with infectious diseases at home and in the hospital.

GLOSSARY

Abortive: an infection in which some or all viral components have been synthesized but no infective virus is produced. The situation may result from an infection with defective viruses or because the host cell is not permissive and prohibits replication of the particular virus. Also called non-productive infection.

Acute: 1) about a pain - intense, sharp, violent; 2) about a disease - that has a short evolution and intense clinical manifestations: (examples: acute appendicitis); 3) evolution (1-1.5 months).

Adenophlegmon: acute inflammation of a gland and the adjacent connective tissue.

Anamnesis morbi: put details about the first manifestations of the disease, complaints, symptoms and signs of illness in a chronological order. Note disease development up until the moment of patient's examination, also the sequence and intensification of symptoms. Not to forget negative symptoms or symptoms which at first seem irrelevant to the clinical diagnosis. Describe the patient´s functional status since the beginning of the disease, also the treatment and laboratory-instrumental examination done so far. If possible, include the results (use patient´s medical documentation, if necessary). Describe under what circumstances and how the patient was taken to the hospital (by ambulance).

Anamnesis vitae: is past medical history of the patient in infancy, childhood, adolescence, and adult. The information obtained during collecting of the anamnesis vitae is very important for understanding of character, cause, and conditions of the disease onset. The history of the patient´s life consists of four elements: 1) social anamnesis, 2) familial anamnesis, 3) anamnesis of previous diseases and 4) anamnesis of pernicious habits. Describe the patient´s lifestyle and nature of occupation, length of working under some sort of

special conditions. Note the main diseases that have occurred in the patient´s family and what illnesses do the patient´s close relatives suffer from. Name what diseases the patient has had previously, describe exposition to pernicious factors at workplace. Describe the patient´s conditions of life, leisure activities and pernicious habits. All of the aforementioned information must be arranged chronologically and quantitatively.

Anamnesis/History: anamnesis is the information that originates from an earlier time in the patient´s life and regards the patient´s health problem as a whole. The anamnesis helps guide diagnostics and treatment of the patient.

Antidiarrhoeal drugs: drugs that are claimed to stop or decrease diarrhoea, such as antimotility drugs. These drugs are not useful for children with diarrhoea. Some are dangerous.

Asymptomatic form: there are no symptoms. The patient has the disease but no symptoms.

Attenuated („fruste form"): in medicine, is an atypical or attenuated manifestation of a disease or syndrome, with the implications of incompleteness, partial presence or aborted state.

Barky cough: croup is a common viral illness in children. The virus causes swelling of the throat, including the larynx (around the vocal cords) and the trachea (windpipe, or air passage from the throat to the lungs). The swelling in the throat can change your child's voice and cause a harsh, „barky" cough.

BCG: an immunization to prevent tuberculosis, given at birth.

Bowel: intestine.

Carriers: a human or animal organism that harbours pathogenic microbes, usually in one of the body's natural cavities, constituting,

at the same time, a permanent source of infection.

Classify: to select a category of illness and severity (called a classification) based on a child's signs and symptoms.

Clinical diagnosis: based on the collected clinical information: anamnesis, physical examination, laboratory and instrumental examination results, severity of the disease, complications of concomitant diseases.

Colitis: inflammation of the large intestine (the colon).

Communication skills: skills used in teaching and counselling with mothers, including: ASK AND LISTEN, PRAISE, ADVISE, AND CHECK UNDERSTANDING.

Computed Tomography (CT): a computerized X-ray imaging procedure in which a narrow beam of X-rays is aimed at a patient and quickly rotated around the body, producing signals that are processed by the machine's computer to generate cross-sectional images - or "slices" - of the body. These slices are called tomographic images and contain more detailed information about the internal organs than conventional X-rays.

Congenital malformation: A physical defect present in a baby at birth that can involve many different parts of the body, including the brain, heart, lungs, liver, bones, and intestinal tract. Congenital malformation can be genetic, it can result from exposure of the fetus to a malforming agent.

Congenital rubella syndrome (CRS): is an illness in infants that results from maternal infection with rubella virus during pregnancy. When rubella infection occurs during early pregnancy, serious consequences such as miscarriages, stillbirths, and a constellation of severe birth defects in infants.

Contagious: A communicable disease that can spread rapidly from person to person through direct contact (touching a person who has the infection), indirect contact (touching a contaminated object), or droplet contact (inhaling droplets made when a person who has the infection coughs, sneezes, or talks).

Contraindication: a situation or condition in which a certain treatment, procedure or drug should not be used.

Coughing fits: these coughing fits are much more serious than a prolonged session of coughing when the body tries to rid itself from phlegm present in the respiratory passages. The coughing fit is so intense that when the child coughing tries to draw an inward breath, the air rushes in with a whooping sound, hence the name „whooping cough".

Croup syndrome: swelling in the airways and problems breathing. Children with croup often have a high-pitched „creaking" or whistling sound when breathing in. This is called stridor.

Deficiency: a lack or shortage. Vitamin A deficiency is a shortage of vitamin A in the body.

Dehydration: loss of a large amount of water and salts from the body.

Differential diagnosis: that is, developing a list of the possible conditions that might produce a patient's symptoms and signs - is an important part of clinical reasoning. It enables appropriate testing to rule out possibilities and confirm a final diagnosis.

Dysentery: diarrhea with blood in the stool, with or without mucus.

Electrocardiogram (ECG or EKG): records the electrical signals in the heart. It's a common and painless test used to quickly detect heart problems and monitor the heart's health.

Electroencephalography (EEG): the recording of electrical activity along the scalp resulting from current flowing within the neurons of the brain. EEG can be used to diagnose epilepsy and other disorders associated with altered brain electrical activity.

Encephalitis: inflammation of the brain.

Epicrisis/patient's summary: short, straight to the point overview of the case history (diagnosis and its brief explanation, overview of treatment, prognosis regarding future performance at work and regarding the course of the disease based on diagnosis and severity of disease, and other recommendations for aftercare).

Epidemiological anamnesis: includes a set of information about the patient, the team, which he associated with its activities, and the areas where there could be infection. This information is used for the diagnosis, determine the sources of infection and ways of its transmission and the choice of measures, excluding its further spread.

Epistaxis: nose bleeding.

Etiology: the cause, set of causes, or manner of causation of a disease or condition.

Exclusive breastfeeding: giving a child only breastmilk and no additional food, water, or other fluids.

Extrapharyngeal form (extrabuccal): is characterized by a short-term incubation period, the absence of mild tonsillitis, the rash appears near the portal of entry, it is more intensive there: burn, injury, puerperal.

Feverish: a slight fever.

Focus of infection: center of an inflammatory process, place where pus collects; place from where infection-causing microbes can spread.

Fontanelle: the soft spot-on top of a young infant's head, where the bones of the head have not come together.

Haemorrhagic form: in medicine, loss of blood from damaged blood vessels. A haemorrhage may be internal or external, and usually involves a lot of bleeding in a short time.

Human pathogen: is a pathogen (microbe or microorganism such as a virus, bacterium, prion, or fungus) that causes disease in humans.

Hypertoxic form: the peculiarity of the clinical course hypertoxic forms of diseases can be explained by non-specific sensitization of the organism and massive toxin formation.

Hypothermia: low body temperature (below 35,5 °C axillary or 36 °C rectal temperature.

Hypoxia: a condition in which too little oxygen is reaching the organs of the body.

Immune suppression: weakening of the immune system so that the body has little resistance to disease.

Immune system: the system that helps the body resist disease by producing antibodies or special cells to fight disease-causing agents.

Immunity: is body's ability to recognize germs to prevent them from causing illness. The immune system's job is to help identify and eliminate dangerous germs that enter the body before they can cause disease or damage.

Immunization status: a comparison of a child's past immunizations with the recommended immunization schedule. Immunization status describes whether or not a child has received all of the immunizations recommended for his age, and, if not, what immunizations are needed now.

Infant: a baby up to age 12 months.

Initial visit: the first visit to a health worker for an episode of an illness or problem.

Iridocyclitis: is a type of anterior uveitis that involves the iris and ciliary body. It is a leading cause of visual impairment in many people. Symptoms include pain and redness in the eye, increased sensitivity to light, and blurry vision.

Jaundiced: having a yellow colour in eyes and skin.

Koplik spots: spots that occur in the mouth inside the cheek during the early stages of measles. They are small, irregular, bright red spots with a with spots in the center. They do not interfere with drinking or eating and not need treatment.

Kwashiorkor: a type of protein-energy malnutrition due to lack of protein in the diet. A child with kwashiorkor has oedema, which may cause his limbs to appear puffy, sparse hair and dry scaly skin.

Laboratory-instrumental examination: laboratory tests, bacteriology, virusology, serology tests, radiology, endoscope, ECG (EKG), EEG, CT, etc.

Latent: of a quality or state existing but not yet developed or manifest; hidden; concealed.

Local infections: infections located only in a specific place on the body.

Malignant: tending to spread and result in death.

Marasmus: a type of protein-energy malnutrition due to long-term lack of calories and protein.

Meningitis: a dangerous infection in which the spinal fluid and

the membranes surrounding the brain and spinal cord become infected.

Meningococcaemia (meningococcal septicemia): the clinical form of meningococcal infection caused by Neisseria meningitidis when bacteria enter the bloodstream and multiply, damaging the walls of the blood vessels.

Mitigated: milder form of the disease with slightly expressed symptomatology and small rashes is called measles mitigated. Such measles is possible only in persons who passed vaccination or immunization, and also in babies who not up to the end have (incompletely) lost maternal antibodies. Mitigated measles most often develops in the people who received the immunoglobulin injection (during the incubation period) made after contact to the patient.

Moursou's sign - inflammation of the parotid duct orifice (Stenson's).

Mouth ulcers: sores on the inside of the mouth and lips or on the tongue. They make it difficult to eat or drink.

Myocarditis: inflammation of the heart muscle.

Nasogastric (NG) tube: a tube inserted through a patient's nose to his stomach and may be used to give ORS solution to severely dehydrated patients when IV therapy is not available, or to feed a severely child who cannot eat.

National Immunization Program: aims to increase national immunization coverage to help reduce vaccine-preventable diseases. The program provides free essential vaccines to protect the public against a range of diseases.

Objective examination: the patient must be examined according to the principles acquired previously in internal medicine propae-

deutics. Pathologic changes have to be described thoroughly and it is also necessary to include the description of negative objective findings (e. g a feature of the disease the patient does not have). Describe the patient´s general condition (contact, consciousness, behaviour, position of the patient in bed or any other prominent features). The results of visual examination, palpation, percussion and auscultation should be classified based on organ systems. The description must be thorough enough to give cause for primary diagnosis.

Oedema: swelling from excess fluid under the skin.

OPV: oral polio vaccine.

Oral Rehydration Salts (ORS): a mixture of glucose and salts conforming to the WHO recommended formula. Solution for prevention and treatment of dehydration from acute diarrhoea, cholera, etc.

Pathogen: is any organism or agent that can produce disease.

Pathogenesis: is studying how a disease infects an individual after exposure.

Pathophysiology: is studying the resulting effects and symptoms due to the disease.

Pericarditis: inflammation of the outer lining sac of the heart.

Pneumatosis intestinalis (PI): is defined as the presence of gas bubbles within the intestinal wall, mostly located in the mucosa or submucosa.

Premature: born early, before 37 weeks of pregnancy.

Presenting complaints: this should include all chief complaints, symptoms and signs of the disease.

Primary diagnosis: is a hypothesis which relies on anamnesis

and information acquired through objective examination. The validity on the hypothesis shall be verified with analyses and/or tests in order to reach a clinical diagnosis. There may be several primary hypotheses in the beginning but during further diagnostics the unsuitable ones are to be eliminated. In this part of the academic case history the primary diagnosis or several primary alternative hypotheses have to be substantiated by gathered anamnesis and information acquired through objective examination.

Probiotics: are live microorganisms that provide improvement or restoration of intestinal flora.

Prognosis: two aspects: 1) prognosis of the clinical diagnosis in all its aspects (regarding recovery, healing, working capacity, life, etc.) and the clinical course (good, bad, pessimistic, hopeless) in theory; and 2) the probable prognosis for this particular patient in all of the above aspects with explanations.

Protracted evolution (prolonged): 2-3 months.

Pustule: a reddish bump on the skin containing pus.

Radial pulse: the pulse felt over the radial artery, which is the main vessel at the wrist on the outside of the thumb.

Recommendations: advice, instructions that should be followed.

Recurrent convulsions: spasms or fits that occur repeatedly.

Respiratory distress: discomfort from not getting enough air into the lungs.

Semi-solid food: food that is part solid and part liquid. A soft, wet food such as gruel or porridge is semi-solid.

Septicaemia: an infection of the blood, also called „sepsis”.

Shock: a dangerous condition with severe weakness, lethargy, or unconsciousness, cold extremities, and fast, weak pulse. It is caused by diarrhoea with very severe dehydration, haemorrhage, burns, or sepsis.

Signs: physical evidence of a health problem which the health worker observes by looking, listening, or feeling (fast breathing, chest indrawing, sunken eyes, stiff neck, pus draining from ear, etc.)

Source of infection: is defined as „the person, animal, object or substance from which an infectious agent passes or is disseminated to the host."

Stable: staying the same rather than getting worse.

Stupor: refers to a state in which a person is almost unconscious, and their thoughts are not clear: losing consciousness.

Sunken eyes: are usually a result of dehydration.

Symptoms: health problems reported by the mother such as cough, diarrhoea, ear pain, etc.

Tenesmus: a clinical symptom, where there is a feeling of constantly needing to pass stools, despite an empty colon.

Teratogenic factors: induce congenital malformations are termed the „teratogenic factors"; they include infectious, physical, chemical, hormonal, and maternal health factors.

Trenant evolution: which unfolds slowly.

Urgent: requiring immediate attention, important to save a child's life.

Vulnerable: endangered, likely to become ill.

Young infant: a baby age 1 week up to 12 months.

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