MINISTERUL SĂNĂTĂŢII DIN REPUBLICA MOLDOVA
UNIVERSITATEA DE STAT DE MEDICINĂ ŞI FARMACIE
NICOLAE TESTEMIŢANU

CATEDRA BOLI INFECŢIOASE

FACULTATEA DE EDUCAŢIE CONTINUĂ
ÎN MEDICINĂ ŞI FARMACIE

BOLI INFECŢIOASE LA COPII

PRACTICAL GUIDE FOR INTERNATIONAL STUDENTS

INFECTIOUS DISEASES IN CHILDREN

Chişinău 2015

Introduction

It is during early childhood that children tend to be more affected by infectious diseases, in particular, by acute intestinal infections and upper respiratory system infections. Although in recent years the morbidity and mortality caused by infectious diseases decreased, their incidence remains an actual problem in medicine. On average, from 10 visits to the family doctors, about 7-8 cases correspond to infectious diseases in children.

Most of the children with infectious diseases are treated at home. It is the family doctor's duty to timely diagnose the diseases and indicate the necessary treatment, and when required, apply the outbreak anti-epidemic measures, and 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 accumulate the theoretical knowledge in the field of infectious diseases in children and an understanding of the particular epidemiology of the diseases during their individual study of the recommended material and additional literature, as well as during lectures.

The medical practice and the necessary maneuvers 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 specimens;
- Immunization calendar in the Republic of Moldova (2016-2020);
- Self-training schemes;
- Maneuver;
- Bibliography.

Diphtheria

Diphtheria is a severe and widespread infectious disease. It has epidemic potential, but thanks to 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 are 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.
2) Secondary prevention of the spread by the rapid investigation of close contacts, ensuring their proper treatment.
3) Tertiary prevention of complications and deaths by early diagnosis and proper management.

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

Questions for self-training:

1. The etiology of diphtheria
2. The epidemiology, route of transmission and source of infection in diphtheria.
3. The pathogenesis in diphtheria.
4. The classification of diphtheria.
5. Clinical picture of localized forms in diphtheria.
6. Clinical picture of generalized forms in diphtheria.
7. Clinical picture of diphtheria in new-borns and infants.
8. Complications in diphtheria.
9. The diagnostic in diphtheria.
10. The differential diagnosis of diphtheria.
11. The treatment in diphtheria.
12. Specific and nonspecific prophylaxis in diphtheria.

Classification of clinical forms of diphtheria

Frequent clinical forms:

1. Diphtheria of nasopharynx and tonsil;
2. Diphtheria of larynx and trachea;
3. Diphtheria of front department 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.

The classification of tonsillar and pharyngeal diphtheria

1. Localized (catarrhal, insular, membranous);
2. Spread form;
3. Toxic form:
    - I degree,
    - II degree,
    - III degree,
4. Hypertoxic;
5. Hemorrhagic form;
6. Gangrenous form;
7. Associated (pharynx+eyes+nose+larynx, and others).

Clinical cases

Task nr.1

A ten-year-old child became ill, has a fever of 37.5°C, complains about moderate aches in the pharyngeal isthmus, and has difficult and painful swallowing. On the second day of illness, the temperature is 37.8°C, and the pharyngeal isthmus is hyperemic. 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 tonsils bleeds. Membranes do not deform due to friction between the two blades. 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.
5. When can the patient be discharged from the hospital?

Task nr.2

A four-year-old child became suddenly ill with a fever of 39.0°C, has a headache and painful swallowing. On the second day of the disease, he visits the doctor. During the examination the child appears pale and adynamic. The submandibular lymph nodes are enlarged and sensitive during palpation, he has a foul-smelling mouth and a cervical edema. The pharyngeal isthmus and the tonsils are hyperemic, covered by a thick fibrous membrane which extends on the uvula, the pillars and the posterior wall of the pharynx. Except for weakened heart sounds, 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

A18-month-old toddler became suddenly ill, has a fever, a dry cough and hoarseness. Gradually, the baby becomes agitated, querulous, has frequent, **barky cough* and loss of voice. During examination perioral cyanosis and intercostal retractions are detected. The respiratory frequency is 56 per minute, the cardiac contraction frequency is 100 per minute, the breathing through the nose is free. The auscultation of the lungs detects harsh breathing and unique rales. 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.

From the patient's past medical history *(Anamnesis vitae)* we learn that he is vaccinated against BCG and HVB-1. Periodically the patient contacts infectious respiratory diseases (about 3 recorded episodes) and there is a recorded case of diarrhea. We also know that about five or six days ago he was in contact with an adult with angina.

* *Additional signs and symptoms of laryngitis in infants or children are associated with croup and include a hoarse barky cough and fever.*

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 septicemia. Nowadays, as a result of using antibiotics in the treatment of this infectious disease, contributed to low cases of scarlet fever, without early or late complications and with easy and atypical forms of illness.

Questions for self-training:

1. The etiology of scarlet fever.
2. The epidemiology, route of transmission and source of infection in scarlet fever.
3. The pathogenesis in scarlet fever.
4. The classification of scarlet fever.

5. Clinical picture of localized forms in scarlet fever.
6. Clinical picture of generalized forms in scarlet fever.
7. Clinical picture of scarlet fever in infants.
8. Complications in scarlet fever.
9. The diagnostic in scarlet fever.
10. The differential diagnosis of scarlet fever.
11. The treatment in scarlet fever.
12. The prophylaxis in scarlet fever.

Classification of clinical forms of Scarlet Fever

Based on the type of disease:

1. Typical:
2. Atypical
    - Attenuated -"frust[1] form";
    - Extrapharyngeal form (extrabuccal forms) - they are 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;
    - Malignant: hypertoxic; hemorrhagic.

Classification of severity:

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

Severity Criteria:

• *General:*

- Neurotoxic syndrome;
- Metabolic-Vegetative syndrome;
- Hemorrhagic syndrome;
- Early septic manifestations.

• *Local:*

- Streptococcal tonsillitis- follicular or necrotic;
- Adenophlegmon[2];
- Hemorrhagic rash, epistaxis[3].

Classification based on the evolution of the disease:

- Abortive[4];
- Acute and recurrent;
- Without complications and allergic episodes;
- With complications and allergic episodes;
- With allergic episodes.

With complications:

- Toxic;
- Septic;

- Allergic.

[1]In medicine, a *fruste form* (French, “crude, or unfinished, form”; pl., forms frustes) is an atypical or attenuated manifestation of a disease or syndrome, with the implications of incompleteness, partial presence or aborted state.

[2]*Adenophlegmon*- Acute inflammation of a gland and the adjacent connective tissue;

[3]*Epistaxis*- nosebleeding;

[4]*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 nonpermissive and prohibits replication of the particular virus. Also called nonproductive infection.

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 symptoms he showed 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 blotches that join together to form pink/red areas. The child has petechial rash and white discontinuous dermographism. We also observe a marked and delimited erythema of pharyngeal mucosa, whilst the tonsils are “clean”. His tongue presents abundant deposits that desquamate/exfoliate at the apex and the edges. The other body systems show no pathological features.

**join up with the meaning to <u>unite</u>, to confluate ,or to <u>connect.</u>*

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

An 8-year-old child became suddenly ill with fever 40.0^0C, has vomited many times in 24 hours, slept badly and felt delirious. At the hospital admission, fever was 40.0^0C, 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 cream-colored deposits. Pulse - 160/min, weakened heart sounds, blood pressure -110/70 mmHg. Painless abdomen, urine is dark yellow, meningeal signs are absent.

1. Establish clinical diagnosis addicted to illness classification.
2. Indicate treatment at the pre-hospital stage.
3. Mention severity signs of the disease.
4. Prescribe treatment.

Task nr.3

A 7-year-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, hyperemia and small maculopapular rashes around it, that spread moderately to the trunk. Right inguinal lymph nodes are enlarged, about 1,0*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.

In the Republic of Moldova there is an increasing risk of a measles widespread because of the intense migration of the population. In our country the main guidance document for doctors is the Ministry of Health Ordinance nr. 37 from January 23rd 2006, which contains strategies of prevention of both measles and rubella. Routine measles vaccination for children, combined with mass immunization campaigns in countries with low routine coverage, are key public health strategies to reduce global measles deaths.

Questions for self-training:

1. The etiology of measles.
2. The epidemiology, route of transmission and source of infection in measles.
3. The pathogenesis in measles.
4. The classification of measles.
5. Clinical picture of measles.
6. Clinical picture of measles in infants, adults, pregnant.
7. Complications in measles.
8. The diagnostic plan in measles.
9. The differential diagnosis in measles.
10. The treatment in measles
11. The prophylaxis in measles.

Classification of clinical forms of Measles

Based on the clinical form:

1. Typical;
2. Atypical:
   - *asymptomatic;*
   - *abortive*[1]*;*
   - *mitigious*[2]*;*
   - *toxic;*
   - *hemorrhagic;*
   - *bronchial (dyspneic).*

Classification by severity degree:

- mild;
- moderate;
- severe.

Severity Criteria to be considered:

- ***General:***
  - central nervous system damage (general poisoning signs, repeated vomiting, hallucinations, consciousness disorders);
  - Croup syndrome - Laryngotracheal stenosis;
  - Bronchoobstructive syndrome.

- ***Local:***
  - The number of eruptive elements and their size;
  - The nature of the eruptions (hemorrhagic, cyanotic shade).

Classification by the course of the disease:

- Smooth (uncomplicated);
- Not smooth, uneven (complicated).

* *abortive*[1]- 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 nonpermissive and prohibits replication of the particular virus. Also called nonproductive infection.

**mitigious*[2]- 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 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.

Clinical cases

Task nr.1

A 5-year-old child is considered sick about 5 days, with fever, rhinitis with abundant serum eliminations. A dry cough that becomes wet in some days. In the 4^{th} day of the disease appeared a maculopapular rash on the face and neck. In the 2^{nd} day, the rash expanded on the thorax. At the 5^{th} day of illness child's general status was serious, with fever 39.2^0C, dyspnea, edematous face, pasty eyelids, hyperemic conjunctiva. Mucopurulent secretions from the nose, productive cough. On the unchanged background of the skin of face and trunk are detected abundant, confluent, velvety, red maculopapular exanthema. Hyperemic and edematous mouth mucosa. On the posterior wall of the pharynx and uvula are observed bleeding elements, gums hyperemia, and edema. Lungs auscultation - harsh breathing, dry and humid rales of varying caliber. There aren't pathological modifications from the cardiovascular and digestive system. Meningeal signs are negative. Epidemiological anamnesis – the child is not vaccinated. Two weeks ago when he attended kindergarten there was a child with the same symptoms who were treated at home.

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

Task nr.2

A mother with her 2-year-old child visits the doctor because for the last three days the toddler has been sick. After examining the child, the doctor diagnosed him with a typical form of measles. Consequently, the child was hospitalized.

1. Which piece of information is helpful in establishing the diagnosis in this case?
2. Which investigations may confirm the clinical diagnosis?
3. With which diseases can we make the differential diagnosis?

4. Which are the hospitalization criteria?

Task n.3

A 10-year-old child has been ill for about 4 days, with a fever of 38°C, a cough and nasal secretions. On the third day of the disease on his skin appeared a small maculopapular rash that does not merge together. The submandibular and cervical lymph nodes are slightly enlarged. The lungs auscultation detects dry rales. The abdomen is soft and painless; the liver is 2 cm below the costal margin. From the epidemiological anamnesis we learn that a month ago the child came into contact with a patient with hepatitis A, and received Gamma-Globulin. Other epidemiological information is unknown.

1. Which piece of information is crucial in establishing the diagnosis?
2. Which investigations may confirm the clinical diagnosis?
3. With which diseases can we make the differential diagnosis?
4. Which are hospitalization criteria?

Rubella

Rubella is a contagious disease spread across the world particularly affecting children. 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.

Questions for self-training:

1. The etiology of rubella.
2. The epidemiology, route of transmission and source of infection of rubella.
3. The pathogenesis of rubella.
4. The classification of rubella.
5. Clinical picture of rubella.
6. Clinical picture of rubella in pregnancy and congenital rubella.
7. Complications in rubella.
8. The diagnostic plan in rubella.
9. The differential diagnosis in rubella.
10. The treatment in rubella
11. The prophylaxis in rubella.

Clinical cases

Task nr.1

A 5-year-old child who attends kindergarten is considered ill about 3 days with general symptoms like *_feverish_, mild rhinitis, insignificant cough. During the examination, the family doctor observed small pink macula, more spread on the spine, buttocks and extensor limb surfaces. Occipital and laterocervical lymph nodes are enlarged, mobile, painless. The oropharyngeal mucosa is with mild diffuse hyperemia. Other systems - without pathological features.

*_feverish- a slight fever_

1. Establish and explain the diagnosis.
2. Develop a differential diagnosis.
3. Make an investigation plan.
4. How should the test results look like in order to confirm the diagnosis?
5. Prescribe the appropriate treatment.

Task nr.2

Ten days ago, a 9-year-old child developed an acute respiratory infection. He has a mild catarrh (a coryza), and one day he noticed on his body the presence of a pink and punctiform rash causing no pruritus. The disease evolved without a fever and after 4 days of illness, the child went back to school.

On the morning of the fifth day, he complained of a headache. He had a fever of 39.0°C, he also had vomited 2 times and had 2 watery stools, but without any pathological inclusions. In the evening of the same day, he experienced generalized seizures and was transported by ambulance to the hospital.

1. Establish and explain the presumptive diagnosis.
2. List which anamnestic and clinical data is necessary for a correct diagnosis.
3. With which diseases we must do firstly a differential diagnosis?
4. Create an investigation plan.
5. Which is the indicated pre-hospital first aid procedure to follow? Which drugs should be prescribed and in which doses?
6. Prescribe the treatment the patient must follow in 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 her second pregnancy. We know that she was not vaccinated against rubella, and we don't know if she already has had the disease.

1. Explain which signs helped in diagnosing rubella.
2. List the necessary investigations for confirming the diagnosis.

3. What is the correct approach the doctor should suggest regarding the patient and his mother in this case?
4. Which are the specific prophylaxis strategies against rubella? Please refer to the vaccination and immunization terms as they are defined in the National Immunization Program.

Herpetic Infection (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 globally. An estimated 417 million people aged 15-49 (11%) worldwide have HSV-2. Most oral and 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. The etiology in HI.
2. The epidemiology, route of transmission, source of infection, receptivity and immunity in HI.
3. The pathogenesis in HI.
4. The classification of HI.
5. Clinical picture of HI.
6. Clinical forms of HI
7. Complications in HI.
8. The diagnostic plan in HI.
9. The differential diagnosis in HI.
10. The treatment in HI.
11. The prophylaxis in HI.

Classification of the Herpetic Infection

By etiology:

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

By clinical course:

- First episode or primary HI;

- Herpetic Recurrence;
- *Latent*[1] (Latency) HI.

Based on the localization of the process:

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

Mucocutaneous HI:

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

Rare forms:

- Herpetic eczema Kaposi-Juliusberg (Kaposi syndrome);
- Herpetic associated erythema multiform;
- Herpetic whitlow *(herpetic panaritium),* and on the palm of the hand*;*
- Herpes gladiatorum (common among wrestlers).

Based on the type of the diseases:

- Typical;
- Atypical:
    a) Hemorrhagic;
    b) Hemorrhagic necrosis;
    c) Edematous;
    d) Abortive[2];
    e) Disseminated;
    f) Migratory;
    g) Zosteriform HI.

** Latent[1]HI- of a quality or state) existing but not yet developed or manifest; hidden; concealed.*

* *abortive*[2]- 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 nonpermissive and prohibits replication of the particular virus. Also called nonproductive infection.

Based on the disease's severity:

- mild;
- moderate;
- severe.

Severity Criteria to consider:

- Related to on 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 5-year-old child suddenly became ill, he has anorexia and hypersalivation. He appears anxious, cries all the time and has a fever of 38-39°C. In the morning he is visited by the family doctor who finds that the child has „a clean" skin on the mucosa of the checks. On the gums there are small groups of vesicles, erosions and his aphthae are covered with white-cream color sediments. The child's cervical lymph nodes are enlarged, and they hurt. The other body systems present no pathological features. We know that a week ago his mother had a herpetic eruption on her lips.

1. Establish the correct diagnosis and explain your position.
2. Indicate the treatment.
3. What recommendations would you give to the mother's child about how she should care for him in this period?

Task nr.2

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. Is it appropriate to treat the patient in this department?
3. If not, where he must be isolated?
4. Indicate the treatment for the patient.
5. During his stay in the hospital, the patient interacted with other children.

Task nr.3

An 8-month old infant suddenly became ill. He has a fever of 39°C and anorexia. In the last 24 hours he had diarrhea two times. A week ago, he contracted an acute respiratory infection with his mother. In the same period his grandmother developed a herpetic eruption on her lips. On the second day of the disease, as a result of hyperthermia he developed tonic-clonic seizures. The seizures lasted from1 to 3 minutes. The baby was hospitalized in the Infectious Disease Children's

Hospital in the Intensive Care Department. On the fourth day of illness his complete blood count showed the presence of leukocytosis together with neutrophilia and lymphopenia. The cerebrospinal fluid is clear, the lymphocytes level is 600 per cm^3, unit erythrocytes, the protein level is 0,52 g/l. Glucose and chlorine levels were normal. The PCR of cerebrospinal fluid (CSF) detected HSV type 1. Specific antibodies like Ig M and Ig G were not detected. On the fifth day of disease, the CT scan showed low-intensity herpes outbreaks in the temporal and frontal lobes.

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

Varicella (Chickenpox) and Herpes Zoster (shingles) Infection

Varicella zoster virus or varicella-zoster virus (VZV) is one of eight herpes viruses known to infect 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. VZV enters through the respiratory system. Having an incubation period of 10–21 days, averaging at 14 days, targeting the skin and peripheral nerve, the period of illness is from 3 to 4 days. 1–2 days before the rashes appear, is when this virus is the most contagious. Some signs and symptoms are vesicles that fill with pus, rupture, and scab before healing. Lesions tend to stay towards the face, throat, and lower back sometimes on the chest and shoulders. Shingles usually stay located around the waist.

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. In Ramsay Hunt syndrome, VZV affects the geniculate ganglion giving lesions that follow specific branches of the facial nerve. Symptoms may include painful blisters on the tongue and ear along with one sided facial weakness and hearing loss. If infected during initial stages of pregnancy severe damage to the fetus can take place. Reye's syndrome can happen after initial infection, continuous vomiting and shows signs of brain dysfunction: extreme drowsiness or combative behavior. In some cases, death or coma can follow. Reye's syndrome mostly affects children and teenagers, using aspirin during infection can increase this risk.

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.

Varicella Classification

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

By severity of the disease:

- mild;
- moderate;
- severe.

By the course of the disease:

- With complications;
- Without complications.

Severity Criteria:

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-year-old child who attends kindergarten presents with fever of 37.2°C. He has maculopapular and vesicular rashes on the surface of his skin, but the skin appears unchanged. The next day, the number of eruptions on his skin increased, and the fever was 37.8°C. More eruptions were observed on the child's scalp and he has two open sores on the buccal mucosa.

1. Establish and explain the clinical diagnosis.
2. Make a differential diagnosis with other diseases.
3. Prescribe the treatment for the patient.
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 the night shift noticed on the child's scalp, trunk, upper and lower limbs pink color macule about 3-4 mm in diameter. It is known if the child has ever contracted infectious diseases.

1. Which disease do you suppose it could be?
2. Which information may confirm the diagnosis?
3. Indicate the treatment for the patient.

Task nr.3

A 10-years-old child was hospitalized in the Infectious Disease Children's Hospital with a fever of 39.0°C. He was diagnosed with Viral Hepatitis. On the first day he had a fever of 39.0°C, itching, and pain in the left inferior intercostal region. On the second day, the general condition of the child became more serious. He had a fever of 39.5°C, headache and weakness. He also had grouped herpetiform vesicles of about 3-5mm developing on an erythematous base.

1. Establish and justify the clinical diagnosis
2. Create an investigation plan.

3. With which disease you should make differential diagnosis?
4. Indicate the treatment.

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 1960s. 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 in mumps.
4. Classification of mumps.
5. Clinical picture of parotitis in patients with mumps.
6. Clinical picture of pancreatitis in patients with mumps.
7. Clinical picture of orchitis in patients with mumps.
8. Clinical picture of meningitis in patients with mumps.
9. Clinical picture of mumps in pregnant women, newborns, infants and adults.
10. Complications of mumps.
11. Diagnostic plan of mumps.
12. Differential diagnosis of mumps.
13. Treatment of mumps
14. Prophylaxis for mumps.

Mumps Classification

Based on the type of disease:

1. **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).

2. Atypical

- asymptomatic;
- attenuated ("form frust"[1])

[1]In medicine, a *form frust* (French, "crude, or unfinished, form"; pl., forms frusts) is an atypical or attenuated manifestation of a disease or syndrome, with the implications of incompleteness, partial presence or aborted state.

Based on the level of severity:

- mild;
- moderate;
- severe

Severity Criteria:

- ***General indicators:***
  - *CNS disorder* (intoxication syndrome, with affection of the meninges and encephalic tissue);
  - *Height and duration of the fever*

- ***Local one:***
  - Affecting not only of the salivary glands but also other organs such as the pancreas, or gonads;
  - The degree of parotid gland swelling:
    a) 1st degree – the swelling of the parotid gland is assessed only by palpation;
    b) 2nd degree - the swelling of the parotid gland is assessed visually and by palpation;
    c) 3rd degree - the swelling of the parotid gland is accompanied by cervical oedema.

Mumps Course:

- Cyclic, without complications;
- With complications.

Clinical cases

Task nr.1

A 7-year-old child has a fever of 38.0°C, tiredness and 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, sensible and elastic. The skin where the painful swelling appeared was bright (or shiny), of a normal color. Moursou's sign was positive. Other changes were not observed.

* *Moursou's sign* - inflammation of the parotid duct orifice.

1. Establish and justify 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 repeated vomiting. From the patient's *Anamnesis Morbi* we know that infection started with a fever of 38.0°C and tiredness. On the second day, a swelling in the right parotid gland appeared, and on the third day, another swelling appeared 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 serious and he was hospitalized. During the hospital admission the general state of the child appears serious, he is sleepy and pale.

We notice that the parotid gland is swollen on one or both sides of the face, elastic and painless. The skin in this region is of a normal color. Moursou's sign is positive on both sides and the oral mucosa is dry. There is no modification to the isthmus of the pharyngeal. The child is able freely to breathe through his nose. The lung auscultation shows normal breathing without rales. The cardiac contractions are rhythmic and clear. During palpation the abdomen is soft. The child feels pain in the left hypochondrium and the epigastric region. The liver and the spleen are enlarged. The child has been constipated for the last three days. Brudzinski's sign is positive. We know that the child attends a kindergarten where in last 3 weeks a case of mumps was detected.

* *Moursou's sign* - inflammation of the parotid duct orifice.

1. Establish and justify the presumptive diagnosis.
2. List the necessary investigations to be run in order to confirm the etiologic treatment.
3. Prescribe the treatment.
4. Which are the disease-specific precautions to be put in place?

Task nr. 3

A 10-year-old child presents with fever of 39° C, fatigue, headache and repeated vomiting. Due to his state, the patient and was transported by ambulance to the hospital. During the hospital admission the child's general status appears serious, he reports phonophobia and photophobia. The oral mucosa is clear and pink and there are no deposits on the tonsils. He breathes through is nose normally and the lymph nodes are normal, too. The lungs auscultation showed vesicular respiratory sounds without rales. The cardiac contractions are rhythmic but weakened. The

abdomen is soft and painless; the liver and the spleen are normal. The child present meningeal signs such as the Kernig's sign and neck rigidity. The spinal tap (Lumbar puncture) detected a clear and colorless cerebrospinal fluid and an elevated opening pressure. The levels of glucose and chlorine are normal. The proteins level is 0.033 g/l, the neutrophils level is 10%, the lymphocytes level is 90% and the pleocytosis level is 325 cells/mm^3.

1. Establish and justify the presumptive diagnosis.
2. Which clinical data may confirm the etiologic diagnosis?
3. Name other localizations where the infection may occur.
4. Where should the child receive treatment, at home or in the hospital?
5. 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 display 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. Children are vaccinated at 2, 4 and 6 months of age and are given a booster at 4-5 years.

Questions for self-training:

1. Etiology of pertussis.
2. Epidemiology, route of transmission and source of infection in 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. The diagnostic plan of pertussis.
9. The differential diagnosis of pertussis.
10. The treatment of pertussis
11. The prophylaxis for pertussis.

Clinical classification of the Whooping Cough

Based on the type of the disease:

1. **Typical;**
2. **Atypical:**
    - asymptomatic;
    - attenuated;
    - abortive[1].

* *abortive*[1]- 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 nonpermissive and prohibits replication of the particular virus. Also called nonproductive infection.

Based on the level of severity:

- mild;
- moderate;
- severe.

Severity Criteria:

• *Coughing fits*[1] *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 edema 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 apnea;

• 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 hematological modifications.

Classification based on the course of the disease:

- Cyclic, without complications;
- With complications.

**Coughing fits*[1]- 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”.

Clinical cases

Task nr.1

A 5-year old child has a wet coughing fits and a low-grade fever of around 37.3°C to 37.5°C. He had a short-term seizure. He has been vomiting and he doesn't recognize his mother. During the inspection the doctor observes that that general state of the child is serious. He is pale, has a bulging fontanelle. His neck is rigid, and he is in a *stupors state*. The Brudzinski's sign is positive. His pulse is 100 beats per min., the BP is 130 over 70 mm Hg. The respiratory frequency is 46 breathes per min. The internal organs present no pathologies.

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

1. Which is the main conclusion that we can make in this case? Which is the presumptive diagnosis?
2. Indicate the laboratory tests necessary to confirm the diagnosis.
3. Elaborate a treatment plan.

Task nr.2

A 4-year-old child 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 hyperemia, accumulation of viscous sputum in pharynx, and a fever of 38°C. Before manifesting these symptoms, he developed cyanosis and apnea. At the moment of the hospital admission it is observed that the child is in a serious state, having lost 5600 gr of his weight. He developed cyanosis around the mouth, his respiration frequency is 40 breathes per minute and he is apathetic. His rhythmic cardiac contraction is 140 beats per minute, the BP (blood pressure) is 100 over 60 mm Hg. He has a bulging anterior fontanelle and a soft abdomen. He liver is found to be +1.5 cm and the spleen +0.5 cm. He had 2 normal stools in the last 24 hours.

1. Establish and justify the presumptive diagnosis.
2. Indicate the necessary laboratory investigations that may confirm the etiologic diagnosis.
3. Make a differential diagnosis.
4. Indicate the treatment of this patient.

Task nr.3

A 4-year-old child presents a frequent dry cough. His general state is normal and has a low-grade fever of around 37.2°C to 37.5°C. During the first 7 to10 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. It's known if the child was against the whooping cough. He received a DTP 1,2,3 vaccines but he didn't receive a booster vaccine.

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

FLU (Influenza) and Acute Respiratory Infections (ARI)

Flu-like illnesses and acute 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 immune resistance weakens causing complications and superinfections that can lead to death. Thus, the ability to timely diagnose influenza and a acute respiratory infections, 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 newborns, infants and vaccinated children.
8. Complications of influenza.
9. Diagnostic plan of influenza.
10. Differential diagnosis of influenza.
11. Treatment of influenza
12. Prophylaxis for influenza.

Parainfluenza

1. Etiology of parainfluenza.

2. Epidemiology, route of transmission, source of infection, receptivity and immunity to parainfluenza.
3. Pathogenesis of parainfluenza.
4. The classification of parainfluenza.
5. Clinical picture of parainfluenza
6. Clinical syndromes in parainfluenza.
7. Complications in parainfluenza.
8. The 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.

Infection with respiratory syncytial virus (VSRI)

1. Etiology of VSRI.
2. The epidemiology, route of transmission, source of infection, receptivity and immunity to VSRI.
3. Pathogenesis of VSRI.
4. Classification of VSRI.
5. Clinical picture of VSRI.
6. Clinical syndromes of VSRI.
7. Clinical picture of VSRI in newborns and premature infants
8. Complications of VSRI.
9. The diagnostic plan of VSRI.
10. The differential diagnosis of VSRI.
11. The treatment of VSRI.
12. The prophylaxis for VSRI.

Classification of Acute Respiratory Infections

Depending on etiology:

1. Influenza;

2. Parainfluenza;
3. Adenovirus infection;
4. Respiratory syncytial virus (RSV).
5. Rhinovirus infection;
6. Reovirus;
7. Enteroviral infection;
8. Coronavirus infection;
9. Mycoplasmosis;
10. Bacterial ARI (pneumococcus, streptococcus, Haemophilus influenzae);
11. Associated ARI (virus-bacteria, virus-viral, virus-mycoplasma).

Based on the type of the disease:

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

Based on the severity of the disease:

- mild;
- moderate;
- severe.

Severity Criteria depends by the degree of:

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

Classification based on the course of the disease:

- Without complications;
- Undulant / cycling evolution;
- With complications.

Types of Influenza/FLU

- Type A, A_0, A_1, A_2;
- Type B;
- Type C.

Based on the type of the disease:

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

Main flu syndromes:

- neurotoxic syndrome;
- catarrhal respiratory syndrome;
- asthmatic (bronchial obstruction syndrome);
- croup syndrome;
- abdominal syndrome;
- hemorrhagic syndrome;
- producing changes to the lung segments.

Based on the severity of the disease:

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

Flu Severity Criteria:

The severity of the disease is determined by the degree of:

- neurotoxicity;
- laryngeal stenosis;
- respiratory insufficiency;
- multiorgan disorders.

The course of the flu:

- without complications;
- with complications (such as pneumonia, otitis, encephalitis, serous meningitis, myocarditis, neuritis, polyradiculoneuropathy, purulent laryngotracheitis).

Parainfluenza classification

Based on the type of the disease:

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.

The course of Parainfluenza:

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

Classifications of the Adenoviral Infection

Depending on the type of the disease:

- Typical (with conjunctivitis);
- Atypical (without conjunctivitis).

Clinical Syndromes of the adenoviral infection:

- Neurotoxic syndrome;
- Catarrhal upper respiratory syndrome;
- Rhino pharyngoconjunctivitis;
- Pseudomembranous conjunctivitis;
- Conjunctivitis and adenoviral keratoconjunctivitis;
- Pharyngoconjunctival fever;
- Pharyngotonsillitis.

Other syndromes:

1. Croup syndrome;
2. Bronchial obstruction syndrome
3. Abdominal or diarrheic syndrome;
4. Interstitial adenoviral pneumonia.

Course of the disease:

- With complications;
- Without complications.

Classification of the Respiratory syncytial virus (RSV)

Depending on the type of the disease:

1. Typical;
2. Atypical.

Clinical syndromes:

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

Based on the degree of severity:

- mild;
- moderate;

- severe.

Based on the disease Course/ Evolution:

- without complications;
- with complications.

Clinical cases

Task nr.1

A 2-year-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°C fever, rhinitis, productive cough, edema and hyperemia of the left eyelid. The child's general state is deemed medium. He has face edema and conjunctivitis. The pharyngeal isthmus and his tonsils are hyperemic, and there also hyperemia on the posterior pharynx. The lymphoid follicles are swollen, and the lymph nodes a little enlarged. The lungs auscultation showed harsh breathing with wet rales. The liver is +2.5 cm, and the spleen +1.5 cm. The patient had diarrhea 4 times in the last 24 hours without inclusions.

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

Task nr.2

An an-8-year-old child who attended school the day before the first illness symptoms appeared, a fever of 37.5-38,0°C, apathy, dry to hoarse barky cough, runny nose and hoarseness. Rhinoscopy detects edema and hyperemia of the nasal mucosa and of the pharyngeal isthmus. Immunofluorescence detected influenza virus antigens.

1. Establish and justify the presumptive diagnosis.
2. Make a differential diagnosis.
3. Which clinical and laboratory data may confirm the diagnosis?
5. 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 symptoms observed are hyperemia of the face, epistaxis, subconjunctival hemorrhage and seizures that last of a short time. The objective assessment of the patient shows that the general status of the patient is severe. Paleness and a bilateral subconjunctival hemorrhage are observed. The lungs auscultation detects harsh breathing,

and multiple dry and wet rales. The cardiac sounds are weakened, the pulse is 140 beats per minute, the BP (blood pressure) is 130 over 70 mm Hg. The abdomen is soft; the liver dimension is around +1.5 to 2.0 cm. The spleen is not palpable, and the diuresis is normal. From the patient's medical history, we learn that the child had febrile seizures two times when the fever reached 39.5°C. We also know that he developed meningitis when he was 7 months and that he is not DTP-vaccinated.

1. Establish and justify the presumptive diagnosis.
2. Decide a plan of investigation to confirm the etiological diagnosis.
3. Note any changes in the patient's blood analysis during the course of the disease.
4. Which are peculiarities of this case?
6. Indicate the treatment.

Task nr. 4

A five years old child suddenly becomes ill, he has a fever of 39.6ºC, adinamy and a headache. Three hours later, the child starting vomiting and his general condition worsened. He loses consciousness and he develops seizures. The child is transported by ambulance to the hospital. It emerged that five days ago he interacted with another patient with fever and cough. During the hospital admission the general conditions of the child are very severe. The patient is unconscious, present a fever of 40.0°C, has pale skin without a rash, and cyanosis in the lips.

Convulsion occur regularly. The nasal secretion is absent, but the patient shows scleral injection. The pharynx is hyperemiated. Also, the child has a very pronounced dyspnea, 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 diminished. The heart rate is 165 beats per minute, BP is 75 over 50 mm Hg.

Neurological status: the meningeal signs are positive.

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.5

A six years old child has been ill for 3 days developing acute symptoms such as fever of around 37.5°C to 38.5°C, rhinitis, cough, edema and a hyperemia of the left eye eyelid. We know that the child attends kindergarten. The physical examination of the child shows that his general state is moderate, presenting swollen face and abundant eliminations from the nose. The eyelid of the left eye is edematous, the conjunctiva is hyperemiated, granulated and slightly swollen. The pharynx

and the palatine tonsils are also hyperemiated. The tumefaction of the lymphoid follicles in the posterior wall of the pharynx is also observable. The lymph nodes are slightly swollen. The lung auscultation lungs shows rough breathing combined with unique dry rales. The liver is enlarged by 2.5 cm bellow the right costal margin and the spleen is enlarged by 1.5 cm below the left costal margin. The child had two liquid stools without any pathological inclusions.

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 in Children

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 meningococcemia are major causes of illness, death, and disability in both developed and under-developed countries. Meningococcal vaccines have sharply 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 picture of localized forms of meningococcal infection.
6. Clinical picture of generalized forms of meningococcal infection (meningococcemia).
7. Clinical picture of generalized forms in meningococcal infection (meningococcal meningitis).
8. Clinical picture of generalized forms in meningococcal infection (meningococcal meningoencephalitis).
9. Clinical picture of rare forms of meningococcal infection (endocarditis, arthritis, iridocyclitis, pneumonia).
10. Clinical picture of meningococcal infection in infants.
11. Complications and sequelae of meningococcal infection.
12. Diagnostic plan of meningococcal infection.
13. The differential diagnosis of meningococcal infection.
14. The treatment of meningococcal infection
15. The prophylaxis for meningococcal infection.

Classification of the Meningococcal Infection in Children

According to clinical peculiarities:

Localaized form:

- Nasopharyngitis;
- Carriers of Neisseria meningitidis.

Generalized form:

Frequent:

- Meningococcemia;
- Meningitis, meningoencephalitis;
- Fulminant form;
- Meningitis + meningococcemia.

Atypical form:

- Meningococcal endocarditis;
- Meningococcal arthritis;
- Meningococcal pneumonia;
- Iridocyclochorioiditis.

Based on the severity of the disease:

- mild;
- moderate;
- severe;
- fulminant form.

***Based on the duration of the disease*:**

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

Based on the course of the disease:

- Without complications, cyclic;
- With recurrence and aggravations;
- With complications.

Clinical cases

Task nr.1

A 1-year and 6-month baby was 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 vomited 4 times. Today was transported to hospital by ambulance due to the high fever and

seizures. From his **EA* we learn that his elder sister attends kindergarten and she was in contact with a patient with a meningococcal infection. Moreover, two days ago her nasopharyngeal culture detected meningococci. We also know that the child has never developed other infectious diseases. The objective assessment shows that the general state of the patient is serious. He is sleepy, his skin is pale, and his neck is rigid. The respiratory frequency is 44 breathes per minute. Both Kernig's sing and Brudzinski's sign are positive.

Blood test results	**CSF analysis results**
*Hb -110 g/l	Opening pressure – elevated
*RBC - 4,5 10^{12}/l,	Appearance - cloudy and turbid
* WBC- 25,0 10^{9}/l,	Pleocytosis – 15000 cells/cm^3
SEG- 55%,	Neutrophils - 99%
Non-Segmented - 15%,	Lymphocytes - 1%
Eosinophils- 0 %,	Proteins - 9,9g/l
Lymphocytes- 25 %,	
Monocytes- 5 %,	
* *ESR* - 45 mm/h.	

**EA (epidemiological anamnesis); *Hb-hemoglobin, *White blood cells (WBC), *Red blood cells (RBCs), *ESR (erythrocyte sedimentation rate),* CSF (cerebrospinal fluid).*

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.
4. Which peculiarities of vaccinated children?

Task nr.2

A 4-year-old child was transported by ambulance to the hospital from the kindergarten as 4 hours ago he stated to develop the following symptoms: fever of 39.5°C, headache, anxiety, photophobia, hyperesthesia. He also 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-year-old child presents fever, anxiety, loss of appetite and has vomited 3 times. The patient interacted with his brother who has an acute respiratory infection and is now on the fifth day of disease. 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 an ambulance. During the hospital admission his is conscious and presents a fever of 39.5°C, adynamy and skin hyperesthesia. The cardiac contractions are 92 beats per minute and the BP is100 over 60 mm Hg. On the skin of lower limbs and buttock were detected multiple hemorrhagic 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

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 fluctuating from 38.5°C to 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 pharynx hyperemia and mucopurulent secretions flowing from his nose into the pharyngeal mucosa. The general health state of the child appears serious, presenting loss of appetite, headache, apathy, hyperesthesia, and hypodynamy. From the patent's EA we know that he has no past pathologies recorded. Six days ago, he was in contact with a child who later was hospitalized because of a meningococcal infection suspicion. The objective examination shows that the child's general conditions are moderate to severe. He is conscious and has no skin eruptions. The pharyngeal mucosa is hyperemic presenting a granular appearance. The tonsils are slightly increased (type I), 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.

Blood test results	**CSF analysis results**
*Hb -120 g/l	Opening pressure – normal
*RBC - 3,8 10^{12}/l,	Appearance - clear
* WBC- 13,0 10^{9}/l,	Pleocytosis – 6 cells/cm3 – all are lymphocytes
SEG- 68%,	Proteins – 0.33g/l
Non-Segmented - 5%	
Eosinophils- 0 %,	
Lymphocytes- 25 %,	
Monocytes- 6 %,	
*ESR - 16 mm/h.	

**EA (Epidemiological Anamnesis), *Hb-hemoglobin, *White blood cells (WBC), *Red blood cells (RBCs), ** ESR *(erythrocyte sedimentation rate),* CSF (cerebrospinal fluid).*

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

Enterovirus infection (Non-Polio 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.

Serious infections with non-polio enteroviruses are less common but may cause pericarditis (inflammation of the outer lining sac of the heart), myocarditis (inflammation of the heart muscle), encephalitis (inflammation of the brain), and paralysis.

Questions for self-training:

1. Etiology of enteroviral infection.
2. Epidemiology, route of transmission, source of infection, receptivity and seasonality of enteroviral infection.
3. Pathogenesis of enteroviral infection.
4. Classification of enteroviral infection.
5. Clinical picture of meningitis and enteroviral infection.
6. Clinical picture of herpangina and enteroviral infection.
7. Clinical picture of exanthema and enteroviral infection.
8. Other clinical forms of enteroviral infection.
9. Complications of enteroviral infection.
10. Diagnostic plan of enteroviral infection.

11. Differential diagnosis of enteroviral infection.
12. Treatment of enteroviral infection.
13. Prophylaxis for enteroviral infection.

Classification of the EI

EI affecting the CNS:

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

EI affecting the skin and mucosa:

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

With involvement of muscular system:

- Myocarditis;
- Myalgia;
- Encephalitis and myocarditis of the new-born.

Based on the disease severity*:*

- mild;
- moderate;
- severe.

Based on the duration of the disease:

- Abortive[1];
- Acute;
- Tenant;
- Chronic.

According to the type of the disease:

- Typical;
- Atypical.

Other forms:

- Acute undifferentiated fever;
- Acute diarrhea;
- Hepatitis;
- Pancreatitis;
- Orchitis;

- Glomerulonephrytis.

* *abortive*[1]- refers to 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 nonpermissive and prohibits replication of the particular virus. Also called nonproductive infection.

Clinical cases

Task nr.1

A-8 month-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. The Information gathered refers to the fact that from the age of 2 months he was fed with artificial milk formulas. We also know 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 objective examination shows that the patient's general condition is severe. He presents adynamy, 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 weakened but rhythmic, and the patient has tachycardia. The mouth mucosa is pink and dry. The child also has hyperemia 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 and justify 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.2

During the last 5 days, a-5-year-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. During the day he vomited 2 times and he had diarrhea 2 times without mucus. The mother called the family doctor.

1. Establish and justify 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.3

The patient is an-8-year-old child who grows up and develops normally. He contracted measles at the age of 3 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 hyperemic, and he has granulations and hyperemia of the posterior pharynx wall. On the palatoglossal arch can be observed 3 vesicles and 2 erosions. The meningeal signs are negative. During the lumbar puncture (Spinal tap) the CSF opening pressure was elevated. The Pandi's reaction is positive, he also has lymphocytic pleocytosis, but the glucose and chlorine 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 and justify the right diagnosis and mention the clinical type of the infectious disease.
2. Indicate an investigation plan.
3. Make a differential diagnosis.
4. Indicate the treatment.

Poliomyelitis

Polio, short for Poliomielitis, is caused by a human enterovirus called the poliovirus. Polio can interact in the host body in two ways:

- Causing an infection not including the central nervous system, which causes a minor illness with mild symptoms;
- Causing an infection including the central nervous system, which may lead to paralysis

Less than 1% of poliovirus infections result in paralysis. Outbreaks of poliovirus were largely unknown prior to the 20th century. However, with improved sanitation in the 20th century, the average age at which individuals were exposed to poliovirus increased.

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 picture of poliomyelitis.
6. Clinical forms of poliomyelitis.

7. Clinical picture 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. Prophylaxis for poliomyelitis.

Classification of the Poliomielitis:

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

Classification of the paralytic Poliomielitis:

- Spinal;
- Bulbar;
- Encephalitic;
- Associated: (bulbospinal; pontospinal).

* *abortive*[1] - referred to 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 nonpermissive and prohibits replication of the particular virus. Also called nonproductive infection.

Clinical cases

Task nr.1

On 27.01.1998, a 5-month-old baby had the following symptoms: fever of 38°C for 2 days, psychomotor agitation and cortical hyperexcitability. On 02.02 other symptoms appeared, namely hypotonia and hypokinesia of the right leg. He was hospitalized with the diagnosis of "Poliomyelitis and perinatal encephalopathy." From the patient's anamnesis it emerged that the baby did not enter in contact with poliomyelitis patients. It is also known that on 16.01.1998 the patient was not VPO1 and DTP1 vaccinated. It is the family's first child. At the age of 3 months, he developed an acute respiratory infection. The patient was hospitalized on 17.02.1998, on his twentieth day of illness. He was active, but had hypertrophy of right lower limb, areflexia of the right patellar. The meningeal signs were negative. The stool analysis performed on 06.03.1998 didn't show the presence of viruses.

Blood test results (18.02.1998)
*Hb -101 g/l
*RBC - 4,1 10^{12}/l,
* WBC- 11,7 10^{9}/l,
SEG- 39%,
Non-Segmented - 2%
Eosinophils- 1 %,
Lymphocytes- 49 %,
Monocytes- 9 %,
*ESR - 12 mm/h.

**EA (epidemiological anamnesis),*Hb-hemoglobin, *White blood cells (WBC), *Red blood cells (RBCs), *ESR (erythrocyte sedimentation rate),* CSF (cerebrospinal fluid).*

The serologic analysis performed on the first days looked like this: type I- :32, type II- 1:1256; type 3- 1:128; Two weeks later, it showed: type I – 1:32; type II -1:1256; type III- 1:128. When visited by a neurologist, the patient showed paresis in the right lower limb. The X-ray presented a normal vertebral column (spine). The ENMG test showed anterior spinal cord damage signs.

1. Establish and justify diagnosis.
2. Indicate treatment.
3. Illustrate the disease prognosis.

Task nr.2

On 04.11.1998, a 4-month-old baby had been having a fever of 38.6°C and restlessness for about 3 days. On the third day of the disease other symptoms appeared, namely pain in upper and lower limbs, psychomotor agitation and cortical hyperexcitability. On 09.11.1998, the baby was hospitalized. During the objective examination the patient presented lower and upper limbs hypokinesia (which appeared in the morning of the third day of illness) and areflexia. The skin was pale, cold and wet. The meningeal signs were absent. From the patient's anamnestic history, we learn that he was the first child of the family, and that he suffered asphyxia from birth. The child was diagnosed by neurologists with "Perinatal Encephalopathy with seizures complications and **ICH* syndrome."

On 15.10.1998 the child was vaccinated with DTP1 and VPO1. On 04.11.1998 the child could not stand on his feet and had a fever- of 39.0°C. From 09.11.1998 to 13.11.1998 he received treatment at the regional hospital, and from 13.11.1998 to 15.12.1998 at Infectious Diseases Hospital "Toma Ciorba." From 15.12.1998 to 30.15.1998 the patient was transferred to the Department of Neurology at "The Mother's and Baby's Center".

**ICH- intracranial hypertension syndrome.*

1. Establish and justify diagnosis.
2. Make differential diagnosis.
3. Make an investigation plan and describe the treatment.

Shigellosis

Shigellosis is an acute invasive enteric infection caused by bacteria belonging to the genus Shigella; it is clinically manifested by diarrhoea that is frequently bloody. Shigellosis is endemic in many developing countries and also occurs in epidemics causing considerable morbidity and mortality. Among the four species of Shigella, Shigella dysenteriae type 1 (Sd1) is especially important because it causes the most severe disease and may occur in large regional epidemics. Major obstacles to the control of shigellosis include the ease with which Shigella spreads from person to person and the rapidity with which it develops antimicrobial resistance.

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 picture of shigellosis in newborns and infants.
8. Complications of shigellosis
9. Diagnostic plan of shigellosis.
10. Differential diagnosis of shigellosis.
11. Treatment of shigellosis.
12. Prophylaxis for shigellosis.

Clinical classification of the Shigellosis

Based on the type of the disease:

1. ***Typical;***
2. ***Atypical:***
    - Asymptomatic;
    - Attenuated;
    - Food poisoning like;
    - Dyspeptic (in infants);
    - Hypertoxic.

Based on the severity of the disease:

- mild;
- moderate;

- severe:
    - ✓ with predominance of toxic syndrome;
    - ✓ colitis;
    - ✓ or both.

Severity criteria

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 in 24 hours.

**tenesmus (a clinical symptom, where there is a feeling of constantly needing to pass stools, despite an empty colon).*

Depending on disease duration:

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

Based on the course of the disease:

- Without complications;
- With complications;
- With aggravation.

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 and diarrhea. There are 15 episodes of diarrhea recorded in a day. The stools are greenish, poor, with blood streaks and **tenesmus*. The patient's skin is pale and presents no rush. He has saburral tongue and his skin

snaps back quickly. The eyes are normal, and the pharyngeal isthmus shows no peculiarities. During the lung auscultation the vesicular breathing appears without rales. The cardiac sounds are normal, rhythmic but weakened. The abdomen is soft. The patient expiries pain in the large intestine tract region. The liver and the spleen appear normal. The stool is poor and watery, with blood strips and sigmoid colon spasms. The diuresis is normal, and the meningeal signs are negative.

* ***Tenesmus*** refers to cramping rectal pain. ***Tenesmus*** gives the feeling that the patient *needs to have a bowel movement, even if he already has had one. The patient experiences a feeling of incomplete emptying.*

1. Establish and explain 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. Shighella sonnei was detected in his feces. About ten days ago, the child was having 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 Sh.sonnei at 1:200 and 1:400.

1. Establish and justify the diagnosis.
2. Indicate the treatment.

Task nr.3

A 2-year-old baby was hospitalized on the first day of illness with the diagnosis of "Acute Gastroenterocolitis". The first 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 strips appeared in the stool. The baby appears apathetic, sleepy and has a suffering face. His skin is pale and cyanotic. The tongue is dry and presents white deposits. The abdomen is soft, but painful during palpation. The sigmoid colon is spasming.

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

Salmonellosis

Salmonella is 1 of 4 key global causes of diarrhoeal diseases. Most cases of salmonellosis are mild; however, sometimes it can be life-threatening. The severity of the disease depends on host factors and the serotype of *Salmonella*. Antimicrobial resistance is a global public health concern and Salmonella is one of the microorganisms in which some resistant serotypes have emerged, affecting the food chain. Basic food hygiene practices, such as "cook thoroughly", are recommended as a preventive measure against 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 picture of salmonellosis.
6. Atypical forms of salmonellosis
7. Clinical picture of salmonellosis in newborns and infants.
8. Complications of salmonellosis
9. Diagnostic plan of salmonellosis
10. Differential diagnosis of salmonellosis.
11. Treatment of salmonellosis.
12. Prophylaxis for salmonellosis.

Clinical classification of the Salmonellosis

Based on the type of the disease:

1. Typical:

- **Gastrointestinal forms:**
  - gastritis;
  - gastroenteritis;
  - gastroenterocolitis.
- **Generalized forms:**
  - Septic form;
  - Typhoid fever.
- **Salmonella Carriers:**
  - Healthy;
  - Temporary and chronic convalescence.

2. Atypical:

- Attenuated;

- Asymptomatic.

Severity:

- mild;
- moderate;
- severe.

Severity Criteria:

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.

Classification depending on the duration of the disease:

- Abortive[1] (7 days);
- Acute (1-1.5 months);
- Trenant[2] (1.5-3 months);
- Chronic (continues to carry the disease).

** abortive[1]- 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 nonpermissive and prohibits replication of the particular virus. Also called nonproductive infection.*
** trenant[2]- In medicine, a forme fruste (French, "crude, or unfinished, form"; pl., formes frustes) is an atypical or attenuated manifestation of a disease or syndrome, with the implications of incompleteness, partial presence or aborted state.*

Clinical cases

Task nr.1

A 12-year-old child was admitted to the hospital on the first day of illness. Six hours after consuming meat croquettes the following symptoms appeared: fever of 39.0°C, headache, dizziness, abundant and repeated vomiting (7 episodes) and pain in the epigastric region. He had two stools, the last one was watery. During examination it is observed that child is passive, pale and has saburral tongue. The cardiac sounds are weakened, the pulse is 118 beats per minute, the BP is 80 over 40 mm Hg. He has a bloated abdomen and gurgling intestines.

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 presents a fever of 39.0°C, abundant vomiting (10 recorded episodes), and has a greenish diarrhea with mucus and blood (12 stools in the last 24 hours). The patient appears aphetic and pale. He has cyanosis of the nasolabial triangle, low skin elasticity, dry mouth mucosa and saburral tongue. He also has a bloated abdomen and gurgling intestines. Feels pain in the sigmoid colon.

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

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

Task nr.3

A 5-month-old baby was admitted to hospital with an acute respiratory infection, namely bronchopneumonia. He received treatment and his general conditions appeared normal. On the eighth day of illness a fever of 38.00°C appeared and he vomited two times. In the evening of the same day, the child developed diarrhea with mucus and blood drops. There have been 8 diarrhea episodes during night. Blood wasn't present in each stool. The baby was anxious and lost appetite. He shared the hospital room with other 3 babies. All the babies are less than 12-month-old.

1. Establish and explain the presumptive diagnosis.
2. What examinations are necessary for confirming the diagnosis?
3. Prescribe the treatment.

Escherichiosis

Escherichia coli (abbreviated as *E. coli*) are bacteria found in the environment, foods, and intestines of people and animals. *E. coli* are a large and diverse group of bacteria. Although most strains of *E. coli* are harmless, others can make you sick. The symptoms of *E. coli* infection include stomach cramps, diarrhea, blood in the stool, and fever. The symptoms usually go away in five to 10 days. People with *E. coli* infection are contagious for a week or two after their illness resolves. *E. coli* can contaminate meat when animals are slaughtered and the bacteria can get mixed into beef during the grinding process. *E. coli* can also pass from cow udders and milking equipment into unpasteurized milk. Unwashed vegetables may also carry *E. coli*, and sometimes a town's water supply can become contaminated. The bacteria can also be spread from one infected person to another person if they do not wash their hands carefully.

Questions for self-training:

1. Etiology of escherichiosis.
2. Epidemiology, route of transmission, source of infection of escherichiosis.
3. Pathogenesis in escherichiosis.
4. Classification of escherichiosis.
5. Clinical picture of escherichiosis.
6. Clinical forms of escherichiosis.
7. Clinical picture of escherichiosis in newborns 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.

Clinical Classification of the Escherichia Coli infection

According to clinical syndromes:

- **Gastrointestinal:**
    - gastroenteritis;
    - gastroenterocolitis;
    - enterocolitis.
- **Generalized:**
    - septic,
    - typhoid,
    - meningitis,
    - pyelonephritis,
    - pneumonia).

Degrees of the severity of the disease:

- mild;
- moderate;
- severe.

Severity criteria of the disease:

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, or blood);

c). Intramural **bowel** gas, also known as **pneumatosis** intestinalis;

d). Permanent abdominal pain.

Based on the course of the disease:

- Without complications;
- With complications;
- With aggravation.

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 vomited 2 times, has a fever of 37.8°C, is fussy and thirsty. A loss of appetite is also present. The objective examination shows a pale skin, * *sunken eyes*, saburral tongue, a bloated abdomen. His skin snaps back quickly (in less than 2 seconds).

* *sunken eyes* are usually a result of dehydration

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, has a temperature of 37.5°C. He also has been having diarrhea without mucus. There are 10 recorded episodes. The stools vary from watery to yellowish. During the examination his teguments appear pale but without a rash. The child has *sunken eyes and skin snaps back quickly (in less than 2 seconds). 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.

* Sunken eyes *are usually a result of dehydration*

1. Establish and explain the presumptive diagnosis.
2. Make a differential diagnosis.

4. In your opinion, where should the patient be treated?
5. 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 medicines like Linex 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 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. Create 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, and E; G virus and TT virus do not cause liver disease. 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 D) 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 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 picture of acute viral hepatitis
6. Atypical forms of acute viral hepatitis.
7. Clinical picture of acute viral hepatitis in newborns and infants.
8. Complications of acute viral hepatitis
9. Diagnostic plan of acute viral hepatitis
10. Differential diagnosis of acute viral hepatitis
11. The treatment of acute viral hepatitis.
12. The prophylaxis for 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 type of the disease:

1. **Typical;**
2. **Atypical:**
    - Anicteric;
    - Attenuated;
    - Asymptomatic.

Based on the disease severity:

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

Based on disease duration:

- Acute (3 months);
- Trenant (3-6 months);
- Chronic (more than 6 months).

Course/Evolution:

- 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, along the fever, 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 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.
3. Which laboratory investigations may confirm the diagnosis. Describe which results are you expecting to see?
4. Define the serological profile of Viral Hepatitis A.
5. Indicate the treatment.

Task nr.2

A 4-year-old child was hospitalized on the fourth day of illness due to pronounced jaundice on sclerae and teguments. He has a fever of 37.5°C, and pain abdominal in the upper quadrant. He presents hepatomegaly (+3cm), the level of bilirubin in his blood is 127 μmol/L – which are typical symptoms of the *icteric phase*. But three days ago, the main symptoms were a fever of 39.0°C, fatigue, decreased appetite, headache, nausea and repeated vomiting – typical of the *preicteric phase.*

*Symptoms of the first **phase** – the **preicteric phase** include: nausea / vomiting, decreased appetite / weight loss, fever, fatigue, headache and joint pain, upper quadrant abdominal pain, enlarged spleen/liver/lymph nodes and rash and itching of the skin (urticaria).*

1. Define an investigation plan.
2. Make a differential diagnosis for preicteric phase.
3. 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 color. 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 color.

Analysis of blood biochemistry
Bilirubin level - 21 μmol/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.

Anexa 1.	**CALENDARUL VACCINĂRILOR OBLIGATORII ÎN RM PENTRU ANII 2016-2020**									
Vârsta efectuării vaccinării	**Imunizarea împotriva**									**Note**
	Hepatitei virale B-HepB	**Tuber- culozei-BCG**	**Polio-mielitei-VPO**	**Infecţiei cu rotavirus-RV**	**Infecţiei-Hib**	**Infecţiei cu pneumococi-PC**	**Difteriei, Tetanosului, tusei convulsive-DTP**	**Difteriei, Tetanosului DT/Td**	**Rujeolei, Oreionului, Rubeolei-ROR**	
24 ore	HepB-0									În matern.
2-5 zile		BCG								În matern.
2 luni	HepB-1		VPO-1	**RV-1**	Hib-1	**PC-1**	DTP-1			Concomitent în ac.zi: i/m HepB+DTP+Hib în componenţa vaccinului pentavalent, PC şi VPI separat cu diferite seringi şi în diferite locuri anatomice; VPO şi RV picături în gură
4 luni	HepB-2		VPO-2	**RV-2**	Hib-2	**PC-2**	DTP-2			
6 luni	HepB-3		VPO-3 VPI		Hib-3		DTP-3			

12 luni						**PC-3**			**ROR-1**	Separat cu diferite seringi şi în diferite locuri anatomice
22-24 luni			VPO-4				DTP-4			Concomitent, peste 16-18 luni după vaccinare
6-7 ani			VPO-5					DT	**ROR-2**	VPO-5 şi DT– concomitent primăvara ROR-2 – toamna (în cl.I)
15-16 ani								Td	**ROR-3****	Concomitent (cl.9), separat cu diferite seringi şi în diferite locuri anatomice
Adulţii: la 20, 30, 40, 50 şi 60 ani								Td		Imunizarea la atingerea vîrstei indicate

1. Vaccinările opționale recomandate în mod individual, inclusiv contra plată: contra Papilomavirusului uman – fetele de la vârsta de 12 ani 2 doze cu interval de 6 luni între ele; gripei – de la vârsta de 6 luni anual; hepatitei virale A - de la vârsta de 1 an 1 doză persoanele nevaccinate; infecției meningococice – vaccinuri mono- sau polivalente ne conjugate – de la vârsta de 2 ani, conjugate – de la vârsta de 2 luni; varicelei – de la vârsta de 9 luni pentru persoane care n-au suportat infecția; tusei convulsive cu component pertusis acelular – membrii familiilor și îngrijitorilor bebelușilor.
2. Vaccinarea împotriva altor boli infecţioase (holera, tularemia, febra tifoidă, bruceloza etc.) va fi efectuată grupelor de populaţie cu risc sporit de infectare, în funcţie de situaţia epidemiologică şi în conformitate cu deciziile Ministerului Sănătăţii.
3. Imunizarea împotriva febrei galbene, encefalitei acariene, pestei va fi aplicată persoanelor care pleacă în regiunile endemice în mod individual, inclusiv contra plată.

State University of Medicine and Pharmacy "Nicolae Testemitanu"

Questions for examine in infectious diseases in children

1. Scarlet fever. Etiopathogenesis, essential clinical syndromes. Differential diagnosis. Treatment.
2. Scarlet fever, severe forms (toxic and septic). Clinical picture. Treatment.
3. Complications of scarlet fever. Classification. Pathogenesis. Clinical picture. Treatment.
4. Pathogenesis of scarlet fever. Differential diagnosis. Treatment.
5. Specific features of meningococcal infection (meningococcemia, meningitis) in infants.
6. Meningococcemia in children, infective-toxic shock, clinical picture. Pre-hospitalization emergency treatment.
7. Meningococcal meningitis in children. Acute cerebral edema. Clinical picture. Pre-hospitalization emergency treatment.
8. Diphtheria. Etiopathogenesis. Role of the diphtheria toxin. Clinical forms. Clinical picture of the oropharyngeal diphtheria.
9. Complications of diphtheria. Clinical picture. Treatment.
10. Clinical picture and diagnosis of localized oropharyngeal diphtheria.
11. Clinical picture and diagnosis of toxic oropharyngeal diphtheria.
12. Differential diagnosis of oropharyngeal diphtheria with infectious mononucleosis.
13. Differential diagnosis of toxic oropharyngeal diphtheria with mumps and cervical lymphadenitis.
14. Whooping cough. Etiopathogenesis. Clinical picture.
15. Whooping cough. Criteria of severity. Specific features of paroxysmal stage. Complications. Diagnosis.
16. Whooping cough. Features and evolution in infants. Treatment. Prophylaxis.
17. Measles. Etiopathogenesis. Clinical picture. Treatment.
18. Measles. Clinical forms. Differential diagnosis of the catarrhal period. Complications.
19. Measles. Differential diagnosis of the eruptive stage.
20. Differential diagnosis of measles with rubella and scarlet fever.
21. Congenital rubella, specific clinical features, diagnosis, prophylaxis.
22. Rubella, clinical picture, laboratory diagnosis. Differential diagnosis. Prophylaxis.
23. Mumps. Etiopathogenesis. Clinical picture. Differential diagnosis of glandular forms. Prophylaxis.
24. Mumps. Lesions of the central nervous system. Clinical picture. Treatment.
25. Mumps. Pancreatitis. Orchitis. Clinical picture. Treatment.
26. Herpes infection (herpes simplex). Etiopathogenesis. Clinical forms. Differential diagnosis. Treatment.
27. Chickenpox. Etiopathogenesis. Clinical picture. Evolution. Treatment. Differential diagnosis.
28. Chickenpox. Complications. Clinical picture. Treatment.
29. Influenza. Clinical picture and evolution in infants and small children.
30. Influenza in children. Clinical syndromes. Diagnosis. Treatment.
31. Affection of the central nervous system of influenza in infants. Clinical picture. Emergency medical assistance.
32. Parainfluenzal infection in children. Clinical picture. Syndrome of laryngeal stenosis (croup), Emergency medical assistance.
33. Adenoviral infection in children. Clinical forms. Pharyngoconjunctival fever. Clinical picture, diagnosis, evolution, treatment.
34. Respiratory syncytial infection in neonates and infants. Clinical picture. Evolution. Diagnosis. Treatment.
35. Enteroviral infection (ECHO and Coxackie). Clinical picture of herpetic angina. Diagnosis. Treatment.
36. Enteroviral infection. Lesions of the central nervous system. Clinical picture. Diagnosis. Treatment.
37. Acute epidemic poliomyelitis. Progress in the fight against poliomyelitis. Etiopathogenesis. Clinical forms. Clinical picture of paralytic forms. Diagnosis. Differential diagnosis. Treatment.
38. Dysentery in children. Clinical picture. Criteria of severity. Diagnosis. Treatment.
39. Dysentery in children. Specific features in infants. Diagnosis. Treatment.
40. Salmenollosis in children. Etiopathogenesis. Clinical forms. Clinical picture of gastrointestinal forms. Treatment.

41. Salmonellosis. Generalized forms (typhus-like and septic).Clinical picture. Diagnosis. Treatment.
42. Salmonellosis in neonates and infants. Specific epidemiological and clinical features. Nosocomial salmonellosis. Prophylaxis.
43. Dehydration syndrome in acute intestinal infections in children. Clinical picture. Treatment.
44. Eschericheosis in infants. Etiopathogenesis. Clinical picture of enteropathogenic and enteroinvasive groups. Criteria of severity.
45. Eschericheosis in children. Classification according to etiological factors. Treatment.
46. Eschericheosis in infants. Clinical picture of enterotoxaemia and enterohemorrhagic groups.
47. Acute intestinal infections with conditioned pathogenic enterobacteria. Criteria of diagnosis: clinical, epidemiological and laboratorial criteria. Specific features of evolution. Treatment.
48. Staphylococcal intestinal infections in children. Clinical forms. Clinical picture. Treatment.
49. Rotaviral infectious in children. Etiopathogenesis. Clinical picture. Diagnosis. Treatment.
50. Oral rehydration in treatment of acute intestinal infections in children, indications. Plan A, B of the treatment. (WHO)
51. Intestinal dysbacteriosis in children. Pathogenesis. Clinical forms. Clinical picture. Diagnosis. Treatment. Prophylaxis.
52. Viral hepatitis A in children. Clinical picture. Diagnosis. Serological tests. Differential diagnosis. Treatment. Prophylaxis.
53. Viral hepatitis in children. Clinical picture of severe forms. Diagnosis. Treatment.
54. Viral hepatitis in children. Etiology. Clinical forms. Congenital viral hepatitis.
55. Viral hepatitis B in children. Epidemiology. Clinical picture and evolution. Diagnosis. Prophylaxis.

DEPARTMENT CHILDREN'S INFECTIOUS DISEASES

Practical skills for students of VIth university year

1. Bacteriological test in Diphtheria, Pertussis, Meningococcal Infection.
2. Bacteriological test in Salmonellosis, Shigellosis, Escherichiosis.
3. Immunofluorescent test in respiratory viral infections, acute diarrhea (technique, importance).
4. Blood cultures in infectious diseases. Technique, indications, clinical interpretation.
5. Technique of "thick drop" of the blood. Indications.
6. Lumbar puncture. Indications. Technique. Clinical interpretation of CSF.
7. Coprological test, clinical interpretation.
8. Serological tests in infectious diseases at children.
9. Gastric lavage. Indications, technique, bacteriological test results.
10. Examination of the patient in acute infectious disease (viral hepatitis, rubella, mumps, etc.)
11. Interpretation the results of the blood tests in infectious diseases in children.
12. Endovenous perfusions, indications, technique, fluids, complications.
13. Criteria of hospitalizations in infectious diseases in children.
14. Indications for discharge for patients with acute gastroenteritis, air ways infections, viral hepatitis.
15. Diet and hygienic regimen for patient with infectious diseases (meningitis, mumps, diphtheria, viral hepatitis).
16. Treatment of acute infectious diseases (medical prescriptions, regimen, diet).
17. Follow-up of children after infectious diseases (hepatitis, salmonellosis, meningitis). Documentation.
18. Immunization and prophylaxis of infectious diseases at children (national schedule of immunization).
19. Rehydration of children with acute diarrhea (indications, technique).
20. Emergency medical assistance in case of acute cerebral edema, toxic-infectious shock, seizures, hyperthermia, food toxic-infection.