

Ministry of Education and Science of Ukraine
V. N. Karazin Kharkiv National University

**VIRAL DISEASES OF THE SKIN
AND MUCOUS MEMBRANES**

Methodological recommendations
for the preparation of applicants of higher medical education
of the 4th year in the discipline "Dermatology, venereology"

Electronic resource

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The methodological recommendations were developed by the team of teachers of the Department of infectious diseases and clinical immunology of V. N. Karazin Kharkiv national university of the School of medicine. An indicative map of the applicants work for higher medical education is provided, with clear, consistent and detailed recommendations for preparation at each stage of the practical training. The list of basic theoretical questions and practical skills, structure and content of topics, test modules for the initial and final level of knowledge control are given, the basic and additional literature is specified, there are references to the electronic resources of department's educational materials in the annexes.

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**ESTIMATED MAP OF WORK FOR HIGHER MEDICAL EDUCATION
APPLICANTS FOR PRACTICAL CLASSES PREPARATION**

PREPARATORY phase:	
1.	To know the interdisciplinary integration of practical classes topics with acquired theoretical knowledge and practical skills in basic disciplines (medical biology, medical and biological physics, Latin language, human anatomy, normal and pathological physiology, biological and bioorganic chemistry, pathological anatomy, microbiology, virology and immunology, pharmacology, philosophy etc.). Acknowledge the terminology (including Latin transcription).
2.	Motivational characteristic and substantiation of the topic of the practical lesson on behalf of the formation of clinical thinking , in particular for the further development of skills in knowledge application in diagnosing of the main symptoms and syndromes and the possibilities of modern laboratory and instrumental methods of internal organs examination in the process of further study and future professional work.
3.	To give better insights into the types of student's educational activity, information provided on the reference stands of the department: thematic calendar plans of lectures, practical classes and extra-curriculum independent work of the 4th year higher medical education applicants corresponding to the curriculum of the model and working program of the discipline «Dermatology, venereology».
4.	Utilization of the basic and additional educational and methodical literature : <ul style="list-style-type: none"> ● textbooks and tutorials (printed and electronic versions), which are listed in these guidance after the theoretical section; ● educational and methodological materials of the department (methodical recommendations for independent preparation for practical classes for the 4th year higher medical education applicants in the discipline «Dermatology, venereology» and methodological recommendations for independent student's work); ● attendance of lectures (on-site supply of the educational process using multi-media presentations during lectures) - according to the thematiccalendar plan. Usage of printed publications for classes preparation, they can be obtained from the library and / or electronic versions of it available on the official site of the V. N. Karazin KhNU http://www.univer.kharkov.ua/en/departments (navigation for sections: ... /Faculties / Departments / infectious diseases and clinical immunology) - ref. Annex 1; and in the open interactive database of the electronic archive of the Repository of the V. N. Karazin KhNU resources

<http://ekhnuir.univer.kharkov.ua> (navigation: Faculty of Medicine / Educational editions, Medical Faculty) - ref. Annex 2.

It is advisable to note the main issues in the form of notes

MAIN phase:

Practical classes duration is 4 academic hours, they are held at the **clinical base** — Municipal non-profit enterprise «State Dermatovenerologic Dispensary №1» of Kharkiv municipal council. (Kharkiv, Tsilinogradskaya Street, 50) – see Annex 3.

ATTENTION!

Its forbidden to attend department classes without a medical uniform, replaceable shoes, medical cap, mask, shoe covers, stethofonendoscope.

1. To achieve the educational goal of practical classes and mastering the theoretical part of the subject, it is necessary to **LEARN** and **ASKNOWLEDGE** the answers to **the main theoretical questions** of the lesson's topic (ref. to the list of the main theoretical questions) that will be checked by the lecturer through an oral and / or written survey (correction, refinement, additional answers) on the main phase of practical classes conduction.

2. **TO BE ABLE TO** solve with explanations of theoretical, multiple choice (for control of the initial and final level of knowledge), situational tasks proposed for the mastering of the topic.

3. **TO MASTER PRACTICAL SKILLS on the topic**

- Take active part in the teacher's demonstration of the methodology of patient's examination, and to assign practical skills near the patient's bed under the supervision of a teacher.

To perform the patient's examination, interpret the received laboratory and instrumental investigations data, be able to use tools needed.

- Make syndromic diagnosis. To perform a differential diagnosis, to analyze the principles of the treatment, to give prescriptions for essential medicines prescribed.

4. **EXECUTE** obligatory tasks foreseen for independent student work

FINAL phase:

1. On the basis of theoretical knowledge and practical skills mastering on the topic to form clinical thinking and syndromic diagnosis making skills for further study in the medical profession.

Purpose and main tasks of the work on the topic of the practical lesson

**VIRAL DISEASES OF THE SKIN AND MUCOUS MEMBRANES.
CLINICAL COURSE, DIAGNOSIS, DIFFERENTIAL DIAGNOSIS,
TREATMENT. PRINCIPLES OF COSMETIC SKIN CARE**

Increase the level of knowledge on the etiology, pathogenesis, classification, clinical features and diagnosis of patients with allergodermatoses: the main clinical and instrumental methods of examination, to teach students of higher medical education in the 4th year of training modern tactics of management of patients with skin pathology.

MAIN QUESTIONS

As a result of studying the 4th year higher medical education applicants

must KNOW (the main theoretical questions):

1. etiopathogenic characteristics of viral diseases of the skin;
2. features of classification viral diseases of the skin;
3. clinical manifestations viral diseases of the skin;
4. comparative characteristics of HSV and VZV;
5. principles of treatment and prevention of viral diseases of the skin.

must BE ABLE (basic practical skills on the topic of the practical lesson):

1. properly collect patient history on viral diseases of the skin;
2. make a diagnosis on clinical grounds;
3. run diagnostic (skin) tests to confirm the diagnosis;
4. make a differential diagnosis;
5. assign individual pathogenetic treatment.

Tests to control the INITIAL LEVEL OF KNOWLEDGE

1. What is the main genetic characteristic of the herpes virus family?
 - A. Large linear DNA genome
 - B. Small ssDNA genome
 - C. Segmented DNA genome
 - D. Circular dsDNA genome
2. Which of the following are characteristics of the herpes virus family? Choose at least one answer
 - A. Can establish virus latency in the host
 - B. Can cause cancer
 - C. Can reactivate and cause disease for life
 - D. Can cause no disease

3. What disease do herpes viruses not cause?
 - A. Infantile paralysis
 - B. Encephalitis
 - C. Sexually transmitted disease
 - D. Cancer

4. How are herpes infections treat?
 - A. Chemotherapy
 - B. Vaccines
 - C. Antivirals
 - D. No method

5. What is the morphology of the herpes virion?
 - A. Complex with a membrane and tegument and icosahedron core
 - B. Baggy virion with over 50 types of spikes
 - C. Compact icosahedron structure
 - D. Small round virus

6. Which one of the following best reflects current knowledge of antiviral therapy for eczema herpeticum?
 - A. There have been no randomized controlled trials of antiviral therapy for eczema herpeticum
 - B. Intravenous therapy is indicated for all patients, regardless of disease severity
 - C. Oral therapy has been shown to be effective, but is generally used only for mild cases

7. Which of the following best reflects the current management approach to eczema herpeticum?
 - A. Since the disease is viral, there is no place for antibiotics
 - B. Antibiotics are often needed because secondary bacterial sepsis is common, usually involving anaerobic bacteria
 - C. Antibiotics are often needed because bacterial sepsis is common, usually involving *Staphylococcus aureus* or group A beta-hemolytic streptococci

8. Which of the following most accurately describes the association between atopic dermatitis and viral skin infections?
 - A. Eczema herpeticum is the only viral infection associated with atopic dermatitis
 - B. Patients with atopic dermatitis are at risk of a variety of viral infections, many of which can become disseminated eruptions
 - C. Patients with atopic dermatitis are at risk of a variety of viral infections, but eczema herpeticum is the only one that becomes a disseminated eruption

9. Which of the following best reflects current practice when it comes to using aciclovir to treat pregnant women with eczema herpeticum?
- A. Since there is no evidence for a teratogenic effect, there are no concerns about giving the drug during pregnancy
 - B. Aciclovir is teratogenic and should never be given to pregnant women with eczema herpeticum
 - C. Although the issue of whether to give the drug during pregnancy is still controversial, women are often given the drug because eczema herpeticum in pregnancy can cause intrauterine infection in 50% of cases
10. Which herpes virus is the most common cause of eczema herpeticum?
- A. Herpes simplex virus type 1 (HSV-1)
 - B. Herpes simplex virus type 2 (HSV-2)
 - C. Human herpes virus 6 (HHV-6)

Standards of answers: 1–A, 2–C, 3–A, 4–C, 5–A, 6–C, 7–C, 8–B, 9–C, 10–D.

STRUCTURE AND CONTENT OF THE TOPIC

HERPES SIMPLEX

Herpes simplex (herpes simplex) is a viral disease of skin and mucous membranes caused by herpes simplex virus (HSV).

Etiology and pathogenesis. Herpes simplex virus belongs to the family of Herpesviridae, subfamily Alphaherpesvirinae type Simplexvirus. There are two antigenic serotypes of HSV* first (HSV-1) and second (HSV-2).

Transmission of HSV-1 usually occurs in childhood, through a direct contact with a HIV-sick or infected person. This causes frequent localization of orofacial herpes lesions caused by HSV-1, in particular on skin areas around mouth (herpes labialis), nose (herpes nasalis), seldom on cheeks, eyelids and ears. In addition to skin, mucous membranes of the mouth (herpes stomatitis) may also be affected.

Transmission of HSV-2 occurs mainly through sexual contact. HSV2 is dominant in causing genital herpes infection (herpes genitalis) with the localization of lesions on skin and mucous membranes of the external genital organs of men and women. However, there is no stable relationship between antigen serotypes of HSV and localization of herpetic lesions on skin and visible mucous membranes (genital, extragenital). This is confirmed by the fact that about 20% of cases of genital herpes are caused by HSV-1. In the pathogenesis of herpes simplex virus, the development of chronic persistent infection in sensory ganglia is crucial. Penetrating through the mucous membranes of the oropharynx, conjunctiva, urethra, cervix, rectum, or skin micro-cracks in the process of initial infection, HSV reaches nerve endings and moves to sensory ganglia through the retrograde axon, where there occurs an acute

infection, when the virus replicates in the cells of sensitive ganglion. Further, virus enters into the state of persistence, which provokes the latent course of herpes. Under certain conditions (primarily, due to the lack of immune control), there occurs activation of the virus; from ganglion, the activated virus migrates along the axon of the peripheral nerve and replicates in the epithelial cells. Except general weakening of the immune control, reproduction of virus is caused by a violation of local immunity in the area of the epidermis.

Epidemiology. At the present stage, herpes simplex is one of the most common uncontrolled human infections (uncontrolled human infections involve the inefficiency of vaccination or treatment methods, which allow achieving the complete elimination of the pathogen from the host's body). More than 50% of the population of developed countries and 100% of the population of developing countries are seropositive to HSV presence. The disease features pandemic nature. Genital herpes ranks first in the list of common human infections transmitted primarily through sexual contact. The problem of herpetic infection is aggravated by the growth of cases of abortive and atypical clinical course of the disease. There is an essential difference between the number of persons seropositive to HSV and the number of people with clinical manifestations of herpes simplex.

Clinic. Herpes can be primary and simplex recurrent. The disease begins with itching or burning, accompanied by the formation of groups of small strained vesicles amid a slightly edematous limited congested spot. The content of vesicles is transparent, becomes thick in 2 -3 days. Vesicles feature a tendency to merge. After 3 -5 days, vesicles dry up and form yellowish -gray crusts. After 6 -8 days, crusts fall off, while secondary pigmentation is left in their place, which then disappears with no trace. Primary herpes simplex.

Primary infection with HSV -1 occurs mainly in young children. In most cases, the primary manifestations of herpes simplex are minor (redness, itching) and remain undetected. However, children infected with HSV -1 may develop primary herpetic gingivostomatitis. The disease is developed suddenly, with an increase in body temperature to 39 -40 ° C and intoxication. Mucous membranes of cheeks, gums, lips, tongue, and throat are tonsils are covered with painful grouped vesicles. After their destruction, there occur painful erosions prone to a merge. Clinical manifestations of the inflammation subside in two to three weeks.

Primary genital herpes. The primary episode of genital herpes occurs after an incubation period of 1 -7 days. In men, herpes rash is usually localized on the head and shaft of the penis and foreskin, while in women it is localized on small and large labia, vagina, clitoris, cervix, perineum, thighs and buttocks. On the background of significant erythema and edema, there develop grouped vesicles, first with clear, and then thick contents. On the ruins of vesicles, erosions, sometimes ulcers and cracks are formed. Subjectively, the rash is accompanied by a sensation of pain and itching. There develops painful bubonadenitis. Unlike further relapses, primary clinical episode of genital herpes features more severe and prolonged course (4 -5 weeks). Recurrent herpes simplex and recurrent genital herpes. In most cases, the initial clinical episode of herpes simplex is followed by clinical recovery. However, virus

(HSV -1, HSV 2) is stored in the body in a latent form throughout a person's life, not causing any clinical symptoms. Approximately 90% of people infected with HSV are virus carriers. Under the influence of a series of factors that reduce protective capacity of the body, which include hypothermia, overheating, infectious diseases, especially colds, etc., there occur recurrences of herpes simplex. Unlike primary clinical episode of the disease, clinical episode of recurrent herpes simplex virus features milder course. In recurrent herpes simplex, typical location of the lesion includes lips, face, cornea and conjunctiva of the eye, buttocks. At these sites, there develop grouped vesicles with clear content, accompanied by itching and burning. In further, painful erosions are formed, which may merge. On the surface of the erosion, exudate dries in the form of a crust. After the removal of crust, secondary spots are left. Clinical recurrences of herpes simplex may occur over many years and decades, with varying frequency - from one or two a year to two to four per month. Compared with the initial episode, recurrences of genital herpes are also characterized by a mild course. Rash on skin and mucous membranes is rather sparse. Typical for herpes, lesions are located on skin and mucous membranes of the vulva.

Genital herpes can cause diverse complications, including reproductive disorders, miscarriage, intrauterine infection of fetus, and be transmitted to a baby during childbirth. In case of transplacental infection, a newborn may develop growth retardation, encephalitis, chorioretinitis. In addition, due to chronic recurrent genital herpes patients may experience significant psychosomatic disorders.

Diagnostic. Diagnosis of herpes simplex is simple and based on presence of typical clinical symptoms: itching, grouped vesicular eruption, formation of erosions and crusts. The recurrent nature of the lesion is testified by similar clinical manifestations in the past; identification of high titers of antibodies to HSV during relapse; identification of antigen in the focus of clinical manifestation. The coincidence of the type identified from the source of HSV and type of HSV, to which the antibodies in a patient's serum are found, is the condition for diagnosis of recurrent herpes. However, it should be noted that serology and identification of viral antigen are not routine methods in the diagnosis of herpes simplex. They are applied only in specific cases, when there is considerable doubt as to the clinical diagnosis of herpes simplex. In addition, high titers of antibodies to HSV with no clinical manifestations (recurrent episodes) are not the reason for the diagnosis of herpes simplex.

Differential diagnosis. In the case of localization in the mouth mucosa, herpes simplex is to be distinguished from acantholytic pemphigus and polymorphous exudative erythema. In pemphigus, erosions are localized on a visually normal mucous membrane, they are not subject to epithelialization, Nikolsky's symptom is positive, acantholytic cells are found in the impression smears from the surface of erosions. Unlike herpes, polymorphous exudative erythema is characterized by seasonality index (spring and autumn), significant size of bubbles and erosions on a dramatically inflamed background, layering of bloody crusts on the red border. Clinical manifestations of genital herpes localized on the genitals should be

differentiated from syphilitic chancre. Unlike herpes, syphilitic erosion is characterized by smooth edges, saucer-like shape, hard bottom, indolence and peculiar regional lymphadenitis. In doubtful cases, the issue is finally resolved by microscopy examination of the material from erosions to detect the agent of syphilis – *Treponema Pallidum*.

Treatment. All currently existing methods and tools for treatment of herpes do not allow achieving complete elimination of pathogens (HSV-1, HSV-2) from the human body. Approaches to treatment of herpes simplex are determined by a clinical picture of the disease, severity of clinical course, frequency of relapses, as well as availability of comorbidity. In the antiviral therapy of herpes infections, preparations of acyclic nucleotides that have an ability to disrupt interaction of virus and cells, in particular inhibit reproduction of the virus through its virostatic action, play the major role. For treatment of infections caused by herpes simplex viruses, the drugs from a group of acyclic purine nucleosides are used: acyclovir, valacyclovir (valine aether of acyclovir) and famciclovir (pro-forma of penciclovir). In the form of topical preparations (cream), acyclovir is prescribed to reduce the intensity and duration of the recurrent episode of herpes simplex. Systemic prescription of purine nucleoside analogs (internal or parenteral) is used for treatment of primary manifestations of herpes simplex virus, as well as treatment of relapse (for active clinical manifestations). With frequent recurrences of skin herpes and genital herpes, acyclovir and valacyclovir may be prescribed in long continual courses (so-called long-term suppressive therapy). For a healthy sexual partner of a patient with recurrent herpes, prophylactic or preventive treatment has no medical meaning, since existing antiviral drugs are unable to eliminate the virus from a human body. In some countries, particularly Ukraine, Russia and Belarus, recombinant interferons and interferon inducers are used as a part of comprehensive treatment of the disease.

Prevention. Preventive measures against primary HSV infection in children are reduced to avoidance of contacts with adults that have active clinical signs of infection. Compliance with the principles of safe sexual behavior (monogamous sexual relationships, the use of barrier protection equipment) is the only way to prevent infection with HSV. Secondary prophylaxis involves the avoidance of hypothermia or excessive sun exposure, as well as the appointment of prolonged systemic antiviral therapy.

HERPES ZOSTER (shingles)

Herpes zoster (shingles) is an acute infectious disease of skin and mucous membranes caused by a neurotropic virus (varicella zoster), which is also a pathogen of chickenpox. The disease is characterized by the occurrence of unilateral grouped vesicular lesions within one to two dermatomes and accompanied by neurological pain.

Etiology and pathogenesis. Shingles and chickenpox are both caused by the varicella-zoster virus, which belongs to the family of Herpesviridae. There is a hypothesis saying that after the primary attack of varicella (manifested in the symptoms of chickenpox), the virus penetrates into the cells of dorsal root ganglion, where it is stored in an asymptomatic condition (persistent) until the moment of

reactivation caused by certain factors (hypothermia, stress, cancer, immune incompetence and others). Under the influence of these factors that weaken the body immune reactivity, the virus is activated, multiplies, causing inflammation of the ganglia. In further, the virus enters the sensory nerves, causing neuritis and neuralgia, spreads around sensory nerve endings in skin and causes formation of a characteristic rash, which is located along one of the nerves. Recurrences of herpes zoster are rare; occur mainly in the background of a significant immune suppression, particularly in HIV infection and malignancy. People of any age may suffer from shingles, while elderly people are at a higher risk.

Clinical picture. The disease may begin suddenly or be preceded by a general malaise, headache, fever, neuralgia or paresthesia in the areas that are to be subject to rash.

The most frequent localization of lesions includes the area of intercostal nerves, hence the name «shingles», while the rash is always localized on one side of the body (unilateral localization), rarely covers a little area on the opposite side (due to anastomotic innervation).

The second most common place of the lesion is the area of trigeminal nerve. The lesion of the first and third branches of the trigeminal nerve causes the emergence of rash in the mouth mucosa. The eruption emerges in a paroxysmal way on congested skin, there appear clusters of vesicles with clear serous contents, which quickly becomes cloudy and shrinks in serous crusts. The rash of vesicles on each individual spot occurs simultaneously, but stains emerge sequentially, with an interval of several days. Foci of the lesions may be located fairly closely, forming almost a continuous line along the nerves.

After rejection of crusts, there remain brownish-red spots, which gradually disappear. In typical cases, the disease continues for two to three weeks. Burning and pain along the affected nerve are observed subjectively, especially when the rash is localized on face and mucous membrane of the mouth cavity. In herpes zoster, mucous membranes are rarely affected; typically, simultaneously with a skin lesion of a certain area. Against the background of edematous (from one side) oral mucosa, there emerge vesicles, which are rapidly destroyed, forming painful erosions, often covered with gray-white pellicle. Subjectively, burning is marked in the affected areas. Very rarely, shingles can affect vaginal mucosa and bladder.

The most common complication of herpes zoster is the development of a persistent pain syndrome, prone to a prolonged and persistent course after dermatological recovery (postherpetic neuralgia). Postherpetic neuralgia occurs in older patients, which significantly affects the quality of life. Timely administration of systemic antiviral therapy during the first 72 hours from the moment of rash emergence (erythema and vesicles) reduces the risk of this complication in a few times. Other complications of shingles include facial paralysis, meningitis, meningoencephalitis, arachnoiditis, vestibular disorders, pneumonia, paralysis of the diaphragm, bladder paralysis, paresis of the lower extremities, myelitis with the disorder of pelvic organs, etc.

Diagnostics. Diagnosis of herpes zoster is usually based on clinical manifestations. Presence of a neurological pain syndrome preceding and accompanying rash, unilateral localization of lesions located along the corresponding nerve and herpetiform grouped localization of vesicles are considered.

Differential diagnosis. In some cases, shingles should be differentiated from bullous form of erysipelas, atopic dermatitis, and sometimes impetigo. Pain syndrome that precedes formation of rash can resemble chest pain and pain in myocardial infarction, pain with bowel obstruction, etc.

Treatment. In the antiviral therapy of both herpes zoster and herpes simplex, an important place is given to the drugs of the group of acyclic nucleosides that feature a virostatic action. Acyclovir, 800 mg orally, 4-5 times a day for 7-10 days is used. Given poor bioavailability of acyclovir, the valacyclovir, 1000 mg orally 3 times a day for 7-10 days, and famciclovir, 250 mg 3 times a day orally for 7 days are widely used in treatment of herpes. In severe cases of herpes zoster, systemic corticosteroids in high doses (40 - 60 mg of prednisone per day, with a gradual reduction of the dose) are prescribed. Topical preparations of acyclovir and penciclovir (creams) are applied locally. The need for analgesics depends on pain intensity. Usually, paracetamol or indomethacin is enough. In some cases, the need to use opioids or epidural anesthesia may arise. Expressed pain that occurs prior to or simultaneously with herpetic eruption indicates a possibility of prolonged neuralgia in the future. In prolonged neuralgia that persists after the rash recourse, analgesics and non-steroidal anti-inflammatory drugs (infometatsin etc.) are prescribed. Patients with herpes zoster should avoid exposure to cold, exercise and stress situations.

Prevention. Primary prevention of chicken pox (and later, herpes zoster) involves a specific vaccine immunization in childhood. Patients with active manifestations of herpes zoster should avoid contact with people (especially children) that have not had chickenpox. If shingles is diagnosed in a hospitalized patient, he is to be immediately isolated to prevent nosocomial infection.

Prognosis. Shingles belongs to a group of diseases that are treated independently and feature no tendency to relapse (except in patients with immune deficiency). Elderly patients that received improper treatment may experience persistent pain syndrome, which leads to a deterioration in the life quality. Recurrences of herpes zoster testify significant violations of immune status. Such patients must be carefully examined for the presence of malignant neoplasms and HIV infections

Test to control the FINAL LEVEL OF KNOWLEDGE

1. Which kind of rash does eczema herpeticum usually cause?
 - A. Dome-shaped vesicles, which dry out and form crusts
 - B. An itchy macular rash
 - C. A hemorrhagic rash

2. A 29-year-old man with AIDS and a CD4 count of 36 cells/mm³ comes to clinic for evaluation of persistent painful ulcers in the perianal region despite taking a 14-day course of valacyclovir 1000 mg twice daily. In the past 2 years he has intermittently taken valacyclovir for recurrent episodes of genital herpes. A sample of the perianal region is obtained for viral culture; subsequently, the culture is positive for herpes simplex virus-2 and acyclovir susceptibility testing shows resistance to acyclovir. Which one of the following would be the next best step in the management of this acyclovir-resistant herpes lesion?

- A. Switch oral valacyclovir to oral famciclovir
- B. Increase dose of oral valacyclovir
- C. Switch from oral valacyclovir to intravenous foscarnet
- D. Switch from oral valacyclovir to high-dose intravenous acyclovir

3. A 48-year old man with a history of acute myelogenous leukemia (AML) who has undergone hematopoietic stem cell transplantation comes to clinic for evaluation of persistent ulcers on his penile shaft, despite taking acyclovir 400 mg orally three times a day for 10 days. He has a 10-year history of recurrent genital herpes simplex virus (HSV) infection for which he typically takes a 5 to 10 day course of acyclovir, and to which he usually responds well. Because the patient developed persistent ulcers despite receiving appropriately dosed acyclovir therapy, a diagnosis of acyclovir-resistant HSV is strongly suspected. Which of the following is the most common molecular mechanism for the development of acyclovir-resistant HSV?

- A. Increased efflux pump activity in host cells
- B. Altered or deficient HSV thymidine kinase
- C. Hyperproduction of HSV DNA polymerase
- D. Altered acyclovir cell binding site on HSV DNA polymerase

4. A 36-year-old woman with HIV infection and with a CD4 count of 250 cells/mm³ comes to the clinic for a routine visit. She started taking tenofovir disoproxil fumarate-emtricitabine plus dolutegravir 3 months ago and has achieved an undetectable plasma HIV RNA level. She has no acute complaints. She reports that she was treated for a second genital herpes outbreak since her last visit to you about 2 months ago. She asks about therapy to reduce the genital herpes outbreaks. Which one of the following regimens would you recommend for suppressive therapy in this woman with HIV infection?

- A. Famciclovir 250 mg taken orally twice a day
- B. Acyclovir 800 mg taken orally three times a day
- C. Valacyclovir 500 mg orally twice a day
- D. Valacyclovir 1000 mg orally twice a day

5. A 27-year-old woman presents in labor at 35 weeks. She has received regular prenatal care since the beginning of her pregnancy. She has a known history of genital herpes and has experienced genital HSV outbreaks prior to the pregnancy.

On physical examination, the obstetrician detects an ulcerative lesion, with surrounding erythema on her genital labia, consistent with herpes. She reports developing a painful vesicle the day prior to the onset of labor. Swabs are obtained on the labial lesion and sent for HSV PCR and culture. The neonate was successfully delivered via Cesarean section and has had no symptoms or signs to suggest neonatal HSV disease. Which of the following is recommended regarding management of the neonate delivered by this woman?

- A. Promptly obtain mucosal specimens for culture and blood for HSV PCR and start the neonate on oral acyclovir immediately after delivery
- B. Obtain mucosal specimens for culture and blood for HSV PCR 30 minutes after delivery and start the neonate on intravenous acyclovir immediately after specimens have been obtained
- C. Obtain mucosal specimens for culture and blood for HSV PCR 2 hours after delivery and start the neonate on intravenous acyclovir immediately after specimens have been obtained
- D. Obtain mucosal specimens for culture and blood for HSV PCR approximately 24 hours after delivery but do not start the neonate on acyclovir as long as the neonate remains asymptomatic

6. A 19-year-old woman presents in labor. She has not had regular prenatal care. On physical examination, the obstetrician detects a small cluster of vesicular lesions on the right side of the vulva, consistent with herpes simplex infection. She reports developing painful vesicles on her labia the day prior to the onset of labor. She is suspected of having a recurrent episode of herpes. Which of the following is recommended regarding management of a pregnant woman with active genital herpes at the time of labor to reduce risk of HSV transmission to the neonate? Assume the newborn will be managed appropriately according to recommendations from the American Academy of Pediatrics and the Centers for Disease Control and Prevention.

- A. Schedule delivery by Cesarean section and treat the mother with oral acyclovir 400 mg three times daily for 5 days
- B. Start the mother on acyclovir 5 mg/kg IV every 8 hours and continue until 24 hours following spontaneous vaginal delivery
- C. Start the mother on oral acyclovir 400 mg three times daily until 24 to 48 hours following spontaneous vaginal delivery
- D. Acyclovir is not helpful at this time since labor has already started

7. A 30-year-old woman who is at 27 weeks' gestation presents for counseling on genital HSV acquisition risk reduction during the rest of her pregnancy because her husband has a history of recurrent genital herpes. The pregnant woman has no known history of genital or orolabial herpes. What recommendation should be given to this couple to prevent the woman from acquiring genital HSV during the third trimester of pregnancy?

- A. Daily oral acyclovir suppressive therapy for the husband until delivery to prevent transmission to his wife
 - B. Daily oral acyclovir therapy for the patient through neonate delivery to prevent acquisition of HSV from her husband.
 - C. No additional precautions are needed during sexual intercourse if her husband has no active lesions.
 - D. Abstain from vaginal intercourse with her husband
8. A 32-year-old woman presents for counseling regarding management of recurrent genital herpes. She has had 3 episodes in the past 11 months. She is interested in reducing her risk of recurrence. Which one of the following is a recommended suppressive regimen to reduce genital HSV recurrence?
- A. Famciclovir 250 mg orally three times a day
 - B. Acyclovir 400 mg orally three times a day
 - C. Valacyclovir 500 mg orally once a day
 - D. Valacyclovir 1000 mg orally three times weekly
9. 19-year-old man presents to clinic with a 2-day history of fevers, malaise, and a painful lump in his right groin. About 6 hours prior to the clinic visit, he noticed multiple painful vesicles in the urethral opening and glans of his penis. He had insertive vaginal intercourse without a condom with a woman he met at a college party about 7 days ago. On examination, he has multiple small vesicles, with an erythematous border, on the penile glans and in the urinary meatus. A sample from one of the lesions is sent for herpes simplex virus (HSV) PCR testing. He has no prior history of any genital or oral lesions. A diagnosis of first-episode genital herpes simplex virus (HSV) infection is strongly suspected with a plan to initiate empiric treatment for HSV. Which one of the following is a recommended treatment for first clinical episode of genital herpes?
- A. Acyclovir 400 mg orally three times a day for 7 to 10 days
 - B. Acyclovir 400 mg orally twice a day for 3 to 5 days
 - C. Valacyclovir 500 mg orally twice a day for 5 to 7 days
 - D. Topical acyclovir applied five times a day for 7 to 10 days
10. A 21-year-old female college student presents to your clinic complaining of a 3-day history of a painful genital lesion on her left labial region. She has been sexually active throughout college and thinks she may have had a similar lesion about 6 months ago but is unsure. You suspect she has genital herpes. She has never had any testing for herpes. Which one of the following tests is preferred to yield a specific diagnosis of genital HSV infection?
- A. Serum antibody for HSV 1 and 2
 - B. HSV PCR on a sample taken from the base of the genital lesion
 - C. Tzanck smear of a swab obtained from the genital lesion
 - D. HSV culture of a sample taken from the genital lesion fluid
-

Standards of answers: 1 – A, 2 – C, 3 – B, 4 – C, 5 – D, 6 – A, 7 – D, 8 – C, 9 – A,
10 – B.

SELF-WORK
of the 4th year higher medical education applicants
on the topic of the practical lesson

1. To provide curation of patients with a detailed history taking and complaints.
2. To give interpretation to the obtained laboratory methods of research.
3. To give interpretation to the obtained instrumental research methods.
4. Set a preliminary diagnosis during the patient's curation.

Recommended literature

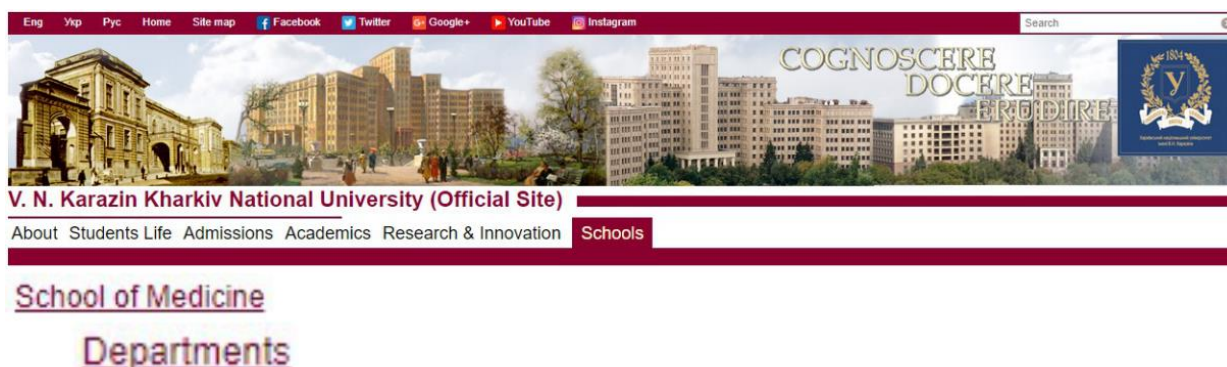
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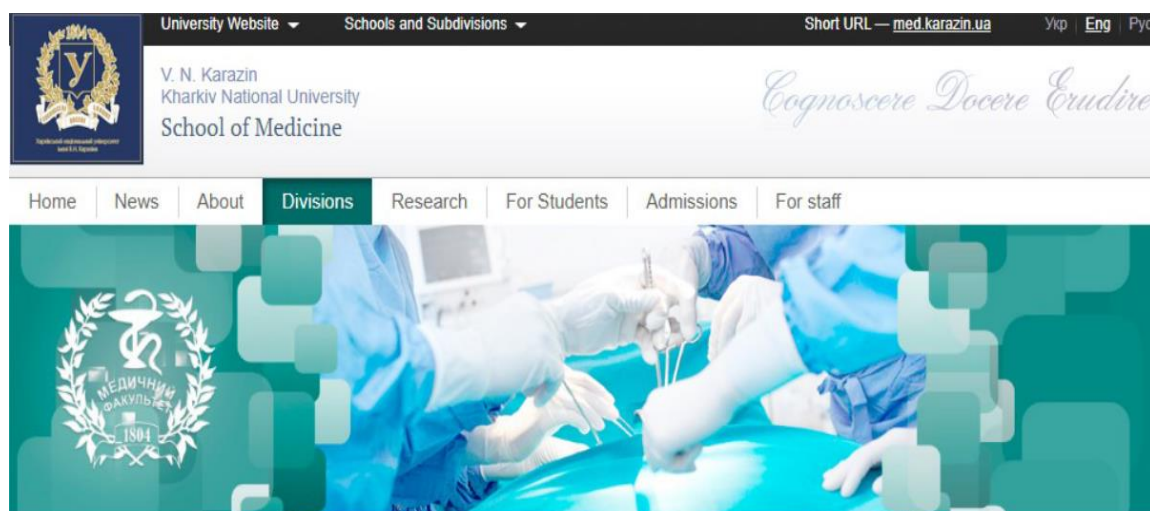
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Official site: <http://www.univer.kharkov.ua/en/departments>



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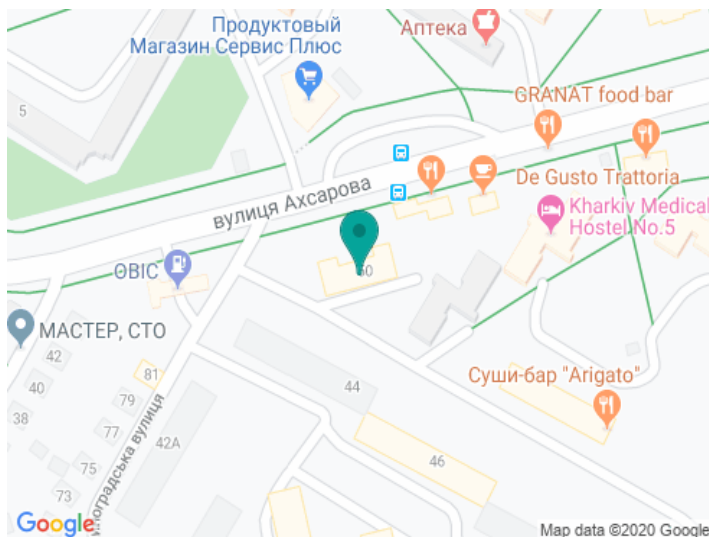
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How to get there? The clinical base of the department is located at: st. Tsilinogradskaya, 50. You can get to this place just from the city center, using the bus 245e (the bus takes passengers just near the metro "Derzhprom"), you need to get to the stop "Tsilinogradskaya", and then walk about 500 meters. You are in place! Or use the subway to the stop "Alexeyevskaya".



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Лядова Тетяна Іванівна
Волобуєва Ольга Вікторівна
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(Англ. мовою)

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