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VIROLOGY AND IMMUNOLOGY

**MATERIALS FOR PREPARING TO LICENSE
EXAMINATION «KROK-1» ON
MICROBIOLOGY, VIROLOGY AND
IMMUNOLOGY
FOR ENGLISH-MEDIUM STUDENTS OF THE
FACULTIES OF MEDICINE AND DENTISTRY**

Part 2

Kharkiv 2018

Standard protocols to laboratory classes in special virology for the II and III year English media students of medical and dentistry faculties / M.M. Mishyna, N.I.Kovalenko, Yu.A.Mozgova, T.M. Zamaziy, O.O. Vovk. – Kharkiv: KNMU, 2018. – 84 p.

Introduction.

«Materials for preparing to license examination “KROK-1” on microbiology, virology and immunology for English-medium students of the faculties of medicine and dentistry (guidelines for students)» were prepared according to the Program on microbiology, virology and immunology for students of medical and dentistry faculties of medical universities of 3-4 accreditation levels.

These materials were made that to help students to remember tests and be prepared to “KROK-1” examination on special virology. This book contains tests that were in “KROK” buklets for English-medium students of medical, dentistry and pharmacy facultaties (<http://testcentr.org.ua>). According to tendence of last years when in “KROK-1” appear tests on infectious diseases we also add such tests.

The book deals with the viruses that can cause infectious diseases in humans. Particular attention is paid to prophylaxis and treatment of various infectious diseases, modern methods of laboratory diagnostics also are discussed.

The book is structured in two parts: I – especially tests where for students correct answer is marked, and it is necessary to write a key words at right side, and II – where schemes and schedules are present that to make the process of answer easily and may help to remember key words for longer time.

Influenza viruses

1. Ambulance brought to the hospital a patient with acute respiratory viral infection. The illness began suddenly with temperature rise up to $39,9^{\circ}\text{C}$. He complains of headache in frontotemporal lobes, pain in eyeballs, aching of the whole body, nose stuffiness, sore throat, dry cough. At home he had a nasal hemorrhage twice. What type of acute respiratory viral infection is it?

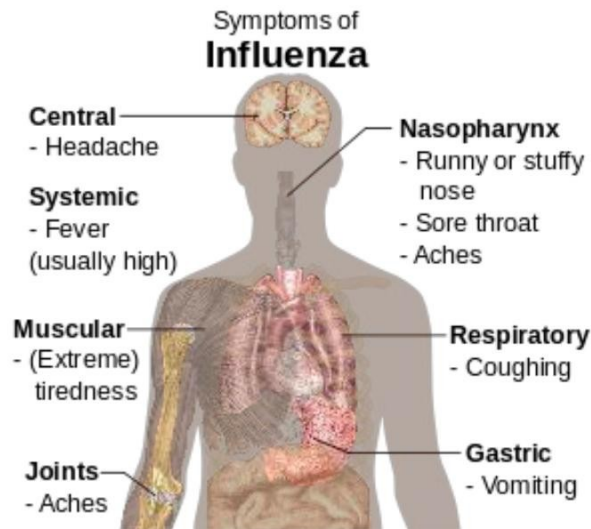
A. Influenza

B. Adenoviral infection

C. Parainfluenza

D. RS-infection

E. Enterovirus infection



2. Material taken from a patient with provisional diagnosis "influenza" was referred to a laboratory. For virological examination the hemadsorption reaction was applied. This reaction can be applied for detection of the following viruses:

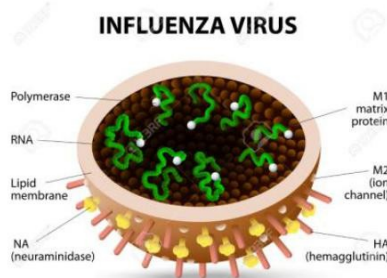
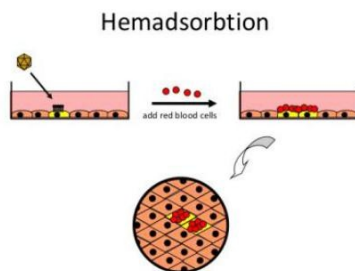
A. Viruses containing hemagglutinins

B. All the complex viruses

C. All the simple viruses

D. DNA-genomic viruses

E. Any viruses



3. During the breakout of acute respiratory infection in order to diagnose influenza the express-diagnosis, based on revealing of specific viral antigen in the examined material (nasopharyngeal lavage), is carried out. Which reaction is used for this?

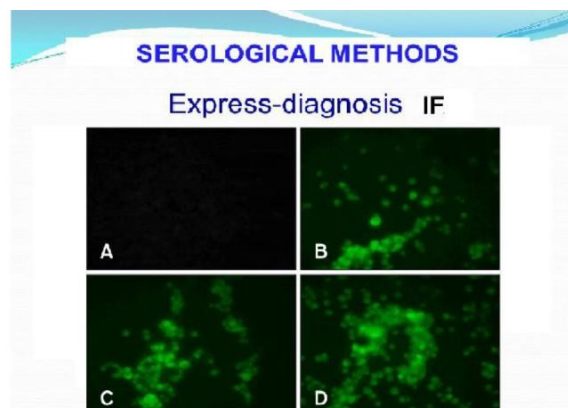
A. Immunofluorescence

B. Agglutination

C. Precipitation

D. Opsonization

E. Complement binding



4. A virological laboratory obtained pathological material (mucous discharges from nasal meatuses) taken from a patient with provisional diagnosis "influenza". What quick test will allow to reveal specific viral antigen in the material under examination?

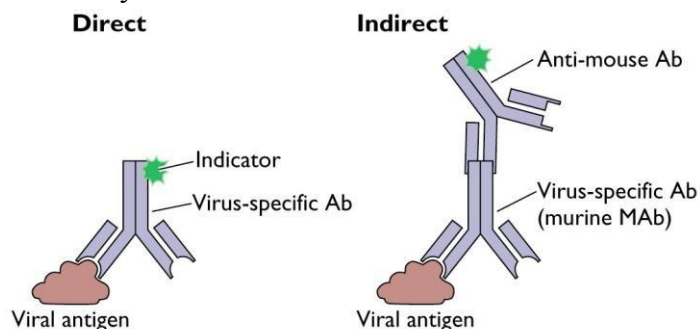
A. Direct and indirect immunofluorescence test

B. Direct and indirect fluorescence immunoassay

C. Hemagglutination inhibition assay

D. Radioimmunoassay

E. —



5. Pathological material (mucosal excretion from the nasal passages) taken obtained from a patient provisionally diagnosed with influenza was delivered to the virological laboratory. What quick test allows detecting specific viral antigen in the investigated material?

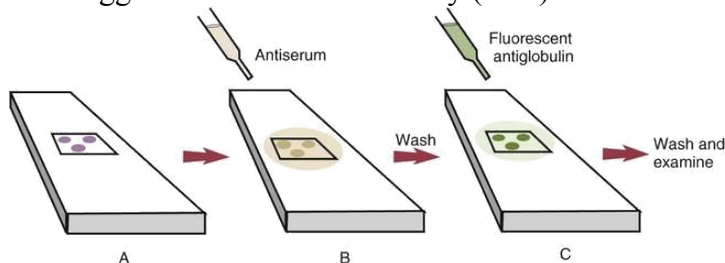
A. Direct and indirect immunofluorescence (IF)

B. Reverse indirect haemagglutination (RIHA)

C. Radioimmunoassay (RIA)

D. Direct and indirect enzyme-linked immunosorbent assay (ELISA)

E. Hemagglutination inhibition assay (HAI)



6. Virological laboratory has received patient's nasopharyngeal lavage. What can be used to single out influenza virus from the patient's lavage?

A. Chick embryo

B. Endo's medium

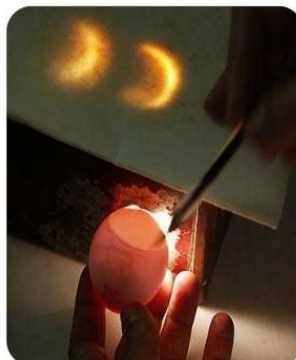
C. Meat infusion agar

D. Meat infusion broth

E. Lowenstein-Jensen medium

Regular Methods in Use

- Egg inoculation
Influenza
- Into tissue culture



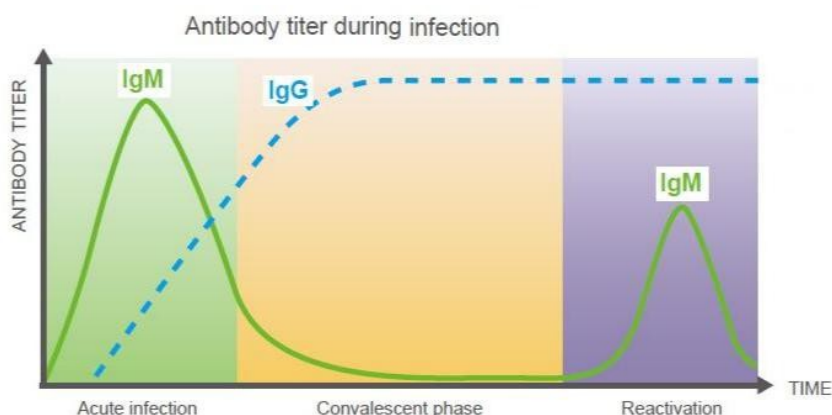
7. Inoculation of hen's embryos is the main method of detection of influenza virus. In order in the material under examination (nasopharyngeal lavage) it is necessary to add beforehand:

- A. Antibiotics
- B. Anti-influenza gamma globulin
- C. Fluorescent serum
- D. Leukocytic interferon
- E. Eubiotics



8. A patient has been diagnosed with ARVI. Blood serum contains immunoglobulin M. What is the stage of infection in this case?

- A. Acute
- B. Prodromal
- C. Incubation
- D. Reconvalence
- E. Carriage



9. A patient fell ill the day before, the disease is acute with a predominance of general toxic symptoms. With an account for the epidemic situation in the city, the doctor diagnosed the patient with influenza A. What emergency etiotropic treatment must be administered to this patient?

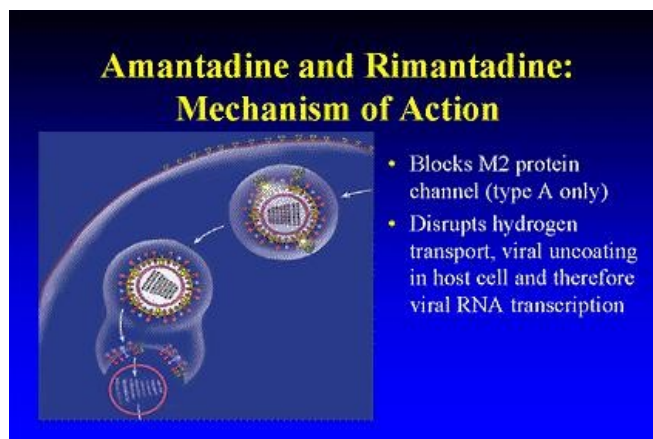
- A. Rimantadine
- B. Oxolinic ointment
- C. Gentamicin
- D. Inactivated influenza vaccine
- E. Human gamma globulin

Amantadine & Rimantadine

- Block the **M2 ion channel** of the virus particle and **inhibit Uncoating** of the viral RNA within infected host cells, thus preventing its replication.
- Activity: influenza A only.
- Rimantadine is 4 to 10 times more active than amantadine in vitro.
- A/E
GI disturbance, nervousness, insomnia.

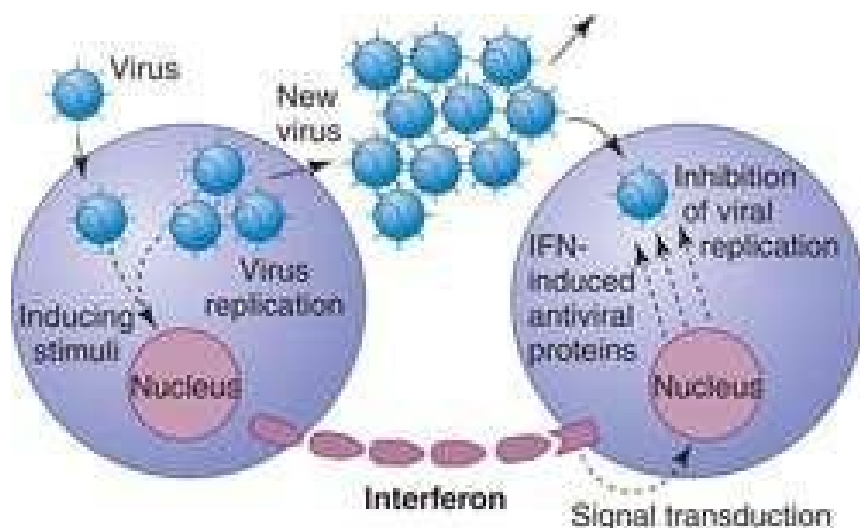
10. Pharmacy has received viricidal drugs. Choose the one used for influenza treatment from the list given below.

- A. Rimantadine**
 B. Metisazone C.
 Levamisole D.
 Azidothimidine E.
 Acyclovir



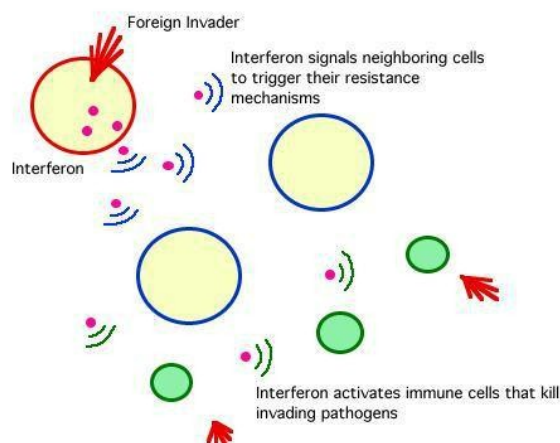
11. Epidemic of influenza was announced in a town. Which drug can be recommended for the nonspecific prophylaxis of influenza?

- A. Leukocytic interferon** B. Antibiotics
 C. Anti-influenza immunoglobulin
 D. Anti-influenza vaccine
 E. Anti-influenza serum



12. A drugstore received a supply of a drug that is widely used for treatment of many virus diseases since it is not virus specific. What drug is it?

- A. Interferon**
 B. Remantadin
 C. Metisazone
 D. Immunoglobulin
 E. Vaccine

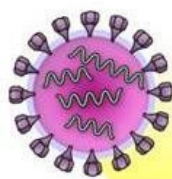


13. To prevent the seasonal influenza epidemics in the city hospitals, sanitary epidemic station gave orders to immunize health care workers. Which of the following preparations should be used for immunization?

- A. Subunit vaccine
- B. Interferon
- C. Amantadine
- D. Rimantadine
- E. Gamma-globulin

SUBUNIT VACCINE

- These are defined as those containing one or more pure or semi pure antigens.
- Usually it consist of specific, purified macromolecules derived from pathogens.

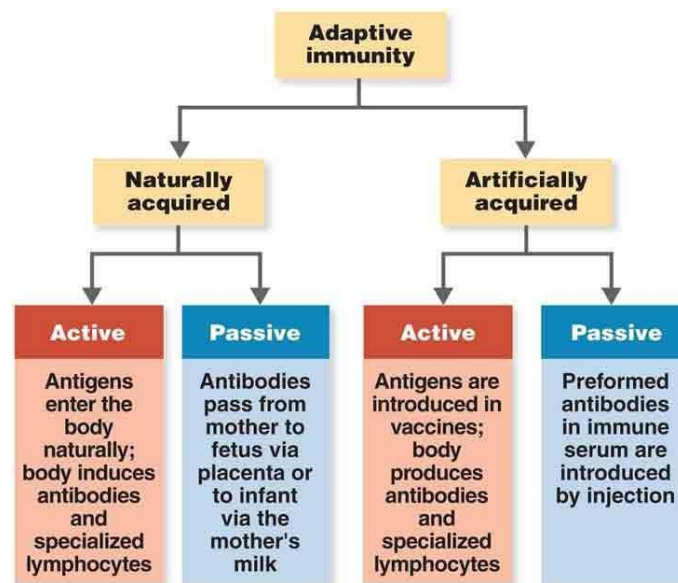


Subunit vaccine

- ✓ No risk of infection
- ✓ Safe to administer in immunocompromised, pregnant women, and the elderly
- ✗ Poor cellular immune responses
- ✗ Poor induction of immunological memory

14. For the specific prevention of influenza, the employees of an enterprise were vaccinated with "Influvac". What type of immunity will develop in the body of the vaccinated?

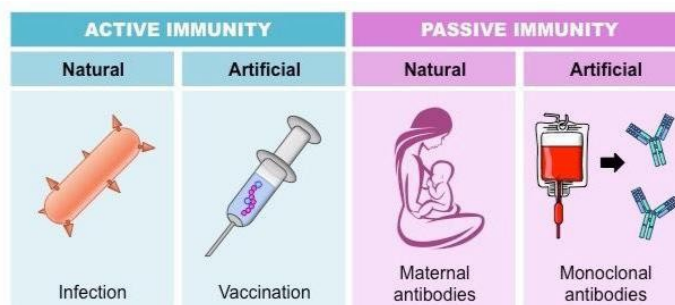
- A. Artificial active
- B. Innate congenital
- C. Natural active
- D. Artificial passive
- E. Natural passive



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15. A person has been in contact with influenza patient. What drug should be administered for specific passive influenza prophylaxis?

- A. Antigrrippal immunoglobulin
- B. Amizon
- C. Anaferon D. Vaccine
- influenza virus inactivated E. Leukocytic interferon



Poxviruses

1. The contents of vesicles that appeared on the mucous membrane of a patient with variola were sent to a virological laboratory. Which of the listed changes were revealed during the smear microscopy?

A. Paschen bodies

B. Babes-Negri bodies

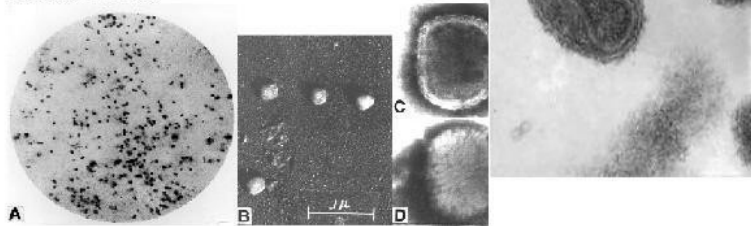
C. Guarnieri bodies D.

Babes-Ernst bodies E.

Syncytium

LABORATORY DIAGNOSIS

- Sample – Fluid from eruptive lesions
- Blood
- Antigen detection, Isolation of virus
- Electron Microscopy
- Paschen bodies



Picornaviruses

1. A 3-year-old child has been taken to a pediatrician. He has no recent history of any diseases. Objective examination revealed no pathology of the internal organs. The child needs the routine immunization against the following disease:

A. Poliomyelitis

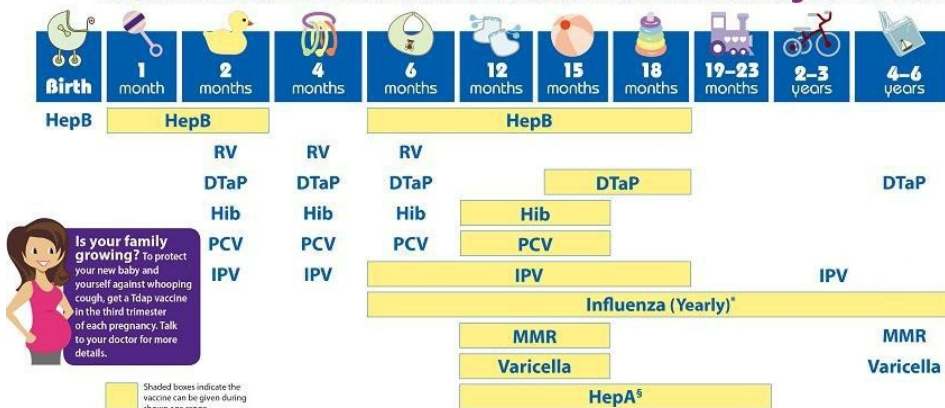
B. Diphtheria and

tetanus C. Measles,
rubella, parotitis

D. Pertussis

E. Type B hepatitis

Recommended Immunizations for Children from Birth Through 6 Years Old



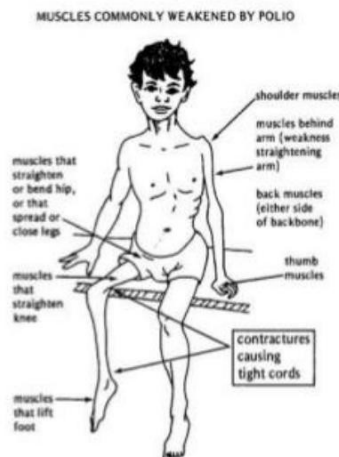
2. A 1,5 y.o. child fell ill acutely with high temperature 38°C , headache, fatigue. The temperature declined on the fifth day, muscular pain in the right leg occurred in the morning, there were no movements and tendon reflexes, sensitivity was reserved. What is the initial diagnosis?

- A. Polyomyelitis
- B. Viral encephalitis
- C. Polyarthropathy
- D. Osteomyelitis
- E. Hip joint arthritis

Clinical Manifestation

• Paralytic Poliomyelitis

- Occur in 0.5-1% of all cases, usually begins with manifestations of abortive or non paralytic poliomyelitis.
- Then after 3-8 days → **paralytic manifest**
- The major symptoms, however, are due to **invasion of the motor nerves**, which are responsible for movement of the muscles.
- This viral invasion causes inflammation, and then destruction of these nerves.
- Divided into 3 types:
 1. **Spinal**
 2. **Bulbar**
 3. **Encephalitic**



3. A child is 9 months old. The patient's body temperature is $36,7^{\circ}\text{C}$, the skin is pale, humid, there is pain in leg muscles. There is no extremities mobility, sensitivity is present. The child has been diagnosed with poliomyelitis. The causative agent of this disease relates to the following family:

- A. Picornavirus
- B. Paramyxovirus
- C. Toxovirus
- D. Adenovirus
- E. Rotavirus

Group IV: (+)sense RNA Viruses

Family	Genus	Type Species	Hosts
Picornaviridae	<u>Enterovirus</u>	<i>Poliovirus</i>	Vertebrates
	<u>Rhinovirus</u>	<i>Human rhinovirus A</i>	Vertebrates
	<u>Hepatovirus</u>	<i>Hepatitis A virus</i>	<u>Vertebrates</u>
	<u>Aphthovirus</u>	<i>Foot-and-mouth disease virus O</i>	Vertebrates
	<u>Parechovirus</u> <u>Parechoviruses:</u>	<i>Human parechovirus</i>	Vertebrates

<p>4. In our country, routine preventive vaccinations against poliomyelitis involve using live vaccine that is administered orally. What immunoglobulins are responsible for the development of local post-vaccination immunity in this case?</p> <p>A. Secretory IgA B. IgM C. IgG D. Serum E. IgE</p> <p style="text-align: center;">Local Immunity</p> <ul style="list-style-type: none"> • Can be produced by Oral Vaccines • Sabin's vaccine for polio given orally X Salk will not protect Local Immunity but produces systemic Immunity • Locally produced Antibodies IgA protect the gut from entry of pathogens • Local immunity antigen protects the individuals 	
<p>5. An 8-year-old child was hospitalized for fever up to 39,8°C, inertness, moderate headache, vomiting. Examination revealed meningeal symptoms. Lumbar puncture was performed. The obtained fluid had raised opening pressure, it was transparent, with the cell count of 450 cells per 1 mcL (mainly lymphocytes - 90%), glucose level of 2,6 mmol/l. What causative agent might have caused the disease in the child?</p> <p>A. Enterovirus B. Meningococcus C. Koch's bacillus D. Staphylococcus E. Pneumococcus</p> <p style="text-align: center;">Enterovirus infection:</p> <div style="border: 1px solid black; padding: 10px;"> <ul style="list-style-type: none"> • Classification: <i>Picornaviridae</i>. • Etiology: Coxsackievirus A and B, Poliovirus, and Echovirus. • General properties: Icosahedral non-enveloped single-stranded RNA virus. • Pathogenesis: <ul style="list-style-type: none"> – Viral replication in oropharynx and intestinal mucosa. – Intestinal lymphoid tissue infection; viremia. – Meninges infection; aseptic meningitis. </div>	

6. A culture of monkey cells (Vero) and a group of mouse sucklings were infected with an inoculum taken from a child with provisional diagnosis "enterovirus infection". There was no cytopathic effect on the cell culture but mouse sucklings died. What enteric viruses might have caused disease of this child?

- A. Coxsackie A
- B. Coxsackie B**
- C. ECHO virus
- D. Polioviruses
- E. Unclassified enteric viruses 68-71

Choice of Virus Isolation System

Virus	Tissue Cultures	Suckling Mice
Polioviruses	+	-
Coxsackievirus group A	(+) ^a	+
Coxsackievirus group B	(+) ^b	+

^aOnly a few serotypes of coxsackievirus group A can be recovered from clinical specimens in tissue cell cultures.

^bCox B produce no CPE in cell cultures

7. A laboratory received a sample of water used in drug production for sanitary and virusological analysis. What group of viruses will indicate fecal contamination of water and thus the need for its additional purification?

- A. Picornaviridae**
- B. Herpesviridae
- C. Orthomyxoviridae
- D. Retroviridae
- E. Flaviviridae

Water Contamination

- Contaminants that may be in untreated water include:
 - microorganisms (viruses and bacteria)
 - inorganic contaminants (salts and metals)
- Water quality depends on the local geology and ecosystem, as well as human uses (sewage dispersion, industrial pollution, use of water bodies as a heat sink)

8. A patient, who works as a milkmaid, has made an appointment with a dentist with complaints of aphtha-shaped rash on the mucosa of oral cavity. The doctor detected rash on her hands in the area of nail plates. What agent causes this disease?

A. Foot-and-mouth disease virus

B. Cytomegalovirus

C. Vesicular stomatitis

D. Herpesvirus

E. Coxsackie

B virus

Hand-foot-and-mouth disease



Rotaviruses

1. A three-year-old child has had marked diarrhea for three days. Immune electron microscopy of his excrements revealed bilayer pseudocovered capsid viruses that looked like small spoke wheels. What viruses have been revealed?

A. Rotaviruses

B. Coxsackie viruses

C. ECHO viruses D.

Coronaviruse

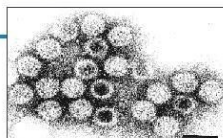
E. Reoviruses

How does rotavirus spread?

- Rotavirus infection is highly contagious

- Rotavirus spread by fecal-oral route

- The primary mode of transmission of rotavirus is the passage of the virus in stool to the mouth of another child



2. An outbreak of an intestinal infection occurred in a kindergarten on the eve of New Year holidays. Bacteriological examination of patients' feces didn't reveal any pathogenic bacteria. Electron microscopy revealed roundish structures with clear outer edges and a thick core resembling a wheel. Specify the most likely causative agent of this infection:

A. Rotavirus

B. Adenovirus

C. Coxsackivirus

D. E.coli

E. P.vulgaris

Rabies viruses

1. A hospitalized patient bitten by a rabid animal has an abusive wound of shin. What kind of vaccine must be given to prevent rabies?

- A. Anti-rabies vaccine**
- B. DTaP
- C. Td D.
- BCG E.
- TABte



2. In the area being the epicenter of the registered rabies cases among wild animals a 43-year-old man presented to a clinic and claimed to have been bitten by a stray dog. He was given a course of anti-rabies vaccine. This preparation relates to the following type of vaccines:

- A. Attenuated
- B. Inactivated**
- C. Molecular
- D. Toxoids E.
- Synthetic



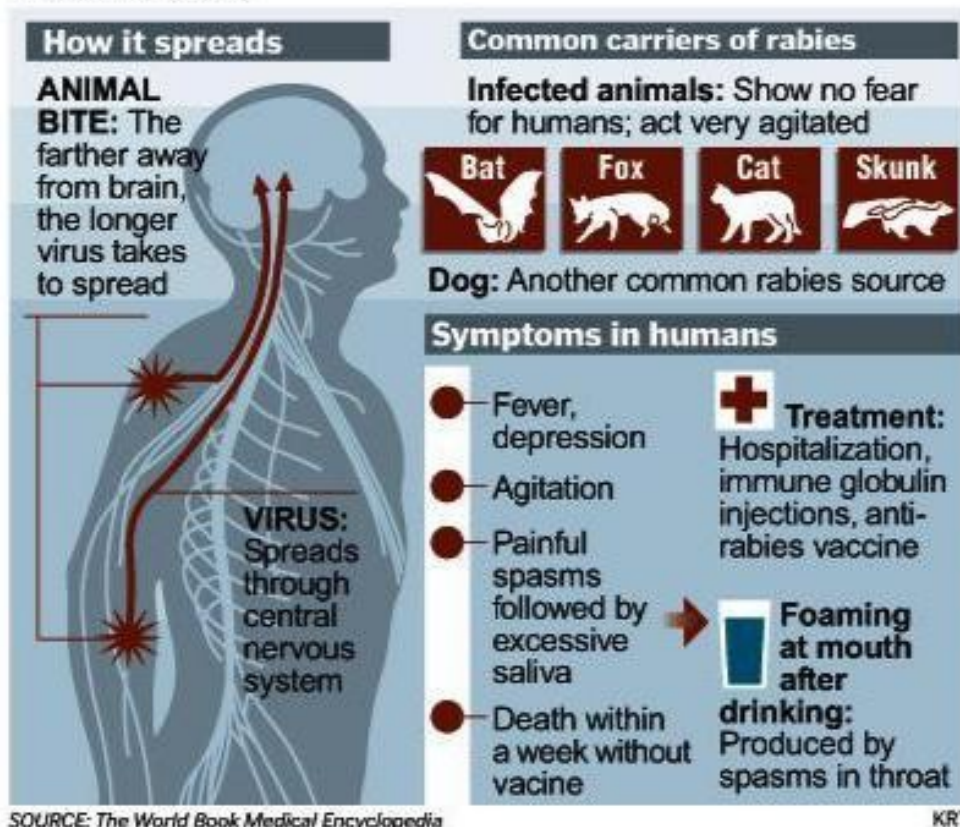
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- A. Attenuated
- B. Inactivated**
- C. Molecular
- D. Toxoids E.
- Synthetic

4. A female patient bitten by a stray dog came to a surgery. Wide lacerated wounds were localized on the patient's face. What treatment-and prevention aid should be rendered in order to prevent rabies?

- A. **Immunization with the antirabic vaccine**
- B. Combined antibiotic therapy
- C. Hospitalization, injection of DTP
- D. Hospitalization, medical surveillance
- E. Urgent injection of normal gammaglobulin

Rabies



5. A man who was bitten by the unknown dog applied to the surgeon. Wide ragged wounds were localized on the face. What curative-prophylactic aid should be given to prevent rabies?

- A. **Start immunization with rabies vaccine**
- B. Prescribe combined antibiotic therapy
- C. Immediate injection of DPT vaccine
- D. Hospitalize the patient and keep under the doctor's supervision
- E. Immediately inject normal gamma globulin

6. Brain autopsy revealed an edema, hyperemia, and small hemorrhages in the medulla oblongata. Microscopically chromatolysis, hydropia and nerve cell necrosis are observed; within the cytoplasm of hippocampal nerve cells there are eosinophilic structures (Negri bodies) detected. What diagnosis corresponds with the described morphological signs?

- A. Rabies
- B. Encephalomyelitis
- C. Meningococcal meningitis
- D. Brucellosis
- E. Encephalitis



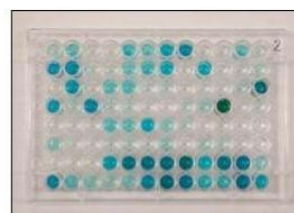
Vesicular stomatitis virus

1. A patient has some vesicles on the mucous membrane of the oral cavity, lips and nose. A dentist suspected vesicular stomatitis. What analysis will allow to confirm the diagnosis?

- A. Recovery of virus from the vesicular fluid
- B. Allergy test
- C. Recovery of bacteria from the vesicular fluid
- D. Contamination of animals with the vesicular fluid
- E. Microscopy of the vesicular fluid

Laboratory Diagnosis

- Virus isolation
- Viral antigen detection
 - Vesicular fluid or epithelium
 - ELISA, complement fixation, virus neutralization
- Antibody tests
 - Paired serum samples
 - ELISA, complement fixation, virus neutralization



Herpesviruses

1. A patient consulted a dentist about pains, reddening and swelling of gums. The dentist assumed herpetic gingivostomatitis. What virus might have caused this disease?

A. Herpes simplex virus type

1 B. HSV type 2

C. Herpes zoster

D. Cytomegalic virus

E. Epstein-

Barr virus

HERPETIC GINGIVOSTOMATITIS

• Diagnosis:

- Age: Young patients History
- First exposure to HSV
- Viral culture, serum antibody. EM, PCR,



Vesicle develop on the lips, tongue, gingival, palate

2. A 26-year-old male patient complains of a rash on the upper lip skin, which arose on a background of influenza with high-grade fever and is accompanied by pain and burning. The rash has been present for 3 days. Objectively: the skin of the upper lip is edematous and erythematous, grouped vesicles are filled with serous fluid and have a rough surface. What is the most likely diagnosis?

A. Herpetic vesicular

dermatitis B. Eczema

C. Contact dermatitis

D. Dermatitis herpetiformis

E. Erythema multiforme

Lab diagnosis:-

Direct

▶ Microscopy

- Tzanck smear
- Cowdry Type A intranuclear inclusion bodies

▶ Culture

- Human fibroblast
- HeLa cells
- Human amnion
- CPE: syncytium formation slower than in HSV

▶ Direct fluorescent antibody

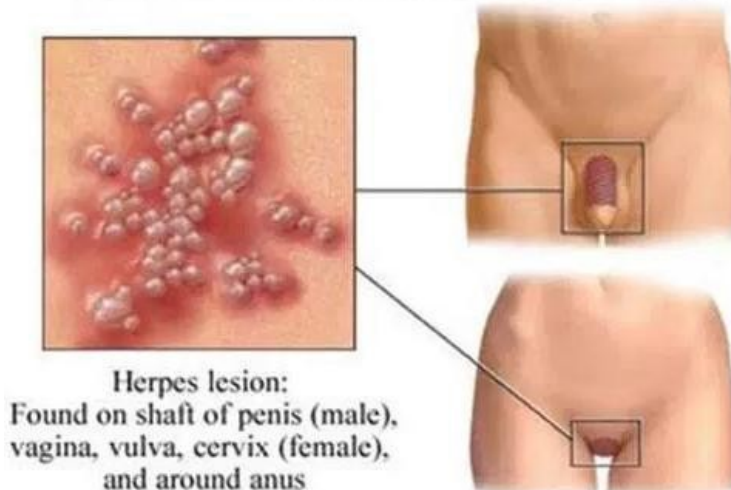


3. A 27-year-old sexually active female complains of numerous vesicles on the right sex lip, itch and burning. Eruptions regularly turn up before menstruation and disappear 8-10 days later. What is the most likely diagnosis?

- A. **Herpes simplex virus**
- B. Bartholinitis
- C. Primary syphilis
- D. Cytomegalovirus infection
- E. Genital condylomata

GENITAL HERPES

How Prevalent Is It And What Should You Do?



4. A 7 y.o. girl has mild form of varicella. Headache, weakness, vertigo, tremor of her limbs, ataxia, then mental confusion appeared on the 5th day of illness. Meningeal signs are negative. Cerebrospinal fluid examination is normal. How can you explain these signs?

- A. **Encephalitis**
- B. Meningitis
- C. Meningoencephalitis
- D. Myelitis
- E. Neurotoxic syndrome

Complications of Varicella



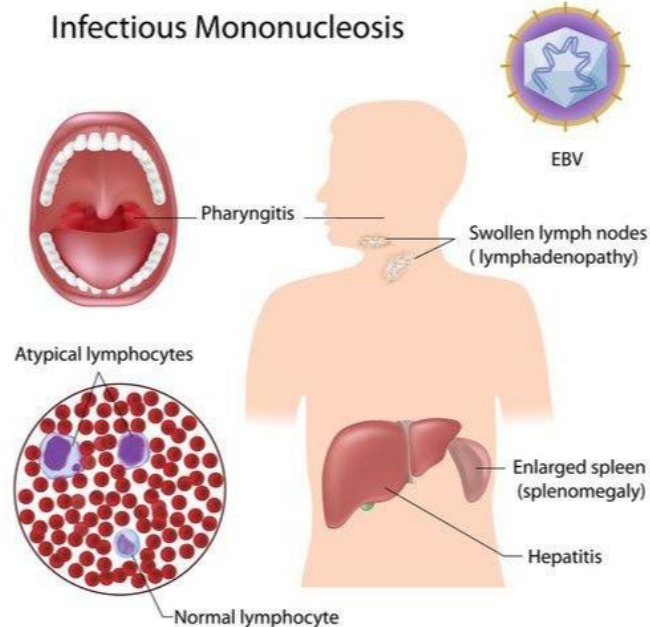
- **herpes zoster (shingles)**
 - lifetime risk 15%-20%
 - mainly affecting the elderly and immunocompromised persons
- **secondary bacterial skin and soft tissue infections**
- otitis media
- bacteremia, **pneumonitis**
- osteomyelitis
- endocarditis
- necrotizing fasciitis
- toxic shock-like syndrome
- hepatitis
- thrombocytopenia
- **hemorrhagic varicella**
- cerebellar ataxia
- **encephalitis**
- severe invasive group A streptococcal infection increases the risk

<p>5. On the 21 day after appearance of vesiculous chickenpox rash a 7-year-old child developed ataxia, nystagmus, intention tremor, muscle hypotonia. Liquor analysis shows insignificant lymphocytic pleocytosis, slightly increased protein rate. What complication is it?</p> <p>A. Encephalitis B. Acute nephritis C. Pneumonitis D. Purulent meningitis E. Postherpetic neuralgia</p>	
<p>6. A 50-year-old woman is being treated for shingles in a neurology unit. What reactivated virus causes this disease?</p> <p>A. Varicella zoster virus (chickenpox virus) B. Herpes simplex virus type 1 C. HSV type 2 D. Measles virus E. Cytomegalovirus</p>	
<div data-bbox="612 698 871 752" data-label="Section-Header"> <h2 style="text-align: center;"><u>SHINGLES</u></h2> </div> <div data-bbox="367 792 895 1149" data-label="List-Group"> <ul style="list-style-type: none"> ➤ Also known as Herpes Zoster. ➤ An acute viral infection of the nerve cells and surrounding skin. ➤ Characterized by a rash of blisters, can be very painful but is not life-threatening. ➤ Caused by the varicella zoster virus that also causes chickenpox. </div> <div data-bbox="895 846 1121 1133" data-label="Image"> </div>	
<p>7. A patient complained about general weakness, fever, painful rash on his trunk skin. He has been suffering from this for 3 days. Objectively: lateral surface of trunk on the left is hyperemic and edematic, there are some groups of vesicles with serous and haemorrhagic contents. What is the most probable diagnosis?</p> <p>A. Herpes zoster B. Contact dermatitis simplex C. Contact allergic dermatitis D. Microbial eczema E. Herpetiform Duhring's dermatosis</p>	
<div data-bbox="148 1563 1126 2029" data-label="Diagram"> </div>	

<p>8. A 67-year-old male patient complains of rash, severe pain in the subscapular region on the right. Objectively: skin in the right subscapular region is covered with linearly arranged pink-red edematous lesions that are somewhat infiltrated, and have clear boundaries. On the lesion surface there are vesicles with transparent exudate. What is the most likely diagnosis?</p> <p>A. Herpes zoster B. Duhring dermatitis C. Erysipelas D. Atopic dermatitis E. Impetigo</p>	
<p>9. 2 days ago a patient presented with acute pain in the left half of chest, general weakness, fever and headache. Objectively: between the 4 and 5 rib on the left the skin is erythematous, there are multiple groups of vesicles 2-4 mm in diameter filled with transparent liquid. What disease are these symptoms typical for?</p> <p>A. Herpes zoster B. Pemphigus C. Herpes simplex D. Streptococcal impetigo E. Herpetiform Duhring's dermatosis</p>	
<p>10. A 3-year-old child has continuous fever, lymph nodes are enlarged, the amount of lymphocytes in blood is significantly increased. Enzymelinked immunosorbent assay (ELISA) revealed antigen of Epstein-Barr virus. What diagnosis can be made based on the information given above?</p> <p>A. Infectious mononucleosis B. Burkitt's lymphoma C. Herpetic lymphadenopathy D. Cytomegalovirus infection E. Generalized infection caused by herpes-zoster</p>	
<p>Investigations</p> <p>Specific EBV serology (immunofluorescence) can be used to confirm the diagnosis if necessary.</p> <p>Acute infection is characterised by IgM antibodies against the viral capsid, antibodies to EBV early antigen and the initial absence of antibodies to EBV nuclear antigen (anti-EBNA).</p>	
<p>11. A doctor examines a 17-year-old girl. The following is detected: pharyngitis, cervical lymphadenopathy, fever. The preliminary diagnosis is infectious mononucleosis. What method of investigation allows to confirm this diagnosis at the disease onset?</p> <p>A. Determining antibodies IgM to Epstein-Barr virus B. Microscopy of blood smear according to Giemsa method C. Determining antibodies IgG to Epstein-Barr virus D. Sabin-Feldman dye test E. Determining the amount of C-reactive Protein</p>	

12. An 18 year old patient was admitted to a hospital with complaints of headache, weakness, high temperature, sore throat. Objectively: enlargement of all groups of lymph nodes was revealed. The liver is enlarged by 3 cm, spleen - by 1 cm. In blood: leukocytosis, atypical lymphocytes - 15%. What is the most probable diagnosis?

- A. **Infectious mononucleosis**
 B. Acute lymphoid leukemia C.
 Adenoviral infection
 D. Angina E.
 Diphtheria




13. Often the cause of secondary immunodeficiency is an infectious affection of an organism, when agents reproduce directly in the cells of immune system and destroy them. Specify the diseases, during which the described above occurs:

- A. Poliomyelitis, viral hepatitis A
 B. Q fever, typhus
 C. Tuberculosis, mycobacteriosis
 D. **Infectious mononucleosis,**
 AIDS E .Dysentery, cholera

Causes of secondary immunodeficiency

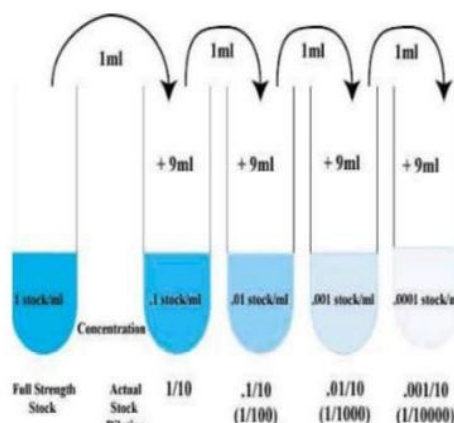
- Metabolic - uremia, diabetes, malnutrition
- Iatrogenic – cytostatics, immunosuppressants
- Malignant tumors
- Viral infections - HIV, CMV, measles, infectious mononucleosis
- Splenectomy
- Stress
- Injuries, operations, general anesthesia

<p>14. An HIV-positive patient's cause of death is acute pulmonary insufficiency resulting from pneumonia. Pathohistological investigation of lungs has revealed transformed cells resemble owl's eye. Name the pneumonia causative agent:</p> <p>A. Cytomegalovirus B. Pneumococcus C. Influenza virus D. Candida fungi E. Toxoplasma</p>	
<p>15. What chemotherapeutic agent is a drug of choice for treatment of herpes?</p> <p>A. Acyclovir B. Rifampicin C. Chingamin D. Doxycycline hydrochloride E. Metronidazole</p>	
<p>16. A patient has herpetic rash. What medication should be administered?</p> <p>A. Acyclovir B. Gentamycin C. Clotrimazole D. Benzylpenicillin sodium salt E. Biseptol</p>	
<p>17. A patient is ill with herpetic stomatitis provoked by immunosuppression. What preparation introduced intravenously, internally and locally can provide antiviral and immunopotentiating effect?</p> <p>A. Acyclovir B. Remantadinum C. Levamisole D. Methisazonum E. Amoxicillin</p>	
<p>18. A patient consulted a dentist about a lesion of his oral mucosa. He was diagnosed with herpetic stomatitis. Which of the following drugs will have an effect on etiotropic factor?</p> <p>A. Acyclovir B. Dimedrol C. Paracetamol D. Levamisole E. Furacilinum</p>	

<p>19. A patient has herpetic conjunctivitis. What etiologic drug should be administered?</p> <p>A. Acyclovir B. Ampicillin C. Methisazonum D. Furagin E. Tetracycline</p>	
<p>20. A patient with herpetic stomatitis was prescribed acyclovir for topical application. What is its mechanism of action?</p> <p>A. It inhibits synthesis of nucleic acids of viruses B. It increases the resistance of macroorganism cells to the viruses C. It inhibits virus maturation D. It inhibits virus penetration into cells E. It inhibits virion assembly</p> <div data-bbox="432 533 1118 1048" style="border: 1px solid black; padding: 10px; margin: 10px auto; width: 80%;"> <h3 style="text-align: center;">Mechanism of Action</h3> <h4 style="text-align: center; color: red;">Acyclovir</h4> <ul style="list-style-type: none"> ■ an acyclic guanosine derivative ■ Phosphorylated by <i>viral thymidine kinase</i> ■ Di- and tri-phosphorylated by host cellular enzymes ■ Inhibits viral DNA synthesis by: <ul style="list-style-type: none"> ■ 1) competing with dGTP for viral DNA polymerase ■ 2) chain termination </div>	
Arboviruses	
<p>1. A patient with clinical signs of encephalitis was delivered to the infectious diseases hospital. Anamnesis registers a tick bite. Hemagglutination-inhibition reaction helped to reveal antibodies to the causative agent of tick-borne encephalitis in the dilution 1:20 which is not diagnostic. What actions should the doctor take after he had got such result?</p> <p>A. To repeat the examination with serum taken 10 days later B. To examine the same serum C. To apply more sensitive reaction D. To repeat examination with another diagnosticum E. To deny diagnosis of tick-borne encephalitis</p>	

Testing paired Samples

- Testing for infectious diseases is performed on acute and convalescent specimens (about 2 weeks apart) *Paired sample*.
- **Must see 4-fold or 2-tube rise in titre to be clinically significant**



2. After a thorough examination the patient who had returned from Central Asia to Ukraine was diagnosed with spring-summer encephalitis. Its pathogen might have entered the body through the bite of the following arthropod:

- A. Dog-louse
- B. Taiga tick**
- C. Mosquito
- D. Itch mite
- E. Argasid tick (*ornithodoros papillipes*)

Genus *Ixodes*: Largest genus of hard ticks

- *I. persulcatus* (Taiga tick) Eurasian

Tick-borne encephalitis (Flaviviridae, genus *Flavivirus*), two forms

Russian Spring Summer encephalitis (far eastern form)

I. taiga forest in E. Russia and NE China

II. vector is *Ixodes persulcatus*

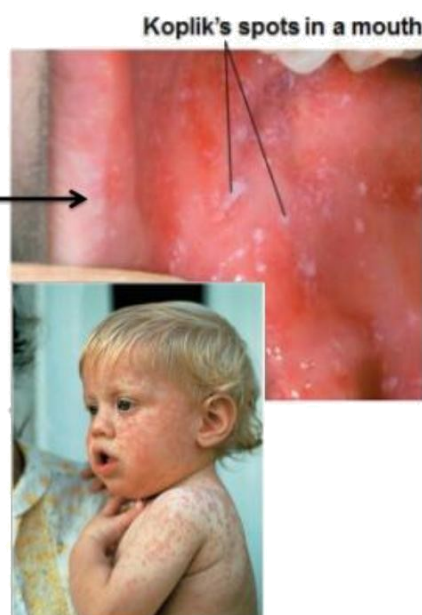
Measles virus


1. A 4-year-old girl died suddenly with symptoms of asphyxia. Autopsy revealed white spots on the buccal mucosa; large blotches of rash on the skin of face, trunk and extremities; conjunctivitis, edema with foci of necrosis on the laryngeal mucosa; giant-cell pneumonia on microscopy. What is the most likely diagnosis?

- A. Measles**
- B. Scarlet fever
- C. Influenza
- D. Meningococcal infection
- E. Typhus

Measles - (*rubeola* or *red measles*) – Morbillivirus - ssRNA

- Transmitted by **respiratory route**
- **Lesions called Koplik's spots** on the mucous membrane of the mouth provide a **diagnosis of measles**
- **Macopapular skin lesions** spread over the body, which gradually turn brown
- Live, attenuated vaccine (**MMR**)



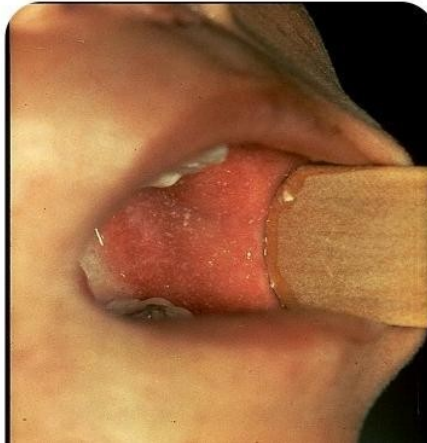
<p>2. A child is 4 years old, has been ill for 5 days. There are complaints of cough, skin rash, to- 38,2°C, face puffiness, photophobia, conjunctivitis. Objectively: there is bright, maculo-papulous, in some areas confluent rash on the face, neck, upper chest. The pharynx is hyperemic. There are seropurulent discharges from the nose. Auscultation revealed dry rales in lungs. What is the most likely diagnosis?</p> <p>A. Measles B. Rubella C. Scarlet fever D. Adenoviral infection E. Enterovirus exanthema</p>	
<p>3. A child, aged 4, has being ill for 5 days, suffers from cough, skin rash, t0- 38,2 °C, facial hydropy, photosensitivity, conjunctivitis. On the face, neck, upper part of the chest there is bright maculopapular rash with areas of merging. Hyperemic throat. Seropurulent nasal discharge. In lungs there are dry crackles. What is the most probable preliminary diagnosis?</p> <p>A. Measles B. Rubella C. Scarlet fever D. Adenovirus infection E. Enterovirus exanthema</p> <p>Measles signs & symptoms include:</p> <div data-bbox="151 851 1109 1064">  <p>High Fever Coughing Runny nose Red, watery eyes Tiny white spots appear in the mouth & throat (Koplik spots)</p> </div>	
<p>4. Such presentations as catarrhal conjunctivitis, pharyngitis, laryngotracheo-bronchitis, white spots on the buccal mucosa in the region of lower premolar teeth, maculopapular rash on face, body and extremities are typical for the following disease:</p> <p>A. Measles B. Spotted fever C. Scarlet fever D. Meningococcal infection E. Influenza</p>	
<p>5. A 7 year old child had an acute onset of disease. Pediatrician stated that mucous membrane of face is hyperemic and covered with a lot of mucus. Mucous membrane of cheeks has whitish stains. Next day the child's skin of face, neck, body was covered with coarsely-papular rash. What disease may be presumed?</p> <p>A. Measles B. Scarlet fever C. Diphteria D. Meningococemia E. Allergic dermatitis</p>	
<p>6. There is a 7-year-old child with complains of cough, lacrimation, rhinitis, skin rash, photophobia and three-day-long fever as high as 38°C. Physical examination has revealed the following: conjunctivitis; bright red maculopapular rash covering the skin of face, neck and torso; hyperemic pharynx; serous purulent secretions from the nose; dry rales in the lungs. What is the most probable diagnosis?</p> <p>A. Measles B. Scarlet fever C. Rubella D. Adenovirus infection E. Chicken pox</p>	

7. A 5-year-old child developed an acute disease starting from body temperature rise up to $38,5^{\circ}\text{C}$, running nose, cough and conjunctivitis. On the 4th day the child presented with maculo-papular rash on face. Body temperature rose again up to $39,2^{\circ}\text{C}$. Over the next few days the rash spread over the whole body and extremities. Mucous membrane of palate was hyperemic, there was whitish deposition on cheek mucous membrane next to molars. What is your provisional diagnosis?

- A. Measles B. Acute viral respiratory infection
C. Yersinia D. Rubella E. Enterovirus diseases

Koplik Spots leading clue to Measles

- Within 2-3 days, the pathognomonic Koplik spots typically arise on the buccal, gingival, and labial mucosa



8. A 3 year old child has been suffering from fever, cough, coryza, conjunctivitis for 4 days. He has been taking sulfadimethoxine. Today it has fever up to 39°C and maculopapular rash on its face. Except of rash the child's skin has no changes. What is your diagnosis?

- A. Measles
B. Allergic rash C. Rubella
D. Scarlet fever E. Pseudotuberculosis

9. Blood serum of a newborn contains antibodies to measles virus. What kind of immunity is this indicative of?

- A. Natural passive
B. Natural active C. Artificial passive
D. Artificial active E. Heredoimmunity

Types of passive Immunity:

▶ Natural passive Immunity:

Resistance passively transferred from mother to foetus or infant, through placenta(transplacentally) and through milk(colostrum).



10. Examination of a child who has recently recovered from measles revealed in the soft tissues of cheeks and perineum some inaccurate, edematic, red-and-black, slightly fluctuating areas. What complication is it?

- A. Humid gangrene B. Dry gangrene
C. Gas gangrene D. Pressure sore E. Trophic ulcer

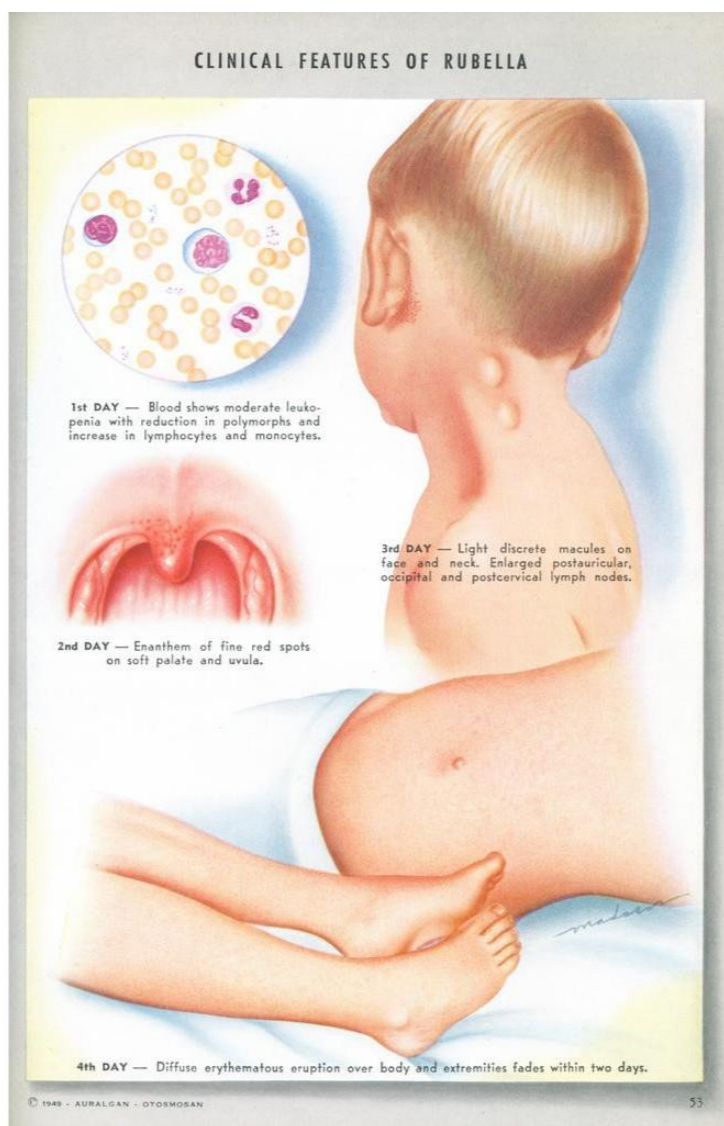
11. A 6 year old child was delivered to the hospital because of measles pneumonia. On the mucous membrane of a cheek a dentist revealed an ill-defined greish area 2x2,5 cm large. Soft tissues are edematic and foul-smelling. The most probable diagnosis of the dentist should be:

- A. Noma
B. Gangrenous stomatitis
C. Pustular stomatitis
D. Phlegmonous stomatitis
E. Ulcerous stomatitis

Rubella virus

1. A 2 y.o. girl has been ill for 3 days. Today she has low-grade fever, severe catarrhal symptoms, non-abundant maculopapular rash on her buttocks and enlarged occipital glands. What is your diagnosis?

- A. Rubella**
B. Scarlet fever
C. Measles
D. Adenoviral infection
E. Pseudotuberculosis



2. A pregnant woman was registered in an antenatal clinic and underwent complex examination for a number of infections. Blood serum contained IgM to the rubella virus. What is this result indicative of?

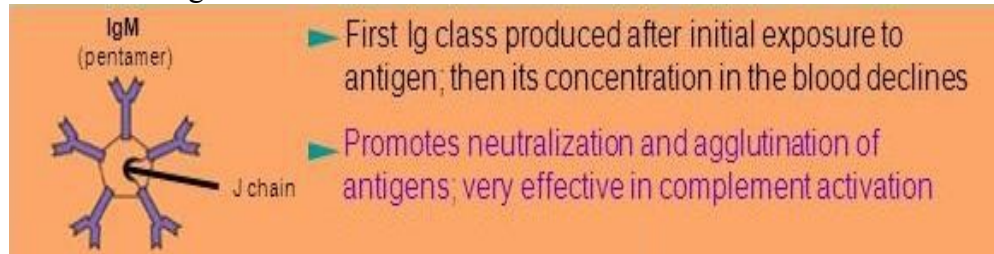
A. Of primary infection

B. Of a chronic process

C. The woman is healthy

D. Of exacerbation of a chronic disease

E. Of recurring infection with rubella virus



3. A pregnant woman was detected with IgM to rubella virus. An obstetrician-gynecologist recommended therapeutic abortion due to the high risk of teratogenic affection of the fetus. Detection of IgM was of great importance as it is these specific immunoglobulins that:

A. Indicate recent infection

B. Penetrate placental barrier

C. Have the largest molecular weight

D. Are associated with anaphylactic reactions

E. Are the main factor of antiviral protection

Class	Percentage of Total	Characteristics and Functions
IgM	5-10%	<ul style="list-style-type: none"> ✓ Levels decrease during stress ✓ Found in blood and lymph ✓ First antibody produced with primary immune response ✓ High concentrations early in infection, decrease within about a week

4. A 36 y.o. woman is in the 12-th week of her first pregnancy. She was treated for infertility in the past. She contacted a child who fell ill with rubella 2 days after their meeting. Woman doesn't know if she has ever been infected with rubella. What is the adequate tactics?

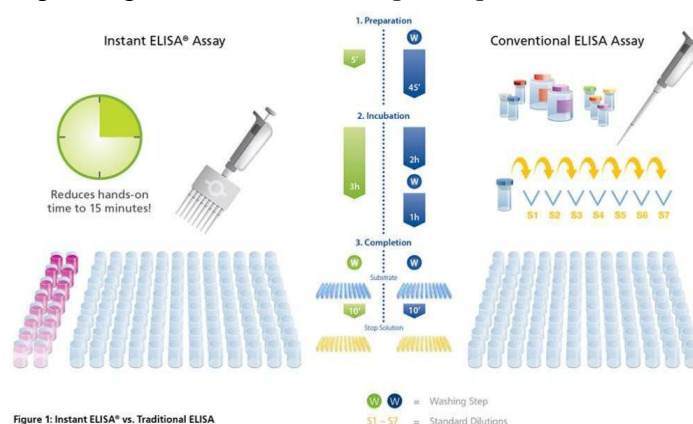
A. Monitoring of the specific IgG, IgM with the ELISA

B. Fetus wastage

C. Immunoglobulin injection

D. Cyclovin prescription

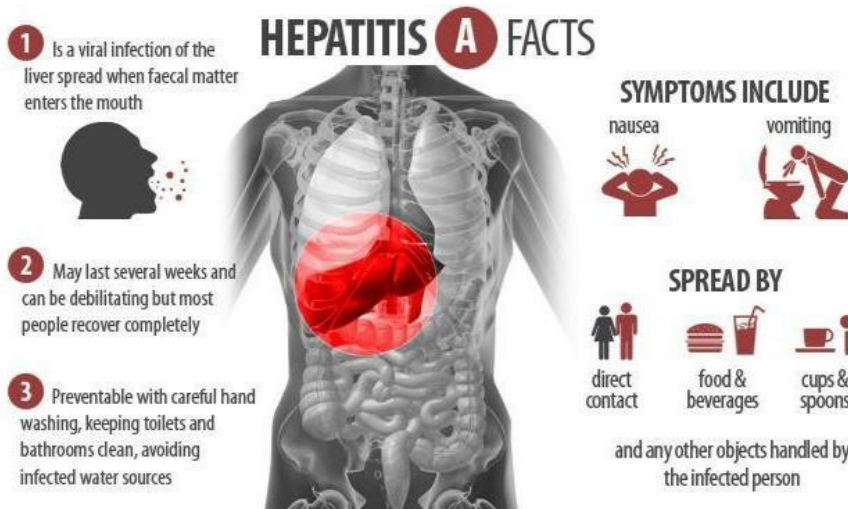
E. Interferon prescription



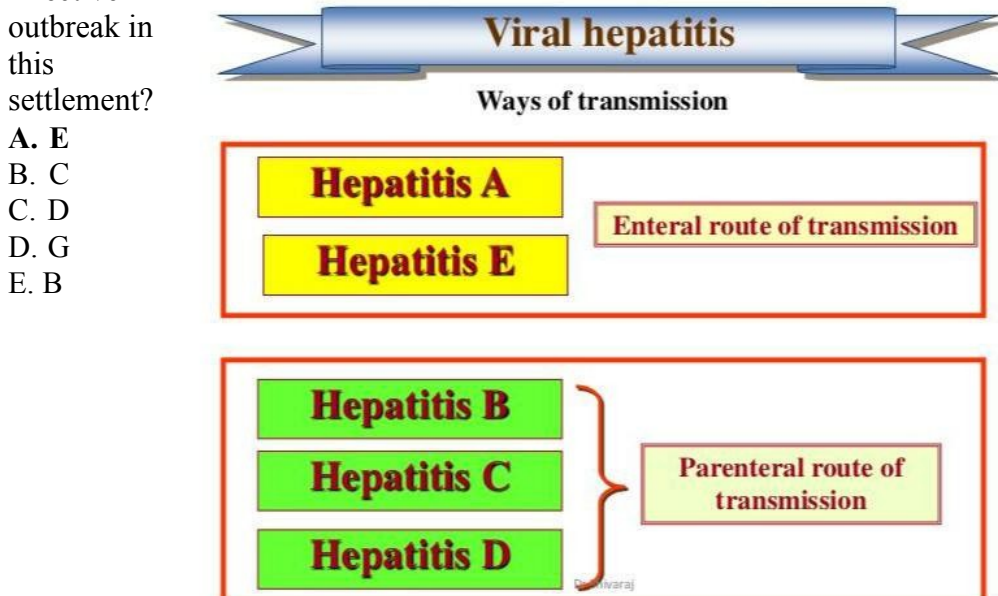
Hepatitis viruses

1. A 20 y.o. patient was admitted to the hospital with complaints of having skin and sclera icteritiousness, dark urine, single vomiting, appetite loss, body temperature rise up to 38°C for 2 days. Three weeks ago he went in for fishing and shared his dishes with friends. Objectively: the patient is flabby, $t - 36,8^{\circ}\text{C}$, skin and scleras are icteritious, liver sticks from under the costal margin by 3 cm, it is sensitive; spleen isn't palpable. Urine is dark, stool is partly acholic. What is the most probable diagnosis?

- A. Virus A hepatitis
- B. Leptospirosis
- C. Infectious mononucleosis
- D. Hemolytic anemia
- E. Intestinal versiniosis



2. A hepatitis outbreak was registered in a settlement. This episode is connected with water factor. What hepatitis virus could have caused the infective outbreak in this settlement?



3. In a township there were registered an outbreak of hepatitis, which was attributed to water supply. What hepatitis virus could be the cause of the outbreak in this township?

- A. Hepatitis E virus
- B. Hepatitis C virus
- C. Hepatitis D virus
- D. Hepatitis G virus
- E. Hepatitis B virus

<p>4. A patient has been admitted to the infectious diseases department for malaise, fever up to 38°C, jaundice. A few months ago, the patient underwent blood transfusion. The doctor suspected viral hepatitis B. What are the principal methods of laboratory diagnosis of hepatitis B?</p> <p>A. Serological and gene diagnostics B. Virus isolation in cell culture and its identification by CPE C. Detection of virions in blood by electron microscopy D. Isolation of the virus in laboratory animals (Nt) E. Isolation of the virus in chicken embryos</p> <p><small>COPYRIGHT © 2014 LIBERATE HEALTH INC. ALL RIGHTS RESERVED. LIB_HEPB101 03/14</small></p>	
<p>5. The donor who for a long time didn't donate the blood was investigated with IFA method. Anti-HBs antibodies were revealed. What does positive result of IFA in this case mean?</p> <p>A. Chronic hepatitis B. Acute hepatitis B C. Acute hepatitis C D. Chronic hepatitis C E. Previous hepatitis B</p>	
<p>6. Examination of a 27-year-old donor who had not donated blood for a long time revealed HBs antibodies detected by ELISA method. In this case, the positive ELISA results indicate that the donor:</p> <p>A. Had hepatitis B B. Has acute hepatitis B C. Has acute hepatitis C D. Has chronic hepatitis B E. Has chronic hepatitis C</p>	
<p>7. Immune-enzyme reaction revealed in blood serum HBs-antigen. What disease is this antigen associated with?</p> <p>A. Viral hepatitis type B B. Viral hepatitis A C. AIDS D. Tuberculosis E. Syphilis</p>	
<p>8. Immune-enzyme assay has detected HBs antigen in blood serum. What disease is it characteristic of?</p> <p>A. Viral hepatitis type B B. AIDS C. Tuberculosis D. Viral hepatitis type A E. Syphilis</p>	

9. During surgical operation a blood transfusion was made. The blood must be checked to find antigens of some disease. What disease is expected to be found?

- A. Viral hepatitis
- B. B. Viral hepatitis
- A C. Adenovirus
- D. Enterovirus
- E. Viral hepatitis E

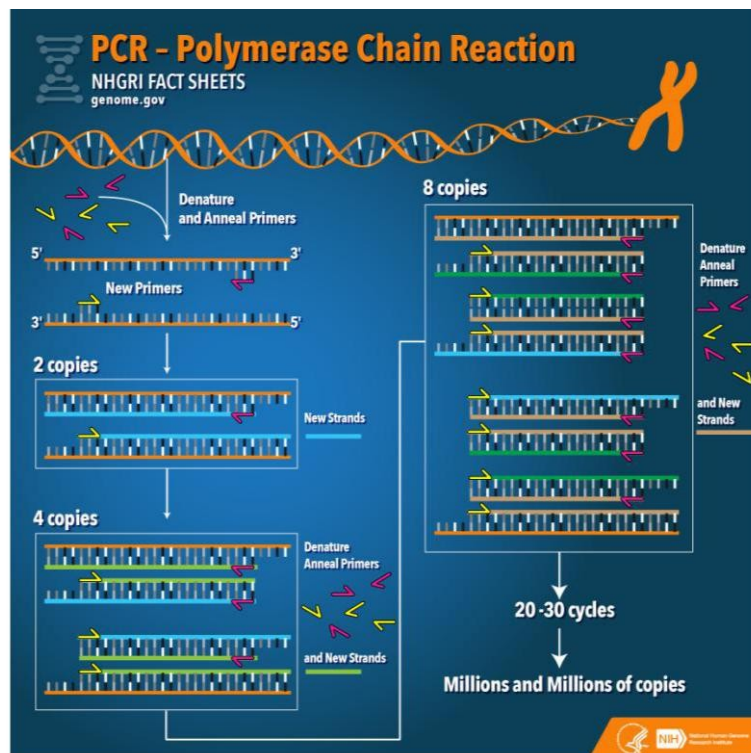
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Laboratory Diagnosis ...

HBsAg	HBeAg	IgM anti-HBc	IgG anti-HBc	Anti-HBs	Anti-HBe	HBV DNA	Interpretation
Acute HBV infection							
+	+	+				+	Early phase
		+				±	Window phase
			+	+	+	-	Recovery phase
Chronic HBV infection							
+	+		+			+	Replicative phase
+			+		+	-	Low, nonreplicative phase
+	±	+				+	Flare-up of chronic HBV
+					+	+	Precore/core promoter mutants

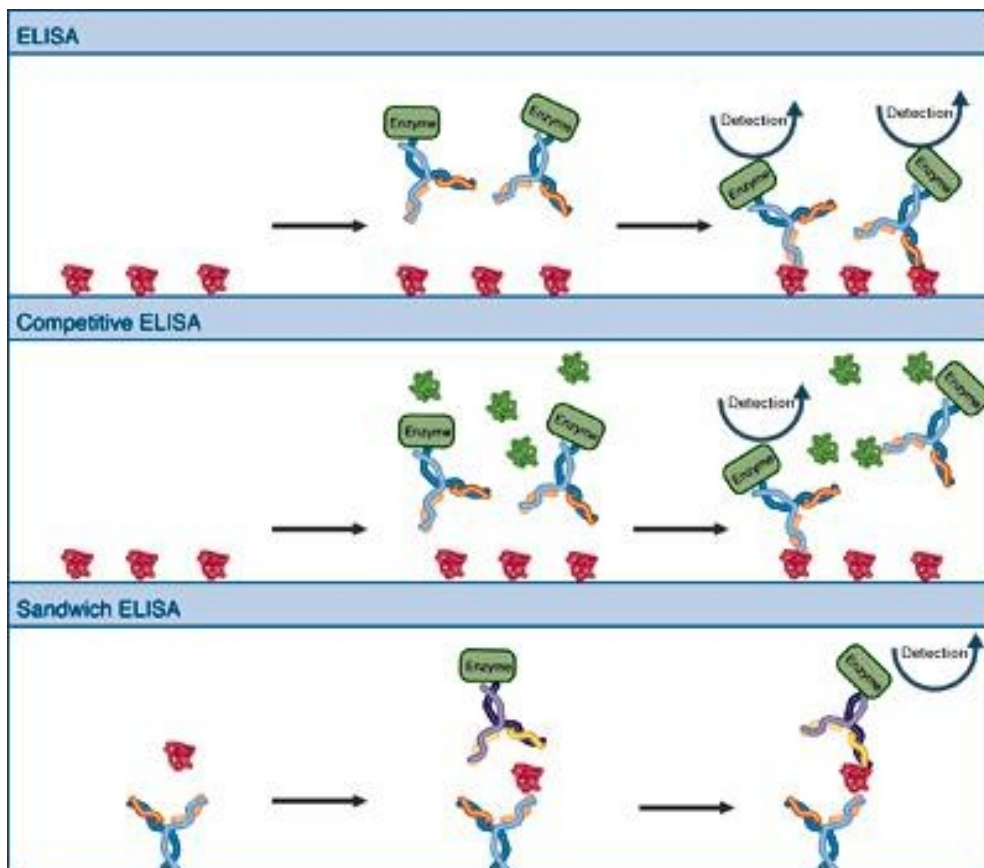
10. Hepatitis B is diagnosed through laboratory tests that determine the presence of HBA-DNA in blood serum of the patient. What reference method is applied for this purpose?

- A. Polymerase chain reaction
- B. Hybridization method
- C. Hybridization signal amplification method
- D. Ligase chain reaction method
- E. ELISA diagnostic method



11. A patient has been hospitalized with provisional diagnosis of virus B hepatitis. Serological reaction based on complementation of antigen with antibody chemically bound to peroxidase or alkaline phosphatase has been used for disease diagnostics. What is the name of the applied serological reaction?

- A. Immune-enzyme analysis
- B. Radioimmunoassay technique
- C. Immunofluorescence test
- D. Bordet-Gengou test



E. Antigen-binding assay

12. Professional dentists belong to the risk group concerning professional infection with viral hepatitis type B. Name an effective method for active prevention of this disease among the dentists:

- A. Vaccination with recombinant vaccine
- B. Secure sterilization of medical instruments
- C. Working with gum gloves on
- D. Introduction of specific immunoglobuline
- E. Introduction of interferonogenes



13. Dentists are at increased risk of being infected with the type B hepatitis. What preparation should be used for reliable active prevention of this disease?

A. Recombinant vaccine of HBsAg proteins

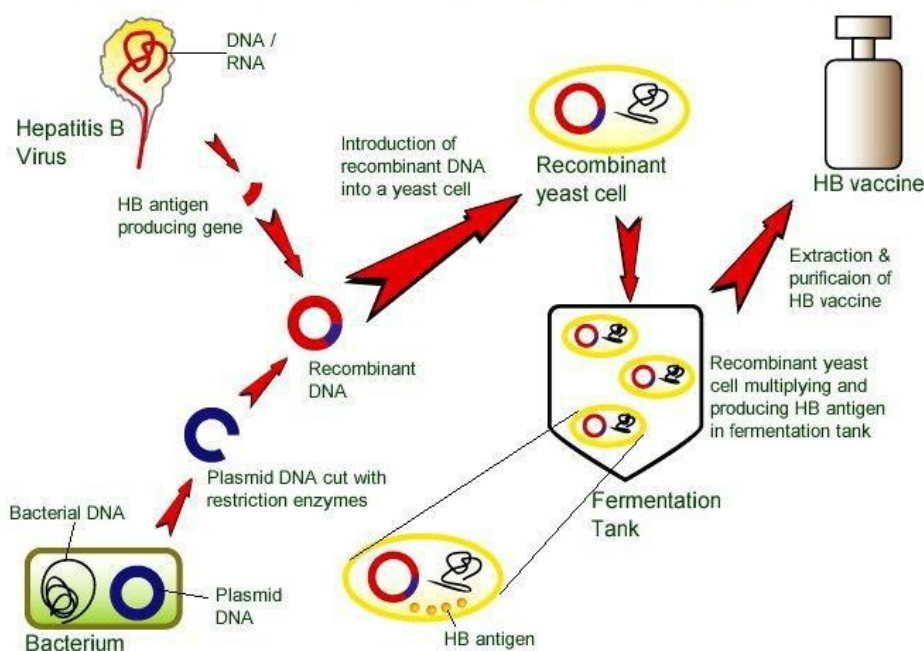
B. Live type B hepatitis vaccine

C. Specific immunoglobulin

D. Monoclonal HBsAg antibodies

E. Antihepatitis serum

Production of Recombinant HB Vaccine



14. In order to eliminate occupational risks dental workers underwent vaccination. The vaccine should protect them from a viral infection, whose pathogen may be found in blood of dental patients who had had this infection or who are its chronic carriers. What vaccine was used?

A. Genetically engineered HBs antigen

B. Live measles vaccine

C. Inactivated hepatitis A vaccine

D. Subunit influenza vaccine

E. Anti-rabies vaccine

15. A 32 year old patient suffering from chronic viral hepatitis complains about dull pain in the right subcostal area, nausea, dry mouth. Objectively: liver dimensions are 13-21-11 cm (according to Kurlov), spleen is by 2 cm enlarged, aspartate aminotransferase is 3,2 micromole/l·h, alanine aminotransferase - 4,8 millimole/l·h. Serological study revealed HBeAg, high concentration of DNA HBV. What drug should be chosen for treatment of this patient?

A. α -interferon **B. Acyclovir** C. Remantadinum

D. Arabinoside monophosphate E. Essentiale-forte

16. It is known that infectious type B hepatitis is a systemic disease caused by the type B hepatitis virus and characterized by a predominant liver affection. Choose from the below given list the drugs for the etiotropic therapy of this infection:

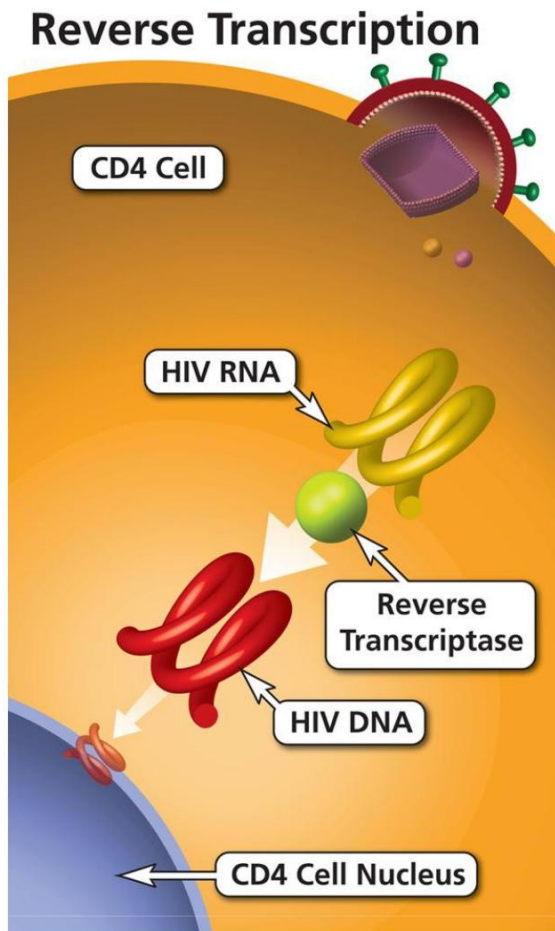
A. Acyclovir B. Penicillin C. Tetracycline

D. Sulfanilamides E. Fluoroquinolones

HIV

1. RNA that contains AIDS virus penetrated into a leukocyte and by means of reverse transcriptase forced a cell to synthesize a viral DNA. This process is based upon:

- A. Reverse transcription
- B. Operon repression
- C. Reverse translation
- D. Operon depression
- E. Convariant replication

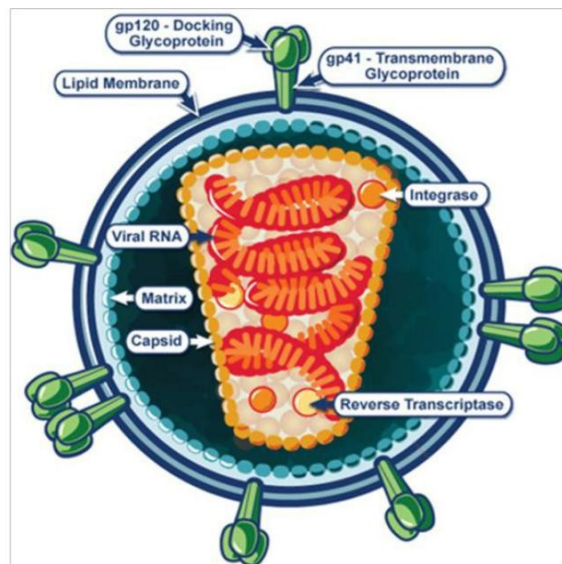


2. During reproduction of some RNA-containing viruses that cause tumors in animals, genetic information can be transmitted in the opposite direction from the RNA to the DNA via a specific enzyme. The enzyme of reverse transcription is called:

- A. Reverse transcriptase
- B. DNA polymerase
- C. Ligase
- D. Primase
- E. Topoisomerase

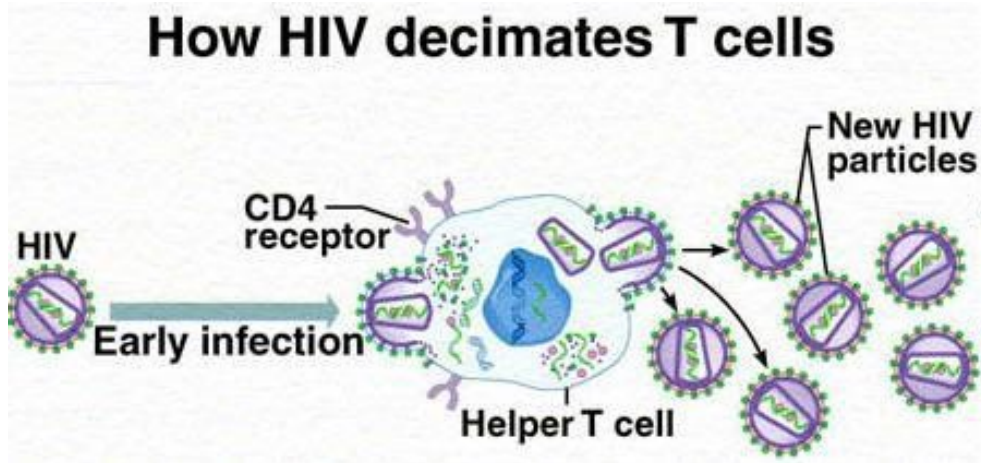
3. The examination of blood serum of a patient with immunodeficiency signs revealed antibodies to gp120 and gp41 proteins. The presence of what infection of this patient does it confirm?

- A. HTLV-1-infection
- B. TORCH-infection
- C. ECHO-infection
- D. HBV-infection
- E. HIV-infection



4. Blood analysis of a patient showed signs of HIV infection (human immunodeficiency virus). Which cells does HIV-virus primarily affect?

- A. Cells that contain receptor T4 (T-helpers)**
- B. Cells that contain receptor IgM (B-lymphocytes)
- C. Specialized nervous cells (neurons)
- D. Mast cells
- E. Proliferating cells



5. A patient consulted an immunologist about diarrhea, weight loss within several months, low-grade fever, enlarged lymph nodes. The doctor suspected HIV infection. What immunocompetent cells must be studied in the first place?

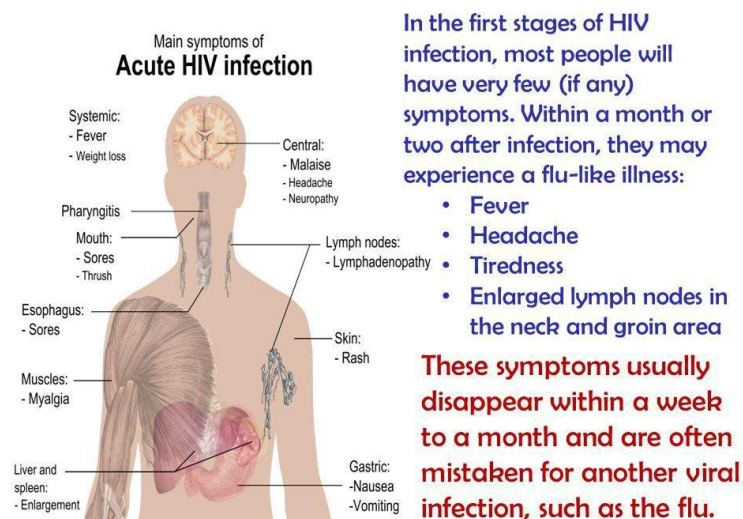
- A. Helper T-lymphocytes**
- B. Suppressor T-lymphocytes
- C. B-lymphocytes
- D. Monocytes
- E. Plasma cells

6. HIV displays the highest tropism towards the following blood cells:

- A. T-helpers**
- B. T-suppressors
- C. T-killers
- D. Thrombocytes
- E. Erythrocytes

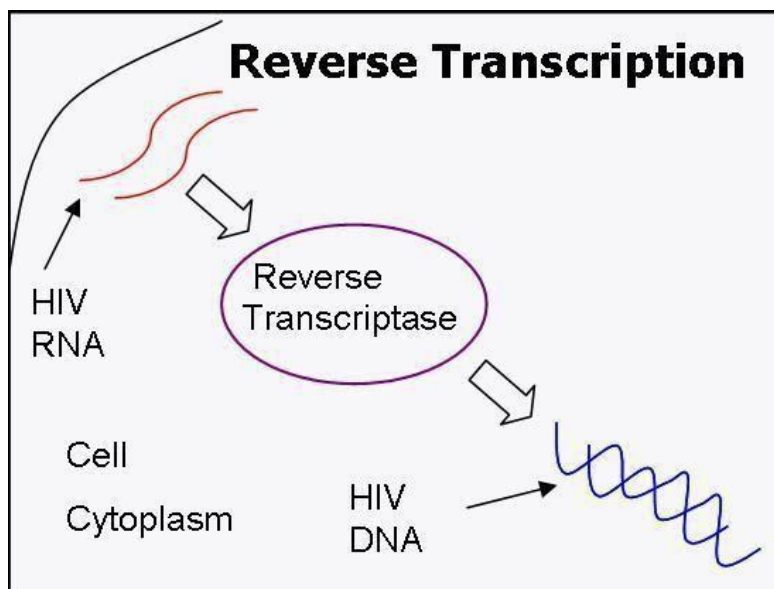
7. Examination of a young man in the AIDS centre produced a positive result of immune-enzyme assay with HIV antigens. Patient's complaints about state of his health were absent. What can the positive result of immune-enzyme assay be evidence of?

- A. HIV infection**
- B. Being ill with AIDS
- C. Being infected with HBV
- D. Having had AIDS recently
- E. HBV persistence



8. It was revealed that T-lymphocytes were affected by HIV. Virus enzyme - reverse transcriptase (RNA-dependent DNA polymerase) - catalyzes the synthesis of:

- A. DNA on the matrix of virus mRNA
- B. Virus informational RNA on the matrix of DNA
- C. DNA on virus ribosomal RNA
- D. Viral DNA on DNA matrix
- E. mRNA on the matrix of virus protein



9. T-lymphocytes are determined to be affected with HIV. In this case viral enzyme reverse transcriptase (RNA-dependent DNA polymerase) catalyzes the synthesis of:

- A. DNA based on the viral RNA matrix
- B. Viral DNA based on DNA matrix
- C. Viral RNA based on DNA matrix
- D. Viral protein based on RNA matrix
- E. Informational RNA based on viral protein matrix

10. Quite often the cause of secondary immunodeficiency is an infection involvement, when the causative agents propagate directly in the cells of immune system and destroy it. The following diseases are characterized by:

- A. Infectious mononucleosis, AIDS
- B. Tuberculosis, mycobacteriosis
- C. Poliomyelitis, type A hepatitis
- D. Dysentery, cholera
- E. Q-febris, epidemic typhus

Which cells does HIV-1 infect?
Identification of molecular targets.

Lymphocytes Receptor: CD4⁺
Coreceptor: CXCR4

Macrophages: Receptor: CD4⁺
Coreceptor: CCR5

Dendritic cells (DC): DC recognized by gp120 on HIV
DC: primary target of mucosal infection!
DC present HIV antigen to resting lymphocytes

Microglial cells: Receptor: Galactosyl ceramide

Epstein-Barr Virus

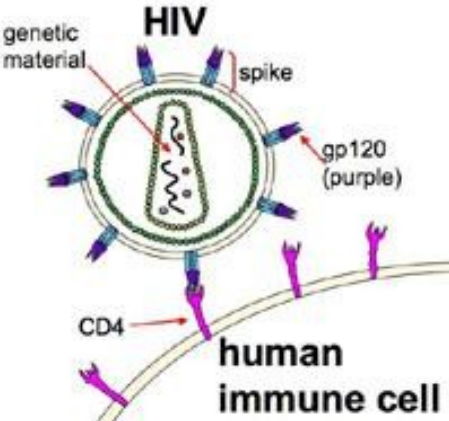

Gammaherpesvirinae:

Primary target cell: B cells and epithelial cells

Site of latency: B cell

Means of spread: saliva (kissing disease)

Limited host range and tissue tropism: receptor for C3d component of the complement system (CR2 or CD21) which is expressed on B cells of humans and some epithelial cells of oro- and nasopharynx.

<p>11. Often the cause of secondary immunodeficiency is an infectious affection of an organism, when agents reproduce directly in the cells of immune system and destroy them. Specify the diseases, during which the described above occurs:</p> <p>A. Poliomyelitis, viral hepatitis A B. Q fever, typhus C. Tuberculosis, mycobacteriosis D. Infectious mononucleosis, AIDS E. Dysentery, cholera</p>	
<p>12. The immunoblot detected gp120 protein in the blood serum. This protein is typical for the following disease:</p> <p>A. HIV-infection B. Virus B hepatitis C. Tuberculosis D. Syphilis E. Poliomyelitis</p>	
<p>13. HIV has gp41 and gp120 on its surface interacts with target cells of an organism. Which of the following human lymphocyte antigens is gp120 complementary bound with?</p> <p>A. CD 4 B. CD 3 C. CD 8 D. CD 19 E. CD 28</p>	
<p>14. A 26 year old manual worker complained of 3 weeks history of fevers and fatigue, weight loss with no other symptoms. Physical findings: Temperature 37,6°C, Ps- 88 bpm, blood pressure 115/70mmHg, superficial lymph nodes (occipital, submental, cervical, axillary) are enlarged, neither tender nor painful. Rubella-like rash on the trunk and extremities. Herpes simplex lesions on the lips. Candidosis of oral cavity. What infectious disease would you suspect?</p> <p>A. HIV infection B. Influenza C. Rubella D. Infectious mononucleosis E. Tuberculosis</p>	<p>Symptoms of HIV infection</p> 

15. A 24 y.o. woman presents with prolonged fever, nocturnal sweating. She's lost weight for 7 kg during the last 3 months. She had irregular intercourses. On examination: enlargement of all lymphaden groups, hepatolienal syndrom. In blood: WBC – $2,2 \times 10^9/L$. What is the most likely diagnosis?

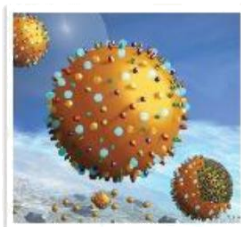
- A. **HIV-infection** B. Lymphogranulomatosis C. Tuberculosis
D. Chroniosepsis E. Infectious mononucleosis

16. A 35-year-old female patient has HIV at the AIDS stage. On the skin of the lower extremities and palatine mucosa there appeared rusty red spots, bright red nodules of various sizes. One of the nodules was taken for histological study. It revealed a lot of randomly distributed thin-walled vessels lined with endothelium, the bundles of spindle cells containing hemosiderin. What kind of tumor developed in the patient?

- A. **Kaposi's sarcoma**
B. Hemangioma
C. Burkitt's lymphoma
D. Lymphangioma
E. Fibrosarcoma

Kaposi Sarcoma (KS) & HIV/AIDS

- Human Herpesvirus type 8 (HHV-8)
 - **K**aposi **S**arcoma associated **H**erpes**v**irus (**KSHV**)
- Immunodeficiency
- Endothelial cells
- Latent/lysogenic
- **Tumors expansion = angiogenesis**

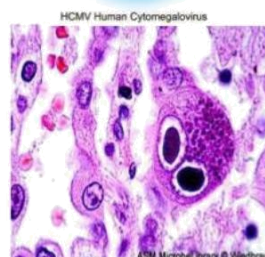
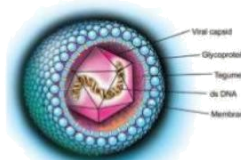


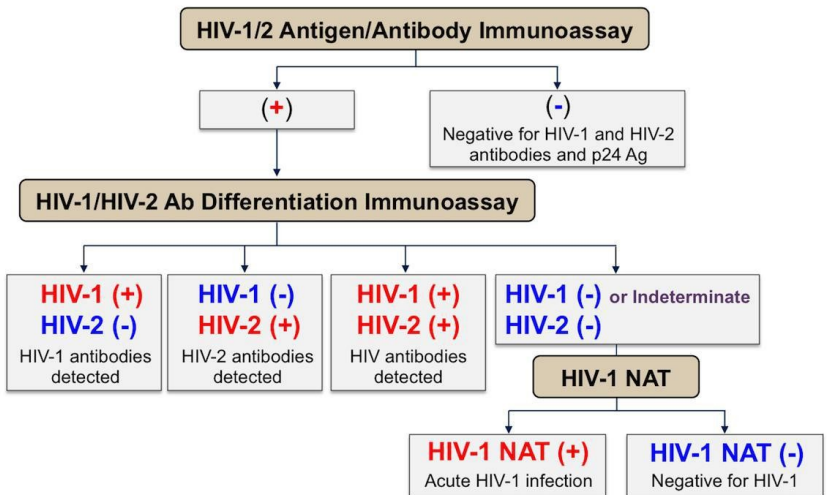
17. An HIV-positive patient's cause of death is acute pulmonary insufficiency resulting from pneumonia. Pathohistological investigation of lungs has revealed transformed cells resemble owl's eye. Name the pneumonia causative agent:

- A. **Cytomegalovirus**
B. Pneumococcus C. Influenza virus D. Candida fungi
E. Toxoplasma

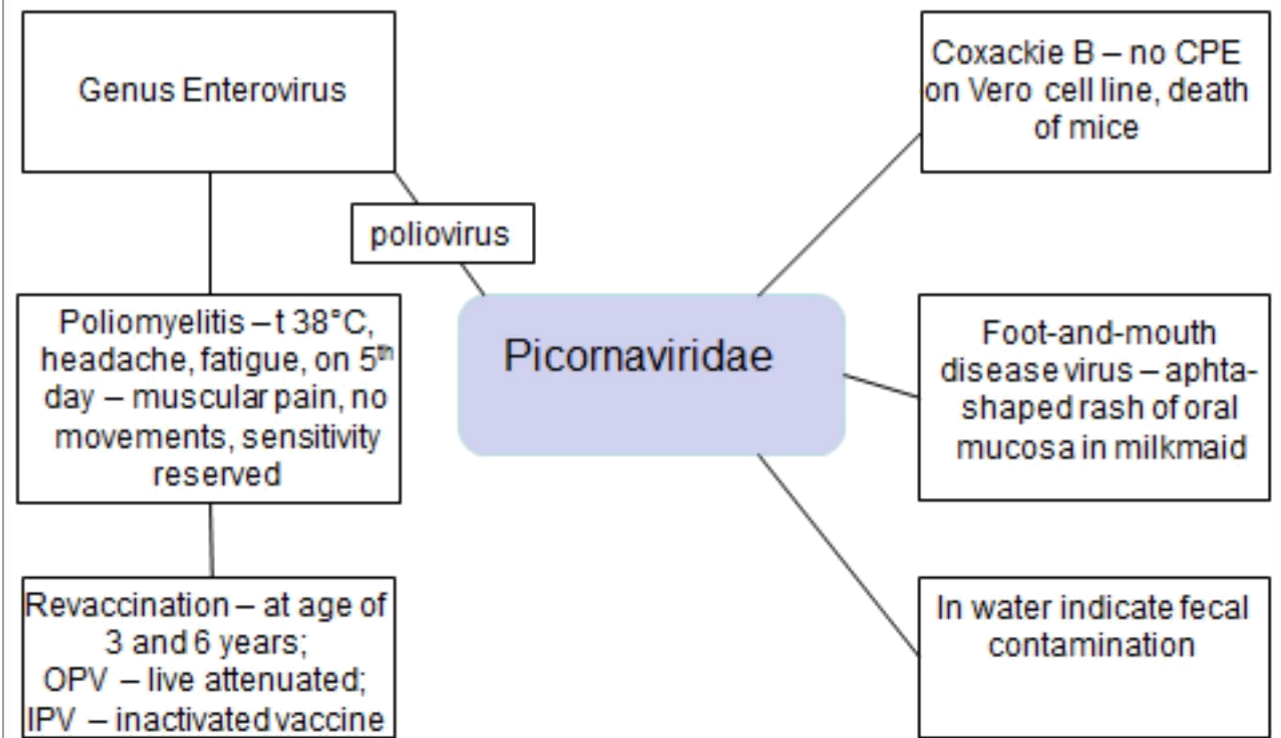
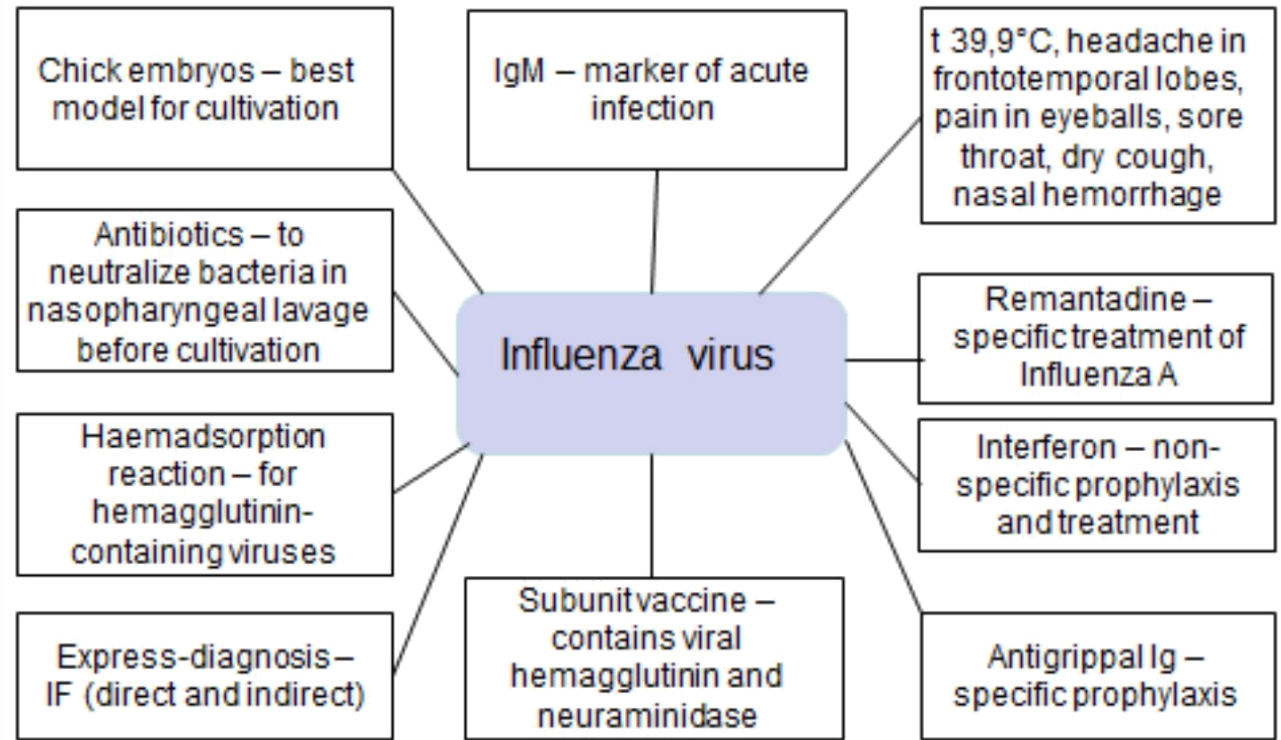
Cytomegalovirus

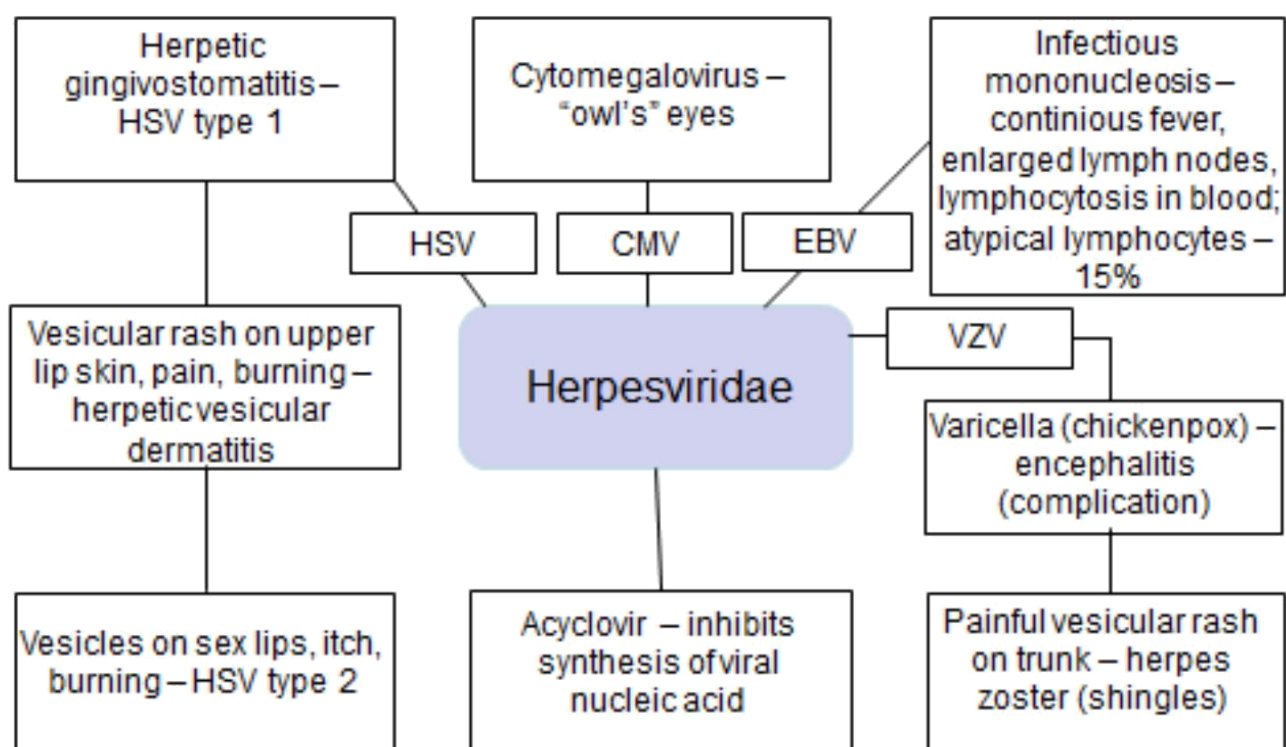
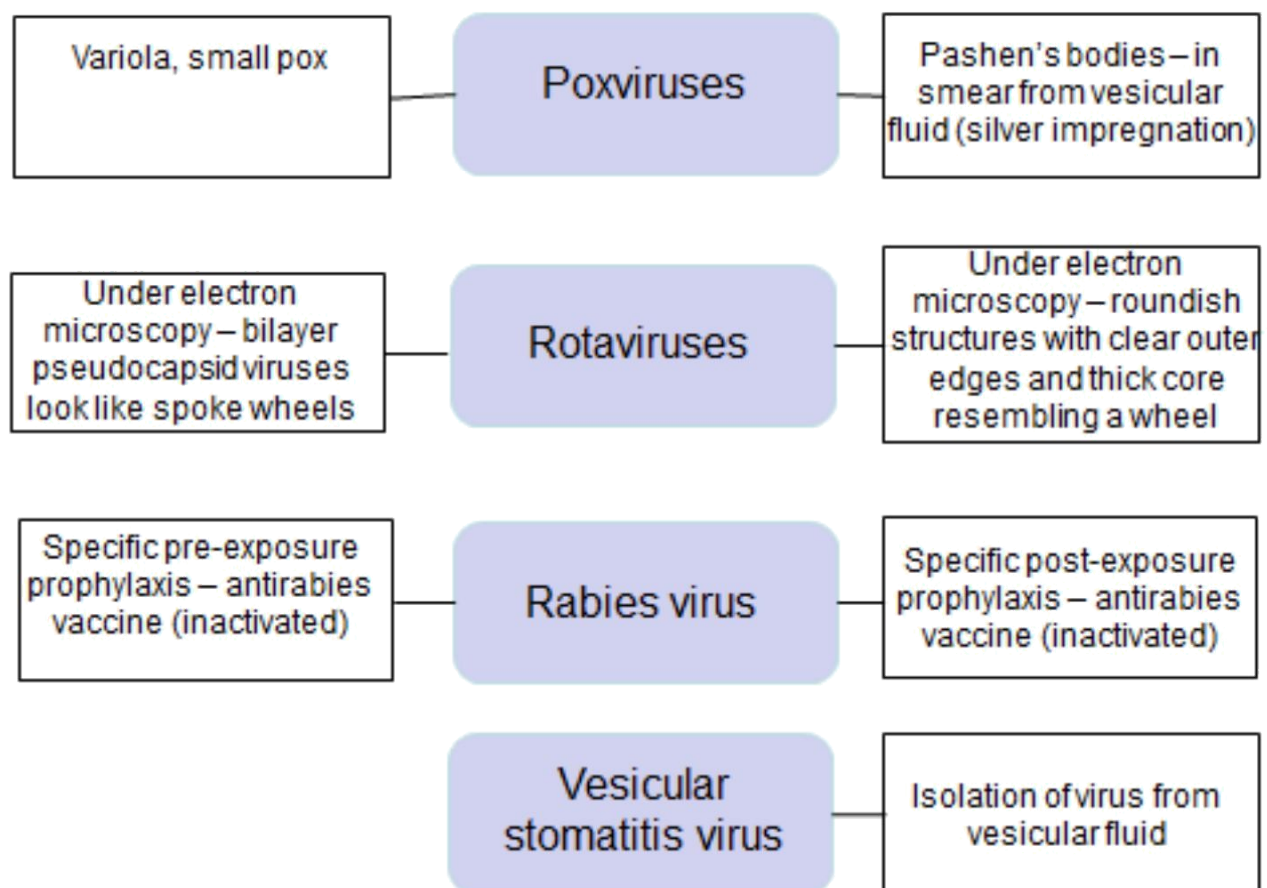
- Asymptomatic persons with CMV infection excrete the virus in saliva, respiratory secretions, urine, and semen.
- Clinically significant HIV-related CMV infection is associated with severe immunosuppression ($CD4 < 50$ cells/ μl).
- CMV-associated syndromes most commonly seen in patients with AIDS are retinitis and enteritis (colitis or oesophagitis).
- A variety of CMV-related neurologic complications have been described, including polyradiculitis, ventriculitis, and mononeuritis multiplex.

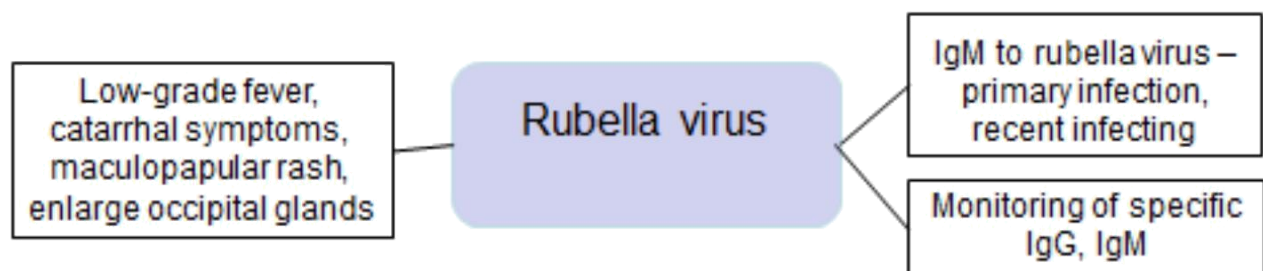
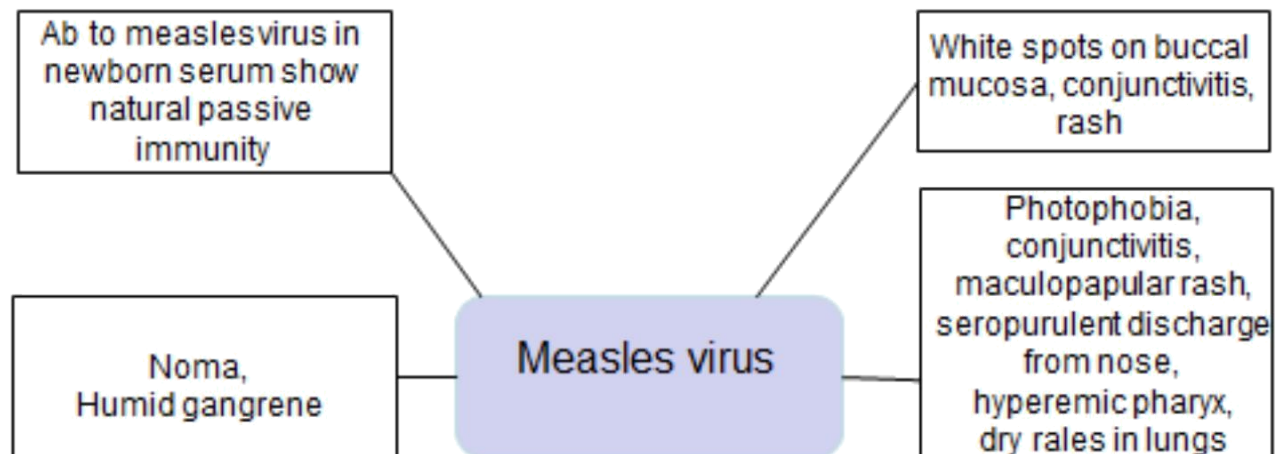
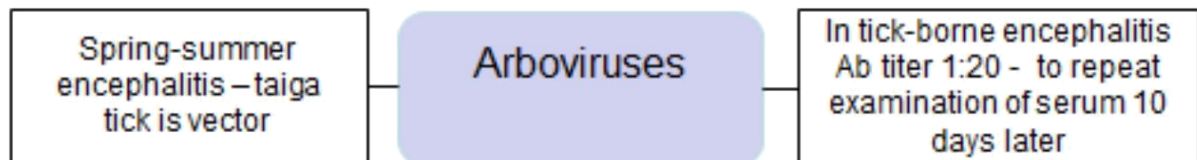


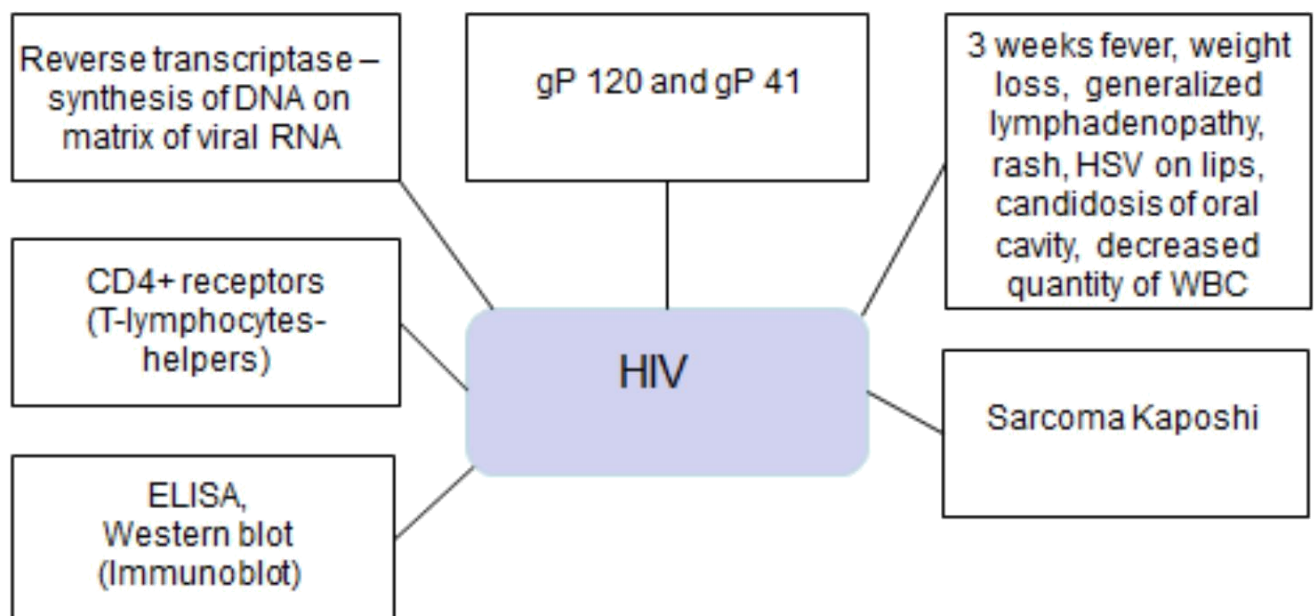
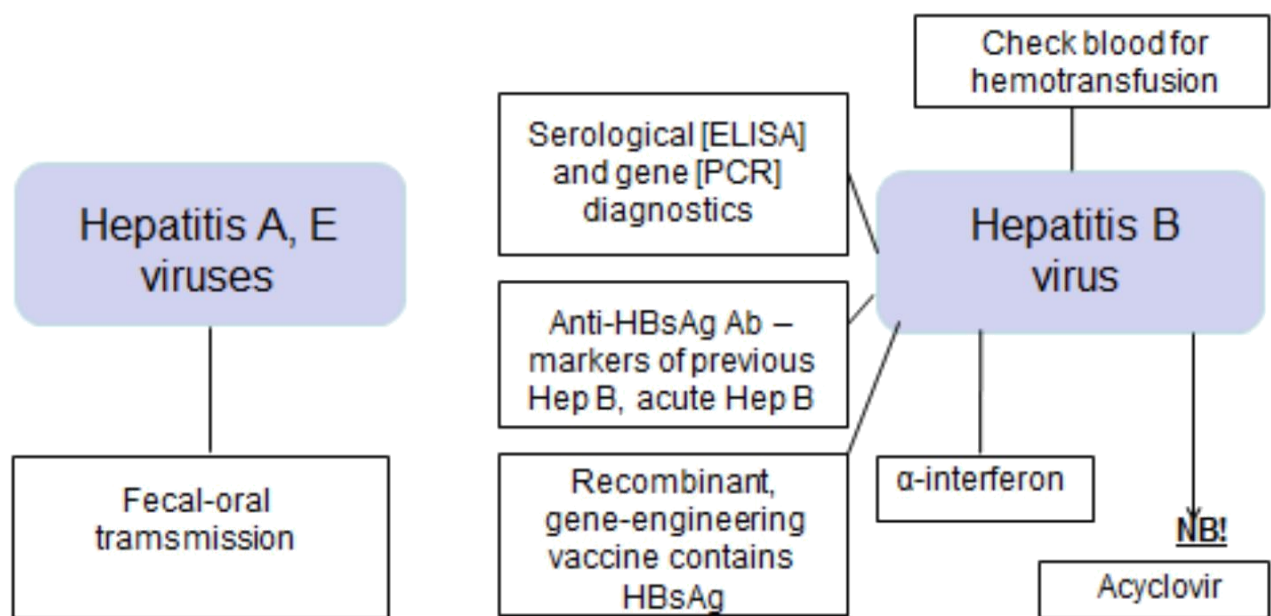
<p>18. A doctor examined a patient with recurrent aphthous stomatitis with concomitant candidosis and decided to eliminate a possibility of HIV-infection. What examination can help to clear the situation up and make a provisional diagnosis?</p> <p>A. Immune-enzyme analysis B. Gel precipitation reaction C. Reaction of hemagglutination inhibition D. Phase-contrast microscopy E. Reaction of hemagglutination</p> 	
<p>19. Medical examination of a 19-year-old worker revealed generalized lymphadenopathy mainly affecting the posterior cervical, axillary and ulnar lymph nodes. There are multiple injection marks on the elbow bend skin. The man denies taking drugs, the presence of injection marks ascribes to influenza treatment. Blood count: RBCs - $3,2 \times 10^{12}/l$, Hb- 100 g/l, WBCs - $3,1 \times 10^9/l$, moderate lymphopenia. What study is required in the first place?</p> <p>A. ELISA for HIV B. Immunogram C. Sternal puncture D. X-ray of lungs E. Lymph node biopsy</p>	
<p>20. The 28 y.o. woman applied to doctor because of limited loss of the hair. In the anamnesis - she had frequent headache indisposition, arthromyalgia, fever, irregular casual sexual life, drug user. RW is negative. What examination must be done first?</p> <p>A. Examination for HIV B. Examination for neuropathology C. Examination for gonorrhea D. Examination for fungi E. Examination for trichomoniasis</p>	
<p>21. Mass serological diagnosis of HIV infection is made by means of enzyme-linked immunosorbent assay techniques. What standard component of the reaction must be adsorbed on the solid phase of the test system?</p> <p>A. HIV antigens B. Monoclonal HIV antibodies C. Specific immunoglobulins D. Enzyme-marked HIV antibodies E. Substrates to determine enzyme activity</p>	
<p>22. A doctor was addressed by a 30-year old man. There is a probability of the patient being HIV-positive. To clarify the diagnosis the doctor proposed to perform polymerase chain reaction. The basic process in this kind of investigation is:</p> <p>A. Gene amplification B. Transcription C. Genetic recombination D. Genomic mutation E. Chromosome mutation</p>	

Special virology









FOR NOTES

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