PRINCIPLES OF DIAGNOSTIC and TREATMENT OF INFECTIOUS PATIENTS

- **A clinical examination of patient was and remains the first diagnostic reception used by doctor in spite of considerable development of methods of laboratory and instrumental diagnostics.**
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Clinical examination allows:

- to set a preliminary diagnosis;
- to estimate severity of the state of patient;
- to define the necessity of hospitalization;

- to define the necessary volume of laboratory and instrumental researches;
- to form preliminary plan of treatment;
- to define the necessity of realization of epidemic measures at suspicion on infectious disease.
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- **At some infectious diseases (measles, epidemic parotitis, erysipelas, tetanus and other) a diagnosis is set on the basis of clinical manifestation without laboratory confirmation.**

Clinical examination is realized in the dynamics of disease that allows to confirm or refute an initial diagnosis, to estimate efficiency of the treatment and to correct plan of laboratory and instrumental examination.

- **At primary examination at infectious pathology must be suspected.**
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- **Complaints.**
  - Patients can enumerate not all complaints, forgetting part from it (intoxication) or considering that it do not relate to this disease.
  - It is necessary to put question about all possible complaints about all systems of organs.
  - Every complaint must be analysed for times origins, to the dynamics, to reaction on the treatment and other

- Complaints must be in detail writtenin in a case report.
- At infectious diseases a diagnosis is usually based on history of disease and epidemiology anamnesis.
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Next signs must be taken to the history of disease.

1) Sharpness of beginning of disease (day, hour, appearance of the first symptoms).
2) Sequence and terms of appearance of symptoms.
3) Periods of development of disease.

4) Dynamics of development of symptoms.
5) Efficiency of any treatment.
6) Doses and duration of drug reception.
7) Possible change of natural duration of disease under reception of treatment.
8) Analysis of laboratory and instrumental study.
9) It is necessary to distinguish leading clinical syndromes and/or separate the signs of damage of different organs and systems.
10) It is important to know the state of patient before disease.

 History of life.

- Birth-place and all subsequent places of inhabitation.
- Features of life, predisposition, professional negative factors.
- Data about the carried and present chronic diseases
- Possibility of the inherited factors.
- Allergic anamnesis.
- Information about the realizeed prophylactic inoculations.

- **Epidemiology anamnesis.**
  - Infectious diseases is related to realization of epidemiologic process: «source of infection − mechanism of transmission − sensitive organism».
  - The correct epidemiology data allows to define directions of diagnostic search.
  - Contact with source of infection, possibility of different mechanisms of transmission. Spectrum of causative agents of infectious diseases which patient could be met.
  - Taking into account of regional infectious pathology.

- **«Social portrait» of patient.**

1) Traveling
2) Features of place of residence of patient (apartment or private house, hostel, barrack), presence of the centralized water-supply and sewage system;
3) who lives with a patient, guests from other regions;
4) character of feeding of patient : at home, at work, places of public food consumption
5) use the food from other regions;

6) use of food out of organized places, thermally not treated, not washed vegetables, fruit etc.;
7) use of from open and unverified sourses;
8) stay in the organized collective;
9) occupation, contacts with people, children, animals and birds;
10) possible contacts with sick persons;
11) absence of information about contacts with infectious diseases does not eliminate infectious pathology;
12) hunting, fishing, tourism;
13) sexual contacts, methods of contraception;

14) medical parenteral manipulations;

15) parenteral unmedical manipulations: use of narcotic, tattoo, cosmetology procedures;

16) social status of patient (refugees, homeless persons, natural disasters);

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- **Physical examination.**

❒ It is realizeed on usual principles and at the same time requires knowledge about private infectious pathology (pathognomonic symptoms of infectious diseases).

- Abundant mistake is incomplete examination limited by the most bright complaints.

- **Complaints, history of disease and examination are summarized in syndromes.**

1) Changes of skin (exanthema, primary affect).
2) Jaundice.
3) Changes of mucous membranes (conjunctivitis, scleritis, enanthema, erosive, ulcers).
4) Changes of pharynx.

5) Changes of fatty hypoderm (edema, induration).
6) Changes of muscles.
7) Changes lymphatic nodes (lymphadenopathy, bubo).
8) Arthral syndrome.
9) Catarrhal-respiratory syndrome (rhinitis, laryngitis, tracheitis, bronchitis, bronchiolitis), pneumonia, respiratory insufficiency.
10) Myocarditis, heart failure (insufficiency of circulation of blood).

11) Changes of tongue («raspberry», «strawberry», «pilose», leucoplakia and other).
12) Syndrome of damage of gastrointestinal tract.
13) Hepatitis, hepatolienal syndrome,.
14) Encephalopathy, meningeal syndrome, focal damage of CNS.
15) Cholestasis.
16) Urethritis, cystitis, pyelonephritis, nephrosonephritis, acute kidney insufficiency.

17) Syndrome of intoxication.
18) Shock.
19) Other.

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- **In a preliminary diagnosis necessarily to specify:**

1) severity of the state of patient,
2) clinical form of disease in accordance with the generally accepted classification,
3) complications and concomitant diseases (risk factors).
4) syndrome of critical condition.

Organs	clinical	laboratory	instrumental
Nervous system	State of consciousness Focal symptoms Meningeal symptoms Psychomotor excitation Cramps State of reflex and motive function	Analysis of CSF Biochemical analyses (sugar, nitrogen and other)	Pressure of CSF CT Electro-encephalography Ultrasonic research
Circulation of blood	Colour of skin State of peripheral veins Shortness of breath Pulse Urination Difference of dermic and rectal temperatures	Hematocrit, haemoglobin Acid-basic state Volume of circulatory blood Pulse oximetry Colloid-osmotic pressure Viscosimetry	BP Central venous pressure Electrocardiography

Organs	clinical	laboratory	instrumental
Breathing	Cyanosys of skin and mucous membranes Frequency, depth and breathing rhythm Shortness of breath Auscultation of lungs	Acid-basic state Gases of blood	Chest X-ray Spirography
Excretion	Anamnestic data Diuresis Jaundice Comatose state	Analysis of urine Remaining nitrogen Urea Kreatinine Bilirubin Coagulation	CT Ultrasonic research

Organs	clinical	laboratory	instrumental
Water-electrolyte balance and acid-basic state	Anamnestic data Thirst Turgor of skin Cramps of sural muscles Pulse Mass of patient Diuresis Shortness of breath Violation of consciousness	Electrolytes pH of blood Hematocrit Density of plasma Albumen Colloid-osmotic pressure	Electrocardiography BP Volume of circulatory blood Central venous pressure Diuresis
Coagulation system	Hemorragic rash Bleeding Signs of thrombosis	Coagulation Fibrinogenum Fibrinolytic activity and other	Coagulography

- **A final diagnosis has nosology form of disease.**
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- **Nosology diagnosis includes causative agent.**
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- **Main task of treatment is to affect causative agent or its toxin that must result in recovery of infectious patient.**
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- ***The plan of examination must***
- be concrete,
- be the most informative,
- be minimal invasive
- take into account tolerance of patient.

- **The plan of examination must be directed:**
- on a main disease;
- on complication;
- on the prognosis of disease;
- on a critical condition;
- on concomitant diseases

- **Directions of the plan of examination are:**
- ***1. General:***
- CBC;
- analysis of urine;
- analysis of feces;
- chest X-ray.
- ***2. Examination on HIV-infection and syphilis***

- ***3. Specific confirmation of preliminary diagnosis :***
- bacteriological;
- virologic;
- serologic;
- allergic and other
- **4. Specific instrumental, biochemical, roentgenologic and other researches corresponding clinical indication**

- **Bacteriologic examinations include bacteriologic examination of blood, defecating, urine, palatal amygdales, the sputum and other usually before etiotropic treatment.**
- **Serologic researches can be realizeed in pair serums (in 7-10 days).**
- **The negative results of researches do not always except clinical diagnosis**

- **The methods of etiologic diagnostics have the special value at their timely application and assist the correct choice of etiotropic treatment (sensitiveness to antimicrobial drugs).**
- **A microscopy of Gram-stained smears of blood, sputum, CSF, urine and exsudates has some value for the start therapy.**
- **Express-test acquired important role due to fast visual estimation of result.**

- ***Microscopy*** is used for finding of causative agent in the pathological material taken from a patient. At most cases it does not allow to put a final diagnosis (except some parasitosises).
- Advantage is rapid discovery of causative agents in pathological material.

- **film preparation** from nose and throat for immunofluorescent microscopy.
- **smear from pharynx** selection of viruses at a flu, measles, german measles, chicken-pox and other viral infections. Material is sent in a laboratory for realization virologic, immunofluorescent, PCR and other researches.

- **Thick drop and thin smear of blood** for microscopic diagnostics of malaria is dried out and sent in laboratory.
- **Microscopic research of CSF** allows to define character of cytosis and suppose microorganism.
- **The microscopy of feces** allows to educe characteristic pathological admixtures, presence of hemocytes and to discover protozoo.

- **Bacteriological method.**
- It is used for selection of causative microbes-agents in a clean culture on artificial nutrient medium or at laboratory animals.
- The selection of pathogenic microorganism at presence of clinical manifestation of disease allows to put a final diagnosis.
- A sensitiveness to the antibiotics can be determined.
- It requires plenty of time.

- Bacteriologic examination on artificial nutrient mediums is best of all to produce immediately after the taking of material.
- The dispatch of material in a laboratory is done as quick as possible (not later than 2 hours from the moment of taking).
- Automatic microbiological systems are presently created.

- **Order to laboratory for tests of taken from infectious patient material must contain:**
- Name of material and research aim.
- Department.
- Name of patient.
- Date of beginning of disease.
- Date of taking of material.
- Supposed clinical diagnosis.
- Signature of doctor.

- **Additional researches.**
- Lavage of stomach with a curative and diagnostic aim.
- Rectoscopy.
- Sternal puncture.
- Taking of material from superficial wounds.
- USI, NT, CT, X-ray, gastroscopy, colonoscopy., ECG.
- Biopsy of lymphnode etc.

•PRINCIPLES OF TREATMENT OF INFECTIOUS PATIENTS

- **A feeding at infectious diseases is one of basic constituents of parts of complex therapy.**
- **Curative feeding (dietotherapia) is *application with the curative or prophylactic aim of the specially made food rations and diets for patients with acute and chronic infectious diseases.***

- **Basic principles of feed of infectious patients.**
- Only valuable and balanced feed.
- Taking into account intoxication, fever, change of metabolism etc.
- Main part of food is given in the clock of decline of temperature.
- It is not necessary to overfeed a patient or aspire to very rapid renewal of mass of body.
- At severe duration and unconscious state of patients enteral tube feeding is used.
- Diets must have 2200-2500 kkal with a subsequent increase to 3000 kkal per day.
- The special attention must be spared to vitamins.

- **PRINCIPLES OF ANTIBACTERIAL THERAPY OF INFECTIOUS PATIENTS**
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- **High-pathogenic stamms of causative agents resistant to antibacterial drugs appear in the conditions of wideuse of etiotropic drugs.**
- **The number of people with the decreased resistance of macroorganism and secondary immunodeficit increases.**
- **Presently successes of microbiology allow to choose antibiotics with the expressed antibacterial action and "narrow" action, that reduces the danger of dysbiosis.**

- **Cost can have influence at choice of antibiotic.**
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- ***The choice of drugs is based on etiology of disease, severity and period of disease.***
- C***hemotherapy*** is antimicrobial, antiviral, antiparasitogenic treatment by chemical substances
- **Antibiotico*therapy*** is treatment by natural antibiotic producted by microorganisms; many modern antibiotics are semisynthetic.

- ***Classification of antibiotics.***
- By ***the mechanism of action***:
- *inhibitors of synthesis of cellular wall of microorganism (*penicillins, cefalosporins, vancomycin and other);
- *antibiotics defiat molecular organization functions of cellular membranes (*polymixin, Levorinum, amphotericin and other);
- *antibiotics depressing the synthesis of albumen and nucleic acids*, in particular at the level of ribosomes (chloramphenicol, Tetracyclins, macrolides, lincomycin, aminoglycosides) and *inhibitors of RNA-polymerase (*rifampin)

By ***chemical structure***:

- 1) betalactams (penicillins, cefalosporins of and other),
- 2) aminoglycosides,
- 3) chloramphenicol,
- 4) Tetracyclinums,
- 5) fusidin,
- 6) rifampins,

- 7) polimyxins,
- 8) polyenes,
- 9) macrolides
- 10) other
- By ***the type of affecting microbal cell***:
- *Bactericidal (*penicillins, cefalosporins, aminoglycosides, rifampin, polimyxin and other);
- *Bacteriostatic (*macrolides, Tetracyclinums, lincomycin, chloramphenicol and other).

- By ***the spectrum of antimicrobial action*** :
- Gram-positive bacteria and cocci: biosynthetic penicillins, lincomycin, vancomycin, fusidin.
- Gram-negative bacteria : aztreonam, polimyxin.
- Wide spectrum: aminopenicillins (ampicillin), ureidopenicillins, cefalosporins, aminoglycosides, chloramphenicol, Tetracyclinums, macrolides, carbapenems.
- Antiphthisic antibiotics (streptomycin, rifampin).
- Antifungal antibiotics (Levorinum, amphotericin B, ketoconazole and other).

- ***A pharmacodynamics and pharmakokinetics of drug, individual features of patient (age, state of immunity, concomitant diseases and other) are necessary to take into account.***
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- **Efficiency of treatment by antibiotics is determined by next factors:**
- Detection of causative agent and its sensitiveness to the antibiotics;
- Use of most active and less toxic drug;

- Determination of optimal dose and method of introduction of antibiotic;
- Knowledge about possible side reactions on antibiotic;
- Distribution in organs and tissues, ability to penetrate physiological and pathological barriers of organism
- Use of combination of drugs with the purpose of expansion of spectrum of action and/or strengthening of antimicrobial effect.

Anti-infectives for treatment of the infectious diseases caused by gram-positive and gram-negative cocci

Microorganisms	Diseases	Antibiotics of the first row	Antibiotics of the second row (reserve)
Gram-positive cocci			
*Streptococcus pyogenes(*group A)	Quinsy, scarlatina, erysipelas, sepsis	Benzylpenicillin	Fluoquinolons, macrolides, rifampin+aminoglycosides
Streptococcus pneumoniae	Croupous pneumonia, purulent meningitis	Amoxycillin, macrolides	Amoxycillin/clavunate, levofloxacin, moxifloxacin
Staphylococcus aureus(penicillin-resistant)	Quinsy, sepsis	Amoxycillin, fusidin, azythromycin	Meropenem, cefalosporins III, vancomycin, amikacin, lynesolide
Gram-negative cocci			
Neisseria meningitides	Meningococcal infection: purulent meningitis, meningococcemia	Benzylpenicillin, chloramphenicol	Cefalosporins III, fluoquinolons, meropenem

Anti-infectives for treatment of the infectious diseases caused by gram-positive and gram-negative bacteria

Microorganisms	Diseases	Antibiotics of the first row	Antibiotics of the second row(reserve)
Gram-positive sticks			
Corynebacterium diphtheriae	Diphtheria	Benzylpenicillin, erythromycin	Fluoquinolons III, cefalosporins I, II, rifampin, azythromycin
Bacillus anthracis	Anthrax	Benzylpenicillin, gentamicin, cefalosporins, ciprofloxacine	Erythromycine, doxicyclin, ampicillin, azythromycin
Listeria monocytogenes	Listeria meningitis	Ampicillin, gentamicin, benzylpenicillin	Chloramfenicolum+ampicillin, ceftriaxon, amikacin
Gram-negative bacteria			
Escherichia coli	Acute infections of urinoexcretory and GI tracts	Ofloxacin, imepenem	Ampicillin, cefalosporins II

Proteus vulgaris Proteus mirabilis	Acute infections of urinoexcretory and GI tracts	Ampicillin, carbenicillin,	Cefalosporins III, gentamicin+ampicillin, rifampin
Klebsiella pneumoniae	Pneumonia, sepsis	Doxicyclin, cefalosporins I, ofloxacin	Gentamicin, co-trimoxazol, fluoquinolons
Salmonella typhi, paratyphi A, B	Typhoid fever	Fluoquinolons	Ceftriaxon, amikacin
Salmonella spp.	Salmonellosis	Fluoquinolons	Cefalosporins III, aminoglycosides
Shigella spp.	shigellosis	Fluoquinolons	Cefalosporins III, aminoglycosides
Pseudomonas aeruginosa	Sepsis, pneumonia	Ceftriaxon, fluoquinolons	Carbapenems

Pseudomonas mallei	Glanderss	Doxicyclin	Rifalexum
Yersinia enterocolitica	Yersiniosis	Chloramfenicolum, ampicillin	Fluoquinolons, streptomycin
Yersinia pseudotuberculosis	Pseudotuberculosis	Chloramfenicolum, ampicillin	Fluoquinolons, aminoglycosides, cefalosporins III
Yersinia pestis	Plague	Doxicyclin, streptomycin, gentamicin	Rifalexum, co-trimoxazol, amphenicols
Haemophilus influenza	ARI, purulent meningitises	Amikacinum, cefalosporins III	Azythromycin, cefalosporins IV, fluoquinolons, aztreonam
Legionella pneumoniae	Легионеллез (pneumonia)	Erythromycine, rifampin, ceftriaxon	Co-trimoxazol, azythromycin, ciprofloxacine, ofloxacin

Bordetella pertussis	Whooping-cough	Ampicillin, erythromycine, doxicyclin	Кларитромицин, cefalosporins I
Francisella tularensis	Rabbit-fever	Doxicyclin, chloramphenicol	Rifalexum, fluoquinolons
Brucella spp.	Brucellosis	Doxicyclin, streptomycin, amikacin	Rifalexum, co-trimoxazol
Vibrio cholerae	Cholera	Doxicyclin	Rifalexum, co-trimoxazol, chloramphenicol, ciprofloxacine

Anti-infectives for treatment of the infectious diseases caused by different causative agents

Microorganisms	Diseases	Antibiotics of the first row	Antibiotics of the second row(reserve)
Borrelia spp.	Lyme-disease	Benzylpenicillin, doxicyclin	cefalosporins II and III, macrolides
Rickettsia prowazekii, Rickettsia burnetii, Rickettsia typhi	spotted fever, Q-fever and other	Doxicyclin	Chloramfenicolum, rifampin
Mycoplasma pneumoniae	ARI, pneumonia	Doxicyclin, erythromycine	Azythromycin, rifampin, fluoquinolons III
Chlamydofila psittaci, C.pneumoniae	Psittacosis, pneumonia	Doxicyclin, macrolides	Azythromycin, fluoquinolons II - III, rifampin
Chlamydia trachomatis	Urogenital хламидиоз	Doxicyclin, erythromycine	Azythromycin

- **Quite often in clinical practice infectiologists use combined treatment by antibiotics. Basic indications are:**

1) mixed infections;
2) preventing of development of stability to the antibiotic;
3) strengthening of antibacterial effect;
4) insufficient sensitiveness of causative agents to antibiotics.

- **The next variants of co-operation of antibiotics are possible:**

1) ***indifferent action*** - no change of effect of each antimicrobial drug (chloramphenicol + erythromycine);
2) ***additive action*** - the antibacterial effect of the applied drugs is equal to the sum of action of each of them individually, independently one from other;
3) ***synergistic action*** - the effect of joint application of two antibiotics exceeds simple sum actions of every drug individually (betalactams + aminoglycosides);
4) ***antagonistic action*** - effect at combination of drugs is below than effect each individually (betalactams + Tetracyclinums).

- **Main problems of etiotropic therapy.**

1) Expansion of spectrum of pathogenic flora, viral-bacterial associations and other).
2) Increase of number of resistant stamms
3) Appearance of new data about the pharmacodynamics depending on age, concomitant diseases, complications, localization of damage and other.
4) Growth of amount of complications and side effects;
5) appreciation of cost.

- The possible ways of decision of the indicated problems:

1) Standardization of charts of initial (starting) empiric therapy.
2) Optimization of ways of introduction of etiotropic drugs.
3) Combined application of etiotropic drugs.
4) Combination with nosotropic drugs.
5) Account of biocomprehensibility and mode of use.

- **PRINCIPLES OF ANTIVIRAL THERAPY OF INFECTIOUS PATIENTS**
- The viral diseases of people become more actual.
- Antiviral therapy, unlike antibacterial, possesses the less arsenal of curative drugs considerably.
- Antiviral therapy is not wideuse practicaly.

- Drugs must have antiviral action at the minimum damaging of cells of macroorganism.
- The methods of application of antiviral drugs are limited by insufficient knowledge of their pharmakokinetics.
- Efficiency depends on protective forces of organism and state of immunity;

- For practical medicine the methods of determination of sensitiveness of viruses are not accessible.
- There is no single classification of antiviral drugs.

The End!!!