MINISTRY OF HEALTH PROTECTION OF UKRAINE
ODESSA NATIONAL MEDICAL UNIVERSITY

Faculty Medical number 1

Chair Histology, cytology, embryology and pathological morphology with a course in forensic medicine

I APPROVE

Vice-rector for scientific and pedagogical work
_____ Eduard BURYACHKIVSKY
" ____ " _____ 2023

METHODOLOGICAL DEVELOPMENT TO THE SEMINARS OF APLICANTS OF HIGHER EDUCATION ON SECTION-BIOPSY DIAGNOSTICS

Faculty, course Medical, course V

Academic discipline "Sectional Biopsy Diagnostics"
(name of academic discipline)

Approved:
Meeting of the department of histology, cytology, embryology and pathological morphology with a course of forensic medicine
Odessa National Medical University

Protocol No. _1__ on " _1__ " _09_ 2023

Head of the department _____ (Varvara SYTNIKOVA)
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Topic: Tasks, methods and organization of the pathology service, its place in the health care system of Ukraine. The main principles of the organization of the patho-anatomical service in medical and preventive institutions. Basic pathological documentation (orders, provisions, instructions). Mandatory forms of medical documentation in the patho-anatomical institution (subdivision).

I. Relevance of the topic:

Pathological anatomy, as a clinical specialty, has a significant place in the work of treatment and prevention institutions of the health care system. In terms of its tasks and content, the pathology service is closely related to the clinic. In their practical work, all doctors constantly have to be present at autopsies, discuss with the pathologist the issue of thanatogenesis and the final diagnosis, analyze the morphological description of biopsies, draw up medical death certificates, participate in the work of drug control commissions and clinical-pathological-anatomical conferences. For this, practicing doctors need certain knowledge and skills in the organization of the pathology service

. II. Entire classes

to acquaint students with higher education, to create an idea of:

and) Tasks, methods and organization of the pathology service

b) The main principles of the organization of the patho-anatomical service in medical and preventive institutions

- *a student of higher education should know:*

and) The main tasks of the pathology service

b) Structures of the patho-anatomical service

c) Basic methods of postmortem and intravital diagnosis of diseases

d) Mandatory forms of medical documentation in a patho-anatomical institution

(subdivision)

- *a student of higher education should be able to:*

to work with the medical documentation of the pathology institution

Topic content:

Pathological anatomy as a fundamental medical and biological science is at the junction of medical theory and practice. Pathological-anatomical service is an integral part of health care, the main purpose of which is prenatal and postmortem diagnosis of diseases, study of etiology, pathogenesis, thanatogenesis of the most common diseases, control over the quality of clinical diagnostics and the effectiveness of the treatment process, as well as improving the professional training of doctors.

The main tasks of the pathology service:

- Lifetime diagnosis of diseases and pathological processes using morphological studies of biopsies, operative material and droppings;
- Dynamic monitoring of the effectiveness of treatment by performing repeated intravital morphological studies;
- Accounting of the results of the final diagnosis of diseases and pathological processes based on the materials of pathological autopsies with the establishment of the cause and mechanisms of death;
- Examination of the quality of diagnosis and treatment based on clinical and morphological comparisons;
- Participation in lifelong diagnosis of diseases, especially in the field of oncology, by examining biopsies, as well as organs and tissues removed during operations ;
- Monitoring of medical and diagnostic work with the aim of reducing diagnostic and treatment defects ;
- Scientific development of pathological examination materials;

- Participation in the work of licensing and accreditation commissions.

The structure of the pathology service.

The chief pathologist of Ukraine heads the patho-anatomical service in the state. At the oblast level, he is subordinated to the regional pathology bureau or the centralized pathology department at the regional hospital, departments of pathological anatomy of medical universities and institutes for the improvement of doctors, pathology departments of scientific research institutes.

Pathological departments at district and city hospitals are subordinated to the regional pathology service.

The basis of the pathological-anatomical service is the pathological-anatomical department (PAD) of medical institutions, the department of pathological anatomy of medical institutes, institutes for the improvement of doctors, and the PAD of research institutes.

Organizational structure of the pathology service of Ukraine

Ministry of Health of Ukraine → Chief Pathologist of Ministry of Health of Ukraine

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Regional pathology office. → Head of OPAB (regional pathologist)

Regional Department of Health Care

Interdistrict pathologist in rural areas

Chief physician of the hospital → Head of pathology Bureau branch

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Pathological-anatomical department

Bureau

The main task of PAV (prospector) treatment and prevention departments is to improve treatment and lifelong diagnosis of diseases by:

1) intravital determination of the nature of the pathological process on operative or biopsy material;

2) detection of acute infectious diseases on sectional, operative and biopsy material;

3) establishing a diagnosis based on the autopsy data of the deceased;

4) establishing the cause and mechanism of the patient's death with the identification of the nature and origin of the disease;

5) improving the qualifications of doctors through a joint discussion of the results of autopsies and histological studies;

6) analysis of the quality of diagnostic and treatment work in cooperation with clinicians through the comparison of clinical and patho-anatomical diagnoses.

Basic methods of postmortem and intravital diagnosis of diseases

The main methods of postmortem diagnosis of diseases are macroscopic (autopsy) and microscopic (necropsy), postmortem - microscopic (biopsy, cytology) and experiment. Additional methods include biological (bacteriological, virological, serological, hematological, tissue culture methods), chemical (histochemical, immunohistochemical, atomic absorptiometry, quantitative analysis, qualitative analysis, biochemical), physical (histoautoradiography, radiography, X-ray structural analysis, ultrasound diagnostics).

Autopsy (from the Greek autopsia - to see someone, to see with one's own eyes)
Appointment:

- improvement of the scientific and cognitive process. During the autopsy, not only the final, terminal phase of the development of the disease is fixed , but also the dynamics of morpho-functional changes are established. For example, the stages of the formation of cardiac (muscat, portal, small-nodular) cirrhosis of the liver or secondary tuberculosis. On the basis of the acquired knowledge, new and improved classifications of diseases are developed;
- control over the quality of work of a medical and preventive institution. Discrepancy or correspondence of clinical and patho-anatomical diagnoses, causes of death are established. Thanks to the study of the latter, it is possible to direct the team's efforts to their future elimination. For example, it has been established that pulmonary edema is often registered as the immediate cause of death in the cardiology department. By the analysis can establish the cause of the incorrect diagnosis. It can be low qualification of the doctor, insufficient use of resuscitation measures or unjustified use of medicines , etc. Autopsy is used to analyze the effectiveness of the use of new diagnostic procedures, medicines, and surgical methods of treatment;
- detection and prevention of infectious diseases, especially quarantine diseases;
- education of students and practicing doctors;
- discovery of new diseases, their etiology and pathomorphogenesis, for example, description of familial hypertrophic cardiomyopathy, a number of hereditary and congenital diseases, prion diseases, chronic gastritis type B, etc.

Necropsy (from the Greek nekros - dead and opsis - to look) - is carried out in order to confirm or deny the detected macroscopic manifestations of pathological processes at the cellular and subcellular levels.

Biopsy (from the Greek bios - life i opsis - to look) ñ microscopic study of the tissues of living people. Biopsy can be both urgent (examination of tissues during surgery) and planned to clarify the diagnosis or during preventive examinations. To conduct an urgent study, the method of making frozen sections or prints is used. The latter is used for cytological studies. The main purpose of biopsies is to establish an

accurate prenatal diagnosis. The material for biopsies is tissue removed by a surgical method, and for cytology it is secretions (urine, sputum, mucus, mammary gland discharge, etc.), tissue impressions from scrapings, as well as cells obtained by aspiration from the mammary gland, liver, lymph nodes, lungs, pancreas, etc.

With the help of auxiliary research methods, pathomorphological changes are determined at the subcellular and molecular levels. Thus, the histogenesis of a number of tumors is revealed by electron microscopy, hormones, receptors, immunoglobulins, antigens, enzymes, nuclear genes by immunohistochemistry , and various classes of proteins, fats, carbohydrates, metals and enzymes by histochemistry .

REGULATIONS ON THE PROCEDURE FOR AUTOPSIES IN MEDICAL INSTITUTIONS.

1. All corpses in inpatient facilities are usually autopsied.
2. The head doctor has the right to cancel the autopsy in the most exceptional cases. About canceling the autopsy, the chief doctor gives a written indication of the medical history with a brief justification of the reasons for canceling the autopsy (his decision). The head of the OOPAB has the right to cancel the cancellation of the autopsy.
3. An autopsy is performed at any time after the doctors of the medical institution have established biological death. An autopsy is performed after providing the medical history of the deceased with a visa of the chief physician or his deputy for medical work (medical department) on referral for an autopsy.
4. Cancellation of autopsies is inadmissible:
    a) in case of death of patients who stayed in the medical institution for less than 1 day.
    b) if there is suspicion of violent death;
    c) in the case of those requiring a forensic autopsy;
    d) in case of infectious diseases and suspicion of them;

e) in all cases of an unclear prenatal diagnosis;

g) in case of death after diagnostic instrumental studies, as well as in connection with the implementation of measures (operation, blood transfusion, drug overdose)

5. Medical histories of all deceased persons for the previous day are submitted to the otolo-anatomical department of the hospital no later than 10 o'clock in the morning.

REGULATIONS ON AUTOPSIES OF DISCHARGES WITH A BODY WEIGHT OF 500.0 OR MORE, NEWBORN AND STILLBORN.

All newborns who died in medical institutions are subject to autopsy and registration, regardless of body weight and length and how long after birth signs of life were observed in them, as well as stillborns weighing 500 g or more, miscarriages with a body weight of 500 g or more during pregnancy from 28 weeks of pregnancy regardless of live or stillbirth.

Procedure and methods of autopsy of the deceased in inpatient medical and preventive institutions

After establishing the fact of biological death by the hospital doctor, the body of the deceased remains in the ward for two hours. Surname, first name, patronymic, date and time of death, branch are written on the thigh in green. Usually, a rubberized tag is attached to the hand, on which the specified passport data is indicated.

When removing the body and its subsequent examination, it is necessary to comply with all moral, ethical and professional requirements. Ethical requirements include the preservation of medical secrecy regarding everything discovered during the autopsy. It should also be remembered that the deceased, whose body serves for science, has relatives and friends. Professor V. Gruberg, for example, demanded that students and those working in the dissection room take off their hats " because wearing hats does not correspond to the dignity of the room . "

At the same time as the body of the deceased, a fully filled out medical card of an inpatient is submitted to the morgue. Before the autopsy of the dead body, the examiner gets acquainted with all the data related to the life, illness and death of the patient, which can be gleaned from the medical card of the hospitalized patient, from Check with the attending physician there are no facts related to the course of illness and death. Sometimes it is advisable to clarify some data even with relatives, especially in cases of a short-term stay of the patient in a hospital. Laboratory, instrumental and other are carefully studied research methods, treatment methods, doses of medicines taken by the patient, diagnoses are entered on the title page of the medical card, as well as all working diagnoses recorded in diaries. The study of these circumstances is haunting another important goal is to rule out or establish the presence of a forensic aspect. It is desirable that the examiner, having studied all the necessary data, formulates a diagnosis himself, which may not coincide with the diagnosis of the attending physician. With this measure, as P. Kalitievsky points out, the examiner to some extent puts himself in the position of the attending physician, which is especially important for mutual understanding between the pathologist and the clinician.

There is a certain algorithm in performing a pathological autopsy :

1. Conduct an autopsy in daylight, as artificial lighting changes color rendering.

2. Put on a robe and a rubberized apron on top of it, as well as armbands. It is recommended to use anatomical gloves. This will make it possible to prevent infectious diseases, as well as the penetration of corpse poison through possible skin defects.

3. External examination of the body of the deceased. They determine the sex, constitution, nutrition, condition of the integuments, the presence of signs of death, rashes, hemorrhages, wounds, ulcers, edema, etc. It is desirable that the attending physician confirms the passport data of the deceased.

4. Main sectional cut. It is necessary to ensure that it does not pass through postoperative incisions, scars and other defects.

5. A detailed examination of the cavities with clarification of the peculiarities of the position and interposition of organs, the presence of cysts, exudate, effusion, foreign bodies, etc.

6. Extraction from the cavities of organs and their research (size, weight, color, consistency, shape, etc.) with the simultaneous taking of a necropsy, as well as, depending on the tasks set before the examiner, material for bacteriological, serological, biochemical and virological studies. X-ray examination of the bones is sometimes carried out.

7. A brief summary with the formulation of the patho-anatomical diagnosis, the cause of death, the presence of possible discrepancies between the clinical and patho-anatomical diagnoses, clarification of additional issues of interest to clinicians.

8. Corpse toilet.

9. Logging of the autopsy.

For the first time, the autopsy method was described in detail by R. Virkhov. Later, it was improved by Chiari, Letul, O. Abrikosov, and G. Shor. The last two methods are the most common in prosectoral practice.

O. Abrikosov suggests examining organs by cavities. First, the organs of the neck and chest cavity are removed in a complex. Then separate intestines, liver, stomach and duodenum in one complex, urinary tract and genitals also in one complex.

G. Shor proposed a method of complete evisceration of organs, which consists in removing the organs of the neck, chest, abdominal cavity and pelvis in the form of a single continuous complex. During the examination, the organs are also not separated from each other, that is, they maintain their anatomical and physiological integrity. This method is quite convenient when examining the bodies of the deceased who died from postoperative interventions. In such cases, it is advisable to examine the area of the operative field in detail, namely the condition of surgical sutures, vessels, the presence and nature of exudate, and the correctness of the operation.

The list of mandatory forms of medical documentation in the pathology institution (subdivision) includes:

- book of receipt and issue of corpses;
- book of registration of pathological autopsies;
- the protocol of the pathological examination of the corpse;
- journal of registration of studies of operative, biopsy and cytological material, droppings;
- journal for registration of urgent/intraoperative biopsies;
- the results of research on biopsies, operative material, droppings, reflected in the "directions for histological examination" (filled form No. 014/y), published in a book;
- journal of registration of studies of consultative material;
- journal of registration of protocols of clinical and anatomical conferences;
- magazine on labor protection and safety technology;
- records of alcohols, other reagents and dyes, as well as precious metals;
- log of quality control of performed pathological work;
- acts of verification of the implementation of standards of quality of patho-anatomical studies.

Documentation of pathological examinations of the deceased.

In each case of pathological examination, a protocol of pathological examination is drawn up, which includes the following sections:

- ✓ passport part;
- ✓ clinical epicrisis;
- ✓ clinical diagnosis;
- ✓ the text of the autopsy report;

- ✓ histological examination data
- ✓ pathological diagnosis;
- ✓ pathological epicrisis;

The clinical epicrisis of the protocol of the pathological examination is compiled by the pathologist in a concise form.

IN the textual part of the protocol of the pathological examination describes in detail, consistently and objectively, all the changes that were discovered during the autopsy of the corpse.

The pathological examination is completed by the formulation of the pathological diagnosis and the compilation of the pathological epicrisis with the selection of the immediate cause and mechanisms of death, the comparison of clinical and pathological diagnoses, and the establishment of the nature and causes of deficiencies in the provision of medical care.

anatomical diagnosis is formulated according to the nosological principle, expanded in the pathogenetic sequence, with the selection of the following rubrics:

- ✓ the main disease;
- ✓ complications of the main disease;
- ✓ resuscitation measures;
- ✓ concomitant diseases and their complications

In patho-anatomical epicrisis the results of the clinical and anatomical analysis performed during the autopsy and when comparing the postmortem clinical and pathological diagnoses of the disease are displayed. Pathological-anatomical epicrisis should not be a simple list of clinical and pathological-anatomical data. In a concise form, it should indicate what the patient was suffering from, in which pathogenetic connections are the diseases and pathological processes detected in him, why the treatment was ineffective, what are the direct causes and mechanisms of death. The degree of reflection of these questions in the patho-anatomical epicrisis in specific cases may be different.

The direct cause of death is considered to be a pathological reaction, process, syndrome, nosological unit that led to irreversible changes in the functions of vital organs. The immediate cause of death can be both the main disease and its complications (blood loss, shock, pneumonia, peritonitis, etc.).

The comparison of clinical and patho-anatomical diagnoses is carried out both for the main disease and for its complications and co-morbidities.

An extract from the protocol of the post-mortem examination, including the post-mortem diagnosis, the post-mortem epicrisis with the comparison of the pre-mortem and post-mortem diagnoses, is typed and sewn to the medical history.

The protocol of the pathological examination is signed by the pathologist who performed the autopsy, checked and signed by the head of the pathological department or the head of the pathological bureau.

The first copy of the typewritten protocol of the pathological examination is permanently kept in the pathological office (department).

The main questions of the topic:

1. The purpose and tasks of the pathology service.
2. Organizational issues of the pathology service.
3. The main tasks of the pathology department of the hospital and centralized pathology departments.

Objective: Mastering the main aspects of the work of the pathology department.

4. Regulations on the order of autopsies.

1) Target task: Resolution of the issue of referral for autopsy.

a) Who has the right to cancel the opening.

b) In what cases is it not allowed to cancel the autopsy.

2) Purpose: the right to issue a medical death certificate in various cases of death.

5. Regulations on the procedure for dissection of corpses of infants and stillborns.

The plan and organizational structure of the lesson (chronogram).

1. Roll call and assignment (5 minutes).

2. Control of the initial level of knowledge (15 minutes).

3. Situational game - consideration of the histories of diseases that were issued without an autopsy. Acquaintance with the report on the work of the pathology department for the reporting year.

4. Analysis of the game, interview with the teacher on individual issues of the research topic (15 minutes).

5. Summary of the teacher and tasks for the next lesson (5 minutes).

Class equipment.

Protocols of autopsies and medical histories of patients released without an autopsy. Report on the work of the pathology department for the past year.

Literature:

List of recommended literature:

a) main:

1. Atlas of micropreparations in pathomorphology / I.I. Starchenko, B.M. Filenko, N.V. Royko and others; VDZU "UMSA". - Poltava, 2018. - 190 p
2. Neoplasms of the maxillofacial area in children / P.I. Tkachenko, I.I. Starchenko, S.O. Belokon and others. – Poltava: Col. "ASMI" - 2018. - 190 p.
3. The basics of pathology according to Robbins: in 2 volumes. Volume 1 / Vinay Kumar, Abul K. Abbas, John C. Astaire; translation of the 10th Eng. edition. Publisher: All-Ukrainian specialized publishing house "Medytsyna". – X II . - 2019. - 420 p.
4. The basics of pathology according to Robbins: in 2 volumes. Volume 1 / Vinay Kumar, Abul K. Abbas, John C. Astaire; translation of the 10th Eng. edition. Publisher: All-Ukrainian specialized publishing house "Medytsyna". – X II . - 2019. - 420 p.
5. Pathomorphology. General pathomorphology: a study guide / edited by Ya. Ya. Bodnara, V.D. Voloshina, A.M. Romanyuk, V.V. Gargin. - New Book, 2020. - 248 p.
6. Pathomorphology of the main disorders of the cardiovascular system: study guide

/ I.I. Starchenko, B.M. Filenko, N.V. Royko – Poltava: "UMSA". - 2019. - 150 p.
7. Workshop on biopsy-sectioning course / I.I. Starchenko, A.P. Hasyuk, S.A. Proskurnya [etc.] – Poltava, 2016. – 160 p.
8. I.I. Starchenko Pathomorphology of the main diseases of the maxillofacial region: academician. manual / I.I. Starchenko, B.M. Filenko, V.V. Chernyak ; "UMSA". – Vinnytsia: Nova Kniga, 2019. – 128 p.
9. C tarchenko I.I. Special pathomorphology (basic course) for students of medical faculties of higher medical educational institutions III-I V levels of accreditation / I. I. _ Starchenko, N.V. Royko, B.M. Filenko. – Poltava, 2017. – 174 p.
10. Tuffaha S. A. Muin Immunohistochemistry in tumor diagnostics / S. A. Tuffaha Muin, S. G. Hychka, Gusky Hans. – "Book Plus", 2018. – 336.

Topic of the next seminar session:

"Method of study of biopsy, operative material and droppings. Research rules and the procedure for filing documentation regarding the study of morphological material."

Topic: Method of research of biopsy, operative material and droppings. Research rules and the procedure for filing documentation regarding the study of morphological material.

I. Relevance of the topic :

The role of morphological studies in complex examinations and treatment of patients is growing all the time. The tasks that clinicians put before pathologists during the treatment of patients and the justification of surgical intervention, its success, rational therapy and prognosis are constantly becoming more complicated.

All diagnostic biopsies, all organs and tissues removed during surgical operations, as well as droppings and scrapings during abortions are subject to pathogistological examination.

Pathohistological examination is carried out in order to clarify and confirm the clinical diagnosis, to establish the diagnosis in clinically unclear cases, to determine the stages of diseases, to recognize different forms and origins of inflammatory, hyperplastic and tumor processes.

Purpose of the lesson:

Acquaint students with higher education with the order of examination of biopsy and operative materials.

to acquaint students with higher education , to create an idea of:

and) Research methods of biopsy, operative material and litter

b) Research rules and the procedure for filing documentation regarding the study of morphological material.

- a student of higher education *should know:*

and) Definition of biopsy and its types

b) Procedure for examination of biopsy and operative materials

c) Mandatory forms of medical documentation in a patho-anatomical institution (subdivision)

- a student of higher education *must be able to:*
- *a)* work with the medical documentation of the pathological institution

b) to collect material for morphological research

Topic content:

Method of research of biopsy, operative material and litter

Biopsy (from the Greek bios - life i opsis - look) - microscopic examination of tissue and cellular material obtained from a patient during life for the purpose of diagnosis, treatment, prognosis and scientific research.

Biopsy material is formally divided into diagnostic and operational

All diagnostic biopsies, all organs and tissues removed during surgical interventions, as well as droppings, scrapings during abortions, carried out in the department of this medical and preventive institution and medical institutions attached to it, are subject to pathogistological examination.

Pathohistological studies are carried out in order to clarify and confirm the clinical diagnosis, to establish the diagnosis in clinically unclear cases, to determine the initial stages of the disease, and to recognize inflammatory, hyperplastic, and tumor processes that differ in form and origin. The study of biopsy and operative materials allows judging the radicality of the operation, the dynamics of the pathological process, the changes that occurred in tissues or neoplasms under the influence of treatment, etc.

Types of biopsies:

- Excisional - removal of the entire pathological formation or organ during surgical intervention.
- Incisional - removal of part of a pathological formation or organ during surgery, but necessarily on the border of damaged and unchanged tissue.
- Puncture - removal of a column of tissue of the studied formation or fragments of an organ by means of a needle or trocars with a feather diameter of the lumen (parenchymal organs, bone marrow, lymph nodes).
- Trepanobiopsy is a method of intravital extraction of bone tissue for examination of the bone marrow.
- Forceps - obtaining material with the help of special devices - forceps, for example, during endoscopic studies.
- Curettage - obtaining material by scraping.
- Aspiration - suction of the contents of an organ or body cavity using a syringe.
- Directed catheterization.
- Biopsy by massage and pressure.
- Biopsy by washing organ cavities.
- Biopsy by washing from surgical wounds.
- Biopsy by smear.
- Smears-imprints.
- Endoscopic.
- Accidental, unplanned biopsy.

Biopsy is a material obtained by biopsy for pathomorphological examination.

Tissues and organs removed during a surgical operation are considered surgical material. Pathohistological examination of the operative material makes it possible to confirm the diagnosis for which the surgical intervention was performed, as well as to clarify its prognosis. Pathologically changed tissues, regardless of the purpose of surgical removal, are subject to mandatory histological examination.

Procedure for examination of biopsy and surgical materials (pathohistological studies)

The objects to be examined are delivered immediately to the pathology bureau (department) to ensure the timeliness of the findings. It is forbidden to accumulate biopsy-operative material (including scrapings) in operating rooms. The operative material must be carefully marked: the patient's last name, initials, medical history number, and a label are pasted on the can with the object to be examined. When several objects from different patients are placed in one dish, each of them is tied separately in gauze with an attached tag made of sticky paper that does not get wet in the liquid, on which the name of the patient and his initials should be written with a simple pencil.

An object delivered from the clinical department that is unsuitable for research (dried, rotten, frozen) is not accepted, which is immediately reported to the head of the department. For each material, a special research referral form is filled out, which is delivered to the pathology bureau (department). All the columns of the form must be filled in by a clinician in such a way that the pathologist who will conduct the research has a sufficient amount of clinical information when evaluating the detected morphological changes. In addition to the clinic of the disease, the form should also include brief data on the anamnesis and the treatment that was carried out (the total number of injected cytostatic and hormonal drugs, the nature of radiation therapy, etc.) and a macroscopic description of the drug.

If the referral form is filled out carelessly and does not contain the necessary data, the head of the department of the pathology office informs the head of the clinical department from where the biopsy material was delivered; in case of repeated cases, he reports to the chief physician (director of the institute), his deputy for medical work.

It is strictly forbidden to divide the biopsy and operating materials into parts and send them to different patho-anatomical laboratories. In such cases, morphological changes characteristic of this process (cancer, tuberculosis, etc.) may appear only in one part of the object, and accordingly, the results will be different. This can disorient the attending physician and harm the patient.

The doctor who ordered the study is responsible for the delivery of the material. The material is delivered to the pathology office (department) by the employees of the medical department. If for certain reasons it is impossible to send the material

immediately after the operation, the surgeon who performed the operation ensures its proper fixation (in 10% formalin solution) and preservation. If the patient died during the operation or shortly after it, the organs removed during the operation are delivered to the pathology bureau (department) together with the corpse.

The staff of the pathology office (department), laboratory is personally responsible for the correct reception, registration and storage of received and processed material.

The laboratory technician of the pathology bureau, pathology department, accepting the material that comes to the laboratory together with the referral form, checks the correctness and completeness of filling in all the columns and the compliance of the received material with the information indicated on the form.

Registration of biopsies and surgical material is carried out by a laboratory assistant.

The 1st option of registration: the registration book is established for each calendar year, has the following columns: NN in order (the numbering of studies starts anew each year), the numbers correspond to the number of pieces cut from the object; date of receipt and date of examination of the material, surname, name and patronymic of the patient, age, medical history number, object of study, approximate clinical diagnosis, necessary clinical information about the patient, histological description of the drug and clinical diagnosis, receipt for obtaining the conclusion.

II registration option: passport data is entered in a blank form, on which the corresponding study number is also indicated. The results of macroscopic and microscopic studies are entered under the copy. A copy of the conclusion is sent to the medical institution, and the original form, received together with the material, is bound and kept in the laboratory. Thus, all clinical information about the patient is stored in the laboratory, this provides clearer documentation and the possibility of summarizing the results of the biopsy work; it is advisable to fill in all the columns of the form in the pathology department on a typewriter.

The macroscopic examination of the material, the choice of methods of its processing, methods of research and the necessary types of staining are carried out by a

pathologist, respectively. It is forbidden to assign this work to a laboratory technician.

Each study (block, piece) is assigned a serial number, which is written on a tag that is placed in a container with the material under study, on a block when embedded in paraffin or celloidin, and affixed to histological preparations. The last two digits of the calendar year of the study are placed on the slides under the study number.

The examination of the delivered pieces of fabric must be completed in the following terms:

a) for urgent biopsies - no later than 20-25 minutes after receiving the material;

b) for diagnostic biopsies and surgical material - within 4-5 days. The period of processing of bone tissue and biopsies that require additional staining methods or consultation of highly qualified specialists may be extended.

Copies of the forms with the results of the histological examination are sent to clinical departments (under receipt) and must be included in the medical history.

It is recommended to keep archival histological preparations and registration books throughout the existence of the pathology bureau (department). Depending on the local conditions, histological preparations of worm-like appendages, keel sacs, tonsils, scrapings from the uterine cavity after an incomplete abortion are kept for one year, and may be destroyed at the end of the period. Histological preparations of benign and malignant tumors, tumor-like processes, with suspicion of tumor growth and specific inflammation are kept permanently. Celloidin blocks are stored in jars in a 70% alcohol solution, on which there should be a label with the indicated numbers and the year of the study. For long-term storage of the material embedded in celloidin, the latter is removed from the blocks, strung on a thread together with tags indicating the number and year of the study, and placed in a 70% alcohol solution. Paraffin blocks with appropriate markings are stored in conditions that delay drying (polyethylene bags, paraffining of the cut surface). Macropreparations or pieces of them are stored in a 10% formalin solution for a year, after which they are destroyed. Pieces of brain tumors, soft tissue malignant tumors and those that are rare are recommended to be stored in a 10% formalin solution throughout the life of the laboratory, if conditions are available.

Histological preparations, if necessary - archival macro-preparations can be

issued to the patient, his relatives or medical personnel for consultation in another medical institution, provided there is an official written request from this institution. The corresponding relationship with the request is pasted in the registration book of histological studies (in accordance with the number of the drug), and after the drug is returned, it is crossed out. The medical institution to which the drugs were issued must return them to the pathology office (department).

When carrying out pathohistological studies, the following amount of research material - malignant tumors is recommended:

Cancer of the uterine body (uterine sarcoma, etc.): tumor 1-4; tumor border with unchanged tissues - 2; cervix - 1; two ovaries - 2; two pipes - 2; lymph nodes of parametrium tissue - 3; myomatous nodes (if any) - 2, 10-14 pieces in total.

Cervical cancer: cervical tumor - 1-2; border of tumor and unchanged tissues - 1; cervical canal - 1; from the body of the uterus - 1; two ovaries - 2; two pipes - 2; lymph nodes of parametrium tissue - 3; myomatous nodes (if any) - 2, 11-15 pieces in total.

Benign processes in the uterus (myomas, endometriosis, etc.): uterus - 2-4; pipes - 2; ovaries - 2; paraovarian cysts - 1, only 3-12 pieces.

Stomach - tumor: tumors - 1-4; tumor border with unchanged tissues - 1-2; cutting lines, upper and lower - 2; regional lymph nodes - 1-3, 8-14 pieces in total.

Stomach - ulcer: ulcer - edge, bottom - 1-3; stomach wall - 3; adjacent areas - 1-2; regional lymph nodes - 3, a total of 5-9 pieces.

Mammary gland: tumor - 1-4; tumor border with unchanged tissues - 1-2; tissue of the mammary gland and adjacent areas - 2-3; lymph nodes (in groups) - 3, a total of 7-14 pieces.

Soft tissue tumors: tumor 2-6; border of the tumor with adjacent tissues - 1-3, only 3-9 pieces.

Lungs (tumor): tumor 1-5; tumor border with unchanged tissues - 3; lung tissue - from adjacent areas - 2-3; regional lymph nodes - 3, total - 8-15 pieces.

Lungs (purulent processes): from 3 to 9 pieces.

Intestine with lymph nodes: from 3 to 6 pieces.

Esophagus: pieces taken during esophagoscopy - all.

Removed esophagus with lymph nodes: 3-5 pieces.

Thyroid gland: from each lobe 1-2 pieces, with nodular goiters 1-2 from each node; lymph nodes - 1-3 pieces, 6-10 in total.

Ovarian tumors: (when removing the uterus with tubes) - pieces from the tumor 2-3; fallopian tubes - 1-2; from the endometrium - 2-3; myomatous nodes (if any) 2-3, 8-13 pieces in total.

Larynx (tumor) - 2; lymph nodes - 2, only 2-5 pieces.

Prostate gland: from each node - 1-2 or all pieces in the form of a scraping when taking material by the method of transurethral electroresection.

The vermiform appendix is examined either completely, by making "rolls", or 1-3 pieces are cut out from the most changed places and from an area remote from the zone of the pathological process.

Tonsils and lymph nodes, pieces of the cervix, polyps and other tissues - each piece is examined separately.

Fallopian tubes in ectopic pregnancy - 1-3 pieces or more.

Gallbladder: 2-3 pieces from the wall or tumor; in the presence of lymph nodes - 3, only 2-6 pieces.

From other organs and tissues, 2-3 pieces are cut from the tumor or the area affected by the pathological process; 1-2 pieces of tissue surrounding the pathological process; with the simultaneous removal of lymph nodes, at least 3 lymph nodes are examined if they do not have macroscopic signs of a tumor.

The material of scrapings, including during gynecological examinations, aspiration and other types of biopsies, trepanobiopsies, is fully investigated.

The order of preparation of biopsy, operative and sectional materials for histological studies.

1. Skin tumors are cut and excised so that when examining the histological preparation, it is possible to assess the nature of changes in the center and periphery of the tumor and in adjacent areas.

2. Before the study, the lungs are fixed for a day by inserting a fixative into the bronchus under pressure from an Esmarch mug raised 25 cm above the level of the

table. From above, the lung is also filled with fixative and covered with gauze or cotton wool. In the case of tumors, incisions are made along the probe inserted into the bronchus. Not only tumor areas, but also the adjacent walls of the bronchi and lung parenchyma, as well as the lymph nodes of the root of the lung, are subject to histological examination.

3. Fixation of the larynx is carried out in an open form, plates along the larynx with a pathological focus and adjacent mucous membrane are cut out for examination.

4. Organs of the gastrointestinal tract are fixed after longitudinal dissection and straightening on cardboard. Pathological focal changes and the condition of the adjacent mucous membrane are described. In the pieces of stomach ulcers, a purposeful search for its malignancy is conducted, for which it is necessary to examine a larger number of histological sections. The polyps are searched for areas of malignancy in the form of compactions and ulcers. In cases of gastric resection to exclude a duodenal ulcer, the delivered drug may contain the edge of this ulcer; places of surgical intervention must be investigated.

5. The vermiform process is cut longitudinally or transversely in the changed places, the contents and changed areas of the wall are examined.

6. Operatively removed testicles or their appendages are dissected for fixation by longitudinal incisions.

7. The prostate gland is dissected for fixation with transverse cuts and pieces are taken for histological examination, capturing the walls of the urethra and the capsule of the gland. In the presence of tumor nodes (areas of hyperplasia), pieces are cut out of them together with areas of adjacent tissue of the gland.

8. Areas of sectoral resection of the mammary gland after palpation are cut and inspected. The size, density of nodes, content and condition of the cyst walls are described. Areas of nodes with marble patterns and cyst walls are subject to histological examination. In each case, several pieces are cut from the pathological focus.

In case of total resection of the mammary gland, it is prepared from the muscles, repeatedly cut with parallel cuts perpendicular to the skin. The tissue in which the lymph nodes are examined is also dissected.

9. During extirpation of the uterus with appendages, all removed organs are examined, including ovaries, tubes, uterine ligaments, regardless of the presence or absence of pathological changes in them. The uterus is opened with a T-shaped incision from the front. At the same time, the size of the uterus, the length of the cervical canal, the thickness of the mucous and muscular membranes are measured. The cervix is dissected and examined parallel to the cervical canal. With leiomyomas, all detected nodes are examined, regardless of their number. The material for electroconization of the cervix is being studied in its entirety.

Cystic tumors of the ovaries are dissected, the remains of the ovary are found in their walls, which must be examined together with the wall of the cyst in areas of its compaction or villous growths.

Dermoid cysts are fixed without surgery. After freeing the contents, the head of the cyst is examined. In teratomas, at least 4-5 pieces are subject to histological examination to study the nature of possible tissue differentiation.

10. The pituitary gland is cut into two halves along the sagittal line for fixation. One of them is subjected to histological examination in such a way that the anterior and posterior lobes, the funnel of the pituitary gland, fall into the sections. The second half is cut into two equal parts along the frontal line, along which sections are prepared for microscopic examination.

11. The thyroid gland is fixed by cutting it lengthwise into 0.5 cm thick plates while preserving the connection between them or as a whole. For histological examination, the following are taken:

a) with diffuse goiters and thyroiditis - pieces from each lobe and isthmus, as well as from any foci of fibrosis and mosaic structure.

b) with nodules - from all nodes, necessarily with the capsule and adjacent tissue, in particular, all sealing zones are cut out.

12. Adrenal glands are fixed, dissected lengthwise into plates 0.2-0.3 cm long, preserving the connection between them. For research, pieces are cut out in the gate area; they must necessarily have cortical and brain matter. In the presence of a tumor, they are excised together with the adjacent tissue.

13. The pancreas is fixed, dissected lengthwise into plates 0.5 cm thick, preserving the connection between them. For histological examination, pieces are taken from the center and at the border with the adjacent tissue.

14. To study the liver and spleen, tissue plates 0.5 cm thick are cut along the length of the organ, and after fixation, pieces are taken from the portal area and near the capsule. In the presence of pathological foci, pieces of them are cut out together with the adjacent tissue.

15. Lymph nodes before fixation are dissected along the large size. The material for research is taken from the gate, the center of the node and the periphery with the capsule.

16. The removed pieces of the brain are cut into plates 0.5 cm thick. After fixation, pieces are cut from the pathologically changed areas on their border with unchanged tissues.

17. For the study of bones, plates 0.5-0.7 cm thick are cut out, which are subsequently subjected to decalcification. Dissections are performed taking into account pathological foci (tumor nodes) and adjacent unchanged bone tissue. The soft tissue component of the tumor is examined without decalcification.

Plan and_organizational structure of the lesson (time card)

1. Roll call and assignment (5 minutes).
2. Control of the initial level of knowledge (15 minutes).
3. Acquaintance with the organization and work of the pathological laboratory and the pathological department of the hospital.

4. Review of educational micropreparations, formulation of conclusions with the help of the teacher.

5. Summary of the teacher.

The main questions of the topic:

1. The purpose of the study of postoperative and biopsy material.

2. Types of biopsies.

3. Procedure for sending material for research.

4. Procedure for registration of postoperative and biopsy material.

5. Option of pathogistological conclusion.

Educational algorithm for independent work of students of higher education :

Students of higher education , under the guidance of a teacher, perform cutting of parenchymal organs for sectional observation, review a set of demonstration histological preparations.

Class equipment:

A set of demonstration and histological preparations

List of recommended literature:

a) main:

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- Neoplasms of the maxillofacial area in children / P.I. Tkachenko, I.I. Starchenko, S.O. Belokon and others. – Poltava: Col. "ASMI" - 2018. - 190 p.
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- Tuffaha S. A. Muin Immunohistochemistry in tumor diagnostics / S. A. Tuffaha Muin, S. G. Hychka, Gusky Hans. – "Book Plus", 2018. – 336.

The topic of the next seminar session: "Analysis and evaluation of the results of the morphological study of biopsies, operative materials, droppings. The role of

morphological studies in the complex of examination and treatment of patients"

The topic №3. : "Analysis and evaluation of the results of the morphological study of biopsies, operational materials, consequences. The role of morphological research in the complex of examination and treatment of patients."

I. Relevance of the topic :

The role of morphological studies in complex examinations and treatment of patients is growing all the time. The tasks that clinicians put before pathologists during the treatment of patients and the justification of surgical intervention, its success, rational therapy and prognosis are constantly becoming more complicated.

All diagnostic biopsies, all organs and tissues removed during surgical operations, as well as droppings and scrapings during abortions are subject to pathogistological examination.

Pathohistological examination is carried out in order to clarify and confirm the clinical diagnosis, to establish the diagnosis in clinically unclear cases, to determine the stages of diseases, to recognize different forms and origins of inflammatory, hyperplastic and tumor processes.

II. Purpose and occupation:

- *to acquaint students with higher education, to create an idea of:*

and) Research methods of biopsy, operative material and litter

b) Research rules and the procedure for filing documentation regarding the study of morphological material.

- *A student of higher education should know:*

and) Definition of biopsy and its types

b) Procedure for examination of biopsy and operative materials

c) Mandatory forms of medical documentation in a patho-anatomical institution (subdivision)

- *A student of higher education must be able to:*

a) analyze and evaluate the results of the morphological study of biopsies, surgical material droppings.

b) to collect material for morphological research

Topic content:

The study of biopsy, operating materials and droppings is the most important part of the activity of institutions and units of the pathology service and pathologists, due to the growing role of morphological studies in the examination and treatment of patients. Lifetime morphological studies are based on a complex, with mandatory application of microscopic (histological) methods, study of biopsy, operating materials, droppings, as well as tissues (organs) that are involuntarily rejected from diseased pieces.

Biopsy material - material obtained by biopsy. Biopsy - morphological study of tissues and parts of organs excised during life or removed in another way for the purposes of diagnosis and/or evaluation of the effectiveness of the applied treatment.

Operative material - organs (or their parts), tissues obtained during various options of surgical intervention. Morphological examination of the operative material is carried out to clarify the pre- and intraoperative clinical diagnosis, control the quality and volume of the surgical operation.

The litter is an organ that connects the fetus to the mother's body. It consists of the placenta, amniotic membranes and umbilical cord. During the morphological examination of the litter, pathological processes associated with diseases of the fetus and mother are diagnosed. Mandatory examination of litter in all cases of stillbirth, in severe condition of newborns and their death.

According to the current rules, biopsies and surgical material in full volume, pieces of tissues (organs) spontaneously rejected from patients, as well as droppings must be sent for pathomorphological (histological) examination by a doctor (the doctor who took the material for examination, the clinician who performed the surgical intervention, the obstetrician) to the institution (subdivision) of the patho-anatomical service serving the relevant medical and preventive institution. It is unacceptable to divide the material into parts with the direction of them to different patho-anatomical institutions (subdivisions).

Smears, sputum, various liquids, and in some cases - punctates, pieces of tissue and other material of diagnostic value are subject to cytological examination. These materials are sent for research to the cytological laboratory of a medical and preventive institution or patho-anatomical department or patho-anatomical office.

The correctness and completeness of the morphological (histological) examination largely depend on compliance with the rules of collection, marking, histological or other fixation of materials, timely delivery of them to the laboratory, completeness of information about the clinical picture of the disease in a special instruction form.

Materials for intravital morphological diagnosis must be delivered to the pathology department in a timely manner, in full, with appropriate labeling and a filled-in direction for pathological examination. At the same time, reasons leading to possible confusion of materials from different patients must be completely excluded, full information about the clinical picture of the disease, the nature of the manipulation performed, the type and number of objects sent for research must be provided, the conditions for obtaining a full conclusion of the pathologist about the essence of the disease, its prognosis.

The technological chain of morphological diagnostic studies includes reception and registration of biopsy and operating materials, droppings; macroscopic description and cut; fixation of delivered non-fixed materials; histological (and in some cases electron-microscopic, etc.) processing of objects; morphological (pathohistological, ultrastructural, etc.) diagnosis; issuance of conclusions and preservation of materials in the archive.

Each stage requires a separate room, a standard set of apparatus, instruments, tools, dishes, reagents and other means. All this should ensure not only the modern level of research, but also the fulfillment of safety requirements. The study of intraoperative, urgent biopsies is advisable to be carried out in a small pathohistological laboratory located near the operating block of a surgical or other department. This laboratory should have a freezing microtome (cryostat-microtome), a set of reagents and devices for staining histological sections made on it, a microscope, and the necessary conditions for the work of a pathologist and a histologist. An urgent histological examination is

performed within 20-25 minutes after the delivery of a piece of cut tissue from the operating room. Urgent biopsy is performed to establish the nature of the disease, to determine the scope of surgical intervention. This technique is especially often used for malignant tumors. Tissues along the line of organ resection are usually examined to rule out invasive neoplasm growth and the presence of other pathological processes. With adequate qualification of the pathologist and good quality of histological preparations, in the vast majority of cases it is possible to distinguish a malignant tumor from a benign one, as well as to verify inflammatory reactions. Sometimes the nature of the impression remains unclear and only after embedding biopsies in paraffin and making sections stained by conventional and special methods, a final histological diagnosis is established.

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The material obtained during scraping, including during gynecological examinations, during aspiration and other biopsies, is examined completely. The number of pieces and subsequent histological sections required for intravital morphological diagnosis can vary widely. So, to verify chronic gastritis, the endoscopist should take at least 2-3 pieces of the mucous membrane from the body and antral part of the stomach, using a forceps endobiopsy. For fixation, a 10% formalin solution buffered to pH 7.4 is used, paraffin embedding is carried out according to the standard procedure, 4-5 serial sections are made from each piece. Obligatory methods of staining - hematoxylin and eosin, according to Giemse for detection of Helicobacter pylori, additional - staining with picrofuchsin according to Van-Gieson (for collagen fibers). It is also desirable to use immunomorphological detection of fixation of Ig-containing

complexes, if there are indications of a possible immune nature of the disease.

The appendix surgically removed and not opened by surgeons, after its examination and description of the external appearance with an indication of the dimensions, must be opened with a reflection in the protocol of the condition of the inner shell and its contents (the presence of foreign bodies, fecal stones, parasites is established). To identify small diverticula, the process is cut transversely every 1-3 mm. The condition of all layers of the wall is assessed on transverse sections. In cases where the lesion is segmental, it is necessary to take pieces both from the externally unchanged and from the affected parts. If perforation is present, material is also taken from the perforation zone. Blocks are cut with a sharp knife or razor along with a mesentery. At least two transverse cut pieces are cut from the appendix, one of which should be taken from the distal edge of the organ. Histological sections are stained with hematoxylin and eosin, sometimes according to Van Gieson. Staining for bacteria and pathogenic fungi is also used.

The study of litter begins with an examination of its maternal surface. The integrity of the organ is noted (if there is a defect - the nature and size of the latter), 2 mutually perpendicular dimensions, such as pass through the center of the placenta, are measured. Describe the size and number of placental lobes, the depth of interlobular furrows. Zones of different color and density are distinguished, the presence of fresh and old blood clots is noted. When examining the fetal surface, the number and type of branching of the main vessels, the color of the placental amnion, the presence of cysts, tumors, and signs of traumatic injury are determined. When examining fruit membranes, pay attention to their color, thickness, presence of swelling, focal compactions. After studying the shell, the length and diameter of the umbilical cord (umbilical cord) are measured. The place of attachment of the umbilical cord (central, peripheral, paracentral, membrane), the presence of true and false knots, hematomas are indicated. Then the umbilical cord is cut off, leaving a stump 1 cm long. Determine the weight of the placenta without membranes and umbilical cord and calculate the placental-gravity coefficient - the ratio of the weight of the placenta to the weight of the newborn. Then the placenta is dissected from the side of the maternal surface with parallel cuts through

the entire thickness into plates 1 cm wide. When examining each surface of the cut, note the blood filling of the tissue, its color, indicate the number, localization, size of infarctions, intervillous thrombi, describe the size and location of cavernous formations.

Laboratory studies of litter are limited to immunofluorescent examination of smears made from the amnion, villous chorion and decidual membrane, as well as bacteriological and virological examination of the most changed parts of the placenta. For microscopic examination, up to 10 pieces are cut from the placenta, membranes, and umbilical cord. The main fixative is a 10% solution of neutral formalin; pieces are usually embedded in paraffin. The histological sections are stained with hematoxylin and eosin, van Gieson picrofuchsin.

Therefore, a full-fledged pathohistological diagnosis should be substantiated by clinical data, a standard examination of the macroscopic and histological structure. When describing and evaluating structural changes in the litter, it is customary to use a scheme that includes accounting for the signs of conformity of the structure of the placenta with the term of pregnancy; detection of the severity of involutive-dystrophic and compensatory-adaptive reactions; establishing the nature of non-infectious and infectious pathology with an indication of the etiology of the process, its localization, prevalence and degree of severity; determination of the presence and nature of placental insufficiency. To determine the severity of one or another structural changes in the litter, rank indicators are used according to the scoring system from (+) to (+++), which mean weak, moderate and significant degrees of severity of a particular manifestation.

Biopsy and operating materials in all cases of detection of malignant tumors and a number of other diseases that require surgical, chemotherapy, radiation, hormonal treatment, as well as in cases of so-called specific inflammation, rare diseases during repeated biopsies are subject to discussion with the head of the pathology department or a consulting doctor . The conclusion (diagnosis) is formulated collegially and drawn up with at least two signatures of doctors. During repeated biopsies (operations), the pathologist not only familiarizes himself with the description and conclusion of the first biopsy (operative material), but also conducts a comparative morphological study of the materials of the first and repeated examination, focusing on the manifestations of

therapeutic pathomorphosis, disease progression.

The pathological-anatomical conclusion based on operative biopsy materials can be final, predictable and descriptive. At the same time, the diagnosis should be coded taking into account the detected nosological forms and pathological processes reflected in the ICD-10 rubrics, and for neoplasms, an alphanumeric list of tumor topography and morphology is also used (ICD-10 International Classification of Oncological Diseases).

The final pathogistological diagnosis is the result of morpho-clinical comparisons, a conclusion about the verification of a specific disease (nosological form) in the patient, with the selection of its clinical and morphological variant, features of the course.

Tentative diagnosis is the result of a morphological examination that allows the pathologist to limit the range of diseases when conducting differential diagnosis (for example, in sections of the lymph node, epithelioid cell granulomas without signs of necrosis are found in tuberculosis, sarcoidosis, etc.). In such situations, a purposeful in-depth clinical examination of the patient, expansion and deepening of methodological techniques for the morphological study of biopsies is required.

The pathologist's descriptive answer allows us to draw a conclusion only about the nature of the general pathological process (exudative inflammation, hyperplastic processes, etc.).

Such an answer is often given in case of insufficiently complete collection of material for biopsy, insufficient clinical examination of the patient.

Due to the complexity of the objects of morphological research, the pathologist's answer may be wrong. Thus, in the early stages of the development of pathological processes, in the conditions of therapeutic pathomorphosis, when taking material from an inaccurately selected zone, a "wrong" answer is possible. If such an answer does not match the clinical and laboratory signs of the disease, the biopsy should be repeated, taking into account the recommendations of the pathologist. In addition, "incorrect" morphological conclusions occasionally occur in cases where age-related or physiological hormonal fluctuations simulate pathological processes. In such a situation, the clinician may insist on re-examination (study) of the biopsy.

After the end of the diagnostic process, the morphological conclusion is sent over the computer network or on the first copy of the completed referral form to the appropriate department that sent the material for research. An appropriate entry is made about this in the computer of the pathology department or in a special journal for registration of the issuance of answers, which indicates the date of issuance of the answer, the surname, patronymic and signature of the medical worker who received the answer. A copy of the agreement must be permanently stored in the computer memory (diskette) or in the archive of the pathology department.

All materials for registration of research results are permanently stored on computer disks or in the archives of the pathology department. Histological preparations, paraffin and/or celloidin blocks are also subject to permanent storage. The "wet archive" of biopsy and operating room materials contained in fixatives is stored only in those cases, if it is about the verification of neoplasms and the so-called specific inflammation.

The study of biopsies, surgical material and placentas makes the pathologist a direct participant in clinical diagnosis, responsible for the fate of the patient.

It is necessary to emphasize once again that only the joint and coordinated work of the clinician and the pathologist contributes to the accurate and timely diagnosis of many diseases. Biopsy requires from the pathologist not only knowledge of pathohistology, but also clinical thinking, and from the clinician - knowledge of the basics of morphology and understanding of the possibilities of microscopy, the ability to correctly evaluate the answers to biopsies and operative material.

The plan and organizational structure of the lesson (chronogram)

1. Roll call and assignment (5 minutes).
2. Control of the initial level of knowledge (15 minutes).
3. Acquaintance with the organization and work of the pathological laboratory and the pathological department of the hospital.

4. Review of educational micropreparations, formulation of conclusions with the

help of the teacher.

5. Summary of the teacher.

The main questions of the topic:

1. The purpose of the study of postoperative and biopsy material.

2. Types of biopsies.

3. Procedure for sending material for research.

4. Procedure for registration of postoperative and biopsy material.

5. Option of pathogistological conclusion.

Educational algorithm for independent work of students of higher education :

A student of higher education under the guidance of a teacher conducts a cut of parenchymal organs for sectional observation, reviews a set of demonstration histological preparations.

Class equipment:

A set of demonstration and histological preparations.

List of recommended literature:

a) main:

- Atlas of micropreparations in pathomorphology / I.I. Starchenko, B.M. Filenko, N.V. Royko and others; VDZU "UMSA". - Poltava, 2018. - 190 p
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- Tuffaha S. A. Muin Immunohistochemistry in tumor diagnostics / S. A. Tuffaha Muin, S. G. Hychka, Gusky Hans. – "Book Plus", 2018. – 336.

Topic of the next seminar session:

"Pathological-anatomical autopsy of the deceased (adult, newborn, stillborn or fetus). The importance of autopsy as a reliable source of information about the causes of human death and population mortality, about the quality of diagnosis and treatment in medical and preventive institutions. The procedure for conducting an autopsy and the preparation of patho-anatomical documentation regarding it. Rules for issuing "Medical death certificate", "Medical certificate of perinatal death". The procedure for drawing up the protocol of the pathological autopsy of a corpse."

Topic: Pathological-anatomical autopsy of the deceased (adult, newborn, stillborn or fetus). The importance of autopsy as a reliable source of information about the causes of human death and population mortality, about the quality of diagnosis and treatment in medical and preventive institutions. The procedure for conducting an autopsy and the preparation of patho-anatomical documentation regarding it. Rules for issuing "Medical death certificate", "Medical certificate of perinatal death". The procedure for drawing up the protocol of the pathological autopsy of a corpse.

I. Relevance of the topic :

Autopsy has great cognitive value, as it contributes to the accumulation of knowledge about human pathology at the organ, system, tissue, cellular, and subcellular levels. Autopsy allows comparison of clinical and patho-anatomical diagnoses, which contributes to the improvement of medical and diagnostic measures in medical institutions and control over the activities of hospital departments. Autopsy allows comparison of clinical and patho-anatomical diagnoses, which contributes to the improvement of medical and diagnostic measures in medical institutions and control over the activities of hospital departments. Autopsy makes it possible to detect a defect in the management of a patient, to identify doctor's mistakes, to carry out scientific control over treatment activities, and to improve the qualifications of doctors.

II. Purpose of occupation : _

To acquaint students with higher education with various methods and techniques of dissection, macroscopic characteristics of detected pathological processes, methods of taking material for histological and bacteriological studies, conducting clinical and anatomical analysis.

Topic content: An autopsy (dissection, autopsy, autopsy) is an examination of the body of the deceased in order to identify structural changes in it. The death of a patient is a complete and irreversible cessation of the body's vital functions and, above all, the systems that regulate these functions (biological

death). There are three types of

death: natural, violent, and death caused by disease .

Cases of death that followed as a result of medical measures performed according to indications , but performed incorrectly, are the subject of forensic medical examination research. For example, transfusion of incompatible blood, overdose of potent drugs, gross error during surgical intervention, and so on.

Corpses of persons who died of diseases in medical and preventive institutions are subject to autopsy . In the case of death in a medical institution after diagnostic and therapeutic measures (for example, surgical trauma), an autopsy is also performed by a pathologist, although the resulting violent action led to death without any pathogenetic dependence on the underlying disease.

There are different methods of dissection : Vykhrov , Heller-Zenker, Kyary , Letyulla, Abrikosov, Shor, combined methods.

Abrikosov's method involves the separate extraction of organ complexes: first, the organs of the oral cavity, breathing, blood circulation, and neck are removed as a general complex, while cutting the aorta and esophagus at the level of the diaphragm. Then the intestines, liver, stomach, pancreas, spleen and, finally, the genitourinary organs (kidneys, urinary tract, genitals)

According to Shor, they use the method of complete evisceration, in which all the organs of the neck, thoracic and abdominal cavities, and the pelvis are extracted as a single complex, without breaking the anatomical connection.

REGULATIONS ON THE PROCEDURE FOR AUTOPSIES IN MEDICAL INSTITUTIONS.

- ✓ All corpses in inpatient facilities are usually autopsied.
- ✓ The head doctor has the right to cancel the autopsy in the most exceptional cases. About canceling the autopsy, the chief doctor gives a written indication of the medical history with a brief justification of the reasons for canceling the autopsy (his decision). The head of the OOPAB has the right to cancel the cancellation of the autopsy.

3. An autopsy is performed at any time after the doctors of the medical institution have established biological death. An autopsy is performed after providing the medical history of the deceased with a visa of the chief physician or his deputy for medical work (medical department) on referral for an autopsy.
4. Cancellation of autopsies is inadmissible:
    a) in case of death of patients who stayed in the medical institution for less than 1 day.
    b) if there is suspicion of violent death;
    c) in the case of those requiring a forensic autopsy;
    d) in case of infectious diseases and suspicion of them;
    e) in all cases of an unclear prenatal diagnosis;
    g) in case of death after diagnostic instrumental studies, as well as in connection with the implementation of measures (operation, blood transfusion, drug overdose)
5. Medical histories of all deceased persons for the previous day are submitted to the otolo-anatomical department of the hospital no later than 10 o'clock in the morning.

The autopsies are carried out in the established order .

Before proceeding to the autopsy, the pathologist carefully studies the medical history: he gets acquainted with the clinical course of the disease treated with therapy, the nature of medical interventions, if any (operation, transfusion of blood and fluids, resuscitation measures). The pathologist should pay attention to the form of taking a medical history, the content and sequence of records of the doctor's daily observations, laboratory tests, the content of the clinical epicrisis, the construction of the final diagnosis, and the timing of its establishment. If something is unclear in the card of an inpatient, the treating doctor present at the autopsy gives an explanation.

After identification of the corpse, they proceed to the external

examination, paying attention first of all to the signs of death that has come: cooling of the corpse, clouding of the corneas; lack of reaction of the pupils to light, the presence of cadaveric darkening, cadaveric spots. During the external examination of the corpse, the gender, features of the body, the condition of the bone skeleton, the condition of the nails and skin of the deceased are determined (color, the presence of rashes, hemorrhages, swellings, surgical wounds, traces of medical manipulations), the condition of the visible mucous membranes of the oral cavity, eyes, etc. is determined

Already during an external examination, you can get a number of data that contribute to establishing a diagnosis. For example, strongly expressed cadaveric emaciation is characteristic of diseases that are accompanied by exycosis, for example, tetanus, in those who died from cholera. Weakly detected cadaver embrittlement or its absence speaks in favor of a septic state. Dark skin color indicates the presence of Addison's disease, which is accompanied by hyperpigmentation of the skin; cyanosis in cardiovascular failure.

Having finished the external examination, they proceed to dissection of cavities and examination of internal organs, their mutual location and deviations due to painful processes (adhesions, deformations). Particular attention should be paid to the examination of the abdominal cavity, pleural cavity (presence of fluid, adhesions, foreign bodies), condition of the peritoneum and other serous membranes (presence of loose overlays, clouding), condition of sutures in case of surgical intervention and condition of drainage.

After removing the organs from the corpse, their size, weight, shape, consistency, condition of the surfaces, and when cutting - the nature of the parenchyma are determined; the presence of pathological processes with a detailed anatomical picture of changes. Hollow organs are cut, while paying attention to the condition of the lining of the cavities and their contents. The integrity of the bones is studied, and to study the bone marrow, it is necessary to saw the sternum, the bodies of the vertebrae, and one of the tubular bones. Vessels and joints are examined.

Autopsies of corpses of stillborns and newborns differ in some features. The corpse should be weighed by measuring the length of the body and the circumference of the head. Indicate signs of prematurity (soft auricles, hair loss on the shoulders, back, umbilical ring below the middle of the distance between the pubis and the xiphoid process of the sternum, short nail plates, in girls - a gaping genital slit, in boys - the testicles are not lowered into the scrotum) or pregnancy (dense skull bones, fused seams), the condition of the umbilical remains. Unlike the autopsy of adult dead, the autopsy of the corpses of newborns begins with the body cavities, and ends with the opening of the skull. At the same time, conditions should be created for a thorough examination of the cerebellum of the tent and the sickle process, which are often damaged during childbirth. At the autopsy of the brain, attention should be paid to the size of the ventricles of the brain, the presence of malformations, foci of necrosis and petrification.

At each pathological autopsy, a histological examination of organs and tissues is mandatory, the set of which varies depending on the nature of the disease. For this, the pathologist takes pieces from the organs and places them right there in a fixing liquid (most often it is a 10-12% solution of neutral formalin). Processing and preparation of this material for histological examination is carried out using the same methods as for biopsy. If necessary, the doctor conducts a separate collection of material for such special studies as cytological, microbiological, virological, cytogenetic, biochemical.

It is better to perform an autopsy of a deceased person from infectious diseases according to the Abrikosov method, preventing the spread of infected fluids and blood .

There is a certain algorithm in performing a pathological autopsy :

1. Conduct an autopsy in daylight, as artificial lighting changes color rendering.

2. Put on a robe and a rubberized apron on top of it, as well as armbands. It is recommended to use anatomical gloves. This will make it possible to

prevent infectious diseases, as well as the penetration of corpse poison through possible skin defects.

3. External examination of the body of the deceased. They determine the sex, constitution, nutrition, condition of the integuments, the presence of signs of death, rashes, hemorrhages, wounds, ulcers, edema, etc. It is desirable that the attending physician confirms the passport data of the deceased.

4. Main sectional cut. It is necessary to ensure that it does not pass through postoperative incisions, scars and other defects.

5. A detailed examination of the cavities with clarification of the peculiarities of the position and interposition of organs, the presence of cysts, exudate, effusion, foreign bodies, etc.

6. Extraction from the cavities of organs and their research (size, weight, color, consistency, shape, etc.) with the simultaneous taking of a necropsy, as well as, depending on the tasks set before the examiner, material for bacteriological, serological, biochemical and virological studies. X-ray examination of the bones is sometimes carried out.

7. A brief summary with the formulation of the patho-anatomical diagnosis, the cause of death, the presence of possible discrepancies between the clinical and patho-anatomical diagnoses, clarification of additional issues of interest to clinicians.

8. Corpse toilet.

9. Logging of the autopsy.

The meaning of autopsy

1. Autopsy played a big role in the development of materialistic views on the functional and structural organization of a person, his vital functions and the essence of painful processes.

2. Autopsy has great cognitive value, as it contributes to the accumulation of knowledge about human pathology at the organ, system, tissue, cellular, and subcellular levels.

3. It allows comparison of clinical and patho-anatomical diagnoses, which contributes to the improvement of medical and diagnostic measures in medical institutions and control over the activities of hospital departments.

4. Conducting autopsies makes it possible to identify defects in the examination of the patient, to analyze the methods of conservative and operative treatment, to identify errors of the doctor (diagnostic, medical-technical, medical-tactical, etc.)

5. Retrospective analysis of the fatal outcome contributes to the scientific control of treatment activities.

6. Autopsy plays an important role in medical education and in improving the qualifications of doctors.

7. An autopsy contributes to the accumulation of materials that reflect the structure of morbidity and mortality, which allows planning the work of health care authorities.

8. Autopsy is also of great sanitary-epidemiological significance, as it contributes to the detection of infectious diseases, thereby preventing the spread of infections.

9. Due to the autopsy, it is possible to study the morphogenesis and pathogenesis of diseases, that is, to identify the dynamics of structural changes during the development of the disease from initial changes to irreversible ones.

10. Autopsy contributes to the study of little-known and rare diseases, the discovery of new nosological forms, natural and therapeutic pathomorphosis, and the discovery of the essence of pathomorphosis.

11. Autopsies of the dead are also important for the development of medical science, for fundamental research in the field of medicine

12. Autopsy is the main basis for developing the problems of thanatology and thanatogenesis, i.e. the study of the causes and mechanisms of death.

Documentation of pathological examinations of the deceased.

In each case of pathological examination, a protocol of pathological examination is drawn up, which includes the following sections:

3. passport part;
4. clinical epicrisis;
5. clinical diagnosis;
6. the text of the autopsy report;
7. histological examination data
8. pathological diagnosis;
9. pathological epicrisis;

The clinical epicrisis of the protocol of the pathological examination is compiled by the pathologist in a concise form.

IN the textual part of the protocol of the pathological examination describes in detail, consistently and objectively, all the changes that were discovered during the autopsy of the corpse.

The pathological examination is completed by the formulation of the pathological diagnosis and the compilation of the pathological epicrisis with the selection of the immediate cause and mechanisms of death, the comparison of clinical and pathological diagnoses, and the establishment of the nature and causes of deficiencies in the provision of medical care.

anatomical diagnosis is formulated according to the nosological principle, expanded in the pathogenetic sequence, with the selection of the following rubrics:

- the main disease;
- complications of the main disease;
- resuscitation measures;
- concomitant diseases and their complications

In patho-anatomical epicrisis the results of the clinical and anatomical analysis

performed during the autopsy and when comparing the postmortem clinical and pathological diagnoses of the disease are displayed. Pathological-anatomical epicrisis should not be a simple list of clinical and pathological-anatomical data. In a concise form, it should indicate what the patient was suffering from, in which pathogenetic connections are the diseases and pathological processes detected in him, why the treatment was ineffective, what are the direct causes and mechanisms of death. The degree of reflection of these questions in the patho-anatomical epicrisis in specific cases may be different.

The direct cause of death is considered to be a pathological reaction, process, syndrome, nosological unit that led to irreversible changes in the functions of vital organs. The immediate cause of death can be both the main disease and its complications (blood loss, shock, pneumonia, peritonitis, etc.).

The comparison of clinical and patho-anatomical diagnoses is carried out both for the main disease and for its complications and co-morbidities.

An extract from the protocol of the post-mortem examination, including the post-mortem diagnosis, the post-mortem epicrisis with the comparison of the pre-mortem and post-mortem diagnoses, is typed and sewn to the medical history.

The protocol of the pathological examination is signed by the pathologist who performed the autopsy, checked and signed by the head of the pathological department or the head of the pathological bureau.

The first copy of the typewritten protocol of the pathological examination is permanently kept in the pathological office (department).

The procedure for filling out a medical death certificate:

Having formulated the patho-anatomical diagnosis, the pathologist proceeds to issue a medical death certificate. The main condition for its correct filling is a professionally constructed diagnosis and competent use of the IC.

The ICD (International Classification of Diseases) is a single code list of three-digit headings, each of which can be divided into up to ten four-dimensional

subheadings. Instead of a purely digital coding system in previous editions, the X-th revision used a digital code with a letter as the first character and a number as the second, third and fourth characters. The fourth digit is located after the decimal point. Thus, the possible code numbers are in the range from A00.0 to Z99.9; all diseases and systems are divided into 21 classes, each class corresponds to a certain letter of the Latin alphabet.

- The medical certificate of death is filled out with a pen in legible handwriting.
- All points of the certificate must be filled out. In the absence of certain information, it is necessary to write "no data", "not established". On the medical death certificates and their roots, the number of the institution according to the State Register of reporting statistical units of Ukraine is inserted, and the serial number of the medical certificate is placed after a fraction.
- The cause of death is recorded in two parts of item 11 of the medical death certificate.

  Its first part is divided into three lines (I a, b, c). It indicates etiologically and pathogenetically related diseases:

  and – the immediate cause of death, i.e. a disease, syndrome or symptom that is a fatal complication of the underlying disease;

  b - indicate intermediate states that are pathogenetically related to the immediate cause of death and the main disease;

  c – the main primary disease that led to the immediate cause of death. The main primary disease, which is recorded in line IV, is coded with one of the IC codes.

  In the second part of clause 11, the doctor must indicate other diseases that negatively affected the course of the main disease, but are causally unrelated to the disease or its complication, which is the direct cause of death.

  In item 13, information is entered only on the basis of the certificate of the deceased, issued in accordance with the Law of Ukraine ìOn the status and social status of citizens who suffered as a result of the Chernobyl disaster.

  In point 14, write down the name of the medical institution, the date of issuance of the certificate, the signature of the doctor who issued the death

certificate, certified by the seal of the institution. Record of issuing a medical death certificate (his record number, date, cause of death) must be made in the relevant medical documents: medical record of an inpatient (form 003/0), birth history form 096/0), medical record of an outpatient (form 025/0) .

Plan and_organizational structure of the lesson (time card)

1. Roll call and assignment (5 minutes).
2. Control of the initial level of knowledge (15 minutes).
3. Acquaintance with the organization and work of the pathological laboratory and the pathological department of the hospital.
4. Review of educational micropreparations, formulation of conclusions with the help of the teacher.
5. Summary of the teacher.

The main questions of the topic:

- Documentation required for autopsy .
- In what cases is it not allowed to cancel the autopsy .
- Signs of death and their meaning.
- External examination of the body and evaluation of the obtained data.
- The most common methods of dissection and their features.
- Macroscopic examination of cavities and internal organs, macroscopic differential diagnosis of detected pathological processes.
- Peculiarities of autopsy of stillborns and newborns
- Peculiarities of autopsies of those who died from infectious diseases.
- Peculiarities of autopsies of those who died from particularly dangerous infections (OOI) .
- Importance of autopsy for medical science and practical health care.
- Clinical and anatomical analysis of a specific autopsy .

Class equipment:

Medical history of the deceased, protocol of pathological autopsy, medical certificate of death.

List of recommended literature:

a) main:

✓ Atlas of micropreparations in pathomorphology / I.I. Starchenko, B.M. Filenko, N.V. Royko and others; VDZU "UMSA". - Poltava, 2018. - 190 p

✓ Neoplasms of the maxillofacial area in children / P.I. Tkachenko, I.I. Starchenko, S.O. Belokon and others. – Poltava: Col. "ASMI" - 2018. - 190 p.

✓ The basics of pathology according to Robbins: in 2 volumes. Volume 1 / Vinay

Kumar, Abul K. Abbas, John C. Astaire; translation of the 10th Eng. edition. Publisher: All-Ukrainian specialized publishing house "Medytsyna". – X II . - 2019. - 420 p.
✓ The basics of pathology according to Robbins: in 2 volumes. Volume 1 / Vinay Kumar, Abul K. Abbas, John C. Astaire; translation of the 10th Eng. edition. Publisher: All-Ukrainian specialized publishing house "Medytsyna". – X II . - 2019. - 420 p.
✓ Pathomorphology. General pathomorphology: a study guide / edited by Ya. Ya. Bodnara, V.D. Voloshina, A.M. Romanyuk, V.V. Gargin. - New Book, 2020. - 248 p.
✓ Pathomorphology of the main disorders of the cardiovascular system: study guide / I.I. Starchenko, B.M. Filenko, N.V. Royko – Poltava: "UMSA". - 2019. - 150 p.
✓ Workshop on biopsy-sectioning course / I.I. Starchenko, A.P. Hasyuk, S.A. Proskurnya [etc.] – Poltava, 2016. – 160 p.
✓ I.I. Starchenko Pathomorphology of the main diseases of the maxillofacial region: academician. manual / I.I. Starchenko, B.M. Filenko, V.V. Chernyak ; "UMSA". – Vinnytsia: Nova Kniga, 2019. – 128 p.
✓ C tarchenko I.I. Special pathomorphology (basic course) for students of medical faculties of higher medical educational institutions III-I V levels of accreditation / I. I. _ Starchenko, N.V. Royko, B.M. Filenko. – Poltava, 2017. – 174 p.
✓ Tuffaha S. A. Muin Immunohistochemistry in tumor diagnostics / S. A. Tuffaha Muin, S. G. Hychka, Gusky Hans. – "Book Plus", 2018. – 336.

Topic of the next seminar session:

"Peculiarities of autopsies of those who died from infectious diseases and especially dangerous infections"

Topic: Peculiarities of autopsies of those who died from infectious diseases and especially dangerous infections

I. Relevance of the topic:

Autopsies of those who died from infectious diseases have a number of specific features. They must be carried out in compliance with the relevant requirements directed to the prevention of the spread of infection and the protection of PAV medical personnel. Autopsies of those who have died from particularly dangerous infections require the observance of strict measures to protect PAW personnel from possible infection and prevent the spread of infection beyond the borders of PAW. Autopsy allows to reveal characteristic morphological changes in organs during infections. The burial of the dead from particularly dangerous infections also has a number of features. Knowledge of this material significantly expands the horizons of students and doctors.

II. Lesson goals:

to acquaint students with higher education, to create an idea of:

a) Peculiarities of the technique of autopsy of the dead from particularly dangerous infections

b) Characteristic morphological changes in organs during infections

- *a student of higher education should know:*

a) feature of autopsy, examination of organs of deceased persons from infectious diseases and especially dangerous infections

b) rules for taking material for research

Topic content:

Peculiarities of autopsy of those who died from infectious diseases and especially dangerous infections. Autopsies of those who died from infectious diseases are carried out in compliance with the requirements aimed at preventing the spread of infection and preventing infection of medical personnel during the autopsy, material collection and additional laboratory tests. In the case of most infections, taking into account the low pathogenicity of the causative agent or the relatively rapid death of the causative agent in the body of the deceased, the autopsy is carried out under normal conditions without the use of special protective measures. The staff of the pathology department is required to carry out current disinfection and observe the rules of personal hygiene.

During the post-mortem examination of those who died from especially dangerous infections (ONI) or when these diseases are suspected, stricter measures are provided to protect personnel from possible infection, as well as measures to prevent the spread of the pathogen outside the place where the autopsy is performed, during the transportation and burial of corpses. The results of microbiological, virological and histological studies of the material from the corpses of persons who died from infections, including especially dangerous ones, are of decisive importance for clarifying the nature of the infectious disease and carrying out anti-epidemic measures.

The term "especially dangerous infections" has become widespread in Russia. In the medical literature, this group of infectious diseases is also referred to as "quarantine" (ital. quarantena from quaranta giornis - 40 days), taking into account the system of restrictive measures, which is recommended to prevent the spread of infections from an epidemic outbreak and to eliminate the outbreak itself.

The volume and nature of restrictions is regulated by international convections ("convection diseases" - the former name of these infections). In 1981, the International Health Assembly defined the following infectious diseases that are covered by the International Health Regulations: cholera,

plague, yellow fever, smallpox, contagious viral hemorrhagic fevers (Lissa fever, Marburg fever, Ebola fever), malaria and other mosquito-borne infections dangerous to humans (in particular, dengue, Rift Valley, West Nile, Chikungunya; equine encephalomyelitis - Western American, Eastern American, Venezuelan encephalitis - Japanese, California, St. Louis, Murray Valley). Since 1985 HIV infection (AIDS) is included among the diseases covered by the International Health Regulations. In the health care system, the dangerous group also includes a number of infections that are not covered by International Health Regulations, but they are severe and cause high mortality.

This is primarily anthrax, as well as thrush, meloidosis, leptospirosis, tularemia, brucellosis, Ku-fever, typhus, ornithosis, rabies. Anti-epidemic measures should also be taken during the autopsy of the corpses of persons who died from tuberculosis, in order to prevent occupational disease among employees of the pathology department and to prevent environmental pollution.

Especially dangerous infections can be suspected during autopsy based on the detection of skin lesions (rash, carbuncles, vesicles, pustules, abscesses, ulcers); enlarged lymph nodes, including the presence of buboes; hemorrhages (small and large) in the skin, mucous and serous membranes, tissue, including in the lymph nodes, lungs (hemorrhagic nature of pneumonia, edema); ulcers and overlays on the tonsils; liquid (rice decoction-like) intestinal contents characteristic of cholera; the characteristic appearance of the kidneys (increase in size, yellowish-gray color of the cortical substance, dark red - the brain substance); changes in the spleen (its significant increase, foci of necrosis in the pulp, the presence of heart attacks, tubercles); abscesses, cheesy-necrotic foci in internal organs, as well as other signs characteristic of ONI.

All those who died from ONI are subject to patho-anatomical, microbiological (bacteriological, virological), serological examinations, except for cases of yellow fever and contagious viral hemorrhagic fevers. In case of suspicion of death from the latter, autopsies are not performed (due to the high risk of infection. The corpse is buried or burned. Contagious viral hemorrhagic fevers can be suspected due to the acute onset, the presence of prolonged - more than 1-2 weeks - hyperthermia, up to 39- 40 ^{o} C. Morphologically, they can be suspected due to the presence of a spotted-papular rash on the skin, hyperemia and swelling of the skin of the face, numerous hemorrhages - petechiae, large hemorrhages in the skin and mucous membranes, bleeding from the gums, sites of syringe injections, hemorrhagic nature of intestinal contents.

The work of the pathology department should always take into account the need for autopsies of those who died from ONI. In the department, it is necessary to have 2-3 complete sets of overalls or several ready-made sets that contain protective anti-plague suits, devices for disinfection, an intact supply of disinfectants, sterile dishes for collecting material. The personnel must have personal preventive measures for quarantine infections.

The ideal place for an autopsy of a person who died from a quarantine infection is a specialized examination room or a specially equipped room on the basis of the pathology department, where the necessary anti-epidemic measures can be carried out. However, circumstances may force autopsies of the deceased to be carried out in ordinary examiners, in a temporarily adapted room or even in an open area at the place of burial.

In any case, the projector first solves three main tasks:

1) to establish or confirm the presumed ONI, using all available morphological and other methods of examination of cadaveric material (macroscopic, microscopic, bacterioscopy, histobacterioscopic, bacteriological, immunological);

- prevent the spread of infection;
- prevent infection of medical personnel.

Persons participating in the autopsy of a corpse of a person who died of the plague must be dressed in an anti-plague suit of type I. Autopsies and burials of corpses of persons who died from cholera, anthrax are carried out in a type II suit. Before entering the room where the corpse is located, the medical staff put on special anti-plague suits (in the anteroom or in another room where clean underwear and overalls are stored).

Autopsies of those who died of plague, cholera, anthrax and in suspected cases are carried out by conventional methods in the presence of consultants specializing in quarantine infections (doctors of the department of especially dangerous infections of the regional center of the State Health Service). Material collection for laboratory research is usually carried out by specialists in ONI, dangerous infections or pathologists.

Autopsies of corpses with suspicion of quarantine infection are carried out without the use of water or with minimal use of it, while the flow of uninfected liquid into the sewer is strictly prohibited. Sometimes it is possible to examine and dissect organs "in place" without removing them from the corpse. This method has some advantages, because when the organs are cut, the infected liquid flows into the cavities of the corpse, thereby reducing the contamination of the table. The main drawback is the limitation of the possibilities of macroscopic research. The method of complete evisceration (according to Shore) can also be used. The disadvantage of the method is the need to work with a large complex of organs, which can contribute to environmental pollution. Special caution should be observed during the dissection of the skull, which must be done in all cases of suspected anthrax.

Collection of material for histological and bacteriological examination, packaging and sending it to the laboratory are carried out according to a clear scheme. It is necessary to take the material from each organ of the corpse in a sterile manner, in a separate jar. Special attention should be paid to the inadmissibility of the disinfectant solution (and if cholera is suspected, even traces) on tools, gloves, and in the vessel in which organ samples are placed.

Plague. To establish a bacteriological diagnosis, enlarged lymph nodes, liver, spleen, intestines, blood (from the heart or large veins), bone marrow from the tubular cyst and sternum are taken from corpses suspected of plague. From decomposed and exhumed corpses, a piece (4-5 cm long) of tubular cyst together with bone marrow is taken (technically, it is more convenient to take tibia or femur). When taking material from organs, select the most changed areas. The pieces are placed in pre-prepared sterile wide-mouth jars with a volume of 100-300 ml. It is best to allocate a separate jar for each piece. In all cases, pieces of lung and intestine are placed in separate jars.

For disinfection, the material must be fixed in a 10-30% formalin solution or 70% alcohol for 10 days.

Cholera. For bacteriological research, during the autopsy, 3 segments of the small intestine (upper, middle and lower thirds) about 10 cm long each are taken. They take the unopened intestine (after applying double ligatures) and place it in a sterile, wide-mouthed jar with a ground cork. After ligation of the cystic duct, the gallbladder is pulled out in its entirety and, without opening, placed in a sterile wide-necked jar. Given that the cholera vibrio is not resistant, the material for bacteriological research must be delivered to the laboratory as soon as possible.

Anthrax. For anthrax, blood is taken from a vein in the arm or leg, a piece of the spleen, lung, brain and its membranes, a segment of the small intestine with cells are taken for bacteriological examination

lesions, lymph nodes. Blood and pieces of organs are placed in sterile dishes, tightly closed and, according to general rules, sent to the appropriate bacteriological laboratory.

For histological examination, it is better to take pieces from all organs. If this is not possible, the sampling is limited to lymph nodes, pieces of tissue from the lungs, spleen, small intestine, and brain. Fixation in a 10-30% solution of neutral formalin for 10 days. For each material sample, a label must be filled out indicating the surname, first name, patronymic of the deceased, name of the material, time of collection (month, day, hour), date of death, name and position of the medical worker who collected the material.

In addition to the label, a referral is drawn up, which indicates the surname, first name, patronymic, address of the deceased, name of the material, date of autopsy, time of taking the material, clinical diagnosis, antibiotics used in the treatment, pathological diagnosis, name and position of the doctor who sent the material .

The outer surface of the dishes with the material is wiped with a swab soaked in a disinfectant solution and well squeezed, wrapped in gauze, moistened and well squeezed from the disinfectant solution, and placed in a bix or box, transferring the objects with cotton wool. The test tubes, wrapped in cotton wool in advance, are placed in metal cases. The bix (box) with the material must be sealed and sent as soon as possible with a messenger to the laboratory on a special transport.

To disinfect the room of the sectional, protective clothing, in which the pathological examination of a corpse with suspicion of plague and cholera was carried out, use a 5% solution of lysol, carbolic acid, a 3% solution of chloramine with exposure for 3-6 hours. If an autopsy was performed on the corpses of people who died from anthrax, chlorine preparations are used for disinfection (5% chloramine solution, 1-2% activated chloramine solution, etc., exposure - 24 hours).

Disinfected protective clothing is rinsed, dried and used again. The instruments are disinfected by boiling in a 2% saline solution for 30 minutes. from the moment of boiling, and after dissection of corpses with suspicion of anthrax - within 2 hours.

Protective clothing and tools after dissection of a corpse with suspicion of plague and cholera can be disinfected by autoclaving at a pressure of 1 atm for 30 minutes, and after dissection of a corpse with suspicion of anthrax - at 1.5 atm for 2 hours. (tools for 30 minutes). After the removal of the corpse, wet disinfection of the section is carried out with the help of a hydraulic remote control and other sprinklers.

Transportation and burial of corpses. After dissection, all internal organs and the brain are placed respectively in the chest and abdominal cavities, as well as in the skull cavity, as well as in the skull cavity, where then a rag, abundantly moistened with a 5% Lysol solution, is placed. It is not necessary to sew up the corpses of those who died from ONI, as is customary under normal conditions. The corpse, wrapped and tied in sheets moistened with a 5-10% Lysol solution, is placed in a dense box (coffin) made of thick boards, on the bottom of which is poured chlorinated lime in a layer of at least 10 cm. The corpse, placed in the coffin, is covered with thick with a layer of chlorinated lime and cover with a lid.

Cholera deaths can be buried in a regular cemetery. When burying corpses, a pit 2 m long, 1 m wide and 2 m deep is dug. A layer of chlorinated lime 5-10 cm thick is poured on the bottom. Burials of those who died from cholera and HIV infection are carried out in a regular cemetery.

The presence of relatives at the burial is possible provided that there is no contact with the corpse. At the end of the burial, the transport and box for transporting corpses, as well as overalls and everything that was in contact with the corpse, is disinfected on the spot. Persons who participated in the burial are under medical observation for the incubation period.

Bodies of those who died from particularly dangerous infectious diseases (plague, yellow fever, contagious viral hemorrhagic fevers) are not released to relatives. Burials are carried out at the general cemetery by a special team under the supervision of a specialist in ONI or an epidemiologist. In the case of cremation, the ashes are buried in the usual way. Urns with ashes can be given to relatives.

Plan and organizational structure of classes (chronology map) .

1. Roll call and assignment (5 min)
2. Control of the initial level of knowledge (15 min)
3. Demonstration of macropreparations of those who died from particularly dangerous infections from the educational museum of the department of ODMU (40 min)
4. Macroscopic differential diagnosis of detected pathological processes (20 min)
5. Formulation of preliminary pathological diagnosis and epicrisis (10 min)
6. Summary of the teacher and tasks for the next class (5 min)

The main questions of the topic:

- ✓ Documentation required for autopsy.
- ✓ Signs of death and their meaning.
- ✓ External examination of the body and evaluation of the obtained data.
- ✓ Peculiarities of the technique of autopsy of the dead from particularly dangerous infections.
- ✓ Macroscopic examination of cavities and internal organs, differential diagnosis of detected pathological processes.
- ✓ Burial of the dead from particularly dangerous infections.

Class equipment:

- Medical history of the deceased
- Section hall of PAV hospital

List of recommended literature:

a) main:

✓ Atlas of micropreparations in pathomorphology / I.I. Starchenko, B.M. Filenko,

N.V. Royko and others; VDZU "UMSA". - Poltava, 2018. - 190 p
✓ Neoplasms of the maxillofacial area in children / P.I. Tkachenko, I.I. Starchenko, S.O. Belokon and others. – Poltava: Col. "ASMI" - 2018. - 190 p.
✓ The basics of pathology according to Robbins: in 2 volumes. Volume 1 / Vinay Kumar, Abul K. Abbas, John C. Astaire; translation of the 10th Eng. edition. Publisher: All-Ukrainian specialized publishing house "Medytsyna". – X II . - 2019. - 420 p.
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✓ Pathomorphology. General pathomorphology: a study guide / edited by Ya. Ya. Bodnara, V.D. Voloshina, A.M. Romanyuk, V.V. Gargin. - New Book, 2020. - 248 p.
✓ Pathomorphology of the main disorders of the cardiovascular system: study guide / I.I. Starchenko, B.M. Filenko, N.V. Royko – Poltava: "UMSA". - 2019. - 150 p.
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✓ C tarchenko I.I. Special pathomorphology (basic course) for students of medical faculties of higher medical educational institutions III-I V levels of accreditation / I. I. _ Starchenko, N.V. Royko, B.M. Filenko. – Poltava, 2017. – 174 p.
✓ Tuffaha S. A. Muin Immunohistochemistry in tumor diagnostics / S. A. Tuffaha Muin, S. G. Hychka, Gusky Hans. – "Book Plus", 2018. – 336.

Topic of the next seminar session:

"The procedure for performing autopsies on the bodies of persons who died with suspicion of the coronavirus disease (COVID-19). Requirements for organizing the burial of those who died from infections caused by COVID-19."

Topic : " Procedure for carrying out autopsies of bodies of persons who died with suspected coronavirus disease (covid -19). Requirements for the organization of the burial of the dead from infections caused by covid -19."

I. Relevance of the topic:

On March 11, 2020, the WHO (World Health Organization) declared a pandemic of COVID-19. Autopsy of the dead from COVID -19 has a number of

specific features. They must be carried out in compliance with the relevant requirements aimed at preventing the spread of infection and protecting medical personnel.

II. Whole classes :

to acquaint students with higher education, to create an idea of :

a) Peculiarities of the technique of autopsy of those who died from COVID-19

b) Characteristic morphological changes in organs with COVID -19

a student of higher education should know:

a) feature and autopsy, examination of the organs of the deceased COVID-19

b) rules for taking material for research

in) Requirements for the organization of the burial of the dead from infections caused by COVID -19

Topic content:

The 2019 coronavirus infection (COVID -19) is an acute infectious disease of the respiratory tract, the causative agent of which is a new coronavirus. On December 31, 2019, the World Health Organization (WHO) was notified of cases of pneumonia of unknown microbial etiology associated with the city of Wuhan, Hubei Province, China. The WHO later announced that a new coronavirus had been isolated from samples taken from these patients. Since then, the epidemic has grown and spread rapidly throughout the world. WHO first declared a public health emergency of international concern on January 30, 2020, and then officially declared a pandemic on March 11, 2020. Clinical trials and research are ongoing to learn more about the virus, its origin, effects on humans, and ways to treat it.

According to data compiled by the Johns Hopkins University Systems

Science and Engineering Research Center, there have been more than 38.8 million cases of COVID -19 worldwide, with more than 26.8 million patients cured and about 1.09 million deaths. The United States has the highest number of recorded infections and deaths in the world. India has the second highest number of reported cases, followed by Brazil, Russia, Argentina, Colombia, Spain, Peru and France.

PROCEDURE

for conducting autopsies of bodies of persons who died with suspicion of coronavirus disease (COVID -19)

Autopsy of the body is carried out in compliance with anti-epidemic measures without performing aerosol-generating manipulations, using personal protective equipment (hereinafter - PPE) aimed at preventing the infection of medical workers.

When dissecting the body, the following PPE should be used: waterproof disposable isolation gown with long sleeves, waterproof disposable covers and a disposable medical cap or a bioprotection suit, a respirator with protection class not lower than FFP 2, two pairs of non-sterile nitrile gloves with a long cuff, a protective shield.

If there is a risk of cuts, punctures, or the use of tools that could potentially damage the skin, chain mail (Kevlar) gloves are worn over nitrile gloves.

When performing an autopsy, a medical apron is worn that covers the legs up to the feet.

Waterproof disposable covers can be replaced with rubber boots.

Sequence of wearing PPE:

isolation gown or bioprotection suit;

shoe covers or boots (if an insulating gown is used);

a medical cap (if an insulating gown is used);

respirator;

protective shield (glasses);

medical gloves.

3. Before issuing PPE, the head of the Bureau must inform the employee about the risks to his life and health from which the use of this PPE will protect him and ensure regular training of employees on the rules of using PPE and demonstration of their correct use in accordance with the Minimum Safety and Health Protection Requirements when employees use personal protective equipment at the workplace , approved by the order of the Ministry of Social Policy of Ukraine dated November 29, 2018 No. 1804, registered in the Ministry of Justice of Ukraine on December 27, 2018 under No. 1494/32946, and in accordance with the order of the Ministry of Health of Ukraine dated March 28, 2020 No. 722 " Organization of providing medical assistance to patients with the coronavirus disease (COVID-19)."

4. Immediately after receiving notification of the delivery to the Department of the body of a person who died with suspicion of coronavirus disease (COVID-19), as well as when changes characteristic for coronavirus disease (COVID-19) are detected during the autopsy by the Expert and other medical workers , which are present during the autopsy, the following actions are performed:

if the autopsy of the body has been started - suspend the further autopsy of the body;

cover the body (with oilcloth, sheet), without using disinfectants;

medical workers, if necessary, wear additional PPE;

isolation of the section block (section hall) should be ensured - limit access to the room, turn on ventilation and/or in the absence of a properly functioning ventilation system, shielded ultraviolet irradiator, close doors and windows;

to urgently inform about the case the administration of the Bureau and the regional / Kyiv city laboratory center of the Ministry of Health of Ukraine in accordance with the administrative and territorial affiliation;

to report a suspected case of coronavirus disease (COVID-19) to medical workers who were outside the section hall, in order to prepare for the disinfection of the premises of the Bureau;

The expert continues the autopsy of the body and conducts material selection with subsequent transfer to the regional/Kyiv city laboratory center of the Ministry of Health of Ukraine in accordance with the administrative and territorial affiliation with compliance with the requirements for collection and transportation, for virological research;

the autopsy is entrusted to a pathologist with one assistant, in order to reduce the number of contact persons;

it is forbidden to allow the autopsy of workers who have not passed training and knowledge verification on putting on, wearing, removing and disposing of PPE.

After dissection of the body, the internal organs are placed in the thoracic and abdominal cavities of the body. Large areas of the body of the deceased, contaminated with liquids, are cleaned and treated with a disinfectant after removing the liquid with an absorbent material. The use of water during an autopsy with suspected coronavirus disease (COVID-19) is prohibited. Sewage showers are sealed. The corpse is treated with a disinfectant solution, the clothes of the deceased and the biological materials of the deceased's body are disposed of in accordance with the State sanitary and anti-epidemic rules and norms for handling medical waste , approved by the order of the Ministry of Health of Ukraine dated June 8, 2015 No. 325, registered with the Ministry of Justice of Ukraine August 7, 2015 under No. 959/27404. If further investigation is necessary, clothes and shoes (physical evidence) are left for up to one day, for drying and disinfection, in a room with turned on ventilation and/or shielded UV-irradiator.

The medical workers who performed the autopsy and were present during the autopsy, after its completion, carefully remove the PPE in the ante-section room in the following sequence:

gloves;

protective shield (glasses);

apron;

an insulating gown and overshoes (boots) or a bioprotection suit;

cap;

respirator.

Before putting on and immediately after removing PPE, wash your hands with soap for 40 seconds and use an alcohol-based hand sanitizer. Hand hygiene products should be readily available at the point of need (e.g. near the point of removal of PPE).

Disposal of PPE is carried out using physical methods - incineration or autoclaving, having previously placed them in medical waste disposal bags resistant to damage and high temperatures (if autoclaving is chosen as the decontamination method). If it is not possible to use physical methods, it is necessary to dispose of PPE in a suitable container for laundry and garbage, followed by soaking them in a disinfectant (exposure time and concentration are determined according to the manufacturer's instructions).

PPE for multiple use (shields, waterproof aprons, boots) must be cleaned and disinfected before reuse (exposure time and disinfectant concentration are determined according to the manufacturer's instructions).

5 . After the end of the autopsy and the removal of the corpse from the dissection hall, the final disinfection is carried out by medical workers who have undergone training and knowledge testing on putting on, wearing, removing and disposing of PPE. For disinfection, medical workers must wear the following PPE:

disposable isolation gown and disposable waterproof covers or bioprotection suit;

a medical (surgical) mask or a respirator of protection class not lower than FFP2 (in the case of using sprayers of disinfectants);

protective glasses or a protective shield;

non-sterile nitrile gloves with long cuffs.

Sequence of wearing PPE:

isolation gown or bioprotection suit;

shoe covers or boots;

medical (surgical) mask;

protective glasses or a protective shield;

medical gloves.

During the final disinfection, the following approaches are carried out:

cleaning of all surfaces in the section hall is carried out with cleaning solutions followed by disinfection, which uses chlorine-containing disinfectants (for example, sodium hypochlorite in a concentration of 0.5%) and alcohol-containing disinfectants in a concentration of 60-80% (the exposure time and the concentration of the disinfectant are determined accordingly to the manufacturer's instructions);

after cleaning and disinfection, irradiation with open ultraviolet bactericidal irradiators is carried out.

Hand hygiene, removal and disposal of PPE should be carried out in accordance with the provisions given in paragraph 6 of this Procedure.

Medical instruments and other reusable items (eg, waterproof aprons, protective shields, or goggles) should be cleaned and disinfected according to the manufacturer's instructions.

Materials or clothing to be laundered should be transported for disinfection in tamper-resistant medical waste disposal bags or biosecurity bags that can be tied and not opened for refilling, but single-use materials should be preferred.

Before starting the dissection of the camera, telephones, computer keyboards and other objects remaining in the dissection hall or ante-section room should be covered with a waterproof (for example, cellophane) cover in order to avoid their contamination and the need for disinfection. If the above equipment was not covered, it should be treated as contaminated - use gloves. During the final disinfection, it is necessary to wipe the surfaces of the equipment with a disinfectant recommended by the manufacturer of the device in accordance with the instructions. The same steps should be taken before removing such equipment from the breakout room.

6 . After the autopsy, all persons who participated in it are subject to medical supervision for 14 days.

7 . The record of persons who had access to the dissection hall during the presence of a body suspected of having the coronavirus disease (COVID-19) is kept in the form of a log of an arbitrary form, with the indication:

dates and times of stay;

surname, first name, patronymic (if available);

residence addresses;

contact phone number.

10. Sectional material is sent to the virological laboratory of the regional / Kyiv city laboratory centers of the Ministry of Health of Ukraine according to the administrative and territorial affiliation.

In case of receiving a positive result for SARS-CoV-2, the primary material is sent to the virological reference laboratory of the Public Health Center of the Ministry of Health of Ukraine for confirmation.

Selection of sectional material, observance of anti-epidemic measures, transportation of samples to the laboratory is carried out in compliance with the requirements listed in Appendix 3 to the Medical Care Standards "Coronavirus Disease (COVID-19)", approved by the Order of the Ministry of Health of Ukraine dated March 28, 2020 No. 722 , and the State Sanitary Rules of the DSP 9.9.5.035-99 "Safety of Work with Microorganisms of I-II Pathogenicity Groups", approved by Resolution No. 35 of the Chief State Sanitary Doctor of Ukraine dated July 1, 1999.

Selection of sectional material for virological examination is carried out as follows:

swabs of the upper respiratory tract are taken: nasopharyngeal swab and oropharyngeal swab;

3-4 samples of materials from both lungs, trachea, segmental bronchi with signs of pathomorphological changes up to 1 cm $^{-3}$ are taken ;

material samples are taken from the affected area of the lung, at the same

time, at least 4 samples are taken from the deep layer of the affected lung tissue, in the presence of liquid nitrogen - 5 samples. For control, take 1 sample from an unaffected area;

to minimize infection of medical workers, a biopsy needle should be used;

material samples are placed in disposable sterile polypropylene cryovials with screw caps that close tightly;

samples of materials from persons who died from pneumonia (bilateral total, viral and viral-bacterial pneumonia, hemorrhagic pneumonia, signs of acute respiratory distress syndrome), including those caused by influenza or severe acute respiratory viral infection, or suspected of it, are taken within 6-12 hours from the time of biological death;

transportation of frozen samples is carried out in accordance with the Procedure for organizing epidemiological surveillance of influenza and acute respiratory viral infections, preparedness measures in the inter-epidemic period and response during the epidemic season of influenza and SARS , approved by the order of the Ministry of Health of Ukraine dated May 17, 2019 No. 1126, registered with the Ministry of Justice of Ukraine on June 7, 2019 under No. 595/33566.

8 . For histological examination, it is necessary to take pieces of organs and tissue during the autopsy and place them in a 10% formalin solution for three days (72 hours) for optimal fixation.

9 . After the autopsy is completed, the body of a person who died of viral pneumonia, severe acute respiratory infection or suspected of having a coronavirus disease (COVID-19) is treated with a chlorine-containing disinfectant solution, placed in an impermeable hermetic bag, and placed in a coffin that is tightly closed.

According to the written statement of the relatives, regarding the refusal to pack the body in an impermeable hermetic package-bag, the body of the deceased is given out for burial dressed and placed in a tightly closed coffin.

Requirements for the organization of the burial of the dead from infections caused by COVID -19.

In accordance with the Order of the Ministry of Health of Ukraine No. 133 dated 19.07.95 "On approval of the List of particularly dangerous, dangerous infectious and parasitic human diseases and carriers of the causative agents of these diseases" COVID -19 is classified as a particularly dangerous infectious disease, coronavirus is classified as a group II pathogenicity microorganism.

According to the requirements of the Resolution of the CMU dated 12.05.2003 N 16 "On the approval of methodological instructions "Organization and implementation of initial measures in the event of detection of a patient (corpse) or suspicion of infection with quarantine infections, contagious viral hemorrhagic fevers and other dangerous infectious diseases of unclear etiology" primary anti-epidemic measures in detection of a corpse suspected of being infected with a particularly dangerous infectious disease should be carried out according to a preliminary diagnosis or the presence of a corresponding syndrome according to a single scheme .

In accordance with the requirements of state sanitary rules and norms DSanPiN 9.9.5.035-99 :

P. 3.I2.4. All corpses of people who died from diseases caused by microorganisms of the I-II danger groups, except for viruses of the 1st group, are subject to mandatory patho-anatomical, bacteriological, virological, and serological examinations. An autopsy is performed by a pathologist or medical examiner in the presence of a specialist in these infections. Autopsy of the corpse is carried out in a special room, which is placed, if possible, on the territory of the hospital.

P. 3.12.7 . Instrumentation , transport on which the corpse was transported , protective suits of personnel and all objects that touched the corpse are subject to thorough disinfection.

The burial is carried out by a special team that transports the corpse to the cemetery or to the crematorium in compliance with the requirements of the anti-epidemic regime. Also, funeral parlors must send special personnel and vehicles to transport bodies according to the established route .

P. 3.12.11. The burial of the corpses of people who died from other diseases , assigned to the II group , is carried out in the general manner.

Delivery of the dead to residential buildings for burial and farewell is prohibited.

During the organization of the funeral, only the employees and the driver of the service are in the special transport (hearse).

At the same time, the greatest risk of getting infected with COVID -19 at a funeral occurs due to ritual rites, due to a large crowd of people, farewell kisses and other risk factors that must be prevented and prevented.

To prevent the infection of COVID -19, it is necessary to reduce the time of the farewell ritual, the number of people present at the funeral of the deceased. If possible, ritual rites should be held in open areas of cemeteries and residential areas. Limit the number of people present in churches, ritual halls and memorial dinners (preferably up to 10 people).

It is necessary to carry out disinfection every 2 hours in the premises for the provision of ritual services, to ensure the observance of a distance of at least 1.5 meters between those present at the farewell ceremony .

At the same time, it is mandatory for all those present at the burial to observe the individual rules of infection prevention:

- compliance with the rules of personal hygiene, thorough hand washing, treatment of hands with antiseptic agents;
- refraining from touching the face with hands;
- avoidance of close contacts, prolonged stay in a closed room;
- avoiding handshakes, kisses, hugs;
- refraining from contact with persons who have symptoms of respiratory diseases - cough, fever, body aches, or maintaining the mandatory distance and time limit during contact (at least 1 meter);

- in case of symptoms of the disease, such as fever, cough, body aches, etc., you should stay at home and refrain from visiting.

Lesson plan and organizational structures (time map).

1. Roll call and assignment (5 min)
2. Control of the initial level of knowledge (15 min)
3. Demonstration of macropreparations of those who died from particularly dangerous infections from the educational museum of the department of ODMU (40 min)
4. Macroscopic differential diagnosis of detected pathological processes (20 min)
5. Formulation of preliminary pathological diagnosis and epicrisis (10 min)
6. Summary of the teacher and tasks for the next class (5 min)

The main questions of the topic:

- Definition of coronavirus disease.
- Documentation required for autopsy.
- Peculiarities of the method of autopsy of the deceased from COVID-19
- Macroscopic examination of cavities and internal organs, differential diagnosis of detected pathological processes.
- Burial of the dead from COVID-19 .

Class equipment:

- history of the deceased from COVID-19
- Section hall of PAV hospital

List of recommended literature:

a) main:

✓ Atlas of micropreparations in pathomorphology / I.I. Starchenko, B.M. Filenko, N.V. Royko and others; VDZU "UMSA". - Poltava, 2018. - 190 p

✓ Neoplasms of the maxillofacial area in children / P.I. Tkachenko, I.I. Starchenko, S.O. Belokon and others. – Poltava: Col. "ASMI" - 2018. - 190 p.

✓ The basics of pathology according to Robbins: in 2 volumes. Volume 1 / Vinay Kumar, Abul K. Abbas, John C. Astaire; translation of the 10th Eng. edition. Publisher: All-Ukrainian specialized publishing house "Medytsyna". – X II . - 2019. - 420 p.
✓ The basics of pathology according to Robbins: in 2 volumes. Volume 1 / Vinay Kumar, Abul K. Abbas, John C. Astaire; translation of the 10th Eng. edition. Publisher: All-Ukrainian specialized publishing house "Medytsyna". – X II . - 2019. - 420 p.
✓ Pathomorphology. General pathomorphology: a study guide / edited by Ya. Ya. Bodnara, V.D. Voloshina, A.M. Romanyuk, V.V. Gargin. - New Book, 2020. - 248 p.
✓ Pathomorphology of the main disorders of the cardiovascular system: study guide / I.I. Starchenko, B.M. Filenko, N.V. Royko – Poltava: "UMSA". - 2019. - 150 p.
✓ Workshop on biopsy-sectioning course / I.I. Starchenko, A.P. Hasyuk, S.A. Proskurnya [etc.] – Poltava, 2016. – 160 p.
✓ I.I. Starchenko Pathomorphology of the main diseases of the maxillofacial region: academician. manual / I.I. Starchenko, B.M. Filenko, V.V. Chernyak ; "UMSA". – Vinnytsia: Nova Kniga, 2019. – 128 p.
✓ C tarchenko I.I. Special pathomorphology (basic course) for students of medical faculties of higher medical educational institutions III-I V levels of accreditation / I. I. _ Starchenko, N.V. Royko, B.M. Filenko. – Poltava, 2017. – 174 p.
✓ Tuffaha S. A. Muin Immunohistochemistry in tumor diagnostics / S. A. Tuffaha Muin, S. G. Hychka, Gusky Hans. – "Book Plus", 2018. – 336.

Topic of the next seminar session:

" Terminal states of the body. Definition. Mechanisms and stages of development. Resuscitation pathology. The concept of intensive care pathology, stages of development, diseases of the living organism, causes and mechanisms of their development, principles of morphological diagnosis. Sudden cardiac death. Modern concepts, causes and mechanisms of development, morphological manifestations of acute heart failure and ventricular fibrillation. Morphological bases and equivalents of arrhythmias. "

Topic: Terminal states of the body. Definition. Mechanisms and stages of development. Resuscitation pathology. Concepts of intensive care pathology, stages of development, diseases of living organisms, causes and mechanisms of their development, principles of morphological diagnosis. Sudden cardiac death.

Modern concepts, causes and mechanisms of development, morphological manifestations of acute heart failure and ventricular fibrillation. Morphological bases and equivalents of arrhythmias.

Relevance of the topic: During life, a person is under the influence of various exogenous and endogenous factors of extraordinary strength, duration or unusual, unusual character. The action of extreme factors leads to the development or adaptation to this factor, or to an extreme (critical, urgent) condition.

Specific goals:

- Know and understand what terminal states are, their classification, characteristics, mechanisms and stages of development.
- To know resuscitation measures, mechanisms of development of resuscitation pathology. Be able to explain the stages and mechanisms of their development.
- Understand the concept of acute cardiac death and its morphological manifestations.

Interdisciplinary integration:

- Reanimation
- Therapy of emergency conditions
- Pathophysiology

Acquired skills:

- ✓ Be able to analyze the patient's condition, identify the type of terminal condition
- ✓ Determine the necessary resuscitation measures
- ✓ Analyze possible complications
- ✓ Explain the mechanisms of pathology development and list pathomorphological manifestations.

Tasks for independent work:

List of key terms:

1. Terminal states of the body: coma, asphyxia, shock, shock reactions, agony, clinical and biological death.

2. Diseases of the living organism: Resuscitation, resuscitation pathology, anoxic encephalopathy, "respiratory brain", cardiopulmonary syndrome, hepatorenal syndrome, gastrointestinal syndrome.

3. Sudden cardiac death: Sudden cardiac death, ventricular fibrillation, ventricular flutter, asystole, electromechanical dissociation of the heart.

Topic content:

Terminal conditions are severe emergency conditions in which the body is between life and death, and the body's independent exit from such conditions is impossible.

Terminal states include:

1. coma
2. asphyxia
3. shock and shock reactions (collapse, fainting).
4. Agony
5. clinical death
6. biological death

Such conditions require immediate resuscitation measures.

Collapse is an acute form of vascular insufficiency, characterized by a drop in vascular tone and a decrease in the mass (volume) of circulating blood (CCB). As a result of a rapid decrease in BCC, the flow of venous blood to the heart decreases, blood pressure and blood pressure drop, which leads to tissue hypoxia, primarily the brain, with inhibition of important body functions.

Types of collapse:

- ✓ Orthostatic - due to a sharp outflow of blood from the head when changing the position from horizontal to vertical.
- ✓ Infectious-toxic - in septic conditions.
- ✓ Cardiogenic - with acute heart diseases.
- ✓ Pancreatogenic - with acute pancreatitis.
- ✓ Intoxicating - with various intoxications.

Clinic: collapse is characterized by sudden general weakness, dizziness, pallor of the skin. Shortness of breath, tachycardia develop, blood pressure and blood pressure drop, cold sticky sweat appears. Consciousness is usually preserved, less often it is clouded.
Treatment: The patient should be placed at an angle: the head is below the body to improve blood flow to the head. Adrenaline, norepinephrine are prescribed to improve the tone of blood vessels, cardiac drugs, polyglucin, gelatinol transfusion is possible to increase blood pressure, restore BCC.

Fainting is a sudden short-term loss of consciousness caused by temporary hypoxia of the brain. It has a reflex character and occurs when frightened, seeing blood, expecting pain, when suffocating, etc.
Clinic: fainting is accompanied by pallor of the skin, cold sweat, a decrease in blood pressure and weakening of the pulse, dilation of the pupils, loss of consciousness.
Treatment: the patient should be laid down, allowed to inhale ammonia, provide fresh air, and remove constricting clothing. Fainting does not require medical treatment.

Shock is a pathological process that develops as a result of the influence of extraordinary external or internal factors, which is manifested by disruption and inhibition of the central nervous system, hypotension, hypoperfusion of the microcirculatory channel, hypoxia of organs and tissues.

According to the etiological feature, shock is distinguished:

1. Traumatic
2. Fiduciary
3. Anaphylactic
4. Bacterial-toxic (septic)
5. Hemorrhagic
6. Hemotransfusion
7. Cardiogenic
8. Pancreatogenic
9. Hypovolemic.

During the shock, 3 phases are distinguished:

The 1st phase is erectile: it is characterized by the patient's disorder, increased pulse rate, short-term rise in blood pressure, microcirculation disorder, shortness of breath. The erectile phase is short-lived.

The 2nd phase is torpid: it is characterized by inhibition of the nervous system, due to which BP falls, BCC decreases, the pulse is weak and threadlike, patients become adynamic, drowsy, reflexes are depressed.

The 3rd phase is terminal (paralytic): there is a breakdown of the compensatory capabilities of the body, blood pressure drops below a critical level, the pulsation of peripheral vessels is not determined, the skin acquires a marble color. A fatal outcome follows. A number of authors do not distinguish the 3rd phase separately.

According to the severity of the course, there are 4 degrees of shock:

11. shock of the 1st degree : condition of patients of moderate severity, pulse 80-100 beats per minute, systolic pressure 100 mmHg.
12. 2nd degree shock: the patient's condition is severe, pulse 100-110 beats per minute, systolic pressure 80-100 mmHg.
13. 3rd degree shock: the patient's condition is extremely serious, pulse 110-120

beats per minute, systolic pressure 60-80 mmHg.

14. 4th degree shock: the patient's condition is practically pre-agonal, the pulse is more than 120 beats per minute or is not determined on the peripheral arteries, blood pressure is less than 60 mmHg. or not defined.

In addition, the severity of shock is divided into 3 degrees based on the shock index (SHI) - this is the ratio of PS pulse to systolic BP pressure. Normally, ШЙ = 0.5 (PC-60: АД-120). Grade 1 shock corresponds to AI = 1.0 (RS-100: AD-100). Shock of the 2nd degree corresponds to AI = 1.5 (PC-120: AD-80). Shock of the 3rd degree corresponds to AI more than 1.5 (RS more than 120: BP less than 80).

Treatment: shock requires emergency care, which consists of:

- in the elimination (if possible) of the cause of shock (narcotic analgesics, immobilization and novocaine blocks for fractures, termination of blood transfusion - for hemotransfusion shock, etc.).
- in the use of vasoconstrictor drugs (adrenaline, norepinephrine).
- in the use of corticosteroid hormones (prednisolone 80-120 mg).
- in the use of antihistamine drugs (diphenhydramine, pipolfen).
- infusion of anti-shock solutions (polyglukin, gelatinol).
- in the transfusion of protein preparations (albumin, plasma).
- prevention of DIC syndrome (heparin, contrical).

In severe cases of shock, anesthesia with artificial ventilation of the lungs is performed.

Agony - a period when blood pressure progressively decreases, the heart rate decreases, the pulse becomes rare, consciousness is depressed.

In the future, muscle tone decreases, sphincters relax, involuntary urination and excretion of feces occur. As a result of blood stagnation in the lungs, the permeability of the vessels of the small blood circulation increases, the swelling of the lungs increases and breathing becomes violently hoarse. Due to severe hypoxia and depression of the respiratory center, atonal breathing appears, reflexes disappear, in particular the reaction of the pupils to light. Further, clinical death develops.

Clinical death is a reversible stage of dying, which is characterized by the cessation of breathing and blood circulation, but the possibility of life recovery remains for some time.

This stage of dying lasts 5-6 minutes, during which the viability of the brain is preserved. In slow dying, clinical death is preceded by agony.

Biological death is an irreversible stage of dying that follows clinical death and is characterized by the cessation of metabolism in the brain, and then in other organs, in the tissues of which irreversible changes incompatible with life develop.

Pathological anatomy.

Biological death is manifested by a number of signs. These include corpse cooling, corpse desiccation, corpse hypostasis, corpse stains, corpse tanning, postmortem autolysis and corpse decomposition, tissue decay and corpse decomposition.

Cooling of the corpse to ambient temperature begins some time after the cessation of breathing and blood circulation. This happens due to the cessation of metabolism, the generation of energy and heat.

Corpse drying begins as a result of the release of moisture into the environment. At the same time, the cornea of the eyes becomes cloudy, and yellow-brown "parchment" spots appear on the skin.

Corpse hypostasis - crimson-violet spots that disappear when pressed, develop after 3-5 hours as a result of redistribution of blood: the left chambers of the heart become empty, and in its right chambers, shiny smooth blood clots of red or yellow color are formed. Arteries also become empty, and the veins of the lower parts of the body are filled with blood.

Corpse spots develop as a result of postmortem hemolysis of erythrocytes: blood plasma containing hemoglobin leaves the veins and seeps into the tissues, after which the corpse hypostases no longer disappear when pressed.

Morbidity begins 2-6 hours after death. It appears in the muscles of the face and. gradually spreading to the muscles of the trunk and lower limbs, after 24-32 hours it

captures all the muscles. Muscles become very tight, lose elasticity and elasticity. The speed and nature of cadaveric browning depend on various reasons - the temperature of the environment, the nature of the disease and the condition of the patients before death. So, in exhausted, weakened by the disease deceased, as well as in small children, cadaveric emaciation can be weakly expressed. In premature fetuses, cadaveric browning does not develop at all. After death from some infectious diseases (tetanus, cholera), cadaver emaciation develops quickly and is expressed very sharply. After 2-3 days, the corpse tan disappears.

Postmortem autolysis and cadaveric decomposition develop in dead cadaver tissues. These changes occur earlier in organs containing many proteolytic enzymes - in the liver, pancreas, and stomach.

Rotting of tissues is due to putrefactive processes as a result of the decomposition of intestinal bacteria in the tissues of the corpse. They melt, acquire a dirty green color and a foul smell.

Corpse decomposition is characterized by the fact that the gases produced as a result of decay permeate the tissues of the corpse and accumulate in the cavities. The corpse swells, sometimes to enormous sizes.

Reanimation - restoration of vital functions of the body.

DISEASES OF AN ANIMATED ORGANISM.

Postreanimation disease.

Disturbances in the functions of organs and tissues arising in the post-resuscitation period are superimposed on the manifestations of the underlying disease that caused clinical death. At the same time, post-resuscitation disorders are often expressed more intensively than changes associated with the underlying disease. Such disorders are manifested by the predominant damage of one or another physiological system in the form of certain syndromes.

Anoxic encephalopathy - damage to the brain due to severe oxygen starvation - is one of the main causes of death of patients in the postreanimation period.

At the heart of this brain damage are its edema and swelling, which arise as a result of hypoxia, increased permeability of blood vessels and the outflow of fluid from the blood vessels into the brain tissue. Widespread ischemic damage to the brain occurs, ending with the death of neurons and the disintegration of white matter fibers. These disorders develop mainly in the cerebral cortex and cerebellum. Severe damage to the cortex leads to sharp suppression, and later to the loss of its functions - decerebration. This condition is called "brain death", because irreversible decerebration with a working heart means the death of a person as a social being, since only the functions of the brain determine the mental activity and individuality of a person. Along with this, decerebration usually ends with cessation of breathing.

If breathing stops with preserved cardiac activity and artificial ventilation of the lungs is used for a long time, even deeper damage to the brain - "respiratory brain" - can develop.

There is a displacement of the brain as a result of its deformation during edema and swelling, the formation of foci of disintegration of nervous tissue. Partial necrosis of brain tissue is also possible, most often it is symmetrical necrosis of subcortical formations. In extremely severe cases, necrosis of the entire brain occurs. Its substance acquires the character of a structureless semi-liquid mass enclosed in the meninges. Reflex activity. The central nervous system is absent, there is no own breathing, the bioelectric activity of the brain disappears. Cerebral blood flow is sharply disturbed or completely turned off, although cardiac activity can be preserved for a long time. As a result, cardiac arrest develops. Irreversible decerebration, and even more so total brain necrosis, are incompatible with life.

Cardiopulmonary syndrome will often occur after resuscitation even in the absence of severe brain damage. It is manifested by insufficiency of the function of the heart and

lungs.

Damage to the heart in the post-resuscitation period is associated with protein and fatty dystrophy of the myocardium, death of groups of cardiomyocytes. These disorders arise as a result of myocardial hypoxia and its overload due to impaired blood circulation in the small circle. Hypoxia of the lung tissue in the post-resuscitation period causes microcirculation disorders and the development of thrombosis. Against this background, as a result of long-term use of artificial lung ventilation, they often develop bronchopneumonia, abscesses, etc. Clogging of small bronchi with mucus and cellular detritus, damage to alveolar-capillary membranes, bronchopneumonia lead to insufficiency of gas exchange in lung function.

Hepato-renal syndrome occurs in the post-resuscitation period together with anoxic encephalopathy and cardiopulmonary syndrome, intensifying their course.

Insufficiency of liver and kidney function develops as a result of blood circulation disorders. Blood stagnation in the portal vein system, diffuse protein and fatty dystrophy of hepatocytes, foci of necrosis in the liver along with a sharp violation of microcirculation are observed. Ischemia and foci of necrosis occur in the kidneys. Particularly severe disorders of kidney function are observed with the breakdown of a large mass of skeletal muscles, which appears when the body dies and revives due to microcirculation disorders and the related necrosis of the muscles of the back, shoulder girdle, buttocks and thighs. The melting of muscle cells (myolysis) leads to the appearance of the muscle protein - myoglobin - in the blood plasma and its excretion by the kidneys. As a result, the tubules are blocked by this protein, the epithelium of the tubules is necrotized, and the excretory function of the kidneys is disturbed (myoglobinuric nephrosis). Insufficiency of the liver and kidneys contributes to the accumulation of toxic metabolic products in the blood, changes in KSHR and ion balance, protein composition of the blood, which complicates the course of encephalopathy and cardiopulmonary failure.

Gastrointestinal syndrome in the post-resuscitation period occurs less often than other disorders. Bleeding erosions and ulcers may occur as a result of general blood circulation disorders, blood stagnation in the portal system, and microcirculation disorders in the stomach and duodenum. It is possible to have a stomach or intestinal ulcer with the development of purulent peritonitis. In recent years, in the post-resuscitation period, large necroses with hemorrhagic leakage are increasingly found in the small intestine, the basis of which is thrombosis of venules, which spreads to large vessels, up to the portal vein.

SUDDEN CARDIAC DEATH.

Sudden cardiac death (sudden cardiac death; sudden coronary death) - a fatal outcome of a cardiovascular system disease occurred naturally within one hour of the onset of its development in persons who were in a stable condition before that (in the absence of signs that allow making another diagnosis).

In 1964, a group of WHO experts first recommended a unified definition of sudden death, according to which the non-violent death of a healthy or sick person who was in a satisfactory condition, occurring unexpectedly within 6 hours, refers to sudden death. A few years later, it was proposed to consider sudden death as a natural death that occurred unexpectedly within 24 hours of the onset of acute symptoms.

Sudden cardiac death includes cases of sudden cessation of cardiac activity, which are characterized by the following signs:

• death occurred in the presence of witnesses within one hour after the appearance of the first threatening symptoms

• before the onset of death, the condition of the patients was assessed by those around them as stable and does not cause serious concerns

• death occurred under circumstances that exclude other causes (violent death, injuries,

other fatal diseases)

Etiology:

Etiological risk factors are of great importance in understanding the occurrence of a fatal outcome. Myocardial infarction and its complications, such as cardiogenic shock, pulmonary edema, heart rhythm disturbances, may also be a combination of cardiogenic shock with pulmonary edema or rhythm disturbances with pulmonary edema. In second place are rhythm disturbances (atrial fibrillation), in third place are cardiomyopathies, in fourth place - angina pectoris and heart defects, in fifth place - pulmonary embolism. In addition, there are other risk factors, such as myocarditis, conduction disorders of unclear etiology (complete atrioventricular block, prolonged Q-T syndrome), postmyocarditis cardiosclerosis, mitral valve prolapse.
Morphological studies in the suddenly deceased showed that the most frequent etiological factor of sudden death is coronary heart disease, and the severity of atherosclerotic lesions of the coronary arteries and changes in the myocardium is one of the important risk factors for sudden death. In most cases, foci of acute ischemic changes in the myocardium are found in those who died suddenly. Rarely, sudden arrhythmic death is observed in patients with rheumatic and congenital heart defects, postmyocardial cardiosclerosis, obstructive and dilated cardiomyopathy, alcoholic myocardial dystrophy, as well as in patients with ventricular hyperexcitation syndromes and prolonged QT interval, mitral valve prolapse, etc.

Individual cases of sudden death of arrhythmic persons without organic heart pathology are known.
Analysis of ECG monitoring data at the time of sudden circulatory arrest shows that in approximately 90 percent of cases, the mechanisms of the latter are ventricular fibrillation, which is often preceded by episodes of paroxysmal ventricular tachycardia, which turns into ventricular flutter. Sometimes ventricular tachycardia, which precedes fibrillation, has a bidirectional, spindle-like shape (like a "pirouette") on the ECG. In a

significant number of cases, ventricular extrasystoles are registered immediately before the development of ventricular fibrillation, especially volleys of polymorphic complexes that begin with an early out-of-order contraction. Less often, ventricular fibrillation develops as a result of an acute violation of intraventricular conduction. At the same time, progressive expansion of the QRS complexes is observed on the ECG, and then ventricular flutter and fibrillation appear. This phenomenon may occur as a result of the use of antiarrhythmic drugs that slow intraventricular conduction.

One of the possible mechanisms of sudden arrhythmic death is ventricular asystole. According to various authors, primary ventricular asystole occurs in 5-20 percent of cases of sudden circulatory arrest. Ventricular asystole can be a consequence of atrioventricular block or weakness of the sinus node. The development of cardiac asystole can be facilitated by ectopic arrhythmia, oppressive function of the negative node or atrioventricular conduction. Thus, asystole sometimes occurs after a single extrasystole or a group of extrasystoles, against the background of a paroxysm of supraventricular or ventricular tachycardia, flickering or fluttering of the atria.

The main electrophysiological mechanisms of VKS:

- Ventricular fibrillation. The immediate cause of fibrillation is acute coronary insufficiency due to coronary artery thrombosis, a sharp increase in myocardial oxygen demand, a decrease in systolic and diastolic pressure, perfusion coronary pressure, coronary spasm. Ventricular fibrillation is characterized by random excitation of individual muscle fibers and lack of coordinated contraction of the ventricles.

  2. Fluttering of the ventricles. Coordinated contractions of the ventricles still occur, but their frequency is high (200-300 per minute) and there is no systematic ejection of blood into the aorta. In 75% of cases, flutter turns into ventricular fibrillation.

  3. Asystole of the heart - complete cessation of contractions of the heart, its stop. It is due to a violation of the automaticity function of the pacemakers of the 1st, 2nd, and 3rd orders (weakness of the sinus node with the absence of functioning

or exhaustion of the function of the lower pacemakers).
4. Electromechanical dissociation of the heart is the termination of the pumping function of the left ventricle while maintaining signs of electrical activity of the heart (gradually depleting sinus nodal or idioventricular rhythm, which turns into asystole).

- The most frequent mechanism of VKS development is ventricular fibrillation, which can occur both against the background of acute myocardial ischemia and possibly without it. Other mechanisms (asystole, electromechanical dissociation), as a rule, develop in patients against the background of other severe complications (shock, heart failure, violation of atrioventricular conduction and myocardial rupture).
- The occurrence of ventricular fibrillation (VF) is explained either by the occurrence of conditions for the ectopic formation of the impulse, or by the mechanism of reentry. Ectopic foci can occur as a result of increased automatism or the appearance of various types of residual oscillations. The reentry mechanism occurs if a premature impulse leads to a disruption of the propagation front of the excitation wave.
- Both in the intact heart and in the body, single electrical impulses cause a single response, but suprathreshold stimuli applied during a short vulnerable period of the cardiac cycle induce multiple corresponding contractions and VF. With AMI or acute ischemia, the threshold for repeated response is reduced, remaining significantly higher than the threshold for a single response. In this regard, it is possible to postulate electrical instability of the myocardium (EMI), when a stimulus of threshold intensity induces repetitive electrical activity in the heart (B. Laun, 1983). In other words, the electrical instability of the myocardium is a decrease in the threshold for the occurrence of VF.

Pathomorphological changes in sudden death.

A decrease in the vessel lumen by 50 percent or more is accepted as a criterion for a stenotic lesion.

Most often, stenoses are localized in the anterior descending branch of the left coronary artery, less often in the right coronary artery and in the branches of the left coronary artery. Atherosclerotic stenosis of the main trunk of the left artery and the mouth of the coronary artery is rarely the only site of significant obstruction in sudden death. Roberts and Buya L.M. established that the atherosclerotic process captures only extramural vessels. In the arteries going perpendicular to the endocarditis, they did not find any changes that could be attributed to atherosclerotic ones. In a number of other studies, it has been noted that pathological changes in intramyocardial arteries as the main vascular lesion in sudden death are rare and almost always exist in isolation from atherosclerotic lesions of epicardial coronary arteries. The absence of acute changes in the main branches of the coronary arteries in most cases of sudden death indicates the presence of other causes causing electrophysiological disturbances that eventually lead to ventricular fibrillation. With this formulation of the question, it should be considered legitimate to assume that fatal heart rhythm disturbances in such cases may be the result of relatively small foci of ischemia as a result of embolization of small vessels or the formation of small thrombi in them. The source of small emboli can be an ulcerated plaque in the aorta or large trunks of coronary arteries. The sudden onset of ventricular fibrillation is difficult to explain only by long-term damage to the coronary arteries.

The absence of fresh thrombosis of the coronary arteries requires the search for other reasons that explain the immediate cause of sudden death. In this connection, several hypotheses can be expressed.

One of them assumes that the possible cause is acute myocardial ischemia, which occurs in connection with an increase in the myocardial oxygen demand during physical, psychoemotional or other nature (alcohol intake) load, which is accompanied by a sharp release of catecholamines, and which cannot be cut out an adequate increase in coronary blood flow due to a significant narrowing of the lumen of the artery.

The second hypothesis relates sudden death to a decrease in coronary blood flow due to a significant drop in blood pressure that can occur during rest or sleep. The discrepancy between the need for oxygen is caused by spasm of the coronary artery. Indirect data

indicate that all the listed factors can play a fatal role in different groups of patients.

Pathological anatomy.

In most cases of VKS in patients with coronary heart disease, stenotic lesions of the main trunks of the coronary arteries are found. Stenoses are more often localized in the anterior descending branch of the left coronary artery, somewhat less often - in the right and left branches. There are also hemorrhages in atherosclerotic plaques, tears and ruptures of their fibrous ring, small wall thrombi. Thrombosis of the coronary arteries is found in 10-50 percent of cases of VKS. According to N.A. Mazur, V.M. Zhukov died among those who died from VKS. (1976), Vyherta A.M. (1980) AMI is detected in 13-40 percent, large post-infarction scars - in 34-49 percent of cases. Structural changes in single muscle cells or small cell groups are often detected. In most cases, the weight of the heart is increased.

Abnormalities of the development of coronary arteries, aneurysm of the aorta with spread to coronary vessels, arteritis, embolism of coronary vessels, etc. can be a rare cause of VKS. Reasons. With perinatal prolongation of the Q-T interval, lesions of intracardiac nerves and nodes are found at autopsy in a number of cases.

Morphological bases of ventricular fibrillation and arrhythmias

Causes of sudden coronary death: ventricular fibrillation (in 80% of cases), asystole or electromechanical dissociation, cardiomyopathy (10-20%).

Ventricular fibrillation develops suddenly, symptoms appear sequentially: the disappearance of the pulse on the carotid arteries, loss of consciousness, a one-time tonic contraction of skeletal muscles, disturbance and cessation of breathing. The reaction to timely cardiopulmonary resuscitation is positive, to the termination of cardiopulmonary resuscitation - rapid negative.

Electromechanical dissociation with massive thromboembolism of the pulmonary artery develops suddenly (often at the moment of physical stress) and is manifested by cessation of breathing, lack of consciousness and pulse on the

carotid arteries, sharp cyanosis of the upper half of the body, swelling of the neck veins. With the timely start of cardiopulmonary resuscitation, signs of its effectiveness are determined.

Electromechanical dissociation with rupture of the myocardium and cardiac tamponade develops suddenly, usually against the background of a long, recurrent anginal attack. There are no signs of effectiveness of cardiopulmonary resuscitation. Hypostatic spots quickly appear in the lower parts of the body.
The problem of sudden cardiac death, which has attracted the attention of cardiologists for many decades, has come to the fore again in recent years, when large epidemic studies conducted under the direction of WHO have demonstrated a significant frequency of sudden death among the adult population. According to the morphological data, in case of sudden death, there are often no changes incompatible with life in the heart, in many cases of sudden stoppage of blood circulation, with the timely application of resuscitation measures, a return to life is possible. Extensive research is being conducted aimed at developing measures to prevent sudden death of cardiac patients.

Theoretical questions:

10. Be able to distinguish collapse, fainting, coma.
11. What is the shock stage of shock
12. What is agony, its pathogenesis
13. Explain the difference between clinical and biological death.
14. What are post-resuscitation diseases, what do they include. Mechanisms of development.
15. What is sudden cardiac death. Mechanism, causes of development. Pathomorphological signs.

List of recommended literature:

a) main:

Atlas of micropreparations in pathomorphology / I.I. Starchenko, B.M. Filenko, N.V.

Royko and others; VDZU "UMSA". - Poltava, 2018. - 190 p
Neoplasms of the maxillofacial area in children / P.I. Tkachenko, I.I. Starchenko, S.O. Belokon and others. – Poltava: Col. "ASMI" - 2018. - 190 p.
The basics of pathology according to Robbins: in 2 volumes. Volume 1 / Vinay Kumar, Abul K. Abbas, John C. Astaire; translation of the 10th Eng. edition. Publisher: All-Ukrainian specialized publishing house "Medytsyna". – X II . - 2019. - 420 p.
The basics of pathology according to Robbins: in 2 volumes. Volume 1 / Vinay Kumar, Abul K. Abbas, John C. Astaire; translation of the 10th Eng. edition. Publisher: All-Ukrainian specialized publishing house "Medytsyna". – X II . - 2019. - 420 p.
Pathomorphology. General pathomorphology: a study guide / edited by Ya. Ya. Bodnara, V.D. Voloshina, A.M. Romanyuk, V.V. Gargin. - New Book, 2020. - 248 p.
Pathomorphology of the main disorders of the cardiovascular system: study guide / I.I. Starchenko, B.M. Filenko, N.V. Royko – Poltava: "UMSA". - 2019. - 150 p.
Workshop on biopsy-sectioning course / I.I. Starchenko, A.P. Hasyuk, S.A. Proskurnya [etc.] – Poltava, 2016. – 160 p.
I.I. Starchenko Pathomorphology of the main diseases of the maxillofacial region: academician. manual / I.I. Starchenko, B.M. Filenko, V.V. Chernyak ; "UMSA". – Vinnytsia: Nova Kniga, 2019. – 128 p.
C tarchenko I.I. Special pathomorphology (basic course) for students of medical faculties of higher medical educational institutions III-I V levels of accreditation / I. I. _ Starchenko, N.V. Royko, B.M. Filenko. – Poltava, 2017. – 174 p.
Tuffaha S. A. Muin Immunohistochemistry in tumor diagnostics / S. A. Tuffaha Muin, S. G. Hychka, Gusky Hans. – "Book Plus", 2018. – 336.

Topic of the next seminar session:

Pathological anatomy of multiple organ failure . Fundamentals of Thanatology. Death, mechanisms, signs. Biological, medical, social aspects due to a chronic incurable disease. The concept of thanatogenesis. Structural mechanisms of cessation of activity of vital organs during the natural course of the disease. Complications of stopping the work of the heart, lungs, brain, kidneys, and liver. "

Topic no. 8: "Pathological anatomy of polyorgan failure. Basics of thanatology. Death, mechanisms, signs. Biological, medical, social aspects of the consequences of chronic incurable disease. Structural mechanisms of termination of the activity of vital organs in the natural course of the disease. Complication of failure of the heart, lungs, brain, kidneys, liver

1. Relevance of the topic

In our body, cells and tissues are renewed during life due to the processes of necrosis, apoptosis, and regeneration. The ratio of these processes determines, to a certain extent, homeostasis. The organism ends its vital activity with biological death.

2. Whole classes:

2. 1. Educational goal:

- to acquaint students with higher education with: Level I

a) the biological concept of death;

b) the legal concept of death;

c) features of necrosis;

d) features of apoptosis.

- a student of higher education should know and master: II level

a) causes of necrosis;

b) classification of necrosis;

c) necrosis morphology;

d) exits of necrosis;

e) prognosis for the patient with necrosis;

f) causes of apoptosis;

g) morphology of apoptosis;

h) differences between apoptosis and necrosis;

i) signs of death.

- to provide students with the opportunity to master skills: III level

a) diagnosis of necrosis by macropreparations;

b) diagnosis of necrosis by micropreparations;

c) diagnosis of signs of death on a corpse.

- help students acquire skills: IV level

a) macro- and microscopic diagnosis of necrosis;

b) determine the features of necrosis of internal organs;

c) differential diagnosis of necrosis and apoptosis.

2. 2. Educational goals:

a) make forecasts for a patient with various types of necrosis;

b) determine the output of necrosis for various internal organs;

c) determine ways of prevention.

3. INTERDISCIPLINARY INTEGRATION:

Disciplines	Know	**Be able**
1	2	3
Previous: 1. Normal anatomy 2. Histology 3. Normal physiology 4. Pathological	 Features of angio-architectonics of internal organs. Anastomoses. Features of the tissue structure of internal organs. Hemocirculation in physiological conditions.	 Determine the type of blood supply to the organ. Be able to identify the organ. Assess hemocirculation in the body.

physiology 5. Biochemistry	Mechanisms of hemocirculatory disorders. Formation of pigments.	Determine the mechanism of hemocirculation disorders. Determine the type of pigment.
The following: 1. Therapy 2. Surgery	Macro- and micro-injury of internal organs. Macro- and microdamages of internal organs.	Determine the type of necrosis, the exits of necrosis. Determine the type of injury and prognosis for the patient.
Intra-subject integration	Necrosis. Apoptosis. Death of a macroorganism.	Determine the prognosis for the patient and preventive measures for various types of necrosis.

4. TOPIC CONTENT

- necrosis;
- apoptosis;
- organ failure;
- death, signs of death.

Necrosis (from the Greek *nekros* - dead) is death, death of cells and tissues in a living

organism under the influence of disease-causing factors. This type of cell death is not genetically controlled.

Causes of necrosis . Factors that cause necrosis:

- **physical** (gunshot wounds, radiation, electricity, low and high temperatures - frostbite and burns);
- **toxic** (acids, alkalis, salts of heavy metals, enzymes, drugs, ethyl alcohol, etc.);
- **biological** (bacteria, viruses, protozoa),
- **allergic** (endo- and exoantigens, for example, fibrinoid necrosis in infectious-allergic and autoimmune diseases, Artus phenomenon);
- **vascular** (heart attack - vascular necrosis);
- **trophoneurotic** (bedsores, unhealed ulcers).

Depending on the mechanism of action of the pathogenic factor, the following are distinguished:

- **direct necrosis** caused by the direct action of the factor (traumatic, toxic and biological necrosis);
- **indirect necrosis** , which occurs directly through the vascular and neuroendocrine systems (allergic, vascular and trophoneurotic necrosis).

Morphological signs of necrosis

Necrosis is preceded by a period of necrobiosis, the morphological substrate of which is dystrophic changes.

A. Early changes: In the initial period of necrobiosis, the cells have not changed morphologically. It should take 1-3 hours before changes detectable by electron microscopy or histochemistry appear, and at least 6-8 hours before changes detectable by light microscopy appear; macroscopic changes develop even later. For example, if a patient with a myocardial infarction dies a few minutes after the onset of angina pectoris (pain due to insufficient blood flow to the myocardium), no structural substrate for necrosis will be found at the autopsy; if death occurs on the 2nd day after an acute attack, the changes will be obvious.

B. Histochemical changes: the influx of calcium ions into the cell is closely related to

irreversible damage and the appearance of morphological signs of necrosis. In a normal cell, the intracellular concentration of calcium is approximately 0.001 of its concentration in the extracellular fluid. This gradient is maintained by the cell membrane, which actively transports calcium ions out of the cell. It has been experimentally proven that when cells are damaged as a result of ischemia or under the influence of various toxic agents, the accumulation of calcium inside the cells is observed only when the changes are irreversible. Calcium activates enzyme nucleases (hydrolysis, cleavage of DNA), phospholipases (destruction of membranes) and proteases (destruction, digestion of the cytoskeleton). An increase in their activity is revealed by histochemical methods. The activity of redox enzymes (for example, succinate dehydrogenase) drops sharply or disappears.

B. Changes in nuclei: one of the important and significant morphological signs of cell necrosis is changes in the structure of the nucleus. The chromatin of the dead cell condenses into large lumps and the nucleus changes in volume, becomes wrinkled, dense, intensely basophilic, i.e. it is stained dark blue with hematoxylin. This process is called **karyopyknosis** (shrinking). The pyknotic nucleus can then break into numerous small basophilic particles (**karyorrhexis**) or undergo lysis (dissolution) as a result of the action of lysosomal deoxyribonuclease (**karyolysis**). Then it increases in volume, is barely stained with hematoxylin, and the contours of the nucleus are gradually lost. With rapidly developing necrosis, the nucleus undergoes lysis without a pyknotic stage.

D. Cytoplasmic changes: approximately 6 hours after the cell has undergone necrosis, its cytoplasm becomes homogeneous and quite acidophilic, that is, it is stained with intensely acidic dyes, for example, in a pink color when stained with eosin. This is the first change detected under light microscopy, which occurs as a result of coagulation of cytoplasmic proteins and destruction (disappearance) of ribosomes. Ribosomal RNA imparts a basophilic hue to normal cytoplasm. Specialized cell organelles, for example, myofibrils in myocardial cells, disappear first. Swelling of mitochondria and destruction (destruction) of organelle membranes cause vacuolization of the cytoplasm. Finally, digestion of the cell by enzymes released from its own lysosomes causes cell lysis (autolysis). Thus, coagulation of proteins takes place in the cytoplasm, which is

changed mainly by their colicivation.

D. Changes in the intercellular substance include both intermediate substance and fibrous structures. Most often, changes characteristic of fibrinoid necrosis develop: collagen, elastic and reticulin fibers turn into dense, homogeneous pink, sometimes basophilic masses that can undergo fragmentation, disintegration into lumps or lysis. Less often, swelling, lysis, and sloughing of fibrous structures can be observed, which is typical for colliquative necrosis.

Clinical and morphological forms of necrosis

Necrosis is manifested by various clinical and morphological changes. The differences depend on the structural and functional features of organs and tissues, the speed and type of necrosis, as well as the causes of its occurrence and conditions of development. Among the clinical and morphological forms of necrosis, coagulation (dry) necrosis and colliquation (wet) necrosis are distinguished.

Coagulation (dry) necrosis

With this type of necrosis, cells that have died retain their outlines for several days. Cells devoid of a nucleus appear as a mass of coagulated, homogeneous, pink cytoplasm.

The mechanism of coagulation necrosis is not clear enough. Coagulation of cytoplasmic proteins makes them resistant to the action of lysosomal enzymes and, in this connection, slows down their dissolution.

Coagulation necrosis usually occurs in organs that are rich in proteins and poor in fluids, for example, in the kidneys, myocardium, adrenal glands, spleen, mainly as a result of insufficient blood circulation and anoxia, the effects of physical, chemical and other damaging factors, for example, coagulation necrosis of p cells of the liver in case of viral damage or under the action of toxic agents of bacterial and non-bacterial origin. Coagulation necrosis is also called dry, because it is characterized by the fact that with it, the areas that arise are dry, dense, crumbling, white or yellow in color.

Coagulation necrosis includes:

A. Heart attack is a type of vascular (ischemic) necrosis of internal organs (except the brain). This is the most common type of necrosis.

B. Caseous (cheesy) necrosis develops in tuberculosis, syphilis, leprosy, as well as in lymphogranulomatosis. It is also called specific, since it is most often found in specific infectious granulomas. In the internal organs, a dry, limited area of whitish-yellowish tissue is found, which crumbles easily. In syphilitic granulomas, such areas are very often not crumbling, but pasty, reminiscent of Arabic glue. This is a mixed (that is, extra- and intracellular) type of necrosis, in which both parenchyma and stroma (both cells and fibers) die at the same time. Microscopically, this area of the tissue is structureless, homogeneous, stained pink with hematoxylin and eosin, chromatin lumps of nuclei (karyorrhexis) are clearly visible.

B. Wax-like, or Zenker necrosis (necrosis of muscles, more often of the anterior abdominal wall and thigh, with severe infections - typhoid and typhus, cholera);

G. Fibrinoid necrosis is a type of connective tissue necrosis that was previously discussed in the lecture "Stromal-vascular dystrophies" as a result of fibrinoid swelling. Fibrinoid necrosis is observed in allergic autoimmune diseases (for example, rheumatism, rheumatoid arthritis and systemic lupus erythematosus). Collagen fibers and smooth muscles of the middle layer of blood vessels are the most damaged. Fibrinoid necrosis of arterioles is observed in malignant hypertension. This necrosis is characterized by the loss of the normal structure of collagen fibers and the accumulation of a homogeneous, bright pink necrotic material that is microscopically similar to fibrin. Please note that the concept of "fibrinoid" is different from the concept of "fibrinous", so the latter means the accumulation of fibrin, for example, during blood coagulation or during inflammation. Areas of fibrinoid necrosis contain different amounts of immunoglobulins and complement, albumins.

D. Fat necrosis:

1. Enzymatic fat necrosis: fat necrosis most often occurs in acute pancreatitis and damage to the pancreas, when pancreatic enzymes leave the ducts in the surrounding tissues. Pancreatic lipase acts on triglycerides in fat cells, splitting them into glycerol and fatty acids, which interact with plasma calcium ions to form calcium soaps. At the

same time, opaque, white (like chalk) plaques and nodules (steatonecrosis) appear in the adipose tissue surrounded by the pancreas.

With pancreatitis, it is possible for lipase to enter the bloodstream with subsequent widespread distribution, which is the cause of fat necrosis in many parts of the body. Subcutaneous fatty tissue and bone marrow are most often damaged.

2. Non-enzymatic fat necrosis: non-enzymatic fat necrosis is observed in the mammary gland, subcutaneous fat tissue and in the abdominal cavity. Most patients have a history of trauma. Non-enzymatic fat necrosis is also called traumatic fat necrosis, even if trauma is not identified as the underlying cause. Non-enzymatic fat necrosis causes an inflammatory response, which is characterized by the presence of numerous macrophages with foamy cytoplasm, neutrophils and lymphocytes. This is followed by fibrosis, and this process can be difficult to distinguish from a tumor.

IS. Gangrene (from the Greek *gangraina* - fire): this is the necrosis of tissues that are connected to the external environment and change under its influence. The term "gangrene" is widely used to denote a clinical and morphological condition in which tissue necrosis is often complicated by a secondary bacterial infection of various degrees of severity or, being in contact with the external environment, undergoes secondary changes. Dry, wet, gas gangrene and bedsores are distinguished.

1. Dry gangrene is necrosis of tissues that are in contact with the external environment, necrosis occurs without the participation of microorganisms. Dry gangrene most often occurs on the limbs as a result of ischemic coagulation necrosis of tissues. Necrotized tissues appear black, dry, they are clearly separated from the adjacent functional tissue. Demarcation inflammation occurs at the border with healthy tissues. The color change is due to the transformation of hemoglobinogenic pigments in the presence of hydrogen sulfide into iron sulfide. Examples can be dry gangrene:

- ✓ extremities with atherosclerosis and thrombosis of its arteries (atherosclerotic gangrene), obliterating endarteritis;
- ✓ with frostbite or burns;
- ✓ fingers with Raynaud's disease or vibration disease;
- ✓ skin with typhus and other infections.

Treatment consists in surgical excision of dead tissue, with the demarcation line serving as a guideline.

2. Wet gangrene : develops as a result of layering on necrotic tissue changes of a severe bacterial infection. Under the action of enzymes of microorganisms, secondary colicivation occurs. Cell lysis by enzymes that are not produced in the cell itself, but penetrate from the outside, is called heterolysis. The type of microorganisms depends on the localization of gangrene. Moisture gangrene usually develops in tissues rich in moisture. It can occur on the limbs, but more often in the internal organs, for example, in the intestine with obstruction of the mesenteric arteries (thrombosis, embolism), in the lungs as a complication of pneumonia (influenza, measles). Children weakened by an infectious disease (more often korem) may develop wet gangrene of the soft tissues of the cheeks and perineum, which is called a noma (from the Greek nome - water cancer). Acute inflammation and accumulation of bacteria causes the necrotic area to become swollen and red-black, with widespread dissolution of dead tissue. With wet gangrene, a necrotized widespread inflammation may occur, which is vaguely demarcated from adjacent healthy tissue and, thus, is difficult to treat surgically. As a result of the vital activity of bacteria, a specific smell arises. Very high mortality rate.

3. Gas gangrene: gas gangrene occurs when the wound is infected with anaerobic flora, for example, *Clostridium perfringens* and other microorganisms of this group. It is characterized by widespread tissue necrosis and the formation of gases as a result of the enzymatic activity of the bacterium. The main manifestations are similar to wet gangrene, but with the additional presence of gas in the tissues. Crepitation (cracking phenomenon during palpation) is a frequent clinical symptom of gas gangrene. The fatality rate is also very high.

4. Bedsores (*decubitus) :* as a type of gangrene, bedsores are distinguished - the death of superficial parts of the body (skin, soft tissues), which are subject to compression between the bed and the bone. Therefore, bedsores more often appear in the area of the sacrum, spinous processes of the vertebrae, and the greater trochanter of the femur. According to its genesis, it is trophoneurotic necrosis, because vessels and nerves are squeezed, which increases tissue trophic disorders in seriously ill patients suffering

from cardiovascular, oncological, infectious or nervous diseases.

Colicative (moist) necrosis

Colicative (wet) necrosis: characterized by the melting of dead tissue. It develops in tissues relatively poor in proteins and rich in liquid, where there are favorable conditions for hydrolytic processes. Cell lysis occurs as a result of the action of own enzymes (autolysis). A typical example of moist colliquative necrosis is an area of gray softening (ischemic infarction) of the brain.

Brain infarction is often called softening, because the main macroscopic sign is a decrease in the elasticity of the brain tissue in the affected area in all terms. During the first day, it is a vaguely limited area of a bluish shade, soft to the touch. By the end of the first day, the area becomes clearer and pales. In the following days, the brain substance in this area becomes even more limp, yellowish in color, sometimes even with a greenish tint. In the first weeks, the volume of the brain increases slightly due to its swelling. After 1-1.5 months. at the site of the infarction, a clearly defined cavity is formed, which contains a cloudy liquid and detritus. Determining the exact timing of a heart attack is too difficult not only by its appearance, but also by histological picture.

Microscopically, brain tissue is homogeneous, structureless, slightly pink when stained with hematoxylin and eosin. Resorption of dead tissues is carried out by macrophages, which have the appearance of fat-granular balls.

Clinical manifestations of necrosis

Systemic manifestations: in case of necrosis, a rash usually appears (due to the release of pyrogenic substances from necrotic cells and tissues) and neutrophilic leukocytosis (due to the presence of an acute inflammatory reaction - demarcation inflammation). Release of the contents of necrotic cells: components of the cytoplasmic contents of necrotic cells that are released (for example, enzymes) enter the bloodstream, where their presence is diagnostic for determining the localization of necrosis. These enzymes can be detected by various laboratory methods. The specificity of the appearance of enzymes depends on the predominant localization of the enzyme in various tissues of

the body; for example, an increase in the level of MV isoenzyme creatine kinase is characteristic of myocardial necrosis, because this enzyme is found not only in the myocardium, but also in the liver and other tissues. The appearance of transaminases is characteristic of liver cell necrosis.

Local manifestations. Covering with ulcers of the mucous membrane of the gastrointestinal tract can be complicated by hemorrhage or bleeding (example: bleeding peptic ulcer). An increase in the volume of tissues as a result of edema can lead to a serious increase in pressure in a limited area (for example, in the cavity of the skull with ischemic or hemorrhagic necrosis). Impairment of function: necrosis leads to functional insufficiency of the organ, for example, the occurrence of acute heart failure as a result of widespread necrosis (infarction) of the myocardium (acute ischemic heart disease). The severity of clinical manifestations depends on the type, the volume of the affected tissue relative to its total amount, and the protective function of the living tissue that remained. Necrosis in one kidney does not cause kidney failure forever when a whole kidney is lost because the other kidney can compensate for the loss. However, necrosis of a small area, corresponding to the cerebral cortex, leads to paralysis of the corresponding group of muscles.

Exit necrosis. Necrosis is an irreversible process. With a relatively favorable outcome, reactive inflammation occurs around the dead tissue, which separates the dead tissue. Such inflammation is called demarcation, and the zone of separation is called the demarcation zone. In this zone, the blood vessels expand, hemoptysis, edema occurs, a large number of leukocytes appear, which release hydrolytic enzymes and melt necrotic masses. Necrotic masses are absorbed by macrophages. Following this, the cells of the connective tissue multiply, which replaces or overgrows the area of necrosis. When dead masses are replaced by connective tissue, their organization is discussed. In such cases, a scar forms at the site of necrosis (a scar at the site of a heart attack). Overgrowth of the necrotic area with connective tissue leads to its encapsulation. Calcium salts can be deposited in the dead masses with dry necrosis and in the area of death that has fallen to the organization. In this case, calcification (petrification) of the necrosis center develops. In some cases, bone formation - ossification - is noted in the

area of death. During the resorption of tissue detritus and the formation of a capsule, which occurs in wet necrosis and most often in the brain, a cavity - a cyst - appears at the site of death.

An unfavorable outcome of necrosis is purulent (septic) melting of the necrotic area. Sequestration is the formation of an area of dead tissue that does not undergo autolysis, is not replaced by connective tissue and is freely located among living tissues. Sequestrations usually occur in bones during inflammation of the bone marrow - osteomyelitis. A sequestral capsule and a cavity filled with pus form around such a sequestration. Sequestration often leaves the cavity through fistulas, which close only after its complete release. A type of sequestration - mutilation - rejection of the ends of the fingers.

The value of necrosis. It is determined by its essentiality - "local death" and exclusion from the function of such zones, therefore, necrosis of vital organs, especially significant areas of them, often leads to death. Such myocardial infarctions, ischemic necrosis of the brain, necrosis of the cortical substance of the kidneys, progressive necrosis of the liver, acute pancreatitis complicated by pancreatic necrosis. Tissue death is often the cause of severe complications of many diseases (rupture of the heart in myomalacia, paralysis in hemorrhagic and ischemic strokes, infections in massive bed sores, intoxication in connection with the effect on the body of the products of tissue decay, for example, gangrene of a limb). Clinical manifestations of necrosis can be very diverse. Pathological electrical activity that occurs in the area of necrosis in the brain or myocardium can lead to epileptic seizures or cardiac arrhythmia. Violation of peristalsis in the necrotic intestine can cause functional (dynamic) intestinal failure. Haemorrhages into necrotic tissue are often observed , for example, hemoptysis with lung necrosis.

Apoptosis

Apoptosis, or programmed cell death, is a process by which internal or external factors, activating the genetic program, lead to the death of the cell and its effective removal

from the tissue. Apoptosis is a mechanism of cell death that has a number of biochemical and morphological differences from necrosis.

Apoptosis is a biochemically specific type of cell death characterized by the activation of non-lysosomal endogenous endonucleases that cleave nuclear DNA into small fragments. Morphologically, apoptosis is manifested by the death of single, randomly located cells, which is accompanied by the formation of round bodies surrounded by a membrane ("apoptotic bodies"), which are immediately phagocytosed by surrounding cells.

It is an energy-dependent process by which unwanted and defective body cells are removed. It plays a significant role in morphogenesis and is a mechanism of constant control over the size of organs. When apoptosis is reduced, cell accumulation occurs, an example is pus growth. When apoptosis increases, a progressive decrease in the number of cells in the tissue is observed, an example is atrophy.

Morphological manifestations of apoptosis

Apoptosis has its characteristic morphological features both at the light-optical and at the ultrastructural level. When stained with hematoxylin and eosin, apoptosis is determined in single cells or small groups of cells. Apoptotic cells appear as round or oval clusters of intensely eosinophilic cytoplasm with dense fragments of nuclear chromatin. Since cell compression and the formation of apoptotic bodies occur quickly and they are also quickly phagocytosed, disintegrated or thrown into the lumen of the organ, it is detected on histological preparations in cases of significant severity. In addition, apoptosis, unlike necrosis, is never accompanied by an inflammatory reaction, which also complicates its histological detection.

Morphological features are most clearly revealed by electron microscopy. Cells undergoing apoptosis are characterized by:

Cell compression. The cell decreases in size; the cytoplasm is condensed; organelles that look relatively normal are arranged more compactly.

It is believed that a violation of the shape and volume of the cell occurs as a result of

the activation of transglutaminase in apoptotic cells. This enzyme causes the progressive formation of cross-links in cytoplasmic proteins, which lead to the formation of a peculiar shell under the cell membrane, similar to keratinized epithelial cells.

Condensation of chromatin. This is the most characteristic manifestation of apoptosis. Chromatin condenses on the periphery, under the nuclear membrane, while clearly defined dense masses of various shapes and sizes are formed. The nucleus can break into two or more fragments.

The mechanism of chromatin condensation has been studied quite well. It is due to the cleavage of nuclear DNA in the places that bind individual nucleosomes, which leads to the development of a large number of fragments in which the number of base pairs is divided by 180-200. During electrophoresis, the fragments will give a characteristic picture of "ladders". This picture differs from that of cell necrosis, where the length of DNA fragments varies. DNA fragmentation in nucleosomes occurs under the action of calcium-sensitive endonuclease. Endonuclease is constantly present in some cells (for example, in thymocytes), where it is activated by the appearance of free calcium in the cytoplasm, and in other cells it is synthesized before the onset of apoptosis. However, it has not yet been established how chromatin condensation occurs after DNA cleavage by endonuclease.

Formation of cavities and apoptotic bodies in the cytoplasm. In the apoptotic cell, first of all, deep indentations of the surface are formed with the formation of a cavity, which leads to the fragmentation of the cell and the formation of apoptotic bodies surrounded by a membrane, which consist of cytoplasm and densely arranged organelles, with or without fragments of the nucleus.

Phagocytosis of apoptotic cells or bodies is carried out by surrounding healthy cells - either parenchymal or macrophages. Apoptotic bodies are rapidly destroyed in lysosomes, and surrounding cells either migrate or divide to fill the space vacated by cell death.

Phagocytosis of apoptotic bodies by macrophages or other cells is activated by receptors on these cells; they engulf apoptotic cells. One of these receptors on

macrophages is the vitronectin receptor, which activates phagocytosis of apoptotic neutrophils.

Apoptosis takes part in the following physiological and pathological processes:

- programmed destruction of cells during embryogenesis (including implantation, organogenesis). Despite the fact that during embryogenesis, apoptosis is not always a reflection of "programmed cell death", this definition of apoptosis is widely used by various researchers.
- hormone-dependent involution of organs in adults, for example, rejection of the endometrium during the menstrual cycle, atresia of follicles in the ovaries in menopause and regression of the mammary gland after cessation of lactation.
- removal of some cells during the proliferation of the cell population.
- death of individual cells in tumors mainly during their regression, but also in tumors that are actively growing.
- the death of cells of the immune system, such as B- and T-lymphocytes, after the exhaustion of inflammatory cytokines, as well as the death of autoreactive T-cells during development in the thymus.
- pathological atrophy of hormone-dependent organs, for example, atrophy of the prostate gland after castration and depletion of lymphocytes in the thymus during glucocorticoid therapy
- pathological atrophy of parenchymal organs after obstruction of excretory ducts, which is observed in the pancreas and salivary glands, kidneys.
- cell death caused by the action of cytotoxic T cells, for example, in transplant rejection and graft-versus-host disease.
- cell damage in some viral diseases, for example, in viral hepatitis, when fragments of apoptotic cells are found in the liver as Councilman bodies.
- cell death under the influence of various factors, but in small doses that damage and can cause necrosis, for example, under the influence of high temperature, ionizing radiation, anticancer drugs.

Regulation of apoptosis

Apoptosis is genetically controlled cell death. Today, a large number of genes encoding substances necessary for the regulation of apoptosis have been identified. Many of these genes have been preserved in the course of evolution - from roundworms to insects and mammals. Some of them are also found in the genome of viruses. Thus, the main biochemical processes of apoptosis in different experimental systems (research is conducted on roundworms and flies) are identical, so the results of research can be directly transferred to other systems (for example, the human body) .

Apoptosis can be regulated by:

- external factors.
- autonomous factors.

A. Influence of external factors

Apoptosis can be regulated by many external factors that lead to DNA damage. In case of irreparable DNA damage by apoptosis, potentially dangerous cells are eliminated. The p53 tumor suppressor gene plays a significant role in this process. activation of apoptosis is also caused by viral infections, disruption of cell growth regulation, cell damage and loss of contact with surrounding tissues or tissue matrix. Apoptosis is the body's defense against the persistence of damaged cells, which can be potentially dangerous for a multicellular organism.

When tissues are stimulated by some mitogen, their cells enter a state of increased mitotic activity, which is necessarily accompanied by some activation of apoptosis. The fate of daughter cells (will they survive or undergo apoptosis) depends on the ratio of activators and inhibitors of apoptosis:

- inhibitors include growth factors, cell matrix, sex steroids, some viral proteins;
- activators include lack of growth factors, loss of connection with the matrix, glucocorticoids, some viruses, free radicals, ionizing radiation.

Under the influence of activators or the absence of inhibitors, endogenous proteases and endonucleases are activated. This leads to the destruction of the cytoskeleton, DNA fragmentation and mitochondrial dysfunction. The cell shrinks, but the cell membrane

remains intact, but its damage leads to the activation of phagocytosis. Dead cells break up into small, membrane-enclosed fragments, which are labeled as apoptotic bodies. An inflammatory reaction to apoptotic cells does not occur.

B. Autonomous mechanism of apoptosis

During the development of the embryo, three categories of autonomous apoptosis are distinguished: morphogenetic, histogenetic, and phylogenetic.

Morphogenetic apoptosis is involved in the destruction of various tissue embryos. Examples are:

- destruction of cells in interdigital spaces;
- the death of cells leads to the destruction of excess epithelium during the fusion of the palatine processes, when the hard palate is formed.
- the death of cells in the dorsal part of the neural tube during closure, which is necessary to achieve the connection of the epithelium of the two sides of the neural tube and the associated mesoderm. Violations of morphogenetic apoptosis in these localizations lead to the development of syndactyly, splitting of the hard palate and *spina bifida* respectively.

Histogenetic apoptosis is observed during differentiation of tissues and organs, which is observed, for example, during hormone-dependent differentiation of tissues and organs, which is observed, for example, during hormone-dependent differentiation of genital organs from tissue embryos. Thus, in men, a hormone is synthesized in the Sertoli cells in the testicles of the fetus, which causes the regression of the Mullerian ducts (from which the fallopian tubes, uterus, and upper part of the vagina are formed in women) by apoptosis.

Phylogenetic apoptosis is involved in the removal of rudimentary structures in the embryo, for example, the pronephros.

In various conditions, both acceleration and deceleration of apoptosis can be observed. Despite the fact that apoptosis can be activated by various factors characteristic of certain cell types, the final pathway of apoptosis is regulated by well-defined genes and

is common regardless of the cause of apoptosis activation.

All factors that increase or decrease apoptosis can act

- **directly** on the mechanism of cell death;

- indirectly , by influencing transcription regulation.

In some cases, the influence of these factors on apoptosis is decisive (for example, in glucocorticoid-dependent apoptosis of thymocytes), and in others it is not particularly important (for example, in Fas - and TNF -dependent apoptosis). A large number of substances are involved in the regulation process. The most studied of them are substances from the bcl - 2 family.

The Bcl -2 gene was first described as a gene that is translocated in follicular lymphoma cells and inhibits apoptosis. Further research revealed that Bcl -2 is a multigene that is found even in roundworms . Homologous genes were also found in some viruses. All substances belonging to this class are divided into activators and inhibitors of apoptosis.

Inhibitors include: bcl -2, bcl - xL , Mcl- 1, bcl - w , adenovirus E1B 19K, Epstein-Barr virus BHRF 1.

Activators include bax , bak , Nbk , Bik 1, Bad , bcl - xS .

Members of this family interact with each other. One of the levels of apoptosis regulation is protein-protein interaction. Proteins of the bcl -2 family form both homo- and heterodimers. For example, bcl -2 inhibitors can form dimers with bcl -2 activators. Thus, cell viability depends on the ratio of activators and inhibitors of apoptosis. For example, bcl -2 interacts with bax ; with the dominance of the first, cell viability increases, with an excess of the second, it decreases. In addition, proteins of the bcl - 2 family can interact with proteins that do not belong to this system. For example, bcl - 2 can bind to R - ras , which activates apoptosis. Another protein, Bag - 1, enhances the ability of bcl -2 to inhibit apoptosis.

Today, it is generally accepted that genes involved in the regulation of tumor growth and development (oncogenes and tumor suppressor genes) play a regulatory role in the induction of apoptosis. These include:

- bcl -2 oncogene, which inhibits apoptosis caused by hormones and cytokines, which

leads to increased cell viability;

- bax protein (also from the bcl -2 family) forms bax - bax dimers , which enhance the action of apoptosis activators. The ratio of bcl -2 and bax determines the sensitivity of cells to apoptotic factors and is a "molecular switch" that determines whether tissue growth or atrophy will occur.
- c - myc oncogene, the protein product of which can stimulate either apoptosis or cell growth (in the presence of other survival signals, for example, bcl - 2);
- the p53 gene, which normally activates apoptosis, but when mutated or absent (which is found in some tumors), increases cell survival. It has been established that p53 is necessary for apoptosis in cell damage caused by ionizing radiation, but it is not required in glucocorticoid-induced apoptosis and aging.

Reduction of apoptosis

The product of the p53 gene monitors the integrity of the genome during mitosis. When the integrity of the genome is violated, the cell switches to apoptosis. Thus, a lack of p53 or an excess of bcl-2 leads to the accumulation of cells: these disorders are observed in various tumors. The study of factors that regulate apoptosis is important in the development of drugs that enhance the death of cells in malignant neoplasms.

Autoimmune diseases may reflect disorders in the induction of apoptosis of lymphoid cells capable of reacting with their own antigens. For example, with systemic lupus erythematosus there is a violation of Fas receptors on the cell surface of lymphocytes, which leads to the activation of apoptosis. Some viruses increase their survival by inhibiting the apoptosis of infected cells, for example, the Epstein-Barr virus can affect the exchange of bcl-2.

Acceleration of apoptosis

Acceleration of apoptosis has been proven in acquired immunodeficiency syndrome (AIDS), neurotrophic diseases and some blood diseases in which there is a deficiency of any formed elements. In AIDS, the immunodeficiency virus can activate the CD4 receptor on uninfected T-lymphocytes, thus accelerating apoptosis, which leads to the

depletion of cells of this type.

The importance of apoptosis in the development of the organism and pathological processes

Apoptosis plays an important role in mammalian development and in various pathological processes. The functioning of bcl-2 is required to maintain the viability of lymphocytes, melanocytes, intestinal epithelium, and kidney cells during embryonic development. bcl-x is necessary for the inhibition of cell death in embryogenesis, especially in the nervous system. Vach is necessary for thymocyte apoptosis and maintenance of sperm viability during their development. P53 is a tumor suppressor gene, so it does not play a special role in embryogenesis, but it is absolutely necessary for the suppression of tumor growth. Mice in which both p53 genes were missing showed an extremely high tendency to develop malignant tumors as a result of complete or partial disruption of apoptosis of precancerous cells. Increased synthesis of the protein encoded by the bcl-2 gene leads to inhibition of apoptosis and, accordingly, the development of tumors; this phenomenon was detected in cells of B-cell follicular lymphoma.

In lymphoproliferative diseases and a disease similar to systemic lupus erythematosus in mice, there is a violation of the function of Fas-ligand or Fas-receptor. Increased synthesis of Fas-ligand can prevent transplant rejection. Apoptosis is part of the pathological process during cell infection with adenoviruses, baculoviruses, HIV and influenza viruses. Inhibition of apoptosis is observed during the persistence of infection, in the latent period, and with increased replication of adenoviruses, baculoviruses, possibly herpes viruses, Epstein-Barr virus, and HIV, activation of apoptosis is observed, which favors the wide spread of the virus. In neurodystrophic diseases, there is a violation of the function of a gene (iar gene), similar to the inhibitor of apoptosis of baculoviruses.

Multiple organ failure (PON) is a pathological condition that develops and progresses

as a result of a severe non-specific reaction of the body to damage or infection and is accompanied by the failure of two or more organ-functional systems. With the development of PON, a qualitatively different pathological state of the body is formed, the danger of which is determined by the speed of occurrence and deepening of the dysfunction of certain organ systems. PON is characterized by damage to all organs and tissues of the body by aggressive mediators with a temporary predominance of symptoms of one or another organ dysfunction: pulmonary, cardiac, renal, and other organ systems. PON develops and deepens depending on the nature of the etiological factor and individual reaction. The terms of detection and the dynamics of the formation of individual syndromes are very variable, dysfunctions of different organs can occur in different combinations.

There are 3 phases of the pathological process:

1) The induction phase is the synthesis of a number of humoral factors that trigger a systemic inflammatory response
2) Cascade phase - the development of acute lung damage, activation of cascades of the kallikrein-kinin system, the arachidonic acid system, blood coagulation, etc.
3) The phase of secondary autoaggression, extremely pronounced organ dysfunction and stable hypermetabolism - loss of the body's ability to independently maintain homeostasis

Signs of general death

Signs of general death are: corpse cooling, cadaveric suffocation, cadaveric desiccation, redistribution of blood, corpse stains, decay of corpse tissues. **Corpse cooling** (" algor mortis ") occurs as a result of the cessation of metabolic processes and the gradual equalization of the temperature of the body and the environment. **Morbid mortis** (" rigor mortis ") is characterized by a sharp tightening of the somatic muscles

due to the disappearance of ATP acid from them after death and the accumulation of lactic acid in them (after 2-5 hours after the death). **Dehydration of the body** occurs as a result of the evaporation of moisture from its surface : this applies to the skin, eyeballs, mucous membranes. **The redistribution of blood** is characterized by its accumulation in the veins, while the lumens of the arteries remain empty. Postmortem blood coagulation is possible in the veins. **Corpse spots** arise in connection with the redistribution of blood and are presented in the form of **corpse hypostases** (appear after 3-6 hours) or **cadaveric imbibition** (appears much later as a result of hemolysis of erythrocytes and imbibition of tissues with blood plasma stained with hemoglobin). **Decay of a corpse** is due to the processes of autolysis and life of the body in connection with the reproduction of putrefactive microorganisms in the intestines .

- **PLAN AND ORGANIZATIONAL STRUCTURE OF CLASSES:**

No	The main stages of the lesson, their functions and content	Learning objectives in mastery levels	Means of training and control	Materials on methodical provision of attendance at classes, control of knowledge of those who study	The term is from the total time of the lesson

1	2	3	4	5	6
1. Preparatory stage:					
1	Organization of classes, setting educational goals, motivation	1 level			5 minutes.
2	Control of the initial level of knowledge, skills, and abilities of students; readiness to perceive the material of the current lesson	2nd level	Tests, situational problems, surveys	Tables, tests, situational problems	25 minutes.
2. The main stage:					
1	Formation of professional knowledge about etiopathogenesis, classification, macro- and microscopic signs of necrosis	3rd level 4th level	Tests, situational problems, surveys	Macro- and micropreparations	15 minutes.
2	Mastering the skills of describing macro- and micro-preparations,		Discussion of signs of disorders with diff. diagnostics		25 minutes.

	interpreting the signs of necrosis				
3	Outcomes of necrosis, forecasts, possibility of prevention				5 minutes.
4	Sketches of necrosis, description of macropreparations				5 minutes.
3. The final stage					
1	Knowledge level control				10 minutes.
2	Summary of knowledge				3 minutes.
3	Assignment for the next class				2 minutes.

6. **MATERIALS ON METHODICAL SUPPORT OF THE LESSON:**

6. 1. Question:

- ✓ Definition of necrosis
- ✓ Macroscopic manifestations of necrosis
- ✓ Microscopic manifestations of necrosis
- ✓ Microscopic manifestations of apoptosis
- ✓ Clinical and morphological classification of necrosis
- ✓ Determination of the death of a macroorganism
- ✓ Signs of biological death

✓ Thanatology as a science

9) Multiple organ failure

A set of tests to control the initial level of knowledge.

16.**2. Materials for methodological support of the main stage of the lesson:**

Orientation map for the formation of practical knowledge and skills:

	Task	Instructions for the task
	2	3
	Etiopathogenesis of necrosis	Specify the causes and mechanisms of the development of necrosis
	Etiopathogenesis of apoptosis	Specify the causes and mechanisms of the development of apoptosis
	Etiopathogenetic classification of necrosis	Explain the principles of classification, characterize each type of necrosis
	Clinical and morphological classification of necrosis	Explain the principles of classification, characterize each type of necrosis
	Macroscopic diagnosis of necrosis	Pay attention to the macroscopic appearance of the necrosis zone, describe it according to the diagram
	Microscopic diagnosis of necrosis	Determine the microscopic signs of necrosis when stained with hematoxylin and eosin

	Microscopic diagnosis of apoptosis	Determine the microscopic signs of apoptosis when stained with hematoxylin and eosin
	Diagnosis of the death of a macroorganism	Determine the signs of death on the corpse
	Complication of necrosis	Justify the possible complications
	Complication of clinical death	Justify the possible complications
	Predictions for necrosis	To determine the outcome of necrosis with justification of the prognosis for the patient
	Prognosis in apoptosis	Possibility of reverse process, complications, recovery

6. 3. Control materials for the final stage of the lesson:

- Control questions:

15. Describe the macropreparation "gangrene of the lower limb" according to the scheme
16. Describe a myocardial infarction macro- and microscopically, using a macro- and micropreparation.
17. Describe gray encephalomalacia of the brain macro- and microscopically.
18. Describe the red encephalomalacia of the brain macro- and microscopically.
19. Describe the sequestration of bone tissue using a macropreparation.
20. Describe the number of facial tissues using a macropreparation .
21. Describe the mutilation of the fingers of the upper limb in leprosy, using a macropreparation.
22. Describe post-infarction focal cardiosclerosis macro- and microscopically.
23. Determine the signs of biological death on the corpse.

17.**CLASS EQUIPMENT**

- Macrodrugs: "gangrene of the limbs", "gangrene of the small intestine", "noma", "splenic infarction", "heart infarction", "brain infarction", "brain cyst", "organization of the kidney infarction zone", "hemopericard", " aneurysm of the heart".
- The corpse of a dead person.
- Micropreparations: "brain infarction", "splenic infarction", "placenta infarction", "brain cyst", "myocardial infarction zone organization", "DPK positive granules in the nuclei of the chorionic epithelium".

List of recommended literature:

a) main:

1. Atlas of micropreparations in pathomorphology / I.I. Starchenko, B.M. Filenko, N.V. Royko and others; VDZU "UMSA". - Poltava, 2018. - 190 p
2. Neoplasms of the maxillofacial area in children / P.I. Tkachenko, I.I. Starchenko, S.O. Belokon and others. – Poltava: Col. "ASMI" - 2018. - 190 p.
3. The basics of pathology according to Robbins: in 2 volumes. Volume 1 / Vinay Kumar, Abul K. Abbas, John C. Astaire; translation of the 10th Eng. edition. Publisher: All-Ukrainian specialized publishing house "Medytsyna". – X II . - 2019. - 420 p.
4. The basics of pathology according to Robbins: in 2 volumes. Volume 1 / Vinay Kumar, Abul K. Abbas, John C. Astaire; translation of the 10th Eng. edition. Publisher: All-Ukrainian specialized publishing house "Medytsyna". – X II . - 2019. - 420 p.
5. Pathomorphology. General pathomorphology: a study guide / edited by Ya. Ya. Bodnara, V.D. Voloshina, A.M. Romanyuk, V.V. Gargin. - New Book, 2020. - 248 p.
6. Pathomorphology of the main disorders of the cardiovascular system: study guide / I.I. Starchenko, B.M. Filenko, N.V. Royko – Poltava: "UMSA". - 2019. - 150 p.
7. Workshop on biopsy-sectioning course / I.I. Starchenko, A.P. Hasyuk, S.A. Proskurnya [etc.] – Poltava, 2016. – 160 p.
8. I.I. Starchenko Pathomorphology of the main diseases of the maxillofacial region: academician. manual / I.I. Starchenko, B.M. Filenko, V.V. Chernyak ; "UMSA". – Vinnytsia: Nova Kniga, 2019. – 128 p.
9. C tarchenko I.I. Special pathomorphology (basic course) for students of medical faculties of higher medical educational institutions III-I V levels of accreditation / I. I. _ Starchenko, N.V. Royko, B.M. Filenko. – Poltava, 2017. – 174 p.
10. Tuffaha S. A. Muin Immunohistochemistry in tumor diagnostics / S. A. Tuffaha Muin, S. G. Hychka, Gusky Hans. – "Book Plus", 2018. – 336.

Tasks from UDRS and NDRS on this topic:

conduct an analysis of the history of diseases in the surgical department of the University

Clinic for the current year and find out the percentage of gangrene of the limbs and intestines among surgical pathology

determine the etiopathogenesis of gangrene in appropriate cases

Topic of the next seminar session:

" Principles of formulating clinical and patho-anatomical diagnoses. Making a patho-anatomical diagnosis. Clinical and morphological analysis of the materials of the post-mortem examination of the corpse in the aspect of assessing the quality of end-of-life diagnosis and treatment (mortem examination). Comparison of clinical and pathological diagnoses. Categories of diagnosis discrepancies. Writing a patho-anatomical epicrisis. "

Topic: Principles of formulating clinical and patho-anatomical diagnoses. Making a patho-anatomical diagnosis. Clinical and morphological analysis of the materials of the post-mortem examination of the corpse in the aspect of assessing the quality of end-of-life diagnosis and treatment (mortem examination). Comparison of clinical and pathological diagnoses. Categories of diagnosis discrepancies. Writing a patho-anatomical epicrisis.

I. Relevance of the topic:

The basis for appropriate treatment of the patient can only be a correct diagnosis. Along with the essential aspect of the important and correct formulation of the diagnosis, the principles of constructing clinical and patho-anatomical diagnoses are the same. Reconciliation of diagnoses can reveal defects in lifelong diagnosis or treatment, which helps to avoid them in the future and thus contributes to improving the qualifications of doctors. Each sectional case must be completed by a clinical and anatomical epicrisis.

Purpose of the lesson :

1) making a diagnosis;

2) reconciliation of clinical and patho-anatomical diagnoses;

3) compilation of clinical and anatomical epicrisis.

The main questions of the topic:

1. Principles of disease classification.
2. The structure of pathological diagnosis.
3. The concept of the main disease.
4. The concept of a competing disease.
5. Concept of underlying disease.
6. The concept of complications of the main disease.
7. Concept of concomitant disease.
8. Immediate cause of death.
9. Features of the construction of the diagnosis in prenatal pathology.
10. Basic principles of reconciliation of clinical and patho-anatomical diagnoses.
11. Basic requirements for the formulation of clinical and anatomical epicrisis.

Topic content:

Principles of constructing a diagnosis:

Clinical and patho-anatomical diagnoses are built on a pathogenetic basis - they reflect the development of the disease, explain the relationship and sequence of changes. In these diagnoses, it is necessary to distinguish between the main disease, its complications and accompanying disease. A prerequisite for such an approach is the evaluation and classification of symptoms found in the clinic or at

autopsy, according to their significance and role in the development of the disease and death of the patient.

A disease that caused death by itself or due to complications is considered MAIN.

COMBINED MAIN DISEASE. Often there are two or more diseases that develop independently of each other at the same time. They can be competing or connecting. One of them can be background (accompanying).

COMPETING diseases mean two or more nosological forms, each of which by itself or due to its complications could lead to death.

COMBINED diseases together, due to their complications, led to the death of the patient, but each of these diseases by itself could not lead to a fatal end.

A BACKGROUND disease is a disease that is etiologically unrelated to the main disease, but in pathogenetic terms plays a major role in increasing the course of the main disease.

A concomitant disease is a disease that did not play an important role in the pathogenesis of the main disease.

For statistical processing of materials in cases of combined main disease, only one of the diseases should be placed in the 1st place. Corresponding explanations are included in the clinical and anatomical epicrisis.

Complications of diseases include those pathological processes that are pathogenetically directly related to the main disease, although in some cases they may have a different etiology (for example , purulent meningitis) with purulent otitis media; peritonitis with perforation and gastric ulcer).

It happens that death occurred from the use of medical (and in particular surgical) or even diagnostic measures. For such cases, MK X-10 provides special headings (T80-89 and auxiliary ciphers in each

heading and in class Y). If the medical intervention was made by Fr by false diagnosis of om , then this intervention in the diagnosis is put in the place of the main disease, in some cases in complications.

In the anatomical diagnosis, it is often necessary to use concepts that express clinical symptom complexes - cardiovascular insufficiency, uremia, etc., but still only with a list of morphological changes characteristic of them or with a mark "according to clinical data". Sometimes the value of clinical data (especially anamnestic data) is so great that they become the basis of pathological diagnosis (surgical patients after organ removal, death of newborns due to maternal pathology, mental patients).

2. RECONCILIATION OF CLINICAL AND PATHOLOGICAL DIAGNOSIS

When comparing diagnoses, the following assessment categories are established:

1. Coincidence of diagnoses;

2. Discrepancy of diagnoses. Here is a possible discrepancy:

a) according to the nosological principle (lung tuberculosis instead of cancer)

b) by etiology (tuberculous meningitis instead of meningococcal).

c) by the localization of the painful lesion (stomach cancer instead of pancreatic cancer).

In the case of a combined main disease, the absence or false diagnosis of one of the diseases is considered a discrepancy between clinical and patho-anatomical diagnoses.

3. Discrepancy of diagnoses due to complications, the essential course of which has changed the main suffering or which has the nature of the cause of death.

4. Discrepancy of diagnoses for the most important concomitant diseases. The issue of discrepancy in diagnoses is resolved by the head of the pathology department, head. clinical departments of the hospital, and in conflicting cases at clinical and anatomical conferences.

The reasons for the discrepancy in diagnoses (there are objective and subjective reasons): the short duration of the patient's stay in bed (less than 24 hours); objective research difficulties; insufficient examination; lack of anamnestic data and laboratory and X-ray data; underestimation of the consultants' diagnosis; incorrect registration of the diagnosis. The difference is 5-10%.

3. CLINICAL AND ANATOMICAL EPICRISIS

Clinical and anatomical epicrisis is the final generalization. Its content depends on the specific case. Necessary parts of epicrisis:

a) reconciliation of clinical and patho-anatomical diagnoses;

b) conclusion on the cause of death;

c) defects in diagnosis and treatment

The examiner in epicrisis can (sometimes should) bring additional data about the relationship and sequence of changes, about the clinical and morphological features of this case. Additional data are required in case of combined underlying disease. If there is a discrepancy in the epicrisis, the reason for the discrepancy should be indicated with the analysis of the documentation from the point of view of the possible establishment of the correct intravital diagnosis, as well as express an opinion about the role of the incorrect diagnosis in the fatal outcome.

FEATURES OF CONSTRUCTIONS FOR THE DIAGNOSIS OF PERINATAL PATHOLOGY

A special place in pediatrics is occupied by the pathology of the perinatal period, which continues from the beginning of the 29th week of intrauterine development to the end of the 7th day of extrauterine life. The death of the fetus, newborn, which occurred during this period, is called perinatal.

The main group of pathological processes that cause perinatal death of the fetus include: asphyxia, birth trauma, hemolytic disease of newborns, hemorrhagic diseases, malformations, infectious diseases. Asphyxia of the fetus and newborn, depending on the clinical situation, can be the main disease or a complication of another disease (congenital pneumonia, bronchopulmonary dysplasia, developmental defects, etc.) Example:

1. The main disease: primary atelectasis of the lungs. Complication: asphyxia (indicate the manifestations of asphyxia). In the nomenclature of the causes of perinatal morbidity and mortality, prematurity is not considered as the main cause of death, but it is more often a concomitant and, in severe cases, a background disease.

For example: 1. The main disease: hemolytic disease of newborns - yellow form (jaundice, hepatomegaly, splenomegaly). Complications: ruptures of the hyperplastic spleen, hemoperitoneum, general acute anemia. Associated diseases: bilateral clubfoot, 2nd degree prematurity.

Diseases of the fetus, together with diseases and conditions of the mother (litter) that caused them, are recommended to be called perinatal diagnosis. It consists of 3 parts:

Part 1 : the disease of the fetus (child) is indicated according to the generally accepted principle;

2nd part: pathology of the litter (in the first place, the main pathology that caused the cause of death), then the pathology that contributed to its onset, and in the last place another pathology;

Part 3: pathology on the part of the mother's body. The main disease or condition of the mother should be considered that which caused the disease and death of the fetus (child).

Thus, regardless of the diversity of perinatal pathology, the peculiarities of its course and the body of the fetus (newborn), the general principles of construction of the diagnosis remain the same as in adults: the nosological principle in the design of the main disease (composition) of the IKX-10, justification of construction and formulation diagnoses (data from morphological, bacteriological and other studies), registration of iatrogenic pathology.

RECONCILIATION OF CLINICAL AND PATHOLOGICAL DIAGNOSIS

One of the main tasks of a medical institution pathologist is "scientific control over diagnostic and therapeutic work by comparing clinical and pathological diagnoses."

This comparison is carried out by the pathologist during the autopsy of the corpse, followed by a study when summarizing the sectional materials (usually once a quarter), when analyzing the results of the biopsy and surgical material.

The clinical-anatomical comparison includes not only the reconciliation of diagnoses, but also the discussion of issues related to the examination of the patient, the timeliness of establishing the

diagnosis, the validity and timeliness of the medical measures taken, and the determination of the cause and mechanism of death.

Reconciliation of clinical and patho-anatomical diagnoses is carried out according to the nosological principle, according to three rubrics: according to the main disease, its most important complication and the most important accompanying diseases.

Reconciliation of diagnoses carried out by a pathologist is an important factor in improving the qualifications of treating doctors and helps to identify weak points in the organization of medical care for the population.

Discrepancy of diagnoses is stated as a discrepancy between clinical and patho-anatomical diagnoses. Moreover, the pathologist must establish the category of discrepancies, guided by the following provisions:

1. The disease was not recognized at the previous stage and due to the serious condition of the patient, neglect of the disease or due to the rapid onset of death (short stay of the patient in the clinic) it was impossible to make a correct diagnosis in this medical institution. This group includes patients with malignant tumors in an inoperable state, with cardiogenic shock, bacterial shock, etc.

2. The disease was not recognized in this medical institution due to deficiencies in the examination of the patient, lack of necessary and available research.

3. Incorrect diagnosis led to erroneous hospital tactics, which played a decisive role in the fatal outcome. This group includes all urgent cases that require immediate radical help (acute appendicitis, intestinal obstruction, acute cholecystitis, etc.).

In the perinatal period, the reconciliation of diagnoses is carried out only for diseases of the fetus (child) using the following assessments:

The main disease was recognized correctly and its cause from the side of the litter (mother) was established.

The main disease is recognized correctly, but the diseases of the mother and litter, which caused the main disease of the fetus (child), which caused death, are not established.

The underlying disease is not recognized.

No fatal complication was diagnosed.

No significant concomitant disease was diagnosed.

When comparing clinical and pathological diagnoses, the following categories of assessments are established:

1) Coincidence of the main clinical and anatomical diagnoses.

2) Discrepancy of the main clinical and anatomical diagnoses.

3) Discrepancy of diagnoses for the most important complications that significantly changed the course of the main suffering or that appeared as the main cause of death.

4) Discrepancy of diagnoses for the most important concomitant diseases. When evaluating the quality of clinical diagnosis of perinatal diseases, it is necessary to treat the percentage of litters not sent for examination in relation to the total number of autopsies of stillbirths.

QUALITY INDICATORS OF CLINICAL DIAGNOSTICS

1. The main disease is not recognized:

a) antenatally;

b) intranatally;

c) postnatally.

2. Illnesses, conditions of the mother and litter that caused the disease of the fetus (child) and were the cause of death have not been established.

3. The specific weight of false diagnoses of the main diseases:

a) on nosology;

b) by etiology;

c) by localization;

d) due to an incorrect construction of the diagnosis.

4. The droppings were not sent for research.

The objective reasons for the discrepancy between clinical and pathological diagnoses include:

1. Inadequacy of examination of the patient:

a) when it was possible;

b) in the absence of this possibility.

2. Lack of anamnestic data and profession.

3. Short-term stay of the patient in a hospital.

4. Objective difficulties or impossibility of examining the patient (due to the severity of the condition, asymptomatic course, areactive state of the patient).

5. Atypicality of the development and course of the process, rarity of the disease (not difficult and difficult to diagnose).

6. Insufficient study of this disease.

7. False assessment of clinical symptomatology (underestimation, overestimation of clinical, radiological, laboratory, etc. research data).

8. Absence of laboratory and X-ray studies:

a) in the absence of conditions;

b) under existing conditions.

9. Incorrect assessment of anamnesis data.

10. Underestimation or overestimation of the consultant's diagnoses.

11. Lack of necessary consultation with various specialists.

12. Incorrect registration and construction of the diagnosis, deficiencies in keeping a medical history.

Errors related to the insufficient level of training and qualification of the doctor are considered as subjective causes of erroneous diagnosis. The results of the comparison of clinical and patho-anatomical diagnoses

(coincidence and discrepancy) should be reflected in a detailed clinical-patho-anatomical epicrisis. If the diagnoses differ, the pathologist must indicate the reason for the discrepancy.

Determining the causes of erroneous diagnosis and the categories of these errors is a task of clinical and anatomical conferences and medical and control commissions.

PATHOLOGICAL EPICRISIS AND THANATOGENESIS

In the epicrisis, it is necessary to reflect the etiology, pathogenesis of the disease, the dynamics of the diagnostic process in the clinic, to carry out differential diagnosis with other diseases. It is also necessary to point out the timeliness of establishing a diagnosis, justify the immediate cause and mechanism of death.

The following points should be reflected in the patho-anatomical epicrisis:

- Justification of the diagnosis of the main disease, that is, an explanation of why this particular disease is the main one among the identified diseases.
- Comparison of clinical and patho-anatomical diagnoses according to all its headings (main, background, competing, connecting, their complications, accompanying) with an indication of their coincidence or discrepancies.
- In case of discrepancy between the clinical and pathological diagnoses, the reason for the discrepancy is indicated. An analysis of the reasons for accounting treatment of pathological changes in organs detected in the clinic should also be given.
- Highlight the importance in the mechanism of development of death of combined, background and competing diseases, if such occurred.

- Carrying out differential diagnosis between certain diseases.
- Reflecting the timeliness of the final diagnosis established in the clinic before assessing the impact of this fact on the treatment and outcome of the disease.
- Clarification of the main (direct) cause of death, that is, the process that became the basis of thanatogenetic mechanisms.
- Analysis of the processes caused by medical and diagnostic procedures, the influence of the latter on the morphological manifestations of the disease.
- Indication of defects in the organization of medical care (late or incorrect hospitalization, late diagnosis, untimely medical care, etc.) with an assessment of the impact of these factors on treatment and the outcome of the disease.
- Clarification of thanatogenesis.
- Clarification of natural and therapeutic pathogenesis.

PLAN AND ORGANIZATIONAL STRUCTURE OF THE LESSON (TIME MAP)

- Roll call and resolution of the task (5 minutes).
- Control of the initial level of students' knowledge using educational protocols of autopsies of the dead (40 minutes).
- Independent practical work of students with study protocols of autopsy (20 minutes).
- Joint analysis of the completed work with the teacher. Solution of situational problems (20 minutes).
- Summary of the teacher and tasks for the next lesson (5 minutes).

Examples of unprogrammed control questions:

➢ Name the basic principles of disease classification.

- Name the structure of pathological diagnosis.
- Define the term "main disease" and give examples.
- What are competing and background diseases?
- The concept of complications of the main disease and the immediate cause of death.
- What are comorbidities?
- Basic principles of clinical and anatomical analysis of fatal cases.
- What points should be reflected in the clinical and pathological epicrisis

Educational algorithm for independent work of students:

- ✓ Study samples of autopsy protocols and the formulation of patho-anatomical diagnosis.
- ✓ Study the formulation of clinical and anatomical epicrisis using the examples of autopsy protocols.

Class equipment:

Educational protocols of patho-anatomical autopsies of the dead.

List of recommended literature:

a) main:

18. Atlas of micropreparations in pathomorphology / I.I. Starchenko, B.M. Filenko, N.V. Royko and others; VDZU "UMSA". - Poltava, 2018. - 190 p
19. Neoplasms of the maxillofacial area in children / P.I. Tkachenko, I.I. Starchenko, S.O. Belokon and others. – Poltava: Col. "ASMI" - 2018. - 190 p.
20. The basics of pathology according to Robbins: in 2 volumes. Volume 1 / Vinay Kumar, Abul K. Abbas, John C. Astaire; translation of the 10th Eng. edition. Publisher: All-Ukrainian specialized publishing house "Medytsyna". – X II . - 2019. - 420 p.
21. The basics of pathology according to Robbins: in 2 volumes. Volume 1 / Vinay Kumar, Abul K. Abbas, John C. Astaire; translation of the 10th Eng. edition. Publisher: All-Ukrainian specialized publishing house "Medytsyna". – X II . - 2019. - 420 p.
22. Pathomorphology. General pathomorphology: a study guide / edited by Ya. Ya. Bodnara, V.D. Voloshina, A.M. Romanyuk, V.V. Gargin. - New Book, 2020. - 248 p.
23. Pathomorphology of the main disorders of the cardiovascular system: study guide / I.I. Starchenko, B.M. Filenko, N.V. Royko – Poltava: "UMSA". - 2019. - 150 p.
24. Workshop on biopsy-sectioning course / I.I. Starchenko, A.P. Hasyuk, S.A. Proskurnya [etc.] – Poltava, 2016. – 160 p.
25. I.I. Starchenko Pathomorphology of the main diseases of the maxillofacial region: academician. manual / I.I. Starchenko, B.M. Filenko, V.V. Chernyak ; "UMSA". –

Vinnytsia: Nova Kniga, 2019. – 128 p.
26. C tarchenko I.I. Special pathomorphology (basic course) for students of medical faculties of higher medical educational institutions III-I V levels of accreditation / I. I. _ Starchenko, N.V. Royko, B.M. Filenko. – Poltava, 2017. – 174 p.
27. Tuffaha S. A. Muin Immunohistochemistry in tumor diagnostics / S. A. Tuffaha Muin, S. G. Hychka, Gusky Hans. – "Book Plus", 2018. – 336.
28.

Topic of the next seminar session:

" Peculiarities of the course, variability of diseases. Pathomorphosis of diseases (natural and induced). Pathology of diagnostic and treatment procedures (iatrogeny). "

Topic: Peculiarities of the course, variability of diseases. Pathomorphosis of diseases (natural and induced). Pathology of diagnostic and treatment procedures (iatrogeny).

I. Relevance of the topic:

Studying the pathomorphosis of diseases is an important stage for understanding the causes of the development of pathology and their consequences. It is important to know and understand changes in the pattern of diseases under the influence of various environmental factors.

II. Purpose of the lesson:

To acquaint students with the definition of pathomorphosis, the concept of iatrogeny, its types, causes and consequences.

The main questions of the topic:

- Definition of pathomorphosis, its form.
- Definition of the concept of iatrogeny.
- Classification of iatrogens.
- Categories of iatrogens.
- What is not related to iatrogeny?

Topic content:

CONCEPT OF PATHOMORPHOSIS

The environment in which a person lives is extremely changeable, which is associated with changes in ecology, technical and informational equipment; the use of GMO products and other influencing factors that must be taken into account in cases of positive or negative changes in the course of diseases.

Under pathomorphosis , it is necessary to understand persistent and significant changes in the manifestations of the disease, which occurred under the influence of various factors of the external and

internal environment.

In 1956, W. Doerr defined some limits and forms of pathomorphosis. He singled out:

1) **natural pathomorphosis** , that is, spontaneous changes in the picture of the disease, which arose as a result of changes in both external (changes in the human ecology) and internal (changes in the human constitution) causes of the disease; 2) **induced or therapeutic** pathomorphosis, that is, changes in the disease that occurred as a result of treatment.

The most studied causes of the pathomorphosis of infectious diseases, tumor diseases.

It is not always possible to separate induced and natural pathomorphosis.

The "specificity" of the pathomorphosis of any disease is determined by the peculiarities of both epidemiological and therapeutic factors.

For a prospective study of the problem, it is important to know the complex of general and individual causes that determine the pathomorphosis, the features and specific weight of each of these causes and their interrelationships. This is necessary for adequate correction and prevention of negative effects.

Iatrogenies (literally - "diseases caused by a doctor", from the Greek: iatros - doctor + genes - generates).

Definition, recommended by the WHO in 1975: "**Iatrogenies** are any unwanted or unfavorable consequences of preventive, diagnostic, therapeutic interventions or procedures that lead to violations of body functions, limitation of usual activities, disability and death".

Iatrogeny is a complication of the main disease caused by erroneous or inadequate actions of the doctor" (Kalitievsky P.F., 1993).

The classification of iatrogens, proposed by P.F. Kalitievsky (1979), which distinguished the following groups of these diseases, became widespread:

I. Iatrogenies associated with treatment:

A. Likarski.

V. Surgical.

S. Caused by physical methods of treatment.

II. Iatrogenies associated with diagnostic measures (more often with vaccinations).

III. Iatrogenies associated with preventive measures.

IV. Information iatrogenies.

V. Iatrogenic pseudodiseases.

VI. Other iatrogenies.

Blagodarov V.M. with co-authors (2001) gave the following classification of iatrogens:

- Iatrogenies that arose in connection with the implementation of preventive measures: the use of vaccines and serums, the violation of the epidemiological regime, which led to the emergence of an infectious disease.
- Iatrogenies arising in the process of diagnosis: technical errors during research, unnecessary (redundant) diagnostic procedures and manipulations.
- Iatrogenies that occurred during the treatment of the patient: side effects of drugs, their individual intolerance, incorrect prescription of drugs, risk when giving anesthesia, performing anesthesia or surgical interventions, wrong choice of treatment tactics and surgical methods, technical flaws during giving anesthesia, performing surgical interventions .
- Iatrogenies arising in connection with resuscitation measures and intensive therapy are caused by traumatic or non-traumatic complications, diseases of the living organism during secondary or closed heart massages, cardiac puncture, catheterization of large-caliber veins, during tracheal incubation and tracheotomy, artificial lung ventilation, during transfusion therapy, detoxification of the body, hyperbaric oxygenation.

- Iatrogenies arising in connection with changes in the patient's psyche: tactless or careless statements of the medical staff to him, the influence of medical information from various sources, self-medication with the use of various medicines.
- Iatrogenies arising in connection with defects in the organization of medical care, patient care.
- Iatrogenies arising as a result of inaction, i.e. failure to provide medical assistance to the patient for one reason or another.
- "Iatrogenic pseudo-diseases" as a result of an incorrect diagnosis, including with the use of computer technologies: inadequate treatment can negatively affect the development of a real disease that actually exists.

According to ICD-10, the group of iatrogenic consequences can include either accidental harm to a patient as a result of medical intervention (non-intervention) as a result of tactical or technical errors, or complications that are not the result of incorrect actions, or an abnormal reaction of the body to a medical action. According to A.V., Smolyannikov et al. (1995) iatrogeny can occur not only under the influence of the medical action that took place, which is absolutely necessary in the treatment of the patient, but also due to the fact that this action, which is mandatory during the treatment process, was not carried out, and thus the patient was harmed ("Iatrogeny with a negative sign"), that is, iatrogenies can arise as a result of medical and diagnostic passivity of the doctor, which is tantamount to not providing the necessary medical care.

Diagnosis and clinical and morphological analysis of iatrogenic pathology are complex and require a great deal of responsibility, which necessitates a thorough joint discussion by clinicians and pathologists of each case of iatrogenic pathology both at the dissection table and within the framework of the treatment and control commission and at the clinical-anatomical conference. It should be taken into account that the genesis of iatrogenia is often (up to 60%), but not always medical error.

Depending on the significance, V.V. Nekachalov suggests distinguishing iatrogenies into three categories:

- iatrogenies of the 1st category - diseases, pathological processes, unusual fatal reactions caused by inadequate, erroneous or incorrect medical actions, which became the direct cause of the fatal end;

- iatrogenies of category 2 - diseases, pathological processes, reactions, and complications caused by medical actions carried out according to substantiated evidence and performed correctly;

- iatrogenies of category 3 - diseases, pathological processes, reactions that do not have a pathogenetic connection with the main disease or its complication and do not play any significant role in the general thanatological assessment of the case.

Independent actions of the patient and actions of a non-medical nature are not the cause of iatrogenicity. For example, a pathological process that developed as a result of self-administration (without instructions or violating the instructions of medical personnel) is not iatrogenic. Any iatrogenic pathological process must be proven clinically or morphologically. Without conducting a patho-anatomical or forensic autopsy, the fact of the presence of an iatrogenic pathological process, which played a significant role in thanatogenesis, cannot be considered proven.

In the process of the main disease, its clinical and morphological picture can change - a pathomorphosis occurs with the development of new nosological forms, or so-called **"second diseases" against the background of transferred diseases** . For academician A.V. According to Smolyannikov, it is a **"second"** disease, a disease that is pathogenetically connected with the main one or was superimposed on it in the process of development; here he also includes diseases that arose in connection with medical interventions for another disease, with which they are not pathogenetically related. This "second disease" should be considered as an "iatrogenic disease", or iatrogenia.

A "second disease" is considered to be a disease that over time has lost its connection with the diseases that caused it, and has acquired an independent meaning. This is connected, on the one hand, with an increase in the average life expectancy of the population, and on the other, with the development of medical science, as a result of which patients are fully recovered, but severe consequences remain, which may be the cause of a new disease. This category includes diseases that arise as a result of various medical manipulations. The "second disease" can be caused by a hereditary malformation: defects of the immune system in diabetes; can also occur as a result of medical and diagnostic manipulations that cause a whole complex of changes: for example: adhesion disease of the abdominal cavity after peritonitis or surgical interventions.

Plan and organizational structure of classes (chronology map) .

1. Roll call and assignment (5 min)
2. Control of the initial level of knowledge (15 min)
3. Demonstration of macropreparations for those who died from iatrogenic diseases (40 min)
4. Macroscopic differential diagnosis of detected pathological processes (20 min)
5. Formulation of preliminary pathological diagnosis and epicrisis (10 min)
6. Summary of the teacher and tasks for the next class (5 min)

Class equipment:

- Medical history of the deceased
- Section hall of PAV hospital

List of recommended literature:

a) main:

29. Atlas of micropreparations in pathomorphology / I.I. Starchenko, B.M. Filenko, N.V. Royko and others; VDZU "UMSA". - Poltava, 2018. - 190 p

30. Neoplasms of the maxillofacial area in children / P.I. Tkachenko, I.I. Starchenko, S.O. Belokon and others. – Poltava: Col. "ASMI" - 2018. - 190 p.

31. The basics of pathology according to Robbins: in 2 volumes. Volume 1 / Vinay Kumar, Abul K. Abbas, John C. Astaire; translation of the 10th Eng. edition. Publisher: All-Ukrainian specialized publishing house "Medytsyna". – X II . - 2019. - 420 p.
32. The basics of pathology according to Robbins: in 2 volumes. Volume 1 / Vinay Kumar, Abul K. Abbas, John C. Astaire; translation of the 10th Eng. edition. Publisher: All-Ukrainian specialized publishing house "Medytsyna". – X II . - 2019. - 420 p.
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37. C tarchenko I.I. Special pathomorphology (basic course) for students of medical faculties of higher medical educational institutions III-I V levels of accreditation / I. I. _ Starchenko, N.V. Royko, B.M. Filenko. – Poltava, 2017. – 174 p.
38. Tuffaha S. A. Muin Immunohistochemistry in tumor diagnostics / S. A. Tuffaha Muin, S. G. Hychka, Gusky Hans. – "Book Plus", 2018. – 336.

Topic of the next seminar session:

" Preparation and holding of the meeting of the medical and control commission, the commission for the study of fatal consequences and the clinical and anatomical conference. Deontological and ethical aspects in patho-anatomical practice. "

Topic: " Preparation and holding of a meeting of the medical and control commission, the commission for the study of fatal consequences and the clinical-anatomical conference. Deontological and ethical aspects in patho-anatomical practice. »

I. Relevance of the topic:

Clinical and pathological-anatomical conferences are held with the aim of improving the qualifications of doctors and improving the quality of clinical diagnostics, identifying the causes and sources of errors in diagnosis and treatment at all stages of providing medical care, and organizational deficiencies. Treatment and control commissions are conducted for the purpose of competent and scientific verification of the methods and content of the doctor's treatment and diagnostic work, the correctness of the organization of the treatment process.

II. Purpose of the lesson:

Acquaint students with higher education with the basic principles of work and tasks of the clinical-pathological-anatomical conference and the medical and control commission.

The main questions of the topic :

1. Tasks of the clinico-pathological conference.
2. What cases are discussed at the clinicopathological conference.
3. Analysis of the results of the study of surgically removed organs and biopsies.
4. The procedure for holding a clinical and pathological conference.
5. Objective and subjective reasons for the discrepancy in diagnoses.
6. Tasks of the medical and control commission in a medical and preventive

institution.

7. The composition of the LCC and the procedure for conducting its work.

Topic content:

Treatment and control commission

The treatment and control commission (LCC) is organized in all treatment and prevention centers institutions

Tasks of the LCC:

1) systematic control of hospital departments, the completeness of clinical, laboratory, X-ray, electrocardiographic and other methods of examination of patients, the correctness and timeliness of their treatment, including operative interventions;

2) detection of defects in the operation of the operating unit, pharmacy, laboratory, X-ray, physiotherapy, pathology and other departments;

3) identification of deficiencies in the treatment and care of patients through selective study and verification of incoming complaints;

4) control over therapeutic nutrition of patients;

5) control over the correctness and timeliness of consultations;

6) systematic control over the introduction and widespread use of the latest research and treatment methods.

Clinical and morphological analysis of fatal consequences

Clinical and morphological analysis is a method of learning the circumstances of the occurrence of diseases, the peculiarities of their course, as well as the immediate causes and mechanisms of death.

The main methodological condition for clinical and morphological analysis is compliance with the principles of the unity of morphological and functional changes. At the same time, based on the study of clinical information about the patient's complaints, the nature of the symptoms that occurred during his life, physical, clinical and

laboratory and other data in their comparison with macroscopic, microscopic and ultrastructural changes, the pathologist reveals the degree of correspondence between the clinical manifestations of the disease and their morphological and functional changes.

The final clinical-expert opinion regarding each specific fatal outcome is taken collegially, when discussing the case at a meeting of the medical and control commission (LC K), the clinical-expert commission (KEK) and the clinical-pathological-anatomical conference at the health care institution. If a pathologist or other specialist disagrees with the conclusion of the meeting of the LC K , KEK and the clinico-pathological conference, this is recorded in the protocol (act) of the meeting and submitted for consideration to the KEK of the regional health management body.

Organization and procedure of the treatment and control commission

The medical and control commission is appointed to comprehensively and qualifiedly clarify the circumstances and features of the course of the disease, the immediate cause and mechanism of deficiencies in the provision of care to patients who died in this medical institution, as well as in the polyclinic, at home, in the area served by this institution.

The chief physician of the health care institution is responsible for the organization and state of the work of the commission, whose annual order determines the composition of the commission. As a rule, the chairman of the commission is the deputy chief physician for the medical department, the permanent members are the chief medical specialists, department heads, the head of the pathology department, and one of the resident clinicians as the secretary.

The final composition of the commission is established in an operational manner in depending on the nature of the disease in the deceased with necessary participation the pathologist or the doctor who performed the autopsy. Doctors who participated in treatment of the patient, members of the commission should not be appointed. Head of Commission is obliged to study all the necessary documentation related to this in case of death (medical history, extract from the patho-anatomical protocol examination of the

deceased and other materials), and appoint reviewer from the most qualified doctors of the medical and preventive institution. If necessary materials from other medical institutions are requested, where the patient was previously treated .

The meeting of the commission is scheduled no later than 20 days after the death the patient On short reports of the attending physician, pathologist , and reviewer are heard at commission meetings if there were shortcomings of the pre-hospital period. The meeting of the commission is recorded by the secretary.

The attending physician is obliged to substantiate the diagnosis given to the patient,

using the results of his examination for this purpose, to report how the disease developed, when and for what reason complications arose, what specific measures were taken in connection with this and their results.

The pathologist reports to the commission the patho-anatomical diagnosis and epicrisis, conducts a comparison of clinical and patho-anatomical diagnoses under all rubrics, provides information on the identified deficiencies in the provision of medical

care and their causes.

Based on the studied medical documentation, the reviewer reports and presents to the commission a written opinion on the timeliness of the patient's hospitalization, the completeness of his examination, the correctness of the treatment at the pre-hospital stage and during the hospital period.

By comparing clinical and pathological data, the reviewer establishes specific reasons for the mistakes made, suggests measures to prevent them in future. In cases of differences of opinion between the pathologist and the attending physician, the reviewer substantiates one of them or offers his own, using data from the scientific literature for this purpose. It determines the dependence of the errors of the attending physician on the entire system

of organization of medical and diagnostic work in the hospital.

The commission is obliged to find out the circumstances of the occurrence of the disease (injury), the peculiarities of its course, thanatogenesis, to establish the quality of the provision of medical care, to develop specific practical measures for the elimination and prevention of identified deficiencies.

When analyzing medical care at the pre-hospital stage, the commission establishes:

- the state of active detection of patients and the timeliness of the patient's initial request for medical assistance;
- completeness of examination in the polyclinic, quality and timeliness of diagnosis,
  correctness of treatment;
- timeliness of hospitalization;
- the correctness of transporting the patient to the medical institution;
- the quality of in-depth medical examinations and dispensary dynamic observation of the patient in the hospital.

When analyzing medical care during the hospital period, the commission establishes:

- completeness, reasonableness and timeliness of examination of the patient in the medical
  institution;
- timeliness the final diagnosis of the disease, his completeness and correctness;
- validity of medical appointments and operative interventions;
- the correctness of medical procedures and surgical operations;
- adequacy of postoperative management of the patient;

- maintaining consistency in the diagnosis and treatment of the patient at all stages of hospitalization.

Quality driving medical documentation is evaluated by the commission in accordance with each stage of hospitalization. At the same time, attention is drawn to the professional literacy of medical records, the completeness of the display of complaints, anamnestic information, data of an objective examination, the presence of records of visits by the head of the department, other officials; preoperative epicrisis, postoperative diagnoses, the state of keeping anesthesia charts and intensive care charts.

At the end of the work, the commission draws up an act, which is signed by all members of the commission.

In the event that the commission identifies shortcomings in the provision of medical care, the following must be indicated in the acts: the essence and nature of the shortcomings, where they were admitted, the surnames and initials of the doctors who admitted the shortcomings, to what extent the specific practical recommendations of the commission for the elimination and prevention of the identified shortcomings in the medical - preventive work of the hospital.

When the commission discovers deficiencies in the provision of medical care, admitted by doctors of other medical institutions, the chairman of the commission must send an extract from the report of the commission to the address of the corresponding chief doctor.

In cases of disagreement between the members of the commission, a re-examination of the fatal case is scheduled at the KEK of the regional health management body

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Clinical and anatomical conference

Clinical-anatomical conference provides a comprehensive and objective analysis of clinical and morphological materials with clarification of causes and sources errors in terms of hospitalization, diagnosis and treatment, detection of gaps organizational order in the medical service of the population, promotion qualifications of doctors.

At the clinico-pathological conference, the following are discussed:

- all cases of discrepancies between clinical and patho-anatomical diagnoses;
- all observations of scientific and practical interest;
- unusual course of the disease;
- cases of drug-induced diseases and drug-induced pathomorphosis of diseases;
- cases of death of patients after surgical, diagnostic and therapeutic interventions, especially those patients who were hospitalized urgently;
- acute infectious diseases;
- cases of late diagnosis, difficult to diagnose the disease, unclear cases that require joint discussion.

At one of the conferences, a report on the past work is being discussed year of the head of the pathology bureau, head of the pathology department (children's pathology department), in which summary data on in-hospital mortality and quality analysis should be presented diagnostics and shortcomings of medical care at all stages of patient treatment.

On clinical and patho-anatomical conferences are obliged to be the chief doctor, his deputies in the medical department, all doctors are present of this medical and preventive institution, as well as doctors of those medical and preventive institutions who participated in the examination and treatment of the patient at the previous stages.

Clinical-pathological-anatomical conferences are held regularly, during working hours, at least once a month.

The agenda of the next clinical and pathological anatomical conference is brought

to the attention of the doctors of the health care institution no later than 7 days before the conference. The preparation of the clinico-pathological conference is carried out by the deputy chief physician for the medical part and the head of the department of the pathological bureau (pathological department).

To cancel the discussion of the case proposed by the boss the pathology bureau, the head of the pathology department,
the administration of the health care institution has no right.

To conduct a clinical-pathological conference, the head of the medical institution appoints two co-chairs (clinician and head of the pathology bureau, head of the pathology department), as well as an opponent from among the most qualified doctors (therapist or pediatrician, surgeon, pathologist, and others).

Two permanent members are appointed to keep the minutes of the conference secretaries from the hospital team.

It is appropriate to limit the agenda of the conference to the discussion of one observation.

The cases to be discussed are reported by treating doctors, the pathologist who performed the autopsy of the deceased, the reviewer who analyzed the data from the medical card of the inpatient (for maternity hospitals, the history of childbirth, the history of the development of the newborn), the quality of the examination, the maintenance of medical documentation, and then it is discussed by the participants of the conference, including doctors of another specialty who participated in the diagnosis of the disease.

The administration of the health care institution, based on the materials, conclusions and proposals of the clinico-pathological conference, develops and implements measures to prevent and eliminate deficiencies in the organization and provision of medical care to the patient.

When comparing the final clinical and pathological diagnoses, only the diagnosis recorded on the first page of the medical history is taken into account; in the clinical and patho-anatomical diagnosis, the main disease, complications of the main disease and concomitant disease must be clearly

distinguished. The date of diagnosis of each disease and its complications must be indicated on the title page and in the epicrisis of the medical history.

In monocausal final clinical and patho-anatomical only the corresponding one should appear in the diagnoses as the main disease nosological unit. Clinical diagnosis cannot be replaced by enumeration syndromes or symptoms of the disease. In the patho-anatomical diagnosis it has to be the morphogenetic essence of the disease.

When conducting clinical and pathological examinations conferences follow take into account that in modern conditions, especially the elderly, there are often two or more diseases at the same time that develop independently of each other, or are in complex pathogenetic relationships.

Among these diseases, it is not easy, and quite often it is impossible to single out the main ones. This situation made it necessary to enter into the diagnostic definition of concepts and terms - competing, combined, background disease, combined underlying disease. Placement in the diagnosis and epicrisis of the detected diseases in accordance with these concepts allows us to more clearly imagine their interdependence and the influence of one on the other, as well as the importance of each disease and its complications in the r enesis of death; at the same time, it is possible to think more reasonably about the expediency, completeness and timeliness of treatment and diagnostic measures.

Complications of diseases include those pathological processes that are pathogenetically directly related to the main disease, but in some cases may have a different etiology (for example: purulent meningitis with purulent otitis, peritonitis with perforated stomach ulcer and others).

In cases where death did not occur from the main disease or a complication of the main disease, but from the use of medical or even diagnostic procedures and manipulations, special headings are provided. For example, ICD rubrics E936 (accidents and complications occurring during surgical and other types of treatment), N 960-979 (adverse

complications associated with the administration of drugs and other medicinal substances),

N 997 (specific complications associated with some surgical interventions), N 998 (other complications due to medical interventions).

When discussing such cases at the conference, the following options for their analysis are possible:

- The medical actions that caused the patient's death were taken based on a false diagnosis. In similar cases, these actions (operative, diagnostic intervention, reactions to medications, radiation energy, etc.) are assigned to the place of the main disease in the diagnosis in accordance with the ICD rubrics E930-E936.
- Medical actions that caused the death of the patient were performed in accordance with certain indications, but were performed incorrectly, which led to the death of the patient (for example, transfusion of blood of a different group than the patient, excessively cooled, hemolyzed; overdose of potent drugs, gross error during operative intervention, conducting anesthesia, etc.). Such cases usually become the subject of a forensic examination. As in the previous category, the actions that led to the death of the patient should appear in the diagnosis at the place of the main disease.
- The medical actions that led to the patient's death were "adequate", that is, applied on the basis of correctly established indications and carried out correctly. Its adverse effect was related to individual intolerance or severity of the condition and neglect of the disease, which could not be determined before. In such cases, the actions that led to the death of the patient, although they can formally be included in one of the above-listed categories of the ICD, should be included in the

group of complications. However, complications of this nature should be distinguished

from the total mass of detected complications of the main disease, which developed as a result of the natural course of the disease. Thus, in the analysis, it is necessary to distinguish two categories of complications - "complications

of the disease" and "complications from treatment". The last group should include processes related to medical actions, if they led to the death of the patient.

At the clinico-patho-anatomical conference, the categories and reasons for the discrepancy in the final clinical - patho-anatomical diagnoses must be discussed.

Given that the clinical diagnosis must be not only correct, but also timely, all sectional observations when the clinical and pathological diagnoses coincide are analyzed in relation to the timeliness of their establishment; the materials of this analysis are discussed at clinical and pathological-anatomical conferences, and are given in the reports of the pathological-anatomical

department.

Sources and causes of false clinical diagnoses can be objective and subjective. The objective reasons for a false clinical diagnosis are due to the short duration of the patient's stay in a medical institution, the difficulty and impossibility of his examination due to his serious condition,

atypical development and the course of the process or insufficient study of the disease.

Subjective causes of erroneous clinical diagnosis are determined by the level of training and qualification of the doctor. When analyzing these two categories of errors, in

each case, the specific reasons for their origin are indicated and highlighted

(severe condition of the patient that does not allow for his examination, atypical or asymptomatic course of the disease, rarity of the disease, insufficient laboratory tests, attention to history, etc.).

Analyzing the cases in which there were discrepancies in the diagnoses, it is necessary to single out those of them when the main disease and the fatal complication were recognized late, which led to the untimeliness of rational treatment and the fatal outcome.

Based on the tasks facing the clinico-pathological conferences, it is necessary that the analysis of the mistakes made should be fundamental, and the speeches at them should not have the character of accusations against individuals who made certain mistakes. The benefit for patients in the future and the improvement of medical qualifications should be the main goal of clinical-pathological comparison.

When controversial issues arise in the formulation of the final diagnosis, its final version is established not by a simple vote of those present at the clinical-pathological-anatomical conference, but by the clinical-expert commission of the Ministry of Health of Ukraine in the specialty "pathological anatomy" or by a group of expert pathologists in agreement with the chief freelance specialist of the Ministry of Health of Ukraine with the specialty "pathological anatomy".

ETHICAL AND LEGAL STANDARDS WORKS OF DOCTOR-PATHOLOGIST

Determination of biological death.

The biological death of a person is ascertained a medical worker. Death of patients can be confirmed at home medical an emergency medical service worker or a family member a doctor, and in the case of their absence in rural areas - a medical one a

middle-ranking employee. The fact of biological death is recorded in the medical record documentation of the deceased at the time of death in a health care institution; in the act statement of death made by a medical worker who established death, when death occurs outside a health care institution. Act of ascertainment of death is issued by a medical worker to relatives of the deceased or persons who represent his interests.

security purposes the right to respect the body of the deceased the medical worker who ascertained death is obliged to take measures, which exclude the deformation of tissues caused by cadaveric incantation (close eyes of the deceased, fix the lower one jaw and give the body of the deceased horizontal position on the back). In case of death outside the institution of health care, the specified measures are carried out with the permission of the employee of the bodies of internal affairs after examining the body of the deceased at the place of death. The call of the employee of the internal affairs bodies and the service of transportation (evacuation) of the dead is carried out by a medical worker, who ascertained death _

In the event of death in health and social care institutions provision and in places of deprivation of liberty, a medical worker stated death, upon referral the body of the deceased to the post-mortem office must indicate in the medical documentation of the deceased, the presence of valuables (jewelry, dental prostheses made of precious metals, etc.) that are on the deceased. Information is also entered into the medical records of the deceased about documents, money and valuables deposited by the patient during admission to the institution. In case of death at home, medical the employee who ascertained death, together with the employee of the internal affairs bodies, is obliged to examine the body of the deceased and make a description of the documents, money and valuables found there with the deceased The description is made in two copies by signature a medical worker who confirmed death, and an employee of internal affairs bodies. At this documents, money and valuables that are with the deceased, with one a copy of the description is delivered by an employee of the internal affairs bodies to storage in the Department of Internal Affairs. The second copy of the description with the body the deceased is heading to pathology bureau.

The procedure for reporting the death of a patient.

In case of death of the patient in health care institution and inpatient social service institution information about this is communicated by the treating doctor (on duty) to the specified person by a patient during admission to a medical institution. In the absence of such persons, this information is transferred to the internal affairs authorities at the place of residence of the deceased indicated in the medical documentation, who are obliged to inform the relatives of the deceased or persons representing the interests of the deceased. In the event of the death of a patient in places of deprivation of liberty, the obligation to informing relatives or persons representing interests the deceased relies on the administration of the institution at the place of death .

About respect for the body of the deceased. The attitude towards the body of the deceased should to correspond to the deceased's lifetime expression of will, excluding cases mandatory pathological autopsy. The corpse, its organs and tissues are not can be the subject of sales and commercial transactions.

In the absence of a written will manifestation of will patient and in the absence of relatives, other representatives of the deceased or at impossibility of carrying out the burial of corpses by them after establishing the cause death can be transferred to educational institutions of health care or research institutions of health care for use in educational and scientific goals After the end of using the corpse for educational or scientific purposes an educational or research institution is obliged to provide burial troupe through a specialized service.

When conducting a pathological autopsy, it is allowed to take organs and tissues of a corpse for diagnostic, educational and scientific purposes, which is recorded in the medical documentation.

The right of citizens information about the results of the pathological examination research. Information about the results of the post-mortem examination of the corpse is issued in writing by the institution, where this study was conducted. The right to receive a conclusion on a patho-anatomical autopsy is granted to a relative of the deceased who received a death certificate, or to other legal representatives of the

deceased. Pathologists, like other medical professionals, are responsible for concealment and/or deliberate distortion of information about the results pathological autopsy in accordance with the legislation.

Plan and organizational structure of employment (chronology map) :

1. Roll call and assignment (5 minutes).
2. Control of the initial level of knowledge (15 minutes).
3. Situational game "clinical co -pathological conference" using autopsies and conference protocols.
4. Familiarization with the protocols of the LKK (50 minutes).
5. Analysis of the game, interview with the teacher after individual questions of the researched topic (15 minutes).
6. Summary of the teacher and tasks for the next lesson (5 minutes).

Examples of issues of non-programmed control .

1. What are the main tasks of the clinical and co -pathologist of the conference.
2. What issues are discussed at the clinical and co - pathologist conference .
3. The procedure for organizing a clinical conference with a co- pathologist .
4. Reasons for discrepancies in diagnoses. Misdiagnosis.
5. Tasks of the medical and control commission, the procedure for organizing its work.

Learning algorithm for independent work of students of higher education .

Under the guidance of the teacher, the student gets acquainted with the protocols of meetings of the clinic and the co-pathologist of annual conferences and medical and control commissions.

Employment equipment.

Protocols of meetings of clinical-pathological-anatomical conferences and treatment-control commissions, medical histories of deceased patients, with expert reviews.

List of recommended literature:

a) main:

✓ Atlas of micropreparations in pathomorphology / I.I. Starchenko, B.M. Filenko, N.V. Royko and others; VDZU "UMSA". - Poltava, 2018. - 190 p

✓ Neoplasms of the maxillofacial area in children / P.I. Tkachenko, I.I. Starchenko, S.O. Belokon and others. – Poltava: Col. "ASMI" - 2018. - 190 p.

✓ The basics of pathology according to Robbins: in 2 volumes. Volume 1 / Vinay Kumar, Abul K. Abbas, John C. Astaire; translation of the 10th Eng. edition. Publisher: All-Ukrainian specialized publishing house "Medytsyna". – X II . - 2019. - 420 p.

✓ The basics of pathology according to Robbins: in 2 volumes. Volume 1 / Vinay Kumar, Abul K. Abbas, John C. Astaire; translation of the 10th Eng. edition. Publisher: All-Ukrainian specialized publishing house "Medytsyna". – X II . - 2019. - 420 p.

✓ Pathomorphology. General pathomorphology: a study guide / edited by Ya. Ya. Bodnara, V.D. Voloshina, A.M. Romanyuk, V.V. Gargin. - New Book, 2020. - 248 p.

✓ Pathomorphology of the main disorders of the cardiovascular system: study guide / I.I. Starchenko, B.M. Filenko, N.V. Royko – Poltava: "UMSA". - 2019. - 150 p.

✓ Workshop on biopsy-sectioning course / I.I. Starchenko, A.P. Hasyuk, S.A. Proskurnya [etc.] – Poltava, 2016. – 160 p.

✓ I.I. Starchenko Pathomorphology of the main diseases of the maxillofacial region: academician. manual / I.I. Starchenko, B.M. Filenko, V.V. Chernyak ; "UMSA". – Vinnytsia: Nova Kniga, 2019. – 128 p.

✓ C tarchenko I.I. Special pathomorphology (basic course) for students of medical faculties of higher medical educational institutions III-I V levels of accreditation / I. I. _ Starchenko, N.V. Royko, B.M. Filenko. – Poltava, 2017. – 174 p.

✓ Tuffaha S. A. Muin Immunohistochemistry in tumor diagnostics / S. A. Tuffaha Muin, S. G. Hychka, Gusky Hans. – "Book Plus", 2018. – 336.

Topic of the next seminar session:

" Control of practical skills and theoretical knowledge. Credit class. "

Topic: Control of practical skills and theoretical knowledge. Credit class.

Goal: to check the ability of students of higher education to describe micro- and macropreparations with the grant of the conclusion of the pathological process according to the topics of the final control.

Basic concepts: see above according to the topics of the final control.

Equipment: set of macro preparations (or their images in electronic form), set of micro preparations (or their images in electronic form), microscope, set of tables, multimedia projector, laptop

Plan: ***1. Organizational activities*** (greetings, verification of those present, announcement of the topic, purpose of the lesson, motivation of higher education seekers to study the topic).

2. Control of the reference level of knowledge

2.1. Frontal survey of knowledge of terminology on the topic:
emphasize the definition or provide an explanation.

2.2. block diagram on the topic as a list of didactic units of the topic;

see above according to the topics of the final control.

2.3. A list of questions for checking basic knowledge on the subject of the lesson.

1. Describe the micropreparation, draw a conclusion.
2. Describe the macropreparation, draw a conclusion.
3. Definition of this pathological process.
4. Complications and causes of death of this pathological process.

3.0 Formation of professional skills and abilities (mastering the skills of diagnosing a pathological process based on the description of microscopic and macroscopic changes in tissues and organs, followed by sketching of micropreparations and description of macropreparations in the album):

3.1 test tasks

see above according to the topics of the final control.

3.2. algorithm for describing a macropreparation and a micropreparation

Description of macropreparation:

1. Specify the name of the organ or ego part;
2. Specify the dimensions of the body (length, width, thickness);
3. Specify the surface of the organ, the condition of the capsule, overlap;
4. Specify the consistency of the organ;
5. The type and structure of the organ at autopsy;
6. Indicate the presence of a pathological formation (if any);
7. Conclude.

Description of the micropreparation:

1. Specify the name of the body;
2. Specify the color;
3. Specify what changes in cells;
4. Conclude.

3.3. Evaluation criteria

When assessing the mastery of each topic, the student is given grades on a 4-point (traditional) scale ("2", "3", "4", "5").

Evaluation of theoretical knowledge on the subject of the lesson:

- methods: survey, solving a situational clinical problem, tests
- the maximum score is 5, the minimum score is 3, the unsatisfactory score IS 2 .

Assessment of practical skills on the topic of the lesson:

- methods: assessment of the correctness of the performance of practical skills
- the maximum score is 5, the minimum score is 3, the unsatisfactory score IS 2.

The grade for one practical session is the arithmetic average of all components and can only have a whole value (5, 4, 3, 2), which is rounded according to the statistical method.

Rating	**Evaluation criteria**
"5"	The student is fluent in the material, takes an active part in discussing and solving situational clinical problems, tests, confidently demonstrates practical skills during micro- and macroscopic diagnosis of pathological processes in organs and tissues according to the algorithm, expresses his opinion on the subject of the lesson, demonstrates clinical thinking.
"4"	The applicant has a good command of the material, participates in the discussion and solution of the situational clinical problem, tests, demonstrates practical skills during micro- and macroscopic diagnosis of pathological processes in organs and tissues according to the algorithm, with some errors, expresses his opinion on the topic of the lesson, demonstrates clinical thinking .
"3"	The applicant does not have sufficient knowledge of the material, is unsure of participating in the discussion and solution of the situational clinical problem, tests, demonstrates practical skills of micro- and macroscopic diagnosis of pathological processes in organs and tissues with significant errors.
"2"	The applicant does not possess the material, does not participate in the discussion and solution of the situational clinical problem, does not demonstrate practical skills of micro- and macroscopic diagnosis of pathological processes in organs and tissues.

4. Summary:

At the end of the lesson, a general assessment based on the sum of theoretical knowledge and practical skills on the topic is presented and emphasized, with further recording in an electronic journal.

5. Recommended literature and information resources

Main:

1. Atlas of micropreparations in pathomorphology / I.I. Starchenko, B.M. Filenko, N.V. Royko, etc.; VDZU "UMSA". - Poltava, 2018. - 190 p
2. Fundamentals of pathology according to Robbins: in 2 volumes. Volume 1 / Vinay Kumar, Abul K. Abbas, John C. Astaire; translation of the 10th Eng. edition. Publisher: All-Ukrainian specialized publishing house "Medytsyna". – X II . - 2019. - 420 p.
3. Pathomorphology. General pathomorphology: a study guide / edited by Ya. Ya. Bodnara, V.D. Voloshina, A.M. Romanyuk, V.V. Gargin. - New Book, 2020. - 248 p.
4. Pathomorphology of the main disorders of the cardiovascular system: study guide / I.I. Starchenko, B.M. Filenko, N.V. Royko – Poltava: "UMSA". - 2019. - 150 p.

Additional:

1. Pathomorphology: National handyman / V.D. Markovskyi, V.O. Tumanskyi, I.V. Sorokina [and others]; edited by V.D. Markovsky, V.O. Tumanskyi. - K.: VSV " Medicine " , 2015. - P. 733-934.

Electronic information resources

1. http://moz.gov.ua – Ministry of Health of Ukraine
2. www.ama-assn.org – American Medical Association
3. www.who.int - World Health Organization
4. www.dec.gov.ua/mtd/home/ - State Expert Center of the Ministry of Health of Ukraine
5. http://bma.org.uk - British Medical Association
6. www.gmc-uk.org - *General Medical Council* (*GMC*)
7. www.bundesaerztekammer.de – German Medical Association
8. http :// library . Med . utah _ edu / WebPath / webpath . html - Pathological laboratory
9. http://www.webpathology.com/ - Web Pathology