

**MINISTRY OF HEALTH OF UKRAINE
POLTAVA STATE MEDICAL UNIVERSITY**

Department of general surgery

**METHODICAL INSTRUCTIONS
FOR STUDENT SELF-DIRECTED WORK
WHEN PREPARING FOR AND DURING PRACTICAL CLASS**

Study discipline	General surgery
Module №2	Necrosis. Bases of transplantology and clinical oncology. Methods of examination of surgical patients
Content module 2.	Fundamentals of transplantology and clinical oncology.
Lesson theme №29	Tumors. Etiology, pathogenesis. Benign and malignant tumors. Histogenetic, morphological, clinical and international (TNM) classification. Clinical groups of cancer patients. Clinical manifestations. Methods of diagnostics. Principles of treatment.
Years of study	<i>III</i>
Faculty	International

Poltava

Content module 2.	Fundamentals of transplantology and clinical oncology.
Lesson theme №29	Tumors. Etiology, pathogenesis. Benign and malignant tumors. Histogenetic, morphological, clinical and international (TNM) classification. Clinical groups of cancer patients. Clinical manifestations. Methods of diagnostics. Principles of treatment.

1. Relevance of the topic:

Despite the modern development of medicine, the diagnosis and treatment of tumors remains a rather complex and urgent problem. This problem is complicated by the constant increase in the number of patients with tumors, the appearance of atypical and late diagnosed clinical forms, and the lack of adequate medical and instrumental support for hospitals. The need for timely diagnosis of different types of tumors is an important task for a doctor of any specialty. An important place in the complex treatment of patients in a surgical hospital is the need to study such an important section as tumors. Familiarization of students with the examination technique, clinical signs of the tumor process in benign and malignant forms of their course and modern methods of diagnosis and treatment is a necessary component of knowledge for the future doctor and nurse.

2. Specific objectives :

1. Know the organization of cancer care in Ukraine.
2. Know the etiology and pathogenesis of malignant tumors.
3. Know the epidemiology of malignant tumors.
4. Know the international classification of tumors.
5. Know the clinic of individual malignant and benign tumors (cancer of the skin, lower lip, breast, atheroma, lipoma).
6. Know the principles of treatment of tumors.
7. To be able to differentiate between benign and malignant tumor growth
8. To take hold of the diagnostic technique for benign soft tissue tumors: atheromas, lipomas.
9. To be able to diagnose according to the clinical symptoms of a patient with a tumor according to the international classification of TNMP .

3. Basic knowledge, skills needed to study the topic (interdisciplinary integration).

Names of previous disciplines	Acquired skills
1. Latin	Have Prescription Writing Skills
2. Anatomy	Anatomical features of tumors
3. Biochemistry	To be able to interpret the analysis of blood, urine, blood biochemistry

4. Histology	Know the structure of tumors
5. Pathanatomy	Pathological signs of tumors, impaired function

4. Tasks for independent work during preparation for the lesson.

4.1. The list of basic terms , parameters, characteristics that a student must learn in preparation for the lesson:

Termin	Definition
Precancer	These are different processes and conditions that precede malignant tumors and often turn into them
Tumor	This is an atypical tissue neoplasm, which is characterized by infinity of growth, inappropriateness, relative autonomy and progression
Carcinoma or cancer	Name of malignant tumors from epithelial tissue
Sarcoma or blastoma	Name of malignant tumors of mesenchymal and neuroectodermal origin

4.2. Theoretical questions for the lesson:

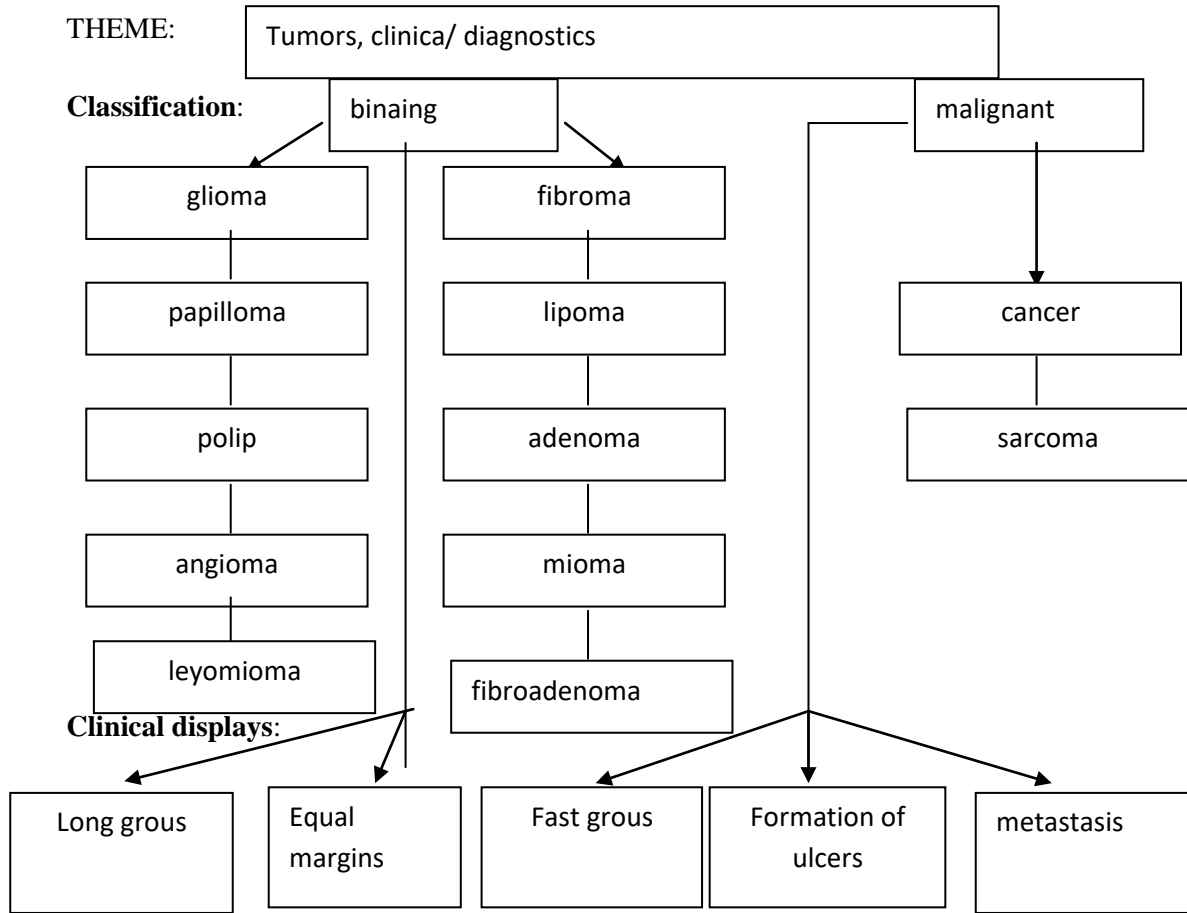
1. Organization of the provision of cancer care in Ukraine.
2. Etiology and pathogenesis of malignant tumors.
3. The epidemiology of malignant tumors.
4. International Classification of Tumors (TNM).
5. Clinical manifestations of cancer of the skin, lips, breast; atheromas, lipomas.
6. Principles of treatment of tumors.
7. Differentiation of benign and malignant growth.
8. Diagnosis of a benign tumor (atheroma and lipoma) in a patient.
9. Evaluation of the data of additional examination methods in a patient with a tumor.

4.3. Practical work (task) that are used in the lesson:

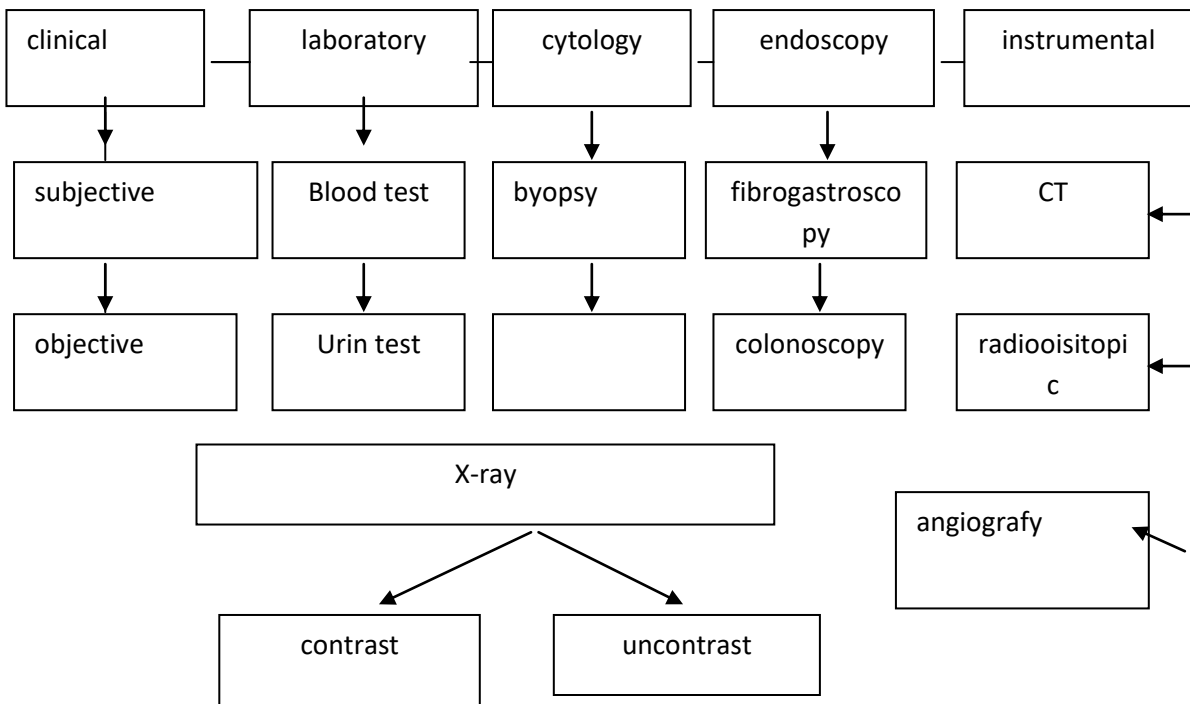
1. The technique of stopping arterial bleeding;
2. Treatment of necrotic and ulcerative areas of soft tissues;
3. The technique of suturing and removing stitches;
4. Prepare a set of tools for surgical interventions;
5. Prepare the patient for additional instrumental examination methods.

5. The content of the topic.

Structural-logical scheme of the topic.



Types of diagnostics:



benign tumor

A **benign tumor** is a mass of cells (tumor) that lacks the ability to either invade neighboring tissue or metastasize (spread throughout the body). When removed, benign tumors usually do not grow back, whereas malignant tumors sometimes do. Unlike most benign tumors elsewhere in the body, benign brain tumors can be life-threatening. Benign tumors generally have a slower growth rate than malignant tumors and the tumor cells are usually more differentiated (cells have more normal features). They are typically surrounded by an outer surface (fibrous sheath of connective tissue) or stay contained within the epithelium. Common examples of benign tumors include moles and uterine fibroids.

Although benign tumors will not metastasize or locally invade tissues, some types may still produce negative health effects. The growth of benign tumors produces a "mass effect" that can compress tissues and may cause nerve damage, reduction of blood flow to an area of the body (ischaemia), tissue death (necrosis) and organ damage. The health effects of the tumor may be more prominent if the tumor is within an enclosed space such as the cranium, respiratory tract, sinus or inside bones. Tumors of endocrine tissues may overproduce certain hormones. Examples include thyroid adenomas and adrenocortical adenomas.

Although most benign tumors are not life-threatening, many types of benign tumors have the potential to become cancerous (malignant) through a process known as tumor progression. For this reason and other possible negative health effects, some benign tumors are removed by surgery.

Risk Factors

- harmful production
- environmental pollution
- smoking
- addiction, substance abuse
- alcohol abuse
- ionizing radiation
- ultraviolet radiation
- hormonal disbalance
- immunity disorders
- viral infection
- injuries
- malnutrition

Types of benign tumors

Benign neoplasms develop from all body tissues.

Fibroma - this tumor grows from the connective tissue, often found in the connective tissue of the female genital organs, as well as in the subcutaneous connective tissue.

Lipoma - a tumor from adipose tissue practically does not differ in structure from normal adipose tissue and has a capsule that limits its boundaries. It is mobile and can be painful.

Chondroma grows from cartilage, often at the site of injury or tissue damage, characterized by slow growth.

Neurofibromatosis (Recklinghausen disease) is the formation of many fibroids and age spots, accompanied by inflammation of the nerves.

Osteoma is a bone tumor with a clear border, most often a single and congenital.

Fibroids are single or multiple encapsulated muscle tissue tumors. *Leiomyoma* - from smooth muscle tissue, *rhabdomyoma* - from striated muscle tissue.

Angioma - this benign tumor develops from blood vessels, looks like a very dilated sinuous vessels located under the skin.

Hemangiomas are congenital formations with dilated capillaries.

Lymphangioma is a benign tumor of the lymphatic vessels. Congenital, continues to grow in childhood.

Glioma - a tumor of neuroglial cells.

Neurinoma is a benign tumor that develops in the peripheral nerves and roots of the spinal cord, less often from cranial nerves.

Epithelium is the most common type of benign tumor, growing from squamous epithelium.

Adenoma - a tumor from the gland tissue.

A *cyst* is a benign mass that has a soft cavity, sometimes with fluid inside. In some cases, it can grow very rapidly.

Stages of benign tumor growth

Stage 1 - initiation, DNA mutation under the influence of adverse factors.

Stage 2 - promotion, cells begin to divide. The stage takes several years.

Stage 3 - progression, relatively rapid growth and increase in tumor size. Compression of neighboring organs is possible.

The development of a benign tumor takes quite a long time, in some cases for decades.

Diagnosis of benign tumors

As a rule, there are no symptoms of a benign tumor for a long time. They are discovered by chance during preventive examinations, or patients themselves notice the appearance of any formation.

Complaints arise only in some cases: adrenal adenoma (pheochromocytoma), for example, causes an increase in blood pressure and related symptoms, a brain tumor - unpleasant sensations associated with compression of the brain and increased intracranial pressure.

Benign tumor treatment

Benign neoplasms are usually removed surgically. In some cases, drug therapy (hormonal) is also used. If the tumor does not cause any inconvenience and does not pose a threat to the patient, then the question of surgical intervention is decided depending on the condition of the patient and the presence of contraindications for surgery.

Indications for surgical removal of a benign tumor:

1. if the formation is constantly injured (for example, when localized on the neck or scalp)
2. if the tumor disrupts the body
3. at the slightest suspicion of a malignant tumor (in this case, cells are examined during the operation)
4. when a neoplasm spoils a person's appearance

The formation is removed entirely, in the presence of a capsule - with it. The removed tissue must be examined in the laboratory.

Method of raising of diagnosis in obedience to international classification (TNMP)

Mandatory parameters]

- **T:** size or direct extent of the primary tumor
 - Tx: tumor cannot be assessed
 - Tis: [carcinoma in situ](#)
 - T0: no evidence of tumor
 - T1, T2, T3, T4: size and/or extension of the primary tumor
 - T₁ – tumour to 2th sm;
 - T₂ – tumour 2 sm and anymore (2-5 sm) with infiltration more deep layers;
 - T₃ – a tumour germinates in a depth organ with partial limitation of him mixed (5-10 sm);
 - T₄ – tumour, that goes beyond scopes organ with complete limitation of mixed
 - **N:** degree of spread to regional [lymph nodes](#)
 - Nx: lymph nodes cannot be assessed
 - N0: no regional [lymph nodes metastasis](#)
 - N1: regional lymph node metastasis present; at some sites, tumor spread to closest or small number of regional lymph nodes
 - N2: tumor spread to an extent between N1 and N3 (N2 is not used at all sites)
 - N3: tumor spread to more distant or numerous regional lymph nodes (N3 is not used at all sites)
- symbol N - nodulus
-
- Symbol M –mts

 - M0 – metastases are absent;
 - M1 – metastasis to distant organs (beyond regional
 - lymph nodes)
 - The Mx designation was removed from the 7th edition of the AJCC/UICC system, but referred to cancers that could not be evaluated for distant metastasis.
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- symbol P – deeps of tumors

 - p1 – defeat of only mucous membrane;
 - p2 – defeat undermucos layer of organ;
 - p3 – the staggered musculus layer, to sub serous;
 - p4 – germination on all depth of wall

Other parameters

- **G (1–4):** the *grade* of the cancer cells (i.e. they are "low grade" if they appear similar to normal cells, and "high grade" if they appear poorly differentiated)

- **S** (0–3): elevation of serum tumor markers
- **R** (0–2): the completeness of the operation (*resection*-boundaries free of cancer cells or not)
- **L** (0–1): invasion into lymphatic vessels
- **V** (0–2): invasion into vein (no, microscopic, macroscopic)
- **C** (1–5): a modifier of the **certainty** (quality) of the last mentioned parameter (has been removed in the TNM 8th edition)

Prefix modifiers

- **c**: stage is determined from evidence acquired before treatment (including clinical examination, imaging, endoscopy, biopsy, surgical exploration). The c-prefix is implicit in absence of the p-prefix.
- **p**: stage given by histopathologic examination of a surgical specimen
- **y**: stage assessed after chemotherapy and/or radiation therapy; in other words, the individual had neoadjuvant therapy.
- **r**: stage for a recurrent tumor in an individual that had some period of time free from the disease.
- **a**: stage determined at autopsy.
- **u**: stage determined by ultrasonography or endosonography. Clinicians often use this modifier although it is not an officially defined one

For the T, N and M parameters exist subclassifications for some cancer-types (e.g. T1a, Tis, N1i)

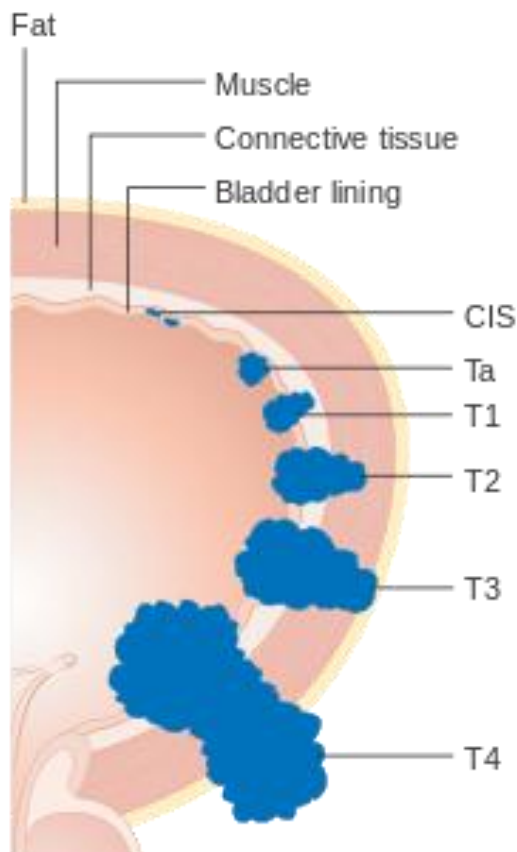


Diagram showing the T stages of [bladder cancer](#)

UICC Stage and AJCC Prognostic Stage Groups

The TNM system is used to record the anatomical extent of disease. It is useful to condense these categories into groups. carcinoma in situ is categorized stage 0; often tumors localized to the organ of origin are staged as I or II depending on the extent, locally extensive spread, to regional nodes are staged as III, and those with distant metastasis staged as stage IV. However, in some tumor types stage groups do not conform to this simplified schema. The stage group is adopted with the intention that categories within each group are more or less homogeneous in respect of survival, and that the survival rates are distinctive between groups. The Union for International Cancer Control (UICC) uses the term **Stage** to define the anatomical extent of disease. The American Joint Committee on Cancer (AJCC) uses the term **Prognostic Stage Group** which may also include additional prognostic factors in addition to anatomical extent of disease.

Method of conducting of differential diagnostics of high quality and malignant tumors

Of high quality tumours	Malignant tumours
Histological insignificant deviations are given from maternal fabric	Histological give sharp, atipic rejections, immature forms – aplasiya of maternal fabric
Expansive growth	Infiltration growth
Grow slowly, evenly	Grow quickly, aggressively
Tissues do not germinate in surrounding	Germinate and damage surrounding fabrics
Metastases are not given	As a rule metastases
The common state of patient is not violated	Acute decline of forces, cachexy
After the surgical deleting the relapses are not given	After the surgical deleting the relapses are often given
Possible self-healing	self-healing does not come

Algorithm of inspection of tumor formation of soft tissues

Task	Pointing	Notes
1. To conduct palpation of education	1. By careful motions to touch to education, to check up the sickliness of him, union with surrounding fabrics, his structure, sizes. 2. The palpate regional lymphatic nodules. To define their sizes, sickliness, union with surrounding fabrics	At palpation of skin and hypodermic-fatty cellulose it is possible to define the soft lobules of of high quality tumour of fatty tissues (lipomi). Ateroma–rounded, elastic, a skin above them does not undertake in a fold. If megascopic, dense painless regional nodulus are exposed, it is possible to suspect regional metastases

VI. System of teaching tasks for verification of eventual level of knowledges.

Situation tasks.

1. Sick T., 69 years, entered permanent establishment with complaints about permanent constipations by duration of to 3 days. Appearance of emptying marks only after raising of enemas. Regularly at the end of act of defecation on an excrement finds tracks of fresh blood. At the clinical inspection the pathology is not exposed. Finger research of rectum did not expose pathology. General blood test: red corpuscles – $3 \times 10^{12}/l$, haemoglobin – 100 g/l, to SOY – 21 mm/g.

At you there was suspicion on a presence at the patient of tumour of distal prst of colon. What special methods of research do you use for verification of dignosis?

2. Patient With., 65 years, sm in a diameter appealed to the surgeon with complaints about a presence in area of hairy part of head of three rounded educations from 1 to 2, which first found 3-4 years to that backwards. They are slowly multiplied, clear, even contours painless are had, hard-elastic consistency, a skin above them is not displaced. What diagnosis will you put? What tactic of medical treatment?

3. To you a woman with a 4-years-old child came on the reception. At a boy from the moment of birth on a neck on the left is rose color of education to 2,5 sm in a diameter, which a bit comes forward on by the surface of skin, soft, painlessly, changes colouring at pressing on. Your preliminary diagnosis and recommendations on medical treatment?

4. Patient And., 22 years, entered permanent establishment with complaints about a presence in the lumbar department of by a volume education (to 7 sm in a diameter) which appeared about 4 years to that are backwards and slowly multiplied. At palpation it soft consistency, painlessly, with clear scopes, it is limited, mobile, with the skin of not connected. Your diagnosis and medical tactic?

5. Patient To., 35 years, appealed to the surgeon with complaints in the presence of by a volume education, by sizes 10x5 sm, in area of left buttock - femoral fold. A tumour interferes with a patient to sit, at palpation is a bit displaced, painless, soft consistency. Is operative medical treatment shown to the patient?

6. Patient B., 42 years, appealed to you for the help in connection with the presence of dense by a volume education to 2 to sm in a diameter in area of hairy part of head. A tumour relatively is quickly multiplied. At palpation: the closeness of education is stony, a skin above him is displaced, contours of clear, a tumour is immobile, painless. On a sciagram homogeneous with clear contours fabric on an external bone plate comes to light. What Your preliminary diagnosis and actions?

7. Patient In., a 51 year, entered permanent establishment with complaints about difficulty of breathing as a result of the «valvular closing» of right nasal motion. Periodically marks the nose-bleeds. At examination: nasal motion is sharply narrowed due to formation of the rounded form. On the sciagram of pathology of bones a nose is not exposed. Your diagnosis and recommendations?

8. A patient with P., 30 years, appealed to the doctor with complaints about a presence in the left milk gland of knot which first found about 2 years to that backwards. A knot is slowly multiplied. At examination in the upper external quadrant of gland of palpation the rounded is determined, to 2 sm in a diameter, education dense, painless, with an even surface. A skin above him is not changed, mobile. The axillary lymphatic nodulus are not megascopic. Your preliminary diagnosis and recommendations?

9. Sick, 58 years, appealed to you with complaints about a weakness, feeling of weight in epigastric, absence of appetite, belch, sometimes vomiting by the eaten meal, disgust for meat products. For the last 3 months lost kg in mass of body to 10. At examination: patient of the lowered feed. Skin covers are pale. A stomach is soft, moderately sickly in epigastrium. Peripheral lymphatic nodulus not palpate. Your reliable diagnosis, tactic of inspection?

10. On the reception a 70-years-old man with complaints about a periodic cough, coughing at the cough of sputum with a blood staining, weakness, rapid fatigueability came to the internist. Considers itself a patient the last 2 months. From 14 years smokes. At examination the easy pallor of skin covers is marked. At percussion thorax a pulmonary sound above both easy is determined. Are hearkened to dry and moist wheezes above the left lung. Your reliable diagnosis and tactic of inspection?

11. Sick, 68 years, appealed with complaints about rapid fatigueability, sharp losing weight in the last months. At the inspection megascopic supraclavicular lymphatic nodulus are exposed. In a blood there is the expressed anaemia, to SOY 56 mm/ch. In an ambulatory card is present record of urologist about that at a patient the cancer of prostate is diagnosed. What stage of disease at a patient?

12. A patient with O., 62 years, appealed to the internist concerning pain in right hypochondrium, back, general weakness, bad appetite, itch of skin. Objectively: patient of the lowered feed, skin and icteric sclera, a stomach is soft, in right hypochondrium the elastic is felt, the rounded form of education measuring 6x8 sm, a bit painfully, urine of dark color, an excrement is colourless. Diagnose.

13. Patient., 25 years, pregnancy 38 weeks. Toxicosis in the first and second halves of pregnancy was not present. At examination infiltrat to 5,0 is exposed sm in the upper external quadrant of the left milk gland. A skin above him was swollen, red-violet color. What process it follows to assume?

14. At the clinical inspection of young woman a surgeon exposed the painless compression in the overhead quadrant of right milk gland. The common state of woman satisfactorily, does not produce complaints, considers itself healthy. What must be recommended to the patient by a doctor?

15. At woman F., 45 years, at prophylactic examination the increase of thyroid is exposed. Doctors suspected the nodulus. For more exact diagnostics it is necessary to appoint the inspection? What follows to recommend to the patient?

Tests and tasks for verification of initial level of knowledges

1. Define the clinical displays of high quality tumour:

a form and fine-grained structure is rounded
 immobile and sroshena with surrounding tissues
 megascopic lymphatic nodulus can palpate
 at palpation a tumour is sickly
 there is a capsule
 fluctuatcion above a tumour

2. What from the transferred tumours are of high quality?

melanoma
 fibroadenoma
 lipoma
 madenocarcinoma
 limfosarcoma
 fibrosarcoma

3. A cancer develops from:

immature connecting tissues
 ferrous epithelium
 blood vessels
 lymphatic vessels
 integumentary epithelium
 smooth or striped muscles

4. There is what characteristically for an of high quality tumour?

hasty growth
 slow growth
 infiltruyushiy growth

cachexy
rapid fatigueability

5. There is what characteristically for an of high quality tumour?

expansive growth
hasty growth
infiltrativniy growth
propensity to the relapses after the operation
absence of power to give metastases
sharp influence on the exchange of matters

6. There is what not characteristically for a malignant tumour?

presence of capsule
atypical structure
metastasin
polymorphism of structure
relative autonomy of growth
slow growth

7. What feature not characteristic for a malignant tumour?

spreads on lymphatic vessels
absence of metastases
germinates surrounding tissues
can exist right through life sick
develops quickly and without visible reasons
the relapse comes after deleting of tumour

8. All researches help raising of diagnosis of tumour, except for:

ECG research
anamnesis of sick
endoscopic researches
laboratory data
biopsy
bacteriologic research

9. All behaves to antitumour except for:

introduction of antitumour antibiotics
application of hormonal preparations
application of altitude chamber

application of chemotherapeutic preparations
 application of radial therapy
 application of phisioprocedure

10. All can be the complaints of patient with a malignant new formation, except for:

rapid fatigueability
 losses of appetite, emaciation
 nauseas in the morning
 pains in area of heart
 apathy
 alternating lameness making to progress

11. All behave to the precancer diseases of intestinal, except for:

chronic anatsidniy gastritis
 paraproctit
 chronic calesus ulcer
 piles
 polypuses of stomach
 polypuses of thick intestine

12. How are of high quality tumours from smooth and transversal-striped muscular tissues named?

papilloma
 leyomioma
 adenoma
 rabdomioma
 dermoid
 hondroma

13. How are of high quality tumours from vessels named?

gemangioma
 leyomioma
 limfangioma
 rabdomioma
 papilloma
 adenoma

14. Name testimonies to deleting of of high quality tumours:
 declining years of patient

permanent injuring of a new formation
 suspicion on the regeneration
 young age of patient
 risk of appearance of metastases
 decline of immunity of sick

15. Name testimonies to deleting of high quality tumours:
 mechanical squeezing by the tumour of surrounding structures
 declining years of patient
 speed-up growth
 decline of capacity of patient
 risk of appearance of metastases
 young age of patient

7. References:

General:

1. General Surgery. Textbook for students of higher medical educational establishments / [Lihonenko O.V., Chorna I.O. , Zubaha A.B., Khimich S.D et all.]; Edited by Prof. S.D. Khimich, Prof. M.D. Zheliba Kyiv AUS Medicine Publishing, 2019.- 608 p.
2. General Surgery. Textbook for students of higher medical educational establishments / [Lihonenko O.V., Chorna I.O. Khimich S.D et all.]; Edited by Prof. Ja.S.Bereznickij, M.P.Zacharash, M.P.Mishalov,. Vinnica: New book, 2019-344c
3. Methodological recommendations for classroom and independent work of students.
4. General Surgery / Ed. S.P.Zhuchenko, M.D.Zheliby, S.D.Himicha - Kiev.: Health, 1999.
5. Cherenko MP, JM Vavryk General surgery in anesthesiology, intensive care, and the basics of patient care - Kiev.: Health, 1999.
6. Gostishchev VK General Surgery: Textbook. - Moscow: Medicine, 1993
7. Gostishchev VK "Guide to practical training in general surgery." M., "Medicine" - 1987.

Additional:

1. AA Simodeyko, SS Philip A. Boldizhar General Surgery Questions and Answers. Uzhgorod, "Willow" - 2005.
2. SM Genyk, MV Prokopishin, VM Rat and others. Case Studies on hirurgii.Ivano-Frankivsk, "Lileya-NV" - 2003.
3. AA Simodeyko, SS Philip A. Boldizhar, V. Pant Practical skills in general surgery patient care. Uzhgorod, Uzhgorod National University. - 2001.
 - Website akady <http://www.umsa.edu.ua>
 - Website department of general surgery http://www.umsa.edu.ua/kaf_zaghir
 - Library UMSA <http://www.umsa.edu.ua/pidrozdilhome/biblioteka/biblhome.html>

The distribution points are awarded to students:

At mastering topic number 29 to module 2 for training activities for students rated a 4-point scale

(traditional) scale, which is then converted into points as follows:

rating	Points
5 (excellent)	5
4 (good)	4
3 (satisfactory)	3
2 (poor)	0

Guidelines prepared
Associate professor, Department of General Surgery
Chornaja I.A. _____