

**MINISTRY OF HEALTH OF UKRAINE**  
**POLTAVA STATE MEDICAL UNIVERSITY**  
 Department general surgery with care of the patient

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 “\_” \_\_\_\_\_ 2021

**METHODICAL INSTRUCTIONS**  
**FOR INDEPENDENT WORK OF THE STUDENT**  
**IN TIME FOR PREPARATION TO THE PRACTICAL STUDY**  
**(auditorium work)**

<i>Study discipline</i>	<i>General surgery</i>
<i>Module №2</i>	<i>Surgical infection. Necrosis. Basics of clinical oncology. Curing of surgical patients.</i>
<i>Informative module №2</i>	<b>Fundamentals of Transplantology and Clinical Oncology</b>
<i>Lesson theme №28</i>	<b>Transplantology. Classification of transplants. Features of the use of different types of transplants. Deontological aspects, legal and legal basis for transplantation</b>
<i>Course</i>	<i>III</i>
<i>Faculty</i>	<i>Medical, Foreign students training faculty</i>

Poltava 2021

### 1. Relevance of the topic:

The modern world appears before man as many different opportunities, at the same time, problems caused by rapid technological progress and various studies in the field of the human and the world around him. In parallel with the development of technology and its capabilities, the number of chronic diseases has increased, it is not possible in some cases to be treated according to generally accepted rules, and the need for donor organs lies in it. Modern injuries are also an important social problem. There is an increase in severe combined injuries, complications of which lead to terminal conditions. Therefore, the need constantly arises to improve the diagnosis and treatment of such patients. All this gives grounds for the further development of transplantology as a science, and organ transplantation to ensure the full activity of people and prolong their lives.

### 2. Specific objectives:

**Know:** The prevalence, classification, etiology, pathogenesis, clinical picture, diagnostic methods, differential diagnosis, treatment tactics, surgical options, graft classification and types of transplantation, indications and contraindications for transplantation of organs, tissues, cells in critical conditions of pathology of the chest and abdominal organs cavities, methods for preventing postoperative complications.

**To be able to:**

diagnose diseases of the chest and abdominal cavity,  
prescribe immunosuppressive therapy, prepare the patient for transplantation, and conduct the postoperative period.

Diagnose indications and contraindications for organ and tissue transplantation, select a donor and recipient, and diagnose acute transplant rejection.

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

Discipline	Know	Know
Anatomy	The normal anatomy of a person, its organs and systems	-//-
Physiology	Physiological processes that occur in organs and systems	-//-
Pathophysiology . Pathanatomy	Irreversible disorders of the functions of organs and systems	-//-
Topographic anatomy	Topography of the organs of the thoracic and abdominal cavities, options for their placement .	-//-
Internal diseases	Etiology, pathogenesis, clinic of diseases of the organs of the chest and abdominal cavities, functional insufficiency of diseases of the heart, lungs, kidneys, liver, pancreas.	Diagnose, interpret data of X-ray examinations, ECG, CT, NMRT, arteriography, draw up a treatment regimen for functional insufficiency of the heart, lungs, kidneys, liver, pancreas ..
Future		

Surgical diseases	Clinical signs of various diseases that need transplantation	To be able to determine contraindications for organ and tissue transplantation.
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#### 4. The content of the topic.

**Transplantation** is (trasplatologia; transplantation + gr. The doctrine of the Logos, science) is a branch of biology and medicine that studies the problems of transplantation, developing techniques of preservation of organs and tissues, as well as the establishment and use of artificial grafts.

**Graft** - a piece of tissue, organ or whole body which is used for transplant. The organism from which the extract organs or tissues for transplant is called the donor, and the body, which are implanted tissues or organs to the recipient.

#### Classification of transplants

The type of transplants all transplant operations are divided into:

1. transplant of organs or complexes of organs (transplantation of heart, kidney, liver, pancreas, tooth, complex "heart-lungs")
2. transplantation of tissues and cell cultures (bone marrow transplant, bone tissue, culture of  $\beta$ -cells of the pancreas, endocrine glands).

The type of donor, depending on the relationship between the donor and recipient are the following types of transplants:

**1. Autotransplantation** - a transplant within one organism (donor and recipient are one and the same person).

**2. Isotransplantation** - transplant carried out between two genetically identical organisms (identical twins). Such operations are rare, as the number of identical twins is small, in addition, they often suffer from similar chronic diseases.

**3. Allotransplantation (homotransplantation)** - transplantation between organisms of the same species (human to human) that have a different genotype. This is the most commonly used form of transplantation. Possible the fence of organs from relatives of the recipient, as well as other people.

**4. Xenotransplantation (heterotransplantation)** - tissue or organ transplanted from a representative of one species to another, e.g. from animals to humans. Method received extremely limited use (use xenomai - pig skin, cell cultures of  $\beta$ -cells of the pancreas of a pig).

**5. The explantation combined (prosthetic)** - transplantation of non-living non-biological substrate. Often regarded as implantation - surgical procedure of implantation in the tissue of other body structures and materials.

#### At the site of organ implantation:

1. Orthotopic transplantation.

A donor organ is implanted in the same place where the corresponding organ of the recipient was located.

## 2. heterotopic transplantation.

A donor organ is not implanted at the location of the organ of the recipient, but at another site. Moreover, the recipient's idle organ can be destroyed, or it can be in its usual place.

Features of the use of various types of transplants:

### 1. Histocompatibility antigens:

A) an allograft loses its function and degenerates in the recipient's body as a result of a cellular or humoral rejection reaction - an immune response.

B) The immune response is directed against transplantation antigens (the so-called histocompatibility antigens), which are located on the cell membranes of the donor organ.

C) Antigens are determined by a complex of genetic loci, which are called HLA-A, -B, -C, -D due to the fact that they encode human leukocyte antigens (Human Leukocyte Antigens):

a) antigens that are encoded by locus A, B and C, biochemically similar, assigned to class I antigens and are easily identified serologically;

b) locus B antigens are class II antigens.

D) Together with the antigens of the main blood groups (AB0), leukocyte antigens (HLIA) belong to the main transplantation antigens determined in humans.

E) All transplantation antigens can be identified by UIIGO, which allows tissue typing for possible transplantation.

## 2. Tissue compatibility

A) Tissue compatibility (histocompatibility) depends on the degree of similarity of the genetically determined antigens of the donor and the recipient:

a) assessment of histocompatibility and typing of tissues before transplantation is a mandatory procedure;

b) a serological reaction for determining histocompatibility is carried out with peripheral blood lymphocytes, or lymph nodes to identify HLA and for the selection of donors and recipients with minimal antigenic differences (the so-called selection of a donor-recipient pair).

B) Currently, it is considered proven that histocompatibility according to HLA-A and HLA-B significantly improves long-term functional survival of the transplant (the exception is liver transplants, the survival of which is not completely proven from compatibility with the HLA system).

## 3. Preexisting antibodies (specific presensibilization):

A) When selecting a donor-recipient pair, in addition to determining the HLA phenotype, it is mandatory to establish the presence or absence of the so-called preexisting antibodies in the recipient:

a) preexisting antibodies in their action are mainly lymphocytotoxic;

b) the presence of such antibodies indicates a specific presensibilization of the recipient and significantly affects the decision to perform transplantation of a donor organ (such specific presensibilization can be detected in about a third of patients and most often occurs as a result of a blood transfusion, pregnancy, or a previous transplant).

B) preexisting antibodies specific for lymphocytes of a specific donor are found in a conventional lymphocytotoxic test, which is called a cross-test or cross-match (donor lymphocytes and recipient serum).

C) A general rule is a categorical prohibition on transplantation of an allogeneic organ when the recipient has antibodies to the HLA donor system antigens.

D) A high percentage of activity of preexisting antibodies (> 25%) is a risk factor for the development of acute (and, to some extent, acute) graft rejection and is considered as a negative prognostic sign.

E) As part of the selection of the "donor-recipient" pair, it is advisable (but not necessary) to study the recipient's preliminary immune status (the absolute number of T-helpers and T-suppressors / killers).

#### **4. Immunological selection of the pair "donor-recipient":**

A) Determination of compatibility according to the ABO system (blood group of the donor and recipient).

B) Determining the degree of histocompatibility (HLA phenotype of the donor and recipient).

B) Determination of preexisting antibodies using the cross-match reaction (level of specific presensitization of the recipient).

#### **5. The drugs for immunosuppressive therapy:**

A) Cyclosporine was isolated from fungi of the genus *Cylindrocarpum lucidum* and *Tolypocladium inflatum*. It is a cyclic Decapeptide with potential immunosuppressive activity. It blocks the immune response of T-lymphocytes by inhibiting the production of interleukin-2 (IL-2). The result is a decrease in response of antigens class I and II in the cascade of graft rejection. Cyclosporine also inhibits the gene transcription of IL-2 (α-interferon, IL-3, IL-4 and other regulators of differentiation and proliferation of T- and B-lymphocytes).

B) Basiliximab and Daclizumab is humanized antibodies to receptor of interleukin-2 (CD25). CD25 appears on the surface of activated T-cells, and the binding antibody blocks interleukin-2 - dependent response of cells. Polyclonal antibodies obtained via immunization of horses with human lymphoid tissue or rabbits immunized with the tissue of the thymus gland. Isolated and purified gamma globulin contains cytotoxic antibodies to various markers of T-cells.

B) a microfenolatom- mofetil (Cell-CEPT) is a semi-synthetic morpholino-ethyl ether myco - phenolic acid, which is produced by the fungus *Penicillium glaucum*. MMF is metabolized in the liver to IFC, which is an active component - an inhibitor of inosine-5-phosphoribosyltransferase, which inhibits the synthesis of purines in lymphocytes.

G) GCSF applied with regard to their anti-inflammatory and immunosuppressive properties:

- inhibit the synthesis of antibodies

- bind complement;

- inhibit synthesis of cytokines from macrophages, which initiate acute rejection (interleukin-1, interleukin-2 and α-interferon).

## TRANSPLANTATION OF VITAL ORGANS

### Kidney transplantation

1. Kidney transplantation is one of the three alternative methods of treatment of patients with end-stage chronic renal failure (hemodialysis, peritoneal dialysis).

The operation is associated with a small number of technical complications, a satisfactory quality of life of patients, long-term survival of renal allograft and patients.

2. Indications for kidney transplantation - end-stage chronic renal failure, the cause of which are:

- chronic glomerulonephritis,
- chronic pyelonephritis;
- polycystic kidney disease
- hereditary and acquired tubulopathy;
- aplasia and hypoplasia of the kidney
- renovascular hypertension
- systemic lupus erythematosus, rheumatoid arthritis
- diabetes type 1 and type 2;
- gout;
- hypercalcemia of any origin

Oxalis;

- urological diseases with obstruction of the urinary tract (kidney stones, tumor, retroperitoneal fibrosis).

3. Contraindications to kidney transplantation

a) transplantation is contraindicated in dialysis patients:

- acute or chronic violation of cerebral circulation
- cardiac and pulmonary failure
- severe liver
- impaired mental status;

b) a temporary contraindication to transplantation should be considered an acute infection.

4. Risk factors in kidney transplantation: obesity, the presence of serological markers of hepatitis b and C and cytomegalovirus infection.

5. The method of selection of donor:

A) For renal transplantation must be considered:

- a) compatible blood group (AB0)
- b) negative test cross-match (no preexisting antibodies);
- in) compatibility leukocyte antigens of histocompatibility (HLA).
- d) the difference in age between the donor and the recipient;
- d) immunization of the patient.

B) Donor kidney with the duration of primary warm ischemia over 30 minutes and the duration of cold ischemia for more than 30 hours to be used for transplantations should not.

6. The method of transplantation:

A) Renal allograft is placed in a heterotopic position - right or left iliac fossa of the recipient, retroperitoneal (developed in 1951 Dubois).

B) Vascular graft (renal artery and renal vein) alternately anastomoses with the iliac vessels, often of the type "end to side".

B) Impose the anastomosis between the transplant ureter and the bladder (neopetrolisthes).

7. The result of kidney transplantation

A) If ischemic injury is minor renal graft function transplanted kidney is restored directly after revascularization.

B) Recovery of graft function manifests the beginning of urination and gradual (within 2-3 weeks) reduction of blood toxins.

### **Liver transplantation**

1. Indications for liver transplantation

- viral C cirrhosis (b, C);
- alcoholic cirrhosis;
- primary biliary cirrhosis;
- primary sclerosing cholangitis;
- autoimmune hepatitis
- fulminant hepatitis
- metabolic liver disease
- malignant tumors of the liver
- biliary atresia.

2. Contraindications to liver transplantation

A) Absolute contraindications.

- the presence of HIV infection
- extrahepatic malignant tumor;
- uncontrolled infection;
- progressive cardiopulmonary failure
- severe pulmonary hypertension;
- drug and alcohol dependence;
- trauma to the abdomen;
- poisoning hepatotropic poisons;
- failure to abide by the rules of immunosuppression.

B) Relative contraindications:

- high titers of HbsAg;
- thrombosis of the portal vein;
- the patient's age of 65 years;
- hepatocellular cancer, cholangiocarcinoma;
- preliminary operations on the bile ducts;
- previously migrated portocaval shunt.

3. The method of selection of donor:

A) Initial evaluation of a potential liver donor include compatibility with the recipient AB0 (blood group):

- a) without taking into account the major of histocompatibility antigens (HLA)
- b) without performing cross-or cross-match samples.

B) Analysed anthropometric characteristics, anamnestic data, clinical and instrumental methods of examination.

B) takes into account the age of the donor, which should not exceed 45-50 years.

G) take into account the weight of the donor, which must be 0,70-1,10 from the recipient's weight (for children the weight of the donor must not exceed the recipient's weight).

4. The technique of liver transplantation

A) the Operation of the recipient consists of three stages, which differ from each other not only technical aspects but also the consequences for the homeostasis of the patient:

a) without hepatic stage - crossing and pinch the common hepatic artery, portal vein, sub - divisions and the suprarenal inferior Vena cava, the common bile duct, the liver, and then hepatectomy;

b) without hepatic stage revascularization of the donor liver by sequential overlaying two navalnyj and portal venous anastomoses;

in) after no liver stage - arterial revascularization of the liver, stage of hemostasis, overlay choledocho-choledocho anastomosis.

### **Heart transplantation**

1. Indications for heart transplantation:

- dilation cardiomyopathy;
- last-stage coronary heart disease (the inability of rehabilitation of patients after myocardial infarction with temporary assisted circulation apparatus or retransplantation surgery).

2. Contraindications to heart transplantation:

- age over 60 years
- severe pulmonary hypertension;
- liver and kidney failure
- defeat of peripheral vessels and cerebral vessels
- infarction of the lungs;
- obstructive lung diseases;
- a sharp violation of nutrition of the patient;
- gastrointestinal disorders,
- diabetes.

3. Donor selection for transplantation:

A) Optimal donors for heart transplantation corpses with brain death in the age of no more than 40-50 years and without previous cardiovascular diseases.

B) selection of donor and recipient are taken into account coincidence ABO (blood), anthropometric data (weight of the donor and recipient should not differ by more than 20%) and the lack of preexisting antibodies in the recipient.

C) the maximum time allowable cold ischemia for the heart does not exceed 6-8 hours.

4. Method of operation of the recipient:

A) transplantation of the donor heart in the recipient is performed under artificial circulation.

B) Because the heart is transplanted in an Orthotopic position, your own heart recipient is deleted

C) When the transplant is performed alternately anastomozirivany the left and right Arteria, pulmonary artery and aorta, after which stop the extracorporeal circulation.

### **Transplantation of the pancreas**

#### 1. Indications for pancreas transplantation

- last-stage diabetic renal failure and the dependence of the patient on chronic hemodialysis.

#### 2. Determination of indications to transplantation of the pancreas

A) In contrast to liver transplantation and heart transplantation of the pancreas is performed not to save the life of the patient, and to prevent the development of chronic complications of diabetes (angiopathy and neuropathy): BK1

a) a serious complication of diabetes is development of diabetic glomerulosclerosis which leads to end-stage renal failure

b) diabetic patients who have reached ESRD treated with chronic hemodialysis and are considered as possible candidates for a kidney transplant.

B) generally recognized in these cases, the simultaneous transplantation of kidney and pancreas

a) in the case of success of the operation the patient becomes independent of chronic hemodialysis and, in addition, he develops a state of insulinnezavisimom in achieving sustained normoglycemia;

b) compensation of diabetes, normoglycemia and no need for exogenous insulin to prevent further development of chronic diabetic complications and protect the kidney transplant from the effects of hyperglycemia.

C) currently the most often performed transplants of the entire pancreas along with a portion of the duodenum, because the blood supply of complex pancreaticoduodenal and liver is practically the same vessels - abdominal trunk, the hepatic, superior mesenteric artery, portal vein, this requires the implementation of complex reconstruction of the Arterial vessels in the donor phase of the operation.

#### 1. The technique of transplantation of the pancreas

A) renal transplant, the transplant of the pancreas is placed in a heterotopic position - right or left iliac fossa.

B) the vessels of the graft anastomosis with the iliac vessels of the recipient.

C) the Outflow of pancreatic secretions occurs or in the small intestine (anastomosis with the duodenum to the ileum of the recipient - the so-called internal intestinal drainage), or into the bladder (with anastomosis of the duodenum to the bladder - Intravesical drainage).

D) renal graft is placed in the opposite iliac fossa.

D) Monitoring of acute rejection is based on clinical, biochemical data and biopsies, and the loss function, the transplant of the pancreas is removed and begin insulin therapy.

### **Replantation, transplantation, implantation of tooth**

Under replantation tooth transplantation understand the extracted tooth in his alveoli. This operation is done in chronic periodontitis in cases when conservative treatment is unsuccessful, and resection of the root apex could not be carried out for one reason or another. Replantation of the tooth can be done if perforation of the root. Finally, replantation is the method of saving the tooth with a full dislocation or accidental deletion. Replantation is

indicated if the tooth has no strongly divergent roots, and the crown is quite durable and is not damaged when removed. Strengthening replanting tooth requires neighboring teeth reimplantation of tooth in their absence is less successful. The operation is best done under block anesthesia, as anesthesia when dental plexus contains in the analgesic solution of epinephrine can cause severe vasoconstriction and impair normal filling of the hole blood clot. The operation of replantation of the tooth begins with the removal of him, which must be done with extreme caution, with minimal trauma to hard and soft tissues of the alveolar process. Extracted tooth is immersed in warm (body temperature) saline solution of sodium chloride with the addition of antibiotics (penicillin, streptomycin). The alveolus of an extracted tooth should be carefully cleaned with a sharp spoon from granulation (chronic periodontitis) and washed with a syringe of warm physiological solution of sodium chloride with antibiotics. While processing the tooth the alveolus loosely are treated with sterile gauze. Processing replantations tooth is chemical and mechanical cleaning of root canals and fillings crowns and roots. When handling the tooth is kept in a sterile gauze soaked in physiological sodium chloride solution with antibiotics. Channels sealed with cement or cover with plastic, after which the resected root tips. Replantations the root tips of the tooth should be removed, as this region is rich in deltoid branching channel with necrotic content can lead to relapse of chronic periodontitis. At the end of the treatment, the tooth is inserted into the alveoli, and this stage of replantation is sometimes great difficulties when transplanting multirooted teeth with divergent roots, as well as in cases when the bone wall of the alveolus is insufficiently malleable.

The best effect is obtained when the fixation of the tooth after replantation for 2-3 weeks with a wire or a prepared tire of stirokrila or other material. Replantation the tooth should be first placed in conditions of complete rest and excluded from the articulation, which is sometimes advisable to remove hills of the transplanted tooth or the hills antagonist. During the first days the patient needs to eat liquid food. Manifested after replantation eliminate the pain using ordinary painkillers. Healing replanting tooth lasts 3-4 weeks. However, even with the most impeccable technique of this operation replanting the roots of the tooth after some time, dissolve the tooth becomes mobile and needs to be removed. The average shelf life replanting tooth 5 years. And yet in some cases such an operation is justified. The longest storage time replanting tooth observed in the transplantation of a healthy tooth, accidentally from the hole or accidentally deleted. When transplanting such a tooth should be thoroughly cleaned from pieces of periodontal and gum residues. Transplantation of the tooth, that is, transplant it into another alveolus, rarely used. This operation may take place in the case when in the alveoli of the tooth, remote about of chronic periodontitis or due to the destruction of the crown, it is possible to transplant healthy supernumerary or impacted teeth. The technique of operation is the same as in replantation, but favorable results are observed much less frequently. Particular difficulties in this operation are the formation of lungs for transplantation of a tooth. The great complexity is created due to the difference in the size of crowns and roots of the teeth remote and replanting. So sometimes you have to expand the alveolus, reduce the length of the root, which affects the process of healing. The same considerations further complicate the transplantation of a tooth from one person to another (homoplastic). Observation of intraosseous implantation of artificial roots made of metal or other material show that in most cases, the implant root, rarely observed inflammation and suppuration, which leads to

loosening and loss of the implant. However, intraosseously implanted artificial roots after implantation can not withstand heavy load and is therefore unsuitable for fixing individual crowns or abutment crowns of the bridge. So for implantation, and especially metal or plastic frames should be treated with caution. bone transplant.

**Bone transplantation** is often necessary with complete adentia, which is usually accompanied by severe bone resorption. At the time of tooth extraction or dislocation, the process of defective bone remodeling begins, which inevitably leads to atrophy of the alveolar ridge.

The bone graft retains its structure and function even with a decrease in the number of viable cells. The bone matrix is gradually filled with cells from nearby tissues during a process known as "slow substitution." Such a mechanism does not work during skin or mucosal transplantation; therefore, in these cases, maintaining the viability of the transplant cells is of paramount importance for the success of the operation.

#### Autogenous bone grafts

The bone tissue is most often transplanted, which is used to eliminate defects caused by atrophy, trauma, tumors, as well as to correct congenital deformities.

Elimination of bone defects is one of the most difficult tasks in maxillofacial surgery. Improving the techniques for obtaining, storing and using transplants has been made possible thanks to a better understanding of the mechanisms of bone repair.

An autologous bone graft is still the only source of osteogenic cells and is considered the gold standard for reconstructive interventions in the oral cavity.

The autograft is taken from bones of the master: the iliac crest, ribs, fibula bones, and also fragments of the upper and lower jaw and mandibular symphysis, retromolar region and branches; tuberosity and hyperostosis bones. Great advantages of autogenous grafts over other bone grafts are determined by the presence of viable osteoblasts and the absence of foreign antigenic proteins, and also the fact that they both osteoconductive and osteoinductive characteristics. The only drawback if you can call it that, is the traumatic and at the taking of the graft.

In the first weeks after transplantation of autogenous graft it is the process of adaptation of bone cells, periosteum, bone marrow with subsequent revascularization. In the second phase there is a stimulation of the cells of the bone bed, and they are differentiating into osteoblasts create bone matrix. Due to the bone-inductive activity of the cells of the bone bed formed new bone, where the transplanted autograft plays the role of skeleton. In the future, at the same time flows the resorption of bone and its tumors, leads to the incorporation of a bone graft into the host's box.

Grafts can be taken from cancellous or cortical bone, or be combined.

If they consist of cancellous bone, after the transplant, they observed faster and more complete revascularization. Meanwhile, the autograft consisting of cortical bone, these processes occur more slowly and, in addition, a significant portion of the transplanted bone dies, and its replacement with new bone is like a creeping nature.

## Lung transplant

Lung transplantation is performed in patients with progressive obstructive, fibrosing or vascular diseases. The nosological spectrum includes:

Chronic Obstructive Pulmonary Disease (COPD) / Pulmonary Emphysema;  
 Idiopathic pulmonary fibrosis,  
 cystic fibrosis,  
 $\alpha$ 1-antitrypsin deficiency (primary emphysema)  
 Primary pulmonary hypertension;  
 sarcoidosis  
 bronchiectasis;  
 lymphangioliomyomatosis;  
 Congenital heart defects;  
 Obliterating bronchiolitis (primary transplantation)  
 Diffuse connective tissue diseases with lung damage,

When making indications for lung transplantation, the degree of impaired breathing function and, as a result, a decrease in the quality of life, the rate of disease progression, life expectancy and prospects of conservative or alternative surgical treatment are taken into account. A prerequisite for referral to lung transplantation is that the possibilities of drug therapy have been exhausted, that is, the patient should receive the whole range of drugs in accordance with the existing recommendations of reputable pulmonological societies.

Contraindications to performing lung transplants are divided into absolute and relative.

**absolute**  
 A patient is not a candidate for lung transplant if the following conditions apply:

Active smoking or substance abuse  
 Simultaneous failure of several organs  
 Current diagnosis of malignant neoplasms, including lung cancer,  
 HIV infection  
 inability to walk  
 Severe connective tissue disease with extrathoracic manifestations  
 mental disorders  
 Coronary Artery Disease

**relative**

The following factors typically make lung transplantation a less viable option:

Over 70 years of age for bilateral lung transplantation

Over 75 years of age for lung lobe transplantation

sepsis of the lungs

Dependence on high doses of steroids (for example, prednisone at a dose of 20 mg per day or more)

Active hepatitis B or C infection

Treatment resistant organisms

Malnutrition or obesity

Previous thoracic surgery / pleurodesis

Recent history of malignancy. (Within two years after the final treatment, or within five years after treatment of breast cancer or melanoma, the patient is not allowed to transplant.)

osteoporosis

The presence of severe esophageal dysfunction

#### Risks:

As with any surgery, there is a risk of bleeding and infection. Recently transplanted lungs by themselves may not heal properly. Since most of the patient's body was exposed to outside air. Graft rejection can occur not only after the operation is completed, but also throughout the patient's life. Graft rejection is a serious complication and assistance should be provided as quickly as possible.

Signs of rejection:

fever,

flu-like symptoms, including chills, dizziness, nausea, night sweats;

increased difficulty breathing;

worsening pulmonary test results;

chest pain;

an increase or decrease in body weight by more than two kilograms in a 24-hour period.

In order to prevent transplant rejection and further damage to new lungs, the patient should be treated with immunosuppressive drugs. Patients, as a rule, should take a combination of drugs in order to combat the risk of rejection. This is a lifetime commitment and must be strictly observed. Immunosuppressive regimen begins immediately before or after surgery. Typically, the treatment regimen includes cyclosporine, azathioprine, and corticosteroids, but since rejection episodes can be repeated throughout the patient's life, the exact choice and dosage of immunosuppressants can change over time. Sometimes tacrolimus is given instead of cyclosporine and mycophenolate mofetil instead of azathioprine.

### **5. An indicative map for independent work with literature on the topic "Transplantology"**

<b>Basic tasks</b>	<b>To learn</b>	
Ethiology	Name the main etiological factors contributing to the emergence of critical conditions in diseases of the organs of the chest and abdominal cavity	
Clinic	Determine the main clinical manifestations of critical conditions in diseases of the chest and abdominal organs	
Diagnostics	List the main diagnostic methods	
Differential diagnostics	Create a differential diagnosis table for acute surgical diseases of the chest and abdominal organs	
Treatment	Emergency care for acute surgical diseases of the abdominal cavity. Present a typical scheme for selecting patients for organ transplantation and elimination of rejection	

## **6.1. Materials for self-control.**

### **A. Questions for self-control.**

1. Give a clinical definition of transplantology, transplantation, what is a transplant
2. What is the classification of transplantation.
3. What is the main histocompatibility complex of a person?
4. What are the mechanisms of transplant immunity.
5. What is the reason for transplant rejection?
6. What is selection of a donor-recipient pair?
7. What are the mechanisms of rejection of the allograft.
8. What are the criteria for selecting donors?
9. What is "brain death" and its criteria?
10. What are the main and relative contraindications to organ transplantation.
11. What are the types of transplant rejection?
12. What is the prevention and treatment of rejection. Immunosuppressive therapy?
13. Indications and contraindications for transplantation
14. Indications and contraindications for heart transplantation.
15. Indications and contraindications for liver transplantation.
16. Indications and contraindications for pancreas transplantation.
17. Indications and contraindications for kidney transplant lung transplants

### **Tests for self-control:**

1. A transplant of cells, tissues and organs is called
  1. regeneration
  2. implantation
  3. transplantation
  4. placentation
  5. mine.
  
2. Components required for transplantation
  1. donor, recipient, transplant
  2. transplant
  3. a bank of organs and tissues
  4. donor, recipient
  5. artificial environment.
  
3. Types of transplantation
  - 1 autotransplantation, allotransplantation, xenotransplantation, explantation
  2. implantation, homotransplantation, explantation
  3. homotransplantation, heterotransplantation,
  4. autotransplantation, placentation, heterotransplantation
  5. replantation, transplantation, implantation.
  
4. Autotransplantation is
  1. transplant of a transplant obtained from an organism of another species
  2. transplant of a transplant obtained from an organism of the same type

3. tissue transplantation within one organism
4. transplantation of material from the body into an artificial environment
5. transplant transplant from another organism.

5. Allotransplantation is a transplant of material

1. between organisms of various species
2. within one organism
3. between two organisms of the same species
4. into the artificial environment
5. within the framework of various organisms.

6. Exclude the wrong answer. An example of an allograft is

1. use of the walking stalk
2. tooth replantation
3. the use of ribs to repair the defect of the lower jaw
4. kidney transplant
5. tooth implantation.

7. Synonym for xenotransplantation

1. allotransplantation
2. heterotransplantation
3. autotransplantation
4. homotransplantation
5. replantation.

8. Transplantation of organs and tissues between organisms of various kinds is called

1. autotransplantation
2. homotransplantation
3. allotransplantation
4. xenograft
5. implantation.

9. Eliminate the wrong answer. Xenotransplantation is a transplant of material

1. from person to person
2. from dog to dog
3. from monkey to dog
4. from monkey to monkey
5. from pig to man.

10. Explantation is

1. transplant of a transplant obtained from an organism of another species
2. transplant of a transplant obtained from an organism of the same type
3. tissue transplantation within one organism
4. transplantation of material from the body into an artificial environment
5. transplantation of the transplant into an artificial environment.

## References:

### General:

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### The distribution points are awarded to students:

At mastering topic number 28 to number 2 module 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

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