Lviv National Medical University
named after Danylo Halytsky
Genaral Sugrery Unit

METHODICAL RECOMMENDATIONS

to practical lesson
for students of 3-rd course, medical faculty
on topic

“ASEPSIS. ANTISEPSIS”

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Methodical recommendations to practical lessons of General Surgery for students of III course medical faculty on topic “ANTISEPSIS. ASEPSIS” (methodical recommendations prepared – M.D.,Ph.D. docent Yury Kushta and M.D., Ph.D. docent Oleh Matviychyk. Lviv, LNMU named after Danylo Halytsky, 2017).

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TOPIC "Antisepsis"

I. Actuality of theme

Actuality of problem of rational usage of antiseptics and antibiotics conditioned by numerous cases of diverse household wounds, high frequency of inflammatory – purulent surgical diseases and postoperative purulent complications.

The base of topic presented by regulated decrees of Ukrainian Ministry of the Health Care about methods of antisepsis and antiseptic preparations, kinds of surgical processing of the surgeons hands and operational field. Knowledge and compliance of these requirements - obligation for medical workers of all links of the practical medicine.

PURPOSE OF LESSON : to master the principles of different kinds of antisepsis usage, to learn a different groups of chemical antiseptics and fundamentals of their clinical application; to induct with methods of surgical antisepsis of the hands and processing of operational field, principles of rational application of antiseptics and fundamentals of prophylaxis of antibacterial therapy complications.

II. Tutorial purposes of lesson

After learning of this theme the student must to **know** [αI - αII]:

1. Kinds of Antisepsis.
2. Basic methods of mechanical antisepsis.
3. Basic methods of physical antisepsis.
4. Groups of chemical antiseptics and their short clinical characteristics.
5. Methods of biological antisepsis.
6. Main groups of antibiotics and chemotherapeutical means.
7. Principles of antibacterial therapy in surgery.
8. Principal complications of antibiotic therapy in treatment of surgical diseases.
9. Modern types of operation field processing.
10. Principles of traditional and modern kinds of the surgeon hands processing.

After learning of topic the student of III course must **to be able** [αIII]:

1. To prepare an operative field (area) to planned operation.

2. To implement hygienic disinfection of the hands correctly.
3. To process the hands for method of Alfeld.
4. To prepare 0,5% solution of Ammonia for processing of the hands.
5. To process the hands in according to Spasokukotsky – Kochergin method.
6. To process the hands by modern preparations – Pervomur, Chlorhexidine bigluconate (Hibitan).
7. To prepare and process an operative field on waxwork.
8. To perform bandaging of aseptic wound.
9. To perform toilet of the wound.
10. To provide a first aid at presence an allergic reactions on antiseptic/antibiotic.

III. Educative purposes of lesson

1. Mastering of knowledge and skills for this topic are very important for every student, because antiseptics and antibiotics are used in all branches of clinical medicine practically.
2. The moral and legal obligation of any profile medical worker is ability to use antiseptics correctly at giving of urgent medical aid.
3. On material of topic to create a feeling of responsibility for right of professional actions at giving of planned and urgent medical aid to surgical patients.
4. Necessary to note, that questions of preparation of operational field and surgeons hands (handwashing) to operation are being studied on discipline General Surgery only. In the same time, a received knowledge – skills are necessary during further teaching and in the next activity of doctors of all surgical specialties (professions).

Practical skills:

1. Hygienic disinfection of the hands.

2. Method of the surgical processing of the hands by alcohol antiseptic.
3. Method of implementation of the intradermal test on sensitivity to antibiotics.
4. Method of operational field (area) processing at clear (aseptic) wound.
5. Method of operational field processing at purulent (septic) wound.

6. Method of direct preparation of operational field.
7. Providing of urgent aid at presence an allergic reaction on antibiotic.

IY. Content of topic

Antisepsis – complex of means and measures, directed on destruction of potential activators in the wounds (or in the tissues / cavities, that its surround), in pathologic focus or into organism.

Disinfection (decontaminaton) **–** destruction on (in) objects of environment of pathogenic or (and) conditionally - pathogenic microorganisms.

In another sense, in surgical context, term "disinfection" means a using of chemical methods (remedies) killing of microorganisms and their spores, moreover its concerns stocks only, pertaining to people – use term "antisepsis". Survived microorganisms after action of antiseptics, don't cause any disease, because they characterized by insufficient infectious dose and decreased virulence. Further they neutralized by factors of immune system.

Disinfectant agent –active substance, that provides extermination of pathogenic and conditionally - pathogenic microorganisms on (in) objects of environment (table. 4).

Decontamination – decreasing of microorganisms amount on the environmental objects.

Sterilization – process, that provide death of vegetative and spores forms of pathogenic and nonpathogenic microorganisms.

Groups of disinfectant means :

1) Disinfectides (table. 4) – used for sterilization (bactericidal effect; characterized by toxic or irritant side action);
2) Antiseptics – used for local disinfection (bactericidal or bacteriostatic action) of the skin, mucous membranes, serous shells.

Demands to ideal antiseptic:

- in little concentration to work quickly on lot amount of activators;
- not to be a toxic;
- not to be an allergen;
- not have a local irritant / damaging action;

- to have a satisfactory organoleptic property.

Distinguish following kinds of antisepsis:

1) mechanical
2) physical
3) chemical
4) biological (action on microorganism; action on macroorganism)
5) mixed (combined).

To **mechanical** antisepsis related: disclosure of the boils; toilet (washing) of the wounds; necroticectomy; primary / secondary surgical processing of the wounds; removing of the blood clots, foreign bodies from the wounds also.

To **physical** antisepsis belong : active drains (flowly - washing and vacuum draining and so on); application of hypertonic solutions; hygroscopic materials; sorbents; ultraviolet and laser radiation; ultrasound cavitation of the wounds; drying of the wounds.

Draining – medical method, that characterized by withdrawal out of fluid content (products of the tissues decay and microbes toxins) from the wounds, boils, content of the hollow organs also, natural or pathologic cavities by using of the rubber strips or tubes (rubber, polyvinyl chloride, silicon) or another materials.

For methods of implementation of pathologic contents escape - draining divided on: passive (outflow under action of gravity); active (creation of negative pressure inside, in the drainage system); flowly – washing draining (active introduction of solution into double tube) and osmotic draining (usage of gauze, including with hypertonic solutions).

To **chemical** antisepsis concerns usage of the chemical substances with different mechanisms of action (table. 4).

Main groups of chemical antiseptics:

- haloids(haloids containing)
- oxidizers
- dye- stuffs
- aldehydes
- detergents

- guanidines
- alcohols
- phenols
- acids
- salts of the heavy metals

Distinguish a group of chemotherapeutical means also, that apply to killing of activators in pathologic focus of the patients, because these preparations introduce parenterally or enterally (nitrofurans, sulfonamids, nitroimidazole derivates, hinoksalin etc).

Chemotherapy (and chemoprophylaxis) – its measures, directed on neutralization or inhibition of bacteria in internal medium of macroorganism with aim to treat (or prophylaxis) of infectious or parasitical diseases.

To biological **antisepsis** concern measures and means :

- action on microorganisms : antibiotics; enzymes; serums; anatoxins; φ-globulins; hyperimmune plasma; bacteriophages;
- action on macroorganisms : vaccines; anatoxins; immune correctors (adjuvants); immunomodulators (bacterial polysaccharides, pyrimidine bases, vitamines).

Complications of antibiotic therapy :

1) allergic reactions (local and systemic);
2) toxic action (influence) on organism (nephro– / hepato– /cardio– / hematotoxic, transient raise of transaminases etc.);
3) hypoavitaminosis (vitamin deficiencies);
4) candidiasis of mucous membranes/organs;
5) dysbacteriosis of the gut;
6) antibiotic - associated colitis (pseudomembranous colitis);
7) superinfection.

In basis of the **mixed (combined)** antisepsis is a combined usage of different methods of antisepsis, that widely apply in medical practice for today.

Preparation and procession of the medical personnel hands – very important measure of contact contamination prophylaxis. Care for skin of the hands of personnel allows for next complex of actions:

- preventive protection of the hands (personal [individual] hygiene, hygienic handwashing; usage of the rubber gloves);
- hygienic antisepsis (disinfection);

- surgical disinfection (surgical processing of the hands).

Preventive protection of the hands skin.

If don't exists possibility to prevent contact of some substances with skin of the hands – necessary to wear gloves, however in medical practice exists necessity of the frequent washing of the hands and their antiseptic processing. Herewith:

- for cleaning of the hands to use a cold (or room temperature) water and special means, that don't contain a soaps and alkalis (water at temperature higher than 35°C and traditional soap degrease a skin);
- several times daily necessary to salve the skin of hands by special emulsions for prophylaxis of microtraumatic injuries of the skin.

Hygienic disinfection – decreasing of microorganisms amount, that situated on the hands after contacts with patients body or its a particle of the normal microflora. In such cases expediently to apply a modern alcohol preparations (they are not allergens, not resorbable, dont change of the skin pH).

Surgical disinfection – processing of the hands before operation by medical staff for expulsion/destruction of transient microflora and decreasing of amount of resident skin microflora (table 1).

Methods of the surgeons hands processing conditionally divided (see. pattern 1) on : old methods ("dry washing") – of Alfeld, Brun, Zabludovsky; modern methods (with previous handwashing by running water) – of Spasokukotsky - Kochergin, in preparation C-4 (Pervomur), iodophors (Iodopyron); and modern methods – application of antiseptics on alcohol basis (Sterilium, Cutasept, Septoderm, Hospisept, AHD-2000), detergents (preparations of superficial activity – (spiritual solution of Chlorhexidine); Triklozan, Ammonia quaternary compounds (Dezoform, Deskoton forte) (tables 2, 3).

Quality control of the surgical processing of the personnel hands carries 1 time for a week – after performing of the hands disinfection – an agent of bacteriologic laboratory takes substrates (washings) by sterile cotton wool swab (tampon) from the palms (interdigital spaces, nails beds) of surgeon or operational nurse and send on research (analysis).

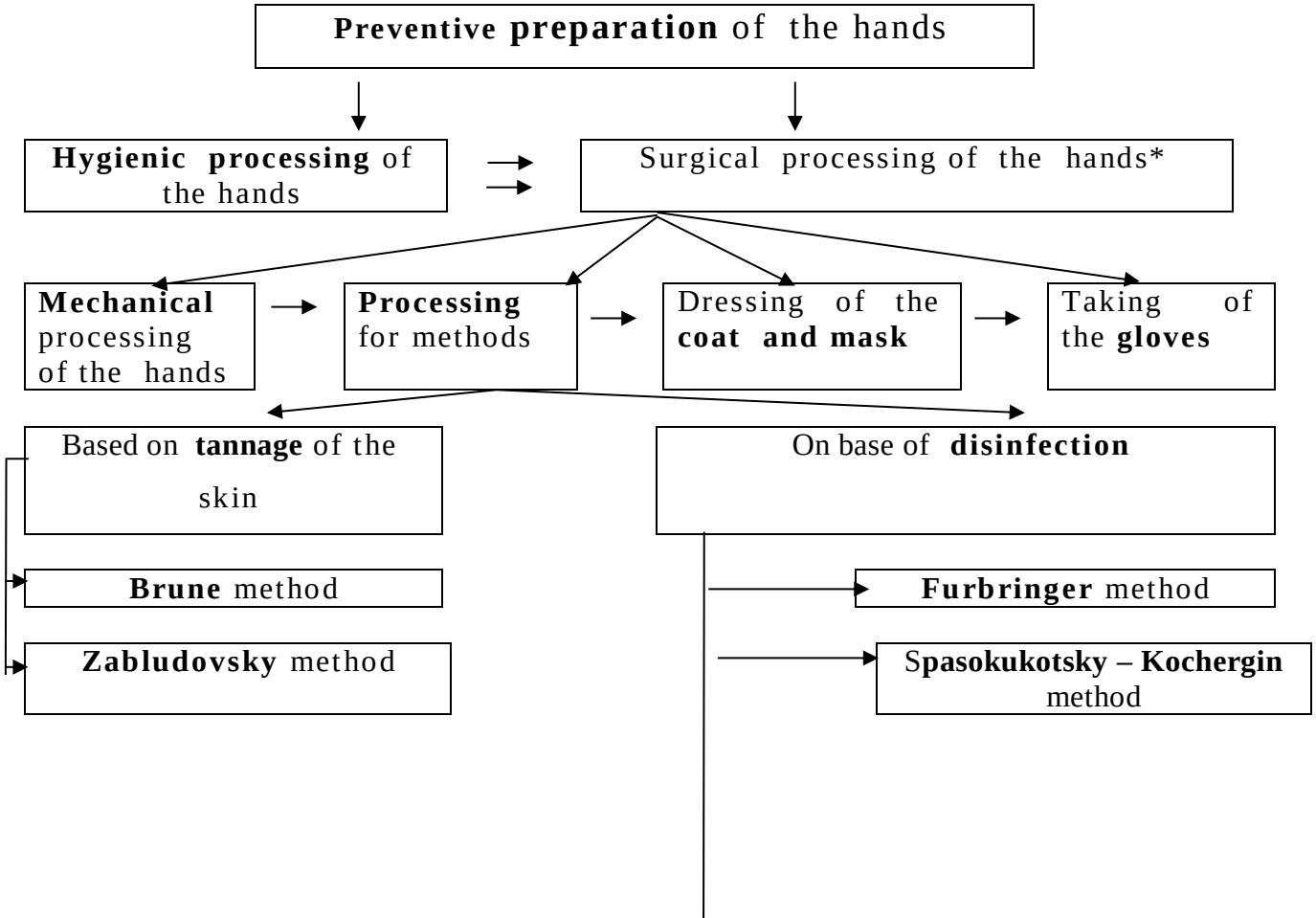
Preparation of operational field foresees hygienic processing and disinfecton of the skin similarly as preparation of the hands of medical staff (pattern 2).

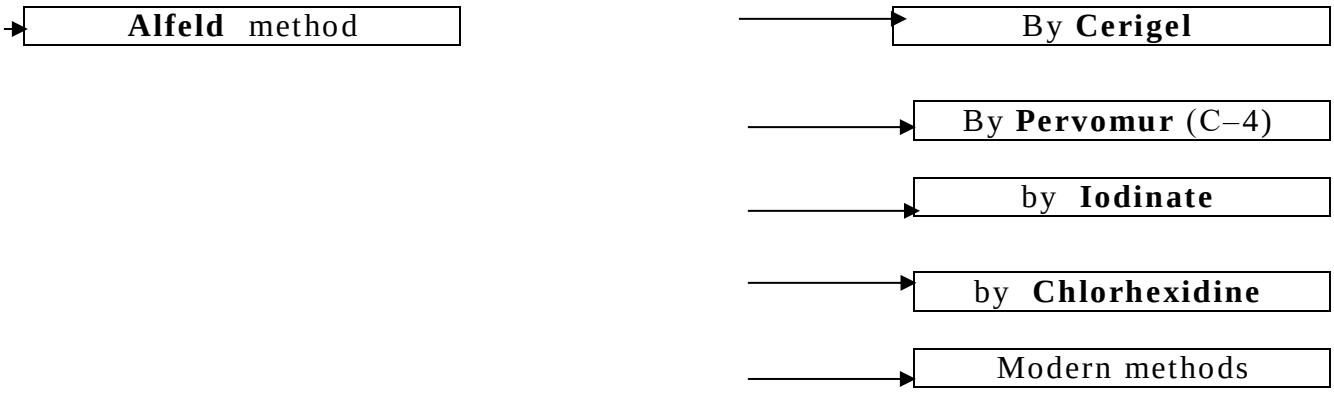
Operation field – its area of the skin, where personnel will perform surgical operation (incision, puncture). Modern methods of operational field disinfection forecast usage of antiseptics from group of Haloids (solution of Iodinate), PAR (spiritual solution of Chlorhexidine) and other (table 2).

V. GRAPHOLOGIC STRUCTURE OF THE TOPIC

The list of the needed knowledge to topic reflected in graphologic structure. During training to the lesson pay attention on the main elements of theme – definitions, mechanism of action of different groups of disinfectant means, principles of the main kinds of antisepsis, clinical characteristics of means of chemical and biological antisepsis, measures of the surgeons hands preparation and operational area to surgical intervention. Reading book, find in graphologic structure mentioned in the text an elements of academic topic and comprehend their interconnection.

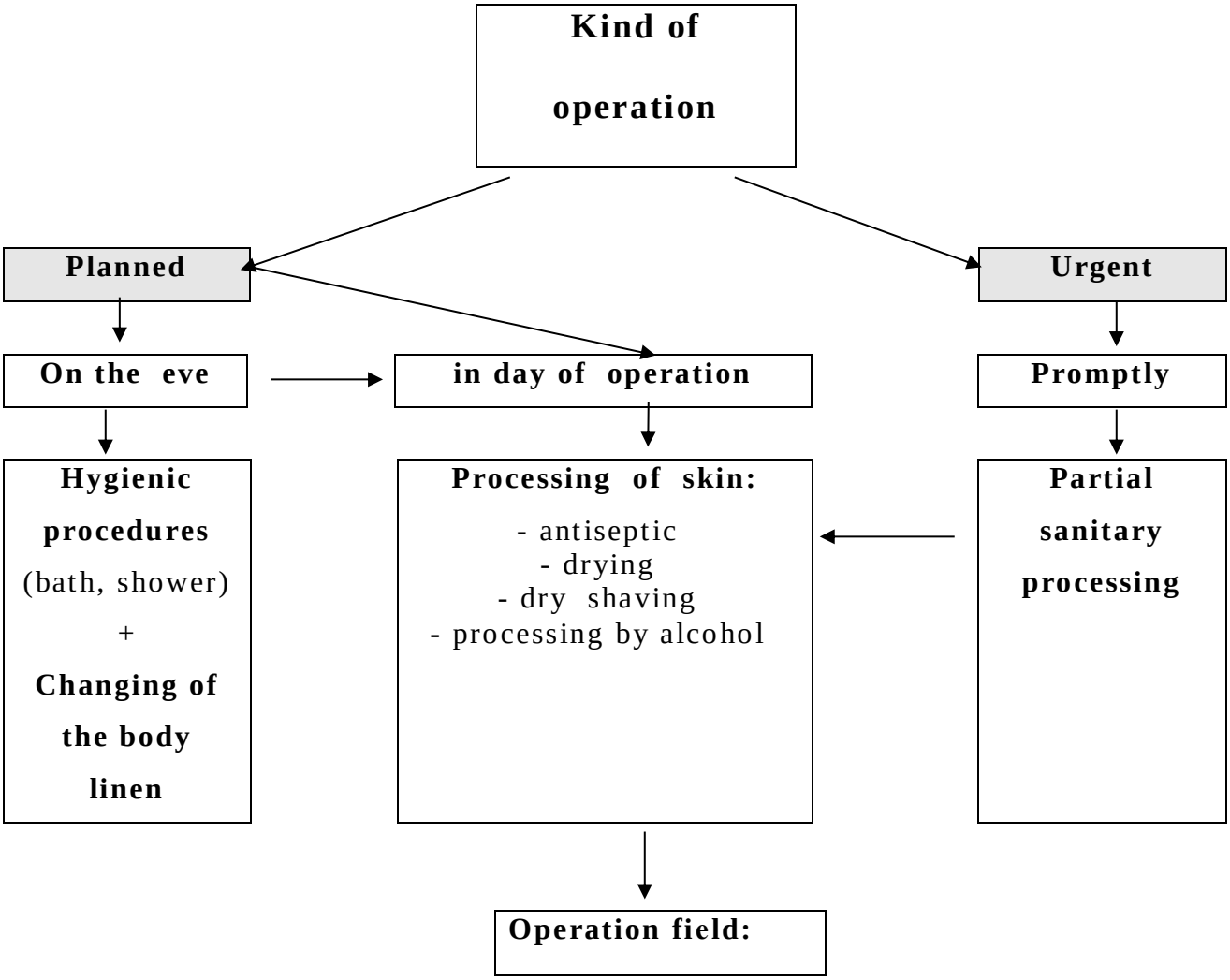
Scheme 1. Preparation of the surgeons hands to operation

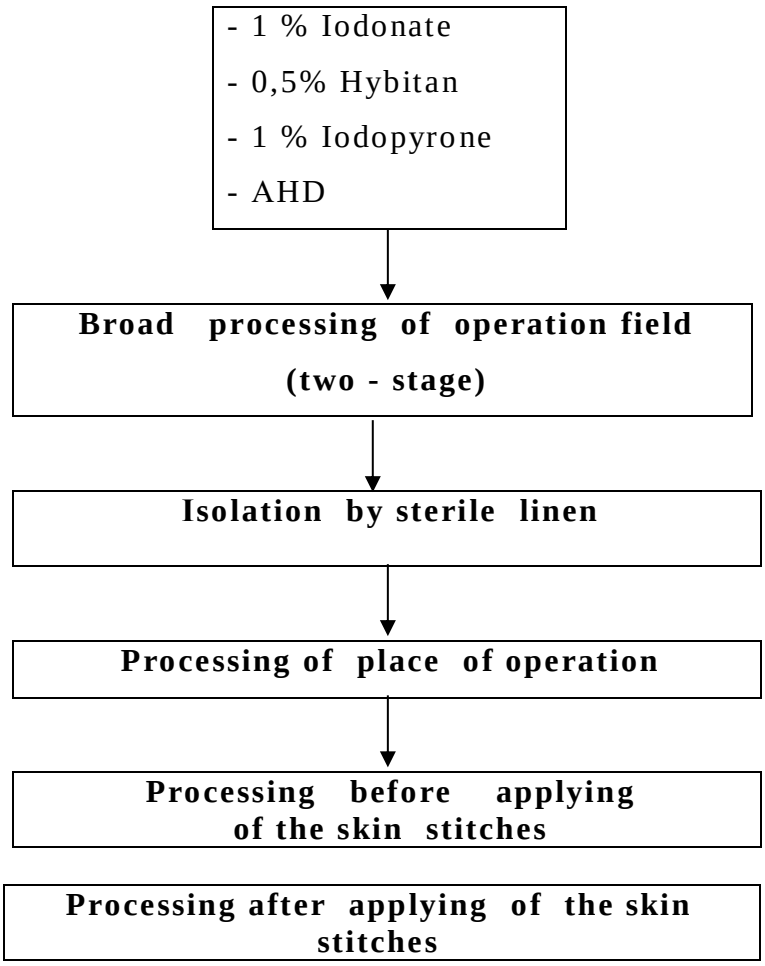




Annotation * : Selective control of the hands processing quality - once a week.

Pattern 2. Steps of preparation and processing of operational field





Supplement 1.

Estimated cards to study and working of practical skills for preparation of the surgeons hands and operational field to operation

Table. 1. Categories of microorganisms, that possible to find on the skin surface

Transient microflora	Resident microflora
Situated on superficial layers	Placed in the deep layers (fatty/sweat glands, hair follicles); most of them - around and under nails
Duration of life - to 24 hours	Live and multiply on the skin permanently

Destroys by traditional washing or helping antiseptics	At washing by soap decreases their amount only (not destroys completely)
	Numerosity $10^2 – 10^3$ on 1 sm^2

Table 2. Comparative characteristics of antiseptics for processing of the hands

Group	Gram (+)	Gram (–)	Mycobac-teria	Fungi	Viruses	Peculiarity of action
Alcohols	+++	+++	+++	+++	+++	Optimal concentration 60–95%, do not have persistent antimicrobial activity
Chlorhexidine (2% and 4% watery solution)	+++	++	+	+	+++	Have persistent antimicrobial activity, do not give allergic reactions
Iodine preparations	+++	+++	+++	++	+++	Irritant action on the skin; may provoke a burn
Iodophorm	+++	+++	+	++	++	Less presented irritant action, than in Iodine preparations
Phenol derivates	+++	+	+	+	+	Effect neutralized by nonionic PAR
Triklozan	+++	++	+	–	+++	Sensitivity of skin to preparation is low
Ammonia quaternary compounds	+	++	–	–	+	Uses in combination with alcohols only

Table. 3. Modern antiseptics for processing of the hands*

NAME	Disinfectant	Time of exposition	Method of application
(AHD-2000)	Ethanol	3 ml – 30 sec. (hygienic) 10 ml – 3 min. (surgical)	To dry by portions into skin of the hands

(BAKTOLIN®)	Lauryl-Sodium sulfate	1–2 ml	Hands wash with preparation
(DECOSEPT®)	2-propanol, 1-propanol	5 ml 30 sec. – 5 min.	To dry by portions into skin of the hands. Postexpositional prophylaxis of HIV - contamination – no less than 5 min.
(JODOBAC®)	Polyvinyl - pirrolidine iodine	1 min.	To dry little amount of preparation into skin of the hands for hygienic disinfection
(CUTASEPT G)	2-propanol	5 min.	Skin mark and disinfect, accumulating preparation by dewy tampon. Wait to full drying out
(SEPTODERM)	Izopropyl. alcohol	1 min.	Disinfection of skin before operation
SEPTIVON	Trichloro-carban	1min.	Washing and hygienic disinfection by drying of little amount of preparation into skin of the hands
(STERILLIUM®)	2-propanol	3 ml - 30 sec. (hygienic) 10 ml - 3 min. (surgical)	Portions to dry into skin of the hands. To wait to full drying. Postexpositional prophylaxis of HIV- contamination no less than 5 min.
(TRICHLOROL)	Chloramine T	1-2 min.	Portions to dry into skin of the hands with purpose of hygienic disinfection
(HOSPISEPT)	Ethanol, propanol	3 ml - 30 sec. (hygienic) 10 ml - 2 min. (surgical)	To dry by portions into skin of the hands (watch- the hands should be dewy during all session of processing)
WIPE OUT® (disinfectant towels)	Glutar-aldehyde	To drying	Hygienic disinfection carry out drying of the hands by towels, that dewy by preparation.

Table. 4. Modern antiseptics and disinfectants for instruments*

NAME	Disinfectant	Method of application
(BLANIDAS Active)	Quaternary ammonium composites	Disinfection of apartments,washing and disinfection, sterilization by soaking
(CIDEX)	Aldehydes	Washing and disinfection by soaking
(DESEFECT)	Quaternary ammonium composites	"Cold" disinfection by soaking
(DEZOXON)	Over acetic acid + Hydrogene peroxide	Washing and disinfection by soaking
(DESOFORM)	Aldehydes + quaternary ammonium composites	"Cold" disinfection of thermolabile and thermostable instruments by soaking
(DESCOPECS)	Aldehydes + quaternary ammonium composites	"Cold" disinfection by soaking
(DESCOTON FORTE)	Aldehydes + quaternary ammonium compostes	For fast disinfection and cleaning of any surgical instruments
(GLUTASEPT)	Glutaraldehyde	"Cold" disinfection by soaking
(DEZACTIN)	Chlorine	"Cold" disinfection by soaking
(KORSOLEX® BASIC)	Aldehydes + dyhidroxy-hexane	"Cold" disinfection by soaking previously exploded and dried instruments
(KORSOLEX® AF)	Alkylamines	"Cold" disinfection by soaking
(KORSOLIN® ID)	Aldehydes	"Cold" disinfection by soaking
(LYSOFORMIN 3000)	Aldehydes + quaternary ammonium composites	"Cold"disinfection by soaking
(CHLORANTHOIN)	Chlorine	"Cold" disinfection by soaking
(CHLORSEPT)	Chlorine	"Cold" disinfection by soaking

VI. Materials to methodological software of lesson

1. Materials to preparatory stage of lesson:

   a) questions and tests to frontal interrogation (supplement №1).

2. Materials to the main stage of lesson:
   а) lecture on topic “Antisepsis. Processing of the hands and operational field”;
   б) graphology structure to topic;
   в) estimated questions for learning of practical skills (supplement №1);
3. Materials to concluding stage of lesson:
   а) untypical situational problems, tests (supplement №2);
4. Glossary.

SUPPLEMENT 1.

CONTROL QUESTIONS

1. Short characteristics of the mechanism of action of the main groups of antiseptics.
2. Main groups of chemotherapeutical remedies in surgery.
3. Draining as method of antisepsis.
4. Principles of prophylaxis of antibiotic therapy complications in surgery.
5. Technique of performing of intradermal sensitivity test to antibiotics.
6. Surgical antisepsis surgeons hands by ”dried washing”.
7. Peculiarities of operation field (area) processing at presence aseptic and purulent diseases.
8. Control methods of quality of the surgeon and operational nurse hands processing.
9. Hygienic disinfection of the hands of medical staff.
10. Medical preparations of biological antisepsis.

Tests to selfcontrol (α- I)

1. To Lugol”s solution, that used in Surgery, necessarily consists of:
   1) Chloramine
   2) Hydrogen peroxide
   3) Potassium permanganate
   4) Iodine
   5) Furacilline

2. What is the main antiseptic and how to process the hands for Spasokukotsky - Kochergin method ?

1) In the one basin of Ammonia 0,5 % solution - 1 minute.
2) Two times during 5 minutes by 96 % Alcohol solution.
3) By napkin with Chlorhexidine bigluconate - 5 minutes.
4) By two napkins with 5 % solution of Ammonia for 5 minutes.
5) By 0,5 % Ammonia solution in the two basins during 3 minutes in every one.

3. What method concerns to mechanical antisepsis ?

a. active draining of the wound;
b. usage of antibiotics;
c primary surgical processing of the wound;
d. ultrasonography cavitation of the wound;
e. usage of Hydrogen peroxide solution.

4. What from presented concerns to mechanical antisepsis ?

a. irrigation of the wound by solution of Hydrogen peroxide;
b. draining of the wound by gauze tampon;
c. removing from the wound of the died tissues;
d. immobilization of extremity by gypsum bandage (cast);
e. laying on the wound an enzyme ointment.

5. What purpose of physical antisepsis?

a. to increase immunity of patient;
b.to suppress a pathogenic properties of microbes;
c. ro kill a pathogenic microbes in organism;
d. to create in the wound unfavorable conditions for microbes development;
e. to kill a microbes spores.

6. To methods of physical antisepsis concern:

a. draining of the wounds;
b. washing of the wounds by solution of Chlorhexidine;
c. primary surgical processing of the wounds;
d. ultrasound cavitation of the wound;
e. usage of antibiotics.

7. Hypertonic solution of Sodium Chloride uses in:

a. primary surgical processing of the wounds;
b. superposition of compress;
c. disinfection of cutting instruments;

d. draining of the purulent wounds and cavities;
e. as chemical antiseptic.

8. Via tube-like drainage of the pleural cavity flow extravasate independently.What kind of antisepsis applies ?
a. mechanical;
b. physical;
c. mixed (combined);
d. chemical;
e. biologic.

9. In what concentration a solution of Furacillin applies for washing of the wounds ?
a. 1 : 200;
b. 1 : 500;
c. 1 : 2000;
d. 1 : 5000;
e. 1 : 10 000.

10. What apply to antiseptics from group of dyestuffs ?:
a. Furacillin, Furagin;
b. Methylene blue, Ethacridine lactate;
c. Iodonate, Iodopirone;
d. solution of the Bleached Lime;
e. none of the above.

11 What preparation - antiseptic applies to the group of aldehydes:
a. Carbolic acid;
b. Dichloride of Mercury (Hg2Cl2);
c. Potassium permanganitis;
d. Formalin;
e. Silver nitrate.

12. The antiseptic, that applies to oxidants, is:
a. Dichloride of Mercury (Hg2Cl2);
b. Potassium permanganate;
c. Carbolic acid;
d. Chloramine;
e. Silver nitrate.

13. To methods of biological antisepsis applies:
a. usage of vaccines and serums;
b. usage of sulfanilamids and nitrofurans;
c. primary surgical processing of the wound;
d. draining of the wound;
e. ultrasound cavitation of the wound.

14. What from the enumerated antibiotics have the ototoxic action:
a. penicillines;

b. aminoglycosides;
c. tetracyclines;
d. cephalosporines;
e. macrolides.

15. To mistakes of antibiotic therapy necessary to appertain:
a. combination of antibiotic and Nistatin;
b. combination of antibiotics from the same group;
c. combination of different ways of antibiotics introduction;
d. combination of antibiotics and proteolytic enzymes;
e. combination of antibiotics and nitrofurans.

16. Purulent wound was washed out by pulsing jet of antiseptic and drained. Name kind of antisepsis?
a. chemical;
b. physical;
c. mechanical;
d. biological,
e. mixed.

(α-II)

17. Install the order (sequence) of actions at preparation of operational area (field) to emergency (urgent) operation :

1) processing by watery solution of antiseptic;
2) partial sanitary processing;
3) dry shaving;
4) processing by alcohol;
5) drying.

18. Modern preparation for surgical antisepsis of the hands :

а) Chloramine B – 0,25% solution
б) Pervomur – 2,4 %
в) Hibitane – 0,5 %
г) AHD – 2000
д) Ammonia - 0,5 %.

19. The complication of antibiotic therapy is:
1. dysbacteriosis;
2. increasing of the arterial pressure (AP);
3. decreasing of hearing;
4. allergic reactions;
5. tachycardia.

Choose correct combination of answers:
a.1,2,3; b.1,3,4; c.2,3,4; d.3,4,5; e.2,4,5.

20. Bactericidal action of ultrasound presented in :

1. destruction of thrombi;
2. change of permeability of microbe cell membrane;
3. cavitation;
4. dissociation of the water molecules;
5. appearance of bacterial cells mutation.

Choose correct combination of answers:

a.1,3; b.2,3; c.2,4; d.1,4; e.3,5.

21. The mechanism of proteolytic enzymes action at presence a purulent processes is:

1. lysis of necrotized tissues;
2. acceleration of the blood coagulation;
3. fibrinolysis;
4. potentiation of antibiotics action;
5. anti swollen action.

Choose correct combination of answers:

a.1,2,3,4; b.1,3,4,5; c.1,2,4,5; d.1,2,3,5; e.2,3,4,5.

22. The active immunization of patient is possible to realize helping next preparations:

1. staphylococcal anatoxin;
2. antistaphylococcal γ - globulin;
3. bacteriophage;
4. human γ - globulin.

Choose correct combination of answers:

a.1,3,4; b.1,2,4; c.1,2,3; d.2,3; e.1.

23. Laser rays of high energy carry out next effect:

1. change chemical reactions in the tissues;
2. increase temperature in the tissues;
3. kill microorganisms;
4. suddenly increase intracellular and interstitial pressure;
5. strengthen reproduction of the young cells.

Choose correct combination of responses:

a.1,3; b.1,5; c.2,4,5; d.3,4,5; e.1,2,3,4.

24. Install concordance (every answer may be used once, many times, or never):

Groups of antiseptics :	Preparations :
1) oxidizers	a) Chlorhexidine
2) halogens (haloids)	b) Carbolic acid
3) antibiotics	c) Nystatin
4) phenols	d) Iodopyrone

5) detergents (preparations of superficial activity)	e) Potassium permanganate
6) salts of the heavy metals	f) Chloramine B
7) dyes	g) Rivanol
	h) Silver nitrate

EDUCATIONAL PROBLEMS TO SELFCONTROL **(α-II)**

1. In postoperative period a patient receives long term antibiotic therapy. The course of disease was complicated by appearance of films on mucous membrane of the patients mouth and diarrhea. What complication is possible to suspect ? What cause of its development ? What prophylaxis of this complication ?

2. The operational nurse opened a drum with dressing material after sterilization and revealed in it the ampoule of benzoic acid, that was not melted. What is it about? What the further actions of operational nurse?

3. During operation of patient, who is known as injective drug abuser, the surgeon was injured by needle. What danger of this complication? What further actions of doctor surgeon should be? What kind of antisepsis necessary to use ?

4. On fifth day after operation in the patient appeared pain in area of postoperative wound. The skin around a wound was tensed, hyperemic. Present a local and general increasing of the body temperature. What complication develops in the patient ? What method of antisepsis necessary to use in this case and what is it about ?

Supplement 2.

TESTS AND UNTYPICAL SITUATIONAL PROBLEMS TO CONTROL **(α-III)**

2–1. Young woman for 10 min. after intramuscular injection of 1 mln. IU Penicillin began to complain on general weakness, apprehensiveness and vertigo, noise in the ears, pruritus of skin. During examination revealed hyperemia of skin of the face,/trunk, decreasing of the blood pressure to 70/40 mm. of Mercury, threadlike pulse, gasp (dyspnoea).

1) What is probable diagnosis of complication ?

a) collapse

b) allergic reaction
c) syncope
d) cardiogenic shock
e) anaphylactic shock.

2) First medical aid consists in next measures:

a) to provide Trandelenburg position
b) to inject intravenously antihistaminic preparation and glucocorticoids
c) to apply tourniquet on extremity
d) to inject intramuscularly vasopressors
e) to provide horizontal position
f) to give to drink a hot tea
g) to begin cardio - pulmonary resuscitation.

3) Note on sequence of actions for prevention of similar complications:

a) to carry out intradermal test on sensitivity to antibiotic
b) to recompose an allergic anamnesis
c) observation during 20 min.
d) to inject antibiotic slowly
e) to provide bed regimen after primary introduction
f) to make first injection of volume in 1/3 of administrated dose.

Correct answer on problem 2–1. 1 – e; 2 – b, c; 3 – b, a, e, d, c.

Test task 2-2. Fill this table of preparations compatibility to antiseptic group:

	Preparation	Haloids	Aldehydes	Detergents	Metals*
		A	B	C	D
1.	Betadine				
2.	Glutaraldehyde				
3.	Iodoform				
4.	Lizoformine				
5.	Collargole				
6.	Lugole (Iodine) solution				

7.	Protargole				
8.	Dekasane				
9.	Sidex				
10.	Silver nitrate				
11.	Dichloride of Mercury				
12.	Hexamethylentetramine (Urotropine)				
13.	Chlorhexidine (Hibitan)				

Remark * : Salts of the heavy metals.

Correct answers on test assignement 2-2 :

1– A; 2 – B; 3 – A; 4 – B; 5 – A; 6 – A; 7 – A;
8 – C; 9 – B; 10 –D; 11 – D; 12 – B; 13 – C.

TERMINOLOGICAL GLOSSARY

Asepsis (gr. *a* – opposition, absence; + gr. *septikos* – putrid) complex of preventive methods and measures, directed on creation of microbeless conditions for preservation of the wound contamination.

Aspiration (lat. *aspiratio* – breath): 1) to suck fluids or air from any body cavity at presence different diseases; 2) penetration of the foreign bodies to respiratory paths during inhale.

Vacuum (lat. *vacuum* – emptiness) – tenuous condition of the gas; space, where no matter completely.

Disinfection (fr. *des* – denial; + lat. *infectio* – infection) – extermination on (in) objects a bacteria activators of intrahospital infection, pathogenic and conditionally pathogenic microorganisms (decontamination).

Drainage (drain) - (fr. d*rainage* - outlet) – inference from cavity of the body or wound a pus or fluid helping special tubes or gauze strips.

Immunocorrection (Immunotherapy) - (lat. i*mmunis* – defend; + lat. *corrigo* – correct) – measures, directed on normalization of immune system functions; correction of immunity violations.

Immunosupression (lat. i*mmunis* – defend; + lat. *supressus* – oppress) – immune depress; condition of decreased organisms reaction.

Contamination (lat. *contaminatio* – pollution) – penetration of infectious, organic/chemical agents or materials into tissues or cavities, that normally are sterile (clear) or have another permanent inhabitants.

Contraperture (lat. *contr(a)*; + lat. *apertura* – opening) – additional incision for introduction of drainage with purpose to drain of purulent focus.

Resident (fr. r*esident*, from lat. *residens/residentis)* – anything, that remains on the same place) – constant/changeless microflora.

Resistance (fr. r*esistere* – stand against) – stability of macro- or micro - organism to action of different harmful factors.

Superinfection (lat. *super* – most; + lat. *infectus* – to infect (to contaminate) – new infection, that complicates course of available infectious disease, caused by microorganisms, resistant to antimicrobial means; repeated contamination.

Transient (lat. *transitivus* –transitive) – anything, that passing (object or subject).