МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
Харківський національний медичний університет

PHYSIOTHERAPY IN COSMETOLOGY

Study guidelines
for the 5th-year English medium
students of medicine

ФІЗІОТЕРАПІЯ В КОСМЕТОЛОГІЇ

Методичні вказівки
для студентів медичного факультету
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Topic 1. Modern physiotherapeutic methods in cosmetology. Electrical therapy in cosmetology. Galvanization

Motivational description. The term "**physical therapy**" literally means treatment by natural factors. With the development of science and technology the possibility of such factors is significantly expanded and improved, moved beyond the natural. ***Modern physiotherapy*** (physiatry, physical therapy, physical medicine) – branch of medicine, which study influence of natural and artificial factors on the human organism and use them for saving of health rejuvenation and powering of health, treatment of pathology, prevention of pathology and medical rehabilitation. Therapeutic physical factors are divided on natural, based on the natural action of natural factors (sun, climate, mineral and fresh water, the use of peloids, sand, air etc.) and artificial, based on the action of various artificial energy sources and factors (electrical, mechanical, thermal, pressure, sound, light, etc.). In modern cosmetology the natural physiotherapy as monotherapy is used rarely (ex. balneology); in a clinic, urban and suburban medical and cosmetic establishments the artificial and combined (natural and artificial) methods are commonly used.

The main principles of physiotherapy

1. Do not conduct two or more general impact methods, causing a generalized reaction of the body, in one day, (ex. ultraviolet irradiation and general body massage).
2. Do not use the methods, causing general reflex action on the same treated field in one same day.
3. Do not use in one same day the physical therapy techniques, similar in nature effects on the body (ex. electrical myostimulation and electrolipolisys; UVR and laser therapy).
4. Do not assign on the same field the procedures, that cause irritation or inflammation of the skin (ex. UVR and galvanization).
5. When complex procedures in a same session is carried out, start with the local impact (face), then finish by general (body) method with 15–20 minutes intervals.

The term "**electrotherapy**" – group of physiotherapeutic methods, which are based on the action of electric current on the body. Depending on the power, voltage, frequency of the used electrical current, we can determine the method and the final effect. The electrotherapeutic methods are based on the impact on the body of the electric currents of varying frequency and voltage in a constant or pulsed regimen, magnetic and electromagnetic fields. Physico-chemical nature of the action of the above factors is to actively moving in the tissues and interstitial fluid of electrically charged particles (ions, electrons, polar molecules), their accumulation in the membranes, which leads to the occurrence of thermal and oscillatory effects not only in the impact zone, and at the level of the whole organism.

Prevention of accidents, working with electrical equipment.

1. Read the instructions carefully before using your new appliance
2. Do not use faulty or damaged wires of devices.
3. Inspect your equipment regularly.
4. Do not attempt to repair the defective equipment by your own hands.
5. Avoid to wet of the electrical wires.
6. Do not put any objects and do not step on the wires.
7. Ensure that electrical wiring is not curved and not twisted.
8. Turn off the unit by removing the plug from the socket.
9. One outlet comprise a single device.
10. Do not touch electrical appliances with wet hands.
11. Do not touch any metal objects while working with electrical appliances.
12. Do not leave the client alone with the switched on electrical devises.
13. Do not clean the electrodes while the appliance.
14. After work, disconnect the device from the network.

Galvanization - impact of the direct current of low power (50 mA) and low voltage (30–80 V) through superimposed on the human skin of the electrodes of different shapes and sizes. The technique is widely used in medicine and cosmetology, for many decades. In cosmetology is used in the complex program of rejuvenation, treatment of oily seborrhea and acne, to treat dry skin. Physiotherapeutic techniques are widely used not only in modern cosmetology, but also in medicine as a whole. Knowledge of these techniques, an understanding of the operating principle of the device and the impact of factors are necessary to a modern clinician for correctly using them in practice.

Training and targeted questions. During study of this topic to learn the basic definitions:

- physiotherapy, electrotherapy, galvanization;
- characteristic of physiotherapeutic methods in cosmetology depending of impact factor;
- mechanism of impact of electrical current on the human skin and organism;
- the main methods of electrical physiotherapy;
- galvanization, desincrustation, iontophoresis, anaphoresis, cataphoresis.

Practical skills

to be able to

– collect anamnestic data, which influence on choice of physiotherapeutic method;

– detect of indications and contraindications for electrical physiotherapeutic methods in cosmetology;

– apply accident prevention measures during working with electrical cosmetological equipment;

– advise the patient about the possibilities of using galvanization to correct cosmetic defects considering his individual characteristics.

Control questions.

1. The general concept of physiotherapy.
2. Classification of physiotherapeutic methods in cosmetology.
3. General principles of using of physiotherapeutic treatment.
4. Safety regulations for working with medical physiotherapeutic apparatuses.
5. Electrotherapy: general description of the methods, indications, contraindications, equipment.
6. The mechanism of influence of the electric current to the skin and the human organism. Types of electric current used in cosmetology.
7. The concept galvanization: general characteristics, mechanism of action, indications, contraindications, technique of procedure.
8. Iontophoresis: the characteristic of method, the indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
9. Desincrustation: the characteristic of method, the indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
10. Medicinal and cosmetic products for iontophoresis and desincrustation.

Tasks for individual work

1. Choose the natural physiotherapeutic methods:

a) magnet therapy; *d) stone therapy;* *g) chrome therapy;*
b) electric epilation; *e) peloid therapy;* *h) iontophoresis of peloids;*
c) desincrustation; *f) air therapy;* *i) aromotherapy.*

2. How to work with cosmetic equipment:

a) turn off the unit by removing the plug from the socket;
b) does not turn off the unit by removing the plug from the socket;
c) do not attempt to repair the defective equipment by your own hands;
d) attempt to repair the defective equipment by your own hands;
e) turn off the unit by removing the plug from the socket;
f) does not turn off the unit by removing the plug from the socket;
g) do not attempt to repair the defective equipment by your own hands;
h) attempt to repair the defective equipment by your own hands.

3. The woman 40 years old with diagnosis: Rosacea. Erythro couperose of 2-nd stage came to the doctor. Name the medicine, which recommended for iontophoresis in this clinical situation. Name the polarity of electrode for providing this procedure.

4. Choose the reaction of skin on anode during galvanization:

a) decreasing of edema; *d) astringent effect;*
b) appearance of hyperemia; *e) absorption of acid solutions;*
c) expanding of the pores; *f) absorption of alkaline solutions;*

5. Galvanization - impact on the body through the electrodes of various shapes and sizes by a constant electric current of the following parameters:

a) the amperage up to 50 mA and a voltage of 30–80 V;
b) the amperage up to 10 mA and a voltage of 30–80 V;

c) the amperage up to 100 A and voltage 50 V;
d) the amperage up to 1 A and a voltage of 100 V;
e) the amperage up to 50 mA and a voltage of 90–100 V;
f) the amperage up to 150 mA and a voltage of 90–100 V.

6. Name the method of chemical atraumatic skin cleansing by using electrodynamic gel and galvanic current:

a) standard dermabrasion;
b) diamond dermabrasion;
c) sand-blowing microdermabrasion;
d) laser peeling;
e) brushing;
f) phyto peeling;
g) salicylic acid peeling;
h) ultrasound peeling;
i) desincrustation.

7. Active electrode during galvanization is:

a) an electrode located in the patient's hand;
b) no correct answer;
c) electrode, which is secured to the patient's body;
d) an electrode, working on the skin of patient;
e) a spherical electrode;
f) a cone-shaped electrode.

8. The patient 17 years old came to the doctor with complaints on oily skin of face and scalp, oily dandruff, comedones. Your provisional diagnosis? Name the methods of electrical physiotherapy for treatment.

9. Patient 22 y.o. Ds: Severe form of Acne juvenile, regressive stage. The iontophoresis of face and skin of back in complex therapy was administered for him. Name the medicine, polarity of active electrode and regimen of procedures for this clinical situation.

10. The patient 45 y.o. asks for rejuvenation iontophoresis procedures with using polarized anti-aging medicines and cosmetics. She has history of golden thread facelifting 10 years ago. Your tactics and recommendation.

Topic 2. Electrocoagulation in cosmetology. Electroepilation. Electro lipolysis. Ridolysis

Motivational description. Methods of electrical destruction of the skin are widely used in medical and cosmetic practice. These techniques require not only knowledge of equipment and the mechanism of action on the tissues, but also require skills.

Electrocoagulation – the use of direct or alternating electric current, which causes a temperature rise in the tissue and, consequently, makes destruction.

Electro epilation – is a destruction of the hair follicle with a direct or alternating electric current.

Ridolysis – anti-aging method using high frequency (6 000 Hz) modulated by low frequency (50–200 Hz) electric current which is fed through the needle electrodes (1–2 cm), introduced into the dermis, causing damage to the connective tissue.

Electric lipolysis – is the process of destruction by electric current of fat, which is broken down and then eliminated from the body. The procedure also improves microcirculation, reduces tissue hypoxia.

Knowledge of these techniques, indications and contraindications for their implementation will allow to the modern clinician to use them rationally in their practice.

Training and targeted questions: During study of this topic to learn the basic definitions:

- destructive physiotherapy;
- electrocoagulation;
- galvanocoagulation;
- diathermocoagulation;
- electro epilation;
- thermolysis and electrolysis;
- blend-epilation and flash-epilation;
- ridolysis;
- electric lipoysis.

Practical skills

to be able to

– collect anamnestic data, impacting on the choice of electro destructive methods in cosmetology;

– detect of indications and contraindications for electro destructive methods in cosmetology;

– apply accident prevention measures during working with electro destructive cosmetological equipment;

– construct an algorithm of compatibility and consistency of electro destructive treatment with other methods and procedures in cosmetology;

– explain the advantages and disadvantages of using electrical destructive methods in cosmetology;

– make a rational choice of electro destructive treatment in cosmetology based on the individual features of patient.

Control questions

1. Electro coagulation: the characteristic of method, the indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
2. Galvanic coagulation: the characteristic of method, the indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
3. Diathermocoagulation: the characteristic of method, the indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
4. Comparative characteristics of different types of electrocoagulation.
5. Electro epilation: the characteristic of method, the indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.

6. Electrolysis: the characteristic of method, the indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
7. Thermolysis: the characteristic of method, the indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
8. Combined methods of electric epilation.
9. Ridolysis: the characteristic of method, the indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
10. Electric lipolysis: the characteristic of method, the indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.

Variants of individual tasks

1. Name of the method of treatment, destruction, removal of abnormal skin growths by alternating electric current of great strength (up to 3 A) and high frequency (1.5–2 MHz) at a voltage up to 200 V:

a) galvanic coagulation; *c) electric coagulation;* *e) epilation;*
b) cryolization; *d) diathermy coagulation;* *f) fulguration.*

2. Which method of electric epilation is based on combination of thermolysis and electrolysis?

a) electrolysis; *c) scan – method;* *e) photoepilation;*
b) thermolysis; *d) blend-method;* *f) flash – method.*

3. Patient K., 62 years, complained of the lesions in the armpits. The history of intolerance to the electric current. On examination multiple papillomas were diagnosed from him. What method of electrotherapy can be advised this patient?

a) electrocoagulation; *d) electric epilation;*
b) none method of electric destruction; *e) galvanic coagulation;*
c) any electric destruction method; *f) diathermocoagulation.*

4. Patient, 43 years complained of pedicle neoplasm on the skin of left hip. Examination had shown the soft fibroma. What method of electrotherapy can be advised this patient?

a) cryodestruction; *d) electric epilation;*
b) none method of electric destruction; *e) diathermocoagulation;*
c) any electric destruction method; *f) galvanic coagulation.*

5. Which method is based on a thermal effect on the follicle, processed by high-frequency alternating current?

a) thermolysis; *c) electrolysis;* *e) photo epilation;*
b) desincrustation; *d) ridolysis;* *f) anaphoresis.*

6. What methods do not apply to the electric epilation:

a) thermolysis; *c) photo epilation;* *e) laser epilation;*
b) blend-electroepilation; *d) flash – electroepilation;* *f) electrolysis.*

7. Name the indications of electric epilation:

a) in-growing hairs; *c) trichotillomania;* *e) hypertrichosis;*
b) alopecia areata; *d) hirsutism;* *f) trichomoniasis.*

8. The woman 54 years old asked a dermatocosmetologist for treatment of her wrinkles. She suffers from type 2 diabetes, GB 2 degrees, angina, takes salicylates. Are the ridolysis indicated in this clinical situation?
9. Girl, 19 years, with complaints of hair growth on the face (upper lip, chin) are in the reception to the dermatocosmetologist. On examination revealed: a lot of dark hair, up to 1.5 cm on the upper lip, chin. She was diagnosed: hirsutism. Appointed consulted an endocrinologist, gynecologist, neuropathologist. What cosmetic techniques can be used in this clinical situation?
10. The 35 years old woman with a diagnosis of cellulite 3 stage is in cosmetic clinic. Contraindications for electrolipolysis are absent. Develop a scheme of her cellulite correction in this clinical situation, specify the regimen of procedures.

Topic 3. Micro current therapy. Darsonvalization in cosmetology. UHF-therapy and magnet therapy in cosmetology. Electric limphatic drainage and electrical myostimulation in cosmetology

Motivational description. ***Microcurrents*** are feeble pulse electrical currents small amplitude (40–1000 mkA) with a frequency of 0.1–500 Hz. Two methods belonge to MCC: ***MENS*** (Microcurrent Electrical Neuromuscular Stimulation – and TENS (Transcutaneous Electrical Nerve Stimulation. ***TENS*** has a narrower spectrum of action – thanks to the analgesic effect is used in plastic surgery with postoperative states in cosmetology. MENS method received more widespread in cosmetology, as it not only relieves pain, but also has a positive effect on reparative processes in the skin. The principal difference of micro currents lies in their free penetration in the body's cells and the normalization of biochemical processes. By acting on the cell membranes, microcurrents improve metabolism, increase the activity of enzymes of potassium channels, ATP synthesis, proteins, lipids, and other vital substances. Due to the effects of micro-currents, nutrients penetrate into the deeper layers of the skin. In addition, micro-currents tone up of smooth muscles of blood vessels, hair follicles, improve skin turgor. They are used for the non-surgical correction of age-related changes of facial contours, smooth wrinkles.

Darsonvalization – therapeutic impact of alternating sinusoidal pulse current of high frequency (100–450, typically 110 kHz), high voltage (10–20 kV) and low power (0.02 mA in amplitude – to 10–15 mA). Apparatus for darsonvalization is an impulse current generator of high frequency and high voltage. For local darsonvalization are used glass electrodes of various shapes, filled with a rarefied air or inert gas. At the heart induced biochemical processes in cells and tissues are oscillatory motion of electrically active components (ions, electrons, dipole protein-colloidal structures), which creates a variable potentials, the electronic and ionic polarization (oscillatory action). During the pulse (about 50 times in 1 c) a quiet or a spark discharge between the electrode and the skin is formed, which clinically manifested by irritating or cauterizing effect.

Ultrahigh frequency therapy– remote influence of continuous or pulsed electric field of ultra-high frequency (40.68 MHz, at least – 27.12 MHz) power of 1–350 W, with a wavelength in the range of 1-10 m, which is generated by the two plates of the capacitor. The energy of the electric field UHF penetrates deep into the tissue but is absorbed by them slightly, to a greater extent - the tissues with the lowest dielectric constant (fat, connective, nervous, bone and skin) with the change of physical and chemical processes related to protein structures of cells, the ionic composition blood, lymph. This takes place a polarization without current, resonant oscillations are excited by the cellular elements; along with primary oscillation effect is also observed moderate heat buildup. Heating the tissue in the area of impact of about 1° C. UHF magnetic component of the field causes the formation of "eddy" currents in tissue. As a result of these effects the arterioles and capillaries dilate (diameter in the zone of influence of capillaries increases 3–10 times), their permeability decreases, increasing local hemodynamics, trophism, tissue metabolism and immune responses improves (increase in phagocytic activity of leukocytes etc.) With increasing resistance to infectious agents, is also developing anti-inflammatory, resolving, analgesic effect; around foci formed a protective barrier.

Magnet therapy– physiotherapy method, in which the human body affected the static magnetic field (the DMF) or alternating (AMF) low frequency magnetic fields. Magnetic fields are a form of physical matter which make a communication and interaction between electrically charged particles. The basis of the biological effect of the magnetic field pointing find an electromotive force in a flow of blood and lymph. Magnetic fields cause various physicochemical reactions of the body, activating metabolic and enzymatic processes in the cell and improving cellular transport of substances. Magnet therapy causes anti-edematous, anti-adhesion, vessels dilation, anti-inflammatory, analgesic, sedative effects. It improves microcirculation and reparative processes in the tissues. Low frequency (less than 105 Hz), pulsed and complicated magnetic fields commonly used in cosmetology.

Electric myostimulation – using of pulse currents for impacting on neuro-muscular apparatus. During stimulation of muscles or nerve fibers by electric current their biological activity become changed and spike answers formed. Electrical myostimulation with frequency 10 kHz cause a sum effect of depolarization and strong long contraction of muscles. Contractions and relaxations of muscles protect against atrophy, restore a nervous regulation of muscles, improve the power and volume of muscles, increase adaptations to physical training, increase of threshold of muscle fatigue.

Electric lymph drainage – is an activation by electric current of lymph, which, in addition, controls both the arterial and venous system, providing the required distribution of fluid and improving transport function of these systems. Under the influence of an electric current is observed acceleration of migration of interstitial fluid in the lymph capillaries and activation of movement of

lymph through the lymphatic vessels. It is a method of electric stimulation of skeletal muscles and muscles of extremities to increase flow of lymph and venous blood, with using pulse current 100 Hz power 20–60 мА. Implemented by the mechanical action of the muscles in the blood vessels, by contraction of vascular smooth muscles and creating an osmotic gradient required for the directional movement of water.

These techniques are widely used in cosmetology and medicine, and their study will help to future clinician to make rational use of them in their practice.

Training and targeted questions: During study of this topic to learn the basic definitions:

- micro current therapy, MENS and TENS, myolifting;
- darsonvalisation;
- UHF-therapy;
- magnet therapy;
- electric myostimulation;
- electric lymph drainage**.**

Practical skills

to be able to

– collect anamnestic data, impacting on the choice of electro therapeutic methods in cosmetology;

– detect of indications and contraindications for electro therapeutic methods in cosmetology;

– apply accident prevention measures during working with electro therapeutic cosmetological equipment;

– construct an algorithm of compatibility and consistency of electro therapeutic treatment with other methods and procedures in cosmetology;

– explain the advantages and disadvantages of using electrical therapeutic methods in cosmetology;

– make a rational choise of electrical therapeutic treatment in cosmetology considering individual features of patient.

Control questions.

1. Microcurrent therapy: the characteristic of method, the indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
2. Darsonvalization: the characteristic of method, the indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
3. UHF-therapy: the characteristic of method, the indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
4. UFH in acne therapy. Rational using in different stages and sevetity of disease.
5. Magnet therapy: the characteristic of method, the indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.

6. Electric myostimulation: the characteristic of method, the indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
7. Electric lymph drainage: the characteristic of method, the indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.

Variants of individual tasks

1. Name the dermatological diseases and cosmetic defects, indicated for using of darsonvalization:

a) acne; *c) alopecia;* *e) oily seborhea;*
b) hypertrichosis; *d) skin tumors;* *f) hirsutism.*

2. Which skin diseases can be treated by UHF-therapy?

a) furuncle in forming stage; *d) furuncle in ulcerative stage;*
b) alopecia; *e) hypertrichosis;*
c) oily seborrhea; *f) cystic acne.*

3. Select the true statements

a) darsonvalization– therapeutic impact of alternating sinusoidal pulse current of high frequency (100–450, typically 110 kHz), high voltage (10–20 kV) and low power (0.02 mA in amplitude – to 10–15 mA);
b) darsonvalization – therapeutic impact of direct current of high frequency (100–450, typically 110 kHz);
c) darsonvalization – therapeutic impact of direct current of high voltage (10–20 kV);
d) darsonvalization – therapeutic impact of direct current of low power (0.02 mA in amplitude – to 10–15 mA).

4. The patient L., 15 years old with a diagnosis: juvenile acne comedonal form, were assigned next beauty treatments: manual extraction of comedones, facial massage by Jacque. Which electrotherapeutic method can be used to the completing these procedures?

a) electrical lymph drainage; *c) magnet therapy;* *e) UHF therapy;*
b) darsonvalization; *d) electric coagulation;* *f) micro current therapy.*

5. Patient R., 31 complained of chronic inflammatory formation in the right axilla. On examination, he was diagnosed: hydradenitis suppurativa, infiltrating stage. What electrotherapy method can be advised to the patient in treatment?

a) cryodestruction; *c) electric lymph drainage;* *e) electric coagulation;*
b) micro current therapy; *d) darsonvalization;* *f) UHF –therapy.*

6. The patient S., 39, has a prevalence of a hypodynamic lifestyle. Which method using pulse current can be advised of the patient in order to increase muscle strength and shape?

a) electric myostimulation; *c) UHF therapy;* *e) ridolysis;*
b) darsonvalization; *d) electric lipolysis;* *f) iontophoresis.*

7. What is the name of the cosmetology method, which is a soft "lift" the skin and muscles using micro-currents?

a) darsonvalization; *c) myolifting;* *e) electric lifting;*
b) electric myostimulation; *d) ridolysis;* *f) face lifting.*

8. The female complains on hair-loosing on the head after a long diet to lose weight. Dermatologist interview shows that the hair remains in large quantities in the brush, on the bath after washing the hair. What methods of physical therapy can be recommended to a woman?

9. The 52 years female with severe manifestations of mixed age are in cosmetic clinic. On examination – pastosity of face, pale skin, expressed porosity, reduced turgor, multiple longitudinal wrinkles on the forehead, in the brow area, nasolabial folds expressed moderately, fuzzy oval face, wrinkles are sagging. What method of electrotherapy can be recommended to the patient?

10. Female 43 years came to the cosmetologist with complaints on cellulite in the thighs. On examination: loose skin on the thighs, atony of skin, "orange peel" in the standing position, flabby muscles. She was diagnosed cellulite 2-nd stage. What methods of electrotherapy can be recommended to the patient?

Topic 4. Phototherapy in cosmetology. UV-therapy. PUVA therapy. Infrared light therapy. Chromo therapy in cosmetology

Motivational description. The light - is electromagnetic radiation, which has the properties of an electromagnetic wave and particle flux (photons) in accordance with the corpuscular -wave theory of light. The wave properties of light are expressed in the reflection, refraction, interference, but corpuscular - in photoelectric and photochemical effects. ***Phototherapy*** (from the Greek "photos"-light) – is a method of physiotherapy application of electromagnetic waves of infrared, visible and ultraviolet parts of the spectrum with therapeutic and prophylactic purposes. It is known, that the solar spectrum at 10 % consists of ultraviolet rays, 40 % – the rays of the visible spectrum, and 50 % – infrared rays. These types of electromagnetic radiation are widely used in medicine. The artificial sourse of infrared and visible light commonly used filament heated by an electric current. For UV radiation in physiotherapy the fluorescent mercury lamps of low-pressure and mercury-quartz high-pressure lamps are used. The energy of electromagnetic field and radiation, interacting with body tissue, is converted into other forms of energy (chemical, thermal, etc.), which serve as a trigger link of physico-chemical and biological reactions that form the final therapeutic effect. In addition, each of the types of electromagnetic fields and radiation causes the unique photo-biological processes, which determine the specificity of their therapeutic effects. The longer the wavelength, the deeper penetration of radiation. Infrared rays penetrate into the tissue to a depth of 2–3 cm, visible light – up to 1 cm, ultraviolet rays – 0.5–1 mm.

The seven colors of the rainbow – it is only the visible part of the light spectrum, a relatively narrow frequency band is its electromagnetic oscillations, which is in the range of 760 – 400 nm. On both sides of this strip are situated invisible parts of the spectrum – the infrared rays of longer wavelength than visible light (400 microns – 760 nm) and ultraviolet rays - with shorter waves (180–400 nm). The long wavelength ultraviolet (UVA) has a wavelength of 400–315 nm, medium-wave (UVB) – a wavelength of 315–280 nm and short-wave (UVC) radiation – wavelength less than 280 nm. The most energy UVC rays have.

PUVA-therapy (PUVA: P-psoralen, UVA-ultraviolet spectrum A (315–400 nm) – Photochemotherapy – therapeutic use of the long-wave UV radiation in combination with photosensitizers (psoralens). When taken orally, some chemical compounds – furocoumarins – can sensitize the skin of patients to UVA radiation and stimulate melanin synthesis.

Chromotherapy – treatment by visible light. Visible light – section of the general electromagnetic spectrum with a wavelength of 760–400 nm, which consists of 7 colors (red, orange, yellow, green, blue, indigo, violet). It has the ability to penetrate the skin to a depth of 1 cm, but operates mainly through the visual analyzer – retina.

Infra red radiation – optical radiation having a wavelength over 780 nm. Red and infrared rays are absorbed by the dermis, but 30 % of the rays penetrate deeper – up to 3–4 cm, reaching the subcutaneous fat and internal organs. Medium and long-wave rays are absorbed by the epidermis.

Light (actinic) methods of physical therapy are widely used today in medicine and cosmetology. Some of them have historical significance, while others are modern and high-tech. Using phototherapy methods the specialist has to be able to determine the patient's skin photo type, biodose of ultraviolet. Study on phototherapy is necessary for the clinician to the rational use of this method in medical practice.

Training and targeted questions. During study of this topic to learn the basic definitions:

- phototherapy;
- UV-therapy, UVC, UVB, UVA;
- Biodose of UV-therapy;
- chromotherapy;
- PUVA-therapy;
- IR-therapy.

Practical skills

<u>to be able to</u>

– collect anamnestic data, impacting on the choice of phototherapeutic methods in cosmetology;

– determine the phototype of the patient and biodose of UVR;
– detect of indications and contraindications for phototherapeutic methods in cosmetology;
– explain the advantages and disadvantages of using electrical therapeutic methods in cosmetology;
– make a rational choise of phototherapeutic treatment in cosmetology considering individual features of patient;
– advise the patient regarding the rational use of phototherapy according the clinical situation and individual characteristics.

Control questions.
1. Physiological effects of light on human body and skin.
2. The concept of human phototypes.
3. The concept of Biodosimetry UV irradiation.
4. UV-therapy: characteristic of method, indications, contraindications, technique of the procedure. Types of solariums.
5. PUVA therapy: characteristic of method, indications, contraindications, technique of the procedure.
6. IR-radiation: characteristic of method, indications, contraindications, technique of the procedure.
7. Chromotherapy in cosmetology: characteristic of method, indications, contraindications, technique of the procedure.

Variants of individual tasks.

1. What is a true. The solar spectrum consists of:
a) 10 % of UV, 40 % - the rays of the visible spectrum and 50 % -infrared rays;
b) 10 % of UV, 50 %- the rays of the visible spectrum and 40 % infrared rays;
c) 40 % of UV, 10 %- the rays of the visible spectrum and 50 %- infrared rays;
d) 50 % of UV, 40 %- the rays of the visible spectrum and 10 % infrared rays.

2. The boundaries of the wavelengths of the ultraviolet light region A:
a) 760–400 nm; *c) 315–280 nm;* *e) 315–400 mcm;*
в) 400 mcm – 760 nm; *d) 280–180 nm;* *f) 315–400 nm.*

3. Ultraviolet radiation in the area of the human body:
a) promotes regeneration; *f) increases of sweating;*
b) anaesthetize; *g) synthesizes of previtamin D3;*
c) all answers are tru; *h) promotes of edema of tissue;*
d) extends of blood vessels; *i) accelerates of proliferation.*
e) improves metabolism;

4. Calculate individual biodose of UVR, if the exposure time of biodosimetry holes 40 s, 6 holes irradiated with increasing exposure time for each with 40 s, received 3 erythematous stripes.

5. The penetration depth of ultraviolet radiation into skin tissue is:

a) 0,5–1 mm;	*c) 1 nm;*	*e) 4–5 cm;*
b) 1 cm;	*d) 2–3 cm;*	*f) 10 nm.*

6. At the reception to the dermatologist the patient K., 46 years came with complaints of rashes on the skin of hips, buttocks. Works driver of truck. On examination: on the skin of the thighs, buttocks painful bluish knots of up to 1.5 cm in diameter. Some of them have purulent rod. The body temperature of 37.4 °C. Which phototherapy method is possible to assign to the patient?

7. Girl 17 years old suffers of acne of moderate severity. Accepts doxycycline 100 mg 1 time a day, the course of 4 weeks. She asks to designate UVA to treat acne and improving skin color. Your tactics and recommendations.

8. Define the patient's phototype by the following characteristics: color white, brown hair, brown eyes, sometimes burns, tan of medium intensity.

9. Infrared radiation has a wavelength:

a) more 870 nm;	*d) more 780 nm;*	*g) more 1000 nm;*
b) less 1000 nm;	*e) less 780 nm;*	*h) less 870 nm4;*
c) 10–500 nm;	*f) 100-200 nm.*	*i) 500–1000 nm.*

10. Note contraindications for PUVA therapy:

a) photosensitising;	*d) using psoralen;*	*g) intolerance of psoralen;*
b) pregnancy;	*e) nephrosis;*	*h) under 18 years old;*
c) hyperthyreosis;	*f) diabetes mellitus.*	*i) all answers are tru.*

Topic 5. Laser therapy. Photorejuvenation. Photoepilation. Radiowave therapy in cosmetology

Motivational characteristic. The word "laser" means light amplification by a stimulated emission. The principle of operation is based on a photonic laser light emission theory, according to which the electron transfer energy from a higher level to a low photon flux occurs. ***Laser*** – the physical device that emits monochromatic light visible and infrared laser radiation which also characterized by coherence (strict ordering of light waves in space and time) and polarizability. The laser beam carries a high energy that is concentrated in the focused light beam in limited area. Parameters for certain types of lasers are following: the pulse energy, wavelength, pulse duration, the divergence of the beam.

Depending on the specified parameters the lasers are divided into low-energy lasers (therapeutic) and high energy lasers (surgical). Low-energy lasers are used for the purpose of activation of metabolic processes in the skin acceleration of epithelial proliferation and reparative processes in the connective tissue reducing the intensity of allergic skin reactions. High energy lasers are used to destroy abnormal skin focus (direct destruction or photocoagulation). This radiation is absorbed in the superficial layers of the epidermis water molecules. Significant tissue heating occurs due to poor thermal conductivity of

the epidermis (up 800 °C), which leads to rapid evaporation and boiling of water. In the confined space of cells there is a breakdown in plasma membrane and evaporation of the irradiated tissue (ablation). Around the charred area at a depth of 100–200 micron there is coagulation of proteins and hemostasis, and deeper (200–500 micron) reversible hyperthermia and edema are formed. Laser cosmetology mainly used in procedures such as the removal of warts, papillomas, birthmarks and vascular lesions, skin rejuvenation and resurfacing, treatment of stretch marks and laser hair removal. *Laser peel* (laser resurfacing, laser dermabrasion) – the use of high-intensity laser for improve skin relief and color. Thermal damage of surrounding tissue is 8 times lower than with laser photocoagulation. Subsequent epithelialization is characterized by the formation of structural ordering of the epidermis, smoothing skin relief and pigmentation. Laser deep peeling improves microcirculation, the degree of hydration, proliferation of cellular and fibrous structures of the dermis, the local immunity. As a result, turgor of skin increases, the dermis thickens, the depth of wrinkles reduces. In addition to removing the skin layers, laser light causes shortening (retraction) due to contraction of the collagen fibers, resulting to lifting of the skin. Laser resurfacing is also used for the treatment of stretch marks on the abdomen, thighs, chest, arms and buttocks. *Fractional ablation or ablative fractional photothermolysis* – a vaporization of micro-locuses of skin with a laser beam, followed by contraction and restoration of vaporized area. CO_2 lasers (10 600 nm) and Er:YAG lasers (2 940 nm) are commonly used for fractional laser peeling as for traditional laser resurfacing (ablation). Momentary heating of the water contained in the tissues, to 300 degrees and above causes the vaporization of micro locuses of tissue. The epidermis in damaged area is restored within a few hours or days, and its recovery rate depends on the diameter of micro damages. Fraxel laser generates microzones of ablation in diameter less than 200 microns, even when using the maximum energy, which is very important for quick recovery to minimize the risk of complications. Therapeutic effects: cleaning, re-epithelization, anti-aging. Indications: active age keratosis, hyperpigmentation, the average depth of wrinkles without excess skin. *Laser epilation* – modern method of removing unwanted hair, the principle of which is based on the properties of the laser beam to selectively impact on the hair and the hair follicle, damaging them and stopping their growth. In modern laser devices for hair removal used three types: neodymium, alexandrite and diode. Laser hair removal is very effective acting on dark hair, and can be used on all body parts. The pulse laser beam acts on the pigment melanin, which is contained in the hair follicle and hair shaft and absorbs burst energy. The more melanin contained in these structures (and the darker the hair), the better the result. The structures of the hair follicle and hair shaft are heated and destroyed. Laser hair removal works selectively on the hair, and

does not damage the epidermis. This allows you to carry out the procedure in the most sensitive areas of the body – the bikini area, face and armpits. The principle of "vascular" lasers is selective absorption of laser light of a specific wavelength (488–585 nm) by blood proteins – hemoglobin in accordance with the phenomenon of selective photo absorbtion. Thus the hemoglobin is coagulated with thrombus formation, followed by hardening of the vessel. Today, the group of vascular lasers is presented by an argon laser, copper vapor laser, neodymium: YAG laser and tunable dye lasers. Radiation of vascular laser passes through the skin without damaging it, which ensures the absence of subsequent scar at the site of exposure.

Photorejuvenation – a method of correction of age-face, which is based on the action of the light beam on all layers of the skin. The method is based on the physical property of high-intensity light pulses with certain wavelengths penetrate to different depths and absorbed by the skin structures - vessels of the dermis, the cells that produce melanin and collagen. The penetration of light into the skin does not destroy its components, but activates the normal physiological activity of cells (metabolism, proliferation), enhances the antioxidant biochemical reactions that destroy the unwanted accumulation of pigment, gradually closes the abnormally dilated vessels, stimulates the production of collagen and elastin. Due to improvement of microcirculation and drainage functions of the dermis this procedure increases skin resistance to infection, reduces the appearance of acne and rosacea. An important advantage - not traumatic and non-invasive procedures: exposure of high intensity light source, selectively generating pulses of a wavelength of 550 to 1200 nm not only effectively removes pigmented and vascular lesions of the skin, but also stimulates the formation of collagen and elastin fibers.

Radio waving surgery – contactless noninvasive method of incision and coagulation soft tissue using high-frequency radio waves (3.8–4.0 MHz). Cutting effect is achieved due to heat generated by the resistance of tissue to penetration of directed high-frequency waves. High-frequency energy is concentrated at the tip of an "active" or "surgical" electrode and causes a surge of intracellular molecular energy that heats the tissue and actually vaporizes cells. Thus direct contact electrode with the cells is missing, and the electrode is not heated. In addition, radiosurgery technique completely eliminates the painful contractions of muscles or stimulate nerve endings during the passage of the waves through the patient's body (the Faraday effect). Radio waving incision is performed without manual pressure or physical crushing of cells of tissues and is not accompanied by mechanical disruption of cells and necrosis of the surrounding layers. Significant advantage is the sterilizing effect radio wave surgery. Thus, the radio wave surgery greatly facilitates operation, improves and speeds up the surgical procedure. Radio coagulator eliminates

burns, which causes rapid healing. Indications: removal of exophytic skin and mucous growths without sutures and use of the optical zoom.

Radio waving lifting (thermage) – method of skin tightening with immediate effect, based on the principle of generating a bipolar radio waves. The method is based on a safe and comfortable exposure to radio waves, which have a thermal effect and stimulates the synthetic function of fibroblasts, increase the production of collagen and elastin fibers, reduces wrinkles and greatly enhances the skin tone. Under the influence of an alternating electric field that changes its polarity 6,000,000 times per second (6 MHz) charged particles within the skin change the direction of its movement with the same frequency. Natural resistance to tissue motion of charged particles leads to an increase in temperature in the deep layers of the skin. At the same time a special nozzle provides contact cooling of the epidermis. The temperature rise in the deep layers of the skin using radiofrequency energy provides a seal collagen of tissue as at 60 °C a fibrillar proteins are contracted and thicken. For a 4–6 months after the procedure there is increased formation of new collagen and the further strengthening of the dermal layer, that underlies the long-term aesthetic result.

Training and targeted questions: During study of this topic to learn the basic definitions:

- laser therapy, photo therapy, radio waving therapy;
- laser peeling;
- laser epilation;
- photo rejuvenation;
- mechanism of influence of the laser beam on the human skin and body;
- radio waving surgery;
- radio waving lifting;
- mechanism of influence of the radio waves on the human skin and body.

Practical skills

to be able to

– collect anamnestic data, impacting on the choice of phototherapeutic methods in cosmetology;

– detect of indications and contraindications for laser peeling, laser epilation, using vascular laser in dermatocosmetology;

– advise the patient regarding the rational use of laser peeling, laser epilation, vascular laser in treatment of cosmetic pathology;

– detect of indications and contraindications for radio waving surgery, radio waving lifting in dermatology and cosmetology;

– advise the patient regarding the rational use of radio waving surgery and radio waving lifting in the treatment of dermatocosmetic pathology.

Control questions.

1. Laser therapy in cosmetology. Characteristics of laser beam. Types of cosmetic lasers. Modern methods of using lasers in cosmetology.
2. Laser deep peel: characteristic of method, depth of impact, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
3. Vascular lasers: the characteristic of method, the indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
4. Laser epilation: characteristic of method, depth of impact, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
5. Photo rejuvenation: characteristic of method, depth of impact, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
6. Radio waving surgery: characteristic of method, depth of impact, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
7. Radio waving lifting: characteristic of method, depth of impact, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.

Variants of individual tasks

1. For what purpose do not use low-energy lasers:
a) for acceleration of reparative processes in the connective tissue;
b) for activation of metabolic processes in the skin;
c) for acceleration of epithelial proliferation;
d) *for* tattoo removing.

2. What are the absolute contraindications to the use of lasers?
a) active tuberculosis; *c) systemic blood diseases;*
b) malignant neoplasms; *d) there is no absolute contraindications.*

3. Which of dermatological diseases and cosmetic disorders is not an indication for laser resurfacing?
a) atrophic scars; *c) wrinkles;* *e) alopecia;*
b) pigmented spots; *d) tattoo;* *f) post acne.*

4. What is name of method of removing unwanted hair, based on the properties of the laser beam to selectively act on the hair and the hair follicle, damaging them and stopping hair growth??
a) photo epilation; *c) waxing;* *e) enzyme epilation;*
b) laser epilation; *d) electric epilation;* *f) sugaring.*

5. Which type of hair may be maximally effectively removed by laser epilation?
a) lanugo hair; *c) black hair;* *e) red hair;*
b) bristly hair; *d) grey hair;* *f) white hair.*

6. What is the non-invasive method of coagulation and incision and soft tissue using high frequency radio waves (3.8-4.0 MHz)?

a) radio waving lifting; *c) thermage;* *e) galvanic coagulation;*
b) radio waving surgery; *d) diathermo coagulation;* *f) cauterization.*

7. What is the physical device performs the cut with no physical manual pressure on the tissue and is not accompanied by mechanical disruption of the cells and necrosis of surrounding layers?

a) ultra sonic scalpel; *c) laser;*
b) electric coagulator; *d) radio waving coagulator.*

8. What are the postoperative effects are possible after radiowaving surgical procedures?

a) swelling; *c) inflammation;*
b) pain; *d) no right answer.*

9. What is the method of face lifting with immediate effect, based on the principle of generating a bipolar radio emission?

a) radio waving lifting; *c) electric lifting;* *e) thermolysis;*
b) ridolysis; *d) electrical myostimulation;* *f) myolifting.*

10. The young man 19 years complained of the presence of papillary structures in the genital area, prone to rapid reproduction. On examination, he was diagnosed with genital warts. What atraumatic removal should be offered to the patient?

a) electric coagulation; *c) vaporization;* *e) radio waving surgery;*
b) diathermocoagulation; *d) cryo deastruction;* *f) thermage.*

Topic 6. Ultrasonic therapy. Hyperbaric in cosmetology

Motivational characteristic. ***Ultrasound*** is elastic mechanical vibrations of the dense physical environment with a frequency of 20 kHz, t. e. in a supersonic acoustic frequencies, which are distributed in the form of longitudinal waves and lead to consistent compression and tension of medium. In therapeutic practice a ultrasound in the frequency range of 800–3 000 kHz are used. Mechanical action of ultra sound connected with vibrations cells, forward and back, that produces a massage at the cellular level, increases the permeability of cell membranes leading to improved cellular metabolism and densified tissue resorption (cellulite, scars and fibrosis). The thermal effect of ultrasound associated with the transition of mechanical energy into heat, that increases local temperature in the tissues at 1–2 degrees, which causes the acceleration of metabolism by 13 %. It dilates blood and lymph vessels, improve of microcirculation as a result, tissue metabolism activated, anti-inflammatory and resolving action of ultrasound manifested. Physical and chemical effects of ultrasound are connected with restructuring of intracellular structures. It enhances the production of enzymes, cell division, activates of fibroblasts; the production of collagen, elastin and hyaluronic acid are increased. Hyaluronic acid depolarization occurs, whereby there is a resorption of scar adhesions, fibrous tissue in cellulite. The penetration

depth of ultrasound in the tissues of the body depends on the oscillation frequency and wavelength: greater than the oscillation frequency, the less penetration depth: at a frequency of 1 600–2 600 kHz ultrasound penetrates to a depth of 1 cm and a frequency of 800–900 kHz – 4–5 cm. Speed of ultrasound in the tissues depends on the density and the acoustic impedance. The velocity of diffusion of ultrasonic wave is 1 500 m/s in liquids and 4 000 m/s in solids. That is why in inhomogeneous media, as tissues of the body, the ultrasound diffusion occurs unevenly. The ultrasonic energy absorption maximum is observed in the bone tissue at the boundaries of different tissues as well as internal cell membranes. The ultrasonic waves are bad reflected from air, so in medical practice ultra sonication is performed through the contact airless environment - petrolatum, glycerin, water and so forth. Ultrasonic energy exposure mode can be a continuous and pulsed. Continuous mode, when ultrasound at a single flow penetrates to the tissue. In pulse mode impulses of energy alternated with pauses. Time of ultrasonic energy impulse and break may be different. If impulse 2 ms the pause lasts 8 ms, if 4 ms – 16 ms. The smaller the pulse duration, the less effective the action of ultrasound. In cosmetic purposes is used the frequency of 1.2–3 MHz, the intensity of 0.1–0.8 W/cm^2. *Ultraphonophoresis (phonophoresis)* of medicines is a physical and pharmacological method of combined effects by ultrasound and medicines. Conventional contact medium (petrolatum, lanolin, glycerin) replace to drugs (aqueous solutions, ointments, emulsions, gels, containing different drugs). Ultrasound enhances the transdermal transport of drugs, which are deposited in the skin, where the blood comes slowly, and then to the organs and tissues. B. *Ultrasound peeling* - exfoliation of skin with ultrasound. The ultrasonic wave penetrating into the skin, improves microcirculation, softens and removes sebaceous plugs resolves small infiltrates, increases the elasticity of the skin, in addition, exfoliates the horny layer of the epidermis, which significantly improves the complexion.

Press therapy (press massage, pneumo massage, pulse bar therapy) – hardware version of lymphatic drainage, which combines the principles of physiological tissue drainage and the healing power of massage by the use of the of air pressure alternation. Action pressure therapy is based on the work of both the local regulatory and central neurohormonal mechanisms, which are based on stimulation of mechanoreceptors, sensory and tactile receptors. In medicine, pressure therapy (pulse barotherapy), exerting an antispasmodic and vasodilatory effect, is used in treatment of persistent muscle tension and prevention of varicose veins, removing heavy legs and toning the walls of blood vessels. Pressure therapy is used in treatment of post-traumatic and postoperative edema. In cosmetology is mainly used for the correction of cellulite and obesity, in anti-aging programs. ***Vacuum therapy*** – dosage impact of barometric pressure on certain parts of the body. In this case, the blood flow and lymphatic circulation improved in the tissue, muscle tone increased and creates favorable conditions for the trophic tissue. Modern vacuum apparatus for cosmetology,

has several functions. *Vacuum cleaning* cleans the skin of acne, comedones, dead skin cells, which is often used in complex care of face. *Vacuum massage* makes stimulation of blood circulation in the deep-lying tissues, causes lymph drainage and detoxification for eliminating edema, toning of muscles and softening cellulite nodes. During the vacuum-therapy takes place a kind of vascular gymnastics, ie alternating expansion and contraction of blood and lymph vessels. Cup massage accelerates the blood circulation, lymph and intercellular fluid in the skin, underlying muscle structures, ligaments, tendons and reflexively related organs. Vacuum therapy may be in two variants: the static and dynamic (moving). Static vacuum massage – cups apply along the spine along the meridian of the bladder for 15–30 minutes. Dynamic vacuum massage-gliding movement of cups on the patient's body in certain directions. *Cup massage* is performed for diseases of the musculoskeletal system, neurological disorders and diseases of the vascular system, diseases of bronchopulmonary system, gastrointestinal tract, impotence, enuresis, stagnant-inflammatory processes of urogenital system. Vacuum therapy is effective in dermatology: at neurodermatitis, urticaria, furunculosis and other dermatoses. Successfully used a vacuum therapy to lose weight and cellulite correction programs.

Training and targeted questions: during study of this topic to learn the basic definitions:

- ultrasound therapy;
- hyperbaric therapy;
- ultrasonic phoresis;
- ultrasound peeling;
- press therapy;
- vacuum therapy;
- vacuum cleaning;
- vacuum massage;
- mechanism of action od ultra sound on the human body and skin.

Practical skills

to be able to

– collect anamnestic data, impacting on the choice of ultrasound and hyperbaric methods in cosmetology;

– detect of indications and contraindications for ultrasonic phoresis, ultrasound peeling, press therapy, vacuum massage and vacuum cleaning in dermatocosmetology;

– advise the patient regarding the rational use of ultrasonic phoresis, ultrasound peeling, press therapy, vacuum massage and vacuum cleaning in treatment of cosmetic pathology.

Control questions:

1. Ultrasound therapy: characteristic of method, mechanism of action, types of ultrasound therapy in cosmetology.
2. Ultra sonic phoresis: characteristic of method, depth of impact, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
3. Ultrasound peeling: characteristic of method, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
4. Press therapy: characteristic of method, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
5. Vacuum therapy: characteristic of method, mechanism of action.
6. Vacuum cleaning: characteristic of method, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
7. Vacuum massage: characteristic of method, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.

Variants of individual tasks

1. What are the mechanisms of action of ultrasound on the human body?

a) mechanical; *c) biological;* *e) all of the above is true;*
b) physical and chemical; *d) thermal;* *f) tru a, b, d.*

2. Which of the following cosmetic disorders is not an indication for ultrasound therapy?

a) postacne; *c) hypertrichosis;* *e) alopecia;*
b) aging of face; *d) scars;* *f) 3–4 stage of celulite.*

3. What is the ultrasonic phoresis?

a) introduction of medicines and cosmetics into tissue using ultrasound;
b) cleaning of skin due to mechanical vibrations of the dense physical environment;
c) cleaning of skin using ultrasound;
d) introduction of medicines and cosmetics into tissue.

4. Which of the following dermatological diseases and cosmetic defects is a contraindication for the purpose of ultrasonic peeling?

a) postacne; *c) unhealthy complexion;* *e) scars;*
b) seborrhea; *d psoriasis) ;* *f) pyoderma of face.*

5. Patient L., male, 16 years, appealed for consultation complaining of a rash on the face, oily skin shine. On examination, he was diagnosed with oily seborrhea. Acne vulgaris. Papular form. Which physiotherapeutic treatment it is advisable to assign in the treatment of this patient?

a) ridolysis; *d) press therapy;*
b) micro current therapy; *e) electrical myostimulation;*
c) vacuum massage; *f) ultrasound peeling.*

6. What are the indications for ultrasound in cosmetology:

a) postacne scars; *c) alopecia of scalp;*
b) 3–4 stages of cellulite; *d) aging of face.*

7. What are the cotraindications for ultrasound procedures in cosmetology:

a) paralysis; *f) the presence of a pacemaker.*
b) dermatitis; *g) acute infectious diseases;*
c) thyrotoxicosis; *h) cancer;*
d) metal objects in the target area; *i) eczema.*
e) active tuberculosis;

8. Methods of ultraphonophoresis:

a) superficial; *c) contact;*
b) profound; *d) distant.*

9. Vacuum therapy is:

a) *exposure to a pulsed alternating electric current high voltage (20 kV) and high frequency (110 kHz);*
b) dosed negative barometric pressure on certain areas of the body by suction of air from the nozzle of costume;
c) combined effect on organs and tissues of ultrasonic vibrations and medicinal or cosmetic products, which are introduced through them.

10. Contraindications to vacuum cleaning:

a) teleangioectasia; *d) mixed skin;* *g) petechiae;*
b) comedones; *e) couperose;* *h dry skin) ;*
c) acne rosacea; *f) acne vulgaris;* *i) oily skin.*

Topic 7. Mechanical stress and mechanical vibrations in cosmetology

Motivational characteristic. ***Brosse (brushing*)** – mechanical peeling of skin surface by rotating soft brushes. The device for brushing is an electrical device with rotating nozzles, brushes and sponges. It may be included in cosmetic processor or be a separate device. The rotation of the brush is clockwise and counterclockwise at various speeds, which is set by the regulator. As a result of procedure, the skin texture becomes smooth due to exfoliation of the stratum corneum and stimulate microcirculation. The procedure is also used to increase the permeability of skin for cosmetics applied in future procedures. The brushing is used more often during the initial stages of the cosmetic procedure after cosmetic cleansing and before extraction of comedone, masks, massage, iontophoresis, chemical peeling, and others. ***Vibro therapy, vibro massage*** (from the Latin. vibrare – shake) – a method of treatment in which the patient's body (or part thereof) is influenced by means of devices (vibro massagers, couches vibration), serving to generate a low-frequency mechanical vibrations (up to 200 units of Hz). Vibro therapy, leads to increased local blood flow and lymph flow, activation of trophic tissue, the activation of the hypothalamic-pituitary system and the

mobilization of the body's adaptive capabilities. ***Cosmecanique*** – apparatus pulsating massage with special plates, which provides a three-dimensional machining (vertical, horizontal and in the direction of movement of maniples). Working head captures skinfold by parallel plates, then pulsing vacuum triggers the mechanical vibrations in the skin and underlying tissues. The device allows you to change the speed and frequency of movement of workers plates. Procedure leads to improving of microcirculation, to lymph stimulation (in 2–3 times) and to drainage of tissue, to increasing of venous outflow in 4–5 times with the unloading of venous network, to strengthening of the walls of venules, to increasing of arterial inflow and blood perfusion in 5–6 times, to stimulation of fibroblasts and dermal fibers update (by 30–120 %), to reducing skin graft on 20 %. Cosmetic effects: lifting, improving of facial contours, reducing of the severity of wrinkles and swelling, improving of the complexion and skin tone, cleaning, decreasing the pores. ***Dermotonia*** – vacuum reflexology method of treatment of the skin. Mechanism of action: reflexology, drainage, defibrosing, hypervascular, exfoliating effects. Different diameters of maniples with rotating teflon balls, allowing them to move in a different directions and perform various movements are used. Dermotonia is carried out without using of cosmetic products. ***Endermologie*** – vacuum massage with special rollers by way of palpation-rolling in the form of "rolling wave" on the body. The procedure is performed on a special individual suit. The maniple of device has a dedicated camera, where the vacuum is created. In this camera two parallel to each other cylindrical rollers are placed, which move synchronously, rotating back and forth with varying speed. The maniple moves on the body, "sucking" a fold of skin with hypoderma. The device has the ability to adjust the intensity of the vacuum, the speed of roller movement, vacuum cycling frequency, direction of rotation of the rollers. Effects: reflexogenic, metabolic activation, vascularizatingi, improving of microcirculation, resorbtive, strengthening of the lymphatic drainage, strengthening oxygenation of tissue, fibroblast activation, acceleration of lipolysis, immunomodulatory, sedative, analgesic. ***Sandblasting microdermabrasion*** – soft mechanical method of dermabrasion, where the abrasive material is a high-speed stream of micro-crystals of corundum, which is created by special device. Pointed crystals of aluminum oxide a size of 150 micron are emitted from a special device nozzle under high pressure. Crystals get on the skin with high speed, exfoliating horny layer and other lower layers of the epidermis and dermis.Corundum sand and micro particles of the epidermis are removed immediately in special container by special vacuum suction. The procedure is virtually painless, anesthesia is not required. The emergence of pain is a marker of exposure to the depth. All materials related to skin are disposable. The powder is not absorbed by the skin. Method is outpatient. Options influencing on the depth: superficial epidermal exfoliation of the stratum corneum (level 1); treatment of papillary dermis (level 2), with or without bleeding; treatment of deep layers of the dermis with bleeding (level 3). ***Diamond microdermabrasion***

allows for the gradual exfoliation due to the use of the abrasive properties of sapphire crystal covering the grinding surface. The maniple oscillates and process of peeling takes place in the most sparing mode.

Training and targeted questions: during study of this topic to learn the basic definitions:

- brosse (brushing);
- vibro therapy, vibro massage;
- cosmecanique**;**
- dermotonia;
- endermologie;
- microdermabrasion.

Practical skills

to be able to

– collect anamnestic data, impacting on the choice of methods of mechanical stress and mechanical vibrations in cosmetology;

– detect of indications and contraindications for methods of mechanical stress and mechanical vibrations in cosmetology;

– advise the patient regarding the rational use of methods of mechanical stress and mechanical vibrations in cosmetology.

Control questions.

1. Brosse: characteristic of method, depth of impact, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
2. Vibro massage: characteristic of method, depth of impact, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
3. Dermotonia: characteristic of method, depth of impact, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
4. Endermologie: characteristic of method, depth of impact, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
5. Cosmecanique: characteristic of method, depth of impact, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
6. Microdermabrasion: characteristic of method, depth of impact, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.

Variants of individual tasks

1. Brosse is:

a) superficial mechanical peeling of skin; *c) superficial laser peeling of skin;*
b) superficial chemical peeling of skin; *d) no right answer.*

2. Indications to brosse:

a) oily skin; *c) low skin turgor;* *e) porous skin;*
b) oily seborrhea; *d) pustule;* *f) sallow complexion.*

3. Contraindications to brosse:

a) couperose; *d) oily seborrhea;* *g) dry seborrhea;*
b) low skin turgor; *e) oily porous skin;* *h) sallow complexion;*
c) pustule; *f) papule;* *i) erosion.*

4. The female 25 years came to the doctor dermatologist with complaints of rash emerging on the site of a remote nevus. On examination: on the skin of the back hypertrophic scar 4 cm long and up to 1 cm in width. What are the methods of dealing with the scar can advise?

5. Indications to endermologie:

a) cellulite; *f) lymph stasis;*
b) striae gravidarum; *g) edema;*
c) varicose vein disease; *h) atony of skin;*
d) scars; *i) skin infections.*
e) the acceleration of wound healing;

6. Indications to cosmecanique:

a) aging skin; *f) edema and pastosity;*
b) gravitational wrinkles; *g) postacne;*
c) mimical wrinkles; *h) hematoma and infiltrates;*
d) seborrhea; *i) streptostaphyloderma.*
e) superficial micosis;

7. Regimens for dermotonia:

a) permanent; *c) impulsed;* *e) pulsed;*
b) alternating; *d) mixed;* *f) static.*

8. Cosmecanique – is:

a) apparatus pulsating massage; *d) massage with special plates;*
b) soft mechanical dermabrasion; *e) ultrasound massage;*
c) mechanical peeling; *f) manual massage.*

9. Endermologie – is:

a) vacuum massage with special rollers by way of palpation-rolling in the form of "rolling wave" on the body;
b) soft mechanical dermabrasion;
c) skin toning using microcurrent.

10. Indications to dermotonia:

a) hematoma; *c) a double chin;* *e) cellulite;*
b) seborrhea; *d) scars;* *f) deformative type of aging of face.*

Topic 8. Hydrotherapy in cosmetology. Steam therapy in cosmetology. Thermotherapy in cosmetology

Motivational characteristic. Actually "hydrotherapy" is called the medical use of fresh water (tap water, river, lake, and so on). Balneotherapy – therapeutic use of mineral water. The water began to be used for medicinal purposes in ancient times – in ancient Rome and Greece. However, only in the XIX century, water therapy received a scientific justification and took a firm place in physiotherapy practice. It should be noted that water is the most common substances in nature. Hydrosphere or water shell of the Earth is about 1.5 billion cubic kilometers; it covers about 1/4 of the earth's surface. Water is a biological irritant, permanent impacting on a human body in his everyday life. She plays the role of protective factors of the organism; its presence ensures thermoregulation, trophic function of tissues, promotes excretion of waste products.

The therapeutic effects of water due to the compounding effect of heat (thermal) and mechanical (hydrostatic) factors. The extent of the thermal effects of water depends on its temperature: cold procedure (below 20 °C); cool (20–33 °C); indifferent or indifferent (34–36 °C); warm (37–39 °C); hot (above 40 °C).

Cold exposure of water is also used in aerotherapy and thalassotherapy (therapeutic bathing). The impact of cold according to reflex mechanism involves the reaction of the autonomic nervous system, causing the changing of metabolism and the regulation of the internal organs function. Common cold procedures contribute to hardening of the body, increase its resistance to temperature variations and have a tonic effect. Local exposure to cold has analgesic effect. Indifferent water treatment perceived as no cold, no heat. They have a general sedative effect, decrease blood pressure and reduce the heart rate. Warm and hot baths Causes a short-term narrowing of vessels in the skin, quickly replaced on more prolonged their expansion and active hyperemia, accompanied by sensation of warmth, sweating, increased heart rate and breathing. Warm water treatments exert antispasmodic and analgesic effects, increases the secretory function of glands, have sedative effect. In general, a thermal effect of water on the body is a high loaded and requires careful attentive application for weakened patients. Any hydrotherapy thermal stimulation combined with the mechanical.

Mechanical action of water caused by the movement of water (stream, waves, swirls, etc.) increases the overall tone of the body, it promotes of training. A similar cause irritation of the waves and the water flow in the rivers when bathing. Mechanical impacts associated with the speed of the water environment, increases the overall tone of the body, promotes the training and hardening. Another type of mechanical action of water caused by hydrostatic pressure of water exerts a compressive action on blood vessels and thorax, causing the restructuring of respiration and circulation. Gas bubbles, dissolved in the water in gas baths, provide additional mechanical impact. Loss of body mass immersed

it in water (by Archimedes law) – this phenomenon is used in medical practice for therapeutic exercises in water in patients with poor muscle tone.

Steam therapy – combined effect of the temperature factor and steam. ***Bath house*** – the procedure involves heating under the temperature of about 80 degrees and wet steam. It may be combined with other procedures – for example, nourishing and moisturizing masks, peels, nourishes the skin with minerals, massage, which helps cleanse the body from toxins, and with contrast influence of cold water, have a tonic effect. ***Vaporization*** – cosmetic procedure, based on the mechanical and thermal effects of steam on the skin. Vaporization is carried out before cleaning, mask, massage, peeling, and as an independent procedure. In cosmetic practice the vaporization of water vapor, water vapor from plant extracts or ozonated steam are used. **Thermotherapy** uses therapeutic effect of temperature factor on the human body. It operates softly and relaxing, but has at the same universal therapeutic effect without causing adverse reactions. In general, thermotherapy relieves stress and fatigue, improves emotional sphere, increases the body's defenses under stress disorders, reduce pain with injuries and diseases of the muscles and joints. ***Heat therapy*** uses natural and artificial sources: moist heat of water baths, warm compresses, therapeutic mud and dry heat warmers, infrared lamps, paraffin, dry air baths and electro- light baths. Heat therapy uses high-frequency and ultrahigh-frequency currents for more in-depth warm. Thermotherapy causes local and general reactions of the organism. Local reactions: improves blood-lymph circulation, vasodilation, accelerates metabolism, regeneration, anti-inflammatory, resolving and analgesic effect. Common reactions conntcted with reflex effect on the nervous, cardiovascular, endocrine systems of the body, increasing heart rate and respiration, lower blood pressure, increased sweating, dilation of bronchi, increased motor function of the gastrointestinal tract. Thermotherapy has found its place in aesthetic medicine, especially in the treatment of cellulite, obesity and skin diseases. The most frequently used mud and paraffin wraps with thermal blanket, thermal devices for massage of the face, head and body. Electrical thermal elements are used for local heat therapy, during which the heat delivered to the patient's specific organ or area of the skin. They consist of a power source and a heating element, whose temperature is set individually. Heat radiator during thermotherapy procedures lead on the treated surface - the therapeutic effect of heating appears in the form of pain relief, reducing of muscle spasm, improving blood circulation, that is why often applied to cosmetic treatments such as massage, myostimulation and ultrasound therapy.

To send a convection heat to the body, physical factors, except water, are used, that impact by contact heat application. These include mud, mineral wax, paraffin wax, clay, sand. They are heat-transfers, or peloids, and their using for therapeutic purposes is also called peloid therapy. Special and principal place among peloids take mud. In addition to the heat action, they also have a chemical action. The mechanism of thermal action of peloids is based on their

high heat capacity and very low thermal, which is considerably less than that of water. Therefore, their applications are well tolerated, even at relatively high temperatures. The peloids able to retain heat for a long time and gradually give it to the body during the procedure. Thus, they provide a uniform and intense heating of the tissue at the point of contact. Peloid therapeutic procedures are intended exclusively for local use. ***Paraffin therapy:*** Purified white, well-dehydrated paraffin wax having a melting point of 52–55 °C is used for therapeutic aim. Along with the main thermal effect paraffin has little mechanical (compression) properties, producing pressure on the skin, which increasing in process of cooling and solidification of the paraffin. ***Ozokerite therapy*** is made by ozokerite, mineral wax, which is a natural rock of petroleum origin, produced in the oil areas. Physical properties of ozokerite are a homogeneous, black, waxy mass. It consists of a mixture of paraffinic hydrocarbons, mineral oils, asphaltene substances, a number of gaseous hydrocarbons. Ozokerite melting temperature is within 50–86 °C. Ozokerite has, like paraffin, thermal and mechanical (compression) action. However, unlike paraffin, and it has also a chemical action due to it contains the active substances with acetylcholine-like and estrogenic properties. Penetrating through the intact surface of the skin, these substances have both a reflex and resorptive effect; affect the condition of the autonomic nervous system, metabolism, tissue blood circulation and lymph flow, the organs of internal secretion. **Cryotherapy** – therapeutic effect on individual organs and tissues of the body of cold factors of various nature and shape. The cold activates the immune system, mobilizes endocrine and neurohumoral systems, which is used in the treatment of many diseases, provides resistance to stress and overload, improves mood and performance. Cryotherapy includes not only traditional hypothermic effects (cold bath, winter swimming, ice packs), but also the impact of inert gas nitrogen or air, cooled down to ultra low temperature -150 -190 ºC. Cryotherapy is divided into the local and general therapy. General cryotherapy is provided in cryo chambers, where skin during 2–3 minutes is exposed by temperature stress without damage of tissue. General cryotherapy mean full or partial short-term immersion of nudity body in gaseous environment at a temperature of -110-160 °C. Cryotherapy which used in cosmetology is based on applications of liquid nitrogen. Clear liquid, colorless and odorless, has a strong therapeutic effect on the tissue, with a boiling point of -195.8 °C at normal atmospheric pressure, non-flammable, does not explode is stored at a temperature -184 -186 °C in special containers – Dewar vessels. Depending on the procedure, in some cases, it causes the destruction of tissue freezing, but in other – vasoconstriction with subsequent expansion of capillaries which significantly increases the blood flow to the site of impact, resulting in improved tissue nutrition. Masks, wraps, injections, conducted after the sessions of cryotherapy, have an increased impact, which greatly helps in the treatment of overweight and cellulite. Cryosurgery with liquid nitrogen is used to remove vulgar, plantar and flat warts, warts, senile keratosis and

hypertrophic scars. Cryomassage recommended in treatment of acne, rosacea, as well as for the treatment of some forms of alopecia. Current treatments based on local application of cold in cosmetology – it ***cryopeeling*** and ***cryophoresis.*** Their effect is improving of skin texture and color, as well as lifting and reducing local fat deposits.

Training and targeted questions:

• during study of this topic to learn the basic definitions:
• thermotherapy;
• cryotherapy;
• cryodestruction;
• cryomassage;
• hydrotherapy;
• steam therapy;
• vaporization;
• ozokerite therapy;
• paraffin therapy.

Practical skills

to be able to

– collect anamnestic data, impacting on the choice of methods of hydrotherapy and thermotherapy in cosmetology;
– detect of indications and contraindications for methods of hydrotherapy and thermotherapy in cosmetology;
– advise the patient regarding the rational use of methods of hydrotherapy and thermotherapy in cosmetology**.**

Control questions.

1. The concept of hydrotherapy in cosmetology.
2. Therapeutic bath: characteristic of method, indications, contraindications, equipment, technique of the procedure.
3. Therapeutic shower: characteristic of method, indications, contraindications, equipment, technique of the procedure.
4. Rubdown and douching: characteristic of methods, indications, contraindications, equipment, technique of the procedures.
5. Hydro massage, hydro puncture: characteristic of method, indications, contraindications, equipment, technique of the procedure.
6. Steam therapy in cosmetology: characteristic of method, indications, contraindications, equipment, technique of the procedure.
7. Vaporization: characteristic of method, indications, contraindications, equipment, technique of the procedure.
8. Heat therapy in cosmetology: characteristic of method, indications, contraindications, equipment, technique of the procedure.
9. Cryotherapy in cosmetology: characteristic of method, indications, contraindications, equipment, technique of the procedure.
10. Cryomassage, cryodesquamation, cryodestruction, cryosauna, cryoplastia.

Variants of individual tasks.

1. What effects causes thermotherapy?

a) toning; *d) hyperemic;* *g) sedative;*
b) all answers are correct; *e) no right answer;* *h) antiinflammatory;*
c) analgesic; *f) antispasmodic;* *i) anticoagulant.*

2. Which skin diseases and cosmetic defects are indications for heat wrapping?

a) unhealthy complexion; *c) oily seborrhea;*
b) alopecia; *d) cellulite.*

3. What is name of method of treatment, destruction, removal of pathologic neoplasms of skin by low-temperature?

a) radio wave therapy; *c) diathermocoagulation;*
b) electric coagulation; *d) cryodestruction.*

4. The patient 19 years complained of rashes in the field of brushes. On examination, she was diagnosed with Flat warts hands. She has an intolerance to the electric current. What method of treatment it is advisable to use for this patient?

a) electric coagulation; *c) laser destruction;* *e) cryodestruction;*
b) electric epilation; *d) diathermocoagulation;* *f) vaporizing.*

5. The patient is 16 years complained of skin oiliness of the scalp. On examination, he was diagnosed with Seborrhea scalp. What method of low-temperature impact it is advisable to assign to the patient?

a) darsonvalization; *c) cryosauna;* *e) cryomassage;*
в) cryopeeling; *d) cryodestruction;* *f) vaporizing.*

6. Indications to cryomassage:

a) rosacea; *c) vulgar warts;* *e) all answers are correct;*
b) acne; *d) alopecia;* *f) keloid scars.*

7. Contraindications to paraffin masks:

a) insect bites; *c) sensitive skin;* *e) pyoderma;*
b) hypertrichosis; *d) teleangiectasia;* *f) all answers are correct.*

8. The patient, whom in the district hospital was diagnosed with widespread psoriasis, psoriatic arthritis, arrived in the sanatorium. Currently, the patient is in remission. What methods of hydrotherapy shown to the patient?

9. The patient 56 years after multiple fractures of the upper and lower extremities arrived in the Rehabilitation Department of sanatorium. On examination: the muscles of the upper and lower extremities are atrophic, muscle strength is reduce, atony of skin . Prescribe the hydrotherapy.

10. To the doctor beautician asked the woman 43 years with complaints of cellulite in the thighs. On examination: the skin on the hips loose, uneven surface, colorof skin is marble. She was diagnosed cellulite 2 stage. What natural treatments can be recommended to the patient?

Topic 9. Aromatherapy in cosmetology. SPA-therapy in cosmetology

Motivational characteristic. Aromatherapy – the use of natural essential oils for therapeutic purposes. oil is introduced into the body in two ways: through the skin (aroma massage, aroma bath, aroma wrapping of enrichment cosmetics, aroma compress) through the respiratory system (aroma inhalation, oil burner, aroma medallion). The use of oils inside is possible, but it requires special training. In the medical and cosmetic practice used only high-quality essential oils are usually high price category marked "for professional use". High-quality natural essential oils have a quiet, smooth, clear, pleasant smell, in which the diversity of the components balanced by tone, which reminiscent about vegetable origin. Counterfeit oils smell aggressive, individual components are notable, is sometimes clearly smell by alcohol, acetone or other technical impurities. As a rule, it is artificially reconstructed oils, which can be used in everyday life for the fragrance, disinfection. Essential oils are used for aromatherapy should have a list of required documents: a certificate of quality of the producing country, hygienic conclusion, it is desirable chromatogram (structure confirmed). One of the basic rules of selection of essential oils is "approval" of smell: if the smell of essential oil is not like, it can be replaced by another, similar in properties. Photosensitizing oils (bergamot, citrus, etc.) are not recommended to use in the summer, but if necessary, use them at least 4 hours before going outside. The same essential oils are not used for more than 3 weeks without interruption. Essential oils are soluble in alcohol and oils, so as emulsifier in cosmetology used wine, alcohol, sea salt, honey, milk, cream, yogurt or kefir. As the transport or basic oils, vegetable oils are used: 1 % dilution (for children, frail or elderly people) - (5–6) drops to 30 ml of base oil; 2 % (the most safe and effective) - (10–12) drops; 3 % - (15–16) drops to 30 ml of base.

Spa therapy in cosmetology. Classic Spa services emerged as aerodynamics, solar and thalassotherapy combined with massage and special gymnastic. Today SPA philosophy is seen much broader: it is the harmony of body and soul, this reunion cosmetic salon and spa, creating a special psychological atmosphere. Spa resorts include the use of natural healing factors (climate, sea and mineral water, mud, clay, seaweed and other seafood); synthetic analogues of natural factors; specially designed cosmetic products, based on natural ingredients; sedative and tonic physical factors; as well as a special regime (relaxation and comfort). Tasks of spa: detoxication of organism, mineralization of the body, correction of weight and shapes, normalization of blood circulation, stimulation of the metabolism, stimulation of the activity of the sweat glands. Indications of spa: treatment of skin, hair, nails; relieve stress, fatigue, for increased tone, the emotional status of the organism; treatment of diseases of the musculoskeletal system (arthritis, arthrosis, rehabilitation after injuries of tendons, bones, osteochondrosis); treatment of diseases of the nervous system

(neurosis, neuroculatory dystonic, polyneuropathy); treatment of diseases of the cardiovascular system (obliterating diseases of limbs, hypertension stage I and II); treatment of endocrine diseases (diabetes, hypothyroidism); treatment of chronic diseases of female and male sex organs; treatment of diseases of respiratory system (bronchitis); treatment of diseases of upper respiratory tract (laryngitis, tracheitis, sinusitis). Contraindications of SPA: acute inflammatory diseases; status of decompensation of the cardiovascular, respiratory, renals disease; oncological diseases; tuberculosis; fever; the tendency to bleeding and blood diseases; some skin diseases (eczema); hyperthyroidism; infectious diseases, angina; recurrent thrombophlebitis. Pharmacokinetics SPA-therapy is based on the ability of the skin to absorb biologically active compounds dissolved or emulsified in water. SPA-treatment includes phyto- and aroma wrapping, natural thermotherapy, hydrotherapy, mud packs, clay treatment, stone therapy, aroma-therapy, aerotherapy and other. ***Healing mud treatment spa*** – using peloids, which represent different types of sludge deposits formed at the bottom of reservoirs, marine estuaries and lakes. Different types of therapeutic muds have some common characteristics: a high moisture and heat capacity, low thermal conductivity, ductility. One of the main therapeutic factors of mud treatments are thermally, so peloids can be seen as a type of thermotherapy. The second factor causing a specific effect of healing mud treatment procedure – chemical, linked to the presence in the peloids biologically active substances both organic and inorganic nature. Peloidotherapy is carried in Mud baths clinic, in which provided a procedural room with mud cabins for treatment, rest rooms, administrative and commercial and industrial premises (for storage of fresh mud, pools for its regeneration (recovery), mud "kitchen" where healing mud is prepared for the procedure). In a therapeutic mud cabin, where treatment is carried, there are one or two couches for admission procedures, dressing room and shower.

Aero therapy – therapeutic effect of open air. Stay in a particular climatic environment of the resort, including a walk in the fresh air, guided tour, games, has a therapeutic impact. Special type of aerotherapy is air baths. For the aero therapy used special facilities: aerarium, climatic pavilion, climatic veranda on which patients, depending on the air temperature may be partially naked or clothed, covered (blankets, sleeping bags). Air baths are dosed according the cold load. The most favorable reception air baths in the range 16–22 °C.

Heliotherapy – treatment by solar radiation. Sunbathing is a potent preventive and therapeutic factor and therefore requires strict dosing.

Thalassotherapy– treatment by sea bathing. On the mechanism of therapeutic action they are approached swimming in other open water bodies (rivers, lakes, outdoor pools). Therapeutic bathes are providing multifaceted therapeutic effect, and are the most powerful climatic therapeutic procedure. Water acts on human body, immersed in it, as a termal cooling factor, as a chemical factor due to dissolved salts and as a mechanical factor caused by hydrostatic pressure and mechanical wave energy. Swimming is a form of physical therapy,

differing only in that the movements are produced in the medium, which reduce of body weight, reducing the total physical load. Breath at the water surface is accompanied by inhalation of hydro aerosols and hydro aeroions. Bathing cause positive human emotional reactions, and thalassotherapy inevitably combined with aerotherapy and heliotherapy. Thalassotherapy trains thermoregulation system, stimulates respiration, increases the vitality of the body, it contributes to hardening of the body. Sea bathing indicated in functional diseases of the central nervous system, fatigue, chronic diseases of the heart and lungs in remission and compensation. In cosmetology thalassotherapy also include comprehensive utilization of marine products in the beauty care products: sea salt, sea mud and loess (seabed), seaweed, sand. Most often used in programs for correction of body shape and anti-cellulite programs, to restore the body after childbirth. Usually it includes exfoliation, body wraps, local applications, baths, massages and others. It is combined well with microcurrent therapy, electrical stimulation, ultrasound phonophoresis.

Peloidotherapy – using mud, parafango, loess (seabed) for cosmetic purposes. Loess or sea soil contains humus remains of some algae and different minerals. It consists of small plates, which gives it hygroscopicity, being located one above the other. Loess absorbs toxins, normalizes metabolism and regenerative processes, reduces skin irritation and inflammation phenomena. All muds possess of chemical, biological, heat physical and mechanical properties. The composition of the muds include soluble salts (containing calcium ions are sodium, magnesium, chlorine, sulfate, etc.), organic matter - humus amorphous detritus bitumens microorganisms (putrefactive aerobes and anaerobes, nitrous, sulfate-reducing, denitrifying bacteria, molds, etc.). According to the degree of mineralizationof muds distinguish freshwater, low mineralized, medium mineralized, highly mineralized, saturated, supersaturated. According the acidity of medium peloids divided into alkaline, slightly alkaline, ultra-acidic, acidic and mild acidic. According to the ratio of the organic component and inorganic the peloids divided into organic (containing more than 10 % organic matter) and inorganic (less than 10 %). According to origin the mud divided into silt (sulphide and sapropel), peat and pseudo volcanic (hydrothermal and knoll therapeutic muds). *Sulphide muds* are ground sediments of marine gulfs and salt lakes, highly mineralized inorganic peloids. *Sapropel muds* are ground sediments of freshwater lakes, contain large amounts of sulphides, are low-mineralized peloids. *Peat muds* are result of incomplete decomposition of marsh plants in the conditions of lack of air and excess moisture, contain predominantly organic substances and a large amount of water. *Peat muds* formed in the oil-rich areas contain clay components, ions are bromine, hydrocarbons and small amounts of organic matter. *Hydrothermal muds* formed as a result of volcanic activity, contains trace elements, hydrogen sulfide, carbon dioxide. *Parafango* – application of a mixture of paraffin and mud,

which have the following cosmetic effects: detoxifying, activating metabolism and regeneration, improvement of microcirculation. It is used for muscle flabbiness, decreased skin turgor, leg edema, cellulite, oily skin, oily seborrhea. Peloidotherapy used as wraps, baths, applications, masks. It combined with galvanization, microcurrent therapy, ultrasound therapy, massage.

Clay treatment – the therapeutic use of clay. Clays are products of the chemical destruction of rocks and have considerable plasticity. The bulk of the clay comprises fumed silica and alumina hydrate, which determines its basic properties, including low thermal capacity and thermal conductivity. Depending on the place of occurrence, there are white, red, blue, yellow, green, black clays. "Purity" and the quality of the clay depends on the depth (the deeper, the better). Cosmetic care involves the use of clay in the form of applications, or masks, wraps, general and local baths, as well as the introduction of clay in the composition of certain cosmetic products (shampoos, masks, and so on). Cosmetic effect of clay is made up of three components: thermal, mechanical and chemical.

A***lgotherapy***– use seaweed for cosmetic purposes. It is the main component of thalassotherapy. The most commonly used in cosmetology Brown algae (Fucus, Laminaria), Blue-green algae (Spirulina), Red-green algae. For the production of cosmetic products the extract, powder or micronized seaweed are used. Algae in cosmetic procedures are used in the form of wrapping, compresses, and masks.

Training and targeted questions:

during study of this topic to learn the basic definitions:

– aromatherapy;
– SPA-therapy;
– peloid therapy;
– algotherapy;
– talassotherapy;
– heliotherapy;
– aerotherapy;
– clay therapy.

Practical skills

to be able to

– collect anamnestic data, impacting on the choice of natural physiotherapeutic methods in cosmetology;
– detect of indications and contraindications for SPA-therapy in cosmetology;
– advise the patient regarding the rational use of SPA-methods in cosmetology**.**

Control questions

1. Aromatherapy: characteristic of method, depth of impact, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.

2. SPA-therapy: characteristic of method, depth of impact, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
3. Talassotherapy: characteristic of method, depth of impact, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
4. Peloid therapy: characteristic of method, depth of impact, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
5. Algotherapy: characteristic of method, depth of impact, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
6. Clay treatment: characteristic of method, depth of impact, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.
7. Climatщtherapy: characteristic of method, depth of impact, indications, contraindications, equipment, technique of the procedure, possible complications and their prevention.

Variants of individual tasks

1. The main tasks of SPA-therapy are:
a) treatment of thyrotoxicosis;
b) treatment of cancer;
c) reduce stress, fatigue;
d) treatment of hairs;
e) treatment of cellulite;
f) treatment of depression;
g) treatment of infective diseases;
h) correction of skin aging;
i) increase in the tone and emotional status of the organism.

2. Choose the contraindications to the use of clay masks:

a) teleangiectasia;	*d) insect bites;*	*g) acne;*
b) pyodermia;	*e) hypertrichosis;*	*h) comedous;*
c) hirsutism;	*f) all answers are right;*	*i) alopecia.*

3. Choose the natural methods of modern cosmetology:

a) talassotherapy;	*e) myolifting;*	*i) biotatoo.*
b) ; aromatherapy	*f) chromo therapy;*	*j) algotherapy;*
c) peloid therapy;	*g) endermologie;*	*k) stone therapy;*
d) vaporization;	*h) mesotherapy;*	*l) dezincrustation.*

4. Aromatherapy includes next procedures:

a) algotherapy;	*d) stone therapy;*	*g) biotatoo;*
b) aromainhalation;	*e) aromabathing;*	*h) aromamassage;*
c) aromacompress;	*f) aromaapplication;*	*i) all answers are right.*

5. Contraindications to SPA-therapy:

a) neurosis;	*d) tuberculosis;*	*g) fever;*
b) cancer;	*e) cellulite;*	*h) trauma of skin;*
c) hypocoagulation;	*f) thyrotoxicosis;*	*i) obesity.*

6. Indications to algotherapy:

a) cellulite;	*d) dry skin;*	*g) hyperkeratosis;*
b) skin laxity;	*e) thyrotoxicosis;*	*h) tumors;*
c) Duhring dermatitis;	*f) allergic reaction to iodine;*	*i) all answers are right.*

7. Contraindications to algotherapy:

a) cellulite;	*d) dry skin;*	*g) hyperkeratosis;*
в) skin laxity;	*e) thyrotoxicosis;*	*h) tumors;*
c) Duhring dermatitis;	*f) allergic reaction to iodine;*	*i) all answers are right.*

8. The female 25 years came to the SPA-center with a diagnosis: Oily seborrhea. Acne vulgaris, comedonal form, mild severity. Assign and justify the use of adjuvant physiotherapeutic therapy.

9. The female 38 years old came to SPA-center. Condition after labour. Overweight. Cellulite 3 stage. Postpartum depression. Assign and justify the use of physiotherapy methods.

10. Choose the contraindications to SPA-therapy:

a) diabetes;	*f) infectious diseases;*
b) hyperthyroidism;	*g) psorias;*
c) hypothyroidism;	*h) angina;*
d) cellulite;	*i) chronic diseases of the genital organs.*
e) pyoderma;	

Навчальне видання

ФІЗІОТЕРАПІЯ В КОСМЕТОЛОГІЇ

Методичні вказівки
для студентів медичного факультету
5-го року навчання англійською мовою

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PHYSIOTHERAPY IN COSMETOLOGY

Study guidelines
for the 5th-year English medium
students of medicine