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Introduction

We are entering the 21st century being equipped by a substantial inventory of various medical devices and drug preparations, however, many of them are not always of great help. Fortunately, the medical science does not stand still and offers new treatment methods. One of such methods is magnetic-laser therapy. This therapy is broadly used in the medical practice, and becomes more popular day after day.

Nowadays, many magnetic-laser therapy devices exist, and the "Vityas" Quantum Therapy Device, manufactured by the "Vityas" Republic's Unitary Production Enterprise, is a bright representative thereof. The Device generates several radiation types at the same time (laser pulse-modulated radiation of infrared wave-range, continuous laser radiation of the visible red light and radiation of permanent magnetic field), each of them being curative, and in combination, they provide a more expressed curative effect.

The "Vityas" Device has successfully underwent its clinical tests at the Scientific-Research Institute of Traumatology and Orthopedics, the Dermatovenerologic Dispensary of Minsk, the Physiotherapy Division of the Belarusian Medical Academy of Post-Diploma Training of the Ministry of Public Health of the Republic of Belarus, and has been recommended into medical practice because of its efficiency and operating safety.

The affection of the "Vityas" Device may be applied both independently, and combined with medication, which in a number of cases allows to drop the duration and volume of medication. Treatment with the "Vityas" Device radiation does not prevent application of any other traditional and non-traditional treatment methodologies.

Application of the "Vityas" Device is notable for absence of pain, operating safety, asepticity, a possibility to apply treatment in the doses, variable by duration and by radiation power. The advantageous features of the "Vityas" Device among other devices of its class are its reliability, compactness, ease and comfort of operation, which enable to use it both at medicinal institutions, and at home.

The methods of using the quantum therapy provided in the present Methodical Guide are broadly known and have been applied in clinical practice for many years. The Guide is built on the principles of clearness, simplicity, efficiency and "make no harm".

Safety Precautions

1. Persons not younger than 18 years, who have studied the present Certificate and the "Methodical Manual on Application of the "Vityas" Device", are allowed to work with the Device.
2. Start the radiation mode only after placement of the radiator onto the point (zone) of affection.
3. The aim of the treatment method, the therapeutic doses, and the control of the results of treatment, shall be made by the doctor on laser therapy, or by the doctor-specialist according to the "Methodical Manual on Application of the "Vityas" Device".

IT IS FORBIDDEN:

- To switch on the Device at a faulty power unit, damage of insulation of the cord and the body;
- To disassemble the Device and connect to the mains in the disassembled condition;
- To leave the switched on Device without supervision;
- To direct the focused direct or reflected laser radiation into one's eyes;
- To effect the area of the heart projection with the radiation of the Device;
- To give the Device to children.

Attention! Never allow any direct or reflected affection of laser radiation on the organs of vision

Contraindications to Applying the Quantum Therapy Method

1. Pregnancy
2. Convulsive state
3. Mental disorders, and diseases at the background of the psycho-emotional arousal
4. Agnogenic febrile state
5. Renal, hepatic, blood-circulation and respiratory insufficiencies
6. Heavy endocrine pathologies, for example, achrestic diabetes mellitus, etc.
7. Heavy blood diseases
8. Oncology
9. Vesical calcification and cholelithiasis (to treat under physician's observation)

Design of the Device and Operation

a) Design of the Device

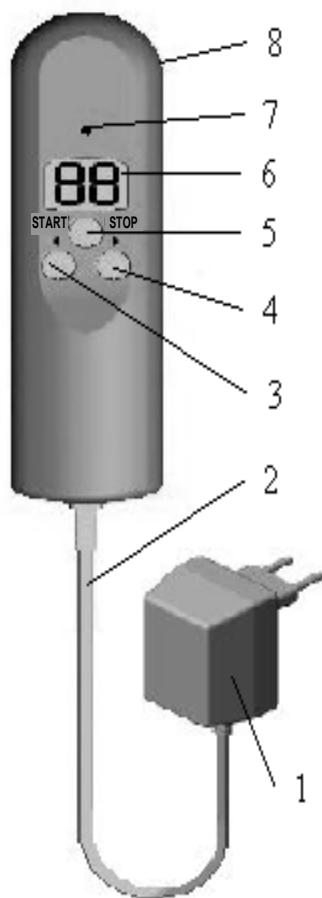


Figure 1.

- 1- power unit 230/220 V, 50/60 Hz
- 2- connecting cord
- 3- button of reducing the number of the selected mode (◀)
- 4- button of increasing the number of the selected mode (▶)
- 5- button **START/STOP**
- 6- digital indicator
- 7- single indicator
- 8- body of the Device

The general view of the Device is given in Fig. 1. The control buttons (3, 4, 5), indicators (6, 7), and laser radiators are installed in a single body (8). The power unit (1) is connected by the connecting cord (2). The bodies of the Device and the power unit are made from high impact plastic.

The face panel of the Device has controls for selecting the modes: buttons ◀ (3), ▶ (4), START/STOP (5), and indicators: digital (6) and single (7).

The opposite side (relative the face one) has the radiator. It consists of a constant magnet and a quantum radiator built on laser diodes of infrared and red spectrum of radiation. The radiation modes are listed in Table (page 9).

b) Preparation to Operation

- 1) Take the Device out of the packing, and without pressing any control buttons connect the power unit (1) of the Device into the mains 220 V, 50 Hz, and:
 - the Device will automatically pass through its operation self-checking mode;
 - the operation self-checking mode lasts for 5 seconds and terminates with indication of the "mode number" accompanied by a sound signal. For example: **02**



- 2) By buttons ◀ (3) or ▶ (4) set the required mode number of the Device affection, selected from the Section "Methodological Recommendations" for a particular disease. For example: **03**

- 3) The Device is ready for operation.

Notes: 1. In case of a failure of the Device, the digital indicator will give a failure message. A failed Device is subject to repairs.

2. At switching the Device on with the control buttons depressed, the check-up modes are set, which may be quitted by a repeated switching on (subpoint 1).

c) Operating the Device

- 1) Study the Methodical Recommendations on treating a particular disease.
- 2) Take a comfortable posture. Place the radiator of the Device above the first affection point (according to the methodology of treating a particular disease), having attached in to the skin of the body or at a small distance from it. Start the mode of laser radiation.
- 3) **The start of the radiation mode** is made by pressing the button **START** (5).
At this: a sound signal is given, the lasers and the unit indicator are switched on, the digital indicator passes over into the timer mode, which indicates the remaining time of affecting the particular point. For example: , where: "2" means two minutes, and "L" means a symbol simulating the hands of the clock by blinking.
- 4) Go on affecting the selected point until the digital indicator reaches the mode of **Automatic pause**. For example: , where **n.** means the pause, and **2** is the number of the next affection point, where the radiator should be put to continue the affection mode.
At this: a sound signal is given, the unit indicator blinks, the quantum radiator of laser diodes is switched off. The duration of the automatic pause is 10 s.
- 5) To continue the procedure, place the radiator of the Device during the pause over the next affection point. The automatic pause will interrupt automatically, or it may be forced interrupted by a short-time pressing the button **START**.
- 6) **Automatic mode stop** is made by the software after the end of the affection onto the last (tenth).
At this: a sound signal is given, the unit indicator goes out, the laser radiators are switched off, and the digital indicator shows the number of the mode at which the affection has taken place.
- 7) **A forced pause is ensured** by a short-time depressing of the **STOP** button during the affection (at radiation and timer counting). It is used to stop the radiation mode for a long time. The sign of the pause is indicated and the number of the point, at which a stop has been made.
*The start to continue the mode is made by a repeated short-time depressing of the **START** button.*
- 8) **A forced stop of the mode is achieved** by pressing the **STOP** button and keeping it depressed for 3 seconds.

d) Switching the Device Off

- 1) Switch the Device off by disconnecting the power unit (1) from the mains 230/220 V, 50/60 Hz.

Characteristics of modes of radiation of the "Vityas" device							
Mode No.	Type of laser radiator	Type of radiation (during affection)	Time of affection on a point (both lasers are ON)	Energy of radiation (affection on a point.)	Total affection time per one procedure	Total energy of radiation (affection) per one procedure (10 cycles)	
01	red $\lambda = 620 - 700$ nm infrared $\lambda = 810 - 880$ nm	continuous 12,500 Hz	2 minutes	1.2 J	20 minutes	12.0 J	
02	red $\lambda = 620 - 700$ nm infrared $\lambda = 810 - 880$ nm	continuous 12,500 Hz	3 minutes	1.8 J	30 minutes	18.0 J	
03	red $\lambda = 620 - 700$ nm infrared $\lambda = 810 - 880$ nm	continuous 12,500 Hz	4.5 minutes	2.7 J	45 minutes	27.0 J	

Notes: 1 The time of automatic pause for moving the device to the next affection point is 10 s.

2 A cycle includes an affection mode and a pause of 10 s.

3 All the modes have the total power of laser radiation of 10 mW at the spot area at the output of radiator of about 1 cm².

4 The level of magnetic field, created by the permanent magnet, makes from 5 to 50 mTl.

Recommended Practice

GENERAL RULES

Be sure to consult your physician on application of the Device for treating your disease.

Application of the Device is allowed only after establishing an exact diagnosis by the physician.

It is allowed to use the Device in combination with the traditional medication.

The Laser Device may be used with a concentrating orifice for irradiating acupuncture points. In such version, the Device may be used by the specialists proficient in acupuncture methodology.

After each affection session, a 15-20 minute break is recommended. The optimum way is to hold laser procedures at about one and the same time of the day (in home conditions – before your rest hours).

In parallel with the quantum therapy, we recommend using vitamins and microelements, the deficit of which is notable for this locality or particular season. It is recommended to have nutrition abundant in vitamins and microelements.

Prior and after application of the Device, disinfect the body of the radiator by a special solution (3 % of hydrogen peroxide, or 0.05 % of chlorhexidine, or 1 % dioxidyne). Never let the liquid inside the Device and onto the glass of laser diodes. Otherwise, the Device will need drying before usage, and the glasses will need cleaning with a cloth or cotton plug, moistened in alcohol solution.

In case of doubt, consult your physician or laser therapist.

CHOOSING THE AFFECTION MODE

1 Based on the disease diagnosis, concluded by the physician, find it in the list of the Application Guide.

2 By the physician's recommendations and the algorithm provided, define the "Device Affection Mode" with account of the "Disease Forms", "Course of Disease" and "Patient's Age".

3 According to the Figures and the offered affection algorithm, make the treatment procedures to the indicated points (areas).

4 To affect the points of the back, which are hard to access, invite medical personnel or relatives.

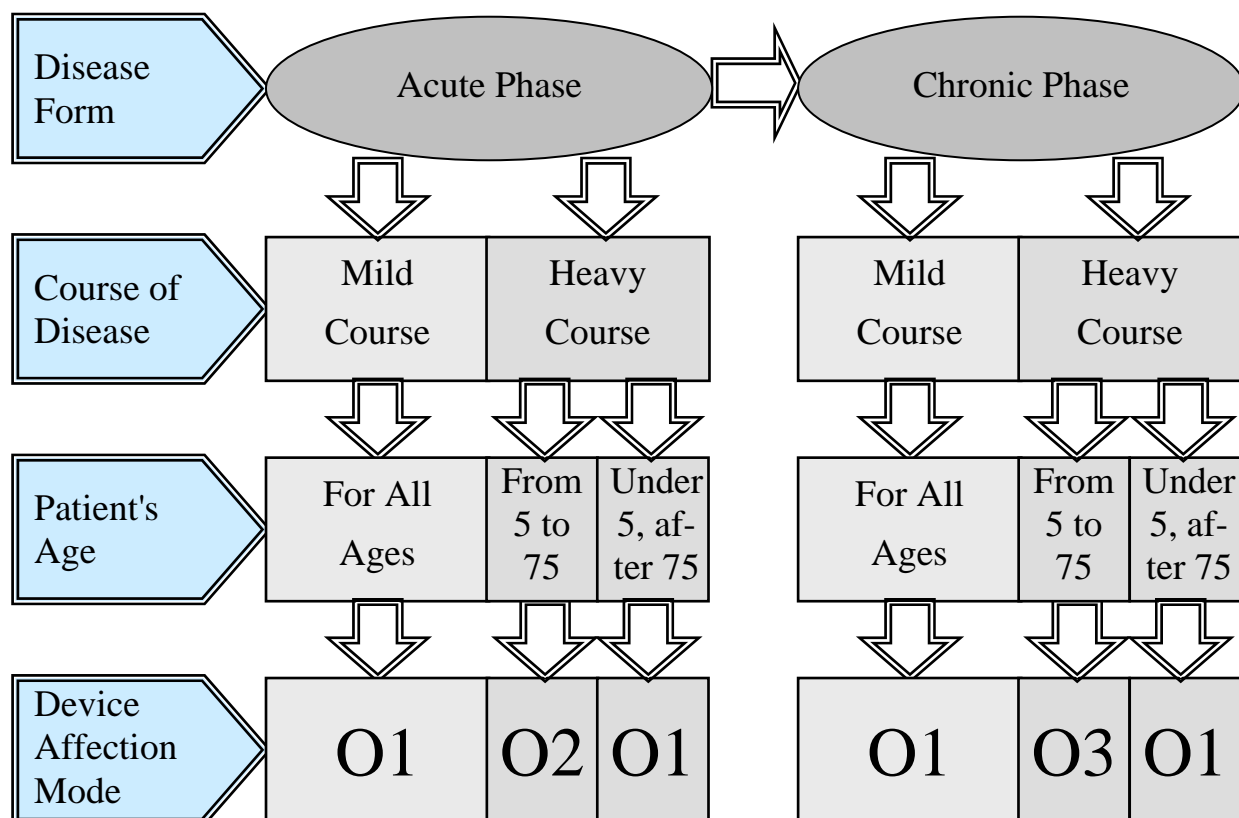
The affection point (area) is a place on the patient's body subject to affection of the Device.

DISEASES AND CLASSIFICATION are given below in the order of sections as used in the medical science.

Physical terms are given in "**Appendix A**".

1 TRAUMATOLOGY

1.1 ARTHRITIS, ARTHROSIS



Apply radiation around the joint (by a circle), while orienting the laser spot (area) across or along the movement direction (Figure 1.1).

In the area of maximum swelling or pain, the irradiated areas should be 2 cm apart from each other. In the periphery – up to 4 cm apart from each other. No more than 10 areas are allowed per one irradiation session.

It is recommended to conduct a daily course during 3 weeks.

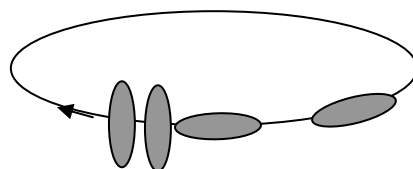
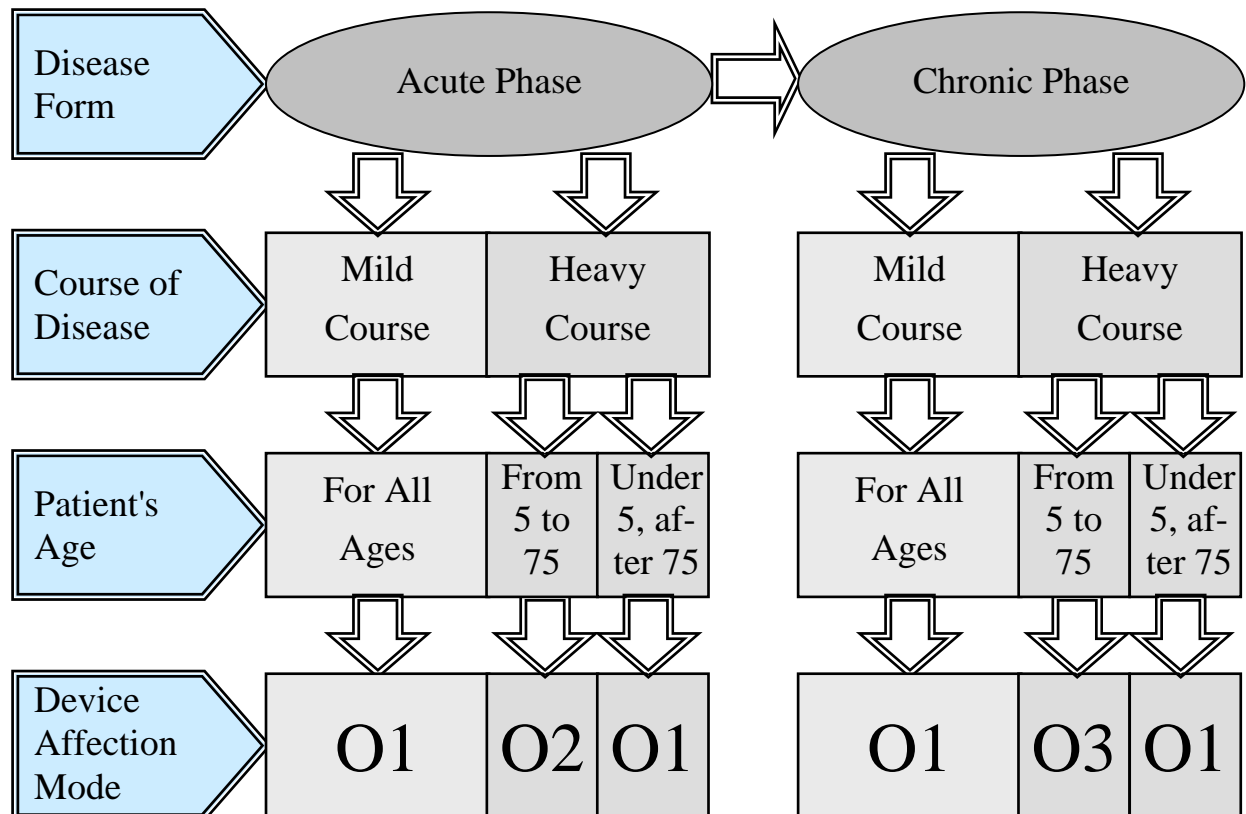


Figure 1.1

1.2 ARTHRITIS, GONARTHROSIS



It is recommended to conduct a daily course during 20 days, as it is shown in Figure 1.2. It is recommended to clean the affection area with 100% dimexid solution 5 minutes before the procedure.

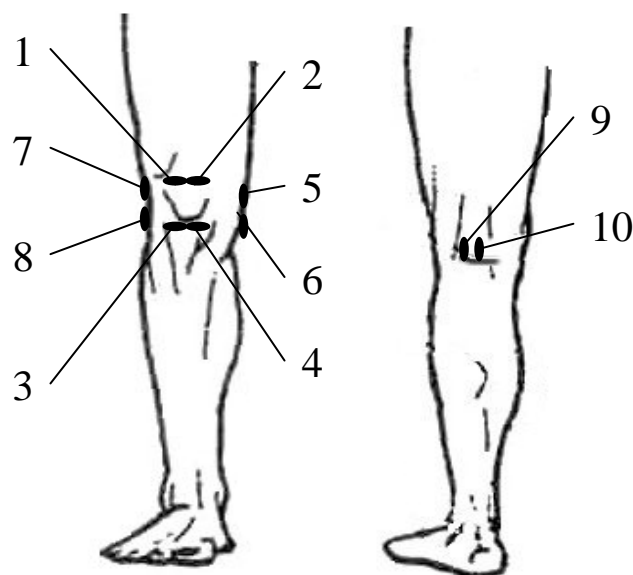
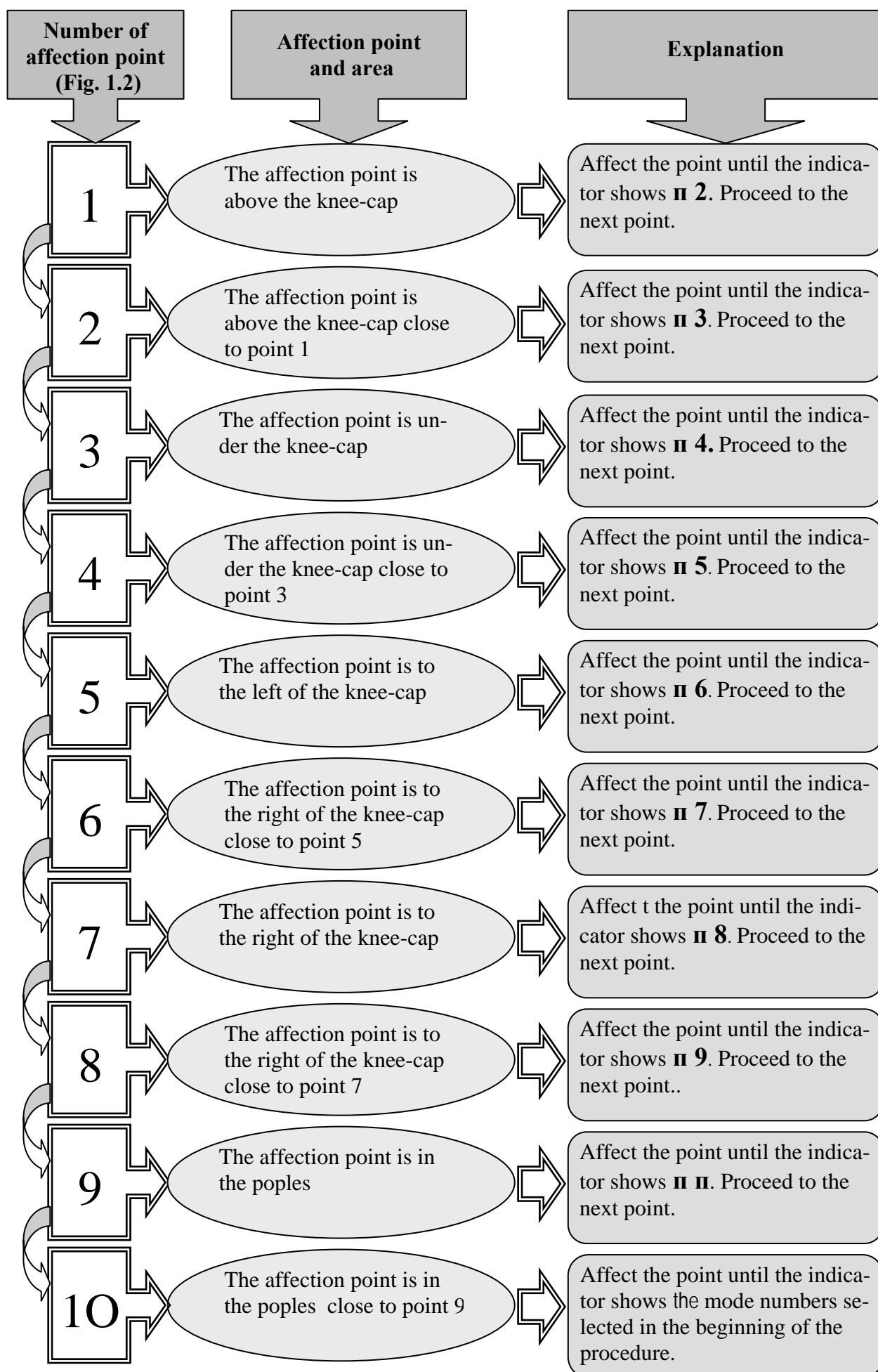
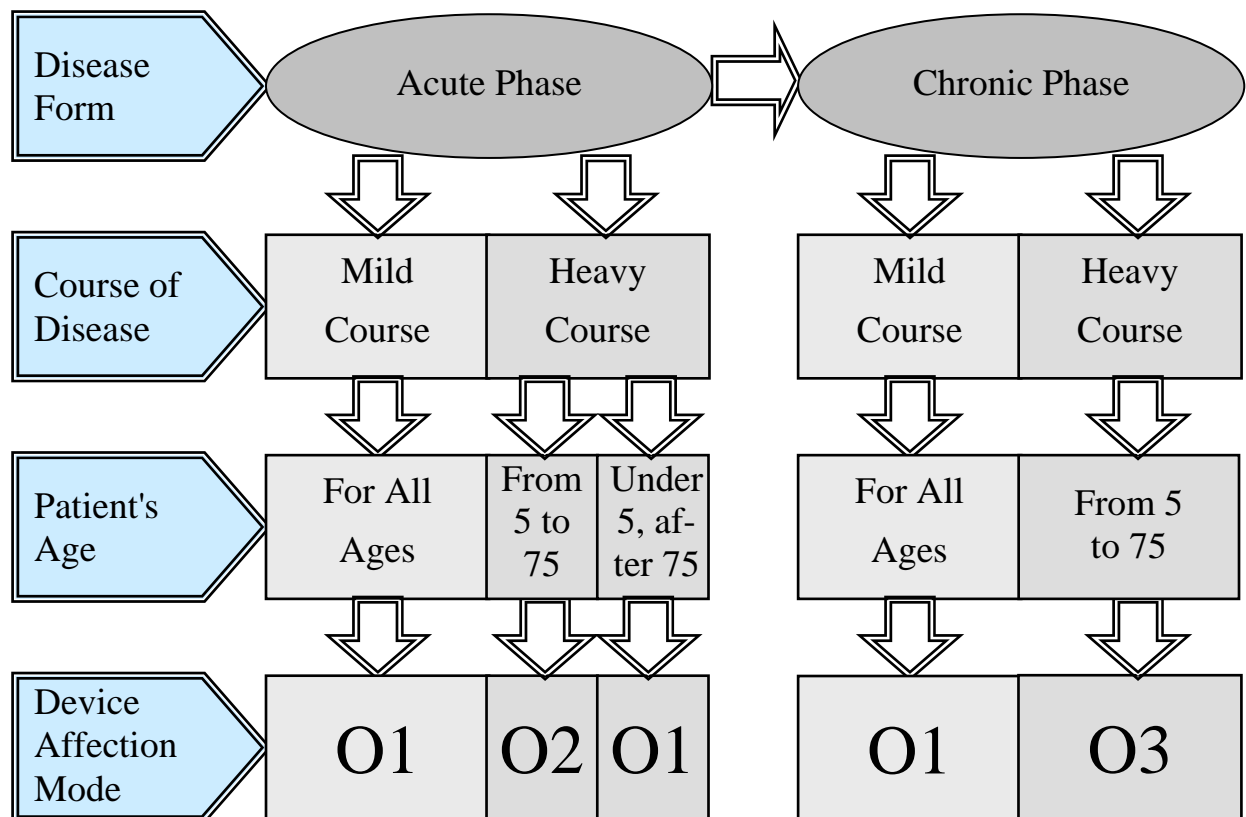


Figure 1.2



1.3 ARTHRITIS, HIP JOINT ARTHROSIS



It is recommended to conduct a daily course during 20 days as it is shown in Figure 1.3. It is recommended to clean the affection area with 100% dimexid solution 5 minutes before the procedure.

For the "O3" mode, it is allowed to split the affection procedure into two-three sessions during the day.

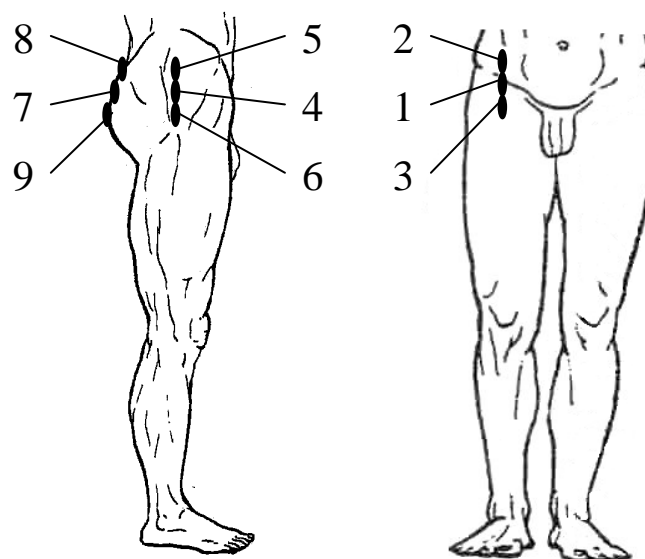
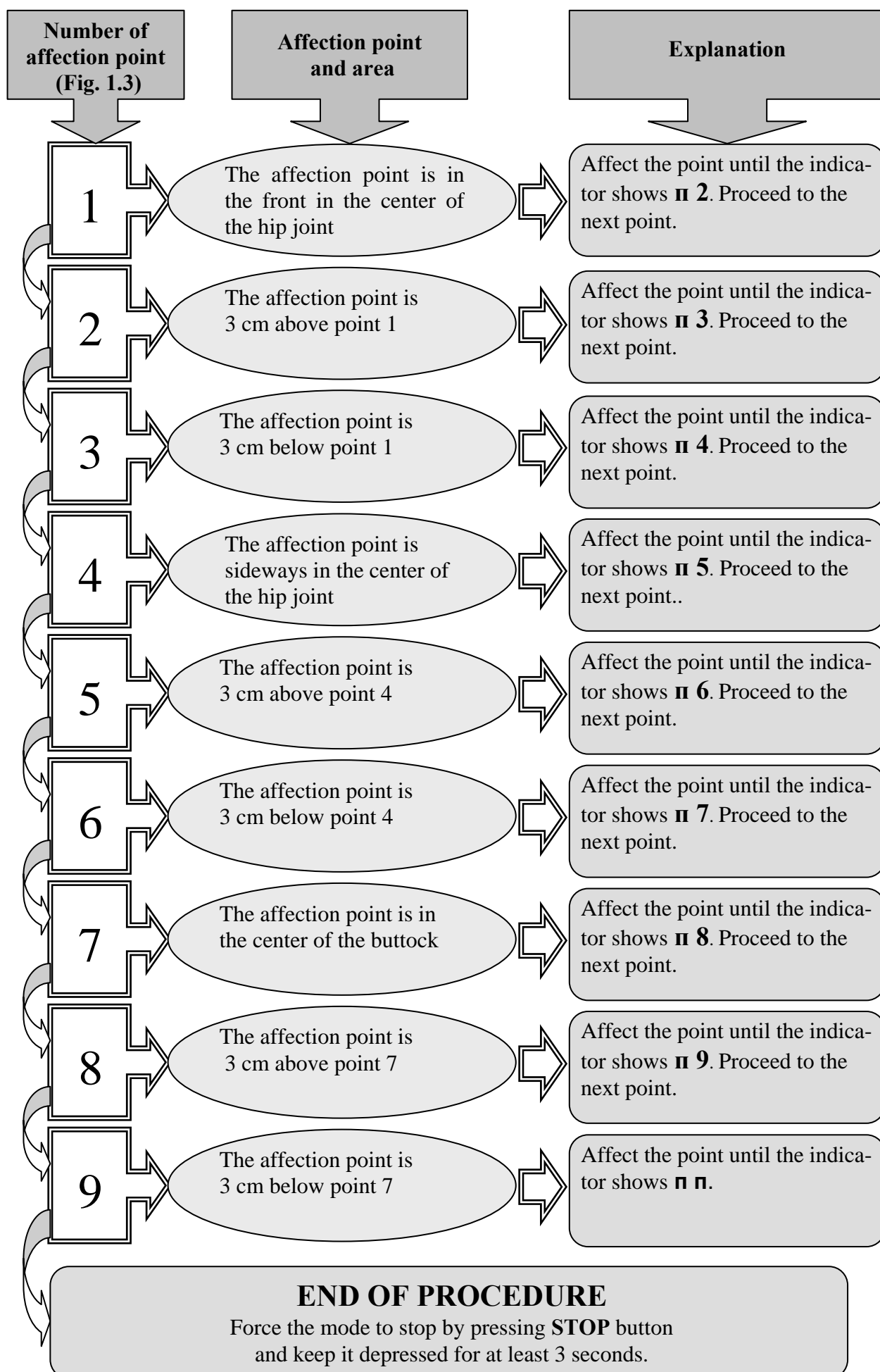
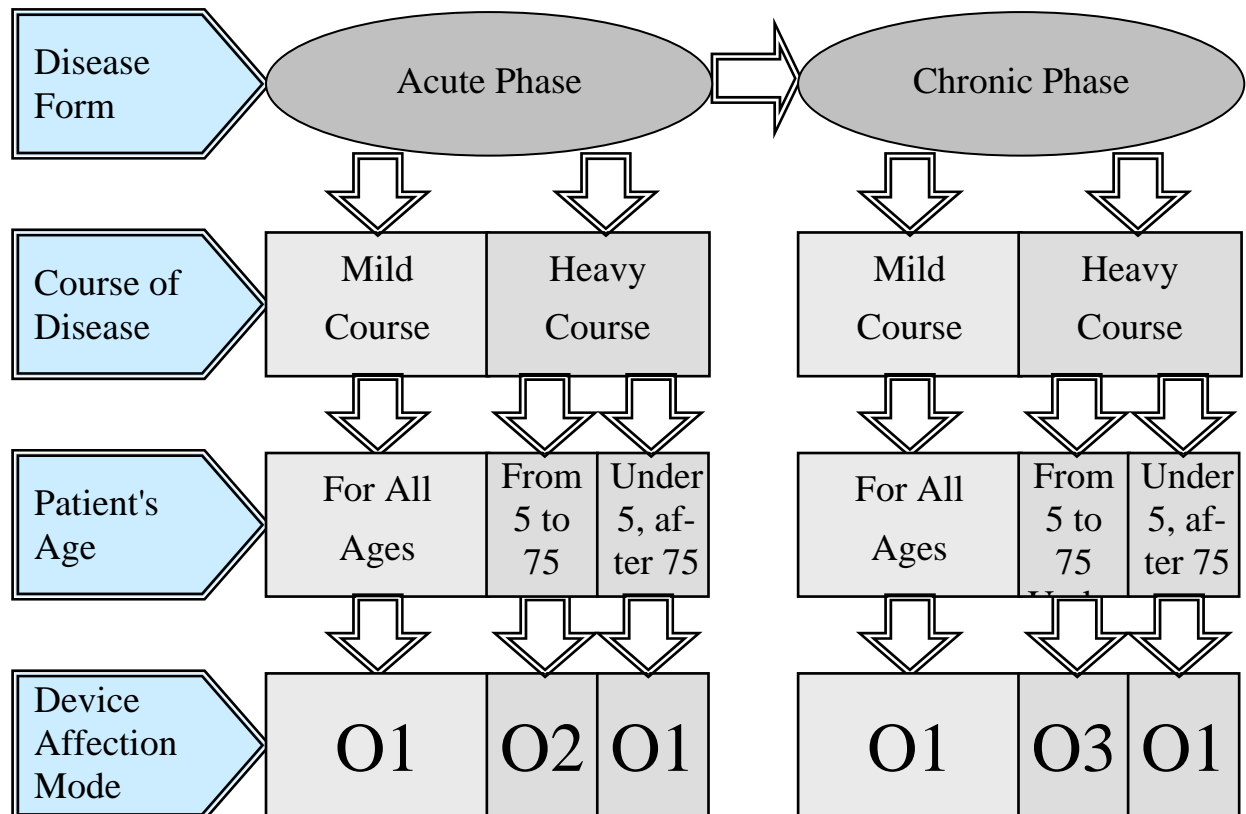


Figure 1.3



1.4 ARTHRITIS, RADIAL WRIST JOINT ARTHROSIS



It is recommended to conduct a daily course during 20 days as it is shown in Figure 1.4. It is recommended to clean the affection area with 100% dimexid solution 5 minutes before the procedure.

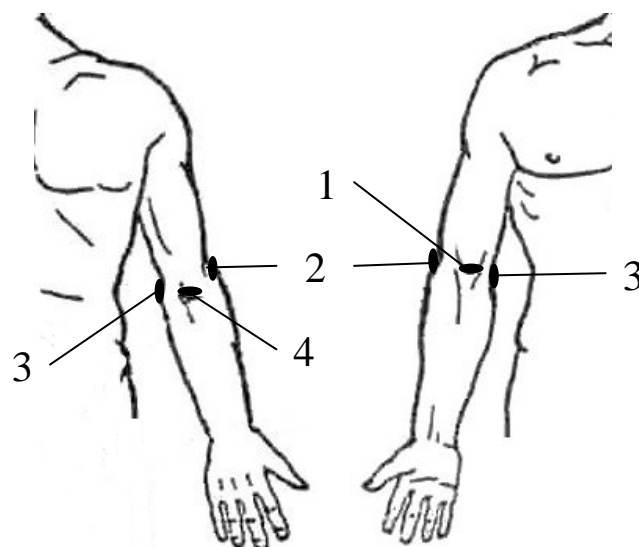
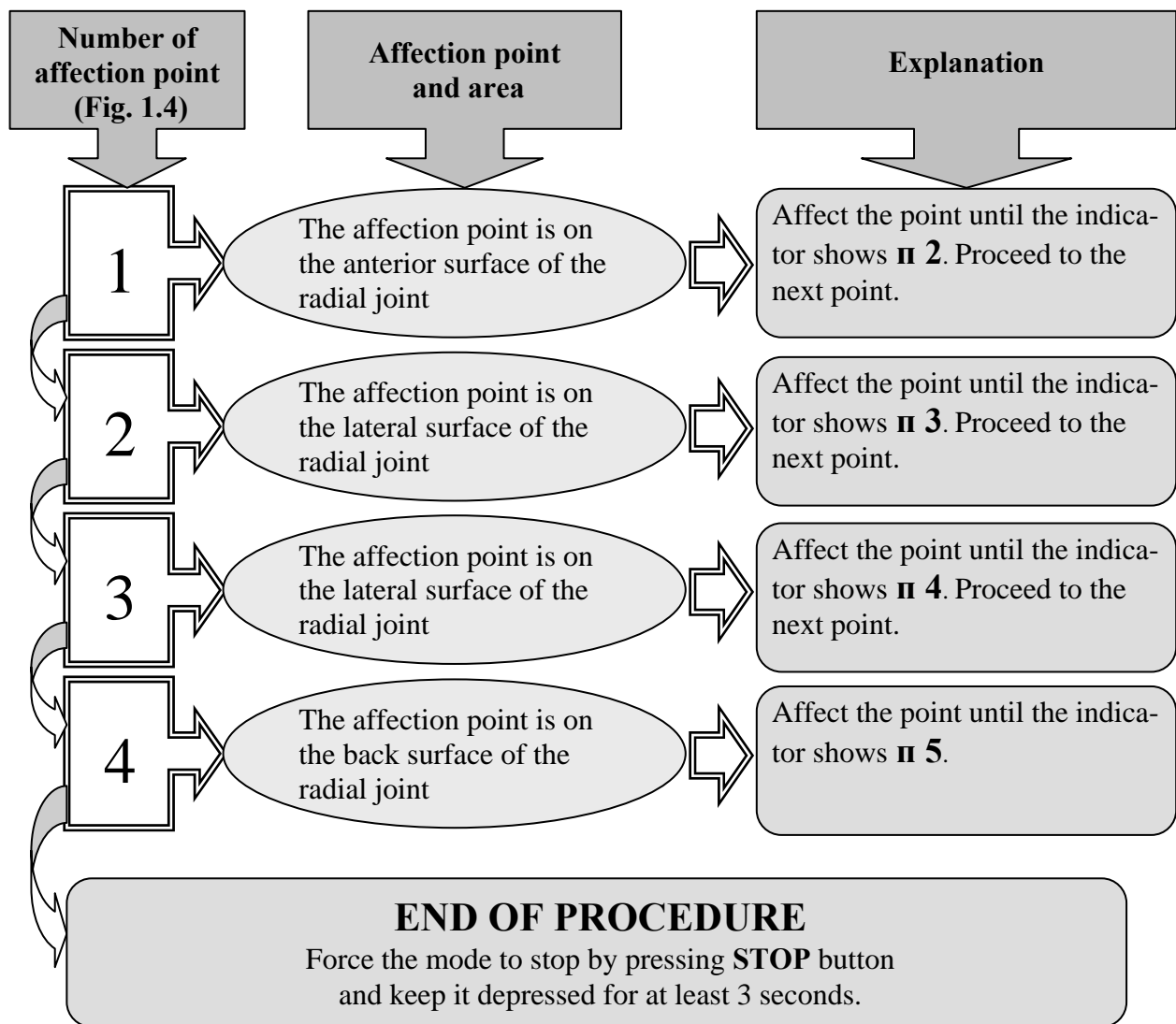
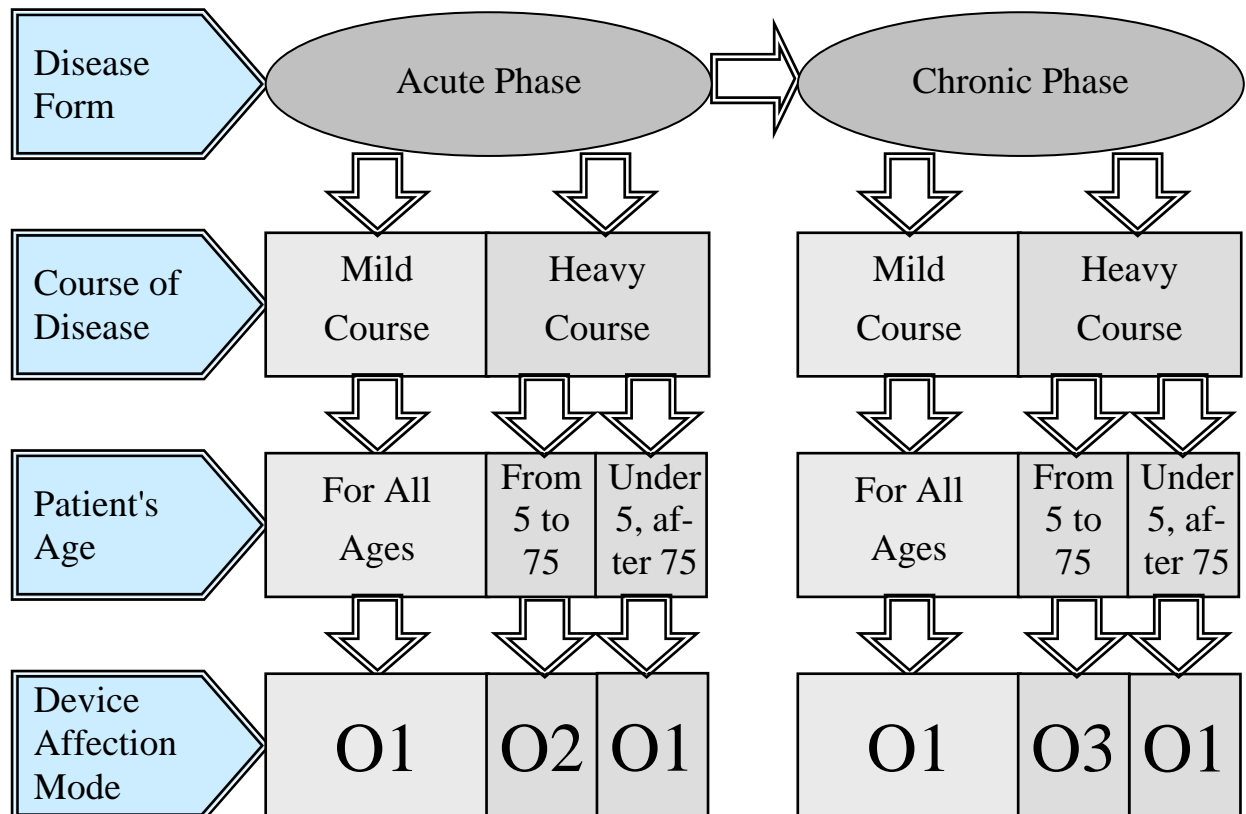


Figure 1.4



1.5 ARTHRITIS, ARTHROSIS OF PHALANGES OF HAND AND FOOT



It is recommended to conduct a daily course during 20 days as it is shown in Figure 1.5. Repeat the courses after 2-3 weeks for 2-3 times during aggravation season.

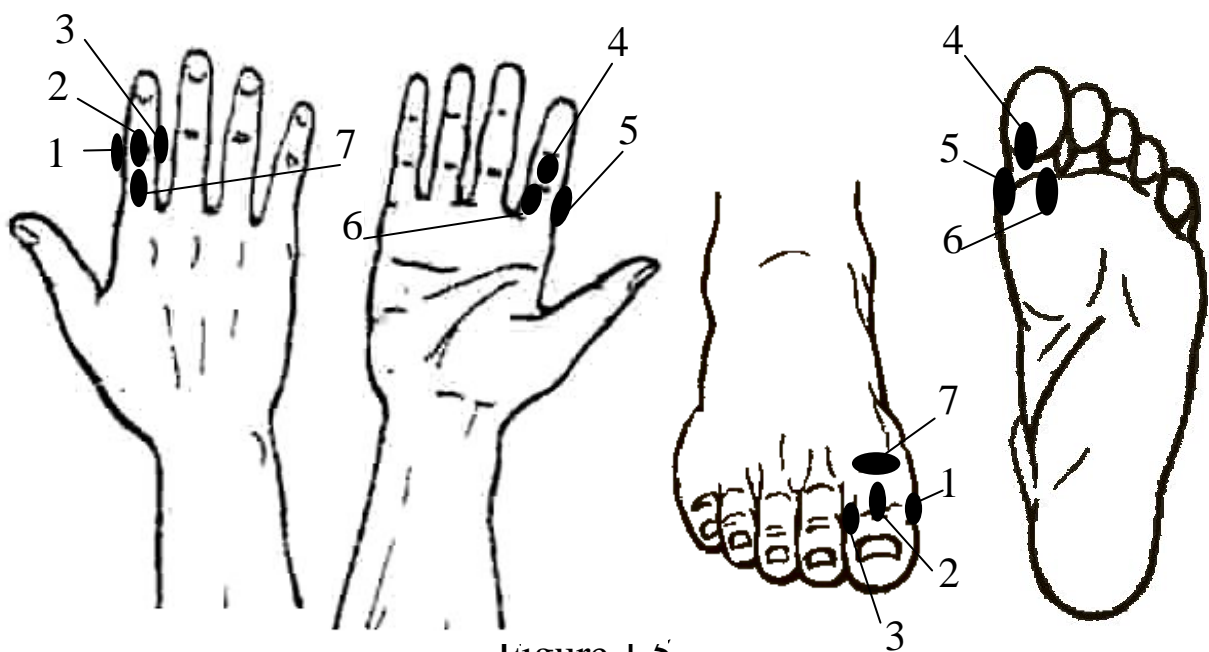
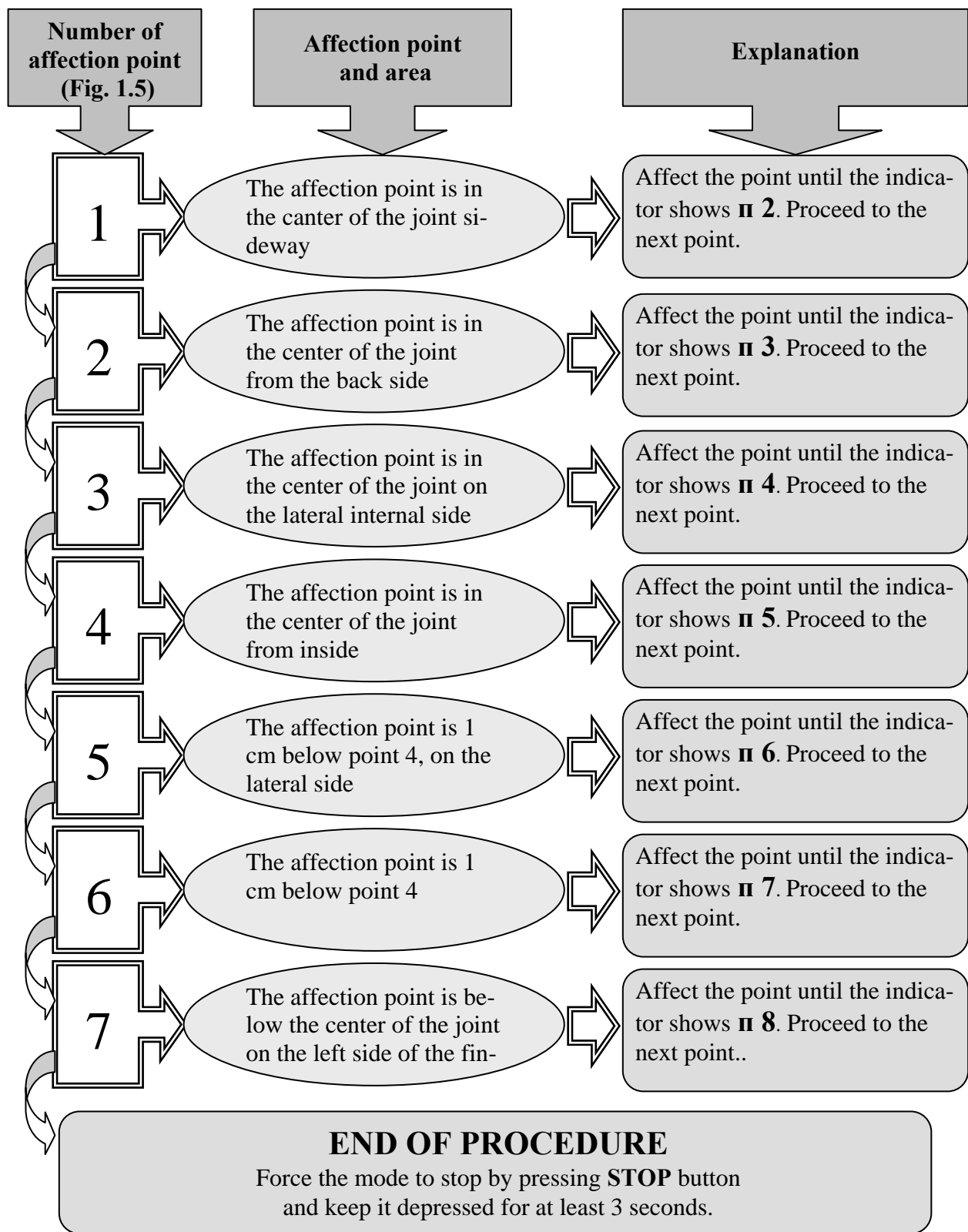
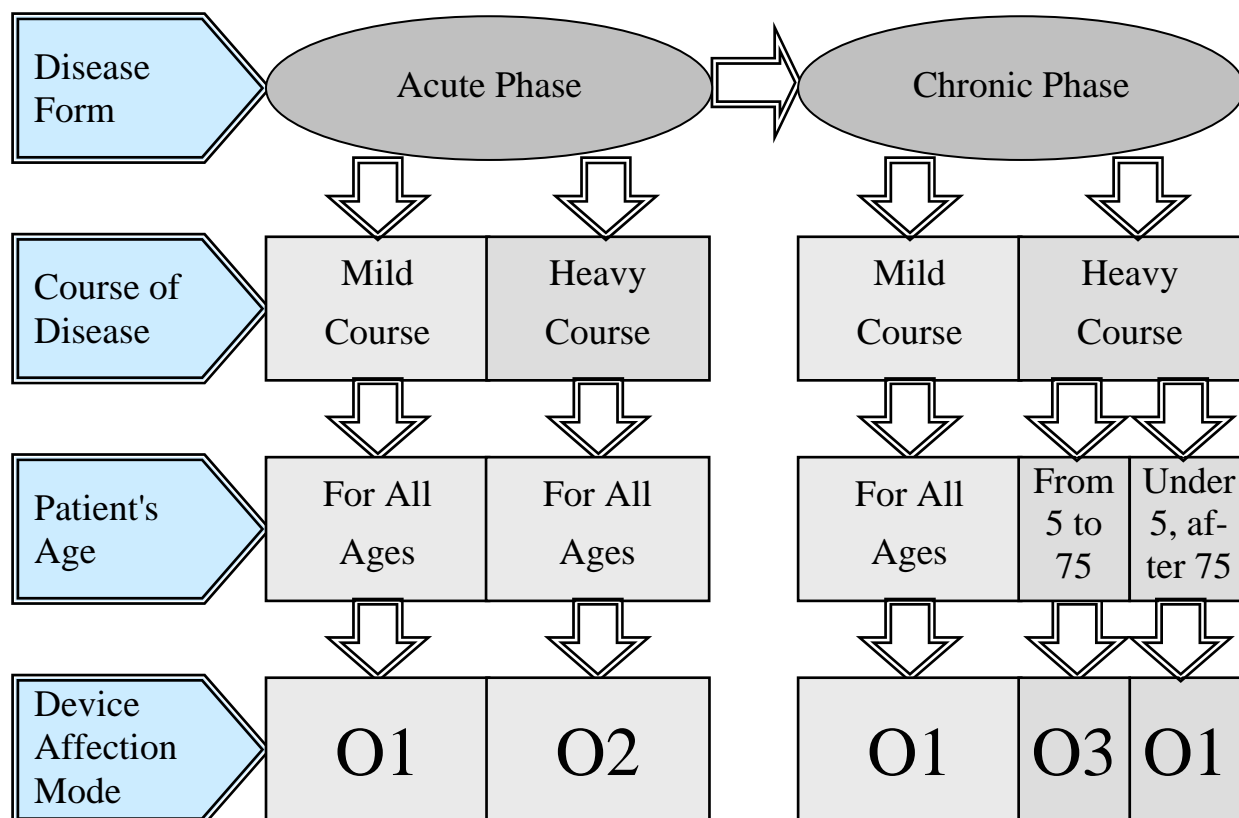


Figure 1.5



1.6 CALCANEAL SPUR



It is recommended to conduct a daily course during 14-20 days as it is shown in Figure 1.5. It is recommended to clean the affection area with 100% dimexid solution 5 minutes before the procedure.

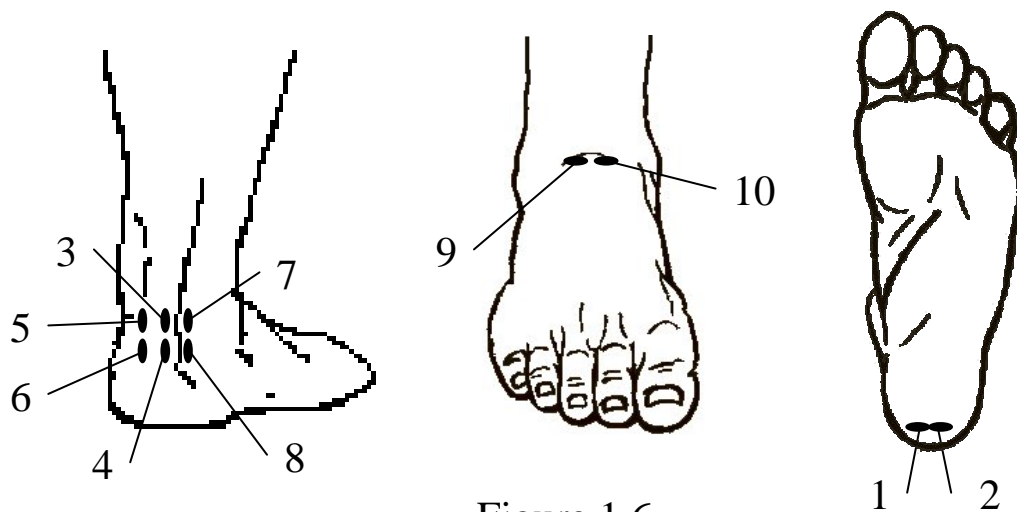
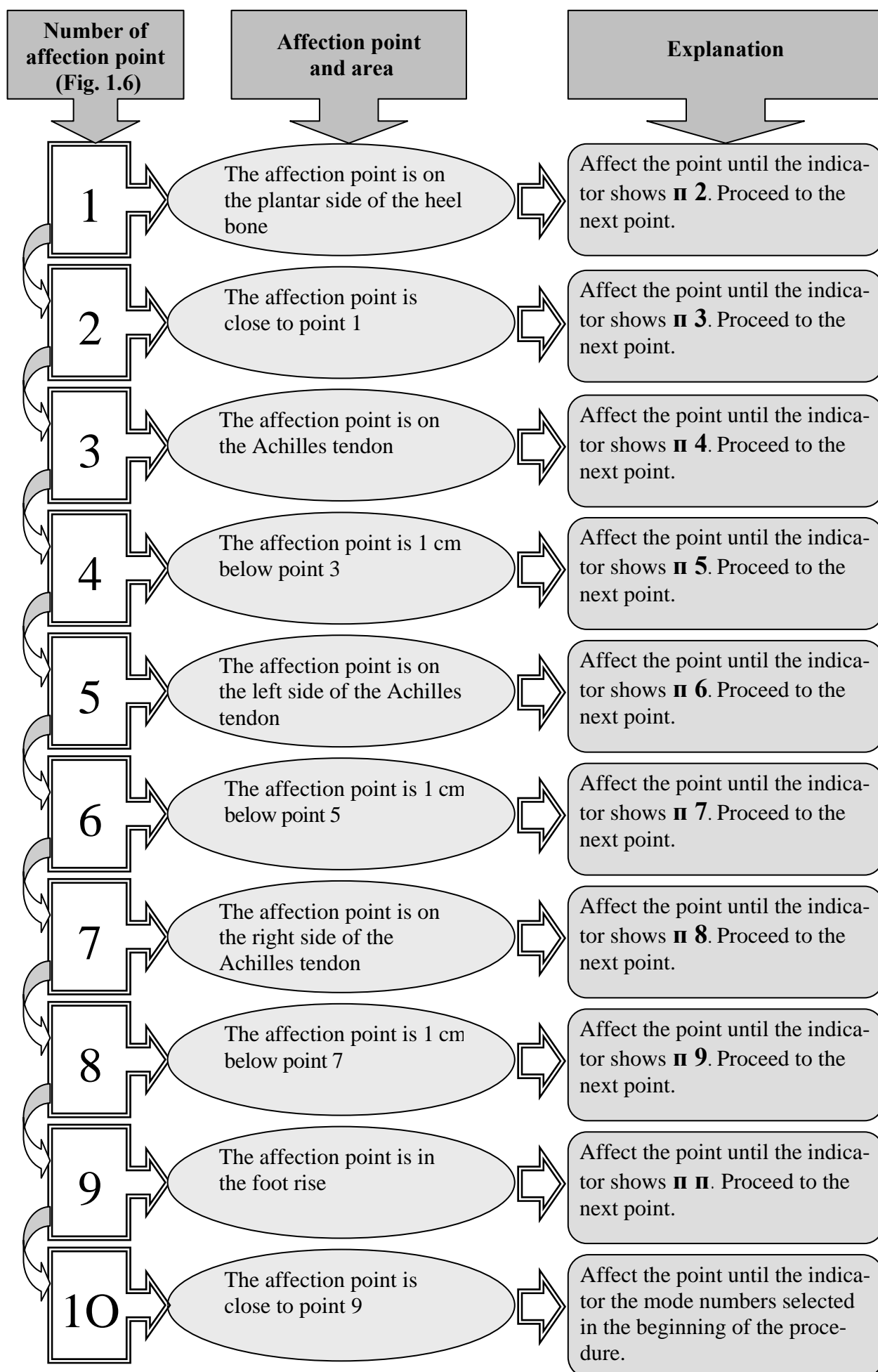
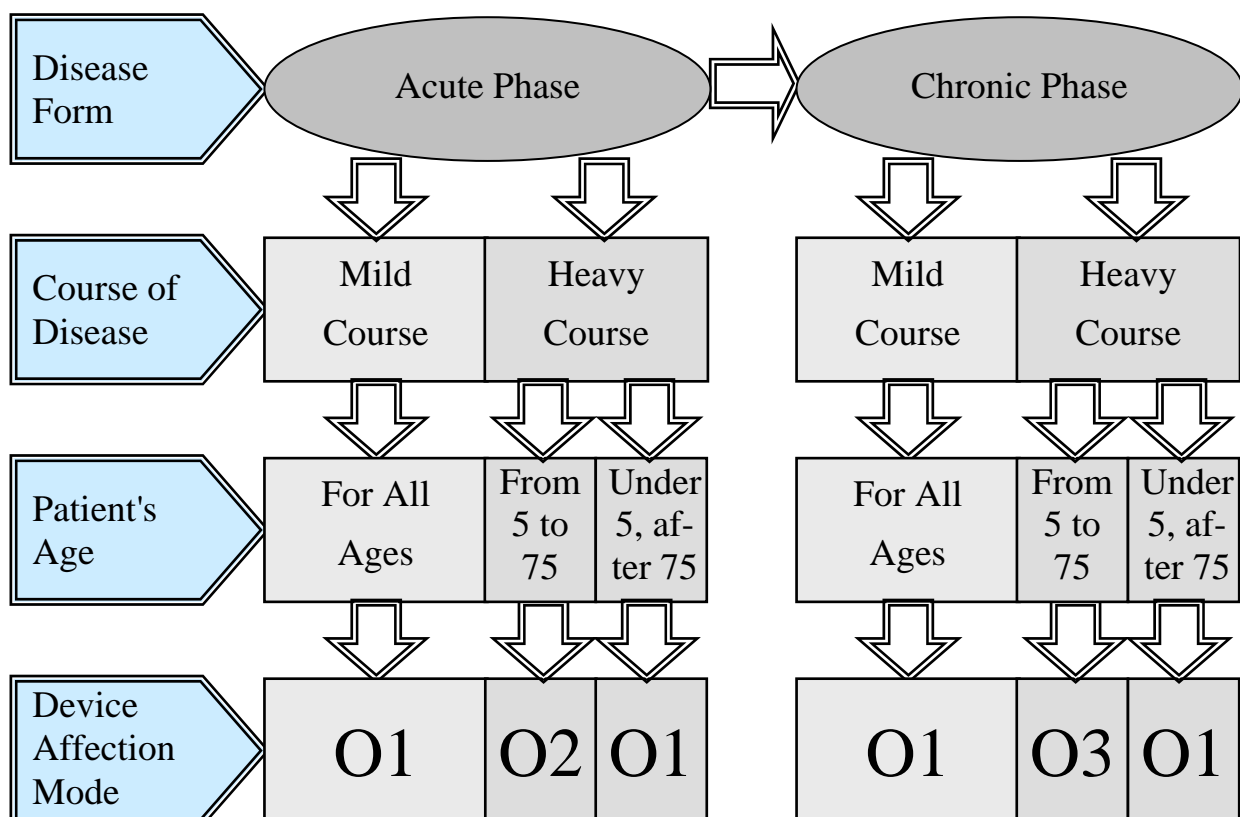


Figure 1.6



1.7 OSTEOCHONDROSIS OF BACK BONE, RADICULITIS



It is recommended to conduct a daily course during 30 days as it is shown in Figure 1.7.

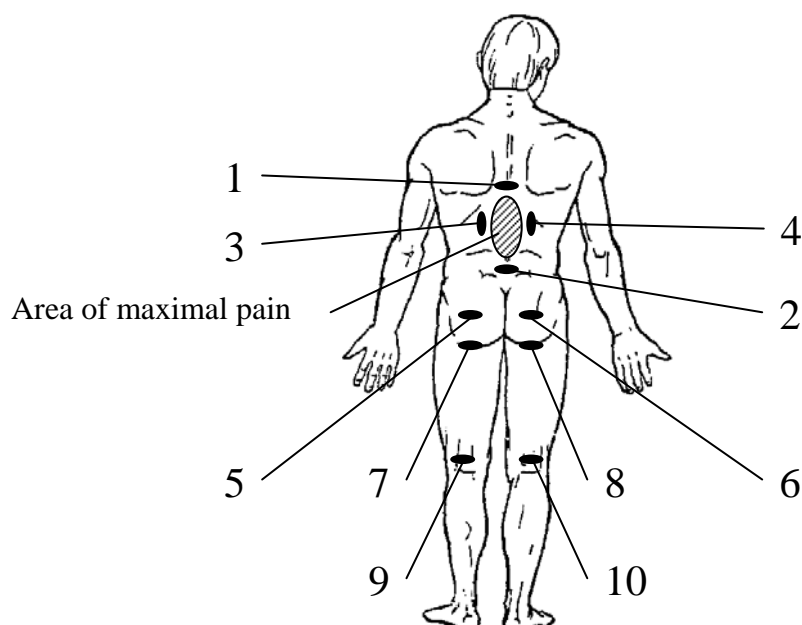
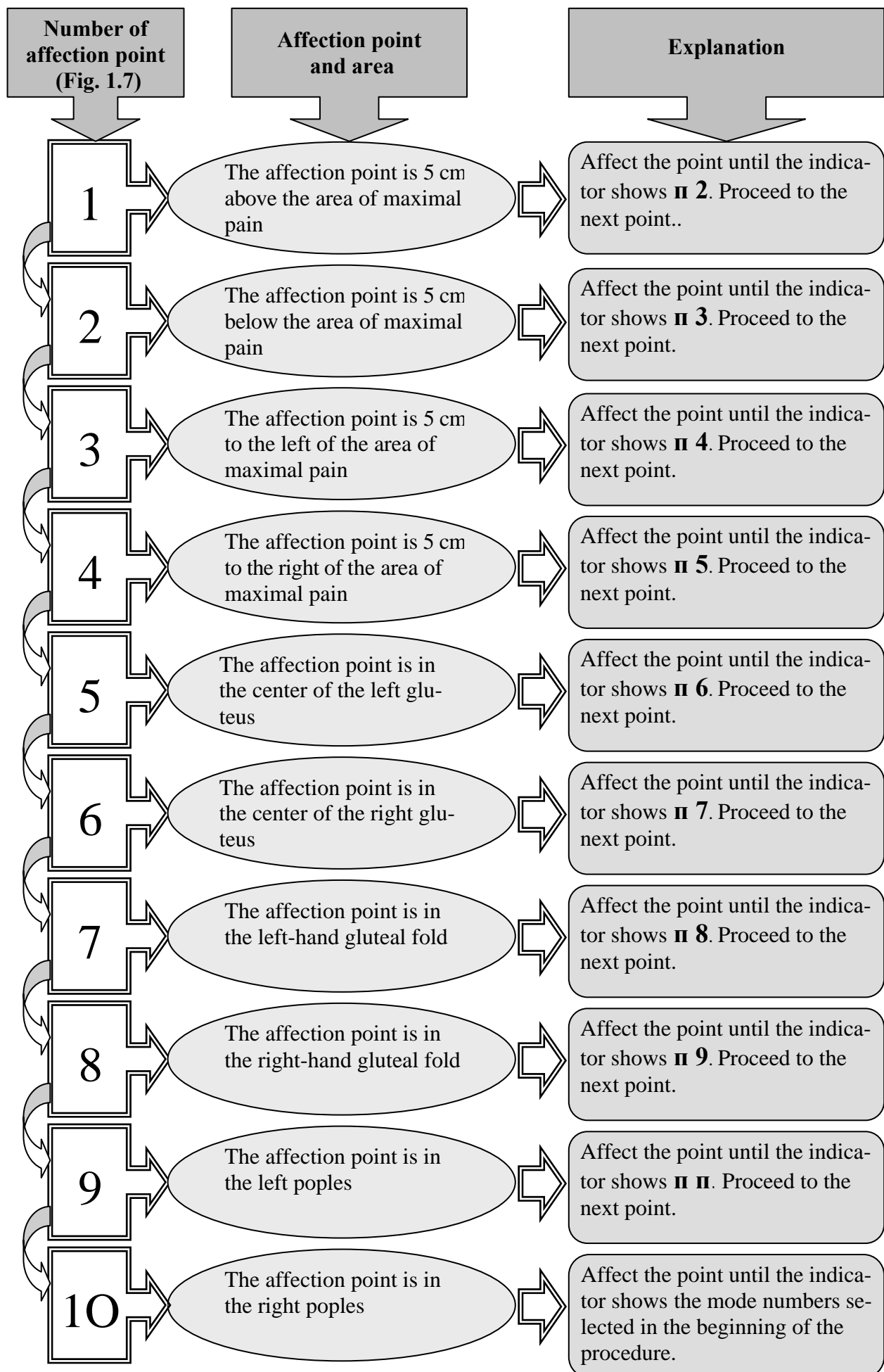
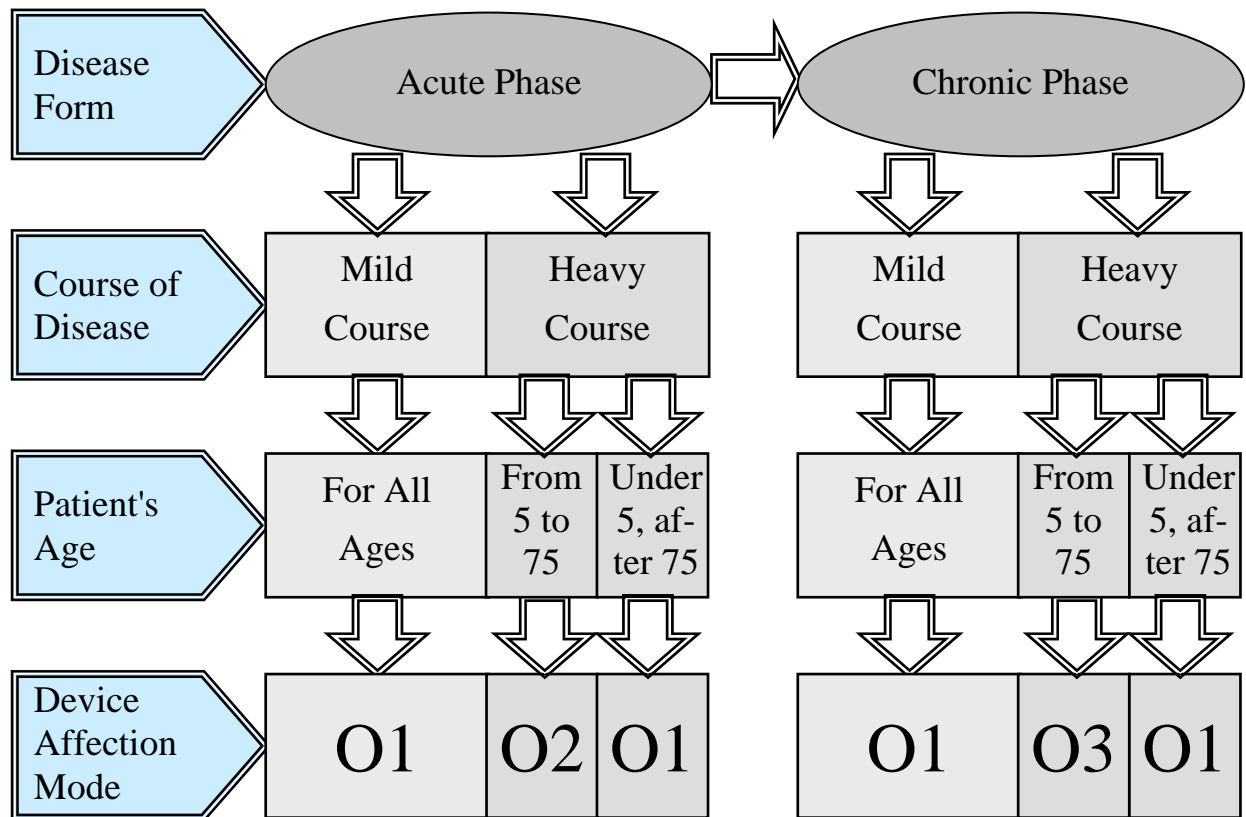



Figure 1.7



1.8 NEURODYNIA



 Prior to switching on, press the Device tight to the skin. At the moment of driving the Device away from the face, it is better to close the eyes and, if necessary, interrupt the procedure.
 Any damage to the eyes by the laser of this energy is excluded, but still it is not recommended to admit any direct getting of the laser radiation into the eyes.
 It is recommended to conduct a daily course during 2-3 weeks as it is shown in Figure 1.8. (Points 2 and 4 are located same as 1 and 3, but on the other side).
 At the paresis of the left-hand nerve, the radiation is conducted in mode 3.

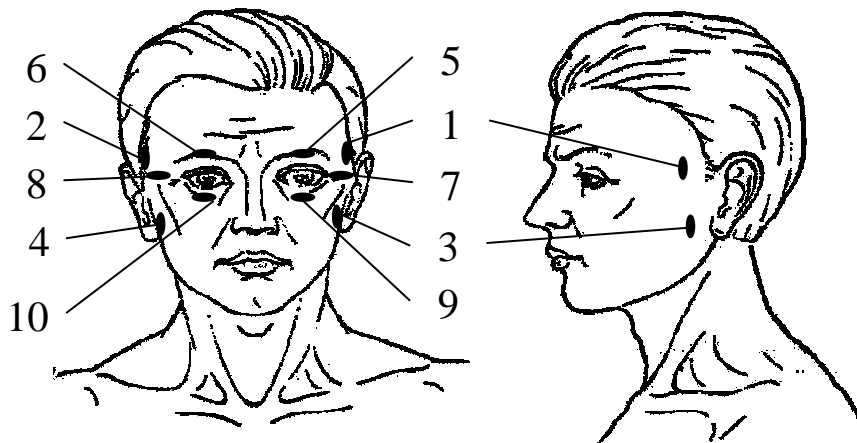
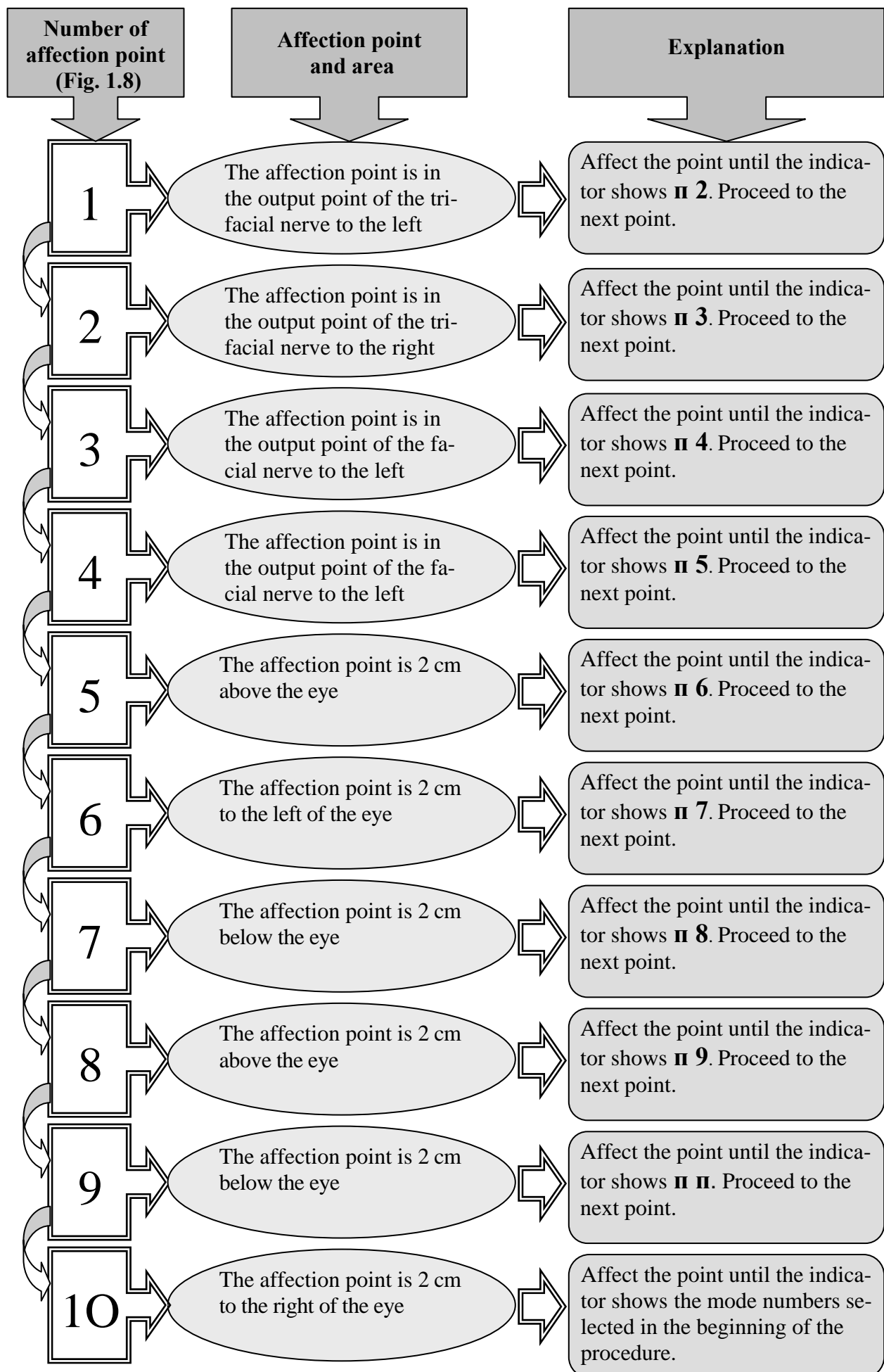
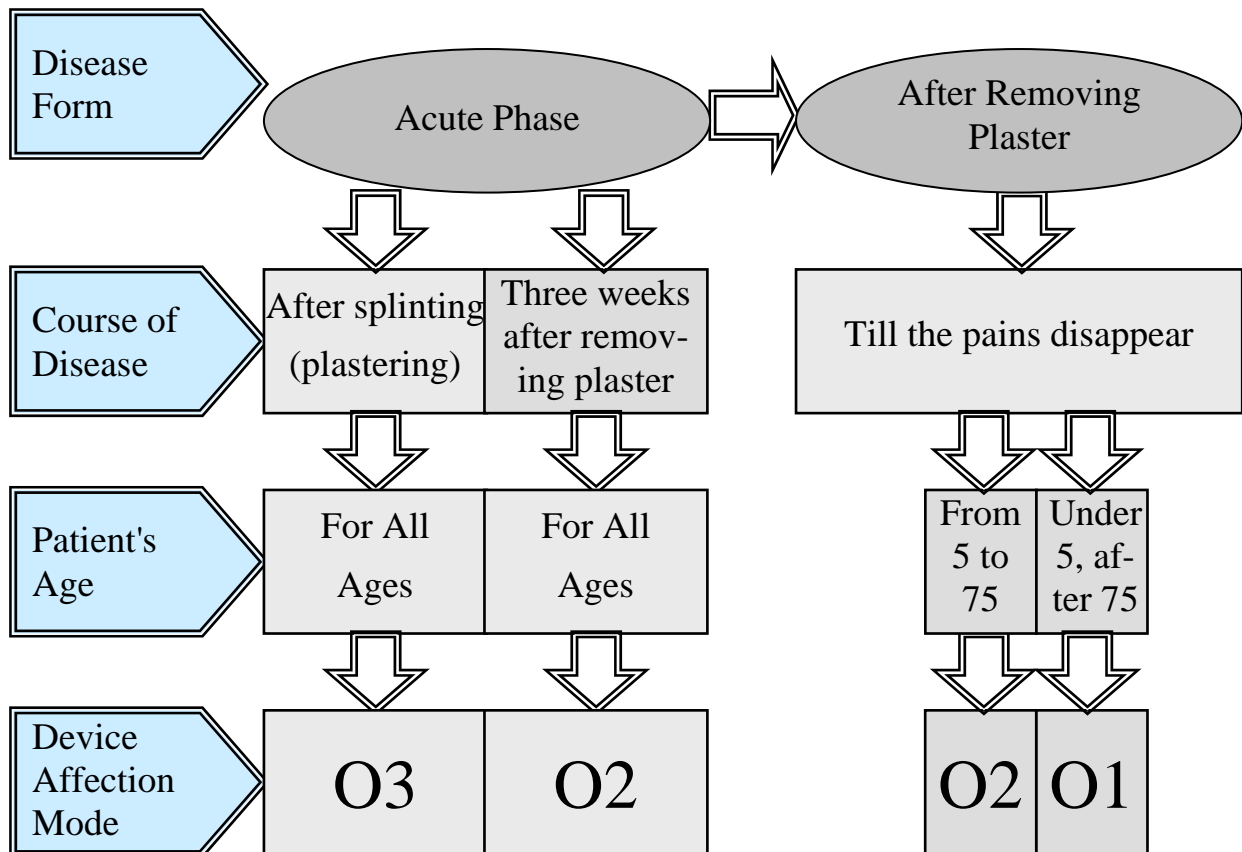


Figure 1.8



1.9 BONE FRACTURES



It is recommended to conduct the procedures, as shown in Figure 1.9, till the pains disappear 1.9:

- twice a day at affecting through the dressing;
- three times a day, when affecting through the plaster.

For modes "O2", "O3", it is allowed to split the procedure into two-three sessions during the day.

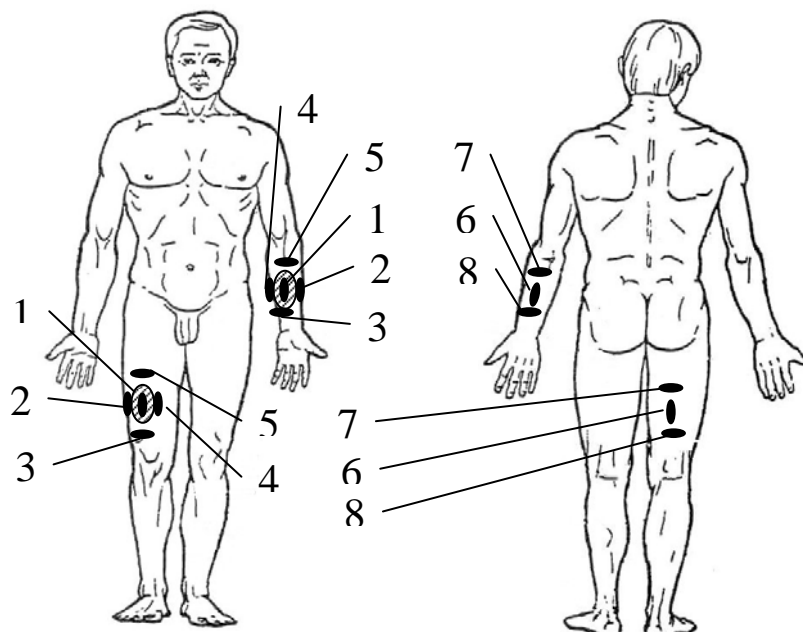
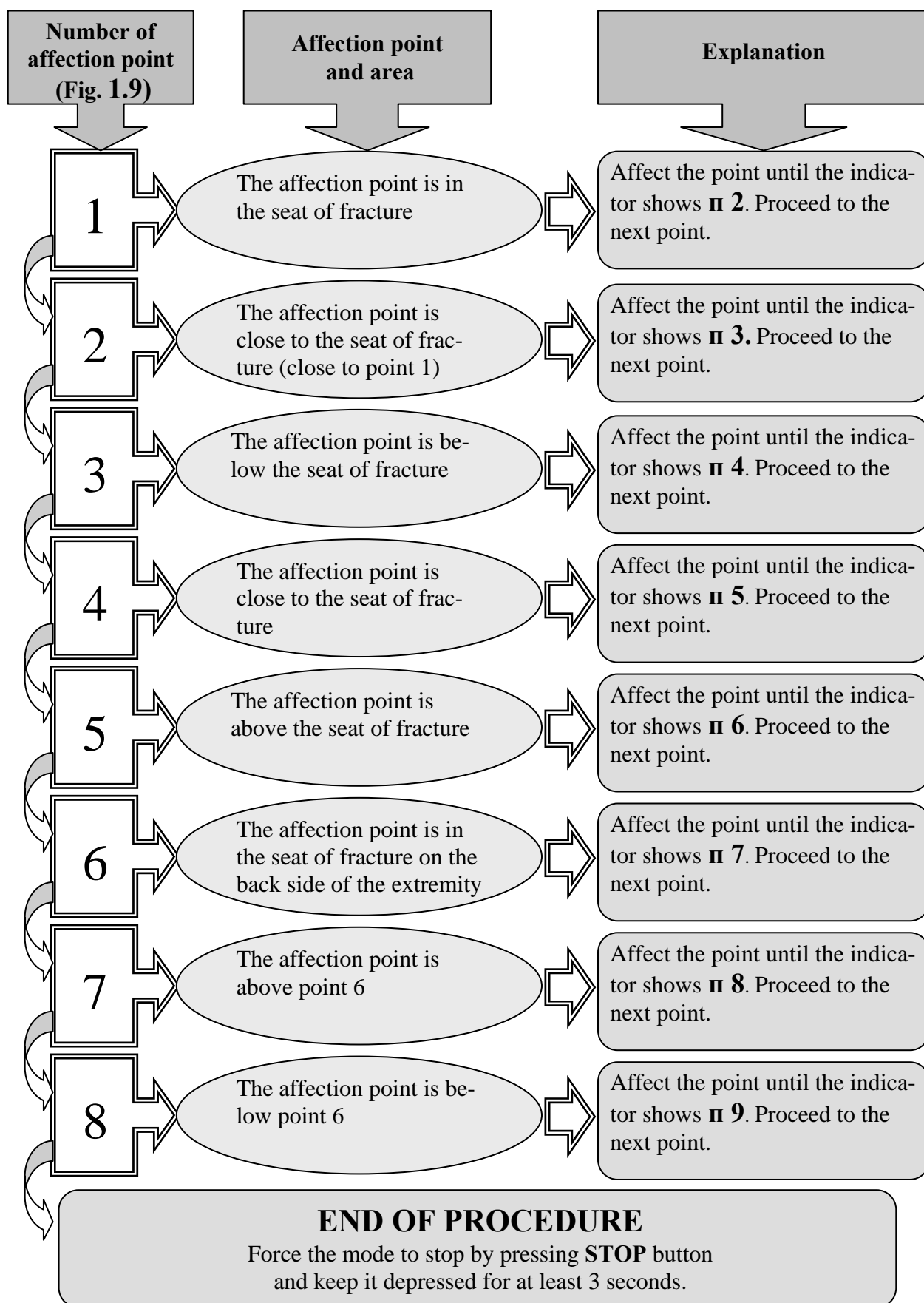
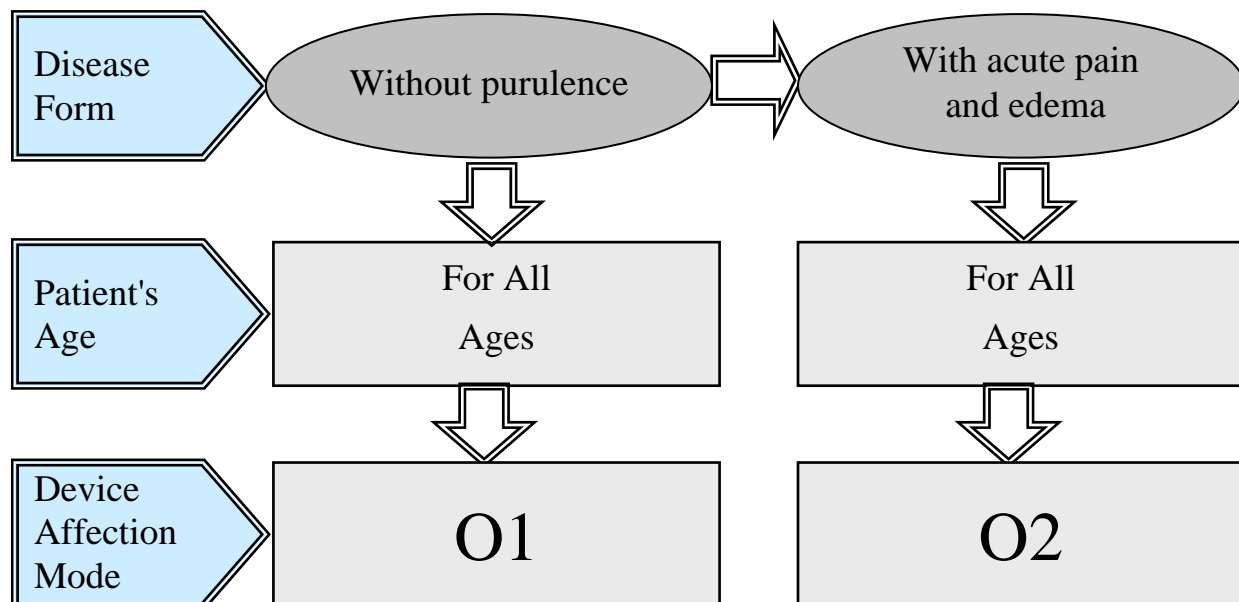


Figure 1.9



1.10 CONCUSSIONS, HYDRADENITES



It is recommended to conduct daily courses, as shown in Figure 1.10, until the inflammation repairs.

Treat concussions same as hydradenites.

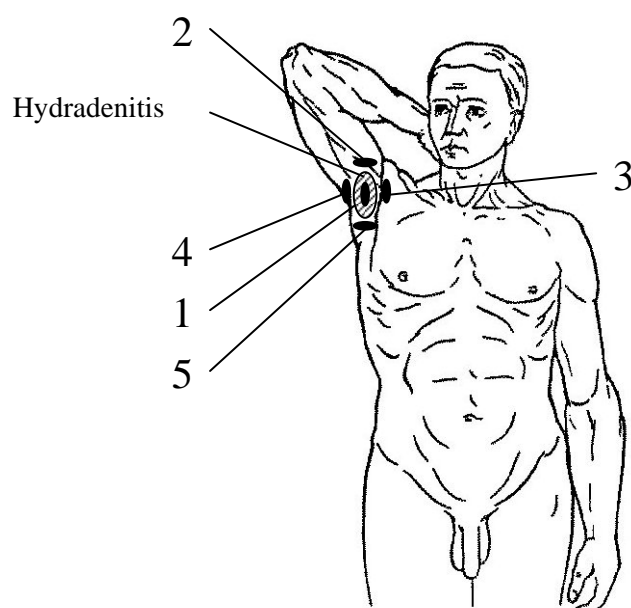
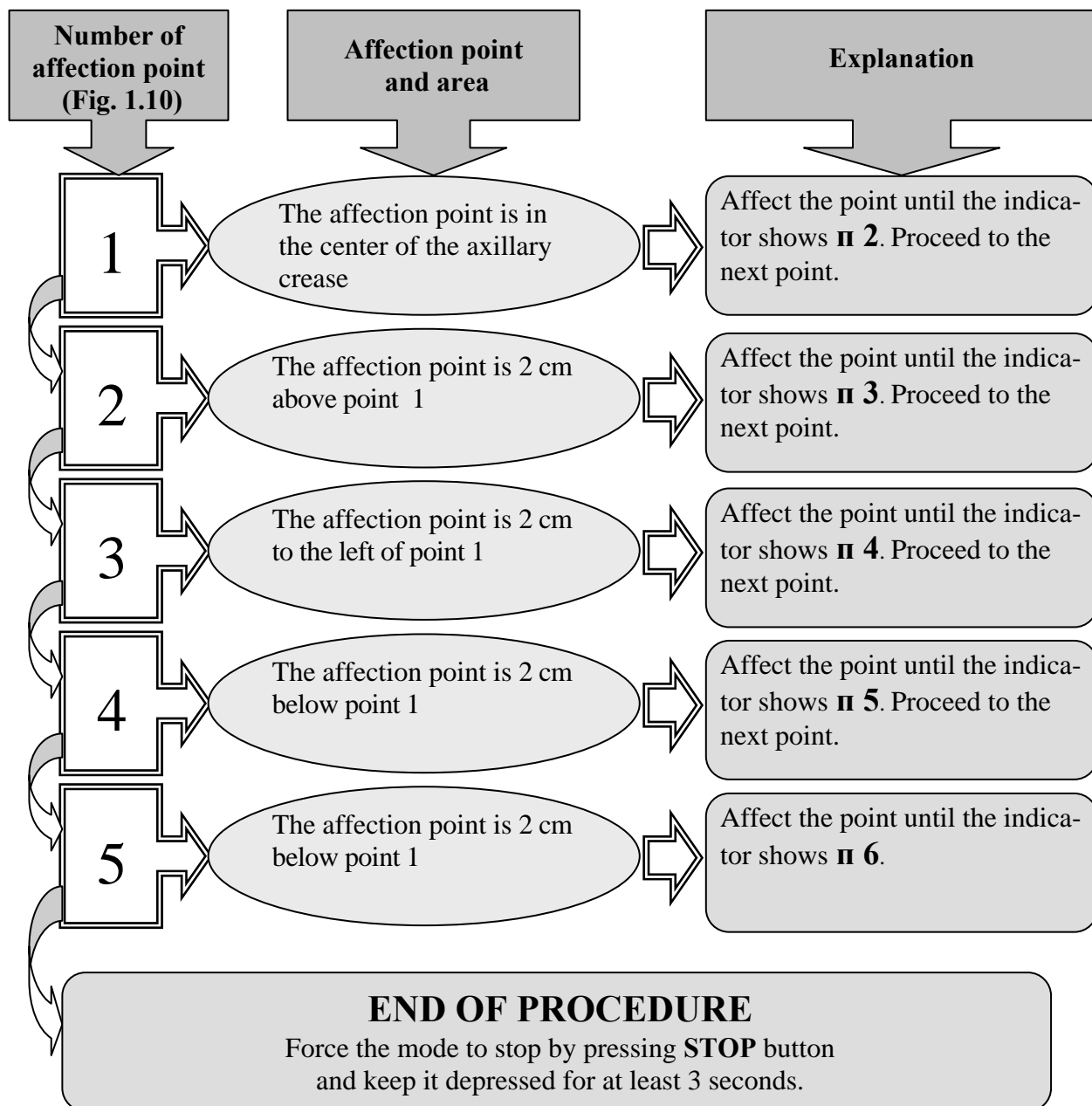
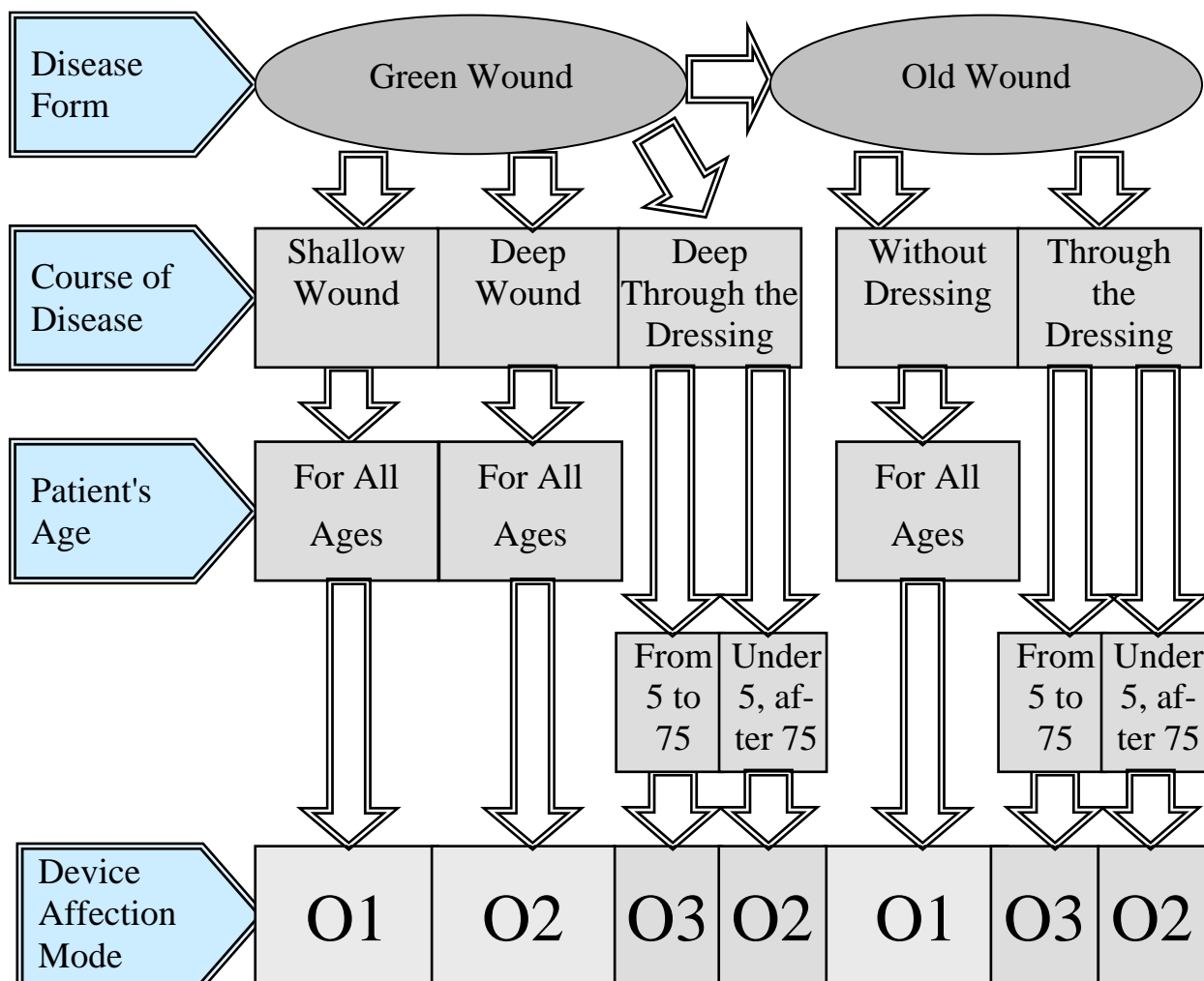


Figure 1.10



1.11 OPEN WOUNDS



It is recommended to conduct daily courses till the repair of the wound by irradiating the surface of the open wound from the distance of about 1-4 cm from the dressed wound, very close to the dressing.

Prior to laser affection, treat the open wound by colourless antiseptics (3% oxygen peroxide solution, 0.05% chlorhexidine solution, 1% dioxydine solution, or others).

Make irradiation by the areas, which successively overlap the whole wound, and the adjacent healthy areas (0.5-2.0 cm wide). Make a transfer to the next area selected for affection during a pause.

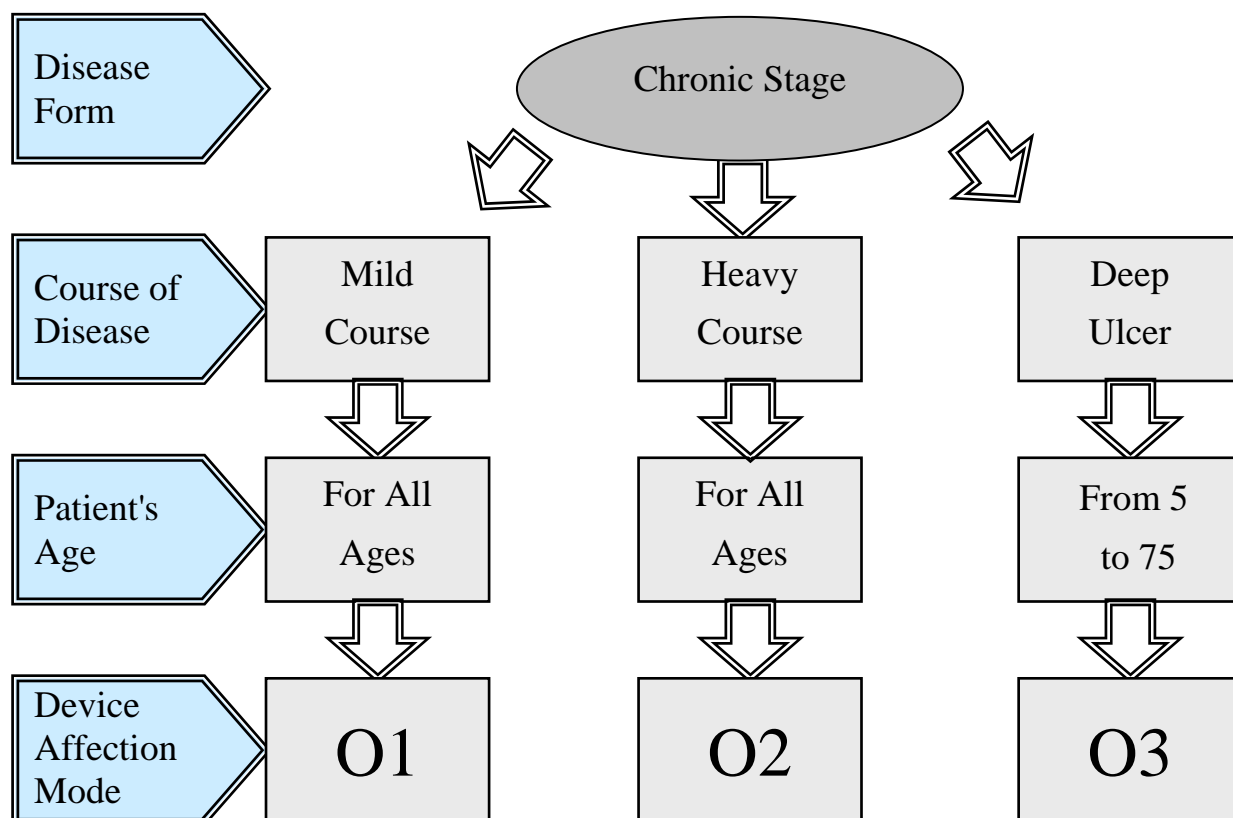
If the number of areas for wound irradiation is less than 10, it is necessary to make a forced stop of the mode by pressing the **STOP** button and keeping it depressed for at least 3 s.

If 10 areas are insufficient to treat the whole wound surface, go on irradiating till the end of the procedure by pressing the **START** button.

It is allowed to split a long affection procedure into two-three sessions during the day while making breaks.

After affecting an open wound, make a triple disinfection of the radiator of the Device.

1.12 TROPHIC ULCER, LONG OPEN WOUNDS, DECUBITUS



It is recommended to conduct daily courses during 20 days or till the wound repairs, by radiating the surface of the open wound from the distance of about 1-4 cm, when the wound is dressed, close to the dressing.

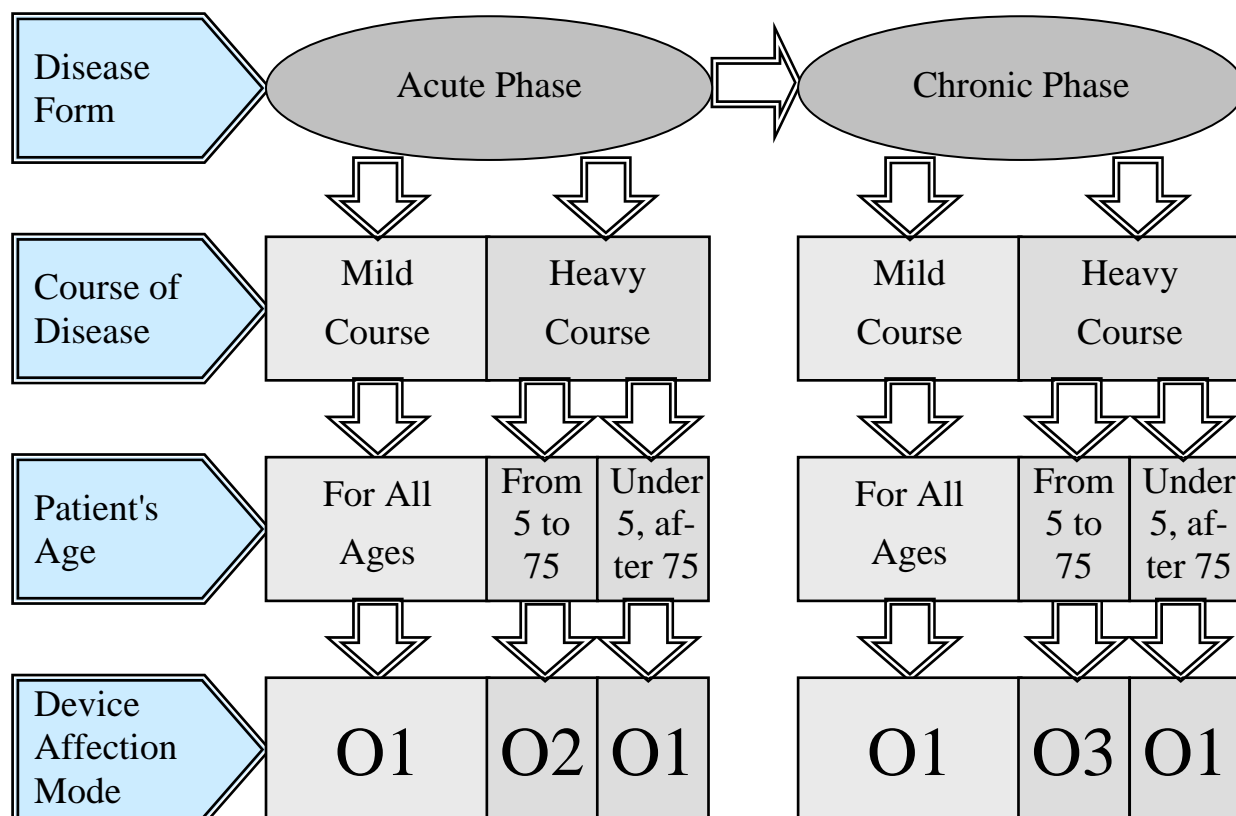
Prior to laser affection, treat the wound by colourless antiseptics (3% oxygen peroxide solution, 0.05% chlorhexidine solution, 1% dioxidine solution).

Make the radiation by the areas, which overlap the wound edges by 1-2 cm over the whole wound area. Move the affection points along the length of the wound.

For the "O3" mode it is allowed to split the affection procedure into two-three sessions during the day.

After affecting an open wound, make a triple disinfection of the radiator of the Device.

1.13 HUMEROSCAPULAR PARASYNOVITIS



It is recommended to conduct a daily course during 20 days as it is shown in Figure 1.13. It is recommended to clean the affection area with 100% dimexid solution 5 minutes before the procedure.

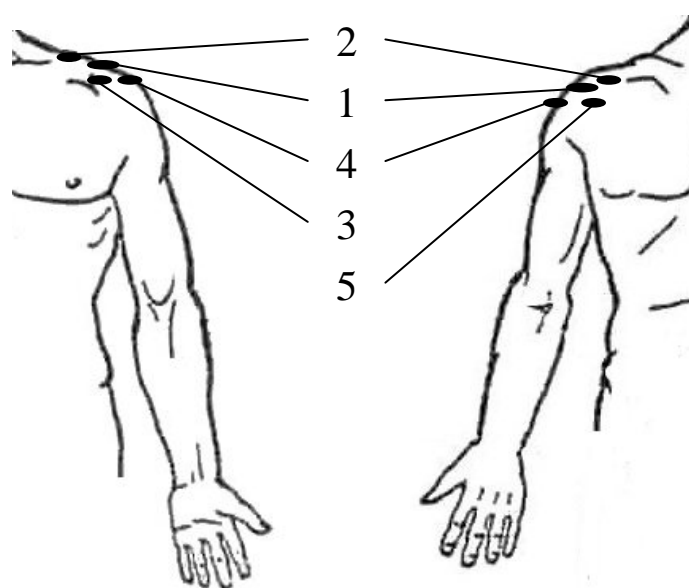
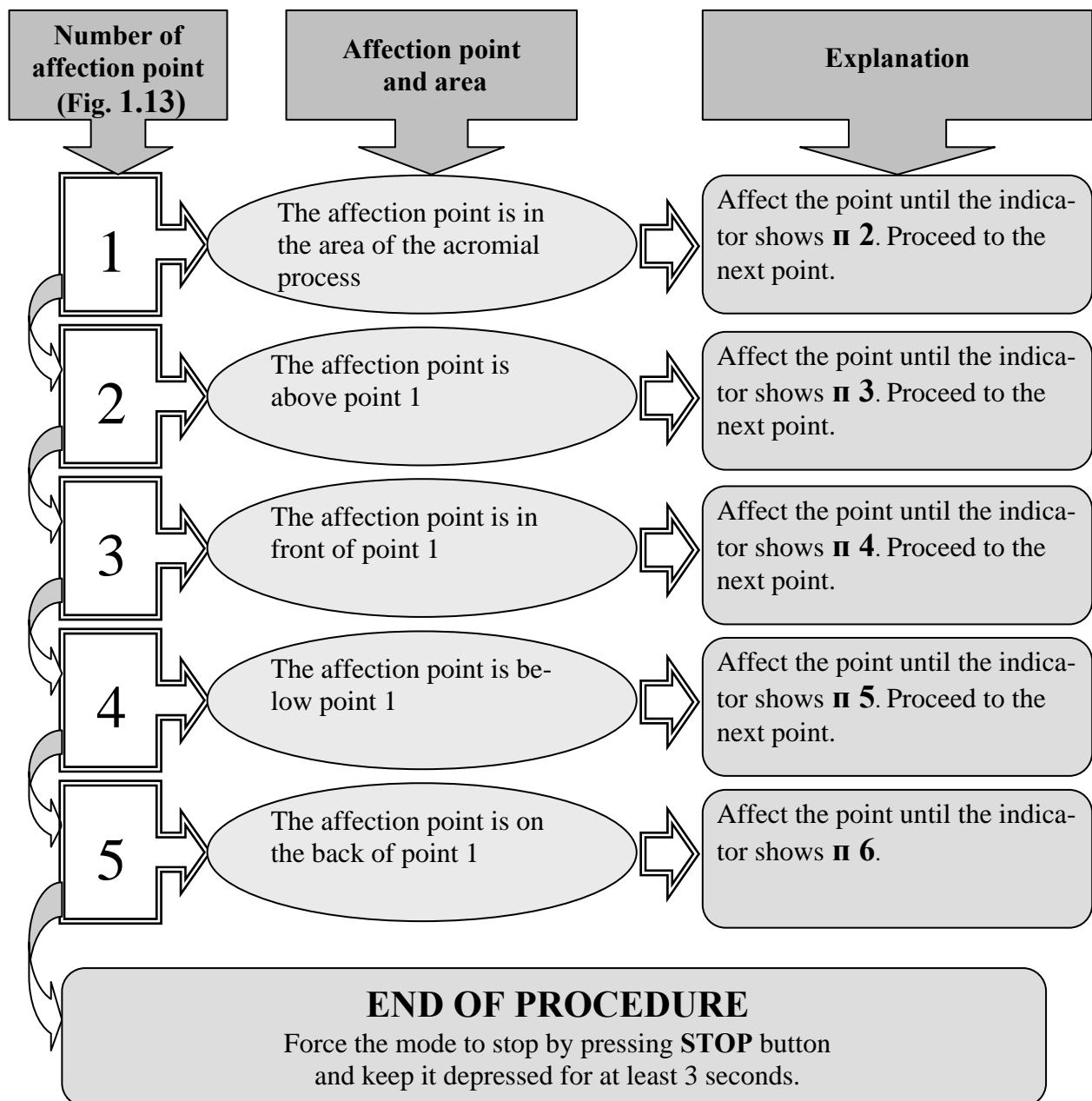
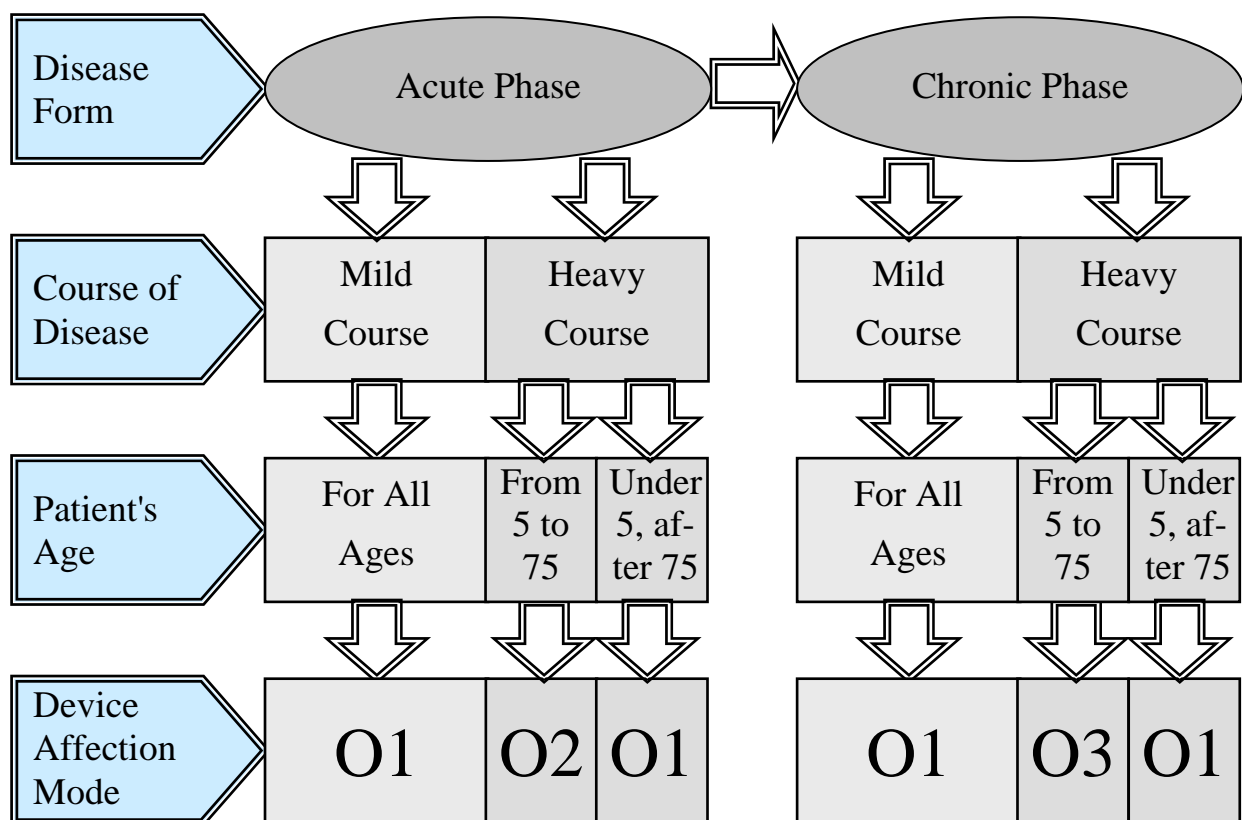


Figure 1.13



1.14 MYOSITIS, PERITENDINITIS, SPRAIN



It is recommended to conduct a daily course during 2-3 weeks.
Place the affection points ladder-shaped (according to Fig. 1.14).
It is allowed to split the affection procedure into two-three sessions during the day.
To affect the hardly accessible points of the back, invite other persons (relatives).

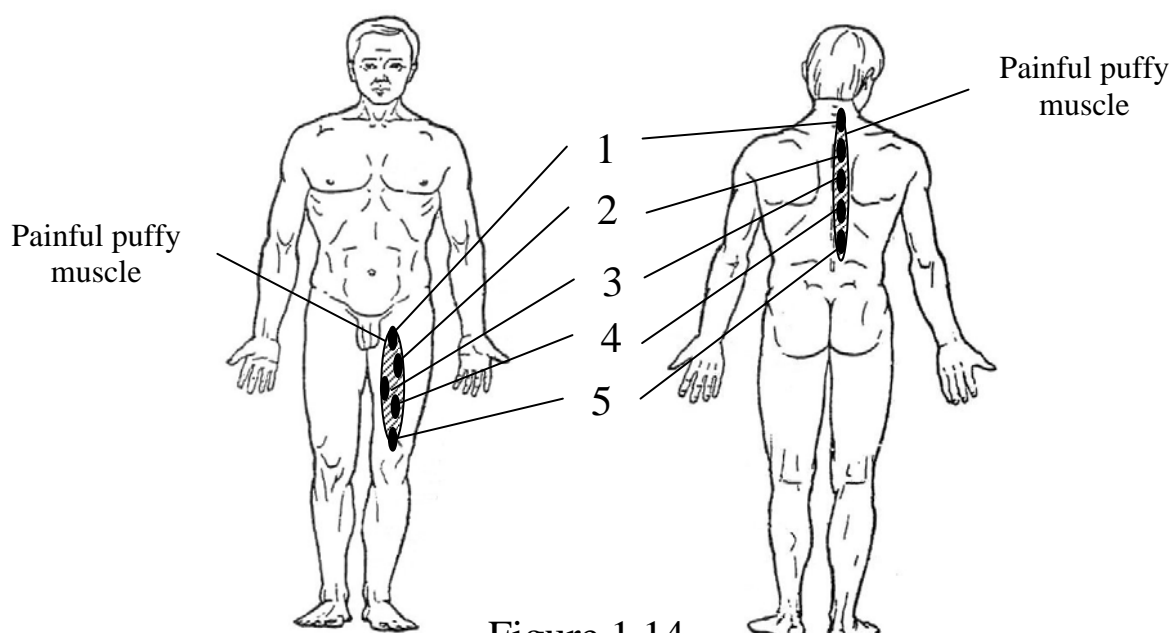
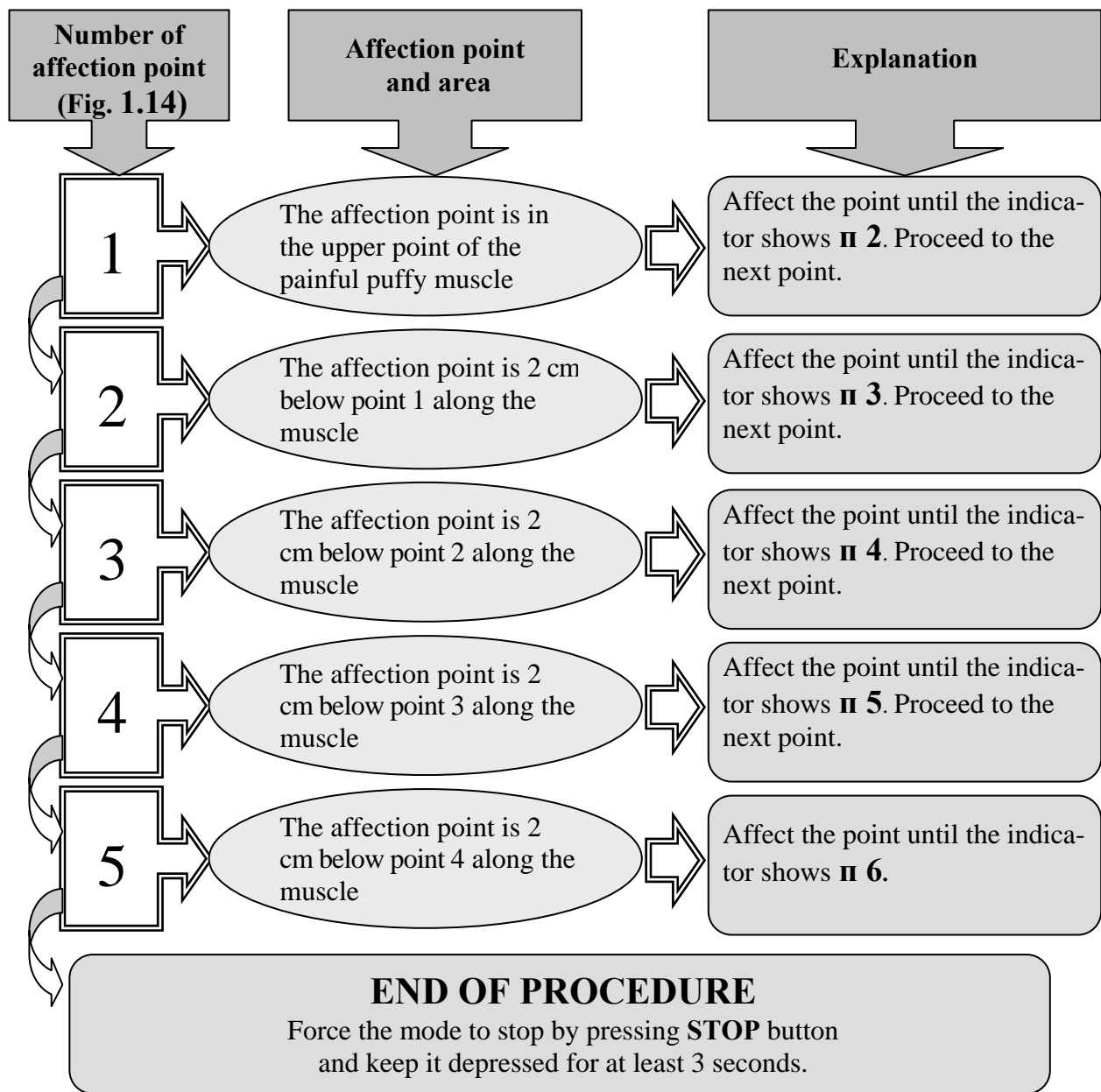
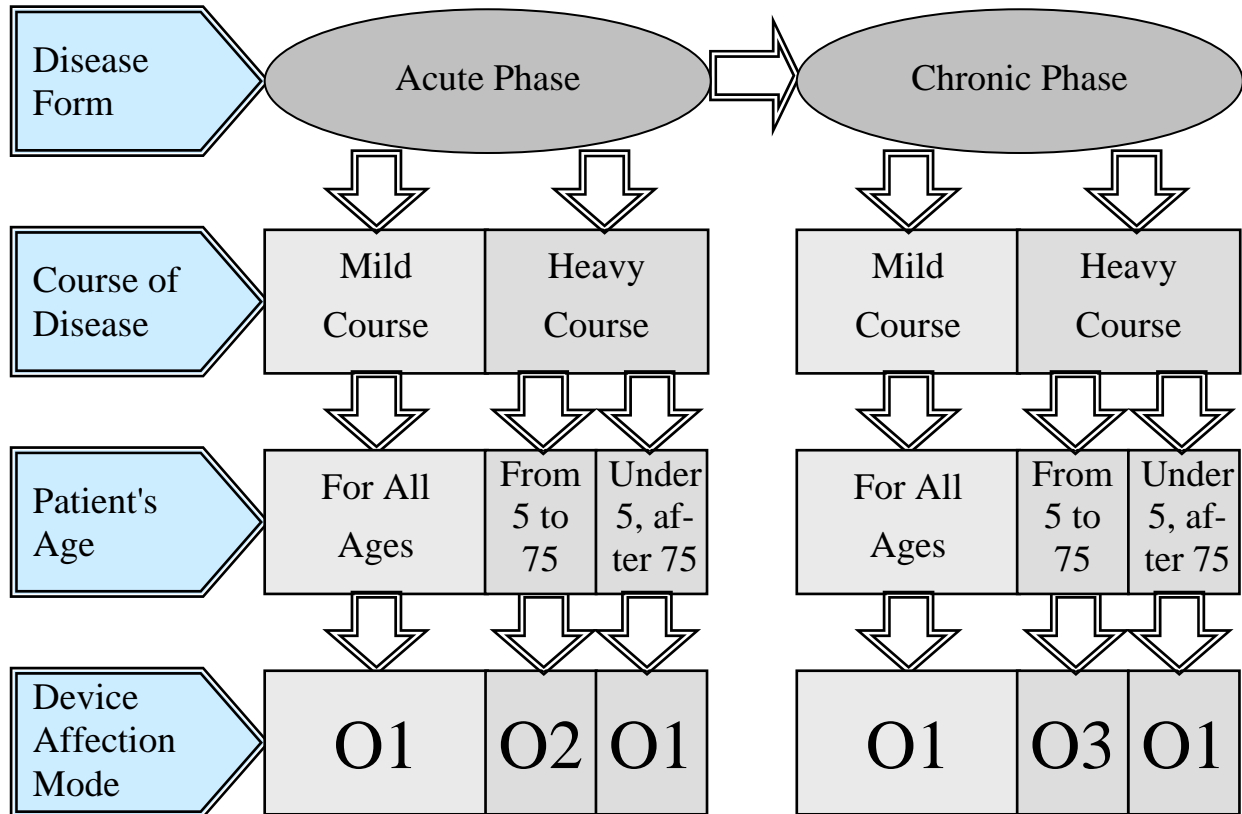


Figure 1.14



2 SKIN DISEASES

2.1 DERMATITIS, ECZEMA

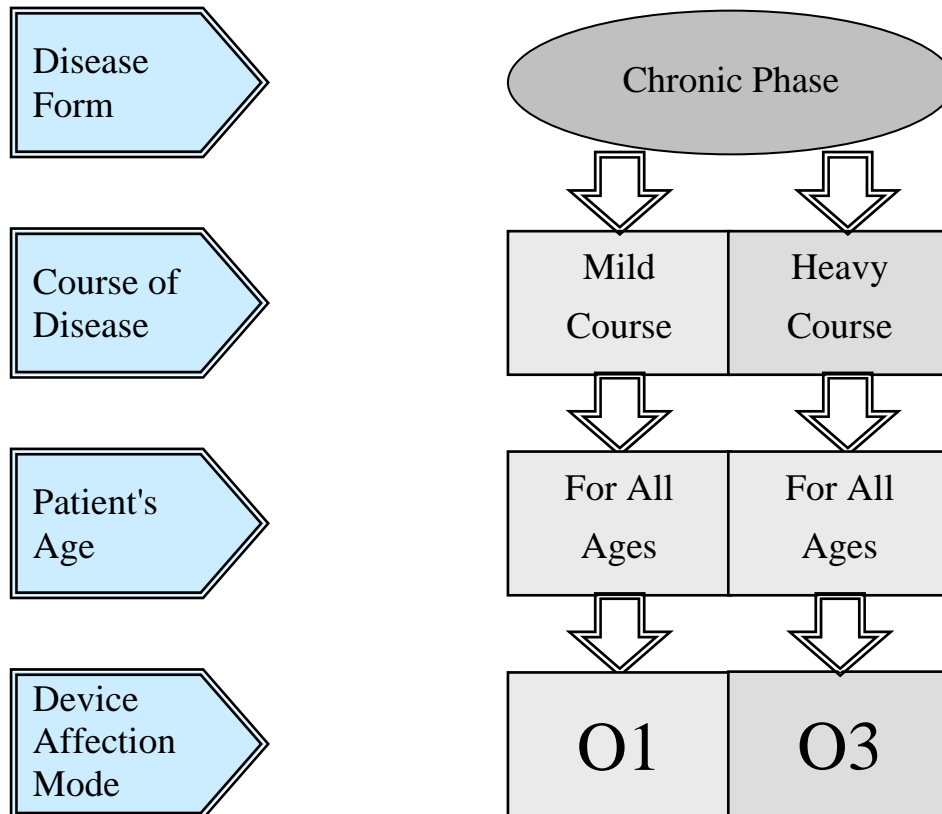


The lesion foci in the extremities should be irradiated by circles while moving length-wise (those in the body should be irradiated crosswise) by areas (with overlapping edges) along the whole area at the distance of 1-5 cm from the surface.

It is recommended to conduct a daily course during 2 weeks, then to repeat the course 2 weeks later, and to take maximum 10 areas (points) per one session.

After affecting the lesion foci, make a triple disinfection of the Device irradiator.

2.2 FURUNCULOSIS, VERRUCAS



It is recommended to conduct a daily course during 20 days. The affection points in the extremities should be located lengthwise, and on the body – crosswise, right against the surface, or at a distance of about 1 cm.

The exposure dose for one furunculus is defined as a dose for one point, total – maximum 10 points per one session.

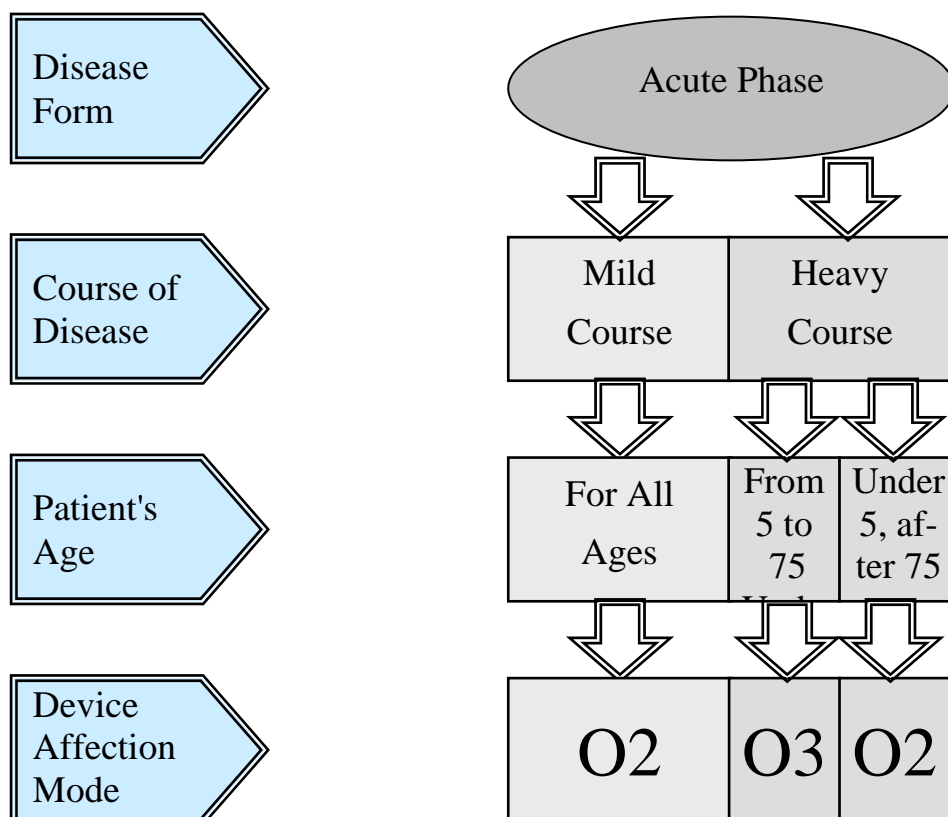
Prior to a quantum therapy procedure, make a surgical treatment of the inflammation area, ensuring purulence drainage.

After affecting the last current point, make a forced stop of the affection mode by pressing the **STOP** button and keeping it depressed for at least 3 s.

After affecting the lesion foci, make a triple disinfection of the Device irradiator.

High radiation energy densities are used to treat verrucas. Therefore, affect one verruca during 10 cycles in the selected mode.

2.3 HERPES OF SKIN AND GENITAL ORGANS



The lesion foci in the extremities should be irradiated by circles while moving lengthwise, those in the body should be irradiated crosswise, flash to the surface or at the distance of about 1 cm; maximum 10 areas (points) per session.

Prior to start the treatment, consult a dermatologist, and take Zavirax or Acyclovir.

It is recommended to conduct 1 session per day during 2 weeks.

For the "O3" mode, it is allowed to split the affection procedure into two-three stages during the day.

After affecting the lesion foci, make a triple disinfection of the Device irradiator.

2.4 WRINKLES



Irradiate wrinkles in the morning or in the evening in the "03" mode by scanning motions.

Press the irradiator to the skin and move is slowly, as if smoothing the skin by the Device. One session – on the right-hand part of the face, one session – on the left-hand part thereof, and one session – on the forehead skin. Additionally, you may irradiate the chin and neck.

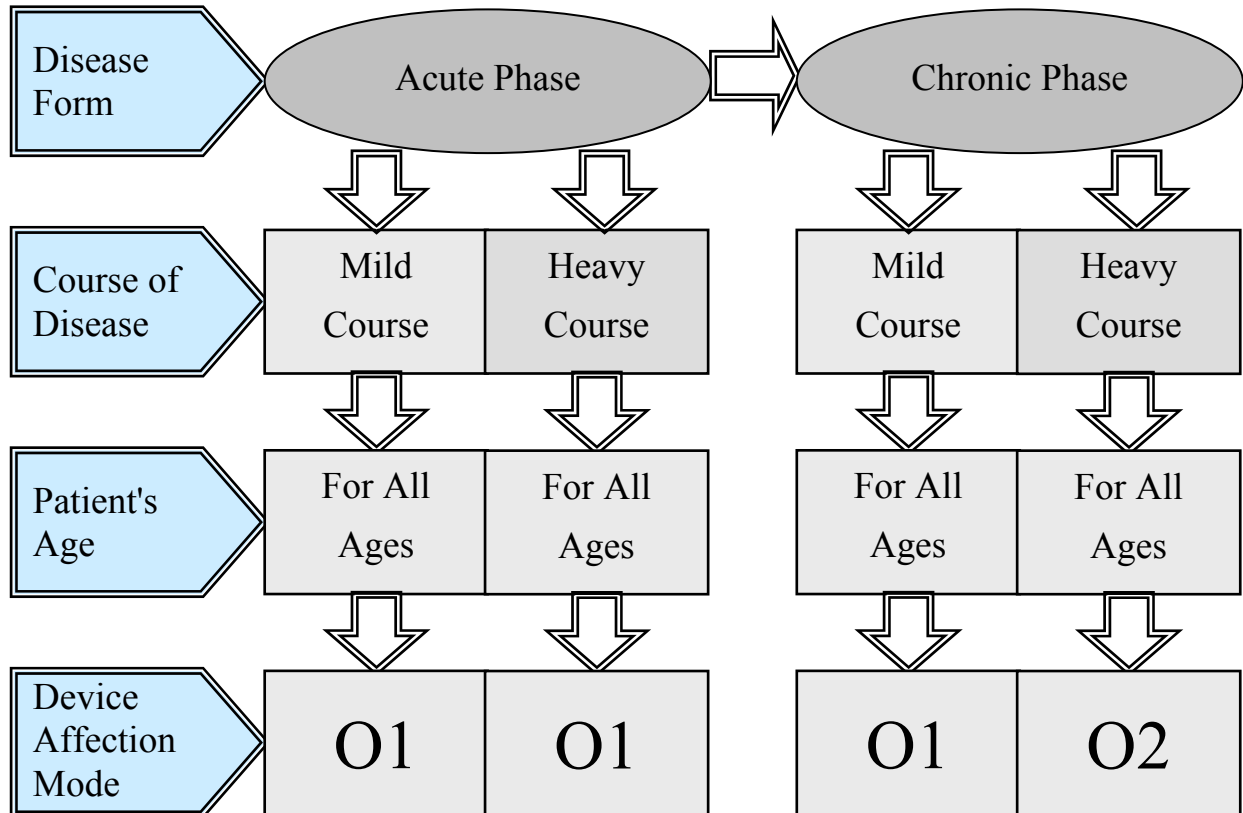
Avoid the direct laser light from getting into the eyes.

It is recommended to conduct 1 session per day during 4 weeks.

Repeat the course in 1-2 months.

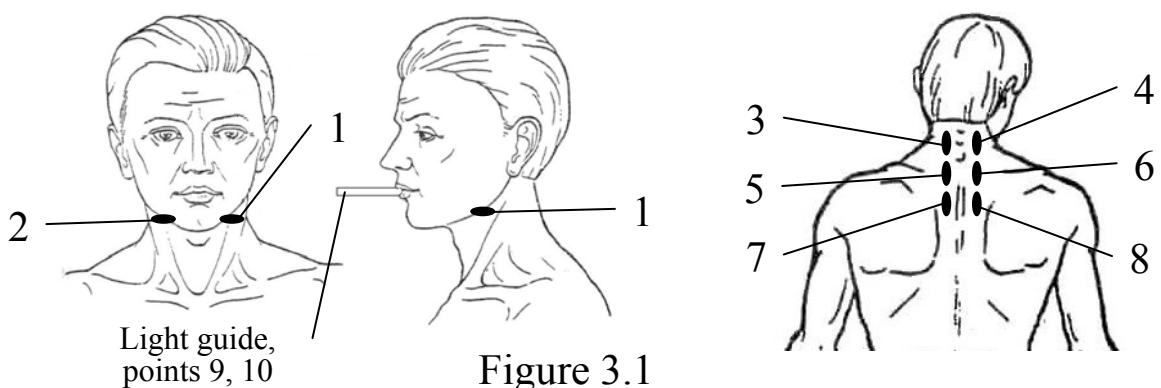
3 ENT (EAR, NOSE, THROAT) DISEASES

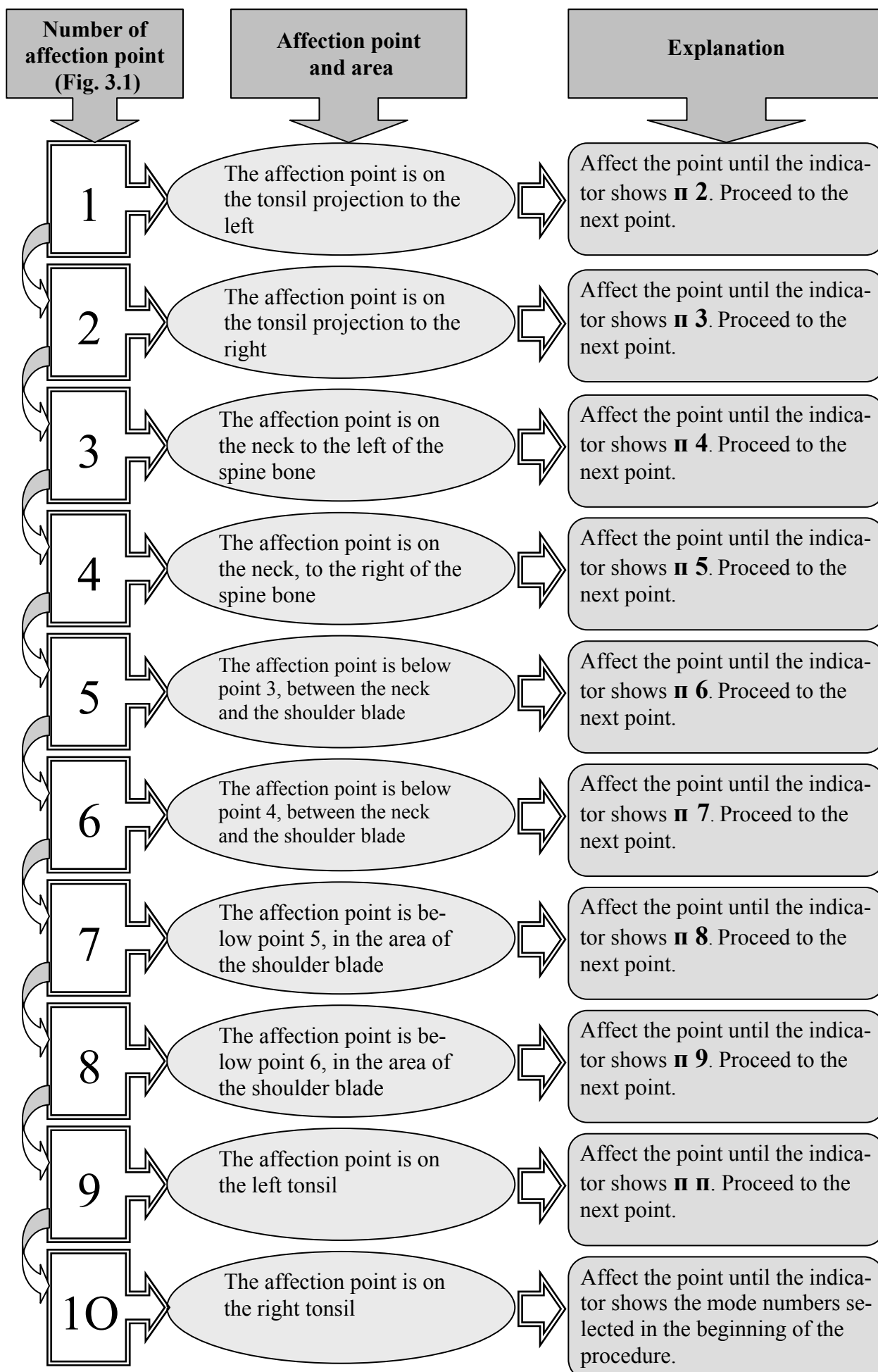
3.1 ACUTE AND CHRONIC TONSILLITIS



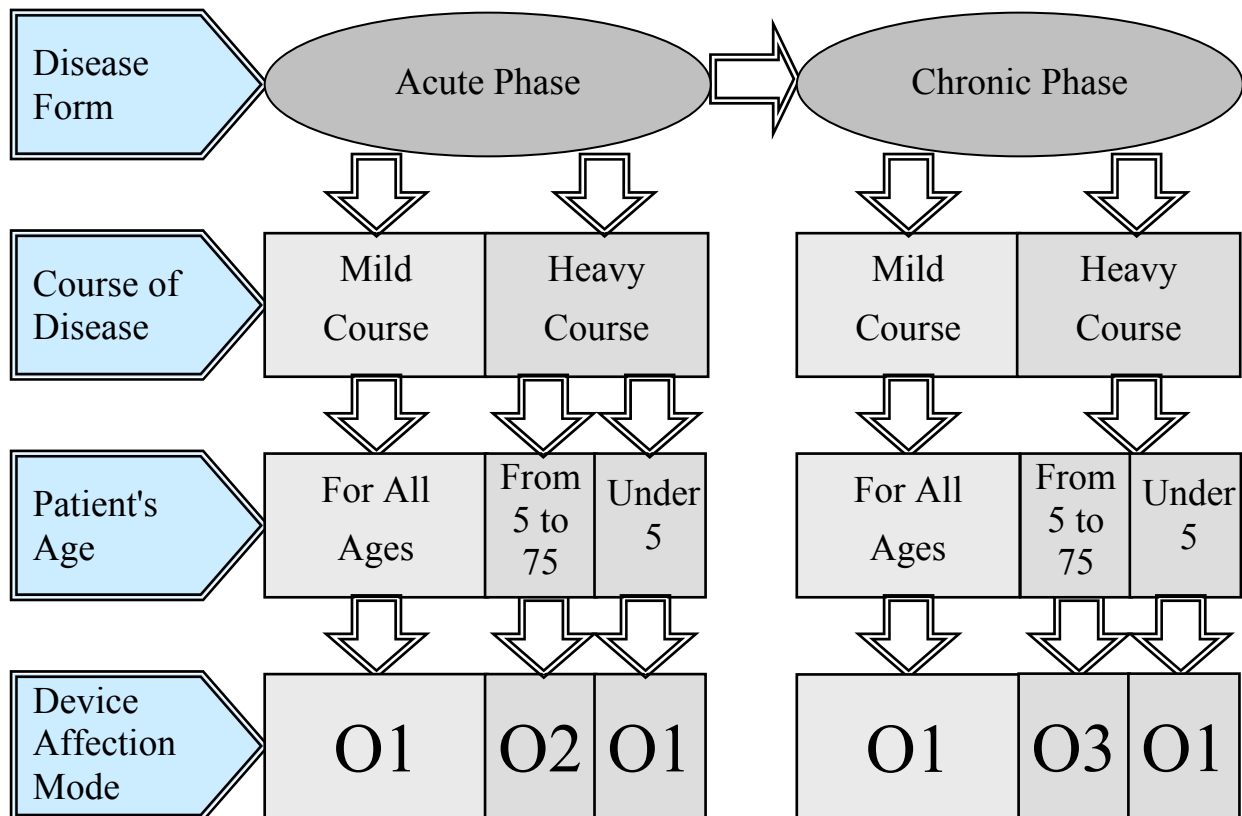
Expose points 1, 3, 5 and 2, 4, 6 in the form of scanning, as shown in Figure 3.1. Affection points 9 and 10 are irradiated through the mouth with the help of the waveguide attachment (**by medical personnel only**).

It is recommended to conduct sessions every day in the morning and in the evening during 2 weeks. The course should be intermixed with gargarism and antibacterial and deallergizing preparations. Make a triple disinfection of the attachment.





3.2 RHINITIS



Affection points 5 and 6 are exposed through the nostrils by means of the light guide attachment (**by medical personnel only**). Prior to use, oil the attachment with Vaseline. Refrain from any vasomotor drops on the eve of the treatment.

It is recommended to conduct a daily course during 10 days, as it is shown in Figure 3.2.

At a chronic rhinitis, make a repeated 2-week course 1-2 months later. Make a triple disinfection of the attachment.

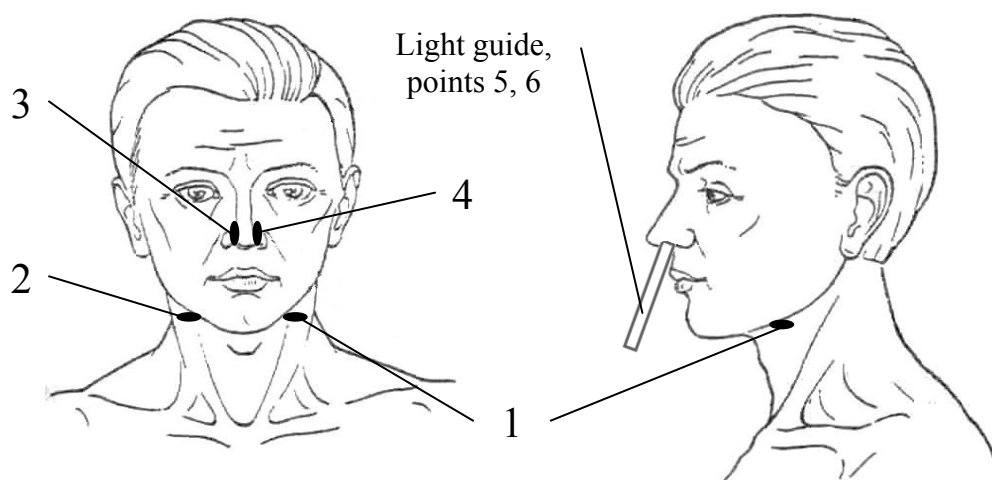
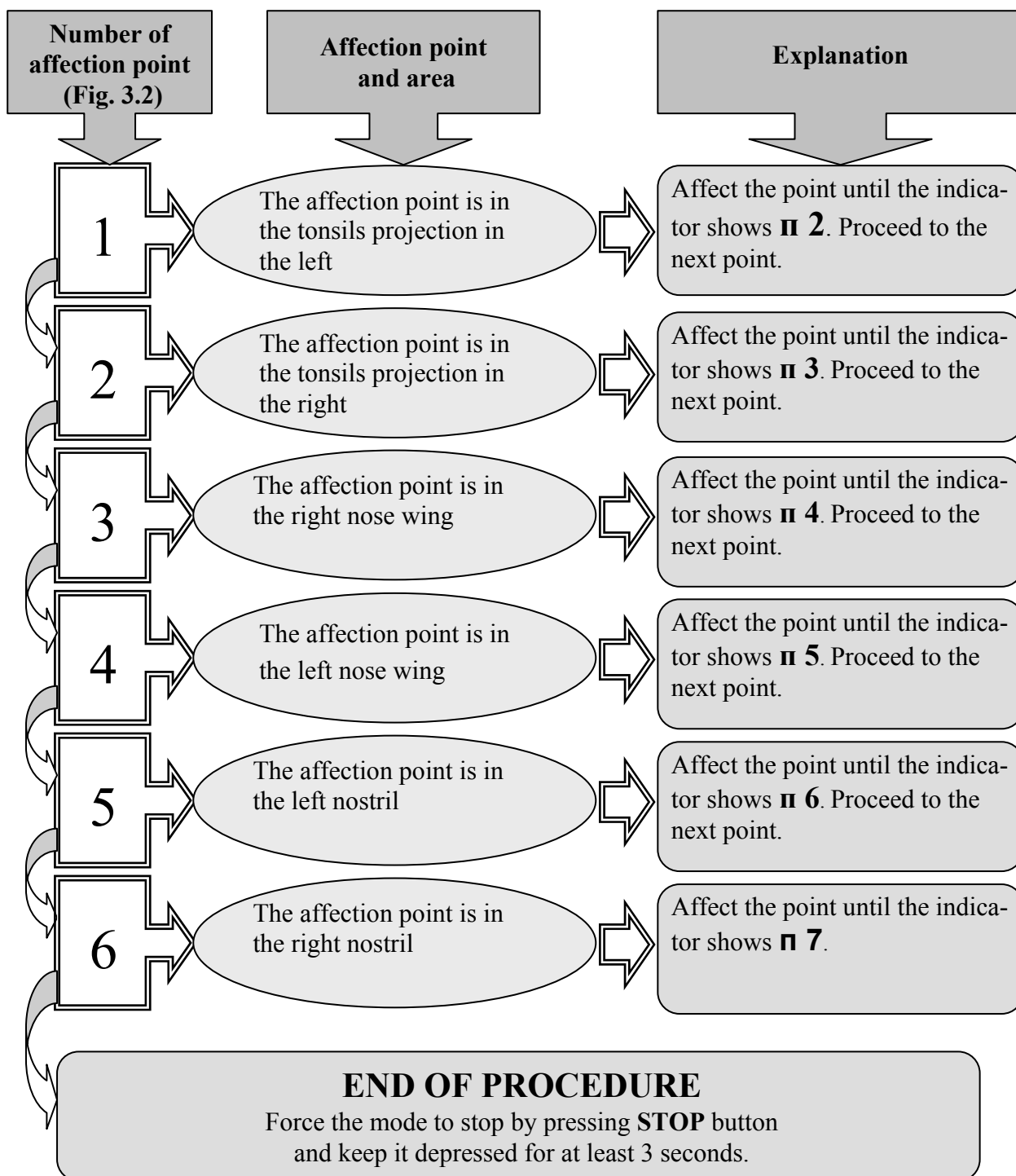
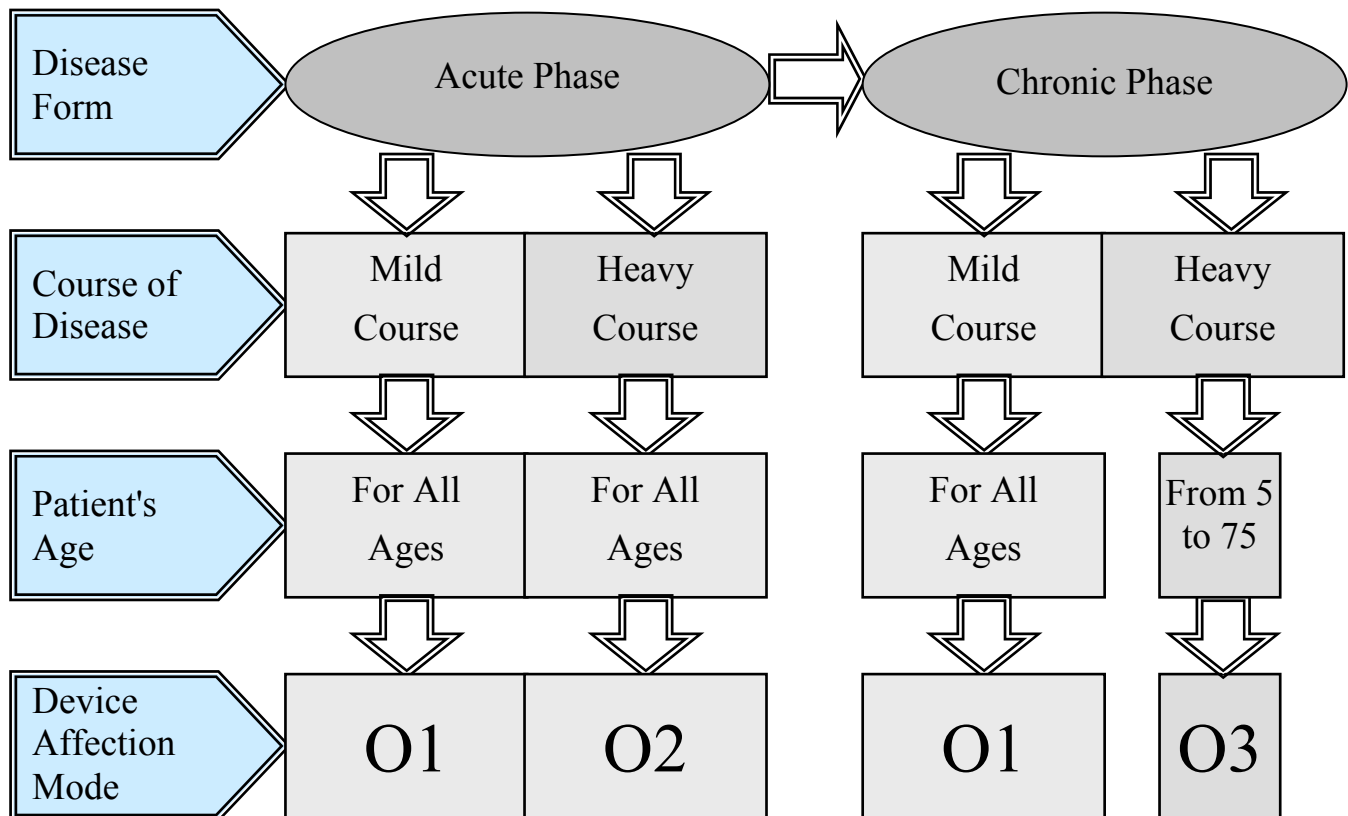


Figure 3.2



3.3 SINUITIS



Affection points 5 and 6 are irradiated with the help of the light guide attachment inserted into the nasal passages by 1-2 cm (**by medical personnel only**). Prior to use, apply some Vaseline oil onto the attachment.

It is recommended to run a daily course in the morning and in the evening during 14 days, as shown in Fig. 3.3. Do not take any vasomotor drops on the eve of the treatment. Disinfect the attachment.

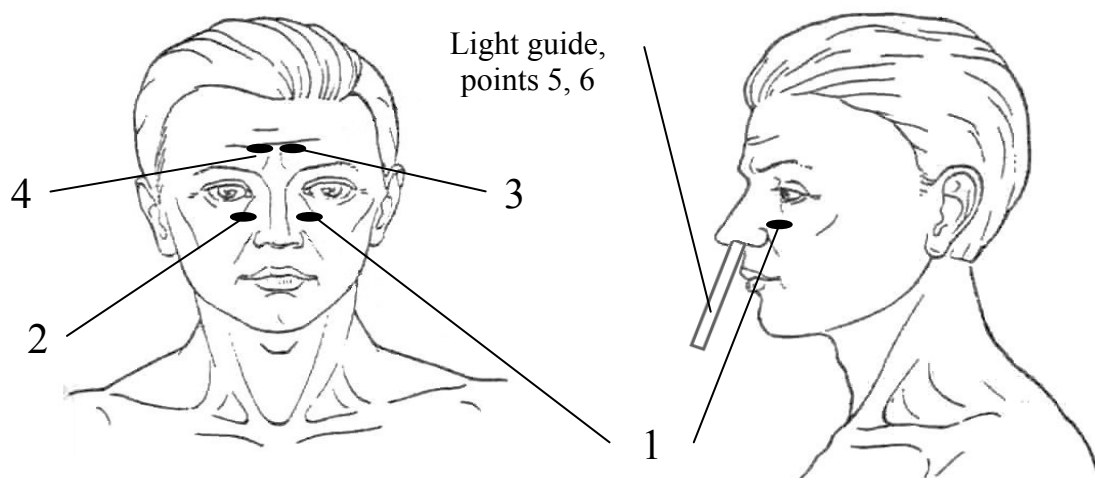
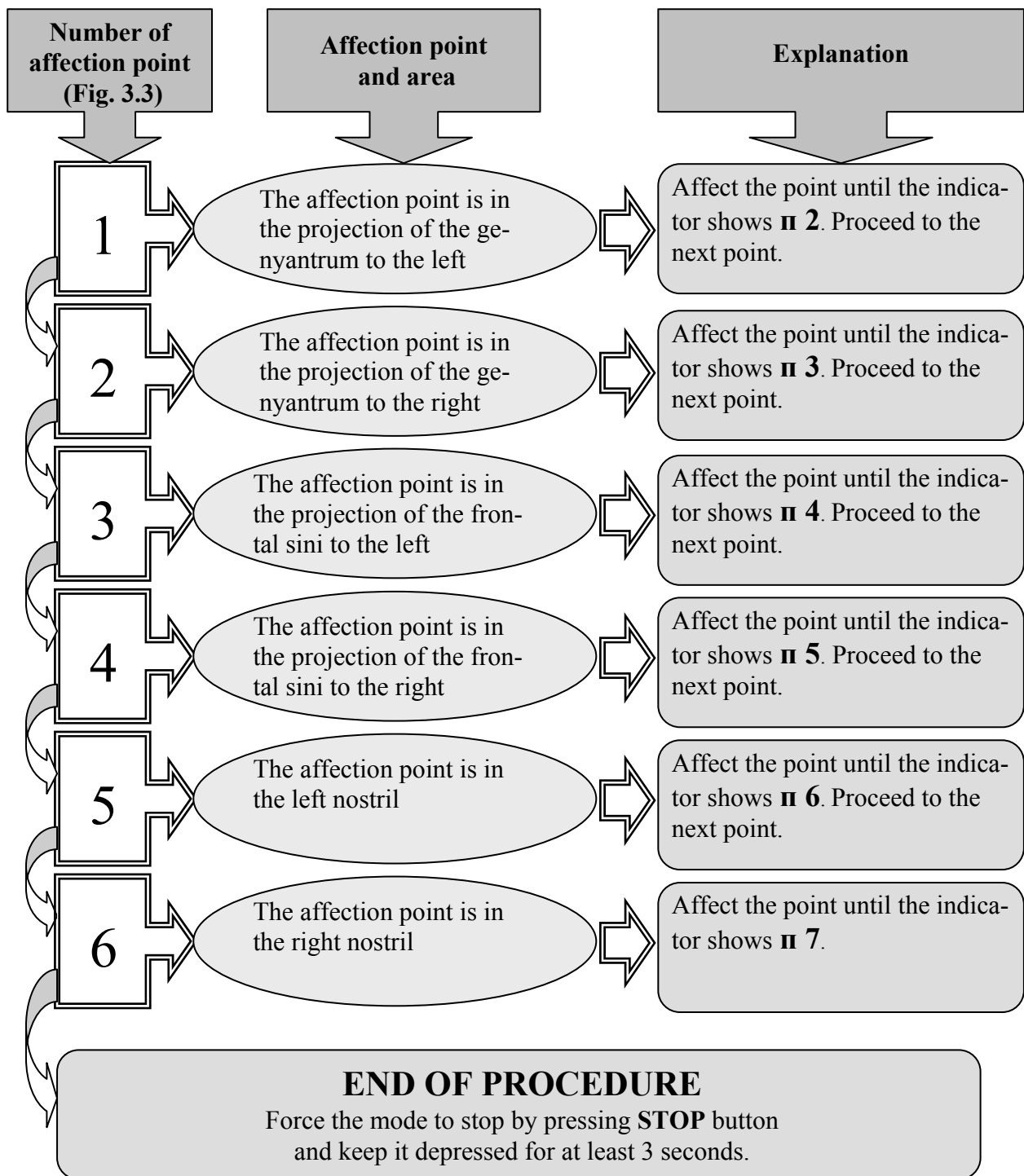
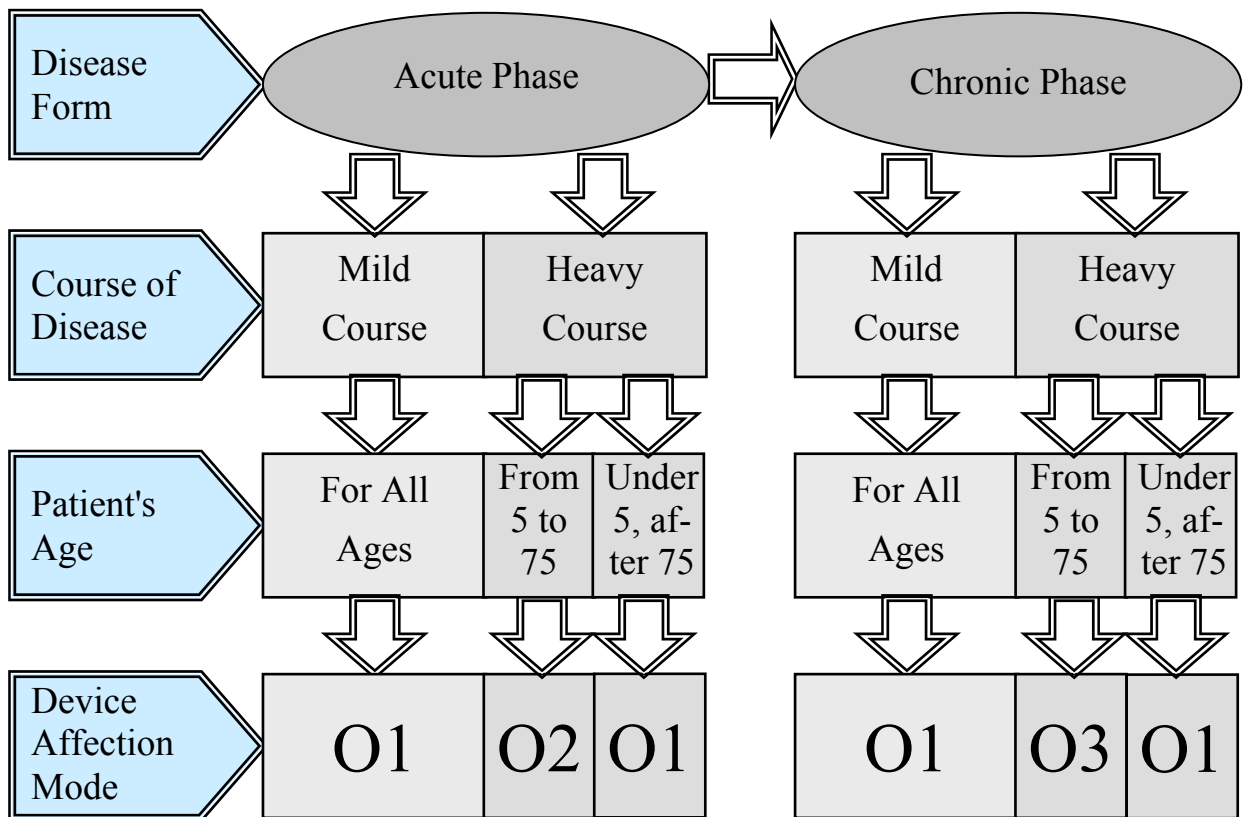


Figure 3.3



3.4 OTITIS



Affection points 3 and 4 are exposed by means of the light guide attachment, which carefully inserted into the auditory passage (**by medical personnel only**).

It is recommended to have daily treatment sessions in the morning and in the evening during 10-14 дней (Figure 3.4). Disinfect the attachment.

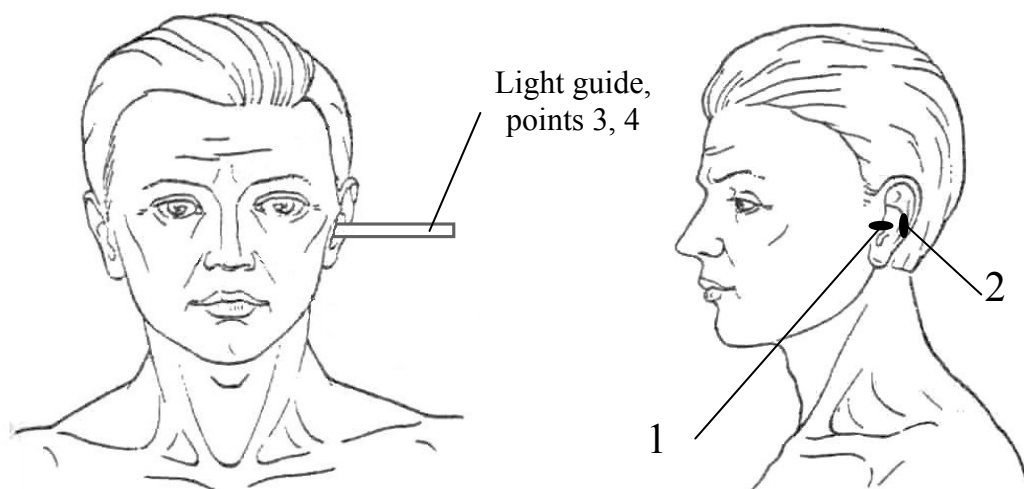
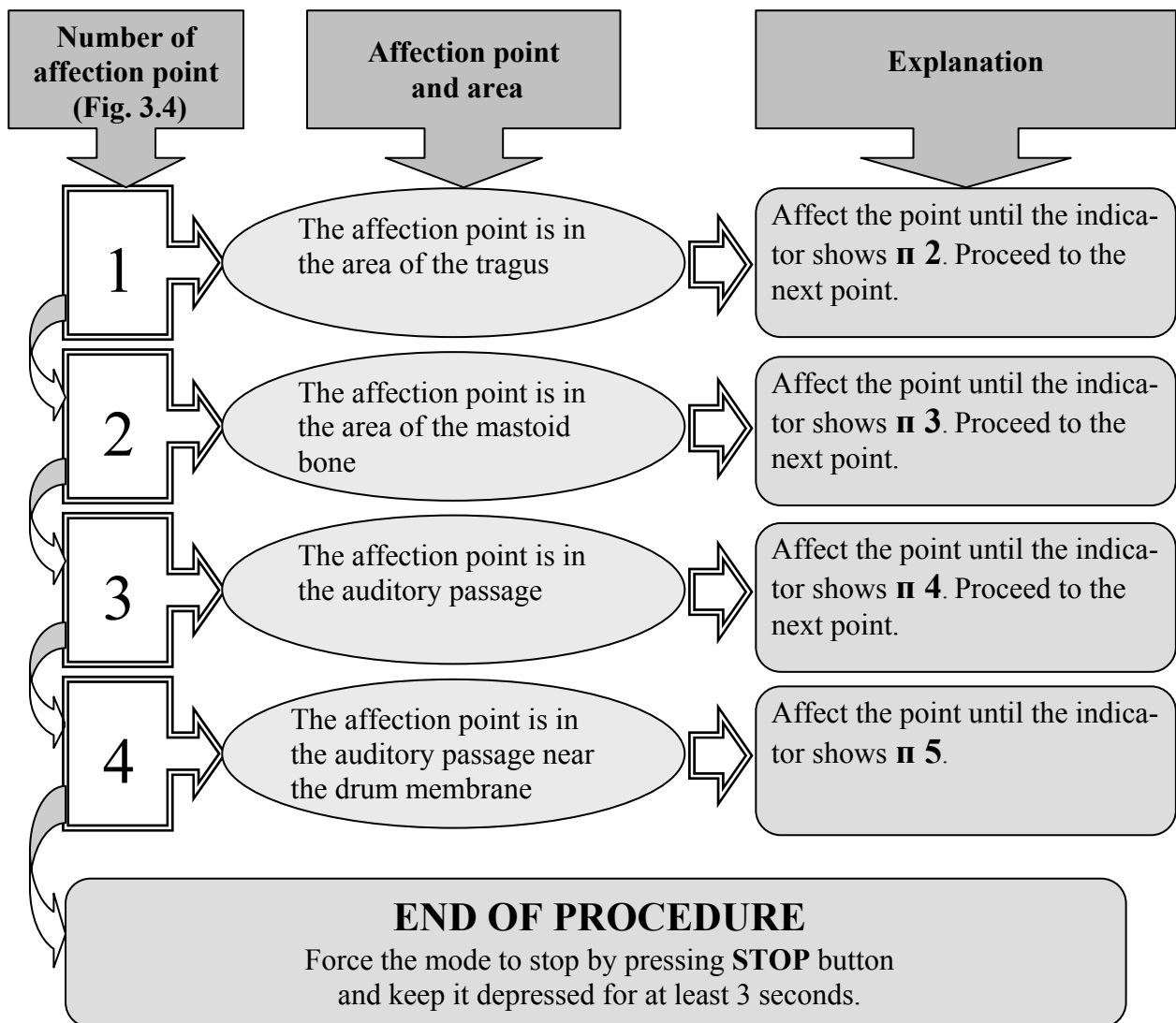
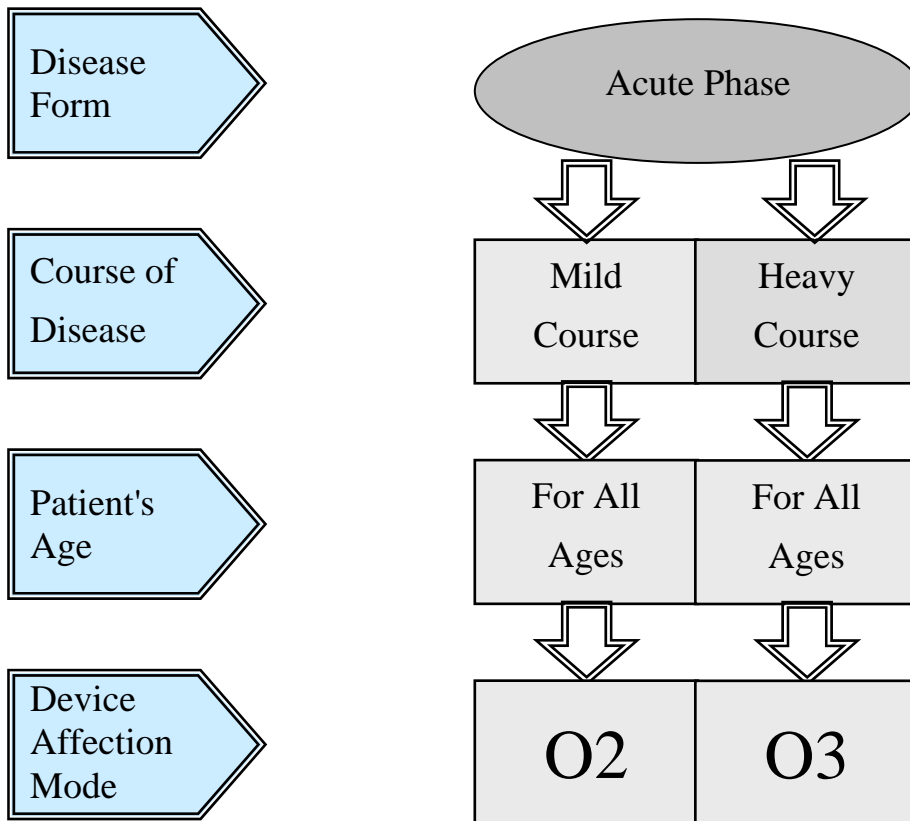


Figure 3.4



4 DENTISTRY

4.1 ACUTE ENDODONITIS



Irradiate point 1 by tightly pressing the Device flat to the skin.

Make irradiation of point 2 through the mouth to the inflamed sections with the help of the light guide attachment (**by medical personnel only**).

It is recommended to conduct daily courses in the morning and in the evening during 10 days, as shown in Fig. 4.1.

In case of a heavy course of the disease, apply laser treatment only after consulting the dentist.

After affecting the lesion foci, make a triple disinfection of the attachment.

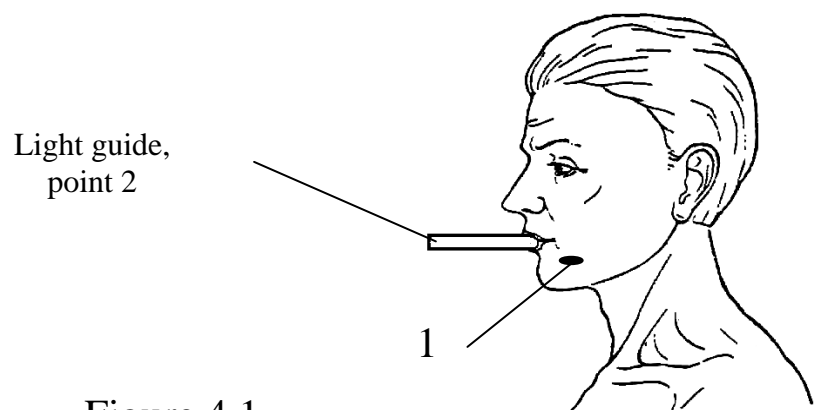
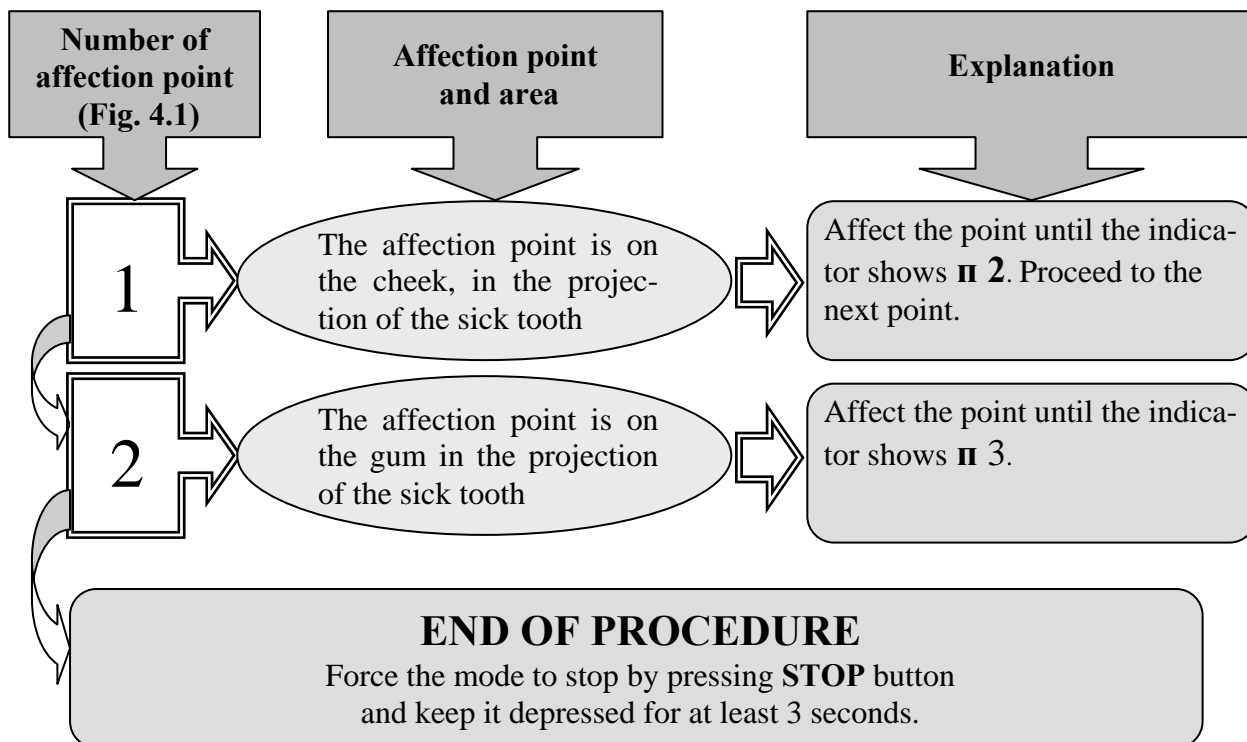
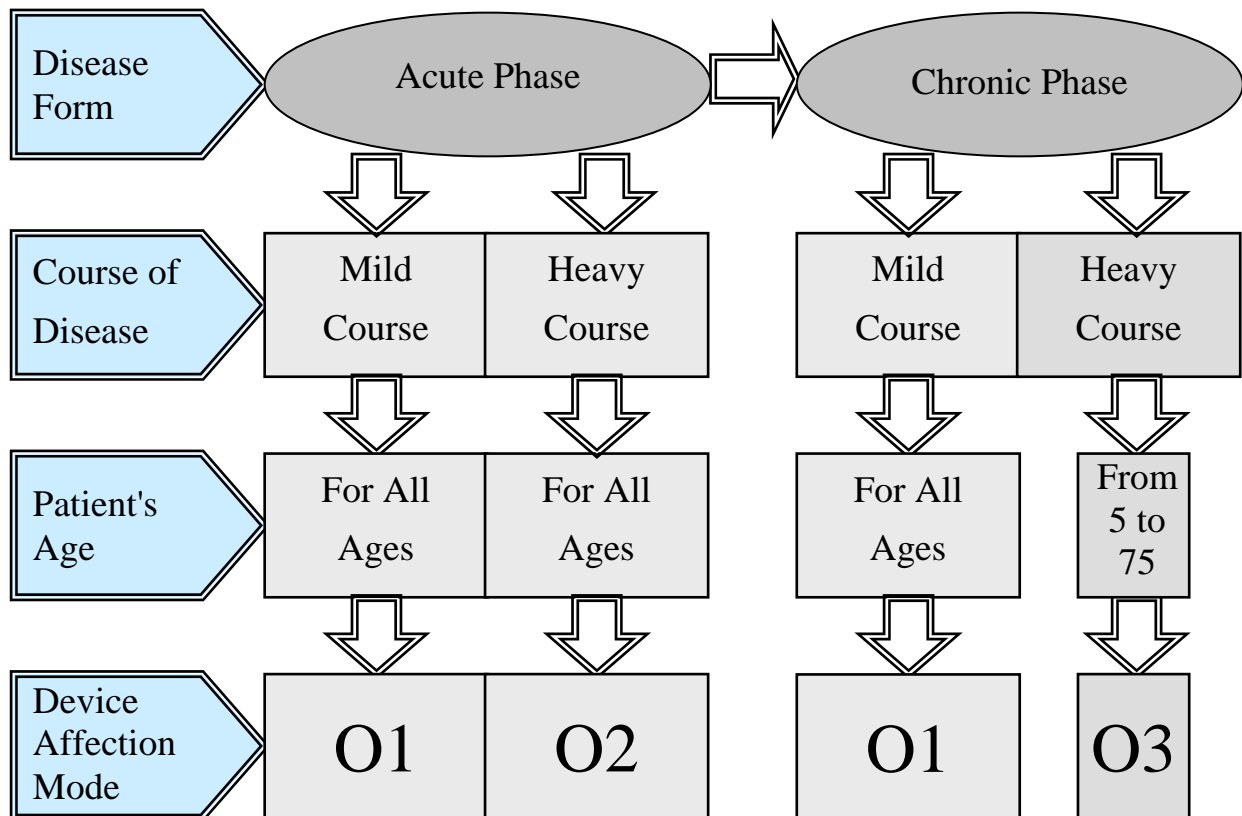


Figure 4.1



4.2 ALVEOLYSIS, GINGIVITIS

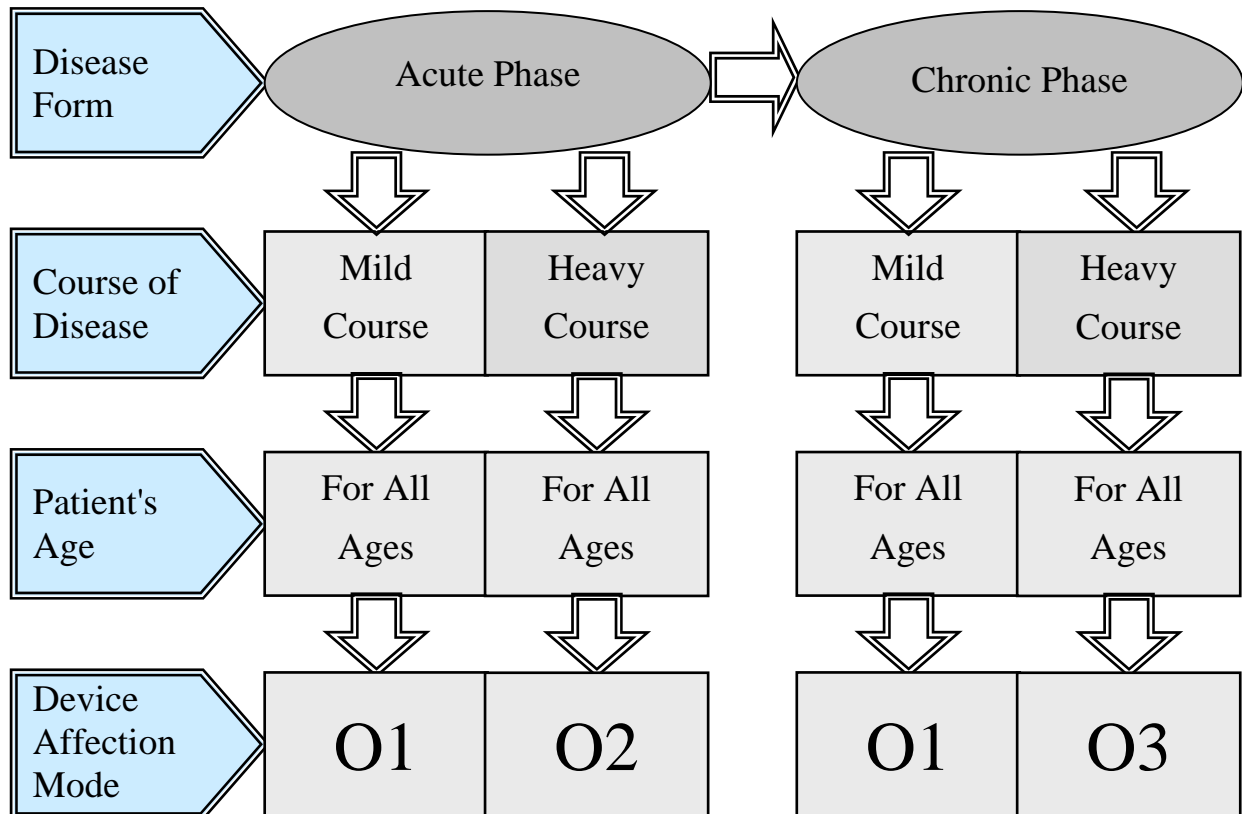


Make irradiation in the projection of the inflammatory tissue, having pressed the irradiator to the skin, or with the mouth open by using the light guide attachment (**by medical personnel only**).

It is recommended to conduct a daily course during 14 days, one session per day. The duration of one session should not exceed 30 minutes.

5 GYNECOLOGY

5.1 CERVICAL EROSION



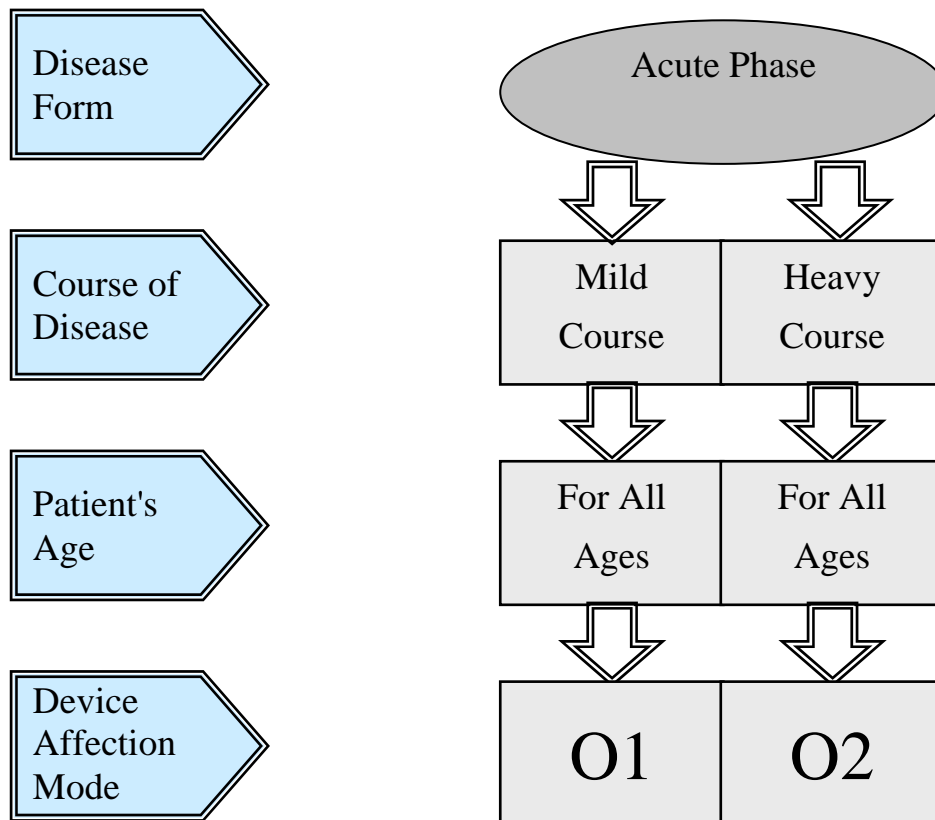
The radiation treatment of cervix is to be carried out with the help of light guide attachment **(by medical personnel only)**.

Put condom on light guide attachment before using.

It is recommended to conduct a daily course during 10 days.

After each treatment the condom should be put off and utilized, light guide attachment should be disinfected thrice.

5.2 DISRUPTION AND HYDROPS OF MAMILLA



It is recommended to conduct a daily course during 14 days, as it is shown in Figure 5.2. Should any purulence indications appear, stop the laser therapy till lancing of the abscess.

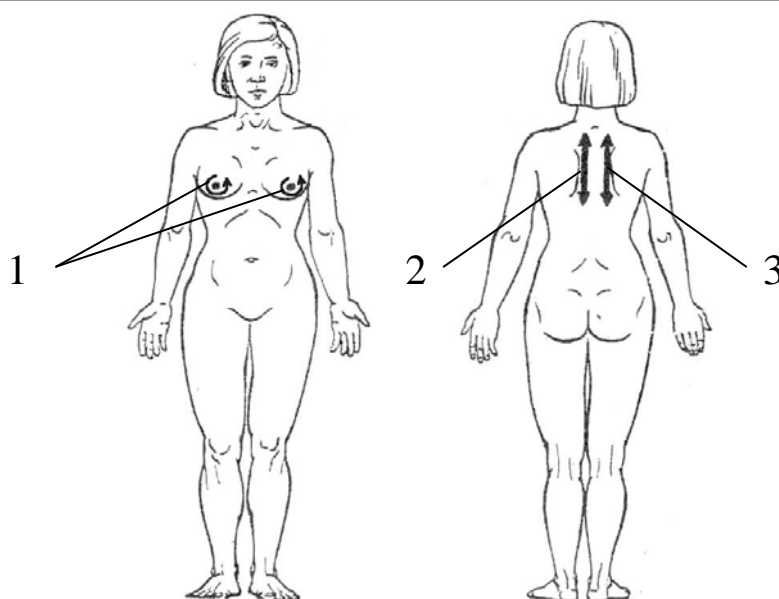
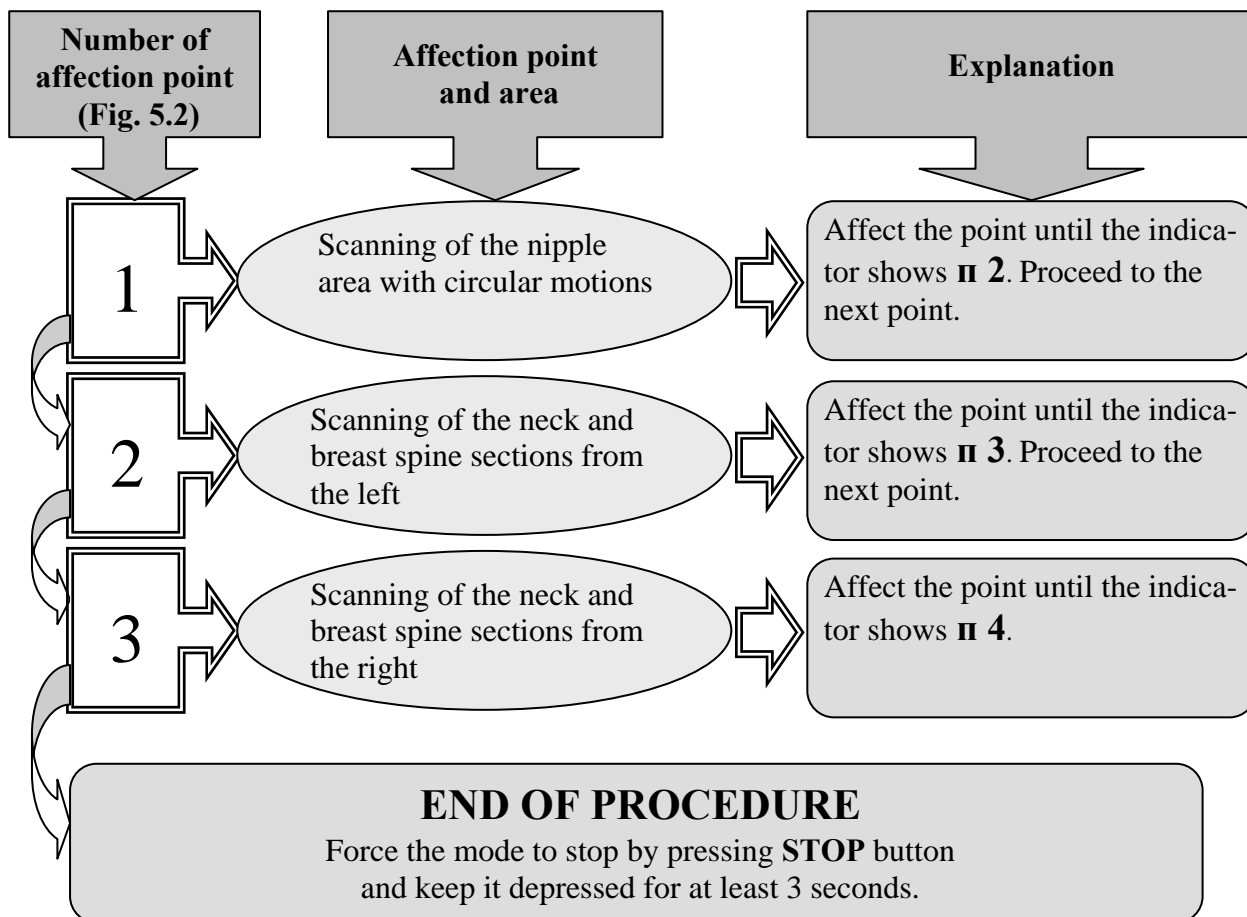
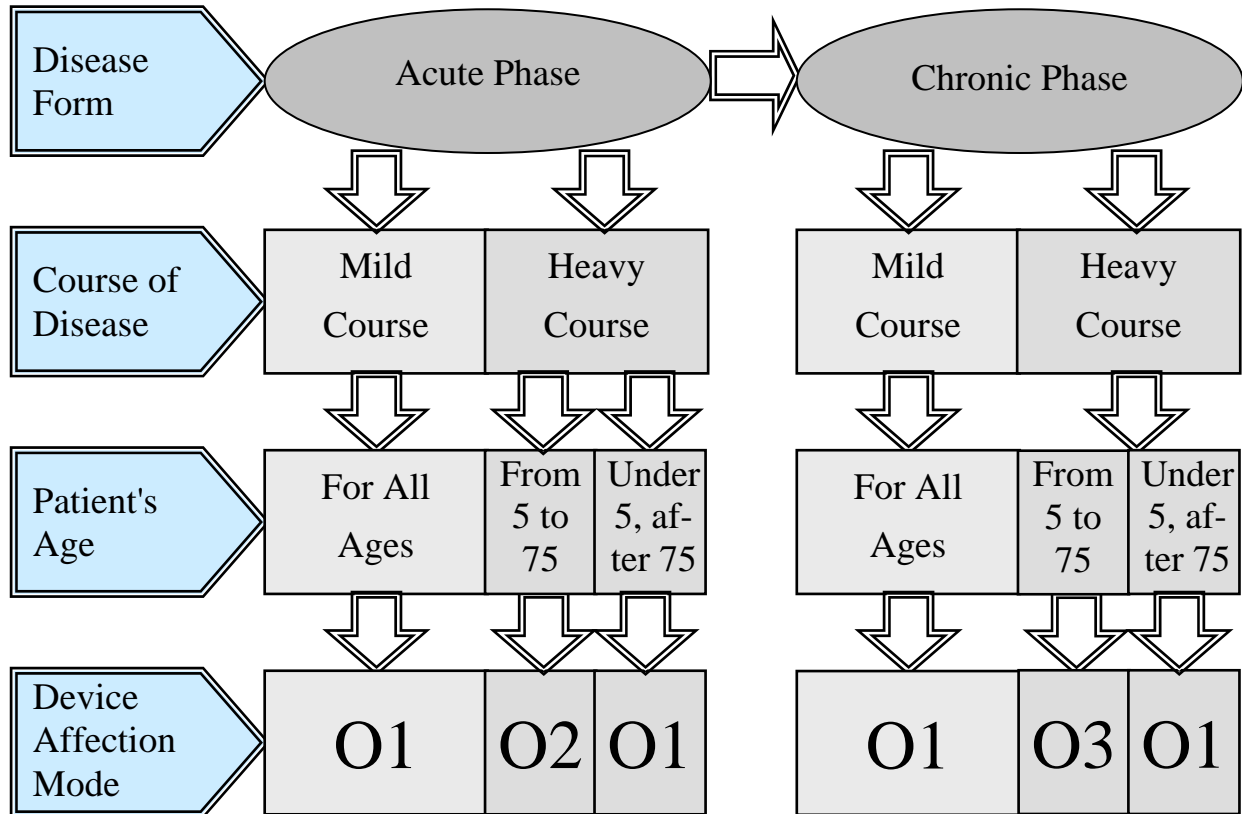


Figure 5.2



6 GENERAL MEDICINE

6.1 BRONCHITIS, PNEUMONIA



It is recommended to conduct a daily course during 14 days, as it is shown in Figure 6.1. During the course of treatment be sure to take antimicrobial, expectorant, antihistaminic and tonic medication.

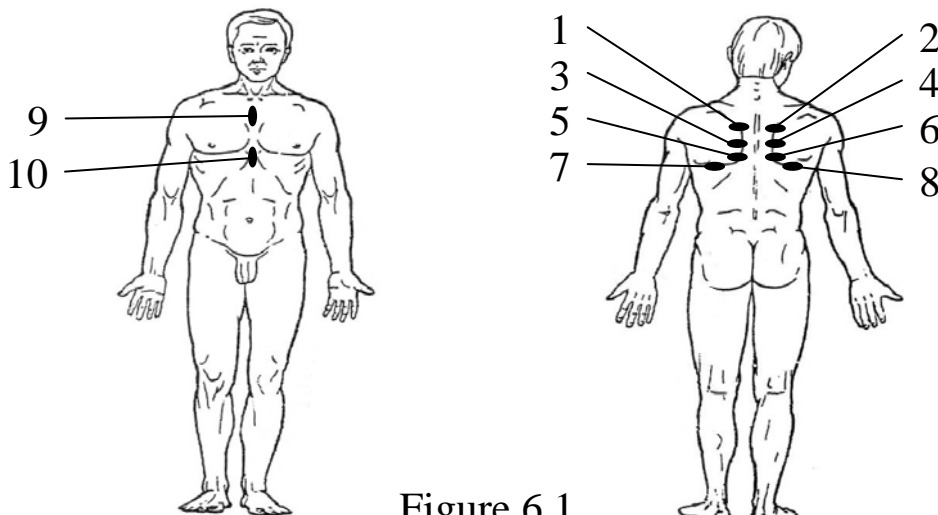
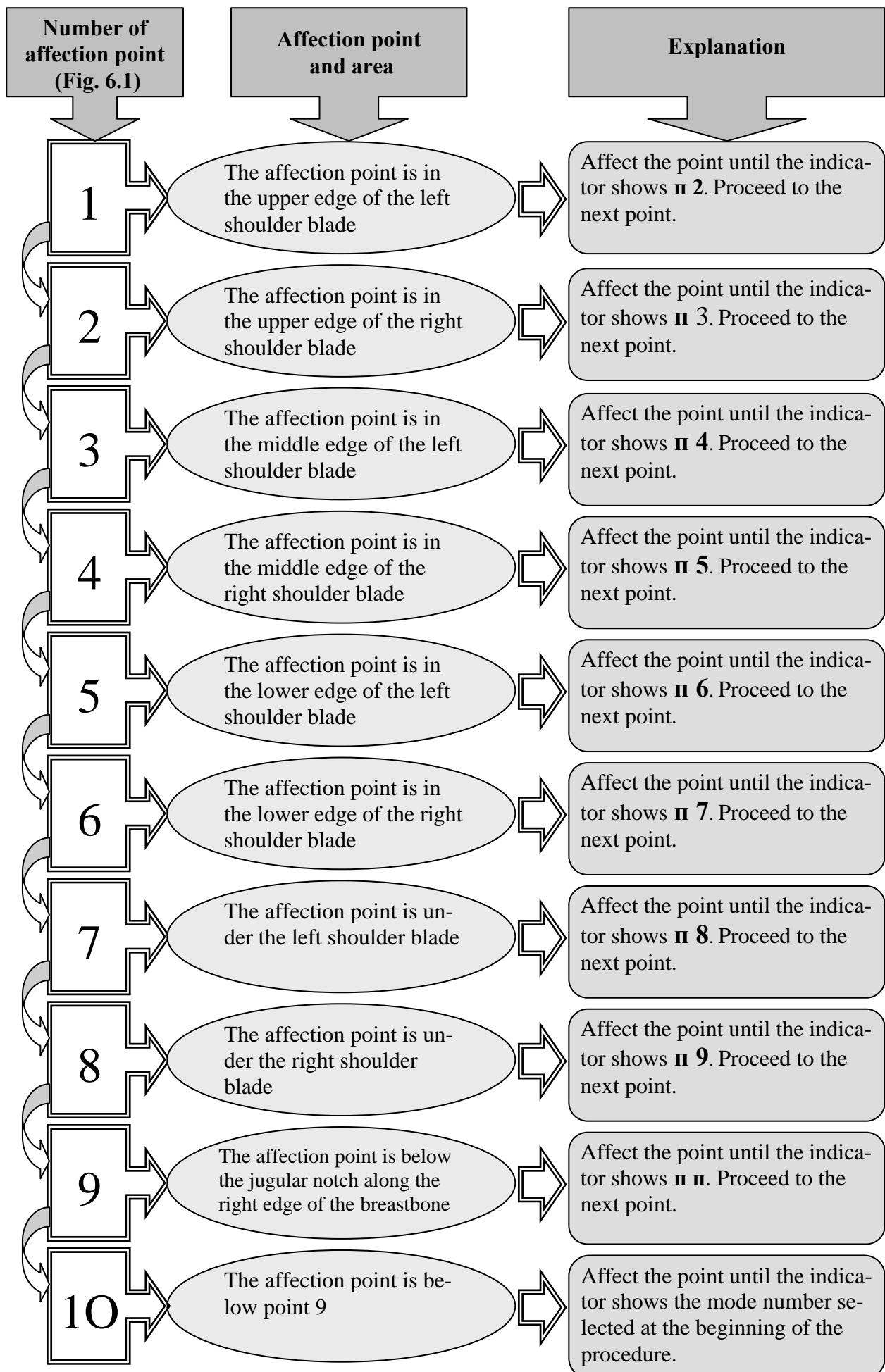
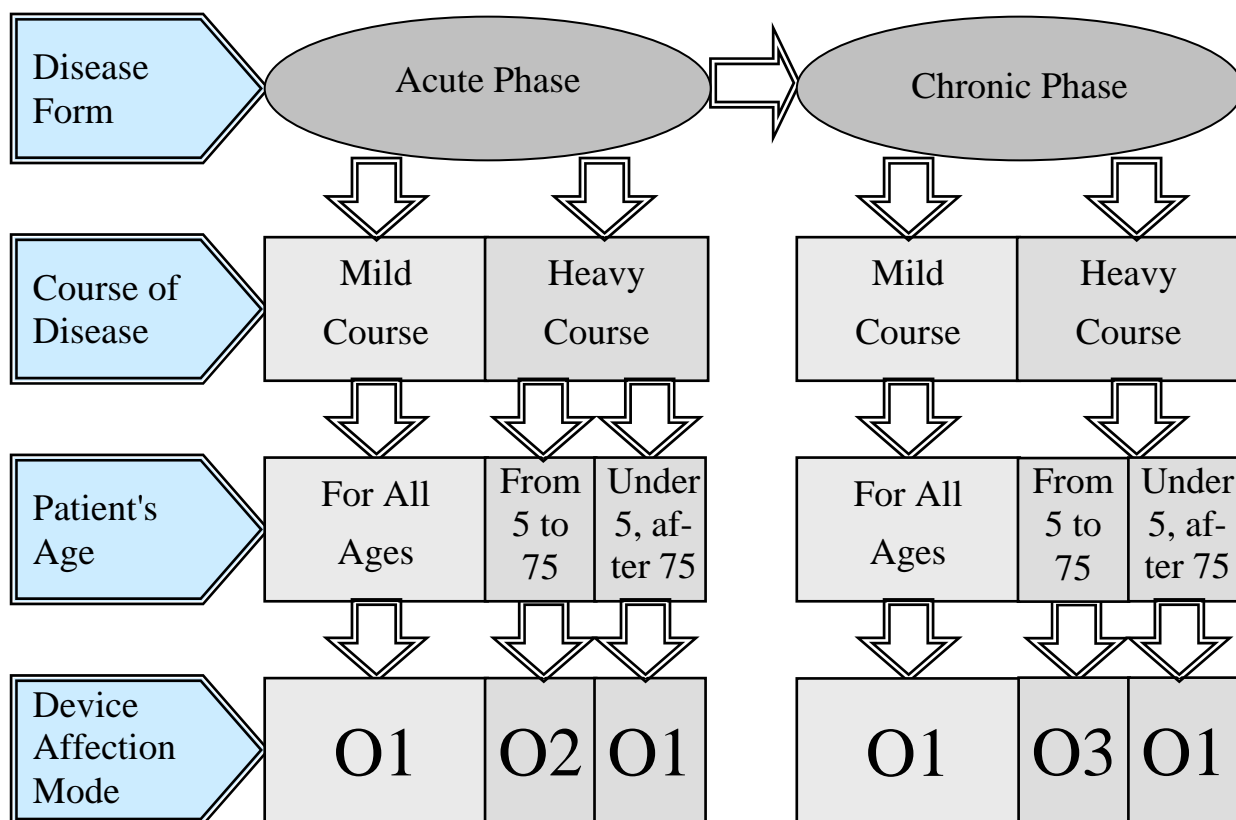


Figure 6.1



6.2 BRONCHIAL ALLERGY



It is recommended to conduct a daily course during 14 days as it is shown in Figure 6.2. Take 4 courses during the year.

During the course of treatment be sure to take antimicrobial, expectorant, antihistaminic and tonic medication.

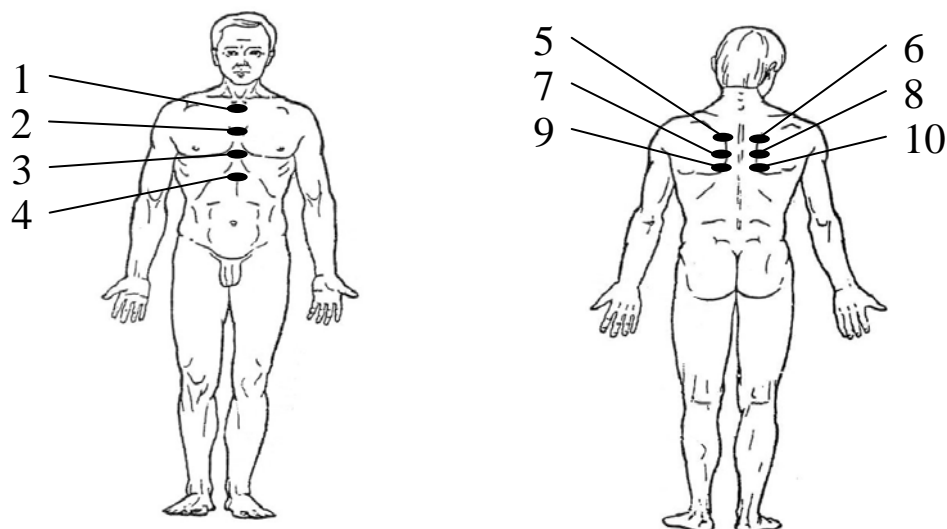
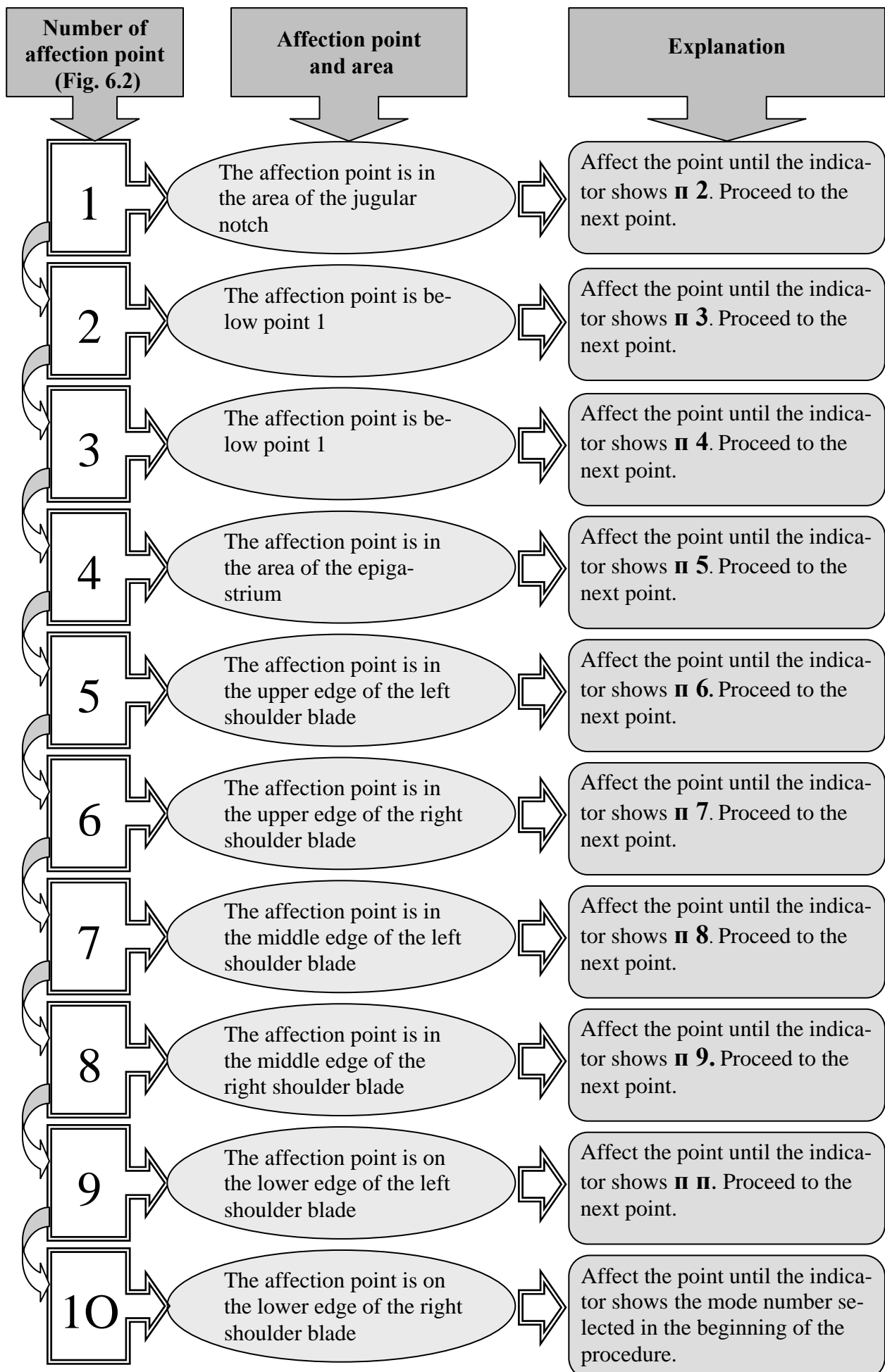
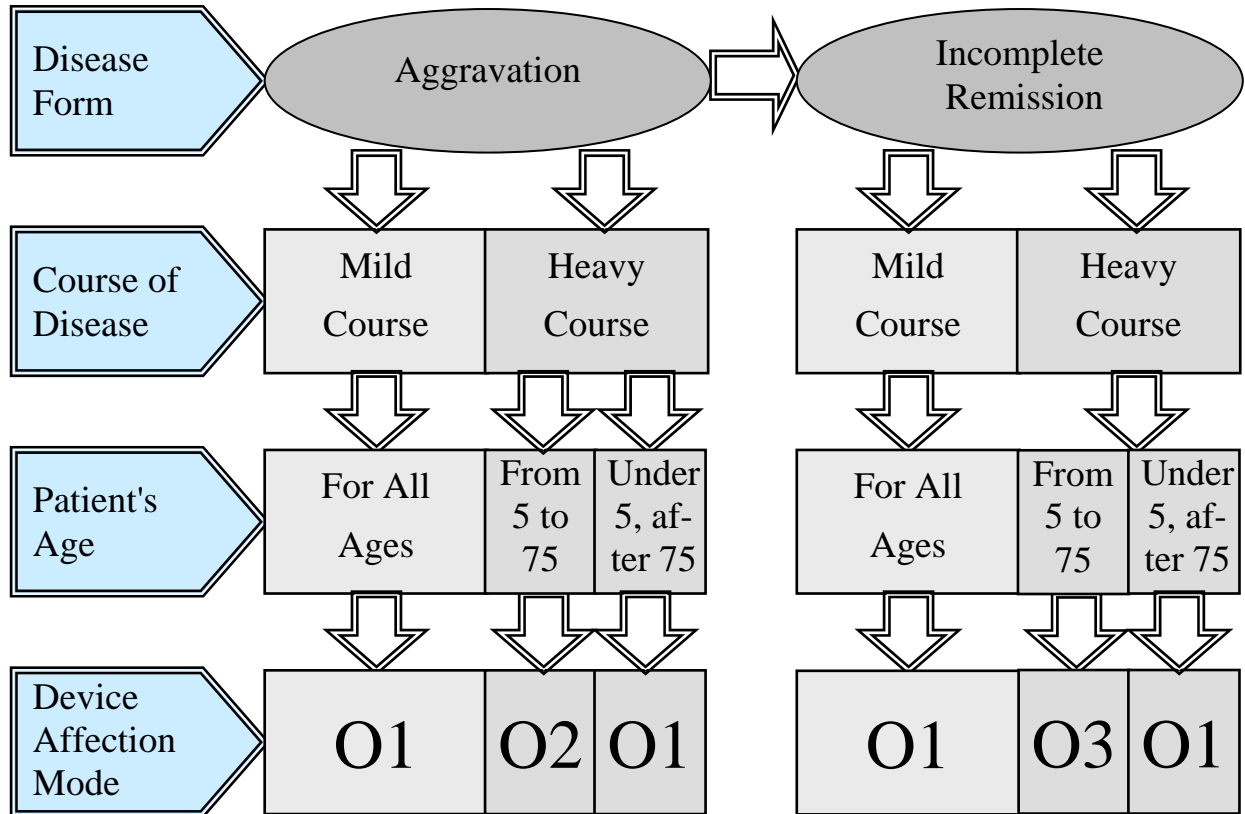


Figure 6.2



6.3 PEPTIC ULCER



It is recommended to conduct a daily course during 14 days, as it is shown in Figure 6.3. To avoid serious complications, make treatment of the acute phase of the peptic ulcer after making the esophagogastroduodenoscopy and therapist (gastroenterologist) consulting. Administration of antisecretory agents (Ranisan, Fomacid) is mandatory. In case the histology examination (mandatory at gastric ulcer) detects microbes-campilobacters, they should be eliminated by special medication. The sense of laser therapy is to radically decrease the chances of surgical complications of the peptic ulcer and of the number of acute conditions, and to achieve faster ulcer healing. The effect of external laser therapy may be essentially strengthened by two sessions of local ulcer irradiation through the endoscope in combination with other endoscope therapies (**by medical personnel only**).

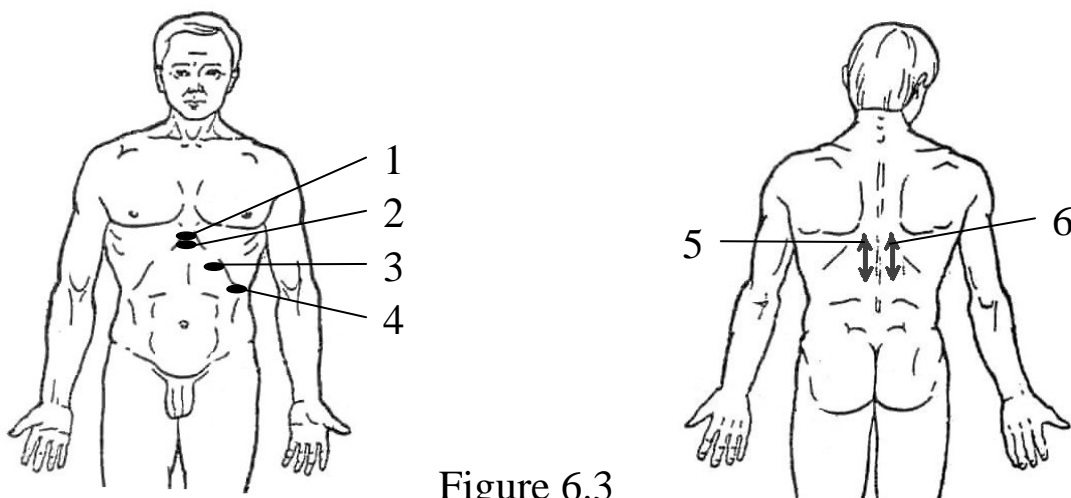
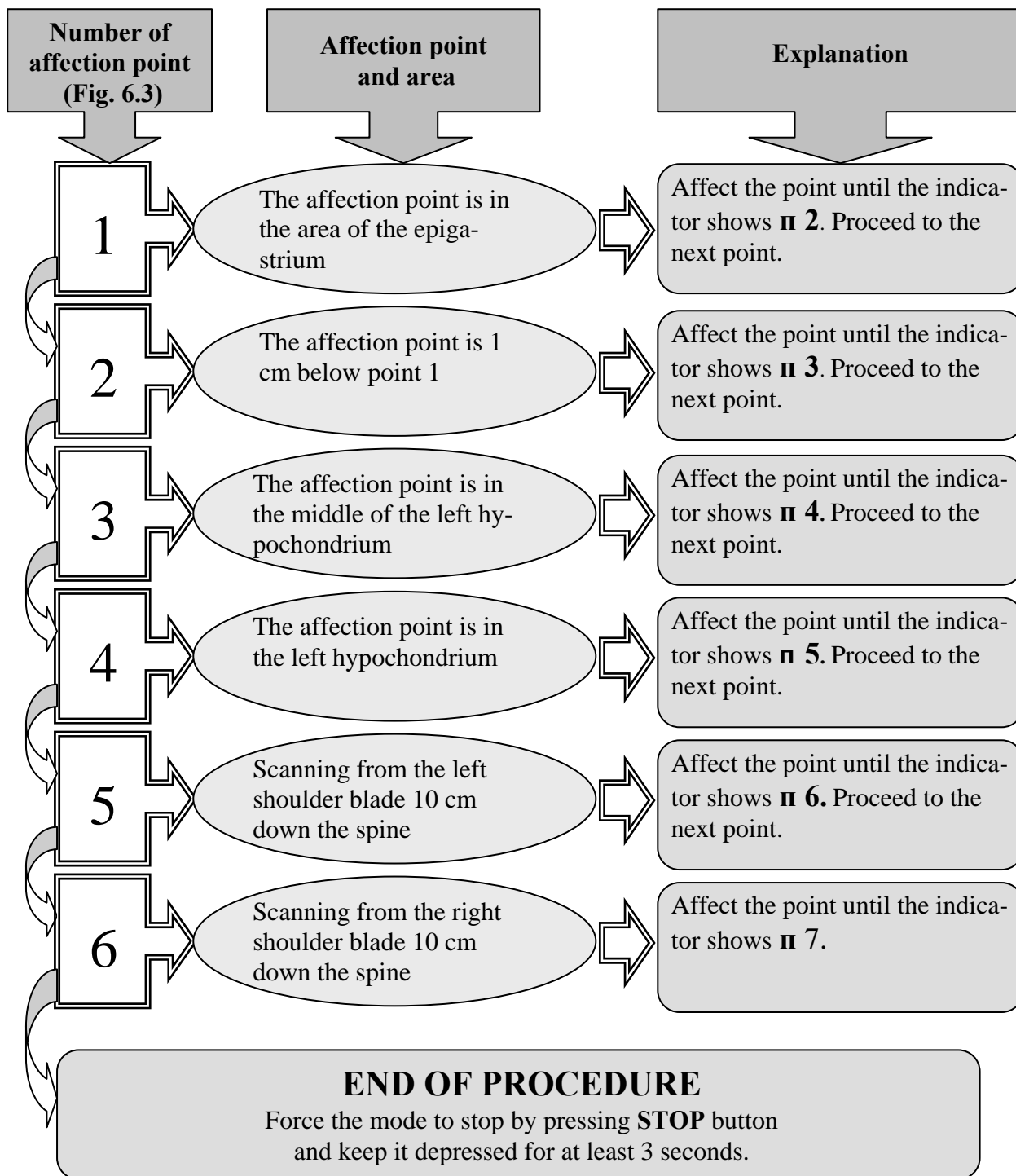
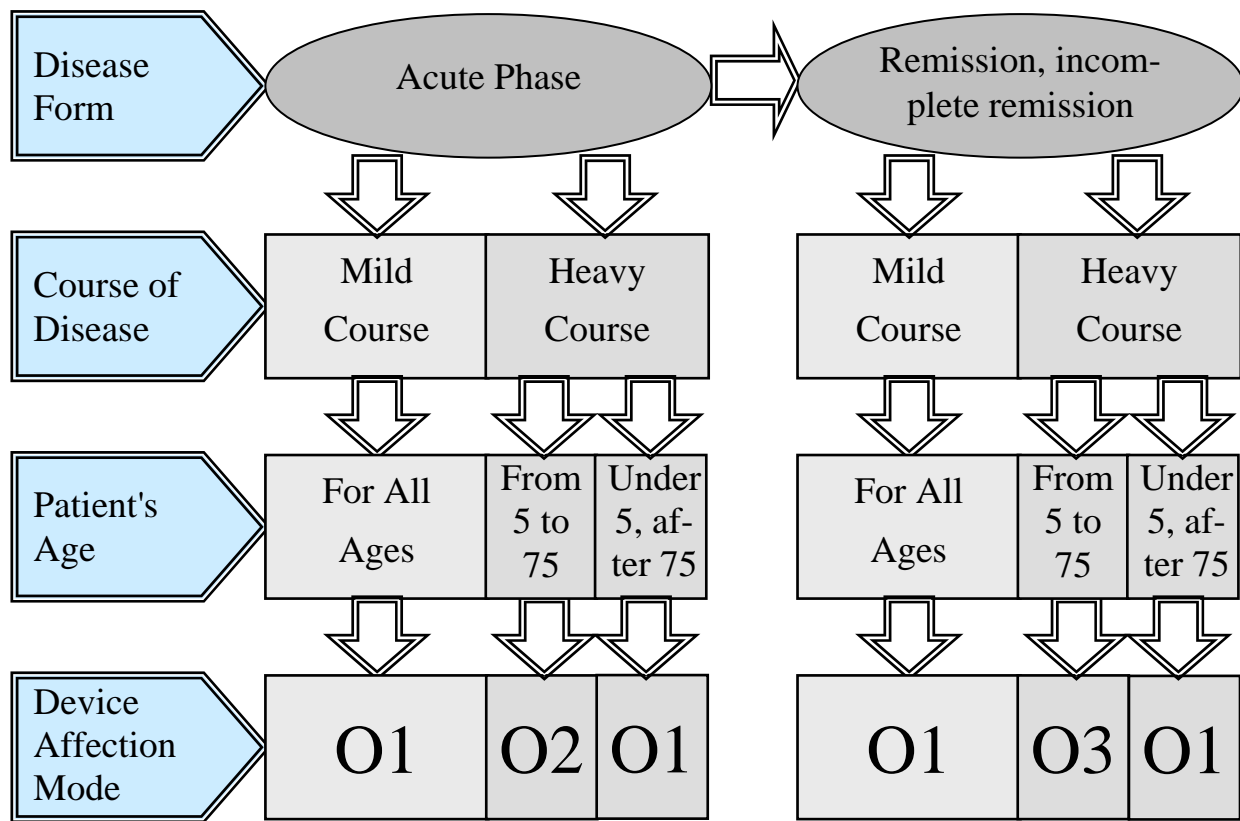


Figure 6.3



6.4 PEPTIC ULCER DISEASES



In is recommended to conduct daily courses in the morning and in the evening during 14 days, according to Fig. 6.4.

ATTENTION!!! To avoid heavy surgical complications, be sure to follow the rules given in point 6.3.

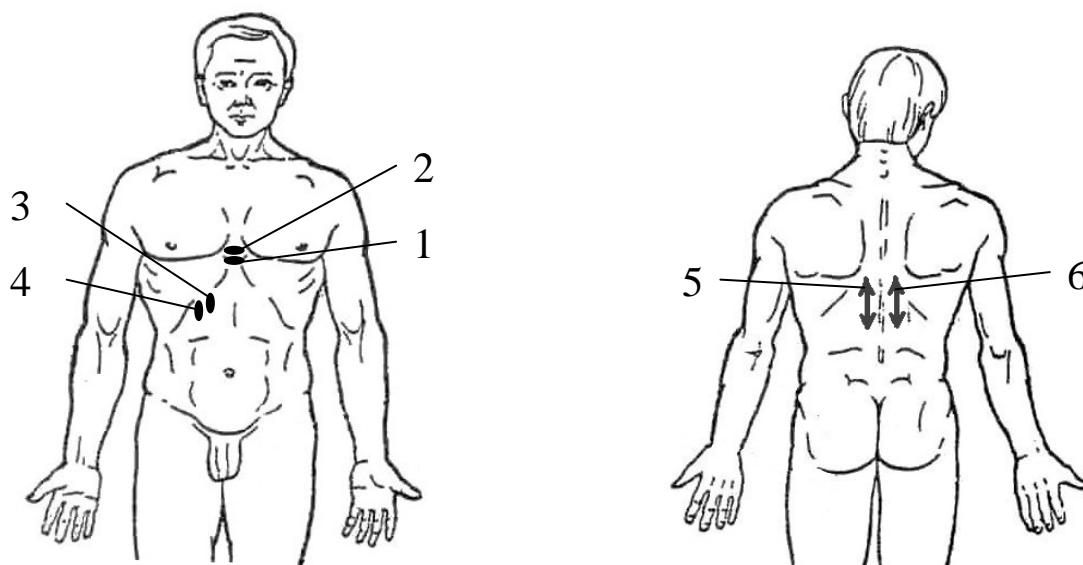
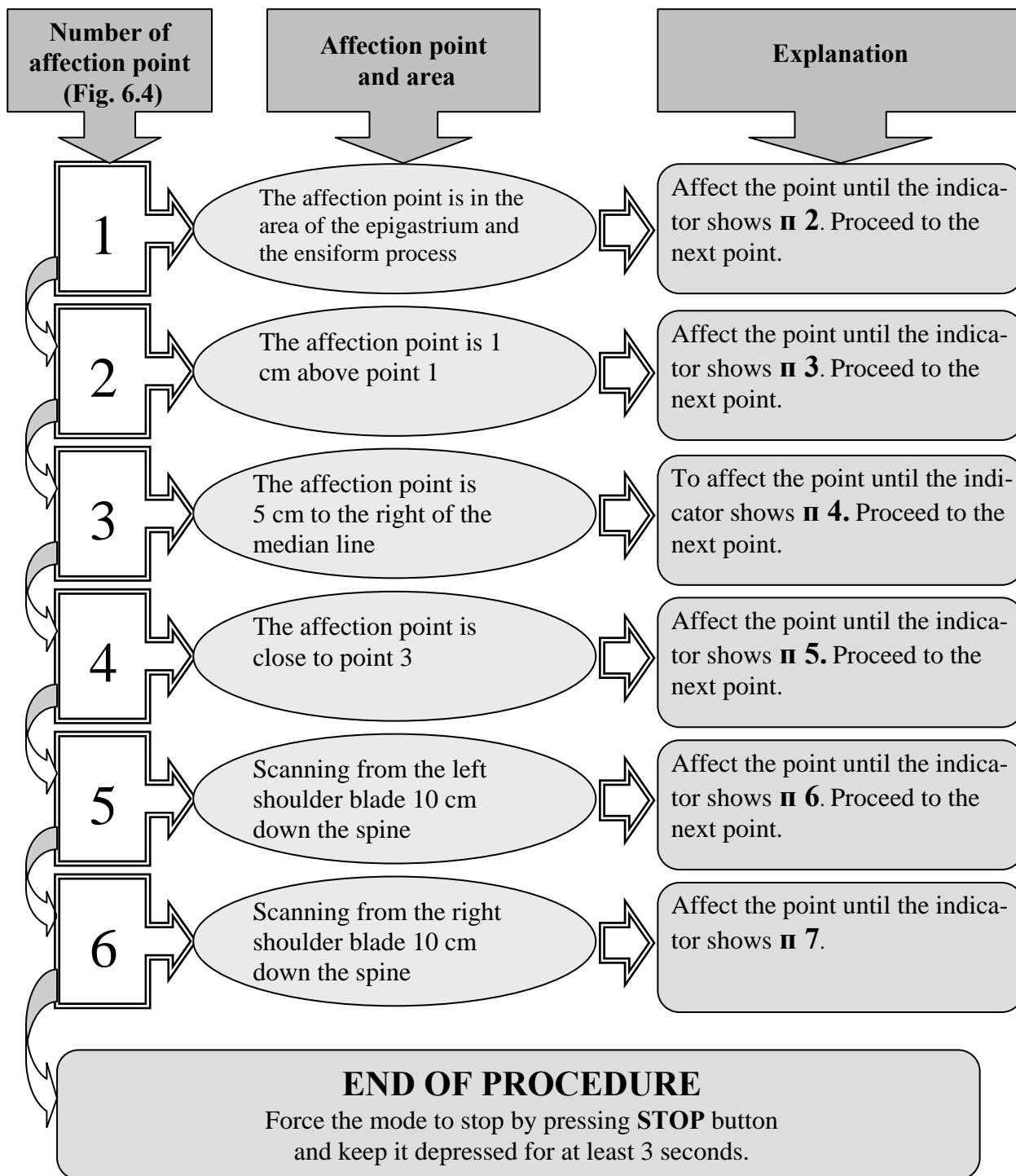
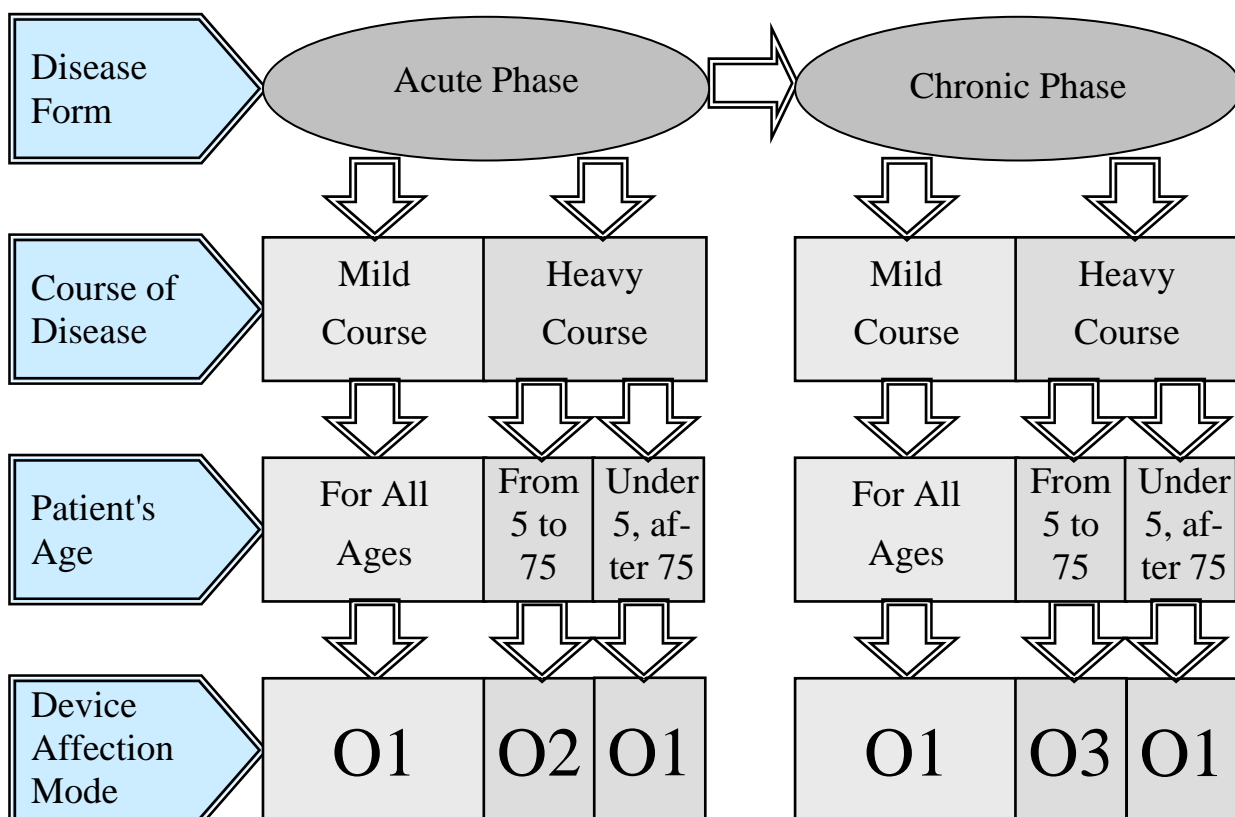


Figure 6.4



6.5 DYSKINESIA OF BILE PASSAGES, CHOLECYSTITIS



It is recommended to conduct a daily course in the morning and in the evening during 3 weeks, according to Fig. 6.5. Remember that treatment of the cholelithiasis and acute cholecystitis usually require surgical interference. Therefore, start your laser therapy after consulting the surgeon. Application of laser in such cases removes the inflammation, which is positive even if a surgery is required. Laser therapy is indicative at chronic non-calculous cholecystitis. It is conducted by repeated courses 2-4 times per year and helps to avoid surgery.

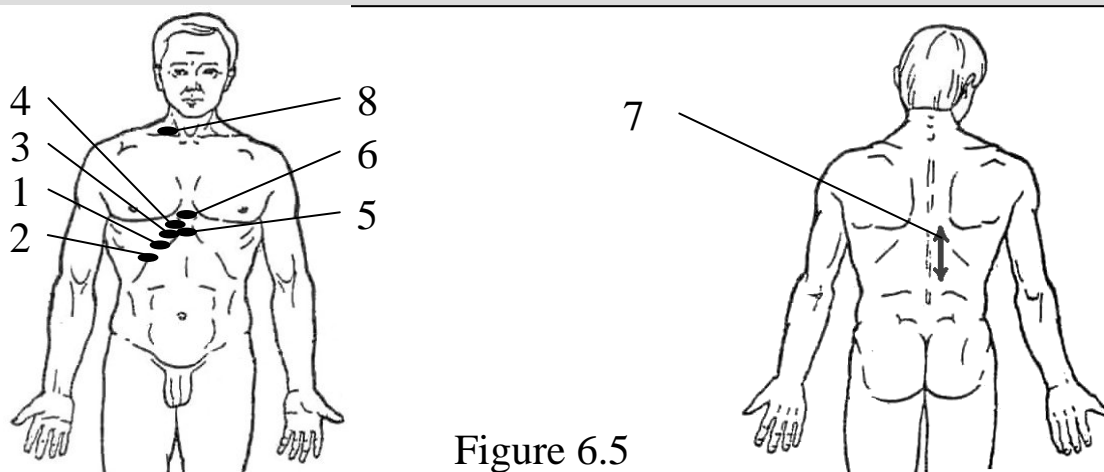
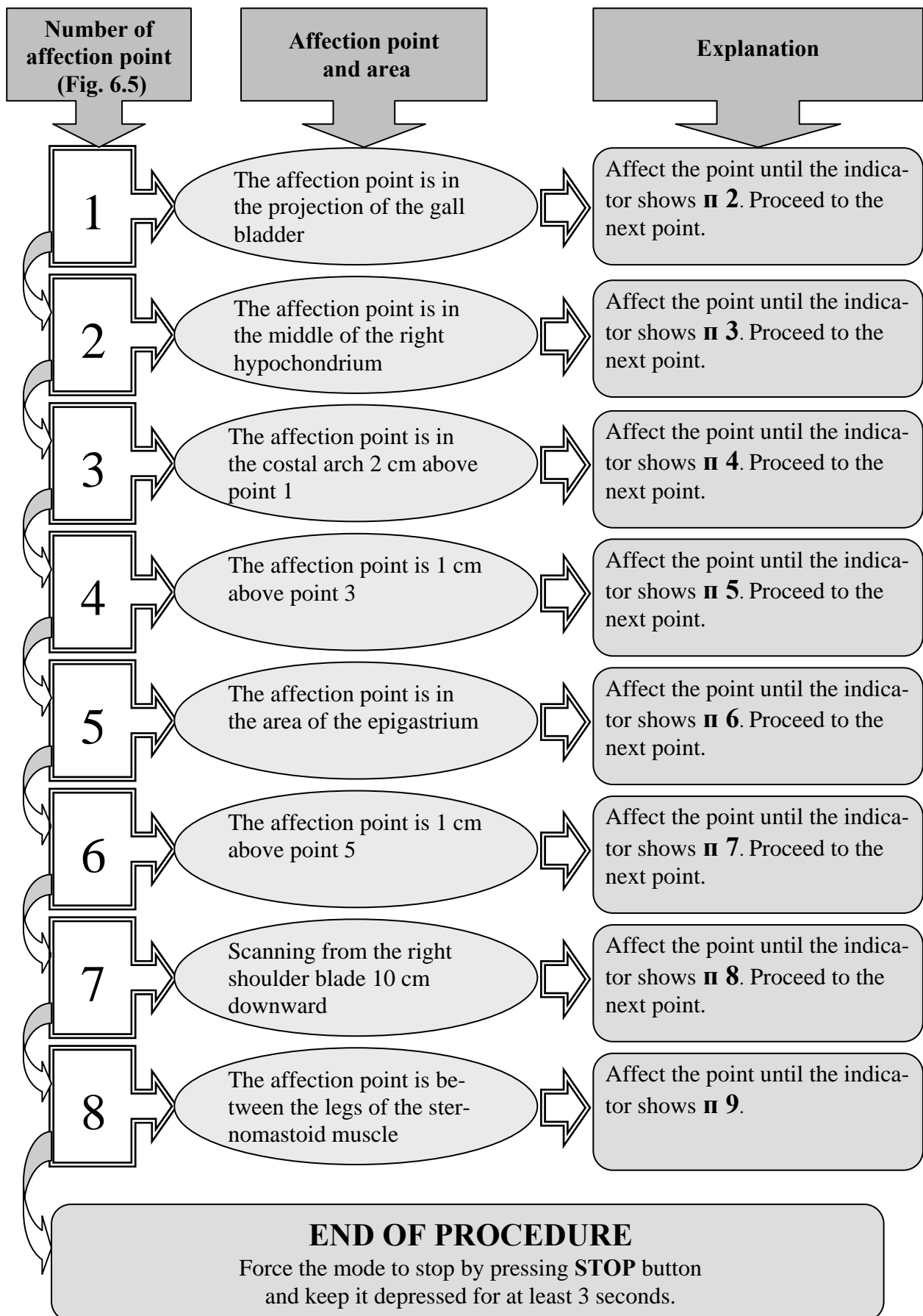
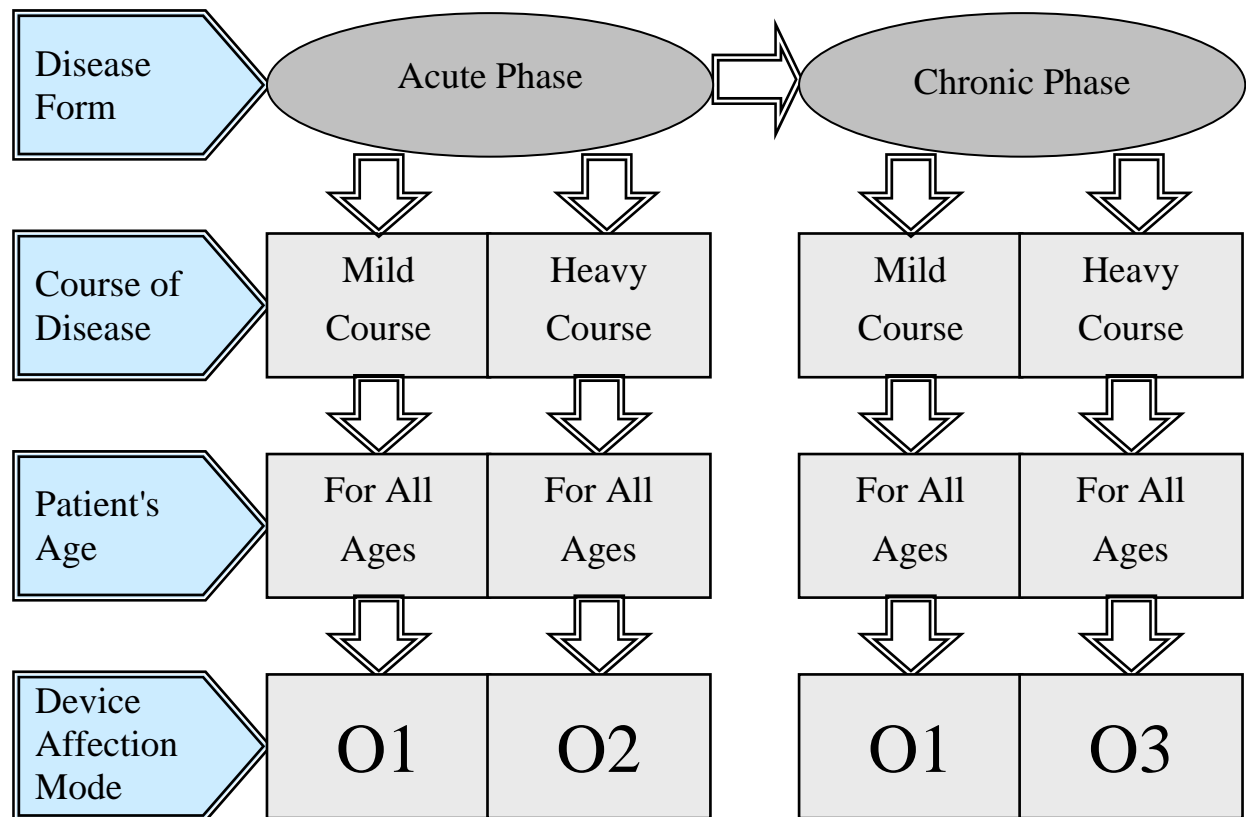


Figure 6.5



6.6 CHRONIC PANCREATITIS



The acute pancreatitis is a surgical disease. However, application of laser therapy, in parallel with the administration of the surgeon, may quickly stop the development of the disease. At frequent acute conditions of the pancreatitis, consult the surgeon and make the required analyses. The treatment course: at acute pancreatitis – 2 weeks, at the chronic one – one month, once per day (according to Fig. 6.6). Start the treatment immediately after the acute condition, without bringing the process to surgery.

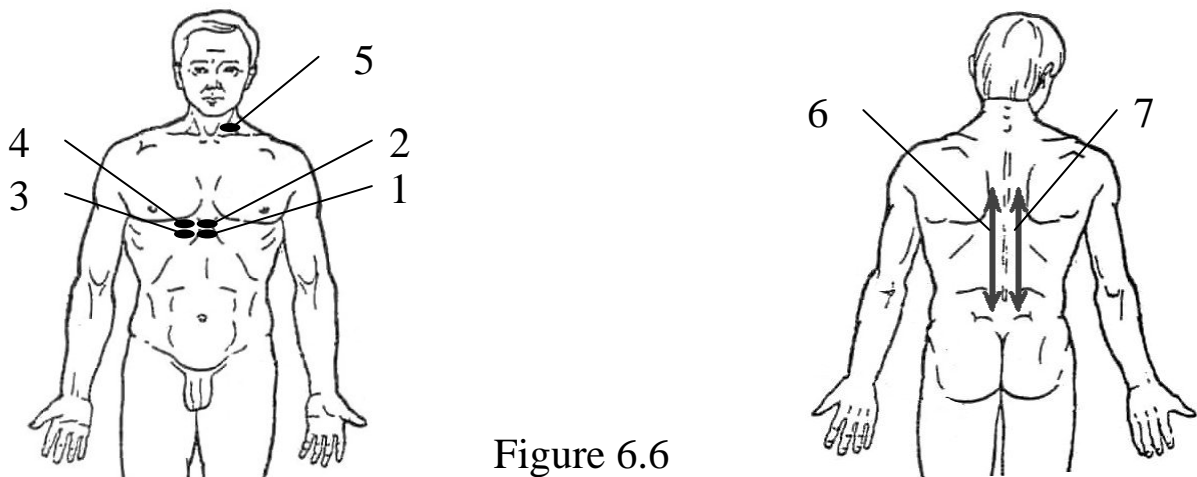
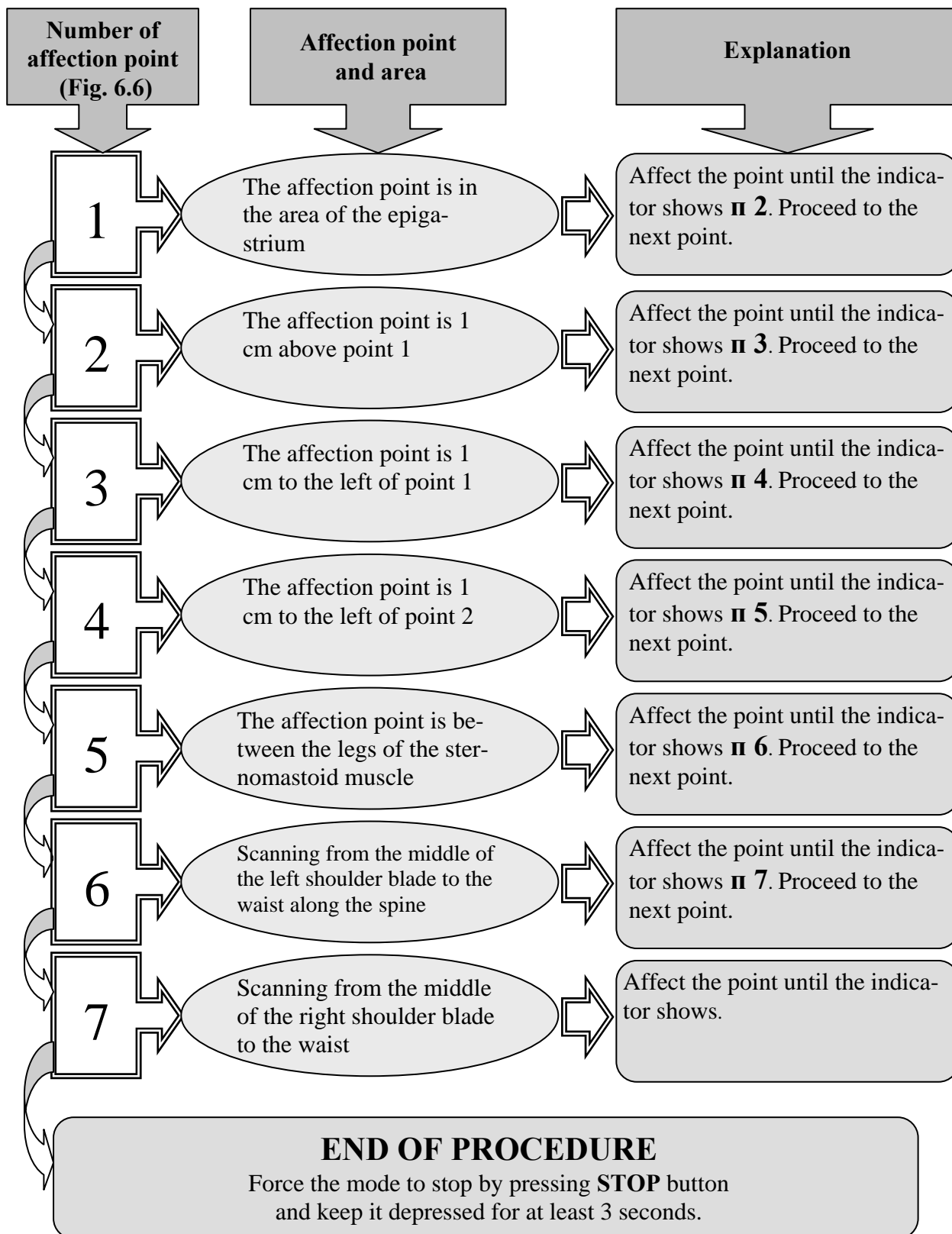
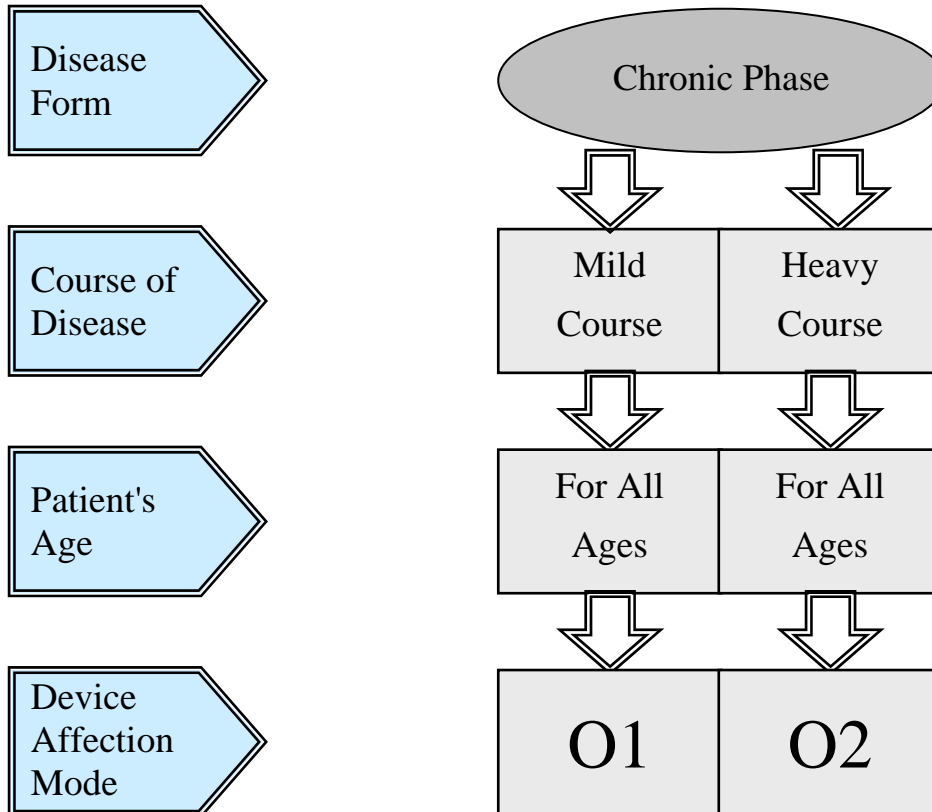


Figure 6.6



6.7 OBLITERATING ENDARTERITIS (ATHEROSCLEROSIS), PHLEBEURYSM



It is recommended to conduct a daily course during 3 weeks, as it is shown in Figure 6.7. Repeat the course 2 weeks later.

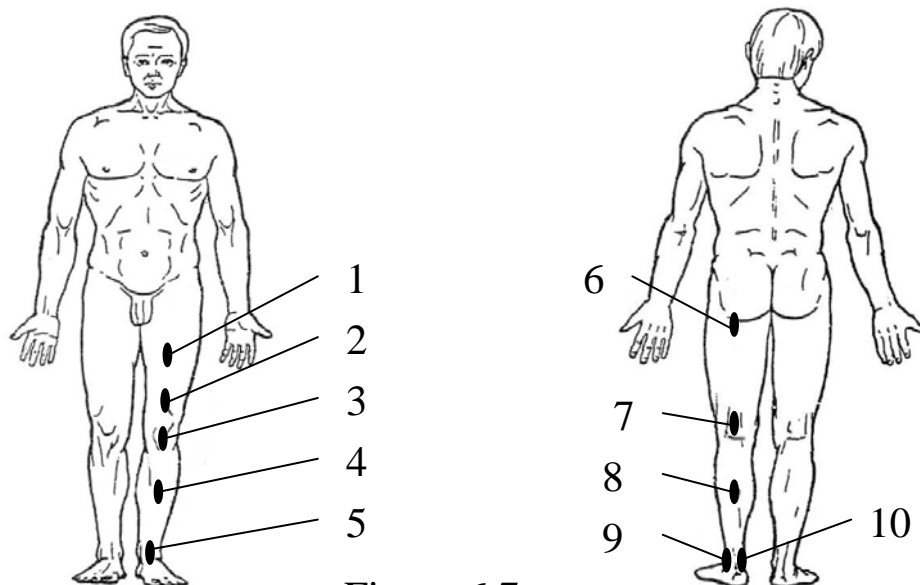
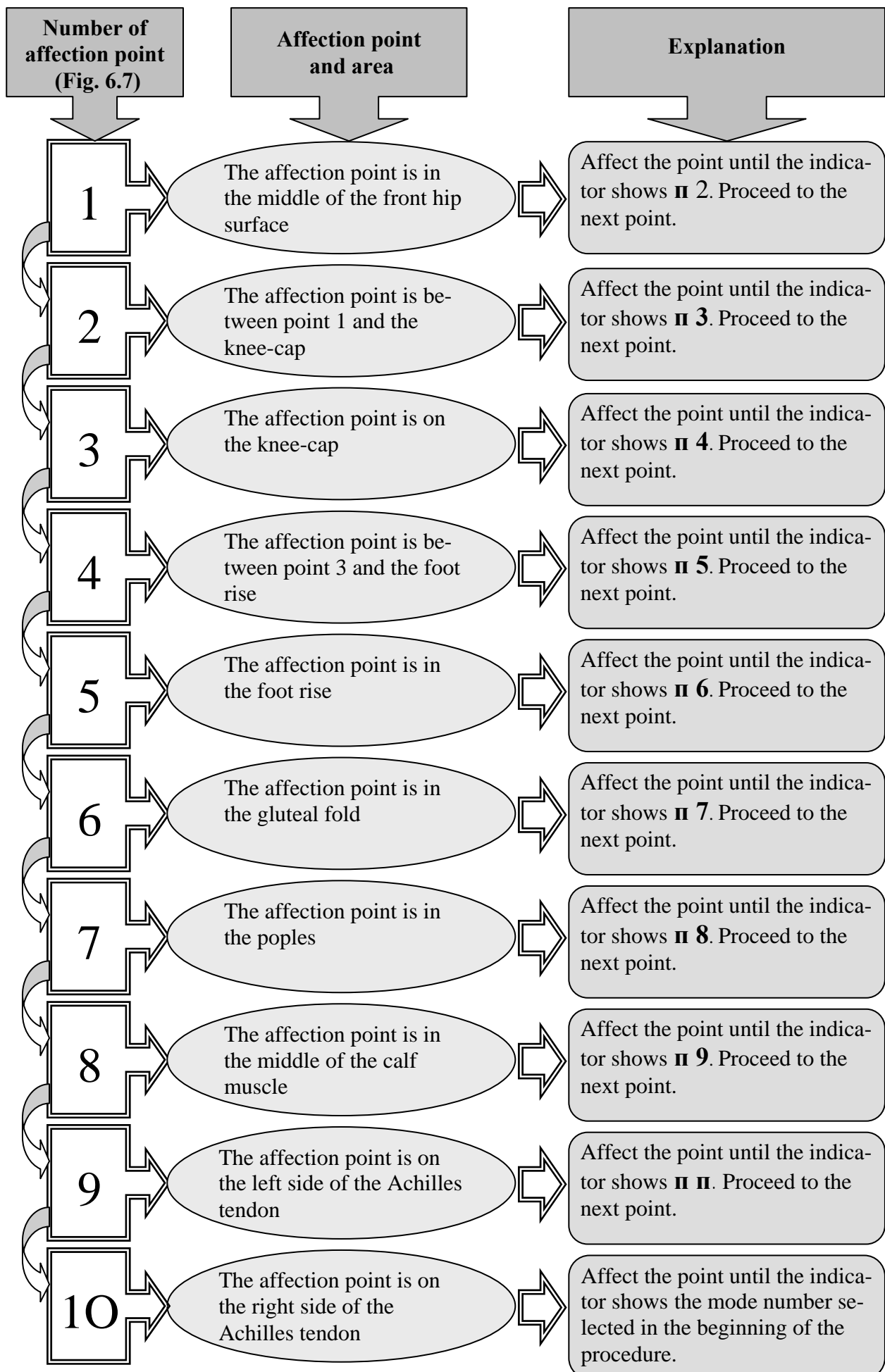


Figure 6.7



Basic Affection Principles of Laser Radiation and Magnetic Fields on Live Cell and Organism

Low-intensity laser radiation (power density from 1 to 100 mW/cm²) has now securely entered the inventory of the modern medicine as a very efficient asset to treat a broad range of diseases: old nonhealing wounds and skin ulcers; gastric and duodenal ulcers; diseases of oral cavity mucosa and paradontium; post-surgery wounds; injuries; rheumatoid arthritis; intervertebral and strain osteochondrosis; gynecopathies; dermatoses; acute and chronic diseases of ears, throat and nose; burns; prostatites; pancreatites, cholecystites and many other diseases.

Studies have shown that affection by low-intensity laser radiation provokes changes in the activity of major metabolism enzymes, cell membrane permeability, protein synthesis rates, DNA, RNA, cell fission, tissue regeneration, genetic system damage reparations, and activity of the immune system [1].

The researches [1], carried out on biological systems of various organization level (enzyme molecules in solution, human and animal cell cultures), have revealed that the biological activity (and hence, the therapeutic effect) are based on the changes of the spatial organization of cell components (with the liquid-crystal character of ordering), which is responsible for regulation of metabolic processes (of enzyme macromolecules, and membranes), caused by laser radiation.

The photo-physical mechanism of these changes [1] comprises reorientation of separate highly-ordered anisotropic sites (domains) of specified components of a live organism, as result of interaction of the light wave with an integrated electric dipole of the domain of the molecules and cells, which is induced by this wave.

The mechanism of such reorientation is rather deeply investigated in physics in the example of classical liquid crystals of nematic type, and is known as the light-induced analogue of the Frederix effect.

The Frederix effect consists in reorientation of a charge of molecules of liquid crystals in direct (constant) electric and magnetic fields.

An important peculiarity of the mechanism of the light-induced Frederix transition is its field (wave) character, that is, the reorientation of the domain charge of liquid crystals is made not due to absorption of light quanta, but as a result of interaction of the light wave with the integrated electric (magnetic) dipole, induced by this wave. Experiments show that while for small isolated molecules the orienting effect of weak light fields is negligibly small, for similarly oriented, densely packed molecules, which are able to reorient their electric field only simultaneously (by forming a domain), the aggregate electric torque will increase by several times, that is, for such domain, the ratio between the energy obtained in the field, and heat fluctuation will be several times higher than for an individual molecule.

It has been established that the value of photo-biological effect depends only on the dose. Therefore, the preset dose may be absorbed by a biological object both at high radiation power during a short interval, and at a lower power of radiation, but during a longer period. [1]

Apart from primary photo-physical processes, defining the biological and therapeutic effects of low-intensity laser radiation, which is based on the light-induced analogue of the Frederix effect, the change of cell functionalities is caused also by a permanent magnetic field. A weak magnetic field, like low-intensity laser radiation, is an efficient biostimulator.

The magnetic field is a special kind of matter, by means of which communication and interaction are effected between the mobile electric charges. Everywhere, where there is a moving stream of charged particles, we have a magnetic field. It can exist in any physical environment. The magnetic field itself affects only mobile charges. It is caused by the fact that only moving charges have their own magnetic field, and only through it the external magnetic fields can influence the particles. [2]

Therefore, the superposition of the magnetic field in addition to the laser radiation results in an essential increase of cell sensitivity to the light affection of laser radiation.

In the mechanism of initial action of magnetic fields, a great role is played by reorganization of liquid crystals, which make the basis of the cellular membrane and many endocellular structures. The observed orientation and deformation of liquid crystal structures (membrane and mitochondria, etc.) under the influence of the magnetic field are telling on their permeability, which is playing an important role in regulating the biochemical processes and performance by them of biological functions.

The biophysical and biochemical action of constant and variable magnetic fields on biological objects is charging the macromolecules (enzymes, nucleic acids, proteins, etc.) and changes their magnetic susceptibility. In this connection, the magnetic energy of macromolecules may exceed the energy of thermal motion, and therefore the magnetic fields in therapeutic doses cause orientation and concentration changes of biologically active macromolecules, which tells on the kinetics of biochemical reactions and the rates of biophysical processes [2].

The effect of magnetic fields on elementary currents in atoms and molecules of extra- and endocellular water results in changes of its quasi-crystalline structure. Water properties are changing: surface tension, viscosity, conductivity, dielectric permeability, etc., due to a certain spatial orientation of elementary currents in its atoms and molecules. It promotes the performance of the specific functions by the molecules of proteins, nucleic acids, polysaccharides and other macromolecules forming a uniform system with water, the transport and metabolism of which depend on the condition connected with water. Physiological and therapeutic actions of the magnetic field on the organism are based on the reaction of the organism and its systems on the influence of the magnetic field.

The organs and systems of the organism are differently reacting to the effect of the magnetic field. The selectivity of responses depends on the electric and

magnetic properties of the tissues, their distinctions in microcirculation, the intensity of metabolism, and the condition of neurohumoral circulation. By the degree of sensitivity of various systems of the organism to the magnetic field, the first place is taken by the nervous system, and then goes the endocrine system, followed by the sense organs, the cardiovascular system, blood, muscular, digestive, secretory, and respiratory and bone systems. [2]

Thus, the therapeutic effect of laser affection on the tissues of a live organism is considerably amplified in the magnetic field due to metabolism acceleration. The result of the influence of laser radiation in combination with the magnetic field on biological objects is more than a simple sum of these two factors, and is characterized by the synergetic-resonant action. [3]

The publication **of the Methodical Guidelines on Application of the "Vityas" Quantum Therapy Device** (under the general editing by Professor Ulashchik, V. S., Chief Specialist on Physiotherapy of the Ministry of Public Health of Belarus) is intended for beginning users, laser-therapists and skilled doctors of other medical specialities. It does not cover the completeness of diseases, which can be treated by the method of laser therapy. Improvement of professional skills of physicians may be achieved by training at corresponding courses and by studying the special literature.

The treatment methodologies have been designed by Dr. Ozeran, V. A., a surgeon and Candidate of Medical Sciences, on the basis of his personal experience, the experience of other doctors at treatment of various diseases, and on the extensive materials in the area of quantum medicine.

The Device has successfully passed clinical tests at the Scientific-Research Institute of Traumatology and Orthopedics, the Dermatovenerologic Dispensary of Minsk, the Division of Physiotherapy of the Belarusian Medical Academy of Post-Diploma Training of the Ministry of Public Health of Belarus.

LITERATURE

1. Edited by Doctor of Medical Sciences Lyandres, I. G. "Biostimulation Mechanisms of Low-Intensity Laser Radiation". Minsk. 1998.
2. "New Generation Devices for Local Magnetic Therapy and Heat Treatment". Collection of Methodical Manuals for Medical Students and Physicians in the System of Additional Training. Moscow. 2001.
3. Edited by Professor Skobelkin, O. K. "Application of Gallium Arsenide Magnetic-Laser Therapeutic Device in Medicine". Methodology Guidelines. Moscow. 1991.

BRIEF VOCABULARY OF PHYSICAL TERMS

Laser is a generator of coherent electromagnetic radiation in the optical range, based on use of induced transitions.

Power of laser radiation (P) is the energy, transferred by laser radiation in a unit of time.

The unit of measure is watt ($1 \text{ W} = 1 \text{ J/s}$, milliwatt ($1 \text{ W} = 1000 \text{ mW}$)).

Power density of laser radiation represents the power of laser radiation falling on an area unit of the receiver.

The unit of measure is W/m^2 , mW/cm^2 ($1 \text{ W/m}^2 = 0.1 \text{ mW/cm}^2$).

Average power of pulse laser radiation (Pcp) is the energy, transferred by the pulse or pulse-modulated laser radiation per unit of time.

The unit of measure is watt ($1 \text{ W} = 1 \text{ J/s}$, milliwatt ($1 \text{ W} = 1000 \text{ mW}$)).

It is defined by the expression $P_s = P_i \cdot \tau \cdot F$, Where

P_i is the pulse power of laser radiation in watts (W) or milliwatts (mW);

τ is the duration of a pulse of laser radiation in seconds (s);

F is the frequency of pulses in hertz (Hz).

Energy of laser radiation (W) is the energy, transferred by the laser radiation. The unit of measure is joule (J), millijoule ($1 \text{ J} = 1000 \text{ mJ}$).

Energy of irradiation (affection) (E) is the energy transmitted to a body during the effect of the laser radiator at a preset radiation power.

The unit of measure is joule (J), millijoule ($1 \text{ J} = 1000 \text{ mJ}$).

It is defined by the expression $E = P \cdot t$, Where

P is the power of laser radiation in watts (W) or milliwatts (mW);

t is the time of affection in seconds.

Density of energy of irradiation (affection) (D) is the energy of irradiation (affection) transmitted through an area unit of the surface of a body.

The unit of measure is J/m^2 (J/cm^2), or mJ/cm^2 .

($1 \text{ J/m}^2 = 0.0001 \text{ J/cm}^2 = 0.1 \text{ mJ/cm}^2$).

It is defined by the expression $D = E / S$, Where

E is the energy of laser radiation in joules (J) or millijoules (mJ);

S is the area of laser beam on the body surface in square meters (m^2) or square centimeters (cm^2).