

УЧЕБНОЕ  
ПОСОБИЕ

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# ЛЕЧЕБНАЯ ФИЗИЧЕСКАЯ КУЛЬТУРА

4-е издание, дополненное

Министерство образования и науки РФ

Рекомендовано ФГАУ «Федеральный институт развития образования»  
в качестве учебного пособия для использования в учебном процессе  
образовательных организаций, реализующих программы высшего образования  
по специальностям 31.05.01 «Лечебное дело» и 31.05.02 «Педиатрия»

Регистрационный номер рецензии 07 от 13 января 2017 года

TUTORIAL  
GUIDE

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# PHYSICAL THERAPY



Moscow  
«GEOTAR-Media»  
PUBLISHING GROUP  
2020

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## Chapter 8

# **REHABILITATION DURING RECOVERY FROM INFECTIOUS DISEASES AND IN TUBERCULOSIS**

**Class objective:** based on knowledge of impaired function compensation mechanisms in infectious diseases, students (trainees) should learn how to use PT means and forms at different patient rehabilitation stages (inpatient facility — outpatient facility — sanatorium).

**Test questions and tasks for background information check.**

1. What is infectious endocarditis? Pathogenesis, clinical signs (heart examination).
2. What is an infectious process, infectious disease?
3. What is the doctor's tactics when suspecting infectious disease?
4. What is occupational contact with viruses?
5. What is typhoid fever? Clinical signs and course.
6. What are the clinical signs and treatment of intestinal infections?
7. What are respiratory infections? Clinical signs, prevention.
8. What are contact home infections? Clinical signs, prevention.
9. What PT means are used in combined treatment of patients?

**Skills to be mastered by the student (trainee) during the training session.**

- ▶ Develop a combined rehabilitation treatment program for patients with infectious diseases.
- ▶ Determine the purpose and objectives of rehabilitation treatment.
- ▶ Perform functional sampling or testing. Evaluate their results.
- ▶ Assign the motion regimen. Determine PT means and forms.
- ▶ Determine dosage of PT means.
- ▶ Perform ET, MHE procedures, dosed walking, climbing stairs for patients with various infectious diseases.
- ▶ Determine indications and contraindications to massage prescription.
- ▶ Perform the procedure (session) of therapeutic massage (when indicated).

- ▶ To evaluate the patient's condition and the impact of the procedure (RG, MHE, massage) on it, fill in the documents, evaluate the results.

**Practical lesson structure is standard.**

The organisation of medical care for patients with tuberculosis is defined by the Procedure of medical care for patients with tuberculosis, approved by the Order of the Ministry of Health of Russia dated 15.11.2012 No. 932n. It is provided in outpatient, daycare, and inpatient settings, in the form of primary paramedical care, primary medical care, primary specialised medical & sanitary care, and specialised (including high—technology) medical care. Treatment of patients with tuberculosis is performed according to WHO Guidelines (2009) and the DOTS Strategy (G.N. Ponomarenko).

## 8.1. INFECTIOUS PROCESS, INFECTIOUS DISEASES

**An infectious process** is a complex of pathological and protective & compensatory adaptive reactions at different levels of interlinked morphological, metabolic, executive, and regulatory (especially immune) physiological systems which form the basis of various infectious diseases.

**Infectious diseases** (*infectio*— contamination) is a group of diseases caused by pathogenic microorganisms and characterised by contagiously, presence of the incubation period, infected organism reactions to the causative agent, and (usually) cyclic course and formation of post-infectious immunity.

By prevalence, infectious diseases (along with cardiovascular and oncological ones) consistently belong to the group of the most common world diseases of various ontogenesis, with the leading position among them. Morbidity related to tuberculosis, influenza, acute and chronic respiratory, intestinal, and skin diseases continues to increase.

During any period of infectious diseases, various specific and non-specific complications can develop (different specific and/or non-specific processes and reactions to the main disease).

## 8.2. CLASSIFICATION OF INFECTIOUS DISEASES

ICD—10 is adopted in Russia. Class I of the classification includes infectious and parasitic diseases divided into groups using a mixed principle (table 8.1). It must be noted that several deviations from ICD—10 are accepted in Russia. For example, influenza and other acute respiratory diseases are included in Group I of the class “Infectious diseases” (in ICD-10 they belong to respiratory diseases).

**Table 8.1.** Classification scheme of principal human infectious diseases (according to the transmission mechanism and causative agent sources)

Group of infectious diseases	Infections included in the group
Intestinal infections	Typhoid fever, paratyphoid fever A and B, dysentery, cholera, bacterial food poisoning, etc.
Respiratory or airborne infections	Influenza, measles, diphtheria, scarlet fever, smallpox, tonsillitis, tuberculosis
Bloodborne infections	Epidemic and recurrent typhus, malaria, plague, tularemia, tick-borne encephalitis, acquired immunodeficiency syndrome (AIDS)
Zoonotic infections	Rabies
Contact home infections	Infectious skin & venereal sexually transmitted diseases: syphilis, gonorrhoea, chlamydiosis, etc.

For clinical purposes, most attention should be paid to the development of classifications accounting for pathogeny, forms and variants of the disease course, condition severity, presence of complications, outcomes.

### 8.3. PHYSICAL EXERCISES AND MOTION REGIMEN

In clinical practice of infectious diseases, PT means are considered a method of active functional therapy. Active patient participation in the treatment process allows for the recovery of separate system functions or the development of the patient's functional adaptation.

PT is a method of non-supportive medication treatment, which is especially important during the convalescence and remission period. Physical exercises (exertions) are indicated only during the convalescence period. Trophic impact of physical exercises is especially important, as it activates plastic (including reparative & regenerative) and oxidative & reducing processes, which promote enhanced glycogen formation and deposition in muscles or liver (in cachexia). Homeostasis normalisation and activation of the general immunological body reactivity are also very important. Under the impact of physical exercises, the body's adaptation to muscular exertions successively restores, and the balance between body and the environment is achieved.

The use of physical exercises solves the goal of eliminating residual impairment after the disease and restoration of the body balance with the environment. During the patient treatment in the convalescence period, the original infection is not so important as the character and severity of organ and system damage. In all infectious diseases, the cardiovascular system usually suffers, so the sessions should be generally performed according to the methods used in



cardiovascular diseases. If the disease involves mainly the respiratory or digestive system, the session procedures should be justified by corresponding clinical & physiological indications.

When choosing PT methods, one should account for the age and sex of patients, aetiology, pathogeny, features of the disease course and outcome, concomitant diseases, as well as the patient's tolerance of increasing physical exertions.

PT must be used already during the early recovery period, at the improvement of the patient's general condition and body temperature decrease (to normal values), sometimes to subfebrile values. During this period, physical exercises have a tonic action, providing gradual activation of all organ and system functions, as well as the prevention of possible complications in lungs (pneumonia, pleurisy, bronchitis), peripheral vessels (thrombophlebitis), etc.

During *the bed regimen*, physical exercises are firstly performed in supine and lying on the side positions. The sessions include exercises that are easy to learn and perform for all joints of extremities and torso muscles. Movements in large joints of extremities are first facilitated by the leverage shortening and range decrease. Some exercises for them may be performed in facilitated conditions (by placing a sliding surface under the extremity). Respiratory exercises (both static and dynamic) are widely used. Upon the improvement of the patient's condition, sitting starting positions are added, exercise load doses are increased, increasing the number of reps, the pace, involving larger muscle groups, and complicating exercises.

When preparing for a transition to the ward regimen, special attention should be paid to exercises for muscles of lower extremities.

During the *ward regimen*, the PT method depends on which organs have suffered the most during the disease. During this period, patients are adapted to gradually increasing physical loads. Exercises are performed in the lying, sitting, and standing starting positions, with complete motion amplitude and involvement of the majority of muscle groups, as well as with gym items, on balls, near the wall bar. It is important to concentrate the attention on full breathing and combination of breathing with exercises during the sessions. Apart from ET, MHE and dosed walking are used.

During the *free regimen* (patient prepared for discharge), the interconsistency of activity in all organs and systems is improved, and the body adaptation to various loads is expanded using physical exercises. Hiking, elements of sports games, skiing, cycling are used.

Contraindications to physical exercises are temporary.

**Massage** allows to eliminate or decrease the painful muscular spasm, strengthen muscles, improve the blood flow and, thus, improve tissue nutrition. The following massage types are used: classic (therapeutic) massage, with therapeutic ointments, pneumatic massage, point massage, etc.

When performing the massage in the infectious inpatient department, specific requirements should be complied with as part of the sanitary & epidemic regimen, and the prevention of nosocomial infections. With this purpose, patients with non—contagious infections and free motion regimen have a strict procedure for massage sessions in physiotherapeutic rooms; time for patients from different departments, time for the sanitary location treatment and the specialist's rest should be defined.

The massage for patients with highly contagious infectious diseases is performed in boxes or isolated wards. In this case, the massage specialist should comply with preventive measures, depending on the infection character. If a single specialist performs the massage for patients with different infectious diseases, after each procedure, they must perform thorough sanitary hand treatment according to current orders and guidance papers on compliance with the sanitary & epidemic regimen and personal preventive measures in specific infectious diseases.

General **indications** to massage in acute infectious diseases:

- ▶ satisfactory condition of the patient;
- ▶ end of the acute disease phase (period);
- ▶ early and late convalescence periods;
- ▶ absence of disease exacerbation and relapse signs, and exacerbations of concomitant diseases;
- ▶ patient consent for the procedure.

General indications to massage in chronic infectious diseases:

- ▶ end of the disease exacerbation phase;
- ▶ satisfactory condition of the patient;
- ▶ absence of subfebrile fever, signs of decompensations of the main and the concomitant diseases.

**Contraindications.** In some cases, contraindications include diseases that developed independently, in others — concomitant pathology, in third — complications related to the first, second, or combined causes.

- ▶ For gastrointestinal infections.
  - In gastritis, colitis. Massage plan: affect the paravertebral and reflexogenic zones of the back, the neck, and the abdomen; regions of the abdomen, abdominal muscles. The patient is in the prone position, with lower extremities slightly flexed in hip and knee joints. Method:

massage of paravertebral regions of spinal segments  $Th_{IX}-Th_V$  and  $C_{IV}-C_{III}$ . Massage duration: 10–15 min. Treatment cycle: 12–15 procedures every other day.

- In gastric and duodenal ulcer disease. Massage plan: affect the reflexogenic zones of the back, the thorax, and cervical sympathetic ganglia; massage of the abdomen region. Patient position: sitting, prone, and supine positions. Method: massage of paravertebral regions of spinal segments  $Th_{IX}-Th_V$ ,  $C_{VII}-C_{III}$ . Massage duration: 15 min. Treatment cycle: 12 procedures every other day.
  - Chronic hepatitis, chronic (acalculous) cholecystitis, biliary dyskinesia. Massage plan: effect the paravertebral and reflexogenic zones of the thorax, massage of regions of the solar plexus, the abdomen, the liver, and the gallbladder. Patient position: prone and supine positions. Method: massage of paravertebral regions of spinal segments  $C_{III}-C_{IV}$  and  $Th_{VI}-Th_X$ . Massage duration: 12–15 min. Treatment cycle: 12 procedures every other day.
- ▶ For respiratory diseases.

Indications for massage in respiratory diseases: predominantly pneumonia, chronic pulmonary diseases (emphysema, pneumosclerosis, asthma).

Massage plan: effect the paravertebral and reflexogenic zones of the thorax, indirect massage of the diaphragm, lungs, the heart region combined with respiratory exercises and aimed at chest muscle relaxation. Patient position: prone, supine, on the side positions (in unilateral processes — on the healthy side). Method: massage of paravertebral regions  $L_V-L_I$ ,  $Th_{IX}-Th_{III}$ ,  $C_{IV}-C_{III}$ . Duration: 12–18 min. Treatment cycle: 12 procedures every other day.

- ▶ For cardiovascular diseases.

Massage plan: effect the paravertebral regions of spinal segments  $L_I-Th_V-Th_{III}$ ,  $C_{VII}-C_{IV}$ . Back and neck muscle massage. Massage duration: 20–25 min. Treatment cycle: 12–15 procedures every other day.

- ▶ For nervous system diseases.

Some infectious diseases are accompanied by specific polyneuritis; in others, polyneuritis is considered a complication. Massage plan: it is prescribed in the subacute disease period; stroking, rubbing, kneading, and vibration manoeuvres are used. First procedures are performed in the form of general classic (therapeutic) massage, then muscles and nerve trunks of extremities are massaged selectively.

**Psychotherapy.** For the patient, the single fact of establishing the diagnosis of an infectious disease (e.g., typhoid fever) can cause a negative emotional reaction. One can imagine which reaction follows the contamination

with highly infectious diseases (cholera) or the human immunodeficiency virus (HIV). The presence of specific pathology, especially of an infectious one, in the patient has a moral connotation. The disclosure of such private information may lead to personality handicap, and thus to indecisiveness, social withdrawal, isolation. This presents a large potential for psychotherapeutic impact in the form of a properly organised dialogue, which consumes much time and requires the endurance of the doctor, the massage specialist, the PT specialist. When an infectious disease is suspected, the patient is isolated from society, and this puts a large responsibility on the shoulders of the doctor and the whole medical staff.

In their practice, specialists use such psychotherapy methods as hypnotherapy, rational explanatory and group emotional & stress psychotherapy, emotional & stress aesthetic psychotherapy. Apart from that, autogenic training, individual analytical (revealing) therapy, art, book, music, dolphin therapy, etc. can be used.

The possibilities of psychotherapeutic impact combined with PT, physiotherapy, together with low diet fasting & diet treatment enable multiple variants of the rehabilitation process.

**The sanatorium—resort treatment** is contraindicated in the acute period of the disease, in exacerbations of the chronic process, and the presence of general contraindications.

## 8.4. MEDICAL REHABILITATION FOR TUBERCULOSIS

ICD—10 code: A15—A19.

**Tuberculosis** is an infectious disease caused by *Mycobacterium tuberculosis* and characterised by the development of cellular allergy, specific granulomas in different organs and tissues, and polymorphic clinical signs. Lungs, lymphatic system, bones, joints, genitourinary organs, skin, eyes, nervous system are typically involved.

**Classification of tuberculosis** used in Russia is based mainly on the pulmonary and extrapulmonary forms. Lungs, lymphatic system, bones, joints, genitourinary organs, skin, eyes, nervous system are typically involved (fig. 8.1).

Classification presumes the indication of the following parameters in the diagnosis: process localisation and extent (e.g., in lungs — by lobes and segments, in other organs — by specific localisation), process phase (infiltration, lysis, seeding or resorption, induration, scarring, calcification), as well as the presence or absence of *M. tuberculosis* (BK) in the material — BK (+) or BK (—).

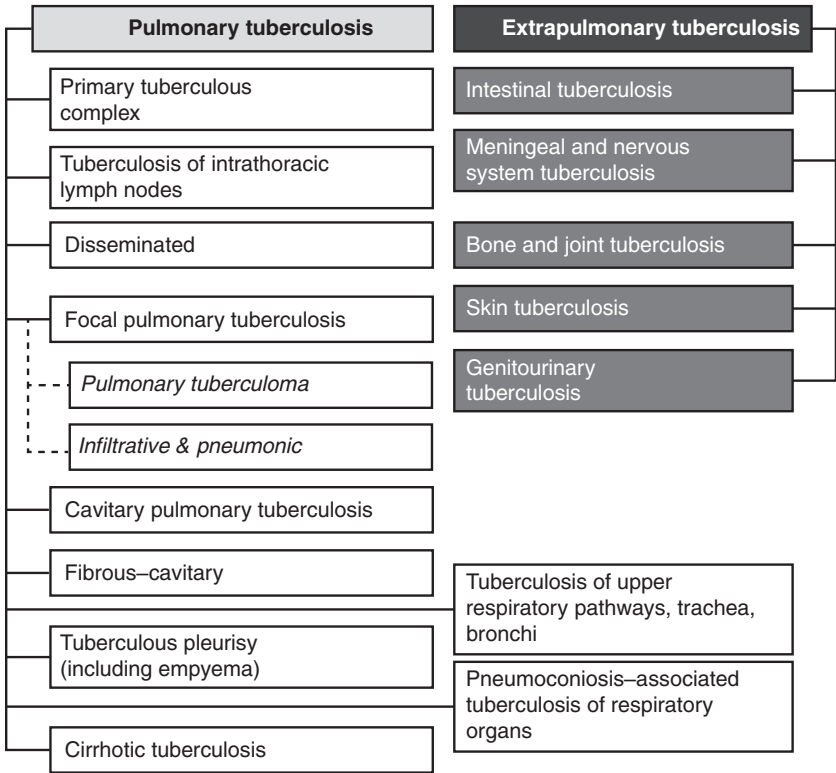


Fig. 8.1. Classification of tuberculosis

**Clinical signs**

- ▶ **Primary tuberculosis** is an infectious disease caused by *Mycobacterium tuberculosis* during the primary infection period (7–10% of infected persons); it is most typical for infants and HIV–1–infected patients. It follows an asymptomatic course until complications develop.
- ▶ **Secondary tuberculosis** is an infectious disease caused by *Mycobacterium tuberculosis* during repeated contact of the human with *M. tuberculosis* (exogenous reactivation of “old” foci or exogenous superinfection from another source); it is most commonly observed in middle-aged and older persons. It is characterised by organ-specific lesions (most commonly lungs) with the formation of a focus, an infiltrate, or a cavity (cavern).

According to the Procedure of medical care for patients with tuberculosis, approved by the Order of the Ministry of Health of Russia dated 15.11.2012

No. 932n, it is provided in outpatient, daycare, and inpatient settings, in the form of primary paramedical care, primary medical care, primary specialised medical & sanitary care, and specialised (including high–technology) medical care. The treatment of patients with tuberculosis according to WHO Guidelines (2009) using the DOTS strategy (*directly observed treatment short scheme chemotherapy*) and includes 6–month chemotherapy cycles (depending on the drug resistance of Mycobacteria) or 24–month cycles in multiple tuberculosis.

Patient treatment steps: inpatient department — sanatorium—resort treatment — dispensary.

**Medical rehabilitation means** include medications, physical exercises, massage, walking, physio-, reflex-, and psychotherapy.

Patients are prescribed the Diet No. 11 — a variant of the standard diet with increased amount of protein, vitamins C, groups A and B, and mineral substances.

The **motion regimen** represents the method of the patient’s life regulation within the framework of complex rehabilitation. It mainly presumes correctly selected alternation and dosing or rest and activity, depending on the patient’s health condition.

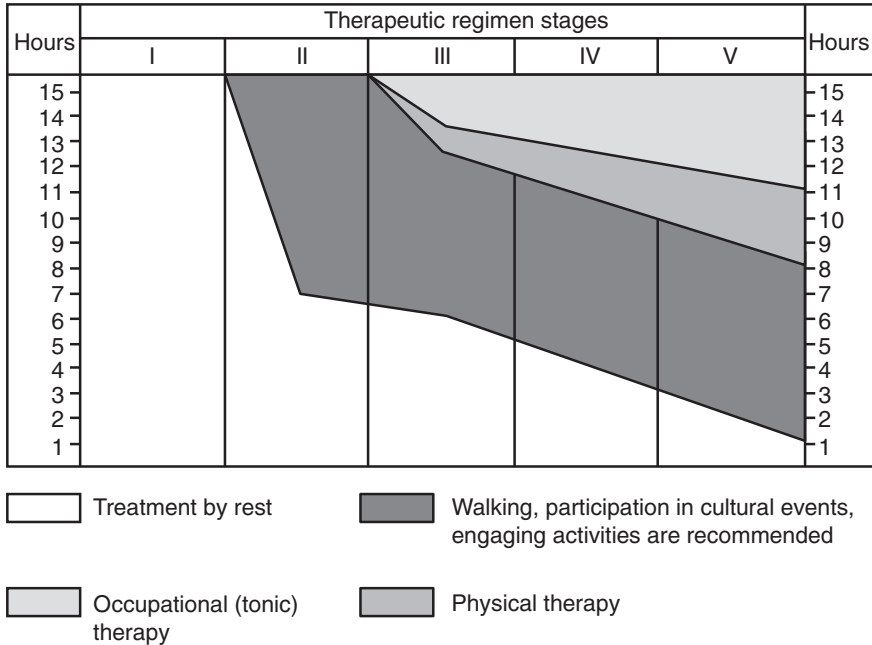
Treatment aims to support protective forces of the body, thus promoting recovery processes in the body. The motion regimen is selected according to the tuberculosis form, stage, and spread, as well as the psychosomatic condition of the patient and their age.

Rest and activity dosing should be performed individually for each patient.

Opposite to the earlier practice, where the patient had to be inactive during the whole treatment course in the inpatient department, the modern motion regimen gradually introduces the physical activity into the patient’s daily schedule. The physical activity gradually increases along with the patient transition to subsequent steps of the motion regimen. The fig. 8.2 depicts the transition from rest to active activity: gradual reduction of the time spent in bed and substitution of the rest with entertaining activities, PT, and occupational therapy.

**Physical exercises.** The goal of medical rehabilitation, which includes PT, is the restoration of functions impaired by the disease, prevention of locomotor system disorders, delayed development of pathological changes or their elimination.

Regular and systematic physical exercise loads coordinate respiratory and circulatory functions, increase functional possibilities of the cardiovascular system, increase metabolism, improve the general condition. All this promotes rehabilitation of patients and reconvalescents, creates favourable conditions for their return to society.



**Fig. 8.2.** Therapeutic regimen stages during the inpatient step of the patient’s treatment

During the ET sessions, the following conditions should be followed:

- ▶ free pace, large freedom of movements;
- ▶ strict individualisation of exercises;
- ▶ a large number of respiratory exercises;
- ▶ observation of exercise effect on respiration and circulation during its performance and after its end;
- ▶ selection of corresponding exercises and their sets.

PT should correspond to the age, sex, functional capabilities of the patient, and the localisation of tuberculosis.

Exercises are performed in different starting positions: standing, sitting, lying, kneeling. The sessions should include conditioning exercises for different muscle groups and joints (mostly isotonic) combined with respiratory exercises (both dynamic and static). Upon the improvement of the patient’s general condition, sessions are complemented with gym items (balls, hoops, etc.), near the wall bar.

The use of gym items increases PT efficacy. Manipulations with small items develop agility and increase hand mobility.

When performing PT sessions, general guidelines should be accounted for.

- ▶ Physical exercise loads should be evenly distributed to the whole body, with a gradual activation of different muscle groups. The scope and intensity of the physical exercise loads should be increased gradually. The scheduled dosing of physical exercise loads should be strictly followed. To prevent excessive exercise loads, one should account for the patient's health condition, age, moral and physical fitness, etc.
- ▶ Exercises should be filled with emotional content and should be of known interest for the patient.
- ▶ Exercises should correspond to patient capabilities. Do not use exercises with specific prolonged elements. It is also important to avoid excessive loads for separate muscle groups. The emphasis should be made on the correct alternation of physical loads and recuperation.
- ▶ During the ET exercises, one should avoid excessive physical strain. Between exercises, elements of respiratory exercises may be introduced.
- ▶ ET intensity should be increased gradually, achieving maximum during the second half of the main part, and then it should be decreased so that at the end of the session, the body recuperates to a calm state. The ideal environment for exercises is the outdoors, i.e. the environment with the cleanest air and minimal dustiness (meadows covered with grass, lawns, etc.). In the fresh air, PT may be performed during any season.

The following types of **therapeutic walking** can be used in the combined treatment of patients: on even surface, cross-country, with stepping over subjects of different size and volume, walking with eyes opened and closed, etc. Currently, Nordic (Scandinavian) walking is also recommended for patients with tuberculosis during the recovery phase (see Chapter 2).

**Activity games** and **elements of sports games** improve the attention, agility, and reaction in changing situations. They significantly support the efficiency of the neuromuscular system, enable the movement of the whole body, while not overloading individual organs. During games, their complexity and (if required) duration can be changed.

**Walks, hiking trips** are considered the most active PT forms, as the body encounters the most active contact with nature. Hiking trips train the body, strengthen the nervous, respiratory, cardiovascular, and locomotor systems.

**Massage.** Massage plan: effect the paravertebral and reflexogenic zones of the chest, indirect massage of the diaphragm and the lung area. The patient is in the sitting or lying position.

Massage method: stroking, rubbing and kneading, vibration. Thorax massage should be performed in draining positions.



Apart from therapeutic (when indicated), point massage and self-massage is used.

**Reflexotherapy** is also effective; it normalises the respiratory function, impacts the reflectory zones of lungs in the regions of the back, the hand, and the foot.

**Psychotherapy.** Tuberculosis is a prolonged disease with a constant possibility of relapses, which by itself negatively impacts the patient's psychic condition. That's why neglecting psychoprophylaxis and psychotherapy may negatively impact the whole treatment. The diagnosis itself sometimes causes a very negative reaction. The onset of treatment leads to further problems.

Corresponding psychoprophylaxis and psychotherapy are considered the means of prevention and treatment of psychological disorders in patients with tuberculosis. They consist of the following elements:

- ▶ Favourable smoothing effect on inadequate reactions and measures, promoting the change (using persuasion) of the stereotypic point of view regarding tuberculosis.
- ▶ Helping to develop correct and realistic relationship to unfavourable changes in life caused by the disease.
- ▶ Psychosomatic relaxation (removal of psychological straining using verbal persuasion and, if possible, the satisfaction of the patient's demands and interests in the inpatient conditions).
- ▶ Helping the patient to solve developed conflict situations (improving family, work contacts, etc.).
- ▶ Helping the patient to search for a new approach to life based on life values that have preserved their meaning for the patient.

During psychotherapy, psychic correction methods are used: auto training, individual analytical (revealing) therapy, art, music, psychostimulating therapy, hippotherapy.

**Occupational therapy** is an important part of general patient rehabilitation. Patients requiring prolonged treatment should be engaged in small manual works right from the start to prevent the destructive habituation to inactivity, as well as to mitigate difficulties with adapting to the medical institution environment.

Entertaining types of activity, e.g. in the form of small manual works, performed by the patient in bed are especially indicated during the initial treatment phase and rehabilitation. Light forms of entertaining activity are replaced by occupational therapy. The patient, for whom occupational and social relationships that were part of their life suddenly cease to exist, tries to somehow

compensate for them while staying at the medical institution. The goal is to find such values, with which the patient would not develop an anti-productive attitude to labour and activity in general. Labour and different useful activities of all types help to avoid the erroneous view on the “tuberculosis–labour” relationship, thus allowing to prevent the occurrence of psychological disorders as a result of inactivity.

Occupational therapy must be feasible: the work performed during it should be selected in such a way that it could bring practical results, and the patient could continue it after the treatment finishes. The attitude to labour, workability, labour capacity and reaction to physical loads define the psychological and somatic compensation of the patient.

Accounting for the evaluation of these parameters, the prognosis can be compiled for the patient return to their previous social environment.

**PT after thoracic surgeries.** Thoracic surgeries (lung resection, thoracoplasty, and surgeries accompanied by thoracoplasty) lead to certain, sometimes quite a significant decrease in respiratory function of the lungs. Scoliosis and thoracic deformities develop frequently; shoulder girdle mobility is limited, muscular contractures are formed. The post-operative sputum expectoration often accompanies these symptoms.

After large thoracic surgeries, the patient’s head and neck tend to tilt to the healthy side; the shoulder on the side of the surgery becomes somewhat displaced and moved forward. On that side, the pelvis is also shifted. The spine becomes C-shaped, so the convexity of this curve is directed to the side of this surgery; its top point is located between Th<sub>III–IV</sub> vertebrae, depending on the number of ribs removed. Under the clavicle on the healthy side, the concavity of the thorax can be noticed.

The degree of spinal curvature and thoracic deformity depend on the character and scale of the surgery performed, condition of muscular and fibrous tissue, the patient’s age, and the presence of postoperative complications.

The task of rehabilitation for these patients is to prevent the development of complications in LMS and the respiratory system.

ET with the patient should be started 2–4 weeks before the surgery to teach them how to perform exercises for back and shoulder girdle muscle relaxation, maintain correct posture and movement stereotype that will be required for them after the surgery to prevent the development of complications.

The preoperative exercises are consist of 4 main components:

- ▶ providing torso statics (correct torso position), training of those muscle groups which this position depends on (prevention of various thoracic and spinal deformities);

- ▶ exercises required for the prevention, and in some cases — elimination of muscular contractures; they are also needed to improve the shoulder girdle mobility;
- ▶ development of correct respiratory movement ratio (inspiration—expiration—pause);
- ▶ expectoration skill development.

After surgery, one should control the correct body position of the patient not only in bed but also in the sitting and standing position. Conditioning exercises combined with respiratory ones (both static and dynamic) are included in sessions. Massage of neck and shoulder girdle muscle is recommended (according to the sedative method). Since Day 2 after surgery, the motion regimen is expanded: the patient performs exercises in sitting and standing positions, dosed walking is added — first (within the ward) in the department, then in the hospital territory. During sessions, respiratory exercises aimed at RF improvement, intercostal muscle strengthening (using respiratory training devices) are performed together with conditioning exercises.

**Sanatorium—resort treatment** is performed according to the Procedure of medical care for patients with tuberculosis (patients with focal, disseminated, infiltrative tuberculosis in the phase of resorption and induration of focal and infiltrative changes, scarring, pulmonary tissue destruction, tuberculoma, cavitary and fibrous—cavitary tuberculosis in the absence of acute toxic events, tuberculous pleurisy in the cicatrisation phase, conditions after surgical interventions).

A large network of local sanatoriums and climatic & therapeutic resorts (coastal, mountain, steppe, forest-steppe zone) exists, where patients with tuberculosis receive combined treatment, including the combination of specific chemotherapy with physical methods, PT means, psychotherapy, etc. Patients with tuberculosis are referred to as climatic & therapeutic resorts.

Duration of sanatorium—resort treatment for patients with tuberculosis is 2–4 months.

Indications to medical—social expert commission: forms of tuberculosis accompanied by persistent impairment of bodily functions leading to quality of life limitations and requiring social protection measures, including rehabilitations.

## Self-control Questions

1. Which medical rehabilitation means are used for the treatment of infectious diseases?

2. Which physiotherapeutic methods are used for the treatment of gastrointestinal complications?
3. What are PT goals for the treatment of gastrointestinal complications?
4. What is the physical mechanism of action exercises during the treatment of the gastrointestinal system?
5. What are medical rehabilitation means used for the treatment of bronchopulmonary complications?
6. What types of respiratory exercises are used for the treatment of infectious patients?
7. Which contraindications to PT means are known?
8. What are the goals of medical rehabilitation use in patients with tuberculosis?
9. At which treatment stage are PT means used?
10. Are PT sessions outdoors beneficial for patients with tuberculosis?
11. What are climatic zones more preferable for the rehabilitation of patients with tuberculosis?
12. What are the goals of preoperative exercises in tuberculosis?
13. In what period after thoracic surgery can a tuberculosis patient perform ET?