

## 1. Asthma

Bronchial Asthma is a chronic disease, which is the result of the inflammatory condition in the bronchi. Inflammation is accompanied by swelling of the mucous membrane in the bronchi, production of viscous secretions and smooth muscle spasm narrowing the airways, which leading to a shortness of breath (*asthma* is derived from a Greek word meaning *dyspnea*, “to pant”).

The causes can be divided into external and internal. The external causes include allergens, infections, stress, and medications which may have negative effects on the respiratory organs. The internal causes are the malfunctioning of the immune and endocrine systems, autonomic nervous system, and bronchial hyper-responsiveness.

As the disease progresses, the diaphragm and respiratory muscles stop functioning properly, which leads to a breathing difficulty because of the exhaustion of the respiratory muscles.

In the clinical picture, asthma consists of the acute attacks (gasping for air) and periods between them. Acute attacks require hospitalization and intensive treatment. After coping with acute exacerbation, the patient is prescribed therapeutic exercise in complex with breathing exercises.

Breathing technique using the Frolov’s Respiration Training Device includes the key elements necessary for bronchial asthma rehabilitation: long smooth exhale, voluntary control of breathing, establishing a normal breathing rhythm and lungs extra air removal.

### **Positive effects of breath therapy with the Frolov’s Respiration Training Device in patients with asthma:**

- Reduced respiratory muscles fatigue
- Improvement of the ventilation and gas exchange during regular breath exercises
- Immune and autonomic systems improvement
- Reduced inflammatory condition
- Elimination of the shortness of breath
- Increased reserve capacity of the respiratory system
- Less medications required
- Life quality improvement

### **Important rules for breathing technique with Frolov’s Respiration Training Device in asthma treatment:**

- Begin the breath therapy without the device — inhale through your nose.
- The period of adaptation takes 1-1,5 months, after which the device can be used for inhaling and exhaling. The duration of the exhale should be increased slowly. It is important that the body is relaxed during the exercising. If necessary, the evening exercises can be used in complex with inhalation during the day or additional morning exercises.

Another benefit of using the Device is its suitability for pre-school children, pregnant women and patients with concomitant diseases (such as angina, hypertension, hormonal disorders and other diseases).

## 2. Pneumonia

**Pneumonia is an infectious inflammation of the lung parenchyma, which affects the alveoli (alveoli are spherical outcroppings in the lungs wrapped in a fine mesh of capillaries and responsible for the gas exchange).**

The causes include infection with various bacteria, viruses, fungi that trigger the disease.

The infection causes inflammation and swelling of the bronchial tubes. It hinders ventilation so that alveoli do not get enough oxygen, which leads to the gas exchange imbalance. This causes atelectasis (a collapse of lung tissue) and then inflammation of the lung tissue. Inflammation may affect different parts of the lung — bronchi, alveoli or pleura.

Diagnostic tools include examination and x-rays. Depending on the pattern of ventilation a patient may suffer from restrictive lung disease (impairing lung ventilation) caused by decrease in the lung compliance. When pneumonia is combined with a chronic bronchitis obstructive lung disease may prevail. It is characterized by obstruction of the bronchi with sputum.

Acute pneumonia treatment is aimed at killing the infection with antibiotics, which also reduces inflammation and improves ventilation. In case of the adequate treatment and absence of complications a couple of weeks are enough for complete resolution. In case of additional complications such as atelectasis or empyema in the inflammatory part of the lung, treatment may take from 4 to 6 weeks. If pleura is affected in a patient with pneumonia, 2-3 months are required for complete resolution.

Patients who have recovered from the acute pneumonia are vulnerable to the developing chronic obstructive pulmonary disease (COPD). In terms of statistics, up to 84% of patients after hospitalization have bronchomotor function disorders that may lead to the bronchial spasm and the transition from acute disease into chronic.

It explains why acute pneumonia requires not only to focus on the inflammation treatment but also some additional therapeutic exercises starting from the first days of hospitalization.

Therapeutic exercises for pneumonia treatment include conditioning and breathing exercises.

#### **Positive effects from the Breathing therapy in patients with pneumonia:**

1. Acquiring the correct breathing pattern habit: diaphragmatic respiration — full inhale, which fills the lungs with air, and slow relaxed exhale.
2. Minimizing work of the accessory breathing muscles, which relieves shortness of breath, reduces the waste of oxygen and ensures an adequate rate of ventilation.
3. Improves airway obstruction.
4. Relieves breathing difficulty.
5. Breathing out against the positive air resistance helps to create positive expiratory airway pressure. Research proves that the positive expiratory airway pressure improves sputum expectoration, reduces hyperventilation of lung tissue and relieves inhaling and exhaling. Scientists approve this breathing technique even in case of the acute pneumonia. During acute, subacute pneumonia and clinical recovery period, such technique improves clinical aspects of pneumonia, the function of external respiration and the cardiovascular system.

The process of full biological recovery after pneumonia takes from 6 to 12 months, during which rehabilitation is required. Breathing exercises with the Frolov's Device during recovery and preventive medical examination periods ensure adequate lung ventilation and gas exchange, helping to accelerate full recovery.

Respiration Training Device can be used when the patient is lying down (on the back or on his/her side), which is important taking in consideration different types of pneumonia. The Device can also be used as an inhaler for pneumonia treatment and during the rehabilitation.

### 3. Tuberculosis

**Tuberculosis is a contagious disease, caused by the various strains of mycobacteria, usually *Mycobacterium tuberculosis*. Pulmonary tuberculosis is the most common form of tuberculosis, which accounts for 80% of all cases.**

The last decade has shown the increase among the people that are sick with the tuberculosis as well as in drug-resistant tuberculosis cases and disease complications. In order to fight bacteria, patients are prescribed 4-5 medications at a time, which often results, along with partial improvement of pathological changes, in such side effects as alteration in lung tissue, pulmonary fibrosis (the development of excess fibrous connective tissue in the lungs that impedes their functions) or bronchial deformation.

The disorders can prolong or complicate breathing problems leading to, respiratory insufficiency and bronchial obstruction. Therefore, tuberculosis treatment should not only fight tubercular bacillus with medications, but also improve lung conditions and metabolism in order to enhance body's defense mechanisms.

The disease persists over a long period of time and even intensive treatment does not guarantee that the disease will not occur again, especially during the first two years after the recovery from active tuberculosis. Therefore, tuberculosis patients need an intensive rehabilitation throughout this period of time. It should include therapeutic exercise, massage, physiotherapy and resort therapy.

#### **Positive effects of the breath therapy in patients with tuberculosis:**

1. Improved lung ventilation and gas exchange.
2. Restored correct breathing biomechanics.
3. Enhanced body's defense mechanisms.
4. Improved gas exchange, metabolism, the autonomic nervous system and mental state.
5. The cyclical variations in intrathoracic (and intrapleural) pressure help to prevent or treat pleuritis.
6. Breath therapy during the post-surgery period helps patients cough up bronchial secretions, which normally accumulate after the surgery. It also improves blood flow in the abdominal region and thoracic cavity.

The Device settings can be adjusted to suit the patient's condition and the reserve capacity of the respiratory system and other systems of the human body.

During functional rehabilitation of the respiratory system, in addition to the breath therapy, Frolov's Respiration Training Device can also be used for phyto-inhalation and aromatic oils inhalation, which helps to improve rehabilitation and life quality of patients.

***Note: In cases of pulmonary hemorrhage and hemoptysis the use of the Device is contradicted.***

### 4. Allergy

#### **Breath therapy positive effects in patients with allergy:**

Hypoxia can significantly increase adaptation abilities and defense mechanisms of the human body. Cell metabolism switches to an economical and most efficient use of oxygen to supply body with the necessary amount of energy. Moreover, a gradual decrease of oxygen supply triggers anaerobic respiration (without oxygen). These greatly benefit your body by activating the reserve capacity of it and naturally enhancing its self-recovery capability.

1. Hypercapnia is a favorable condition because of CO<sub>2</sub> importance for all the biochemical processes in the body. CO<sub>2</sub> regulates the work of enzymes and vitamins that help the immune system to restore its functions.
2. Breath therapy with the Frolov's Respiration Training Device helps the body to recover and build up natural resistance to the allergies.

## 5. Insomnia

**Insomnia is a persistent sleep disorder characterized by difficulty falling asleep and/or staying asleep, reduced deep sleep stage and sometimes inability to sleep at all.**

In recent years, insomnia has become a pressing problem in developed countries and the number of people suffering from it is increasing every year.

Sometimes insomnia is a symptom of a more serious disorder, not a stand-alone disease. Often it is a symptom of neurosis, some heart disease, mental disorders or neuroinfection. Insomnia is also traditionally considered as an indicator of ageing changes in the nervous system of elderly people.

Sleep disorders can also occur in healthy people after excessive physical or emotional strain. That is why only consistent sleep disorders lasting for a month or occasional sleep disorders over a period of at least three months are considered to be insomnia.

How does breathing technique with the Frolov's Respiration Training Device help eliminate insomnia?

Although the human brain represents only 2% of the body weight, it receives 20% of the total body oxygen consumption. To carry out all the necessary functions such as food consumption or sleep the brain needs a remarkable amount of oxygen. It explains the improvement of sleep quality, better memory, and stable mood in patients doing breath therapy exercises, which are the results of increased oxygen supply of neurons and enhanced brain performance.

There is also a correlation between electroencephalogram's brain wave patterns and breathing curves. For example, rapid breathing correlates with electroencephalogram's low amplitude fast waves, while relaxed breathing correlates with steady rhythm of brain waves. When a person is falling asleep, the breathing rhythm changes and body temperature drops a little — these are typical characteristics of sleep.

### **Breath therapy positive effects in patients with insomnia:**

1. The breathing rhythm becomes similar to that near bedtime. After the exercises body temperature drops a little just like before falling asleep, that is why in insomnia treatment it is better to do breathing exercises before bedtime.
2. Practicing slower exhales stabilizes the processes of an excitation and inhibition in the CNS, relieving irritation, reducing fatigue and improving the sleep quality. A slow prolonged exhale helps to relax body muscles.
3. Breathing out against the positive water resistance helps to create expiratory positive airway pressure. It widens bronchi, enhancing lung ventilation, increasing blood oxygen and distributing more oxygen into your other organs and tissues as well as improving the brain activity.
4. Diaphragmatic (abdominal) breathing stabilizes the intrathoracic pressure enabling your heart-vascular system to work properly. It increases blood distribution into all body organs and parts of the brain, which optimizes the functioning of your nervous system, relieves headache and dizziness, and improves sleep quality.
5. Using Frolov's Respiration Training Device enables you to focus on the breathing itself, relax and fall asleep quicker.
6. Regular breathing exercises will gradually replace sleeping pills and phytopreparations.

Improvement of the sleep quality is registered both in elderly people with long-term sleep disorders and in young people with occasional sleep problems. Both groups of patients find it easier to fall asleep after the therapy and feel refreshed and active in the morning.

Breathing exercises reduce the frequency of waking up at night from 4-6 times to 1-2 in men suffering from prostate adenoma.

## 6. Smoking

**Smoking is based on the nicotine addiction that is destructive to a different body organs and systems.**

Statistics show that today there are about a billion smokers in the world. Approximately 50% of Russians are smokers and about 100,000 of them die from smoking every year. Diseases that are triggered or complicated by smoking annually kill 3,5 million people in the world.

Cigarette smoke contains more than 4,000 different chemicals, including high-toxic and cancer-causing chemicals (formaldehyde, benzene, arsenic etc.) Smoking firstly affects respiratory organs — poisonous chemicals damage the lungs, which inevitably leads to the bronchitis, emphysema or lung cancer.

**In order to quit smoking quickly and easily:**

- Improve your nervous system in order to go smoothly through the adjustment period after quitting smoking.
- Improve your respiratory system — clear the lungs, stabilize ventilation and gas exchange.

Breathing technique with the Frolov's Respiration Training Device will help you to follow these steps.

**Positive effects of the breathing technique with the Frolov's Respiration Training Device in patients during quitting smoking period:**

1. Reduced withdrawal symptoms such as strain, anxiety and nervousness. This is the result of stabilized gas exchange, elimination of tissue hypoxia, including the nervous system hypoxia.
2. Breathing exercises with the Frolov's Respiration Training Device include breathing in and out against the resistance. This technique boosts the clearance of the bronchi and lungs, creating the drainage effect. Once the bronchi draining function has improved, lungs are cleared of toxic substances that left from smoking. This may involve coughing up dark-brown phlegm with an unpleasant smell.
3. The overall improvement of the respiratory system not only enhances ventilation and gas exchange but also sharpens your sense of smell. Therefore, not only smoking but even the smell of tobacco smoke seems disgusting, which creates persistent aversion to smoking.

To make a withdrawal process less painful, breath therapy can be combined with the aromatic oil inhalation, the so-called aromatherapy treatment for respiratory problems. Inhalation of essential oils enhances the positive effects of the Device.

## 7. Neurosis

**Neurosis is an umbrella term for a group of the long-term mental disorders involving asthenia (failure to control your emotions, lack of energy, frequent shifts in the mood), obsession and hysteria.**

The causes include various psychological traumas, excessive emotional strain or intellectual overload.

Symptoms of neurosis, among others, include emotional distress, excessive anxiety, panic attacks and mood disturbance. Physical symptoms of neurosis include frequent headaches, heartache, chronic fatigue, dizziness, poor appetite, sleep disorders etc. Neurosis very often causes various breathing disorders, which make it difficult to diagnose and to treat this disease.

Treatment plans may include both psychotherapy and medications.

**The positive effects of the breath therapy on the nervous system** have been known for a long time in medicine and have a scientific explanation. Respiration center is located in the brain stem and is closely connected with other parts of the brain, which are accountable for reflexes and general functioning of the body. Research has shown that inhale activates sympathetic part of the autonomic nervous system, while exhale activates parasympathetic part.

1. Breathing exercises involving deep breathing and pausing before exhaling activate sympathetic nervous system. This part of the autonomic nervous system increases the heart rate and contractions as well as arterial pressure, inhibits peristalsis, decreases the release of the gastric juice and pancreatic secretion, and widens bronchi and bronchioles.
2. Breathing exercises involving slow exhaling and pausing after it activates parasympathetic nervous system, which slows down heart contractions, decreases blood pressure, increases digestion and contracts bronchial muscles. Calm deep exhales with pauses help your body to relax and balance the nervous system.
3. Respiratory center is connected with the part of the cerebral cortex associated with movement, that is why not only movement can affect breathing, but breathing can also be used to control muscle tone. This effect lays the basis for the muscle relaxation techniques and slow breathing relaxation.
4. Breathing exercises enhance the work of the respiratory center and central nervous system, increase the secretion of serotonin («the hormone of happiness») and improves qualities of blood.
5. Chronic stress affects the rate of breathing resulting in hyperventilation and hypocapnia (a state of reduced CO<sub>2</sub> in the blood). It leads to further brain disorders, while correct breathing releases stress and tension in your body.

Frolov's Respiration Training Device makes it easier for you to benefit from positive effects of the breath therapy in the treatment of the various neurotic disorders. Along with improving your psychoemotional and physical state, it reduces the feeling of oxygen shortage, labored breathing, palpitations, excessive sweating and sleep disorders.

Once you improve your overall health, you will find it easier to smoke less and avoid overeating, which is common for many people in stressful situations.

The Respiration Device can also be used for aromatherapy, which is successfully used in treating neurotic disorders. Combining aromatherapy with the breathing exercises boosts the nervous system resistance to the harmful factors.

## **8. Sport and Fitness**

**Clinical studies show a substantial improvement in performance quality and exercise effectiveness in sportsmen who do special breathing exercises.**

For example, the ability to perform static exercises increases from 1–2 minutes to 6–8 minutes as a result of breathing training. During a 100 m run, less experienced runners make 16–19 breaths per 11.3–12.2 seconds of running, while more experienced runners make only 4–5 breaths per the same time.

In order to achieve significant results in sports, a diversified training of respiratory system is necessary. It is essential to have high resistance to hypoxia (low O<sub>2</sub> content) and hypercapnia (high CO<sub>2</sub> content), as well as good respiratory muscle endurance. It's been proven that hypoxic training increases power and helps stabilize heartbeat frequency. Respiratory training that combines both hypoxia and hypercapnia increases maximum physical power by 23% and overall exercise capacity by 55%.

Studies show that breath resistance training has a positive influence on the respiratory system: respiratory muscle strength and endurance are increased, resistance to hypoxia and hypercapnia is greatly improved, and the amount of energy supplied to the muscles also increases with improved aerobic performance.

The optimal training program of the respiratory system would be the one that simultaneously uses several training factors, trains breathing and bronchis muscles, optimizes lung ventilation and blood circulation, and increases body adaptation capacities.

"SPORT-BREATHE" technique is a specially developed breathing training program with application of the Frolov's device. After two weeks of training under this program we see increase of lung capacity and improvement of respiratory function in sportsmen by 20%. Athletes and their coaches also notice that shortness of breath during exercises is greatly diminished while their overall performance capacity increases.

"SPORT-BREATHE" is the only breathing training method that combines several training factors and is also perfect for rehabilitation processes and adaptation to climate and time zones changes.