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USER MANUAL
for SMART BREATHE individual breathing simulator
<http://smart-breathe.com/>



Dear customer !

This user manual sets out the main principles of use of the SMART BREATHE individual training simulator. The recommendations have been prepared based on the results of testing of the breathing simulator in clinical and medical settings.

This manual will be of use to users of the breathing simulator and specialists in the field of rehabilitation, prevention, physical therapy as well as sports and restorative medicine.

Introduction. Breathing is a major function of the body which has an impact on our state of health and physical potential. The respiratory system includes the lungs as the organ responsible for gaseous exchange and ventilation as well as the blood circulation system which transports oxygen from the lungs to the cells and carbon dioxide from the cells to the lungs. There is external respiration (lung ventilation) and cellular respiration when the cells use oxygen for chemical reactions.

All cells use oxygen during metabolism. It is known that hypoxia or deficiency of oxygen in the cells is the main cause of many diseases and aging of the body. That is why respiratory exercises boosting the oxygenation of cells are one of the most effective ways to normalise health parameters, enhance your abilities, stabilise your psyche and fight off stress.

Resistance breathing has long been known to medicine. This method is used in the Smart Breathe simulator. Any person can perform respiratory exercises with Smart Breathe while doing household chores, working on the computer or watching TV, so the training does not take any extra time. The principal benefits of Smart Breathe are its ease of use, convenience and efficiency. Those who wish to give up smoking will also benefit from exercising with the Smart Breathe simulator. As the oxygenation of cells rises, the craving for smoking diminishes. Moreover, the smoking rituals such as holding a cigarette in the mouth and in the hand and exhaling the smoke which cause psychological addiction are to a large extent compensated by a similar ritual of respiratory training.

1. Purpose and principle of operation

1.1. Purpose

The Smart Breathe individual breathing simulator has been devised for performing respiratory exercises. Important to remember: Smart Breathe is a medical device meant only for individual use. Smart Breathe is used for treatment, rehabilitation and prevention of various diseases in adults and children (8 years of age and above).

For prevention purposes Smart Breathe is indicated to healthy persons and sportsmen as a training simulator for the respiratory muscles to form the proper respiratory stereotype, enhance

physical endurance, increase adaptation potential of the body and improve resistance to adverse environmental, weather and industrial factors as well as psycho-emotional distress.

1.2. Diseases and/or conditions for which the treatment mode is indicated:

-such causes and symptoms of chronic obstructive pulmonary disease as:

- chronic bronchitis

- asthma

- bronchiectasis

- cystic fibrosis

- atelectasis

- immotile cilia syndrome

1.3. Rehabilitation:

- in the case of pulmonary tuberculosis

- in the case of emphysema

- after myocardial infarction

- after surgery

- in the case of muscular atrophy

- in the case of inefficiency of the muscles of inspiration

- in the case of physical weakness, low performance in everyday activities.

1.4. Indications to immediate termination of the procedure:

- coughing

- provoked shortness of breath

- onset of angina pectoris

- decreased blood pressure

- considerable increase in blood pressure

- nausea

- confusion, light-headedness

- unprovoked exaltation

- tiredness

1.5. Contraindications:

- acute asthma

- acute heart failure

- acute pulmonary embolism

- acute pulmonary tuberculosis

- pneumothorax

- recent facial, oral, esophageal surgery or trauma

- recent pulmonary surgery

- tympanic membrane rupture or other middle ear pathology
- pulmonary cyst
- prominent shortage of breath which disturbs everyday activities
- active haemoptysis
- pulmonary hypertension.

ATTENTION: In the case of chronic diseases the simulator is used when the disease is not in the stage of exacerbation. If a chronic disease has exacerbated, the necessary treatment should be carried out and only 7-10 days following the exacerbation the training simulator can be used.

1.6. Principal of operation of the simulator

To perform breathing exercises the simulator has a regulated opening for letting the air through, which creates resistance to breathing during inhalation and exhalation. The size of the inner opening of the simulator is regulated stepwise which allows to easily regulate the resistance to breathing taking into account the patient's age and state of health. The respiration training thus involves the effects of artificial breath regulation well known in medicine. Resistance breathing trains the respiratory muscles increasing their strength and endurance as well as bronchial muscles and works as a pneumatic massage of the human bronchi and lungs.

During training a gas mixture is formed in the lungs characterised by a moderate decrease in the amount of oxygen and moderate increase in the concentration of carbon dioxide (hypoxic/hypercapnic gas mixture) which helps normalise the functioning of the immune system due to development of activation and training reactions.

2. Structure of the simulator and package contents

The simulator contains a monoblock unit (1), a mouthpiece (2), a storage case (3) and a neck strap.

Figure 1. Package contents.

3. The method of exercising with the breathing simulator

3.1. General rules.

In the case of a therapeutic course it is recommended to exercise with the breathing simulator daily, preferably at one and the same time 2-3 times per day. The duration of the treatment course is, on average, 3-4 months. After it has been completed, training can be continued bringing the number of training session to 2-3 times per weeks (prevention programme).

Breathing exercises can be done at any time, but no earlier than 2 hours after a meal. The best time for exercising is in the evening before going to bed 2-3 hours after supper. Following the evening training session you are recommended to drink a glass of water and not to eat until morning.

Attention! *If the breathing simulator is used by diabetics, pregnant women or children or if a person has to take a medicine before sleep, a light meal is allowed (in accordance with the regimen of medication and the diet). You should assume a comfortable position for exercising so*

that you can easily do the “belly breathing”. You can exercise sitting at the table, in the armchair, of the sofa, in a reclining or half-lying posture or even lying on your side.

3.2. Exercising with the simulator

Keeping the simulator tight in your mouth (*Figure 2*), inhale evenly through your nose for 2-3 seconds. Then slowly exhale through the simulator with resistance selected using the external ring of the device. The exhalation should take longer than the inhalation. It is recommended to gradually increase the length of exhalation, starting with 7 seconds and adding one second each week eventually bringing the length to 20-30 seconds.

The level of resistance to exhalation is selected individually by turning the external ring. Turn the external ring and move the arrow to one of the sections on the central immobile ring marked with strokes from 1 (minimum resistance) to 5 (maximum resistance) (*Figure 3*). The main criterion of the properly selected resistance is the lack of tiredness after a 15-minute exercise. As your body becomes more and more fit you can increase the resistance and bring it to the maximum after 1-3 months of exercising.

To maximise the efficiency of training, it is recommended to breathe using your diaphragm: expand your belly during inhalation and contract it during exhalation (diaphragmatic breathing). Diaphragmatic breathing increases the efficiency of respiratory training, considerably improves blood and lymph circulation, cleans the internal organs and has a massage effect on the abdomen (liver, gall bladder, stomach, pancreas, bowels, kidneys, prostate gland and other abdominal organs).

During training try to breathe in a smooth and calm way without strain and abrupt belly movements.

The internal ring of the simulator regulates the resistance during inhalation through the mouth. It is primarily meant for training the respiratory muscles which helps improve the endurance of the body and is especially good for sportsmen. The majority of users should inhale through their nose. In this case the internal ring is set to the maximum marked with 5 strokes (*Figure 3*).

Duration of training. 2-3 training sessions (5-15 minutes each) per day in the first days of training. Every 3-4 days gradually increase the length of exercises reaching the maximum of 40 minutes per day.

NB! It is not recommended to exercise for 40 minutes without interruption. It is better to distribute this time between several trainings of 15-20 minutes each.

Attention: during training you can experience slight lack of air, warmth, salivation, expectoration and possibly yawning. These physiological reactions are not dangerous and are connected with the adaptation of the body to the new respiration conditions.

In the course of therapeutic respiration the functioning of the body is readjusted: the work of the breathing organs as well as the nervous and immune systems is normalised and the blood circulation and metabolism is improved. After 4-6 months of regular training, if your condition has become better, you can switch to the prevention mode of 2-3 times per weeks. It is not recommended to make long breaks (for a month or longer). If your body does not get enough exercise, its potential decreases and its resistance to diseases diminishes.

A detailed description of the principles of operation, the method of use and the effects achieved can be found on our website at www.mr-ab.se.

4. Maintenance and storage of the simulator

Before using the simulator for the first time and subsequently after each training it is recommended to take the mouthpiece off, wash everything with warm water using a safe washing product (soap, baking soda, etc), rinse and dry. If necessary, all the parts of the device can be wrapped up in soft tissue and sterilised in boiling water.

Keep the simulator in a dry place at a room temperature in the plastic case which comes together with the device.

Attention: it is forbidden to use the simulator if the plastic has changed its colour or if the device has been chipped, cracked or has other damages which make it unsuitable for use.

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