General

For those living a modern life style it is crucial to achieve an overall improvement of the capacity and quality of breathing. An Israeli ingenious invention enables this kind of improvement with a multi-system approach, using Respine4u.

Normal daily function in modern life involves stress and strain. Stress is managed by the sympathetic nervous system (Fight or Flight), and this response system is balanced and offset by the system that calms - the parasympathetic nervous system which also manages our breathing.

When there is a lack of balance between the calming system and the system that responds to stress, it generates an overreaction of the sympathetic system which responds to emotional stress, at the expense of the para-sympathetic system – which is the calming one. It is natural that when the relaxation system is less pronounced, the quality of breathing is impaired, and it will be less complete and less effective.

Thus, ongoing constant stressful situations disrupt the balance, interfering with the calming system which then functions inadequately and makes efficient breathing difficult.

The stress most of us feel during our waking hours, therefore interferes with our ability to breathe effectively, and gain enough oxygen in the inhalation process for the essential needs of the blood and for the removal of carbon dioxide through exhaling.

Shallow breathing can be felt as a slight motion mostly in the center of the chest, as opposed to deep, full breathing which is felt when the lungs move towards the abdomen and the lower back as well as in the direction of the shoulders, and the upper rib cage.

Shallow breathing means less healthy air, in comparison to complete breathing which fills the lungs and replaces more than 0.5 liters of air, allowing us to feel the top section of the lungs, the shoulders and the upper back.

Breathing that is most beneficial to the human body, occurs under control of the brain, in a state of relaxation devoid of stress.

Resting to generate effective diaphragm breathing on Respine4u – fig.1

We all know expressions such as "I am too busy to breathe" or "I don't have time to breathe"; I may notice that I am not breathing enough, or someone might notice I have stopped breathing and tell me to 'stop a minute, get some air, breathe a little', or they may ask why I am panting… When something traumatic occurs people will tell you to "take a deep breath".

Superficial, shallow breathing in fact, is only partial breathing – through which the volume of approximately half a liter of air is replaced rather than the 3.5 liters which is the volume of full, deep breathing. The maximum capacity of the lungs in a healthy person is 5-6 liters, and even when emptying the lungs breathing out "all the way", there is still a liter of air left in the lungs.

The following factors influence the ability to breathe:	The Biomechanics of the Prone Position while on Respine4u
1. The Brain - the level of connection and transfer of information between the brain and all the organs participating in the respiratory system, and the extent of information the brain receives from the body systems, to control coordinated activation of this mechanism.	Respine4u was developed as a product for wellbeing and convenience to enable the optimal prone position that allows for the changes that occur in the various body systems simultaneously, controlled by the brain and without application of any external strength or intervention.  This enables improved communication between the brain and the body, thereby improving the brain's intake of information from the body systems, to better supervise and manage the body.
2. The Para- Sympathetic system is responsible for regulating breathing –the measure of balance between this and the sympathetic system - for example, when we are physically or emotionally stressed, a feeling of anxiety, distress, fear, nervousness or restlessness, the dominant system in this case is the sympathetic system and we know how difficult it can be to breathe in situations like this.	Lying on Respine4u promotes a state of rest, relaxation, and meditation. This leads to a balance between the Sympathetic and Parasympathetic systems, as well as the use of the diaphragm efficiently for breathing deeply and to the full capacity of the lungs.

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3. Lung activity – the capacity and the ability of the lungs to function at full volume depends on how healthy they are, it depends on air pollution, smoking and other contaminants such as influenza or – hopefully not - an infection or other harmful viruses. Therefore, sensitivity and the absorption of oxygen, particularly in the upper back section of the lungs, will be impacted accordingly.	Lying on Respine4u enables the spine to float, reducing the load of the abdomen and chest from the back system, thereby reducing tension from all the elements of the back system, as occurs when floating in a pool.
4. The Thoracic cavity (chest cavity) and the ribs, their position, the fitness of the muscles system	Lying on Respine4u reduces the impact of the weight of the shoulders and upper thoracic cavity on the upper body. It also reduces the resistance of the force of gravity to one's height when carrying the body and filling the upper lungs. Release of the thoracic muscles and the shoulder girdle thereby enabling efficient expansion. Activating the thoracic cavity against the pallet which spreads the pressure across the entire upper body where it is in contact with the pallet, causing the brain to slow the pace of respiratory system through diaphragmatic breathing and a state of relaxation.

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5. The Diaphragm pushing downwards enables the development of low pressure between the pulmonary pleurae (the membranes covering the lungs) and respectively the filling of the lungs in the air at their lower part towards the abdomen allows them to fill towards the back and at the same time the rib movement at the top of the rib cage allows the filling of the upper lungs.	The state of relaxation generates a balance between the para-sympathetic and sympathetic systems. Breathing regulated by the brain stem and the para-sympathetic system, becomes diaphragmatic breathing during the entire period of use.
6. The head and neck – the position of the head, without bending it forward, backwards, or sideways allows for open airways and proper function of the windpipe for the intake of air into the lungs.	Symmetric Posture - to allow the brain to relax the muscles and the body along the axis of symmetry. Enable to position the head and neck to simulate an upright posture (try breathing with your head bent forward or to the side and see what exertion it necessitates).
7. The functioning of the vertebrae, the discs, and the nervous system in the neck, particularly the C3-C5 vertebrae where the nerves controlling the diaphragm are located. As a result, the transfer of information through the nerves is thereby improved, along with the transfer of information from the spine to the brain.	Lying on Respine4u leads to spinal decompression within a few minutes, reducing the physical stress on the vertebrae and discs and thereby lessening the pressure on the nerves between them.

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8. The shoulders – the position of the shoulders pulled back without slouching forward, allows for efficient breathing and variation of the level of pressure between the pulmonary pleurae (the **Pleura** membranes covering the lungs) upon inhaling and exhaling.	Lying on Respine4u enables positioning of the shoulders without slumping forward (try breathing with your shoulders facing inwards and see what exertion it necessitates).
9. The spine and the back – function of the various tissues, the spine in general and particularly the nerves between the vertebrae and the discs, along T1-T12, the joints between the upper back vertebrae and the ribs; when the nervous system is fully functional and controlled by the brain, and manages the thoracic cavity activity, the ribs and the intercostal muscles.	Lying on Respine4u enables the spine to float, reducing the load of the abdomen and chest from the back, thereby releasing all the elements of the back system, as occurs when floating in a pool. Allowing spinal decompression, reduces the physical stress on the vertebrae and discs thereby lessening the pressure on the nerves between them. Reducing pressure from the back, the spine, the vertebrae and the discs in the neck area, reduction of pressure from the Vagus nerve – which is responsible for the para-sympathetic system (for relaxation) that controls many internal organs including the lungs.

Prone Position on Respine4u for the Elderly

For the elderly, the angle of the ribs is crucial. The normal range of the angle is between 30-45 degrees facing downwards. For those suffering from Chronic Obstructive Pulmonary Distraction (COPD) – a common obstructive lung disease characterized by long-term breathing problems and poor airflow in the bronchi preventing healthy air exchange. This is a progressive disease which includes shortness of breath, coughing and production of mucus that worsens over the years. It is often accompanied by exacerbated events usually as a result of respiratory inflammation.

Due to the fact that their ribs tend to be at a flatter angle, the capacity of the lungs decreases and breathing becomes shallower. When lying in a prone position on Respine4u, all the muscles relax and gradually the sharper angle of the ribs is restored and breathing improves.

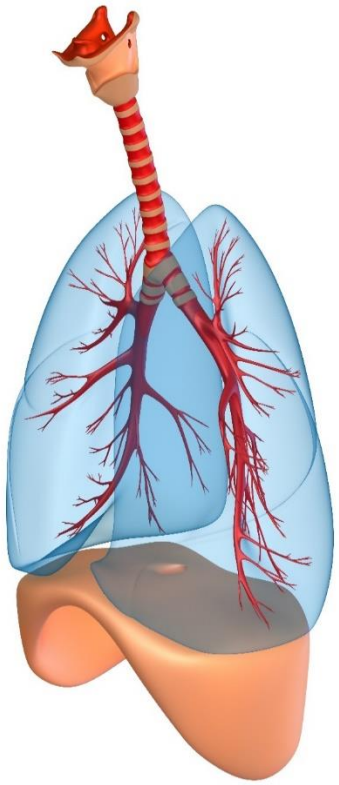
Use of Respine4u allows for spacing of the 12 first vertebrae in the upper back where the attached nerves are responsible for the ribs, thus enabling better spacing between the ribs and improving their mobility.

Breathing

The spontaneous, autonomous mechanism – independent of our will, is what causes us to keep breathing over 15,000 times a day. The lungs take in air according to the body's needs; this is the way we breathe correctly and in the most advantageous manner for the body. It is an autonomous mechanism that is managed in the area of the brain stem, and it automatically involves the function of the calming system.

We feel deep breathing (3.5 liters) not only in the shoulders, but also in the lower back. The lower back is influenced by the function of the diaphragm which generates space for breathing in the abdomen area when the lungs are full in both the upper and lower sections. By generating diaphragmatic breathing, the lungs are able to fill downwards, in the direction of the abdomen, which is why it is so important, as it generates gentle pressure and motion between the vertebrae.

This pressure and movement are essential for the function of the spine and the nervous system that extends from the spine. This inner pressure that is generated in the lungs and the abdomen, is also very important for the function of the intestines, internal organs, the vagus nerve, the main nerve of the parasympathetic system and the immune system.



The muscles which participate in breathing are the diaphragm muscles, the intercostal muscles (between your ribs) which maintain unified motion of the ribs upwards while reducing the spaces between the ribs. Also, the pectoral girdle (shoulder girdle) muscles serve as an anchor counter to the pushing movement generated from the direction of the ribs, upwards. During strenuous intake of breath and shortness of breath, the following auxiliary muscles also contract: the scalene muscles which lift the first and second ribs, the sternum muscles, the clavicle (collar bone) and the mastoid process, which lift the front of the chest towards the head. These muscles assist in expanding the horizontal diameter of the chest. Other auxiliary muscles for inhalation are the wings of the nose, the pharyngeal and tongue muscles, and the muscles of the throat.

It is evident that mechanically, the diaphragm's activity is key, along with various other muscles that support the complexity of the breathing mechanism. Note that chemically, the level of carbon dioxide (CO_2) varies in accordance with the muscles' activity, as the level of carbon dioxide is the trigger for the brain to control breathing autonomously.

When lying on Respine4u, with the muscles of the back in a relaxed state without stress in the muscles of the shoulder girdle, the posterior of the lungs, facing the upper back area will then be serene with a minimum of resistance as a result of reduction of the pressure from the shoulders and the back system.

Yawning is a reflex which so far has not been scientifically explained, but it does serve as a good example for the deepest kind of breathing. After yawning one feels calm and relaxed, apparently the brain is indicating "that's good". Also, after deep inhalations the brain indicates the situation is good and we could feasibly, naturally continue with a series of deep breaths, however that requires an effort and it only occurs when we do it consciously. While on Respine4u, in fact the brain recognizes the relaxed state and it causes the body to continue this efficient breathing.

When coughing for example, particularly forceful exhalation occurs as a result of closing the epiglottis, when the breathing effort occurs against an obstruction and

causes an increase in the pressure in the chest. When the airway is open and the larynx is open, a rapid flow of air out begins.

We wish you good health and ending this situation stronger than ever before,
From the Team at Respine4u.

Available for questions as info@respine4u.com and a link to the website

This message was composed by the Respine4u Team, based on knowledge and practical experience accumulated since 2006 in the field of back pain and the nervous system.

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