

# Breathing

It may seem strange to indicate to you that changing your pattern of breathing could help your problems. This information attempts to explain why.

## ***What is normal?***

The average breathing rate for adults is 8-14 breaths per minute. That is about 4-5 seconds to breathe in and 5-6 seconds out. Air is drawn in through the nose deep into the chest by relaxing and expanding the waist, while breathing in. The normal pattern of breathing involves expansion of the abdomen. This can be readily confirmed by the studying the breathing pattern of young children and animals.

## ***What is the significance of upper chest breathing?***

The pattern of fast and predominantly upper chest breathing can be appropriate, but only in the sense that it resolves an immediate emergency, and then reverts back to slower deeper balanced breathing as soon as the emergency is over. It is good to be unbalanced occasionally as with being able to laugh or cry wholeheartedly. This type of breathing pattern is associated with fright, flight, as well as fun and excitement. The problems arise when this breathing pattern becomes permanent, causing our bodies to stay in an unbalanced, hyperstimulated state. There has to be time for rest and recovery.

# ***Gas exchange perspective***

Breathing rapidly sharply reduces the level of carbon dioxide in the blood. Bringing about a carbon dioxide deficit in the blood (i.e. hypocapnia) through excessive ventilation (increased minute volume) during rapid, deep and dysrhythmic breathing may result in short term and long term physical and psychological complaints and symptoms.

The slight shifts in carbon dioxide chemistry associated with overbreathing may cause physiological changes in the body such as cerebral vasoconstriction (less blood to the brain), coronary constriction (less blood to the heart), blood and extracellular acidosis (increased pH), cerebral glucose deficit (less energy to the brain), bronchial constriction (shortness of breath), gut constriction (irritable bowel symptoms), calcium imbalance, magnesium deficiency and muscle fatigue, spasm (tetany) and pain.

# ***Postural perspective***

We were designed to breathe largely with our diaphragms. The diaphragm is responsible for 70-80% of the work of breathing under quiet breathing conditions. The neck and shoulder muscles - the scalenes, sternocleidomastoids, external intercostals and parasternal intercostals, perform the other 30% of inspiratory work. As soon as we start breathing in our upper chest we bring these upper body muscles into play and this has secondary consequences. The scalene muscles lift and expand the rib cage during inspiration and are active during every inspiratory effort, and are therefore considered a primary muscle and not an accessory muscle. The ribs are also lifted by the parasternal intercostals. The sternocleidomastoid muscles because of their insertion onto the mastoid process and occipital bone, also rotate the back of the head downward. These lifting muscles can create the need for additional stabilising demand from the neck muscles (predominantly posterior), and draw the head and neck forward during upper chest breathing. Tightness in the sternocleidomastoid muscles causes the masseter

(cheek muscles) and the temporalis (muscles at side of head) to become tight and sore.

The pectoralis major, pectoralis minor and trapezius are not typically considered accessory respiratory muscles, but all of these muscles influence the rib cage and act as an extrathoracic anchoring point. Because of their insertions they assist with inspiration and the pulling of the rib cage up and out. With excessive upper chest breathing the shoulders then become rounded, and the trapezius muscles become prominent.

All these muscles then have the potential to become overused and this then leads to corresponding muscle pain and associated symptoms. Typical symptoms include headaches (from tight suboccipital muscles), neck and shoulder pain, chest pain (pectoralis muscles) and the feeling of mucus in the back of the throat (sternocleidomastoid muscles). Until the breathing pattern is corrected, these muscles will continue to be sore.

## ***Possible symptoms of breathing pattern disorders***

Shortness of breath	Fatigue	Feelings of suffocation
Breathlessness	Weakness	Nausea
Chest tightness and pressure	Exhaustion	Sweaty palms
Chest pain	Dry mouth	Light headedness
Cold hands	Dizziness	Fainting
Tingling of skin	Numbness	Blackouts
Heart palpitations	Blurred vision	Irregular heart beats
Anxiety	Stress	Apprehension
Poor memory	Tenseness	Poor concentration
Chronic pain	Headache	Muscle spasms

Stiffness

Stiffness

Abdominal cramps

Throat mucus

Bloating

Poor memory

## **Nose Breathing:**

The first part of good abdominal breathing is breathing through your nose. For some people nasal breathing may be difficult. In some people, this may reflect an underlying structural or nasal lining problem. Problems may be due to environmental factors, such as allergies. This may require a further medical assessment. This poor nasal function may have been an underlying factor contributing towards the faulty breathing pattern. On the other hand, all that may be required is the pain of waking sleeping muscles.

## **Abdominal Breathing - a good place to start is in lying:**

Abdominal breathing using the pump action of the diaphragm is good basic physiological breathing. Preferably with your knees bent - place one hand on the upper chest and the other on the abdomen. Tune into your breathing, feel the rhythm and pattern - ask yourself a few questions: do you nose or mouth breathe? Is the upper hand moving first and most or is it your lower hand?

Focus gently on the out breath. Then try and inhale through your nose and into your abdomen. Commence exhalation at the top of your in breath - don't stop. At the end of your exhalation, it is normal to have a very slight pause before inhaling again.

If this does not work try the following:

- Lift both arms above your head – this helps to fix the upper chest muscles allowing the diaphragm to move
- Nod your head forwards and place your tongue on your hard palate behind your top teeth. Some people find tongue position a key element. The correct tongue position with the teeth apart relaxes the jaw muscles and eliminates clenching. Say the vowel “m”. This will place the tongue on the roof of the mouth behind the upper teeth with the teeth slightly apart. This will relax your jaw and tongue. Relax the shoulders and upper chest; check the looseness of your jaw.
- Breathing in through your nose and out your mouth for 5-6 breaths –this helps release any air still trapped in the upper chest. Breathing out using pursed lipped breathing can be easier as this has been shown to relieve breathlessness, slow the respiratory rate, improve tidal volume and help restore abdominal breathing. Pursed lipped breathing simply means purse your lips as you exhale – like you are about to whistle.
- If you are still having problems really focus on slowing your breathing down; this in itself is often useful in converting yourself to a diaphragmatic breathing pattern. Think to yourself breathe in and breathe out.....
- It is also helpful to place a light weight, such as a wheat bag or packet of rice, over your tummy button (umbilicus) and breathe into this area. This acts as a good feed back tool. Recommended weights vary from 2-8 kg. For beginner’s 1-2 kg is recommended, as the purpose is not to weight lift, but for an awareness of where to breathe into. As you progress, play with heavier weights. This can help improve tone in the abdominal muscles, especially the transversus abdominus, which works in conjunction with the diaphragm to maintain intra-abdominal pressure.

Gently progress from having a pillow under the knees for support to lying down with straight legs. Practice this nasal, low, slow breathing pattern for 5-10 minutes twice a day until you feel it comes naturally.

Sometimes counting can help – try to avoid a too regimented pattern – it should be rhythmical and relaxed.

Suggested counting:

Breathe in 1-2-3

Breathe out 1-2-3 rest.....

To really relax aim to breathe about six breaths per minute. Breathing out should be equal to or slightly longer than breathing in.

## **Further Reading**

Jim Bartley and Tania Clifton-Smith. Breathing Matters. Random House 2006