

Learning How to Breathe

Andy Jancewicz BSc(Hons), PGCHE, Fellow HEA, MRSS(T)

I count myself very fortunate to have had the opportunity to study and work with Leon Chaitow ND, DO during my time at the University of Westminster. Some of you may know that Boris Chaitow (Leon's uncle) together with Stanley Lief DC, DO founded Champneys in 1925 as a naturopathic health resort.

The following article is based primarily on the work of Leon Chaitow and I thank him for permission for the use of his PowerPoint presentation. I strongly believe that shiatsu has more to offer when dealing with respiration or breathing pattern disorders, than any other CAM modality.

Leon has written over 70 health related books (at the last count) including "Multidisciplinary Approaches to Breathing Pattern Disorders". I make no apologies for sharing my enthusiasm to help promote the practice of correct breathing through an understanding of basic physiology.

Respiration

We hardly ever focus on our breathing unless we exercise or develop a condition such as asthma, or a cold. Accomplishing correctly such a common event as respiration can have an enormous affect on our health - on a physiological, physical / structural and emotional level. Most of us as adults breathe within a range of 12 – 20 breaths a minute. However, when you feel tense or anxious you are more likely to take quicker, shallower breaths using your upper chest. Faster breathing is needed when the body requires extra oxygen for emergency action. This is a normal part of the stress reaction –fight or flight response or sympathetic arousal (part of the autonomic nervous system). It keeps the body on alert but this is also a pattern that can easily become habitual as part of a cycle of strain and tension – particularly where there is a background of stress or chronic pain.

As contradictory as it may seem, what a lot of people misunderstand is that correct breathing is not about taking in bigger breaths of air or breathing deeper. At a cellular level the adequate delivery of oxygen to be released in our bodies is very much dependent on the amount of carbon dioxide we retain. For that reason, those essential functions that we allocate wholly to oxygen – muscle, brain, heart and liver, depend on a balance between oxygen and carbon dioxide.

In other words, breathing is not just about taking in the right amount of oxygen, but also about expelling the right amount of carbon dioxide. The Danish physiologist Christian Bohr first described this phenomenon in 1904 and consequently it is known as the Bohr Effect. The Bohr Effect demonstrates that oxygen carried in the blood is released in higher concentration in those tissues that have a higher level of carbon dioxide.

It states that an increase in alkalinity (from a decrease in carbon dioxide such as hyperventilation) increases the affinity of haemoglobin to oxygen, therefore the oxygen molecule is less likely to release its oxygen in an alkaline environment (see Box 1).

Box 1

Hyperventilation Syndrome (HVS) occurs when the rate of breathing exceeds metabolic demands, resulting in haemodynamic and chemical changes that produce characteristic symptoms.

Breathing Pattern Disorders (BPD) include all modifications of “normal” breathing, with HVS as the extreme of this.

NB: the lungs are more alkaline than the rest of the body to enhance oxygen uptake (Levitsky, L. 1995. Pulmonary Physiology (4th Ed.) McGraw Hill).

When you breathe rapidly in an upper chest pattern, you may get rid of too much carbon dioxide and therefore too much carbonic acid with the result that your blood becomes more alkaline than is appropriate for your body's needs (known as “respiratory alkalosis”). When this happens certain unwelcome responses take place automatically in a virtual chain reaction of changes, most notably that you become more sensitive to pain and stressful situations.

Breathing with the upper chest is therefore inefficient and makes you feel less relaxed and more anxious than diaphragmatic breathing – breathing with the belly. Breathing poorly can increase your perception of stress or pain (see Box 2 & Box 3). When we feel stressed or anxious we breathe faster - and breathing faster makes us feel more anxious. Learning better breathing is likely to help ease both pain and stressed feelings.

Box 2

Symptom Summary of Inappropriate Breathing

- **Cardiovascular: palpitations, tachycardia, cold hands and feet**
- **Neurological: dizziness, blurred consciousness / vision**
- **Respiratory: shortness of breath, asthma, chest pain (pseudo coronaries)**
- **Gastrointestinal: dysphagia, epigastric pain, colonic spasm (IBS)**
- **Musculoskeletal: muscle pain (especially thorax), tremors, trigger points, body wise tension**
- **General: anxiety, weakness, exhaustion, sleep problems, increased allergic reactions (+ histamine)**

Multiple influences: biomechanical, biochemical, psychological and environmental

1. Inappropriate breathing can result directly from structural, biomechanical causes, such as restricted thoracic spine or rib immobility or shortness of key or accessory breathing muscles, eg upper trapezius, pectoralis major, sternocleidomastoid, latissimus dorsi, etc.

Texting: Adaptational Demands & Respiratory Consequences

12 students, all familiar with texting, were monitored with surface electromyography (SEMG), skin conductance (SC) from the palm of the non-texting hand, as well as respiration.

Results indicated that ALL subjects showed significant increases in respiration rate, heart rate, SC, and shoulder and thumb SEMG - compared to baseline measures. 83% reported hand and neck pain during texting, and held their breath and experienced sympathetic arousal when receiving text messages. Most were unaware of these physiological changes. The study suggests that frequent triggering of these responses (freezing for stability + shallow breathing) may increase musculoskeletal symptoms.

Lin IM, Peper E 2009 Psychophysiological patterns during cell phone text messaging: a preliminary study. *Appl Psychophysiol Biofeedback*. 34(1):53-57

2. Causes of breathing dysfunction can also have a more biochemical aetiology, possibly involving an allergy or infection which triggers narrowing of breathing passages and subsequent asthmatic type responses.

3. Breathing regulation and control are also affected by our emotions and equally our emotions can affect our breathing. Therefore the connection between emotional distress and breathing is an important cause of many symptoms associated with dysfunctional respiration.

For example, feeling anxious produces a distinctive pattern of upper chest breathing which can adjust blood chemistry. This leads to a chain reaction which reinforces the pattern which produced the dysfunctional breathing in the first place.

The earliest published study relating to breathing and our emotions dates to 1916 and concerned the respiratory changes that accompany anger, disgust, wonder, pleasure, pain and fear as well as laughter and hatred (Feleky A. The Influence of the Emotions on Respirations. *J Exp Psycho* 1916. 1: 218-41).

Even when an altered pattern of breathing is the result of emotional distress, it will eventually produce the structural and biomechanical changes mentioned above.

4. Other catalysts which may impact on breathing function include environmental factors (humidity, altitude, environmental pollution etc).

Box 3

Breathing Disorders may influence pain by;

- **Altering the pH and creating respiratory alkalosis leading to...**
- **Increasing sensitivity to pain, light and sound**
- **Inducing increased sympathetic arousal**
- **Encouraging a sense of apprehension, anxiety**
- **Depleting calcium and magnesium ions**
- **Encouraging smooth muscle cell constriction (eg vasoconstriction, fascial tone etc)**
- **Reducing oxygen release to cells, tissues, brain (Bohr effect) and encouraging ischaemia, fatigue, brain fog, pain**
- **Retarding degradation of circulating histamine (therefore increased allergic reactions)**
- **Creating biomechanical overuse stresses**

Assessment, retraining and treating breathing disorders.

Assessment

- Simple visual and practical assessments of parts of the body associated with respiratory function including assessment for shortness / over activity of postural and accessory breathing muscles.
- The Nijmegen questionnaire provides a very simple non intrusive test of high sensitivity. It is easily administered and is internationally validated. Questions ask about: feelings of constriction in the chest, shortness of breath, accelerated or deepened breathing, inability to breathe deeply, feeling tense, tightness around the mouth, stiffness in the fingers or arms, cold hands or feet, tingling fingers, bloated abdominal sensation, dizzy spells, blurred vision, feeling of confusion or losing touch with the environment.

Retraining

We can help our clients by teaching them how to breath in a more beneficial way. Firstly, experience shows that when people feel they are not getting enough oxygen they tend to focus on breathing in, instead of breathing out. Therefore we can switch this relationship, so the focus is on a gentle longer out breath.

Secondly we can teach our clients to breath from the diaphragm as opposed to their upper chest. This should help the client retain carbon dioxide.

Thirdly we can introduce our clients to simple easy to learn practical breathing rehabilitation techniques. Anti arousal breathing re-training via pursed lip breathing, control pause, restricting shoulder rise, Brugger's relief position etc.

Caution: higher levels of carbon dioxide and an increased supply of oxygen to the brain can make you feel slightly dizzy after or during the above exercises. Sit quietly until the feeling passes. It is perfectly normal and will gradually stop happening as your body learns to tolerate the effects of slower breathing.

Chanting, prayer & breathing

Respiratory (and cardiovascular) effects of rosary prayer ('Ave Maria' in Latin) and recitation of a yoga mantra were assessed – compared with spontaneous breathing. Results were similar, showing a slowing of respiration and synchronisation of all cardiovascular rhythms. This influence on autonomic activity, represented by THM (Traube-Hering-Meyer) oscillations, may offer great benefits to health.

Bernardi L Sleight P et al 2001 Effect of Rosary Prayer and Yoga Mantras on Autonomic Cardiovascular Rhythms. British Medical Journal 323: 1446 – 1449

Treatment

- Manual rehabilitation strategies like shiatsu and sotai- especially those modalities that incorporate stretching into their treatment repertoire.

Correlation Between Faulty Breathing Mechanics & Musculoskeletal Pain ?

A convenience sample of 111 patients attending a chiropractic clinic were evaluated for links between their health, pain histories and faulty breathing criteria, including obvious paradoxical breathing, or a tendency to raise the upper chest to initiate inhalation. 56.4% demonstrated faulty breathing on relaxed inhalation, rising to 75% when taking a deep breath. 87% reported a history of various musculoskeletal pain problems. Only neck pain had a significant correlation with dysfunctional breathing patterns ($p = 0.039$) "Chances are 3 in 4 that new patients seen today will have faulty breathing patterns"

Perri M Halford E 2004 Pain and faulty breathing: a pilot study

Journal of Bodywork and Movement Therapies 8:237-312

- Postural exercises and methods eg; qi gong, yoga, meditation, stress management, counselling etc.

Pranayama Breathing

Cappo and Holmes among many others, have shown that breathing retraining is a valid and highly successful approach and in particular have incorporated into their methodology a form of traditional yoga breathing which produces specific benefits which have gone largely unrecognised in the protocols of most other workers. The pattern calls for a ratio of 1:4 if possible, but in any case for exhalation to take appreciably longer than inhalation. Research indicates that this pattern markedly lowers arousal.

Cappo B, Holmes D 1984 Utility of prolonged respiratory exhalation for reducing physiological and psychological arousal in non-threatening and threatening situations. J Psychosomatic Research 28(4) 265-73

I take an eclectic approach in my shiatsu practice and try to make full use of my varied skills. As well as teaching one-to-one breathing rehabilitation techniques to my clients in my private practice, I also use the techniques as part of group activities when working with various organisations, for example the “Carers Wellbeing Initiative” or “Hastings Mental Health NHS Trust” when supporting carers with anxiety or depression or alternatively “ASK” (Arthritis Support Kent) when supporting people who might be in pain.

I regularly teach a simple neck and shoulders shiatsu routine (working on accessory breathing muscles) to group participants who work on each other under my supervision and then combine this with practical breathing rehabilitation techniques mentioned above and some simple qigong exercises. I try to be creative and use all my transferable skills and knowledge.

Group activities and relaxation classes which teach practical breathing rehabilitation and stress reduction techniques, combined with movement therapies such as tai chi, qigong or yoga, can be very cost effective interventions. Additionally self help preventative exercises can help reduce the risk of symptoms reoccurring.

To summarise - Breathing Pattern Disorders are; commonly habitual, easily recognized, usually capable of being improved or eliminated.

As shiatsu practitioners not only do we practice a bodywork modality ideally suited to addressing these conditions but we also possess many transferable skills that can help us to re-educate our clients. These include qigong, yoga, meditation etc. Additionally simple practical breathing rehabilitation techniques such as anti arousal, diaphragmatic or pursed lip breathing, are easy to learn, under the client’s control, fit in with their daily life, take a few minutes to practice, need no equipment and cost nothing to put into practice.

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Andy was the Director of Education for the Shiatsu Society UK 2013 - 2018. He practices in East Sussex and West Kent and teaches CPD workshops for CAM therapists in London and the south east. You can contact him via email carers.wellbeing@gmail.com