

Understanding and Rehabilitating Unbalanced Breathing

By Leon Chaitow, ND, DO

In the October issue of *Massage Today*,¹ I outlined some of the symptoms that can be created or aggravated by Breathing Pattern Disorders (BPD) such as hyperventilation.

The response to this has been remarkable. I honestly can say that in the many years I have written articles and books, I have never had such a rapid and insistent response asking for more information. This follow-up article goes a small way toward meeting those requests.

This article contains information focusing on three overlapping areas: the background to BPDs, how to recognize BPD in a new client and how to begin rehabilitation. More detailed information can be found in my co-authored book published by Elsevier, *Multidisciplinary Approaches to Breathing Pattern Disorders* (Chaitow, Bradley & Gilbert 2002).

Back pain research and breathing rehabilitation²

A very recent research paper has been published that demonstrates another aspect of the benefit of breathing rehabilitation improvement in chronic low back pain! In this randomized, controlled study, patients with moderate chronic low back pain, of average 1-year duration, improved significantly (both pain and function) whether they were treated with either Breathing Rehabilitation or what was described as "Gold Standard" Physical Therapy. Both groups received one introductory evaluation session of 60 minutes, and 12 individual therapy sessions of equal duration of 45 minutes, over six to eight weeks.

Summary of some of the main BPD effects:³

Excessive carbon-dioxide loss causes blood pH to rise, creating respiratory alkalosis. This induces increased sympathetic arousal, altering nerve function (including motor control). It also encourages a sense of apprehension and anxiety which affects balance. Calcium and Magnesium ions are lost as the kidneys

attempt to restore pH balance by excreting bicarbonate. This enhances neural sensitization, encouraging spasm and reducing pain threshold. Smooth muscle cells constrict, leading to vasoconstriction (and possibly altering fascial tone). Smooth muscle constriction can lead to colon spasm and pseudo-angina. Due to alkalinity, the so-called Bohr effect reduces oxygen release to the cells because haemoglobin retains oxygen more effectively in an alkaline environment, thus affecting tissues and the brain, encouraging ischemia, fatigue and pain. Ischemia encourages the evolution of myofascial trigger points. Overbreathing creates biomechanical overuse stresses, particularly on the accessory breathing muscles (scalenes, sternomastoid, upper trapezius, etc), as well as compromising core stability and posture.

Breathing Pattern Disorders commonly are habitual, easily recognized and usually capable of being improved or eliminated.

Background and Definition of Breathing Pattern Disorders

The extreme of a BPD is hyperventilation, which is defined as breathing in excess of metabolic requirements. A client might show an odd arrhythmic breathing pattern and not be hyperventilating, and perhaps more importantly, might look as if they are breathing okay, but actually be hyperventilating even if apparently fit with good lung function.

About 10% of all patients attending general internal medicine practice in the U.S. are estimated to be suffering from chronic hyperventilation.⁴ My own clinical experience with this sort of problem suggests that a large patient population exists with BPDs who don't meet the criteria for hyperventilation, but whose breathing patterns contribute greatly to their symptom picture.

What are the Symptoms?

The vast majority of patients who chronically overbreathe in this way present with symptoms such as: fatigue, widespread pain (such as fibromyalgia), irritable bowel symptoms, chronic bladder problems, anxiety, allergies, chemical sensitivities, headaches, premenstrual syndromes, photophobia and hyperacusis. In many such conditions, BPDs rarely are causal (except perhaps where anxiety is a major feature), but they almost always are contributory, and sometimes have become a major obstacle to recovery.

As will become clear, the effects of BPDs are global, affecting all systems, having profound neurological, psychological, digestive and circulatory influences. BPDs commonly are habitual, and with a cooperative patient, usually are capable of significant improvement and are sometimes curable over a three to six month

time-frame. Chronic HVS can present with respiratory, cardiac, neurological or GI symptoms, without any clinically apparent overbreathing by the patient.⁵

BPDs More Common in Women

HVS/BPD is female dominated, ranging from a ratio of 2:1 to 7:1 (peak ages 15-55 years). Women are more at risk possibly because progesterone is a respiratory accelerator. This also can have implications for women on hormone replacement therapy. During the post-ovulation phase, carbon dioxide levels drop about 25% and additional stress then "increases ventilation at a time when CO₂ levels are already low."⁶

Blood Sugar and BPD

Feelings of faintness, cold sweats, weakness and disturbed consciousness are common to both hyperventilation and low blood sugar, and symptoms are far worse when both situations are present at the same time.

- During overbreathing both EEG and cortical function deteriorate when glucose values are below 100 mg.⁷
- Three minutes of hyperventilation presents mild effects when blood sugar is in the 85-90mg% range, but with blood sugar at 70-75% (still within normal range), gross EEG disturbances are noted.⁸

It also has been found that fluctuating blood glucose levels, even when these stay within normal limits, can trigger hyperventilation/BPD symptoms. People affected in this way are recommended to eat breakfast (including protein) and to avoid going without food for more than three hours or following a little-and-often, or grazing pattern of eating. This particularly is important to patients who experience panic attacks or seizures.⁹

Perspective of a Cardiologist

Peter Nixon a leading UK-based cardiologist reported: "When dysfunctional thoracic breathing predominates, a shift occurs towards excessive arousal, which as a catabolic state predisposes the soma towards pathology."¹⁰ Someone suffering from BPD could experience catabolic changes; protein, fat and carbohydrate synthesis halted; energy mobilized from increased breakdown of protein, fat and carbohydrates; blood levels of glucose, LDL and cholesterol increase; decrease in repair and replacement of bone; decrease in repair and replacement of skin and gut cells; decreased production of immune cells

(thymus shrinks, less WBCs); decreased sexual function; increased blood pressure; and increased salt and fluid retention.

Why do people breathe this way? One of the major medical researchers into BPD, Claude Lum, discussed the reasons for people becoming hyperventilators, "Neurological considerations leave little doubt that habitually unstable breathing is the prime cause of symptoms. Why people breathe in this way must be a matter for speculation, but manifestly *the salient characteristics are pure habit.*"¹¹

Diagnosis

Although an absolute diagnosis only can be made with CO₂ monitoring using a capnograph that monitors carbon dioxide levels in exhaled air, a simple questionnaire (Nijmegen Questionnaire) is internationally accepted as being over 90% accurate in *suggesting* that hyperventilation exists as a contributory feature of person's symptom picture. This non-invasive test is a simple and accurate indicator of acute and chronic hyperventilation.^{12, 13}

What Patient Signs Might Alert You to BPD?

- Restlessness (type A, "neurotic") look for rapid, fidgety behavior and movement.
- "Air hunger" and sighing "air hunger" describes an attempted inhalation performed almost as a gasping effort, trying to force air into lungs that have not exhaled.
- A rapid swallowing rate (aerophagia) - often resulting in bloating.
- Poor breath holding times shown by an inability to comfortably (i.e. without strain) hold the breath out for more than 10 to 15 seconds. This suggests poor carbon dioxide tolerance as "normal" and is considered to be around 30 seconds.
- A perceptible rise of the shoulders on inhalation suggests chronic overactivity of the accessory respiratory muscles and the likelihood they will contain active trigger points.
- Obvious paradoxical breathing ("hi-lo" test) with a hand on the chest and a hand on stomach (the upper hand moves first on inhalation, demonstrating an inappropriate pattern).
- Visible "cord-like" sternomastoid muscles suggesting overuse of the accessory breathing muscles.
- A rapid breathing rate over 18 per minute (although this might not be obvious).
- Symptoms including muscular stiffness and aching (particularly of the neck and shoulders), fatigue, brain-fog, IBS, chronic pain, anxiety, panic, phobias, cold extremities, paraesthesia,

photophobia/hyperacusis and comments such as, "I can't take a deep breath."

- A positive Nijmegen questionnaire test, and/or capnometry evidence.

Possible Treatment Sequence for HVS/BPD

Note: The sequence outlined below is one I have evolved for my own practice and is not a recommendation for others. It does however contain the elements I feel are necessary for a successful restoration of breathing. Treatment and retraining commonly involves eight to 12 weekly sessions, followed by treatment every two to three weeks, for approximately six months. An educational component should be included at each session.

First Two Treatments: (Not less than weekly): release and/or stretch of upper fixators of the shoulders/accessory breathing muscle (upper traps, levator, scalenes/SCS, pecs, lats) as well as attention to trigger points in these; soft tissue (NMT, MET, PRT, etc) attention to the diaphragm area (anterior intercostals, sternum, abdominal attachments costal margin, quadratus lumborum/psoas), as well as attention to trigger points in these. Retraining: pursed lip breathing, as well as guidance as to restricting shoulder rise during inhalation. Give an introduction of the capnograph biofeedback method.

Sessions (Weeks) Three and Four: As above, plus mobilization of thoracic spine and ribs (as well as lymphatic pump/drainage methods), plus address fascial and osseous links (cranial, pelvic, limbs). Retraining: anti-arousal breathing, plus specific relaxation methods, stress management, autogenic training, visualisation, meditation, counselling. Sessions of capnograph biofeedback training as required.

Sessions (Weeks) Five to Twelve: As above, plus focus on other body influences (ergonomics, posture). Retraining: additional exercises as appropriate.

Sessions (Weeks) 13 to 26: Review and treat residual dysfunctional patterns/tissues. Throughout: as indicated nutrition, psychotherapy and adjunctive methods, such as hydrotherapy, tai chi, yoga, Pilates, massage, acupuncture, etc.

Successful breathing retraining

There have been many reports and studies showing the value of breathing rehabilitation.¹⁴ Lum¹⁵ reported on a study in which more than 1000 anxious and phobic patients were treated using breathing retraining, physical therapy and relaxation. Symptoms were usually abolished in one to six months with some younger

patients requiring only a few weeks. At 12 months, 75% were free of all symptoms and 20% had only mild symptoms however, about one patient in twenty had "intractable symptoms."

Instructions for Anti-Arousal/Pursed Lip Breathing ^{16 17 18 19}

Place yourself in a comfortable (seated-or reclining) position, and exhale slowly and fully through pursed lips (as though you are blowing through a drinking straw), with your lips just barely separated. Imagine that a candle flame is about 10 inches from your mouth and exhale (blowing a thin stream of air) in such a way as to not blow this out, but to just make it flicker. When you have exhaled fully, without strain, close your lips and pause for a count of one and then inhale through your nose. The complete exhalation will have created a "coiled spring" so you do not have to try to control how you inhale. Then, without pausing to hold the breath, exhale fully and slowly through pursed lips once again, blowing the air in a thin stream until you feel the need to inhale. Close your lips, pause for a count of one, and then inhale freely through the nose again. Repeat the inhalation and the exhalation for not less than 30 cycles of in and out. Practice this exercise morning and evening. You might feel light headed after the 30 cycles, so rest for a few minutes before resuming normal activities.

Shoulder restraint

Methods need to be taught to encourage the restraining of shoulder movement (accessory muscle activation) during breathing using one of a variety of methods. For example: The patient is seated at the edge of a chair with arms hanging down, palms facing forward. On inhalation, the patient gently turns the arms so the thumbs point slightly backwards, and on exhalation this is released and relaxed. The rhythmic breathing pattern, along with this gentle restraint of accessory breathing muscles, starts the process of separating the act of inhalation from their over-activity.

The information in this short article has focused on the background, appearance, assessment and rehabilitation of breathing pattern disorders these are not pathologies any more than poor posture is a pathology but they can profoundly influence emotions, chemistry and structure. I sincerely hope you can use the essential features of this message to benefit your clients and perhaps yourself.

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