

Please do not discard. The following information might help a friend.

The purpose of this booklet is to draw attention to a rational new approach to reversing asthma and the many related chronic hyperventilation disorders.

For more information on chronic hyperventilation syndrome and Buteyko therapy, see:

<http://members.westnet.com.au/pkolb/buteyko.htm>

Technical Companion Booklet:
“Buteyko — For the reversal of Chronic Hyperventilation”

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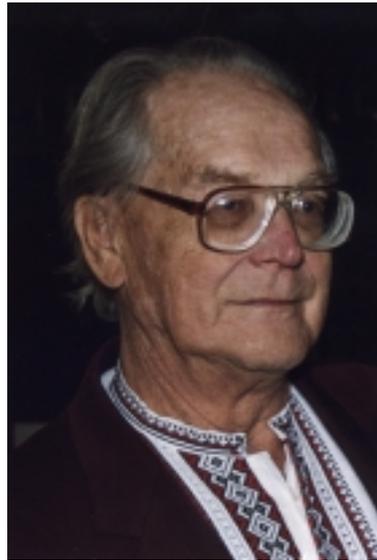
WHY YOU HAVE ASTHMA

You have asthma because you have been habitually breathing more air than your body requires. This holds for all asthmatics, no matter what “type” of asthma they have.

It was in Russia that this discovery was made by medical doctor and scientist, Professor Konstantin Buteyko. Naturally it surprises many asthmatics who feel they are not getting enough air and may even be suffering from severe airway obstruction.

In fact, the health problems resulting **from breathing too much** are vast and varied and have been described in the medical literature for the whole of the last century. **Every part of your body, every organ and every system is affected by over breathing.**⁸ This disorder has been given many names¹⁴, but *Chronic Hyperventilation Syndrome (CHVS)* describes best the huge complex of symptoms to which it gives rise. What is still puzzling those doctors familiar with CHVS is why this elementary piece of medical science has remained hidden in the medical journals.^{8,10}

The good news is that Professor Buteyko has developed a simple therapy that teaches you to make a habit of breathing less. This will reverse the disorder together with its symptoms, including asthma.

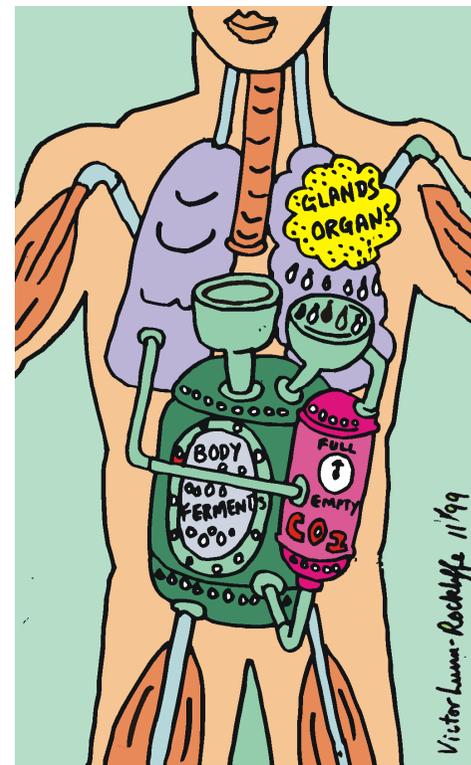


K.P.Buteyko

HOW BREATHING TOO MUCH MAKES YOU SICK

Breathing is a mechanism for regulating the acidity of the blood through the controlled release of carbon dioxide.

The body does not have to **regulate** Oxygen since under normal breathing conditions the blood holds just about as much oxygen as it can. If you hyperventilate (breathe more than you need to), you don't get any more oxygen. **Too much breathing flushes out too much of that valuable carbon dioxide.** As will be shown later, with insufficient carbon dioxide not enough oxygen can get to the brain, and as a result you become dizzy and faint.



A popular myth is that carbon dioxide is nothing more than a waste product. Yet it is as important to life as is water, which is just as much a waste product.

The body contains a complex biochemical factory, which produces hormones, enzymes, and everything needed to keep you healthy. Many hundreds of biochemical processes rely on the right mix of carbon dioxide in water to make the right products in the right

quantities.

If you breathe too much for too long, **over breathing becomes a habit** and you develop a **chronic shortage of carbon dioxide**^{4,8,12,13}.

Since all the chemicals the body manufactures and all the body's control functions depend on carbon dioxide⁷, a shortage upsets the entire biochemical balance of the body⁸ leading to a whole host of disorders. Some of these, commonly found in the medical literature, are listed at the back.

But apart from the massive disturbance to the body's biochemistry, a shortage of carbon dioxide has two other very important effects.

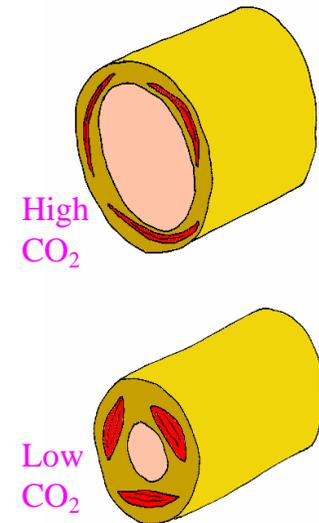
1. Poor oxygenation of tissues: Haemoglobin is the component of blood that collects oxygen from the lungs and delivers it to the body's tissues where it is needed. **Carbon dioxide helps to unload the oxygen.** This basic physiological principle is known as the **Bohr effect** and has been understood for a long time. The importance of this lies in the fact that if the baseline level of carbon dioxide is low, then oxygen is



not fully released from the haemoglobin when it is required, and goes back to the lungs on a wasted trip. **The result is that if you breathe more than you need to, your cells actually get less oxygen, resulting in a feeling of breathlessness which makes you try to breathe even more.**

2. Smooth Muscle spasm: Low carbon dioxide is known to cause **spasm in the smooth muscle** found in the walls of blood vessels, the bronchioles of the lungs, ducts, glands and the gut.^{3,4,8,12,13} **Reduced blood**

flow resulting from narrowing of the blood vessels due to spasm of the smooth muscle, together with the depressed Bohr effect can cause **migraines, fainting, angina pains and high blood pressure.**^{3,12} Spasms are known to occur in the duodenum and in the gut producing conditions such as **spastic colon and irritable bowel syndrome.**¹² The spasm in the bronchioles **produces wheezing as found in asthma**^{3,4,8,12,13}.



ASTHMA

The two major components of asthma are bronchospasm and inflammation of the airways

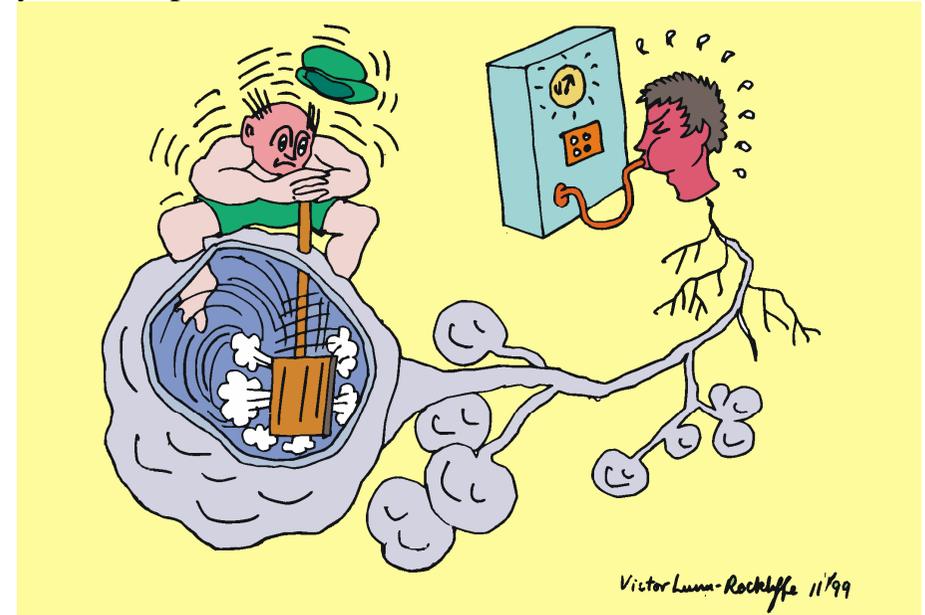
1. Bronchospasm

The bronchioles are the tiny end branches of the respiratory tract. These little tubes carry air into the sac-like alveoli where the gas exchange between air and blood takes place. The alveoli are very tiny, a pair of lungs containing some 500 billion of them. In the walls of the bronchioles you find



the smooth muscle standing guard at the entrance to the alveoli. Its function is to regulate the amount of air going into the alveoli in order to even out ventilation throughout the lungs.

In asthmatics the baseline shortage of carbon dioxide pushes the bronchioles near to a state of closure, making them twitchy and quick to react to any further momentary increase in breathing. A stressful thought, a stressful allergen or even a hearty laugh can push them over the edge. So when your doctor asks you to take a deep breath and blow into a spirometer or peak flow meter, you shouldn't be surprised if you end up with an asthma attack. In fact, the instrument is



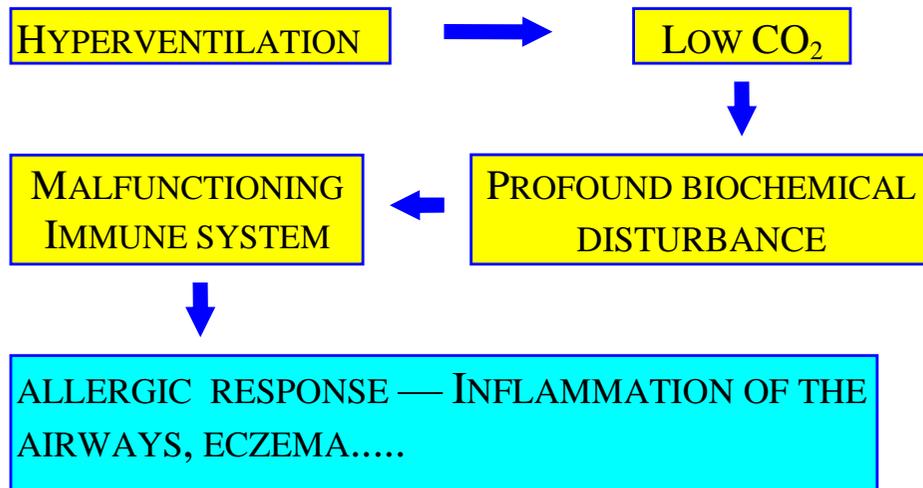
really measuring your lungs' ability to respond to over breathing. The lungs of asthmatics have bronchioles that are particularly good at doing their job. For this reason, according to the Buteyko theory, these tests are not considered useful indicators of disease.

2. Inflammation of the airways

Professor Buteyko tells us that allergic inflammation of the lungs is the result of a malfunctioning immune system. This

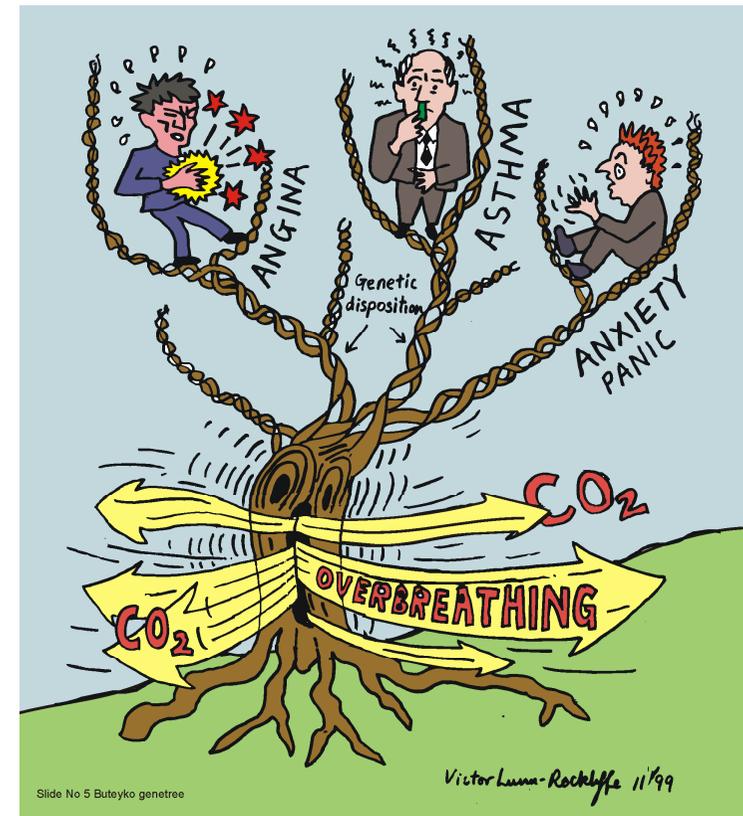
is the consequence of the biochemical disturbances caused by an abnormally low level of carbon dioxide.

Your immune system is a finely tuned biochemical warfare mechanism designed to seek out invaders and destroy them. It has to distinguish between invaders that will cause you harm and the harmless material you get in your blood after a meal, or some pollens you may have inhaled. **The immune system cannot function properly if its biochemical building blocks are disturbed.** People who have abnormal allergic reactions have an immune system which is failing to perform its functions correctly. In the case of arthritis, the disorder causes the body's immune system to turn on itself. In asthmatics the immune system has trouble differentiating between serious and harmless foreign material. That's why harmless pollens can cause inflammation of the airways, triggering hay fever or even asthma in people who breathe too much.



WHY DO NOT ALL HYPERVENTILATORS GET ASTHMA?

So why do some people who breathe too much get asthma, others get arthritis and others get high blood pressure?



The answer is that it depends very much on genetic predisposition. We are as different from each other internally as we are externally. As one biochemical process after another becomes affected by low CO₂, the way the body compensates is very individual, varying from person to person. That's why not everyone who habitually hyperventilates gets asthma.

WHAT CAUSES CHRONIC HYPERVENTILATION?

There are many factors that can make you habitually breathe too much. One of them is the popular idea that breathing more than you need is good for you, although there is no scientific basis for this notion. Eating too much, not exercising enough and keeping too warm can also make you breathe too much. But the one we all know to be the cause of many diseases is chronic stress. And this is how it works:

The body sometimes deliberately produces a shortage of carbon dioxide. It does so as part of a process designed to deal with a physical threat to life



known as **the fight or flight response**. A chain of biological changes comes about as we are faced with a life threatening situation. These are intended to enhance our chances of survival.



All stresses we face, including pleasant ones, elicit this response to some extent. We are familiar with the sweaty palms, pounding heart, **rapid breathing** and heightened nervous activity whether before an exam, a romantic encounter or from seeing moving shadows in a dark alley.

These effects are very real and are well understood by doctors. They cause no harm provided the stress is properly

discharged and it is **short lived**. But today we face new kinds of stresses for which we were not designed.

If the stress lasts for a long time, then biochemical changes take place inside the body that makes breathing too much become a habit.

Stresses faced by modern man often remain undischarged and linger on for a very long time. Examples include work related stresses, social stresses and financial worries.

STRESS → HYPERVENTILATION

**HABITUAL
STRESS × TIME → HYPERVENTILATION**

The resulting low carbon dioxide causes many of the normal fight or flight responses intended for preservation of the individual to turn into debilitating disorders.

HOW DOES BUTEYKO THERAPY HELP?

In the same way that over breathing for too long becomes a habit, so Buteyko therapy reverses this process. **By learning to breathe less over a long time you can restore CO₂ back to a healthy level. The effect of this is that hyperventilation disorders, such as asthma, disappear as your CO₂ level is raised.**

Learning to do this is something like learning Yoga or a martial art. Typically you are taught the method by a Buteyko practitioner who will:

- Explain your condition to you.
- Demonstrate the posture and breathing technique that will help you reduce your breathing.
- Ensure that you perform the breathing exercises correctly.
- Teach you how to measure your breathing correctly.
- Advise on life style changes as they affect you personally.
- Help identify problems that may hold up your progress.
- Provide motivation, support and follow up.



SYMPTOMS OF HYPERVENTILATION SYNDROME

See references p15-16

Biochemical

Electrolyte changes^{4,12}
Elevated Lactic Acid⁸
Elevated lipids¹²
Elevated calcium ionisation inside cells¹²
Elevated sugar levels¹²
Hypophosphatemia^{10,13,15}
Accommodation to low CO₂^{4,12,13}
Elevated uric acid¹²
Loss of CO₂ and base reserve^{8,12}
Low Calcium ions⁸
Poor oxygenation due to Bohr effect^{4, 8,13}



Cardio-vascular

Palpitations^{1,3,4,8,10,12,13,}
Cardiac neurosis^{1,3,12}
Angina pain¹²
Myocardial infarction¹²
Wolfe-Parkinson-White syndrome¹²
Arrhythmias^{3,4,12}
Stenosis of coronary artery^{4,12,13,15}
Tachycardia^{3,8,12,14,14}
Failure of coronary bypass grafts¹²
Right ventricular ectopy¹²
Silent ischaemia¹²
Elevated blood pressure¹²
ECG: Flat or inverted T-wave^{4,12,13,14}
Vasoconstriction^{3,4,8,12,13}
Reduced cerebral blood flow^{3,8,10,13,15}
Mitral prolapse^{1,3,12,14}
Low cardiac output/stroke volume¹⁵

Digestive

Spastic colon¹²
Dysphagia^{3,8}
Dry mouth^{1,10,15}
Flatulence and belching^{1,3,10,15}
Irritable bowel syndrome¹²
Dry throat^{3,15}
Hiatus hernia¹²
Duodenal spasm¹²
Globus^{3,8,14,15}
Vomiting⁸
Bloating^{8,10}
Constipation⁸
Epigastric Pain⁸
Aerophagia^{3,8,12,14}
Diarrhoea⁸

General

Migraines^{3,12}
Failure of Transurethral resections¹²
Edema¹²
Restlessness¹²
Da Costa's Syndrome^{10,12,13}
Excessive sweating^{3,13,14}
Burnout¹²
Raynaud's disease^{8,12}
Chest Pains^{1,3,4,8,10,12,13}
Post traumatic stress disorders¹²
Weakness, listlessness^{1,3,8,10,12,13}
Genito-urinary disturbances^{3,12}
Nausea¹⁴
Renal colic¹²
Influenza-like symptoms¹²
Sleep disturbances^{3,8,12,15}
Exhaustion³
Fatigueability, exercise intolerance^{8,10,14,15}

Neuro-muscular

Muscular stiffness and aching^{8,12}
Myalgia (muscle pain)^{3,8}
Cramps³

Muscle spasm^{3,4,8,12,13}

Tetani^{3,8,15}

Fibromyositis¹⁵

Head and Back pain¹⁴

Tremors or shaking^{3,8,14}

Neurological

Paresthesia, numbness^{1,3,4,8,10,12,13}

Twitching Eyelids⁸

Headaches⁸

Increased sympathetic tone^{8,10,13,14,15}

Nerve irritability threshold altered¹⁵

Decreased parasympathetic tone³

Unilateral paresthesia or numbness(left)¹⁴

EEG abnormalities¹³

Diplopia⁸

Syncope, fainting^{3,4,8}

Feeling of chilliness¹⁴

Hot/cold sensations¹⁴

Visual Disturbances^{3,4,8,13,15}

Dizziness, light headedness, giddiness^{1,3,4,8,10,13}

Intolerance of bright light & noise³

Hyperactivity³

Auditory Disturbances⁴

Seizures, epileptic fits^{4,8,13}

Psychologic

Tension^{3,8,15}

Fear of insanity³

Depersonalization^{3,14}

Hallucination³

Lack of concentration and memory loss^{1,3,15}

Nightmares^{3,8}

Unreal feelings^{3,14,15}

Panic attacks^{3,12}

Anorexia¹⁰

Depression¹⁰

Feelings of inadequacy¹⁰

Anxiety^{8,12,13,15}

Maladjustments in life¹⁰

Phobias^{1,3,8,10,12}

Obsessional behaviour¹⁰

Respiratory

Asthma^{3,4,8,12,13}

Choking¹⁴

Chest Tightness^{3,4,8,13}

Irritable cough^{3,8,15}

Sighing and yawning^{3,8,13,14,15}

Dyspnea^{4,10,12,13,14}

Bronchoconstriction¹⁴

Shortness of breath, air hunger^{1,4,8,10,12,13}

5. Guyton AC, Hall JE, "Textbook of medical physiology", Chemical control of respiration, PUBLISHER: WB Saunders; ISBN:0-7216-5944-6; 1996; EDITION: 9; PAGES: 527-528.
6. Hibbert GA, Pilsbury DJ, "Demonstration and Treatment of Hyperventilation Causing Asthma", British J. of Psychiatry, VOL 153, 1988, 687-689
7. Kazarinov VA, "Buteyko Method: The experience of implementation in medical practice", The biochemical basis of KP Buteyko's theory of the diseases of deep respiration, EDITOR: Buteyko KP; PUBLISHER: Patriot Press Moscow; 1990; PAGES: 198-218. [Available: <http://www.wt.com.au/~pkolb/biochem.htm>]
8. Lum LC, "Hyperventilation: The tip and the iceberg", J Psychosom Res, VOL 19, 1975, 375-383
9. Magarian GJ, "Hyperventilation syndrome: infrequently recognized common expressions of anxiety and stress.", Medicine, VOL 61, 1982, 219-36
10. Magarian GJ, Middaugh DA, Linz DH, "Hyperventilation Syndrome: a diagnosis begging for recognition", West J Med, VOL 138, 1983, 733-736
11. McFadden WR, Lyons HA, "Arterial-Blood Gas Tension in Asthma", The New England Journal of Medicine, VOL 278:19, 9 May 1968, 1027-1032
12. Nixon PGF, "Hyperventilation and cardiac symptoms", Internal Medicine, VOL 10:12, December 1989, 67-84
13. Sher TH, "Recurrent chest tightness in a 28-year-old woman", Annals of allergy, VOL 67, September 1991, 310-314
14. Tavel ME, "Hyperventilation syndrome - Hiding behind pseudonyms?", Chest, VOL 97, 1990, 1285-1288
15. Waites TF, "Hyperventilation - chronic and acute", Arch Intern Med, VOL 138, 1978, 1700-1701

REFERENCES

1. Bass C, "The hyperventilation syndrome", Respiratory Diseases in Practice, Oct/Nov 1990, 13-16
2. Bowler S, Green A, Mitchell C, "Buteyko breathing and asthma: a controlled trial", Medical J. of Australia, VOL 169, December 1998, 575-578
3. Cluff RA, "Chronic Hyperventilation and its treatment by physiotherapy: discussion paper", J of the Royal Society of Medicine, VOL 77, September 1984, 855-861
4. Demeter SL, Cordasco EM, "Hyperventilation syndrome and asthma", The American Journal of Medicine, VOL 81, December 1986, 989-994

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