A breathing discovery

At the end of the last century Austrian physiologists Breyer and Gering made a sensational discovery – man is the only biological specimen on earth who had not developed a correct way of breathing. All other beings know how to breathe, but not humans. Just observe those around you carefully and you will find that people breathe differently. Some breathe deeply, others superficially, some faster, others slower, with pauses and some without.

NORMAL BREATHING

Russian Medical Scientist Professor Konstantin Pavlovich Buteyko has devoted over 40 years of research into breathing and in the process discovered that only one in ten people breathe correctly. Natural or normal breathing results in a very specific accumulated gas mixture that our organism requires to function properly.

THE MYTH BEHIND DEEP BREATHING

Traditional wisdom tells us that deep breathing is the best as it is thought to provide the most oxygen. We inhale oxygen and exhale carbon dioxide and the conclusion that is drawn is that oxygen is good for us and carbon dioxide is harmful. When Professor Buteyko was first analysing his patients he discovered that those who were sick breathed much more than those who were healthy; that is, their tidal volume, depth and frequency was greater. Could it be that “breathing deeply” is in fact contributing to ill health?

THE OXYGEN PARADOX

In 1871 the Dutch doctor De Costa discovered the “Hyperventilation Syndrome” whereby deep breathing in a relaxed state caused dizziness and sometimes fainting. This is often incorrectly attributed to oxygen saturation. According to the Verigo-Bohr effect, it is the ratio of carbon dioxide to oxygen which permits the release or retention of oxygen from the blood.

At the end of the last century Russian physiologist Verigo and Danish scientist Bohr independently discovered that without carbon dioxide, oxygen is bound to the haemoglobin of the blood and simply does not work. This consequently leads to oxygen deficiency in the tissues of the brain, heart, kidneys and other organs and a raising of blood pressure.
Strange as it may seem, oxygen deficiency is not caused by lack of oxygen but by the lack of carbon dioxide! If we breathe too much we get less oxygen.

HOW MUCH CARBON DIOXIDE DO WE NEED?

For the cells of the brain, heart, kidney and other organs, our blood requires a concentration of: 6.5% carbon dioxide and only 2% oxygen.

THE AIR THAT WE BREATHE CONTAINS 200 TIMES LESS CARBON DIOXIDE THAN WE NEED AND 10 TIMES MORE OXYGEN THAN WE NEED.

The function of our respiratory system is not just to push air in and out but to maintain a very specific ratio of oxygen to carbon dioxide.

OVERBREATHING OR HYPERVENTILATION

When we over breathe or hyperventilate, we lose valuable carbon dioxide and "hidden hyperventilation" often goes undiagnosed. When a person is acutely hyperventilating, it's obvious and the implications to the organism are disastrous. Hidden hyperventilation often goes unnoticed. Asthmatics overbreathe three or more times the recommended amount. Long term "hidden hyperventilation" is the hinge upon which Buteyko's discovery and method are based.

TEST THIS OUT FOR YOURSELF

Breathe very deeply for 5-10 minutes and you may experience an asthma attack, blocked nose, dizziness, chest pains, palpitations, coughing and many other symptoms. Reducing the depth of your breathing by breathing shallowly can reverse these symptoms often within a few minutes.

HOW MUCH SHOULD WE BREATHE?

Physiological norms apply to pulse, blood pressure, sugar levels, temperature and breathing as well. Ideally at rest an adult should breathe lightly, superficially, and only through the nose. A healthy person can perform light exercise and still breathe lightly, whilst a sick person requires deep breaths almost all of the time.

BUT HOW CAN WE TELL IF WE BREATHE TOO DEEPLY OR NOT?

Many people think they breathe shallowly but in fact they breathe very deeply. Many people who suffer with asthma, allergies, bronchitis, emphysema and breathlessness will tell you they can't breathe enough, when in fact they are breathing three or more times the normal volume of air.

Professor Buteyko developed a test that can measures your depth of breathing, subsequent retention of carbon dioxide, resultant oxygenation and health. The 'Control Pause' Breathing Test:

- Breathe in gently for two seconds.
- Exhale gently for three seconds.
- Hold your breath, pinching the nose after exhaling, holding your breath until it first becomes difficult.

If you manage less than 10 seconds (on the third step) you have very serious health problems. If you can hold less than 25 seconds your health requires attention, 30-40 seconds is satisfactory and 60 and above is excellent.

WHAT ABOUT THE AIR WE BREATHE?

We are all aware of the dangers of pollution and the declining quality of our air. Many blame asthma and other breathing disorders on pollution and the environment, yet asthma strikes in the county as well as in the cities and some people who work in very polluted environments never suffer with asthma or emphysema. Could there be another problem with the air we breathe?

OUR CHANGING ENVIRONMENT

The problem faced by the evolving human organism has been the depletion of carbon dioxide in our atmosphere from the tens of percent of ancient eras to the current level (1982) of 0.03%. Human evolution has dealt with this dilemma by creating an autonomous internal air environment within the alveolar spaces of the lungs. These alveoli ideally contain around 6.5% of carbon dioxide, quite a contrast to the surrounding air. The gaseous mix in the womb is also an interesting indicator of the ideal human environment – here there exists between 7/8% carbon dioxide.

WHAT HAPPENS WHEN WE OVER- BREATHE AND LOSE CARBON DIOXIDE?

Let's take a look at what carbon dioxide does for us, and from this we can ascertain what a deficiency may mean:

- Oxygenation: Carbon dioxide regulates oxygen departure from blood and a fall in carbon dioxide results in reduced oxygenation of tissue and vital organs (Verigo-Bobr Effect). Poor oxygenation leads to myriad complaints.
- Acid/Alkali Balance and the Immune System: Carbon dioxide, through its conversion to carbonic acid, is the most important regulator of our acid/base balance. A lowering of carbon dioxide results in a shift of the

body's pH toward alkalinity, which changes the rate of activity of all body ferments. An alkaline system is much more susceptible to virus and allergy as it compromises the immune system. A great deal of information is available about the role of pH in the process of binding of the antibody with the antigen. A deviation of the pH from a certain optimum results in a decrease in the affinity and therefore in the weakening of the immune reaction.

- Vessels: Carbon dioxide is a smooth muscle tissue dilator; therefore a shortage of carbon dioxide can cause spasms of brain, bronchi and other smooth muscle tissue. Asthma spasms and migraines are prime examples of this situation.
- The Nervous System: Carbon dioxide is a regulator of nervous system activity and a lowering of carbon dioxide in the nerve cells heightens their excitability, alerting all branches of the nervous system and rendering it extraordinarily sensitive to outside stimuli. This leads to irritability, sleeplessness, stress problems, unfounded anxiety and allergic reactions. Concurrent with this, the breathing centre in the brain is further stimulated, thereby causing an increase in breathing rate and a further loss of carbon dioxide, and a vicious cycle begins.
- The Cardiovascular System: Carbon dioxide is a regulator of the cardiovascular system. A depletion of carbon dioxide can result in angina, chest pains, high or low arterial pressure, hypertension, stenocardia and eventually sclerosis of vessels, myocardial infarcts and strokes.
- The Digestive System: There is a direct relationship between the level of carbon dioxide and the activity of the digestive glands, in particular the linear relationship between the intensity of gastric secretion and the level of carbon dioxide. A shortfall of carbon dioxide can lead to ulcers and poor digestion.

Note for medical professionals:
The above reference to carbon dioxide does not specify its form (i.e. dissolved carbon dioxide gas, carbonic acid, bicarbonates, carbonates or carbamates). Furthermore the author has not explained the various shunts between defensive and compensatory mechanisms that may lead to obvious paradoxes, such as high levels of CO_2 in the blood of asthmatics, and the compensating shifts between respiratory alkalosis and metabolic acidosis.

The Mechanism of Stress

Any stress that you are going through inevitably leads to a deepening of the breathing. This is an ancient bodily reaction. Its role is to avoid CO_2 deficiency in the organism. The point is that in cases of positive or negative emotions, an intensive CO_2 exhalation from the body occurs. As a result, the central nervous system becomes over reactive and the breathing deepens.
Because of deep breathing the oxygen content in lungs slightly increases. Finally a strong tension develops which is necessary to mobilize physical strength to attend the stress - in the form of fighting attacking, defending or fleeing, etc.

We have to view the increase in CO_2 exhaling, the boost of energy and the intensification of metabolism as compensatory factors. That is why any emotion must be discharged physically. That is our point of view. I.P Pavlov failed to explain why undischarged emotions are so bad for the organism. We did it.

I want to emphasize once again that we consider deep breathing stressful. It means that during stressful situations, in order to eliminate stress, one has to lessen the depth of breathing, in other words, to use our method and by doing that, calm the nervous system down.

During stress some psychotropic substances - such as adrenaline, noradrenalin and others are produced. They stimulate our defence- & attack-reactions, enhance our muscular strength, and so on.
At the same time, the production of insulin goes down and its concentration in the blood drops. Deep breathing causes some reactions leading to the increase of sugar content in blood which helps the body to cope with the energy upsurge. The increase of blood sugar is useful when there is enough insulin in the body because it enhances the gaseous flow into muscles, brain and cells and consequently normalizes their function.

However, if the deep breathing lasts longer, the compensatory mechanisms turn into pathological ones and in time, an insulin deficiency develops. For example, due to stress and deep breathing, arthritis patients have increased cholesterol content. We have confirmed by experiments that by decreasing the depth of breathing the cholesterol content in blood returns to normal.

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