Contemporary Breathwork

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1. ABSTRACT

Breathwork is the science and art of breath awareness and breath modulation. It's use in the field of health and wellness promotion is traced in Indian and Chinese cultures from 3,000 BCE. Current usages of breath awareness, slower than normal and faster than normal breathing techniques are presented for physical healing and conditioning, emotional and mental wellbeing as well as spiritual growth. The neurological correlates of breathing practices and the influence of the vagus nerve on breath regulation, the brain's Default Mode Network and Social Engagement System are detailed. Breath awareness' longstanding partnership with meditation and its effects on the brain and subjective well-being are documented. Applications for its remedial effect for clinical anxiety, depression and addictions are noted as well as its importance for practitioners in the healing arts.

2. INTRODUCTION

Since the 1970's there has been an explosion in the blending of ancient breathing techniques for health and spiritual awareness with contemporary growth and therapeutic practices. The result has been the evolution of powerful and incisive healing and consciousness changing modalities. This has given birth to the field of contemporary breathwork which has promoted significant advances in medical, psychological and spiritual domains.

Every major spiritual tradition as well as successful athletic training, mental coaching and emotional therapy have one thing in common. In the process of maintaining self-improvement - breath awareness and breath training are essential. It is more than a metaphor for our connection to our inner source of wisdom. It brings us back to an experience of the inner source of wisdom. In many languages the very word for breath and spirit are the same.

Breathwork is one of the newly emerging tools of complimentary medicine which has the daunting yet highly engaging task of blending the old and the new for the purpose of creating something better than either in isolation. It presents a new paradigm of whole brain learning which is at the intersection of science and art. Our life is a dance of the two cerebral hemispheres: right/left, intuitive/logical. This understanding is not just a poetic viewpoint, but necessary to a full comprehension of how we operate. We can no longer live in world of Newtonian physics, black and white thinking. We learn with our whole body, organically not just with the cerebral cortex. Breathwork bridges both brain hemispheres and accesses functions of paleo, meso and neo cortex, thus reaches a more inclusive level functioning which is elucidated in this paper.

Traditional and contemporary uses of breathwork in healing arts include breathing techniques such as yoga and Taoist techniques used in the Orient for centuries not just for health maintenance but for diagnosis and cure. Off-shoots have been used in Western medicine for child birth (Lamaze), pain control (hypnosis, chronic pain), asthma relief, panic attacks, anxiety and a variety of mental health disorders.

Applications are found in remedial medicine, physical and occupational therapy. Breathwork has been effectively employed to release deep tissue trauma and re-access the shutdown of entire systems under autonomic control that have not been touched by other medical intervention.

Psychological applications of breathwork include healing of emotional trauma not reached by cognitive therapies, chronic tension not relieved but only masked by medications, negative and limiting beliefs and habitual behaviors held in place by negative conditioning.

Spiritual applications of breathwork are not related to any particular religious tenants. Common to most branches of contemporary breathwork is an underlying philosophy that underscores personal responsibility for our lives and connectedness to larger Self that comes from profound linking of all our systems by a unified field of consciousness.

3. DEFINITION AND TYPES OF BREATHWORK

Breathwork is the science and art of breath awareness and breath modulation. It is directed toward releasing deregulated patterns of physical, emotional, and mental functioning and bringing greater harmony to our network of life systems from the neurological to the spiritual — literally to facilitate feeling more comfortable in our skin.

There is a proliferation of contemporary schools of breathwork, some of them focusing on slower than normal breathing and a few on faster than normal breathing. Some schools such as Therapeutic Breathwork bring together time-honored healing traditions with contemporary breakthroughs in mind-body therapies and include both slower than normal and faster than normal breathing for specific effects under varying conditions.

Is breathwork a therapy? Breathwork is a broad rubric designating the use of a directed breathing process for healing or self-improvement. As a form of Yoga it has been used for centuries for physical, mental, emotional and spiritual change and renewal.

Modern psychotherapy refers to a healing process contracted between a client and a trained health professional working from an established theoretical framework. Psychotherapy uses specified techniques to effect change in behavior, thinking and/or feeling states leading to more productive life and sense of well-being.

Breathwork can be effectively employed within the framework of some therapies, but in itself goes beyond psychotherapy and is used in educational models, e.g. Yoga classes using a student/teacher relationship, physical healing arts e.g. massage or physical therapy for pain or stress reduction using a client/technician relationship, or a spiritual seeker model using a disciple/master relationship.

Breathwork is not under the domain of any one discipline or confined by a single model. This article will draw upon the science and practice of breathwork as used in many disciplines while stressing what is most pertinent to its contribution to wellbeing.

3.1. Slower Than Normal Breathing

Breath awareness becomes the foundation for practices which I call maintenance breathing skills that have been so influential for humans through millennium in bringing increased peace of mind and healing to the body. This is exemplified by pranayama in the yoga tradition and translated into contemporary parlance as mindfulness and coherent breathing. Maintenance breathing entails slowing the breath to 5 to 6 breaths per minute for 4 minutes or more. The physiological effect are well documented by Heartmath research (1), for regulating the parasympathetic nervous system and calming the mind. It is the very practical and immediately experienced effects of breath awareness and modulation that can open minds to the benefits of more regularly implemented practices. This can also prepare people for more major lifestyle renovation, e.g., opening awareness to their dietary and exercise habits.

3.2. Natural Breathing

Ultimately our goal in breath awareness is not to be consciously controlling our breathing every moment of the day. Breath modulation techniques are used to counter the holding patterns which impede easy flowing natural breathing and to practice maintaining that state. Breath awareness simply makes us more conscious of when the breath is not flowing easy and naturally so we can pay attention and address the signs of distress. The goal of breath awareness and breath modulation is to experience the joy of natural breathing and being alive.

3.3. Faster Than Normal Breathing

Therapeutic Breathwork is form of breath awareness and modulation that adds to the repertoire of breath awareness and maintenance breathing, by including and teaching the skills of sympathetic nervous system regulation. As a form of healing, increasing the breathing cycle to 30-70 breaths per minute in a safe supportive setting for the purpose of harmonizing ones emotional system, past holding patterns and emotional blockage can be relieved more directly than years of talking about symptoms (talk therapies). Talking often does not reach unconscious memory which has stored emotional reactivity through trauma that gets activated by environmental stimuli and produces feeling and behavioral responses that do not fit current circumstances. In extreme cases they are experienced as flashbacks which put an individual in another time and space that feels out of their control. The elegance of this kind of breathing is that it helps reprogram traumatic responses by going directly to the limbic system where they are stored (somatic approach), rather than trying to enter by the doorway of the prefrontal cortex whose pathways to the experience have been blocked by the body's emergency control systems (verbal approach). When people learn to use this type of breathing consciously, they regain the confidence in their own abilities to handle settings and circumstances which were previously paralyzing to them. This could be as simple as having dinner with their family or as dynamic as performing before a large audience.

As a form of spiritual exploration, faster than normal breathing has facilitated non ordinary states of consciousness leading to transpersonal experiences, which can take us beyond our bodies and our own personal (ego) identities. These could include conception, unity, out-of-body experiences, merging with other forms of life, becoming one with elements, other levels of existence, communication with an archetype, and yogic sleep states.(2)

As reinforced by contemporary research, the human brain develops in relation to its environment and more specifically in dyadic interactions with significant others (3).We are, at our core neurology, relational beings. To reprogram traumatic responses, there is no more powerful tool than dyadic teaching of breath modulation which helps

stabilize and calm a deregulated nervous system and restore a sense of safety in one's body.

4. IMPORTANCE OF GOOD BREATHING

To breathe is to live. How we breathe has a most profound influence on the quality of our life. Breathing correctly is the key to living fully. Many suffer from chronic improper breathing habits that are not immediately obvious. We breathe about seven million breaths a year, and the long-term effects of poor breathing are cumulative. They reduce not only the quality of vitality in our daily experience but can lead to a weakening of our entire system and serious health issues. We can take health for granted until we encounter serious problems. It has been estimated that 60 percent of all emergency transports in larger American cities involve hyperventilation or other breath-related disorders. Research suggests that ten to twenty-five percent of the U.S. population suffers from breath-related illness every year (4). Improper breathing weakens and dis-harmonizes almost every major system in our bodies and makes us more susceptible to chronic and acute diseases of all kinds: infections, constipation, respiratory illness, digestive problems, ulcers, depression, sexual disorders, sleep disorders, fatigue, headaches, poor blood circulation, and premature aging. Many researchers believe bad breathing contributes to cancer and heart disease (5). Proper breathing can keep the systems of the body functioning in harmony, signal us about imbalances in our energy and help us correct them, and thereby be a perfect companion on route to our health and happiness.

In all cultures and throughout history breathing has been regarded as the most vital of human bodily functions. We can survive without food and water, without being able to move or think. But without air to breathe we can only survive for a few minutes. We work in our lives from the first breath to the last, and, despite the life preserving miracles of modern medicine, it is still the spontaneous act of breathing which determines if a person is dead or alive.

The volume of air we breathe in every day is approximately five times larger than the volume of food and drink we consume. On average a normal, healthy person breathes 12 to 14 times per minute. If we live to be 80 years old we will breath about 600 million times. Despite this few people know much about the connection between how we breathe and our general well-being - apart from the fact that it is essential that we keep breathing, minute after minute, hour after hour, night and day in order for us to continue our existence on this planet.

So why do we pay so little attention to this essential and central bodily function? One probable explanation is the modern conception of physical and psychological well-

being: when we feel well we take it more or less for granted without inquiring much about what is affecting what. Not until the body starts to malfunction do we start searching for causes and effects, And even then the search is usually conducted within a very narrow conceptual space. Generally, little attention is paid to the wider connections between various bodily functions, despite the fact that recent research is revealing how closely all the functions of our body are linked together. Most people understand that we breathe less when we are stressed but few people have ever tried to find out why and what effects it may have if we deliberately change our breathing pattern.

This lack of interest can probably be linked with Western medicine's very limited perspective as to the bodily function of breath: breathing provides the body with it's vital supply of oxygen – and that's, basically, all it does. As so often in Western medical research, breathing receives attention only when it's normal functioning is disturbed in some way. And even this, in the case of the breath is quite new – the study of the effects of poor breathing is a relatively new discipline. Given the vital importance of breathing, it is still not getting the medical attention it deserves. However, we are learning more about the effects of poor breathing and a number of symptoms have been identified and rightly linked with poor breathing.

True wellbeing involves balance and harmony in all the components of one's self. Excessive focus on one part of the self to the exclusion of others results in imbalance and dysfunction. The other side of this equation is that the fine-tuning and harmony of all aspects of the self lead to higher states of health, wellness and opens the door for subsequent growth. Healthy breathing is the thread which strings all the elements of one's self together. Healthy breathing is the mainstay of an integrative approach to personal growth.

4.1. Physical Health

Peak performance and achieving one's personal best have always involved a mastery of one's breathing. Though most of us are not in training for the Olympics, our physical health and wellbeing is directly related to regulated healthy breathing habits. Since there are few activities in which we engage in more than taking an inhale and an exhale, any dysfunction in the process gets multiplied exponentially over the years. Conversely, healthy breathing has a nurturing and energizing effect on every physical organ and body system. All forms of yoga and, in particular, hatha yoga have documented results over the centuries on how coordinating steady diaphragmatic breathing with movement (asanas) or in stillness (meditation) improves physical health (6), Breath coaching has become increasingly effective in sports training and general conditioning as ably demonstrated by Optimal Breathing coach, Michael White (7) as just one example. Candace Pert offers evidence for her conclusion that conscious breathing supports physiological healing through a peptide-respiratory link: "Virtually any peptide found anywhere else can be

found in the respiratory center. This peptide substrate may provide the scientific rationale for the powerful healing effects of consciously controlled breath patterns." (8)

4.2. Emotional Wellbeing

Therapeutic breathwork has brought to the awareness of the healing community, the direct link between the ability to regulate one's breathing with the experience of emotional balance. Emotional balance is that middle path between repression on the one side and lack of containment on the other. Deep or repressed feelings that have been inaccessible to cognitive therapeutic intervention have been readily accessed in therapeutic breathwork practice. This is because this technique alters the breathing rhythm to activate the sympathetic nervous system in a controlled way. While the body is beginning to engage in flight/fight/freeze activation and the attendant emotional responses, the breather is staying conscious of his or her breath control. This is the control of a surfer riding a wave rather than a dam trying to hold back a river. The breather learns to ride the wave of feelings rather than suppress or lose control. The full range of emotions - mad, sad, glad, scared and all their variations - can be experienced as a source of positive vitality and wisdom (emotional intelligence). All of the bad examples we have of repression or loss of control in the culture tend to give emotions a negative reputation. However the truth is that a life devoid of feeling is a passionless existence. Our breath can help us be safe with our feelings.

Emotional Intelligence (EI) is the accurate reading of one's and other's feeling states and the ability to use this information effectively. EI is achieved in great part by regulating one's breathing appropriately during charged emotional states. I say appropriately because in some circumstances it may be appropriate to run for higher ground and breathe fast as when avoiding a flash flood verses other circumstances when slow steady breathing may be what is needed, e.g., to thread a needle with which to sew up a wounded person.

The monitoring of breathing through all feeling states allows us to tap into the non-verbal wisdom of emotions and the richness with which they color our existence.

4.3. Mental Clarity

The brain uses a disproportional amount of oxygen to the rest of our body. - It is only 3% of the body's total weight, but uses 25% of the available oxygen. The energy we expend in mental activity requires it. The clarity that comes with mental mastery opens the door to creativity. We are not trapped in thinking loops that repeat endlessly, affording us limited options for novelty and discovery. We can think in a rut and thereby live in a rut.

We think roughly 40,000 - 50,000 thoughts a day and most of them are variations of time honored themes which we took on at an early age and just elaborated with more sophistication (e.g. “I have to hide when Daddy is angry” gets transmitted to “secretive nuclear stockpiling is imperative to defend against the hostile totalitarian regimes in the world.”). Therapeutic breathwork helps ferret out there “tap root” thoughts or “personal laws” - major negative beliefs upon which most of our attitudes and behaviors are based. One of the dictums of mental mastery is that thoughts do not change unless we change them. No one can make us think what we refuse to think. Thus we must consciously choose how we want to think or we will just run our previously programmed tape loops. The fear based tape loops often get reinforced by cultural messages which play upon our fears, e.g., “Hostile countries are planning our demise.” This is not to say we should put on rose-colored glasses in the face of evidence of aggression coming toward us. But if we are breathing easily in the face of challenge, as any good martial artist would be, we are much more resourceful in directing the energies of ourselves and others. In fact, as we populate our thinking with resourceful thoughts, we actually transform many formerly perceived “attacks” into opportunities for mutual benefit. When I hold my breath, I take a fixed position and am much less flexible in my mental emotional or physical responses.

Affirmations are specifically designed thoughts to help lead us out of static thinking patterns often reinforced by fear. A good affirmation is a well-honored tool to help me stretch just the right amount to best facilitate more resourceful thinking and promote clear and creative thinking. I use the four P’s of affirmation writing to maximize the affirmation’s power: Make the affirmation Positive, Personal, Present and Practical, and breath life into the new thoughts. The breath helps take the energy of the thought and spread it throughout the body (literally creating a new stance) and the environment (attracting new possibilities). Full easy breathing is both the facilitator of and the result of clear creative thinking - a positive feedback loop that becomes a new lease on life.

4.4. Spiritual Growth

The diaphragm has been called the “spiritual muscle” in certain ancient practices. Breath control has been a central practice of most spiritual/mystical traditions for thousands of years (5). The breath is known as the “rainbow bridge” from the physical to the spiritual realms. Simple attention to a steady flow of breath can put one in an altered state making one more sensitive to who one is beyond the physical. A prominent researcher in the area of spiritual traditions, Ken Wilber (9) claims that meditation (facilitated by slow regulated breathing) is the only practice which has scientifically documented results on its positive influence on spiritual growth. The Russian mystic G. I. Gurdjieff said, “Without mastering breathing, nothing can be mastered.”

As simplistic as this may sound, how long can you go just paying attention to your inhale and exhale? Most people cannot go for more than a few seconds without thoughts or sensations distracting them. If followed to its origins, the breath leads to our creative source, the spirit which initiates the "breath of life" in one's body. In many languages spirit and breath are linked by the same words. e.g. nephesh in Hebrew, atman in Sanskrit, psyche in Greek. A very common phenomenon in therapeutic breathwork, after physical, emotional and mental holdings have been released, is to have openings to ones spiritual realm or higher self that transport the breather to transcendent states (2). That breath is a powerful agent of healing and growth is well established in cultures around the world. That each of us has the ability to access this power "right under our nose" is being discovered and documented in many volumes (10).

5. HISTORY OF BREATHWORK

The best-kept traditions of how to use the full Power of the breath are mainly from the Asian countries of China, India, Japan and Tibet. As a result, the breath has a very different role in these countries. Breath is used for healing, and maintaining good health, as well as for spiritual advancement.

5.1. The role of breathwork in China

During Emperor Huang Ti's rule around 2700 B.C.E., the maintenance of good mental and physical health was regarded as part of spiritual development, and in order to achieve this, a range of breathing exercises was developed. Some estimate the number of different methods to be around 3000, while others say it is closer to 10,000. Collectively they are known as Qigong (or Chi Kung). Qi is the Chinese name for life energy – a concept that lacks a counterpart in the west. Gong refers to the power to achieve an effect through repeated exercises. Literally, Qigong can be translated as energy cultivation. The breathing exercises in Qigong are also known as 'methods of eliminating illness and prolonging life'. Another common translation is 'achieving Lifeforce'.

5.2. The role of breathwork in India

In India the tradition of consciously using the breath in various breathing techniques is as long-established as it is in China. Here, too, it is used in healing and healthcare, as well as to provide a spiritual path. The method for maintaining and improving physical and spiritual wellbeing is known as Yoga, while the medical aspect is handled by the Ayur-Vedic medicine. The first evidence of yoga practices have been linked with the pre-Aryan Harappa culture which existed in the Indus Valley between 3000-1500 BCE.

In this tradition Prana, similar to Qi in China, stimulates growth in all living organisms at the level of the smallest cells. Everything living requires prana in order to ex-

ist. Prana exists everywhere and can be absorbed by the body value of the food we eat, via our skin, but above all through breathing. Prana is not the same as oxygen; rather it is prana that gives oxygen it's life-giving quality and is cultivated by a variety of breathing practices or pranayama which employ both slower and faster than normal breathing.

5.3. The role of breathwork in Tibet

As in other major Asian cultures, there is no separation between medical care and religious pursuit. Instead there is a distinction between three aspects for human existence: Tantra That represents the cleansing of the body and mind; The somatic aspect that represents medicine; and dharma, that represents the religious aspect.

There are also a number of advanced breathing exercises designed for coping with the country's harsh climate. One is aimed at raising the body temperature, and is so efficient that a person can sit naked in the snow without being affected by the cold. Another is designed to ease movement in the roadless and mountainous countryside, by allowing a person to walk much faster than normal. This exercise helps the person to develop a walking technique that is a form of levitation and makes them almost hover over the ground at very high speed.

Breath awareness and modulation have also played significant roles in Greece, Egypt, Islamic cultures, Christian cultures, and indigenous cultures around the world. (5)

5.4. Beginnings of Contemporary Breathwork

These are a few of the practitioners and theorists who heralded the modern incorporation of breathwork into healing therapies and well being professions.

Wilhelm Reich (1897 – 1957) was a psychoanalyst that pioneered "Vegitotherapy," which combined breathing exercises (shallow, deep) and character analysis with loud vocalization, deep tissue massage and energetic movements (11).

Alexander Lowen (1910 – 2008) was a psychiatrist who developed bioenergetic analysis which delineated developmental body and character types whose treatment involved extensive use of breathing and movement (12).

Arthur Janov (1924 – 2017) was a psychologist whose "Primal Therapy" involved regression to release repressed emotional blockage dating from birth through breathing with cathartic vocalization (13).

Body Psychotherapies - a number of contemporary somatic therapies have evolved to “reestablish a fuller more spontaneous breath by gradually letting go of our need to protect ourselves from feeling by not breathing,” e.g., Hakomi Method of Ron Kurtz (14).

Stanislav Grof (1931 - present) is a psychiatrist who created Holotropic Breathwork which utilizes deep, intense rhythmical breathing accompanied by loud evocative music to release a “COEX” (a dynamic constellation of memories and holding patterns from different periods of life) (2).

Schools of breathwork have proliferated in recent times, some specializing in slower than normal breathing, e.g. yoga and mindfulness. Others emphasize normal or natural breathing, e.g., Dennis Lewis (15). And still others have focused on the use of faster than normal breathing, e.g., Holotropic Breathwork. Therapeutic Breathwork (16) utilizes a toolbox of many of these techniques, “the right breath for the right circumstance,“ and trains the use of faster than normal breathing for professional application.

6. ANATOMY AND PHYSIOLOGY OF BREATHING

With each breath we take in about one million particles that have existed in our environment since the beginning of time and which certainly at some point have passed through every living being on our planet - including Buddha, Jesus, Hitler and Einstein. Every time we breathe out, we add something unique to our environment (5)." What are these particles? How do we take them in and what energetic influence do they have on us and us on them?

6.1. Breath chemistry

On the chemical level the air we breathe is about 20 percent oxygen and .03 percent carbon dioxide. The rest of the air is a combination of nitrogen, water vapor and various other gases including carbon monoxide, methane, helium and air pollutants. Our exhale consists of 14 percent oxygen, 5 percent carbon dioxide, 6 percent water vapor and 69 percent nitrogen and other gases coming from the body’s metabolism. We nourish our body systems on the inhale and release waste on the exhale. Our process, in turn, helps nurture the environment around us. Trees, for example, give off the oxygen we need and take in the carbon dioxide we give off for their nurturance.

6.2. Breath mechanics

We pump in the air at a rate of about 12-15 times a minute when awake and 6-8 times when asleep. Men breathe an average of 12-14 times per minute, women 14-15. Newborn babies breathe about twice as fast as adults. The main breathing muscle to expand the lungs and draw in air is the diaphragm, a dome-shaped sheath of muscle fiber

forming the floor of the chest cavity and the ceiling of the abdominal cavity. The diaphragm is attached to the inside of the lower ribs as well as the lumbar spine. The diaphragm is influenced by the health and mobility of the spine and pelvis and their associated muscles and these in turn are influenced not just by our habitual posture, but also by our emotions and attitudes (15). Tension in the abdominal muscles produces one of the most adverse influences in the diaphragm by impeding its downward motion on the inhale and consequently its efficiency in bringing air into our bodies. Other muscles involved in breathing include the rib, back and psoas muscles. Unnecessary tension in our shoulders, chest, belly, back or pelvis interferes with respiratory coordination.

6.3. Sensory feedback

Our brain stem (medulla oblongata) sends messages through the vagus nerve to the diaphragm and intercostal muscles to initiate inhalation. Exhalation requires a relaxation of these muscles, initiated by an inhibitory message along the vagus nerves. The respiratory system is connected to most of the body's sensory nerves and, as such, immediate or chronic sensory stimulation can impact the force and speed of our breath. Pain, tension or stress generally speed up our breathing and reduce its depth. While this may provide a temporary fix to a sudden need for quick energy, when continued over the long term, they seriously debilitate our system.

6.4. Pathway to our cells

When we breathe air in through our noses, it flows through the pharynx which controls the coordination of swallowing and breathing. Air then passes through the larynx, with which we make sound, and down the trachea where the bronchi divide into the right and left lungs. All the way along, mucous membranes and tiny hairs, cilia, filter out impurities. In the lungs the bronchi subdivide smaller and smaller down to tiny air-filled sacs, called alveoli. Some 750 million of these alveoli run alongside blood-filled capillaries, tiny blood vessels so small that blood cells can only pass through them single file. Here is where the transfer takes place and the alkaline oxygen from the air is taken up by the hemoglobin in the blood while the acidic carbon dioxide is discarded back to the alveoli for elimination on the exhale. The blood vessels carry the oxygen to the body's cells where another exchange takes place, nutrients and oxygen coming in are exchanged for the carbon dioxide waste from the cellular process of metabolism being discharged. Oxygen is essential for the enzymes in the cellular mitochondria to break down carbohydrates and fats into energy we need to work.

The lungs fill from the bottom up and most of the alveoli/capillary exchange takes place in the lower lungs. If breathing is shallow or in the upper chest, we have to work much harder and use more energy to get our needed oxygen. This is an inefficient process that depletes us, even though we may have accustomed ourselves to it feeling "normal."

6.5. Vicious cycle

Our brain stem responds to the amount of CO2 in the blood to initiate messages to the breathing muscles. When we are breathing inefficiently, we begin a vicious cycle of the brain sending messages to breathe more, but because we are discharging CO2 too rapidly by breathing ineffectively we are deregulating the pH balance in the blood, and the brain responds as if the system were more and more oxygen starved (17). The extreme example of this leads to hyperventilation and/or chronic anxiety. The effects of this oxygen starvation to the systems of the body are legion and well documented (18).

6.6. Factors influencing breathing

Learning to breathe in a healthy way is not a mechanical or a cookbook formula because of the multiple factors on several levels that can negatively influence our breathing process. These include:

- •Physical - muscular tension, poor diet, injury;
- •Emotional - unresolved trauma, chronic fear, guilt or anger;
- •Mental - beliefs and self-talk that trigger defense and constriction;
- •Spiritual - imbalances in our subtle energy centers (chakras).

The art of healthy breathing relies on manifesting our self-care intentions in the physical form through the integration of all our interdependent systems in our next breath - which is the result of all the above-mentioned levels operating together. Taking conscious responsibility for each of these levels starts with awareness. When we bring these levels into harmony, our breath is experienced as the bridge of wellbeing flowing from the spiritual to the physical.

7. HEALTHY BREATHING / UNHEALTHY BREATHING

The healthy breath starts with an inhale that is actually a two cycle event. The first part is a contraction of the diaphragm which descends in the abdominal cavity causing the belly to inflate and the lungs to expand and draw in air. In a smooth wave like fashion the costal muscles initiate an expansion of the rib cage increasing the lungs capacity to fill its middle and upper regions. When complete the exhale is initiated by a release of the expanding musculature which causes the lungs to deflate and the air to be expelled. Disruption of this flow can be caused by physical and/or mental and emotional inhibitions.

Breathing deeply and rhythmically will assist your body in healing itself. Good respiration provides the oxygen needed by every cell, every muscle, bone, and organ. When part of you is ailing, the whole organism is thrown out of balance. Vigilant red cells in the blood rush to the aid of the injured or diseased member. Since it is the oxygen

you inspire that provides the energy to the cells, it naturally follows that these cells need to be charged to their fullest potential in order for healing to occur.
Conscious breathing builds energy and endurance, emotional equilibrium, helps with physical healing, graceful aging, pain management, mental concentration, physical performance (sports), and psycho spiritual transformation.

7.1. Good Breathing

For most people their diaphragm contracts 4 millimeters when inhaling. With training this range can be doubled or even tripled in six to twelve months which equals an increase in breath volume of 250-300 milliliters. (15) With good breathing the chest muscles expand the rib cage out and up slightly.This action massages the stomach, liver, pancreas, intestines and kidneys - promoting intestinal movement, blood lymph flow and absorption of nutrients. The belly expands on inhale contracts on the exhale.

Quality breathing is characterized by “effortless effort.” We use no more than 60-70% of our lung capacity or our whole body becomes tense. Nonetheless we can create a new comfort zone of greater breathing capacity that nourishes our bodies in a more healthful way continuously. Comfort of our inhalation is proportional to our readiness and ability to embrace life. Comfort of our exhalation is proportional to our readiness and ability to let go and trust life.

7.2. Poor Breathing

One of the ways we breathe poorly is contracting the belly on the inhale which can be associated with chronic stress and repressed emotions. Poor breathing may result from a poorly functioning diaphragm, the main breathing muscle which represents the floor of chest and the ceiling of abdominal cavity. It is involved with the lifting of the heart and fanning the fires of digestion and metabolism, increasing vitality and wellbeing. With poor breathing we breathe faster, overly expand the thoracic cage and raise the clavicles. Under severe stress increase we hyperventilate. When we hyperventilate we take quick short breaths which reduces the CO2 in our blood and restricts arteries to the brain which reads these signals as a shortage of oxygen and thereby increases the messages to sympathetic nervous system of danger and readiness for fight or flight. Many of us have some degree of this happening chronically out of our awareness.

The effects of poor breathing include reducing the efficiency of the lungs and available oxygen. We must take two to four times more breaths to equal the volume of a healthy breath. This increases our energy expenditure and heart rate, retards vinous flow and the elimination of metabolic wastes from cells to the kidneys and lungs. It is estimated that 70% of body’s waste products are eliminated through the lungs, 30% via the urine, feces and skin. Poor breathing retards the lymphatic system and destruction of bac-

teria, reduces digestive juices available and increases toxins in the digestive tract. Poor breathing weakens and dis-harmonizes almost every major system in body and makes us more susceptible to chronic and acute diseases of all kinds: infections, constipation, respiratory illnesses, digestive problems, ulcers, depression, sexual disorders, sleep disorders, fatigue, headaches , poor blood circulation and premature aging. Many researchers believe bad breathing contributes to cancer and heart disease (5).

7.3. Hyperventilation

The most common breathing disorder is probably hyperventilation. If we don't breathe deeply enough to bring enough oxygen in with every breath, we need to breathe more often to compensate. In shallow breathing, the lungs are not given enough space in chest cavity to expand sufficiently to bring in all the air we need. If we then increase the speed with which we breathe to compensate for this, it can cause the disorder known as hyperventilation. But this means that we will breath out too much carbon dioxide which in turn may cause imbalances in the acid-base blood balance of the blood: in order for the body to function optimally the blood needs to be alkaline with a pH level of 7.4.

It is extremely important for the metabolism that the blood has the correct acid-base balance since this has a direct effect on the cells ability to freely extract oxygen. Even small changes will cause great problems for the cells, and so the body has a special function that monitors and restores any imbalances as soon as possible.When too much carbon dioxide disappears through the exhale and the level in the blood falls below a critical point, this triggers an inhibition of the stimuli to the respiratory center in the brain which makes us stop breathing. In particular when the hyperventilation disorder is caused by stress or general anxiety, the inability to breathe may lead to an immediate alarm to the body sympathetic system and cause what we would call a panic attack. If hyperventilation is allowed to continue over a long period, the body will also adjust to the acid-base balance to the lower carbon dioxide level. This may lead to a symptom known as alkalosis which involves cramps and muscular spasms leading to intense pain in both muscles and joints.

Hyperventilation is far from breathing too much, rather it refers to insufficient breathing. For a person with a heart condition, for example, hyperventilation can be life threatening. The symptoms of hyperventilation are principally increased adrenaline secretion, increased heart rate and contracted muscles. In addition, histamine level in the blood will increase, which leads to increased sweating in the hands and under arms, and a deeper facial tone. These symptoms usually disappear as soon as the situation that triggered the hyperventilation is resolved.

More serious symptoms of hyperventilation can be irregular heartbeat or chest pain, breathing difficulties, dry cough, dizziness, numbness in fingers and toes, digestive disorders – often irritable bowel syndrome and gases – tiredness, sleep disorders, and also phobia, anxiety, and sexual disorders.

It is common for people with chronic breathing disorders to mistake the symptoms for signs of a more serious physical problems such as heart attacks, brain tumors or cancer in the stomach. This, in turn, increases the anxiety that may initially calls the hyperventilation, and so the cycle feeds back on itself. It is estimated that as many as 30 and 40% of suspected heart attacks are in reality severe symptoms of hyperventilation.

Hyperventilation can also be the calls of a number of psychosomatic disorders such as allergies, anorexia, asthma, cancer, circulatory disorders, diabetes, epilepsy, cords, we can immune system, heart conditions, skin disorders, headache, migraine, hypertension (constantly tightened muscles), menstruation disorders, rheumatism, back problems, and sexual disorders. (5)

One way of avoiding the risk of hyperventilation is to exercise the diaphragm. Like any other muscle, it needs exercise to maintain its vigor and functionality. One exercise is to put extra strain on the diaphragm, to “pump up“ the muscle. Light on your back and place a 2 kg bag (of rice, sand or similar flexible material) Between your chest and stomach. Breathe in as normal through the nose, so that the weight on your stomach moves upward. Breathe out through the mouth so that the weight returns to normal. Repeat this for 5 to 10 minutes. Remove the weight and finish the exercise by breathing normally for a few moments without the weight on the chest. Repeat this exercise twice a day.

The most common way of preventing hyperventilation during labor is to teach the mother breathing and relaxation exercises that she can perform during birth. People with other breathing disorders (in particular asthma) are more likely to hyperventilate. People who suffer from hypertension (that also causes high blood pressure) are also more likely to hyperventilate. This is really a vicious cycle since hyperventilation also causes this type of disorder. Many teenagers suffer from hyperventilation, often caused by high expectations from their family combined with poor self-esteem, poor diet and eating habits, and two little physical activity. Adults in similar circumstances suffer the same risk.

Fear of flying can actually be a symptom of hyperventilation. Air pressure in the air craft cabinet is a cost factor for the airline, and they perform exact calculations to work out how low the pressure in the cabin can’t be without causing discomfort for the passengers. Fear of flying is therefore not always necessarily linked with a fear of being

high up in the air or in a limited space – the assumed causes of this phobia – but rather instead the body's reaction to lower than normal air pressure. If this is disregarded it can lead to incorrect treatment with tranquilizing drugs, when all that is needed is to make the person aware that he or she should breathe deeper and in a more relaxed manner than normal during the flight.

The medical treatment often consists of preventing and controlling the symptoms. Most commonly this is done with sedatives, by injection of intravenous calcium, and by getting the patient to breathe in the same air as they breathe out. To achieve this the patient either breathes with a paper bag, or the hands, in front of and covering the mouth and nose. This helps to restore the acid-base balance in the blood. According to Fried (4) this treatment can be as dangerous to the patient as the hyperventilation itself. One reason is that it makes the patient depend on external assistant instead of learning to come out of the hyperventilation pattern unaided.

Incorrect breathing pattern during a faster than normal breathing session may lead to hyperventilation, and if this is not discovered and corrected it may even cause cramps (alkalosis). A competent breathworker gives instructions of how to increase the relaxation, shortening or lengthening the breath and how to vary the intensity in the breathing pattern. Breathwork is sometimes described as "super ventilation". Unlike hyperventilation, which has a forced exhale, breathwork has a relaxed and effortless exhale; this means that the acid-base level remains unaffected. Regardless of the length and intensity of the breathing pattern, breathwork done correctly does not lead to hyperventilation. It may give a tingling sensation throughout the body (as if the blood has become "carbonated" or fizzy) but despite its intensity it is usually perceived as a positive, indeed quite pleasant, sensation. It is often followed by a sense of deep relaxation throughout the body and can also lead to strong emotional experiences and important mental insights and revelations.

In certain situations super ventilation can also lead to contractions of the muscles and even muscle spasms. An explanation for this can be that the intensive breathing pattern dissolves too many psychophysical energy blockages at the same time, causing a state of temporary in balance in the body's circulatory systems. Unlike hyperventilation, where it takes time to regain the acid-base level of the blood, the muscle spasms caused by super ventilation can disappear instantly.

Over the years correctly monitored faster than normal breathing protocols have been used for healing and prevention of recidivism in physical conditions like the cancer research done in Poland. (19) The clinical usage of faster than normal breathing in a style called Holotropic was effectively used in a community hospital setting in the United

States for over 12 years with 11,000 patients. No complaints of adverse reactions were recorded during the sessions nor afterwards on any of the clinical units.(20)

I personally have used both slower and faster than normal breathing techniques since the mid 1970s as a psychotherapist to assist the healing of childhood sexual abuse and trauma in clients of all ages who were unable to break through their walls of fear with traditional verbal therapies. A number of these individuals were so taken by their recovery they went on to get professional degrees and become excellent body and breath oriented therapists themselves. There are increasing numbers of professionally trained breathworkers providing invaluable service in our world. Dispelling the myths about all faster than normal breathing causing hyperventilation is an important step in validating a technique that is a significant advance in our clinical repertoire and a life transforming gift to countless numbers needing support that talking about their challenges from trauma to spiritual growth does not offer.

7.4. Breathwork in the Healing of Anxiety, Depression and Addictions

Anxiety is characterized by a diffuse fear that somatically is measured by a generalized constriction in the musculature especially around the breathing system. The fear generated by not being able to breathe is some of the most intense and immediate fears wired in the human organism. So a generalized tension around the breathing mechanism signalizing danger via the brainstem is not directly suppressible by higher cortical functioning. In other words we can't just talk ourselves out of it. There has to be physiological signals to the midbrain that danger has passed for the system to relax and recover. This is regulated by the polyvagal nerve which controls and responds directly to breathing rate and amplitude.(5) Regulating ones breathing also changes the chemical composition of the blood and sends inhibitory messages to the brain regarding the fear response. In order to maintain this inhibitory state and for the system to reboot the polyvagal nerve must be regulated. This has two phases. First is the break through of the sympathetic emergency reaction which can be accomplished with adaptive faster than normal breathing and sympathetic system regulation. The second phase requires on going maintenance which can be accomplished through periods of slower than normal breathing. This often takes a number of cycles of coaching for the individual to learn self regulation dependent on the severity of the original holding pattern or trauma. (21).

The anxious person's breathing is marked by shorter shallower breathing. Restriction could come from holding in the abdominal area and a concentration of breath in the upper chest with clavicles moving upwards on the inhale, or the opposite of frozenness in the chest and/or reverse breathing, i.e., belly going in on the inhale and out on the exhale. Their experience of diffuse fear is not just in their head. Even if it started with a psychological fear, the body's resultant constriction is to avoid a real or imagined harm. This

puts the organism in a vigilant, ready for fight or flight, posture that restricts breathing and reinforces the experience of immanent danger that can become habitual and self perpetuating. There are a variety of these holding patterns that develop in early life and predispose individuals to an anxiety prone existence. A more thorough examination of six major body themes and breathing styles can be viewed in Break Through with Breathwork(16). Underlying anxiety is often a precipitating factor in turning to substances, legal or illegal for relief.

It has long been known that pain is intensified by the anxiety that accompanies a threatening situation. Fear causes the body to tense itself, a spontaneous reaction to the need to fight or run away. So what we have is a two-stage process--fear giving rise to tension; tension increasing pain. Using the breath to limit tension will help to quiet both the fear and the pain.

Depression presents another face of breathing deregulation and is characterized by overly suppressed breathing for an extended period leading to an altered brain chemistry which keeps the system in a different form of emergency shutdown.(21) In this case a suppressive holding pattern in the breathing mechanism slows down the metabolism and other bodily functions to preserve resources during periods of deprivation or being trapped. The experience of “an elephant sitting on one’s chest” is common as well as the psychological sense of hopelessness and helplessness. The depressed person’s breathing is labored, minimal and can appear to be a struggle to maintain survival. In the animal kingdom these states have been induced by putting animals in conditions of painful stimulation from which they could not escape. Their breathing and energetic functions become depressed until the situation is alleviated at which time the organism can recover and eventually return to normal functioning. Humans can psychologically create trapped conditions in which they see no escape and give the same emergency instructions to their nervous system and bodily functions. Breathwork can be an important adjunct in the recovery process to jumpstart the energy system which then must be maintained by providing an altered psychological and emotional framework. The adroit use of faster than normal breathing, psychological reframing and eventually slower than normal maintenance can reduce the recovery time significantly and avert the dependency on pharmaceutical intervention to bring the system back to healthy self regulation and enhanced growth.

Other research has demonstrated the positive effect of breath modulation on anxiety and depression (22, 23, 24).

Addiction, in part, is an attempt on an individual’s part to maintain a state of feeling good when chronically stressed by using a stimulus that becomes associated with that “feeling good” state and overly attached to it. This is controlled by a reward center in the

brain which produces dopamine when stimulated. Once the associative connection has been made between the addictive substance and this center, repeated stimulation is reinforced independent of higher cortical mechanisms of control or suppression. Animals in the laboratory when give the opportunity to voluntarily stimulate this appetitive center by pressing a bar connected to an electrodes in their brain will continue this activity above any other appetitive need like food and water till death.(25) This center is that strong in its drive for satisfaction. Humans, once the strong association has been made to that center, have a hard time "willing" themselves to break the connection and to parse out more balanced and healthy forms of stimulation that integrate the needs of the entire organism and address the original stress which they had not solved with a more balanced approach. In a sense the period of addiction highlighted this unanswered challenge and exacerbated it to the point, sometimes life or death, where it had to be addressed and other resources brought to bear in reaching healthier solutions. Breathing patterns of people with strong addictions have been noted to be similar to those with anxiety, but often more strongly entrenched. When a person's addictive substance has been ingested, the holding pattern temporarily is released and they feel appeased. The pleasure of letting go of the institutionalized tension they carry is in itself part of the addition cycle. Breathwork has been shown to provide that breakthrough experience which helps disconnect the addictive substance as the only source of stress reduction and help in the process of rebuilding a more healthy balanced energetic approach to life. Breathwork is equipped to do more than shock the system out of the addictive cycle, but to give self regulatory tools on the physical, emotional, mental and spiritual levels - all of which must be integrated into a new life paradigm for the recovery to be a renewal and a growth to a more integrated level of functioning and fulfillment. When any of these aspects are not integrated into the recovery, relapse will continue until it is.

There have been research studies on the use of regular Conscious Connected Breathing programs (faster than normal breathing) in Alcohol recovery with over 50% sustained sobriety. (26)

8. RESEARCH ON USES OF CONSCIOUS BREATHING FOR HEALTH AND WELLBEING

Why focus on the breath's influence on physical, emotional and psychological wellbeing as opposed to other physiological factors? Throughout history the breath has been linked most directly to the source of our aliveness. In many languages the word for breath and spirit are the same. When one stops breathing the spirit or source of aliveness is said to depart. Breath is that physiological function both under autonomic and voluntary control and as such responds to our conscious and unconscious states. Thus breath is the aspect of life where the controlled and the uncontrolled are most evident. The more

conscious we are of our breathing, the less we feel at effect of our environment or completely "out of control" in a helpless sense. To help feel more moment by moment awareness of our connection to the source of life is to help us feel less victimized by life and more at one with our source. Again most traditions that practice meditation to experience safety and connection with source giving experiential meaning to life, start with breath awareness. Embracing a self directed life with personal meaning has been shown to be an essential element for health and fulfillment (5).

8.1. Effects of Meditation and Breath Awareness on the Brain and Body

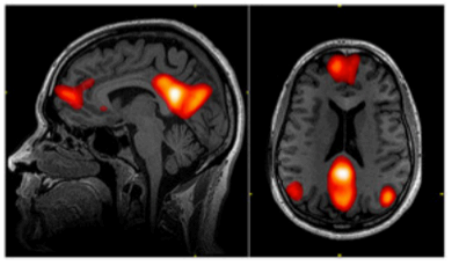
Meditation-and-the-brain research has been accumulating steadily for a number of years now, with new studies coming out frequently to illustrate some new benefit of meditation. Or, rather, some ancient benefit that is just now being confirmed with fMRI or EEG. The practice appears to have an amazing variety of neurological benefits – from changes in grey matter volume to reduced activity in the "me" centers of the brain to enhanced connectivity between brain regions. Breath awareness and meditation help relieve our subjective levels of anxiety and depression, and improve attention, concentration, and overall psychological well-being. The mind can actually change the brain's structure in a mutually reinforcing feedback loop either positively or negatively. The mind is our set of cognitive faculties including consciousness, perception, thinking, judgement, language and memory. It can be defined as the faculty of an entity's thoughts and consciousness. It holds the power of imagination, recognition, and appreciation, and is responsible for processing feelings and emotions, resulting in attitudes and actions.

8.2. Meditation Reduces Activity in the Brain's "Me Center"

A study at Yale University (27), found that mindfulness meditation which utilizes breath awareness decreases activity in the default mode network (DMN-Figure 1), the brain network responsible for mind-wandering and self-referential thoughts – a.k.a., "monkey mind." The DMN is "on" or active when we're not thinking about anything in particular, when our minds are just wandering from thought to thought. Since mind-wandering is typically associated with being less happy, ruminating, and worrying about the past and future, it's the goal for many people to dial it down. Several studies have shown that meditation, through its qui-

Figure 1

The default mode network (sometimes called simply the *default network*) refers to an interconnected group of brain structures that are hypothesized to be part of a functional system. Some structures that are generally included are the medial prefrontal cortex, posterior cingulate cortex, and the inferior parietal lobule. A few of the other structures that may be considered part of the network are the lateral temporal cortex, hippocampal formation, and the precuneus.



FUNCTIONAL MAGNETIC RESONANCE (FMRI) IMAGE SHOWING ACTIVITY IN THE DEFAULT MODE NETWORK.

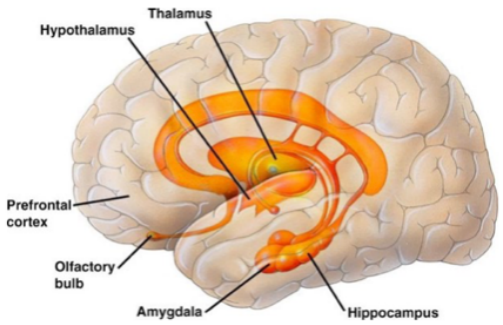
eting effect on the DMN, appears to do just this. And even when the mind does start to wander, because of the new connections that form, meditators are better at snapping back out of it.

8.3. Meditation's Effects Rival Antidepressants for Depression, Anxiety

A review study at Johns Hopkins looked at the relationship between mindfulness meditation and its ability to reduce symptoms of depression, anxiety, and pain. Researcher Madhav Goyal and his team found that the effect size of meditation was moderate, at 0.3. The effect size for antidepressants is also 0.3, which puts the effect of meditation and breath awareness on a par with medication management (28).

Recent research from Emory University gives a more nuanced understanding of the relationship between meditation practice, amygdala activity, and overall mental health. The trial found that adults who practiced mindfulness meditation had reduced amygdala activity as compared to controls when exposed to images that were either positive, neutral or emotionally negative in tone.This finding supports the notion that meditation enhances emotional stability by down regulating the amygdala (29). (Figure 2)

Figure 2



8.4. Just a Few Days of Training Improves Concentration and Attention

Having problems concentrating affects millions of children and adults, with an ADD diagnosis or not. Interestingly but not surprisingly, one of the central benefits of meditation is that it improves attention and concentration: One recent study found that just a couple of weeks of meditation training helped people's focus and memory during the verbal reasoning section of the GRE. In fact, the increase in score was equivalent to 16 percentile points (30).

8.5. Meditation Reduces Anxiety — including Social Anxiety

A lot of people start meditating for its benefits in stress reduction, and there's lots of good evidence to support this rationale. There's a whole newer sub-genre of meditation, mentioned earlier, called Mindfulness-Based Stress Reduction (MBSR), developed by Jon Kabat-Zinn at the University of Massachusetts' Center for Mindfulness (now available around the world), that aims to reduce a person's stress level, physically and mentally. Studies have shown its benefits in reducing anxiety, even years after the initial 8-week course (31). Research has also shown that mindfulness meditation, in contrast to

attending to the breath only, can reduce anxiety – and that these changes seem to be mediated through the brain regions associated with those self-referential ("me-centered") thoughts (32). Mindfulness meditation has also been shown to help people with social anxiety disorder: a Stanford University team found that MBSR brought about changes in brain regions involved in attention, as well as relief from symptoms of social anxiety (33).

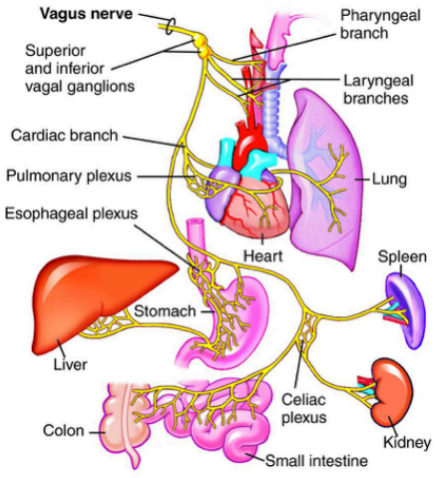
8.6. Short Meditation Breaks Can Help Children in School

For developing brains, meditation has as much as or perhaps even more promise than it has for adults. There's been increasing interest from educators and researchers in bringing meditation and yoga to school kids, who are dealing with the usual stressors inside school, and oftentimes additional stress and trauma outside school. Some schools have starting implementing meditation into their daily schedules, and with good effect: One district in San Francisco started a twice daily meditation program in some of its high-risk schools – and saw suspensions decrease, and GPAs and attendance increase (34). Studies have confirmed the cognitive and emotional benefits of meditation for schoolchildren (35), but more work will probably need to be done before it gains more widespread acceptance.

8.7. The role of the vagus nerve as a link between brain and body

Dr. Stephen Porges is the originator of the PolyVagal Theory (36). The vagus is a cranial nerve that exits from the brainstem and goes to many, many organs in our body; it is a conduit, a cable that connects our body with our brain. The vagus is the largest nerve that travels throughout the body and about eighty percent of its fibers are sensory. It is the portal to the brain from the periphery, and it tells our brain the state of our body.

Figure 3



The vagus also has a whole series of other fibers. Some of them are myelinatedand efficient in communicating; some are unmyelinated, and they regulate organs that are both above our diaphragm and below our diaphragm. Polyvagal theory is relatively new and very important when it comes to thinking about body/mind interface and how breathing and meditation effects our physical and emotional states.

The vagus is very critical in dealing with all or most of our primary internal organs and it communicates to our brain their status. (Figure 3) When you feel good, your vagus is telling your brain that it is in a good

state; when you are not feeling good or you are feeling nauseous, it is conveying that information as well.

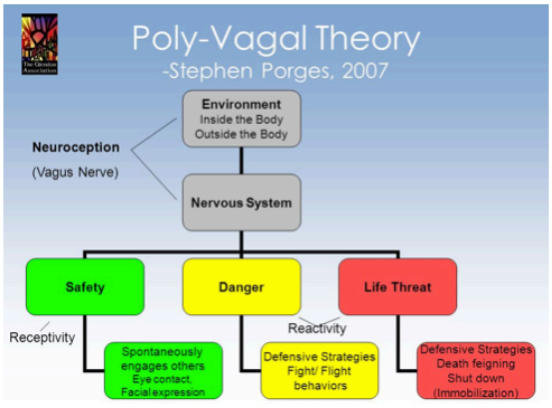
Mammals have a uniquely mammalian vagal pathway, and that vagal pathway is myelinated and goes to the heart and bronchi – the organs above the diaphragm. It is linked to the nerves that regulate the striated muscles of the face and head. Facial expressions literally become a portal that tells you exactly how the vagus is influencing your heart and bronchi.

When people are stressed out, how do their faces communicate it. The window to our autonomic state becomes our face. We functionally have three autonomic nervous systems or circuits that follow a phylogenetic or evolutionary history, and these circuits provide a response hierarchy.

When we're challenged, we use new mammalian circuits (the first in the hierarchy), and when they don't help us get into safe and appropriate situations, we regress and use older and older circuits. Our newest uniquely mammalian circuit is that face-heart connection, and we use this to literally convey to others that we're safe to come close to. When people convey to us that they are safe, we feel comfortable.

However, when we're challenged, which can be due to normal life demands or threat, we can mobilize. To mobilize we need our sympathetic nervous system (the second in the hierarchy) and we have to turn off the social engagement pathway of the vagus which is a calming circuit. But fight/flight doesn't always work for us – and this is the whole story underlying trauma. Trauma is normally associated with unsuccessful attempts to get away. We resort to our most primitive neural circuit, and that, functionally, is a shutdown circuit (the third in the hierarchy) again parasympathetic.That shutdown circuit is also vagal, but it's the old vagus; it's the vagus that we share with reptiles. When this circuit activates, we reduce our cardiac output and we reduce our mobilization.That's associated with dissociative states and hypoxia. So the three types of vagal response are the social communicative, the mobilization and the immobilization. (Figure 4) A primary way to control these responses is to functionally change our breathing. We can also change the motor tone to our face and we can control what is coming out of our mouth or going into it – all of which can impact our autonomic state. Even the acoustic environment,

Figure 4

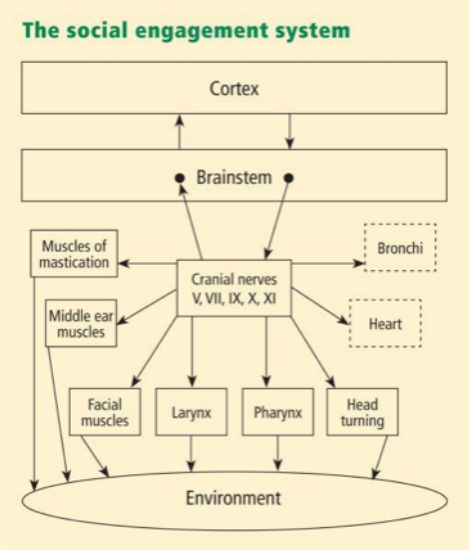


what we listen to, can impact through neural regulation of our middle-ear muscles and can change our physiological state. People have always known that – with chanting, with mothers' lullabies, with motherese (speaking), and even with normal engagement behaviors amongst friends – voice is important.

It's not simply autonomic meaning automatic – it's really a hybrid system that as we get more and more mammalian, we're using more and more voluntary or higher-brain structures to choreograph how our visceral systems work. Our nervous system evolved to pick up certain features in the environment.

The nervous system is evaluating risk, and when it evaluates risk, it tries to negotiate, or navigate, or trigger a neural component that fits that environmental context for that risk factor. What we have to realize is that when people get triggered into either mobilization defenses or shutting down, they are going to develop elaborate narratives to make sense of what their body is doing. When our nervous system fails us, we use behavior. Like with the child going into a temper tantrum, they "act it out." That is really when their nervous system of regulation has failed them and we now use some behavior to dissipate the tension. But a more mature person is informed by an understanding of these systems, and can think and navigate and move the body into a less demanding situation.

Figure 5



We have to separate the vagus into the two vagal pathways – second one that is really a defense system, either mobilization for fight/flight or, as a last resort, for shutting down or freezing. The first level of response is super-diaphragmatic, meaning above the diaphragm, regulating the heart and the bronchi part of the lungs – that is linked to the facial muscles that become part of the social engagement system. (Figure 5)This vagus is the calming system – this is the system that helps down- regulate defensive behaviors and defensive physiological systems. As long as we keep the social engagement system functioning, the two older systems are in homeostatic balance.

Once we understand that, then the polyvagal theory becomes a profound window or portal to understanding clinical symptoms and devising interventional strategies, i.e., we can use Therapeutic Breathwork modulation, both slower and faster than normal breathing, and meditation to directly regulate our nervous system.

8.8. Meditation and Breath Awareness

With meditation and breath awareness we can become much more stable once we get to the point where we can chose the mental and emotional states in which we wish to dwell. The choice is ours and it starts with the breath.

Continual Breath Awareness is being aware of the breath continually. It is meant to be practiced while you are eating, cleaning, working, playing, driving, talking and especially while you are in formal meditation. Breath awareness is the full time meditation practice for those wishing to awaken and no longer use any excuses for not practicing such as "I don't have the time." Breath awareness occurs when we attempt to focus our attention on the breath, our breathing as it comes into the body and as it leaves the body. By doing this the mind is given something to concentrate on and we are then immediately brought to a state of presence if the practice is done correctly. By consciously engaging in any activity, and by drawing our attention single pointedly to this activity, we are placing that activity into the number one spot of our awareness and temporarily making it the top priority in our field of awareness. Our senses are engaged and for the time being we are totally into it, whatever it might be. Now, by reflecting afterwards on what was happening to our mind during this moment of focused and directed concentration, we would find that we were momentarily in a state of mental peace. For the brief moment that we were totally engaged with this activity we were mentally free from any discursive or negative thoughts or feelings and our emotions were likely in a neutral state as well. It is not always easy to notice that we are mentally free from our negative mind states because the noticing cannot happen during the actual time we are concentrated, only afterwards.

Breath Awareness is done when we are using the breath as our meditation object, that is to say that we are using the breath for our point of concentration. The breath is by far the most common meditation object and rightly so because it is always with us, we can have nothing in this world and still own the most useful meditation tool known to humans, the breath. Breath is the bridge from the realms of the physical to the spiritual. In many languages the word for breath and spirit are the same.

8.9. What can Continual Breath Awareness do?

When we become concentrated the problems in life temporarily disappear, they leave our mind and are replaced by whatever we are concentrated on. With Continual Breath Awareness we are bringing our attention "within." Everything we experience is taken in through the body. When we connect with the breath we are connecting with everything. We are mind and body, and the breath is the connection between the mind (the mental) and the body (the physical), when the mind and body connect we connect with everything in our world. Furthermore, to have one reliable object such as the breath

to place our concentration on is most valuable. Continual Breath Awareness allows us to control the many thousands of needless thoughts we have each day by grounding our awareness, we can still notice the thoughts but this noticing is different than the actual thinking of the thoughts. With Continual Breath Awareness one has the the freedom to investigate thoughts without judgment and whenever we chose to do so, which is much different than allowing the thoughts to control our minds and our world. We literally create new neural pathways, influence the hierarchies of response in our brain and strengthen our social engagement, become more compassionate and prepare our brains to serve us in a longer healthier life.

Remaining mindful of the breath throughout the day is synonymous with being mindful throughout the day, there is no difference. We are watching the breath which is the connecting or pivotal point between the mind and body, the mental and physical and contained within the breath are many teachings. The first thing we notice in any meditation practice is that the mind is like a wild monkey out of control (we're trapped in the brain's "me center"), we then notice that the more we focus on this practice and tame that monkey mind the less that the hindrances to our happiness are present. Continued practicing sitting meditation is the easiest way to build our relationship with the breath and keep it at its peak. Regular daily reminders of checking in with your breath reinforces your friendship with the spirit of breath; it is your best friend. And it will take you all the way (37).

8.10. Therapeutic Breathwork and Healing Trauma

Therapeutic Breathwork adds a highly significant element not utilized in any other forms of trauma treatment, the activating breath. In Therapeutic Breathwork clients are coached to engage in another way of breathing that mildly activates the limbic system (sympathetic nervous system) through increasing the breath volume in a safe setting. This allows formerly implicit-only or partially integrated stimuli to resurface and be more fully integrated with safe outcomes. This is facilitated through the assistance of the "observer" breathworker and the "participant" client into an integrated story—often reinforced with the use of mental suggestion (affirmations or "inner child" visualizations that signal safety to the body). This reprograms the chaotic emotional responses and negative story the mind reached (or was told) to explain the disjointed reactions to life experiences.

Since traumatic overwhelming stimuli can happen at any developmental stage in varying degrees, the negative stories are prime to be created in broad themes reflective of the developmental challenges of that stage.
Prenatal/after birth: "I'm not safe" (fragmentation)
Year 1: "I am not enough or don't have enough" (abandonment/deprivation)
Year 2: "I'm not in control" (overpowering or seductive manipulation/abuse)

Years 3 and 4: “I can’t express my feelings” (emotional suppression/guilt and shame)
Years 4 and 5: “I can’t express my gender” (gender judgment/confusion/alienation)
Years 5 and 6: “I can’t have fulfilling love” (intimacy block/betrayal)

Of course, traumas around these themes can happen or be reinforced at any period of a person’s life. Healing involves relinking our emotions, sensations, and pictures with more resourceful outcomes than being frozen and self-talk that is continuously negative (e.g., “I am not lovable”).

Therapeutic Breathwork precipitously engages the sympathetic nervous system to help reprogram what has been frozen in the fight-or-flight mechanism of the vagal system. As such, fears arise and are breathed through consciously and integrated. Energy thwarted by trauma and unavailable for more creative endeavors than being on continuous “red alert” or hyper-vigilant is thereby recovered. It does not anesthetize fears that might be appropriate for the person’s wellbeing (e.g., wearing a seatbelt). But it helps put the original fears in a workable context to be understood and the energy of the fear to be integrated into more conscious use.

Pathways that had been cut off to the prefrontal cortex are now activated in resourceful ways (social engagement system or mammalian level of the vagus system), and clients “make sense” to themselves and can make productive choices based on present needs rather than operating in the trance state of past trauma (16).

9. BREATH AWARENESS FOR HEALTH AND WELLNESS PRACTITIONERS

In any helping interaction, a rapport has to be established for a useful contract to be established and results achieved. Breath awareness has been an instantaneous indication for me as a practitioner as to the level of safety and comfort a client has in their body and the environment they share with me. One’s breathing and body posture shifts with the meeting of any new person. If I am conscious of my interaction, I can immediately begin putting myself and them at ease and establishing rapport. If I unconsciously mimic or amplify the fear they are signaling, putting myself or them in a defensive posture, I have set up impediments to our rapport from the start. Awareness of my breathing as a caregiver is a key to my effectiveness in communicating with my client.

Usually within the first hour I am with a client I ask them to report what they notice about their breathing. This takes some care in presenting it so it is not taken as a criticism. I begin the teaching of breath awareness as a self regulating biofeedback mechanism at the onset. This helps them become aware not only with me, but also in their lives, of when they start to constrict their breathing. They begin to see how this breath holding

is most often associated with a fear reaction, conscious or unconscious. This awareness is then coupled with the skill of altering their breathing to produce more resourcefulness in any situation. This is usually as simple as breathing a bit more freely, oxygenating their muscle systems for action, taking their emotional system out of the fight/flight/freeze reactivity, and opening their minds to more resourceful responses rather than knee-jerk reactions.

With breath awareness, clients become more adept at using other forms of therapy because they notice when they begin to resist. They take cues from me about accepting this awareness as a useful tool rather than more material about which to criticize themselves, "What's wrong with me, I'm not breathing!" Here is where the "unconditional positive regard" and skill of the therapist when combined with breath awareness, provides a more powerful tool for the client than either one alone (16).

10. SUMMARY AND FUTURE HORIZONS

The importance of breathing and breath awareness cannot be overstated for the helping professions and in promoting wellness. With the recent marriage of time honored breathwork techniques with current scientific research, incisive new techniques of breath modulation are blossoming, both slower and faster than normal breathing methods. Research into their usage is proliferating and an International organizations has been established to monitor the training standards and ethical usage of faster than normal breathing techniques (38). Since faster than normal breathing can engender a non-ordinary state of consciousness, there is an excellent guide written concerning its ethical usage (39) as well as its history and professional application with healing trauma which I have written (16). Many body oriented practitioners have already adapted breathwork successfully to their professional practice and the creative field is wide open to explore.

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Figure Legend:
Figure 1 Default Mode Network
Figure 2 Limbic System with Amygdala
Figure 3 Vagus Nerve
Figure 4 Poly-Vagal Theory
Figure 5 Social Engagement System

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