THE RESPIRATORY SYSTEM&PRANAYAMA

Breathing is one of the most important elements of yoga practice. In my opinion, the explanation of proper breathing and its' affects on the body is the most significant role of a yoga teacher. Therefore, my description to a new yoga student would be;

Breathing is an automatic process and it occurs spontaneously and we tend to ignore our breathing in our daily life. Moreover, many people use the upper part of the lungs (upper chest breathing) and the breath becomes fast and shallow. This means when we breathe in, instead of using the deep intra abdominals to lower the diaphragm, the muscles of the upper rib cage, neck and shoulders lift the heavy rib cage to make room for lungs. After an extended period of intense focusing, the whole system seems to be frozen in a certain posture. We become fatigued from the decreased circulation of blood and from the decreased availability of oxygen for the blood. The use of only a fraction of our lungs results in lack of oxygen and may lead to different complications such as heart diseases, sleep disorders, and fatigue are some of the effects of oxygen starvation. Therefore, the full yogic breath not only makes use of the accessory muscles of the chest for a complete yet relaxed breath but also insures that the diaphragm is moving through its full range of motion. In addition, affective breathing in yoga class keeps us steady, focused, connected, and brings oxygen to our muscles to help us stretch deeper. Focusing on breath while practicing asanas also helps in controlling the movements that reduce the chances of injury. "The muscles work in a systematic way with greater coordination with nervous system and Neuro - muscular coordination can be better."[1] Being aware of the breath helps transform the energy in our body from stress to relaxation.

First of all, to understand the importance of the breath from Yogic point of view, knowing **"Why Oxygen is so vital"** is essential.

- Oxygen is the most vital nutrient in our bodies.
- It is essential for the proper and efficient functioning of the brain, nerves, Glands and other internal organs.
- We can survive without food for weeks and without water for days, but without oxygen we will die within a few minutes.
- If the brain does not get proper supply of this essential nutrient, it will cause degradation of all the vital organs of the body.
- The brain requires more oxygen than any other organ. If it doesn't get enough, the result is mental sluggishness, negative thoughts, depression and, eventually, vision and hearing declines. Oxygen supply in our body, however, declines as we get older and if we live a poor lifestyle.
- Oxygen recharges the body's batteries (the solar plexus).
- Rejuvenate the skin
- The chemical basis of energy production in the body is a chemical called Adenosine Triphosphate (ATP). If something goes wrong with the production

[1]http://www.dailyspark.com/blog.asp?post=you_asked_am_i_breathing_right_during_yoga

> of ATP, the result is lowered vitality, disease and premature aging. The oxygen is critical for the production of ATP; in fact, it is in fact its most vital component.

According to the Yoga Sutras of Patanjali, there are eight “limbs” of yoga and each limb relates to an aspect of achieving a healthy and fulfilling life. Proper breathing and control, known as pranayama, is one of the eight "limbs" of yoga.

The breath is the vehicle for Prana, which travels to every cells and tissue thorough the circulatory system. Proper Breathing brings more oxygen to the blood and to the brain, and to control prana.

“...The movement of prana is arrested by the effortless practice of breathing, without strain...The practice of exhalation, when the prana roams in space without touching the limbs of the body, of inhalation, leading to the peaceful movement of prana, and of retention, bringing it all to a standstill for a long time, all lead to the arrest of the movement of prana...These bring about the desired results if they are practiced without violence or force.”[2]

No one would deny that we live in social stressful conditions that are not good for the health of our Respiratory System. Our duties, responsibilities and related to problems become more demanding and as result of these daily actions we develop habits of forgetting to breathe. In a Yogic point of view, we reprogram our natural breath and with yoga breathing we increase the capacity of our lungs, bringing more oxygen supply to the body to function well. We learn how to breathe slowly and deeply. Through the practice of breathing, we create a balance between oxygen and carbon dioxide, which help maintain PH level in the blood. Moreover, we do not only reenergize the body and also reduce the chance of injury by practicing deep and systematic breathing in a yoga class. Breathing slowly can lower the heart rate, helps us to get rid of waste products and toxins from our body, and brings fresh oxygen to the lungs, and in turn, the rest of the body.

In Yoga practice, we integrate focus on breath during movements as well as while maintaining asanas for a long time. It's a purification process that is at the heart of yoga practices. Oxygen is vital because it purifies the blood stream and helps the nerves, brain, glands and other internal organs function properly and help the prevention of major diseases and cure minor illness. “By focusing on breathing, the control of breathing shifts from brain stem / medulla oblongata to cerebral cortex. The thoughts and emotions are by passed and mind can experience focus, and calm awareness. The emotional stress, random thoughts are removed. The emotions create tension in muscles, stiffness and blockages to flow of Prana.”[3] Awareness of breath helps manage these emotional disturbances and makes the prana flowing.

“Deep breathing to restore inner calm and reduce blood pressure. Medical researchers conclude that the emotional benefits of deep breathing include:

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[2] The Concise Yoga Vasistha, Swami Venkateshananda, p. 239

[3] http://www.yogapoint.com/articles/Breath_Yoga.htm

- Gaining a new perspective on stressful situations
- Building skills to manage stress
- Increasing self-awareness
- Focusing on the present
- Reducing negative emotions"[4]

1.Increases the capacity of the lungs and provide correct spinal alignment.
"The Full Yoga Breath increases lung capacity therefore stretching and massaging the muscles of the mid back and increasing correct postural alignment, experienced with time and consistent practice."[5].

2. Helps us to relax. Not only mentally relax but physically.
Because, brings more oxygen to our muscles therefore help us stretch deeper and come into the poses effectively. In addition, reduce muscular tension around major organs such as the heart and lungs. Improves the functions of the brain cells as the brain gets optimum purified blood supply. Helps to clear the mind, keeps us steady, connected and make the thoughts more focused for postures.

3. Breathing also helps in the detoxification of the body.
In addition to the increase in metabolism and the extra oxygen, which help with detoxifying. The practice of deep breathing insures that the diaphragm is moving through its full range of motion. This is important because as we breath in the diaphragm expands downward and massages the lower organs helping them in there detoxification efforts by stimulating peristalsis, and as we breath out it contracts and massages and helps stimulate the lungs and heart which help improve blood flow. Another important point is it helps pump lymph more efficiently through our lymphatic system and body, This is important since the lymphatic system has no way of moving lymph though our body without the help of other muscles including the ones used in breathing.

4.Increased our performance in practice of asanas.
With proper breathing the body makes better use of the energy and fuel for that energy. This oxygen is used to break down muscle glycogen to form ATP. This process is called aerobic glycolysis. To produce ATP, the muscles use oxygen and produce carbon dioxide, the latter of which needs to be removed. The respiratory system brings in oxygen needed by the working muscles and removes carbon dioxide produced. It provides hold a posture for along time at higher level.

5. Encourages proper nervous stimulus to the cardio-vascular system

When we take a deep breath and relax and expand the diaphragm, the vagus nerve is stimulated which activates the parasympathetic nervous system via a chemical that called acetylcholine. The PNS is in the brain stem and through the release of

[4] www.doyoga.com/articles_07/.../breath/diaphragmatic_breath.pdf
[5] MOKAP004- (P-3)

acetylcholine, our heart rate slows and blood pressure drops.

In yoga classes, the breath sets the rhythm for the practice and as a yoga teacher we encourage the students to breathe more deeply. Each movement is linked to a breath. Inhalation refers moving into a pose or lifting the body, exhalation refers moving out of the pose or folding the body. Surya Namaskar A-B series are the most significant examples to understand the importance of breathing in yoga class. During Surya namaskar series, the body needs more energy therefore more oxygen and also synchronizing breath with each jumping movements helps practice effectively and safely. For instance, step or jump back from ardhva uttanasana to plank pose with an exhalation helps the spine and internal organs move safely. In addition, deep breathing combined with back bends improves the lung capacity and function. Another example of breathing and asanas is ardha mastyendrasana (half lord of the fish pose). "Ujjayi (victorious breath) aids spinal movement and yoga students are encourage to always use the inhalation to lift and lengthen the spine, then exhale and move into the twist. The body honors the breath in yogasana, not the other way round (Palmer 2010)"[6]. Moreoever, when Ujjayi (victorious breath) is integrated while maintaining the asanas, it helps mind calm down faster.

The rhythm with equal inhalations and exhalations should be maintained throughout most of asanas but holding forward bend poses for a long time such as Janu Sirsasana are likely to prolong only exhalations to fold deeply. "Upanishads say that inhalation should be as uniform as drinking water through a straw and exhalation as fluent as pouring oil from one vessel to another. Only such breath can be prolonged without causing tension."[7] When we synchronize our breathing with movement, we synchronize the movement not only with the duration or the breaths but with this uniformity aspect of breath as well.

In a yoga class, we use breath to enhance prana, which raise asanas to a higher level. The sound of the breath is also other important part of practicing asanas. Neither the sound of inhalations nor the sound of exhalations should resonate (hum) on the nostrils but it would be desirable for it to resonate in the throat. Hearing the sound of breathing, both inhaling and exhaling is the essential to control its whole duration. If the breath is loud, it will quiet the mind. If the breath is quiet, it will quiet the body.

"A.G. Mohan writes: *"To regulate the breath during the practice of asanas, the technique of ujjayi breathing is important. In ujjayi breathing you constrict your vocal chords slightly as you breathe so that you can feel the air as it flows past. A slight hissing sound often results – the more you constrict your throat and force your breath, the louder the sound. With practice and greater control, you should be able to breathe slowly and very smoothly. Then the sound will diminish and you can direct your attention to a more subtle indicator: the internal sensation of your breath flowing.*"[8]

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[6] MOKAP004 (P-4)

[7] http://peria1949.hubpages.com/hub/Benefits-of-Pranayama-breathing-exercises

[8] http://maciejwielobob.com/2011/05/ujjayi-yoga-asana-breathing/

"When we breathe through our nose, the air passing through the nasal airway and contacting the turbinates is slowed down. This allows the proper mixing of the air with an amazing gas produced in the nasal sinuses called nitric oxide (NO). Nitric oxide is secreted into the nasal passages and is inhaled through the nose. It is a potent vasodilator (dilatation of the blood vessels), and in the lungs it enhances the uptake of oxygen. NO is also produced in the walls of blood vessels and is critical to all organs in the body. A mouth breather will not be humidifying the air, or slowing it down to allow the proper mixing of NO with it. The lungs will have difficulty providing maximum oxygenation for the body with this **dry, unhumidified, unfiltered** and, most importantly, **NO-lacking air**. "[9]This constant and chronic condition affects the cardiovascular system and the heart because the smooth muscles that line all of the arteries react to this poorly oxygenated air with a kind of tightness, a kind of permanent tension, which can be very stressful and depleting to the body. Furthermore it has been clinically shown that blocking NO product in health individual's results in moderate hypertension and reduced heart output as well as shortened bleeding times by activation of platelet blood-clotting factors. Due to the lack of proper oxygenation, the ability to deliver fully oxygenated blood to the cells is also much reduced. Thus mouth breathing has a negative effect on every cell in the body as it deprives them of oxygen. Overall wellness and health requires proper oxygen as every particle of our being requires oxygen. Mouth breathers tend to have amped-up sympathetic nervous systems, always on alert, and they have a hard time getting their physical or mental bodies to relax. Mouth breathing can also affect the development of the Thyroid Gland, and can retard the mental development of children.

"Since the nostrils are much smaller than the mouth, the air when exhaled through the nose slows down the rate by which the breath departs the lungs; this provides the lungs more time to extract O2 for the inhalation before it leaves the body. When there is equilibrium between oxygen- carbon dioxide exchange, the blood will maintain a balanced pH, however, if carbon dioxide is lost too quickly, as in mouth breathing, oxygen absorption is decreased."[10] Breathing through the nasal passage provides the level of control during the asanas will steady the mind and in turn the asana.

[9] http://www.healingnaturallybybee.com/articles/breath2.php
[10] MOKAP010 (P-2)

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