

Pranayama: Review of Central Classical Practices

Respiration takes place at the level of the lungs and at the cellular level. The burning of fuel takes place within the cells in a structure called the mitochondria. The energy storage molecules are called ATP (adenosine triphosphate.)

A change in any of the body parts involved in air/oxygen supply could potentially alter the course of energy production within the entire body. These parts include: nose, trachea, lungs, circulatory system, and muscles that facilitate breathing.

The Pulmonary (Lungs) and Circulatory (Heart) Systems

The pathway of air into the bloodstream

The air flows in the nose, through the trachea (windpipe), to bronchi (branches), to bronchioles (smaller branches), to alveoli (air sacs.) Then gas is exchanged through the cell walls of the alveoli into the capillary beds surrounding the alveoli.

Once in the capillaries, oxygen is transported primarily through hemoglobin, a molecule within red blood cells. (Four protein chains surrounding an iron atom. The iron attracts the oxygen to it for transport.) Once attached to the hemoglobin the oxygen travels through the arterial system, exiting the left side of the pumping heart, to be delivered to individual cells for use in energy combustion. At the delivery point, again the red blood cells are transferred through the cell walls of whatever tissue is being supplied (muscle, nerve, etc.) and gas exchange takes place. Oxygen is released into the cell and carbon dioxide is taken on by the red blood cell to be transported back to the right side of the heart through the veins.

Blood is not evenly distributed in the lungs, being gravity-dependent in the upright position there is more blood in the lower aspects of the lungs than in the upper. The free flow of air is greater into and out of the upper aspects of the lungs. Efficient is dependent on how we breathe!

The diaphragm in its resting state billows upward like a dome. Air flows into the lungs when the structures around them expand and pull them into expansion. The lungs are basically passive. The diaphragm pulls down on them through the effect of the plural sheaths that cover both the lungs and the diaphragm. The lubricant or pleural fluid between allows the motion to glide. Within the alveoli is a protein-containing fluid called surfactant that coats them and keeps them moist. The surface tension of the surfactant provides elasticity to the alveoli and it is actually this surface tension that allows the lungs to recoil reshaping into their original size.

Three actions increase volume of chest cavity in inhalation:

1. extend diaphragm downward as in DIAPHRAGMATIC BREATHING
2. expand chest walls outward as in THORACIC OR CHEST BREATHING
3. move top of chest upward as in CLAVICULAR BREATHING

These actions can be done in any number of complete or partial combinations.

Paradoxical Breathing is the combination of expanding the chest while simultaneously contracting the abdominals which pushes the diaphragm up into the chest cavity. It is a fight flight reaction that becomes habitual or is learned in relation to body styles or parental modeling.

Pranayama Practices

Please refer to the text, *Science of Breath* for explanation of these practices. Below are some recommendations for beginning students and for teaching. If one is unable to pass air freely through the breathing apparatus, the preparatory cleansing practices are recommended. They are:

Jala Neti – nasal wash cleansing practice (*kriya*).

Sutra Neti – String Wash is sometimes used but it is usually seen as odd and unsavory to westerners.

Rhythmic Diaphragmatic Breathing (also called Optimal Breathing)

The five aspects of optimal breathing that should be taught as a baseline for ALL pranayama and asana and vinyasa practices are that the breath should be:

1. Diaphragmatic – initiated, moved primarily and controlled by the diaphragm muscles.
2. Steady – the action of the diaphragm's movement should be continuous and steady without differences in speed or pause
3. Even – the in breath and out breath should be the same length
4. Nasal – the breath should flow through the nostrils whenever possible
5. Silent – any sound-producing tensions or blockages should be removed as possible.

Postures that assist learning breath awareness and optimal breathing are:

A. Crocodile Pose/Makarasana

B. Corpse Pose/Shavasana

Sandbag Breathing

A sandbag weighing 5 -15 pounds is a tool that can be placed on the mid-back or upper abdomen to assist sensory perception and strengthen the diaphragm muscle. A five-to-ten minute practice is a good amount of time for a beginning student.

Nadi Shodhanam (channel purification or alternate nostril breathing)

Classically the timing of the practice is done:

Evening Practice – begin so that you **EXHALE THROUGH THE RIGHT NOSTRIL**

Morning Practice – begin so that you **EXHALE THROUGH THE LEFT NOSTRIL**.

However, for general purposes one can determine the more clogged nostril and begin the practice by exhaling first through the more clogged side, and continuing from there. This grounds the practice in the practitioner’s own current of energetic flow in the moment and can be used universally. If someone has a cold or clogged nostril from allergies or environmental irritants they should perform the nasal wash/jala neti and see if the clog is eliminated. If not, they should skip the practice until the breathing is once again clear.

Introducing the practice: find the more clogged nostril. Exhale through it first, then repeat three rounds. Reverse for three breaths, reverse again for three breaths.

***Kapalabhati* (skull shine)**

This practice is considered a cleansing practice (*kriya*) and is best introduced slowly to beginning students. Students must be able to perform optimal diaphragmatic breathing before being introduced to the practice. A good way to introduce it is to begin by exhaling and slowly inhaling 3 to 5 times. Then rest and see what one notices. Then begin to add a few more repetitions and speed. Notice effects. If the practice is copasetic, begin with 25 repetitions that gradually increase in speed. This is like a locomotive engine that gradually accelerates. Once students have accomplished the 25 repetitions you can add more ‘sets’ of 25 repetitions with a rest period in between. As they continue into more advanced practices, they can work toward 75 repetitions at one time and beyond.

***Bhastrika* (bellows)**

The process for teaching Bhastrika is the same as for Kapalabhati. It is more challenging and harder to control; the inhalation is also forced so even more care should be taken, more rest in between ‘sets,’ and more time taken to progress to quicker and additional repetitions.

***Ujjayi* (ocean or victorious breath)**

The word ujjayi can be translated to mean, “victory arising from the process of expansion.” The glottis in the throat is partially closed which produces a soft ‘sa’ sound on inhalation, and a soft ‘ha’ sound on exhalation. The abdominals work and can be kept slightly contracted in inhaling as well as applying a slight pressure to expel air on exhaling.

Ujjayi can be done alone as a breathing practice to calm the nervous system and to steady the mind. It also will strengthen the diaphragm. It is used as well to give auditory feedback to the practitioner of the rate, steadiness and volume of flow of the breath.

Ujjayi is also used with asana practice. It should be noted that for many people it is too challenging to continue to practice ujjayi breathing throughout an entire yoga class. For beginning, elderly and general classes it is suggested to use it sparingly, as an option, or only for less strenuous sections of the class work.

Bhramari Sitali and Sitkari are less well known and less used but can be of interest to seniors and those interested in energetic practices specifically.

***Bhramari* (nasal bee sound on exhale)**

This sound is quite odd and should be nasal. The tonality does not matter. It should be done for a few minutes (3 or so) for the effect to be noticeable.

Sitali – tongue makes a long tube and protrudes slightly outside of lips.

Sitkari – tongue rolls side to side across the mouth while teeth clench in front of it.

In both of these practices the result is coolness of the body and soothing of the brain and nervous system. The inhale is done through the mouth while the exhale is through the nose as usual.

ADVANCED PRACTICES SHOULD BE LEARNED WITH THE SUPERVISION OF A QUALIFIED TEACHER. IRREPARABLE DAMAGE CAN RESULT IF THIS IS NOT HEEDDED.

Bandhas (Locks)

1. *Jaladhara* (chin lock)
2. *Uddiyana Bandha* (abdominal lift)
3. *Mula Bandha* (root lock)

Mudras/seals used in pranayama practice

1. *Vishnu Mudra* – index and middle fingers folded to palm
2. *Jnana Mudra* – index finger to thumb pad

In most yogic methods of classical meditation practice, steady posture in which the head, neck and trunk are lined up with breathing that is controlled and even are essential for maintaining a focused and calm mind. Pranayama is an essential preliminary aspect of meditative practice.

Sitting Poses Used for Meditation

Maitri Asana – The Friendship Pose: Seated with hands on thighs in a chair, feet touching the floor.

Sukhasana – The Easy Pose: Sitting cross legged

Svastikasana – The Auspicious Pose: Sitting with legs crossed and feet intertwined but not central.

Siddhasana – Accomplished Pose: Sitting with legs crossed and feet intertwined and heels central.

Padmasana – The Lotus Pose: Sitting with legs crossed and feet pulled onto the opposite thighs.

Vajrasana – The Thunderbolt Pose: Sitting on shins and heels.

Additional Terms You May Encounter

The 4 Phases of the Breath:

Puraka – inhalation

Antah Kumbaka – retention after inhalation

Recaka – exhalation

Bahya Kumbhaka – retention after exhalation

Breath with Movement used in Relation to Vinyasa Practice:

Brahmana Kriya - moving during inhalation and holding the breath (nourishing)

Langhana Kriya – moving during exhalation and holding the breath (cleansing)

Rama, Swami, Ballentine, Rudolph, Hymes, Alan. SCIENCE OF BREATH: A PRACTICAL GUIDE.
Himalayan Institute Press, Honesdale, PA, [1979] 1998.