Pranayama part 1: An introduction

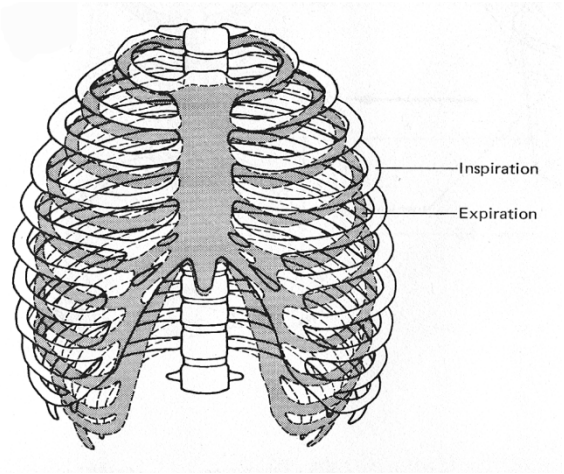
By Alan Goode

As light radiates from the disc of the sun, so air is spread through the lungs.
Move the chest up and out. If the skin over the centre of the breastbone can move vertically up and down and it can expand from side to side circumferentially,
it shows that the lungs are being filled to their maximum capacity.

BKS Iyengar

Pranayama is conscious breathing—not deep breathing. *Prana* means energy or life force and pranayama is the channelling of energy within the body. In this way someone can be doing deep breathing without necessarily doing pranayama. This conscious element is what gives pranayama its potency.

Classically, pranayama is said to be the transition between the outer and inner world—the vehicle through which we internalise, feel the body, and experience our inner life. In performing the asanas it is our will that can be brought to bear to sculpt the body and to learn focus, discernment, and subtlety. In pranayama, however, will power strangles the breath. Pranayama therefore requires a more subtle approach—more observation than action. The practice of pranayama commences where savasana finishes. For this reason students should become proficient in asanas and especially
savasana before commencing the practice of pranayama.



BKS Iyengar writes that:

> "'We all breathe, but how many of us do so correctly, with attention? Bad posture, an ill-shaped or caved-in chest, obesity, emotional disorders, various lung troubles, smoking and uneven use of the respiratory muscles, lead to improper breathing, below one's capacity. We are aware of the discomfort and disability which then arises. Many subtle changes take place in our body as a result of poor breathing and bad posture, leading to heavy breathing, inadequate pulmonary function and aggravation of heart disease. Pranayama can help to prevent these disorders and help to check or cure them, so that one can live fully and well.'[1]

Physiology of the breath

Breathing is a chemical reaction triggered when carbon dioxide levels in the blood rise, causing the diaphragm to contract and suck oxygen into the lungs. Oxygen enters the lungs to the level of the alveoli. These fine airways help the oxygen transfer across the capillary wall to merge with haemoglobin in the blood stream which is then carried throughout the body. Respiration therefore is both voluntary and involuntary—it is habitual and automatic, but can also be regulated through conscious awareness.

Types of breath

BKS Iyengar classifies respiration into four types:

> "(a) High or clavicular breathing, where the relevant muscles in the neck mainly activate the top parts of the lungs.
>
> (b) Intercostal or mid-breathing, where only the central parts of the lungs are activated.

[1] BKS Iyengar, Light on Pranayama, Allen & Unwin 1981 p.31

(c) Low or diaphragmatic breathing, where the lower portions of the lungs are activated chiefly, while the top and central portions remain less active.

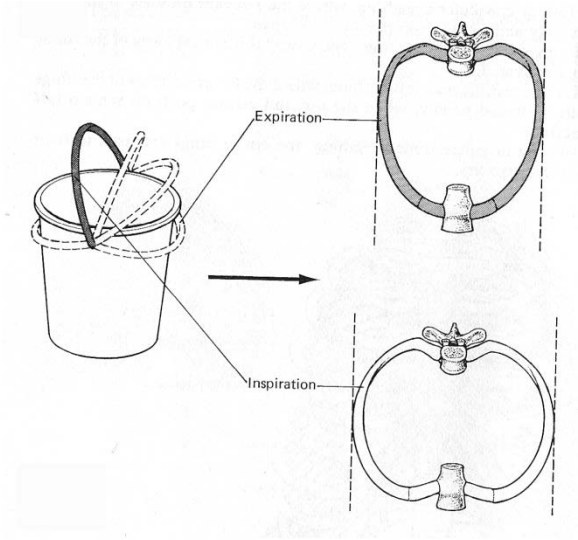
(d) In total or pranayamic breathing, the entire lungs are used to their fullest capacity."[2]

Of the four types of breathing listed above, the two extremes most often seen in students are:

(a) Low breathing or "bloating" of the abdomen. This happens when the middle chest muscles (intercostals spaces) are inflexible so that there is no expansion of the rib cage. Tightness results in the expanding force of the lungs becoming directed downwards to the abdomen. As the intra abdominal pressure increases, the abdomen "bloats".
(b) Upper Breathing is observable as a tensing of the throat as the muscles of the neck and shoulders contract to lift the rib cage in an attempt to get more air. This is often associated with a tense abdomen as well.

Complete Yogic Breath.
Pranayama is when all three types of breathing mentioned previously (lower, mid and upper) combine to form a complete deep breath using all areas of the chest and lungs:

'In pranayamic inspiration, diaphragmatic contraction is delayed until after the conscious contraction of the muscles of the anterior and lateral abdominal wall. These muscles are diagonally connected to the ribcage above and the pelvis below. This action lowers and stabilises the dome shaped diaphragm which originates at the lower rib margin; it pushes up the abdominal organs and increases the capacity of the thorax. This prepares the diaphragm for a subsequent contraction of maximum extent and efficiency by reducing the centripetal pull. This minimises interference with the next action of the sequence, the elevation and expansion of the lower ribcage in ascending upwards. This is accomplished by the vertical pull of the diaphragm followed by the sequential activation of the intercostal muscles to allow the fullest caliper-like movements of the floating ribs, bucket-handle like movements of the individual ribs, elevation and full circumferential expansion of the ribcage as a whole from its origin at the spine. Finally the highest intercostals and the muscles connecting the upper ribs, sternum and clavicles to the neck and skull are contracted, enabling the upper part of the lungs to be filled. Then the already expanded thoracic cavity expands further forwards, upwards and sideways.'[3]



Whilst this description outlines in great detail the act of deep inhalation, pranayama is not practiced technically but experientially, by observing pressure, stretch and sound.

Sound

The sound of the breath as you inhale is regulated at the throat. Emphasis is given not to the amount of air taken in but to the sound and texture of that flow. Smooth consistent flow from beginning to end, without wavering, is attempted and refined until that sound (heard internally, within the ears) both fills the frame of your attention and absorbs the mind.

[2] [2] BKS Iyengar, Light on Pranayama, Allen & Unwin 1981 p.21

[3] [3] BKS Iyengar, Light on Pranayama, Allen & Unwin 1981 p.23-24

Anatomy

The Ribs

The lungs are contained within twelve ribs. There are ten ribs which attach at the spine and sternum (breastbone) while the lowest two, the floating ribs, attach at the spine only and come less than half way round to the side. Attached front and back, the ribs hinge in much the same way as a bucket handle allowing the ribcage to broaden and expand further on full inhalation thereby increasing the capacity of the lungs.

BKS Iyengar writes that:

> "The floating ribs, not being fixed in front to the sternum expand like a pair of calipers to create more space in the chest. Laterally, the thick middle ribs can also expand laterally, thus widening and lifting the rib-cage. This does not affect the top ribs. To fill the uppermost reaches of the lungs requires training and attention. Learn to use the upper inner intercostal muscles and the top part of the sternum. Expand the rib-cage from the inner frame outwards, as this will stretch the intercostal muscles.'[4]

The Muscles

Breathing requires a delicate coordination of muscles. These muscles can be divided into two groups :

(a) Primary Muscles are essential for breathing. These include the diaphragm, abdominal, internal and external intercostals, abdominal muscles, levarores costarum, and transverses thoracis.

(b) Secondary Muscles assist the primary muscles in times of greater need for oxygen such as when playing sports. These include the pectoral minor, trapezius, sternocleoido mastoid, and scalenes.

Accessory Muscles

> "The respiratory muscles of the throat, torso, spine and abdomen are the accessories used in breathing, which is ordinarily dominated by the diaphragm. Besides the muscles already described, those of the neck, especially the sternomastoids and the scalenus, play their parts. They contribute very little to quiet breathing, but become active when the rate or depth is increased and rigid when the breath is held. The use of accessory respiratory muscles varies from one individual to another. It also varies from time to time in the same person, depending on how powerfully he exerts in his breathing and how efficiently and how tensely.'[5]

The Diaphragms

The body has three diaphragms. These are the true diaphragm, the vocal diaphragm and the pelvic diaphragm.

(a) The Diaphragm is a dome shaped muscle that sits up under the ribs and divides the thoracic cavity (containing the heart and lungs) from the abdominal cavity (containing the stomach, intestines, liver, etc). When we inhale this muscle contracts, flattens downward and pulls air into the lungs. On exhalation the diaphragm relaxes to resume its dome shape

(b) The Vocal Diaphragm. Pranayama can be divided into digital (where the fingers control air flow) and non digital (where the throat regulates the flow of air) breathing. The throat acts as the first diaphragm as it limits the flow of air entering the lungs. The narrowing of the opening through which the air flows both regulates the volume and the rate of flow into the lungs. This creates an increase in work for the diaphragm and helps to define and increase its contractive force. In *Ujjayi* (the principle pranayama) the throat is narrowed to slow the flow of air. The sound that this narrowing of the airways makes is important.

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[4] [4] BKS Iyengar, Light on Pranayama, Allen & Unwin 1981 p.30

[5] [5] BKS Iyengar, Light on Pranayama, Allen & Unwin 1981 p.31

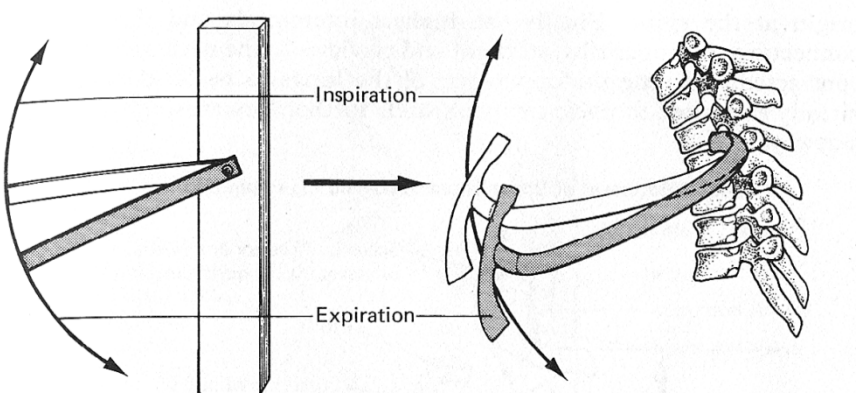
(c) Pelvic Diaphragm. Formed by the muscles of the pelvic floor this interlace of muscles provides the platform on which the waist lengthens, the chest lifts and opens and the lungs reach their full capacity.

The Breastbone

The breastbone has three parts. In breathing, the top and bottom of the breastbone should be kept perpendicular to the floor when sitting in pranayama (or parallel to the floor when lying). Use the breastbone as a support for lifting the side ribs to create more space for the expansion of the lungs sideways and upwards.

The Lungs

BKS Iyengar writes that: "The lungs open sideways and space for expansion is created with the help of the intercostal muscles. Keep the interior intercostal muscles at the back firm. If the skin at the back does not co-ordinate with the intercostal muscles, breathing becomes shallow, reducing the intake of oxygen, causing physical weakness and lack of bodily resistance." (LOP p. 30)



The Skin

"As a drummer tightens the skin of his drum to get resonance and a violinist tightens his strings to get clarity of sound, the yogi adjusts and stretches the skin of his torso to create maximum response from the intercostal muscles to aid the respiratory process when practicing pranayama. " (LOP p. 30)

Intra abdominal pressure / intra thoracic pressure.

The diaphragm divides the trunk into two cavities – the chest or thoracic cavity and the abdominal cavity. When commencing Ujjayi the diaphragm is stretched sideways initially which decreases intra abdominal pressure and has the effect of the upper abdomen falling slightly. Continuing to inhale, the ribs pivot in what is often described as a bucket handle effect (fixed front and back, the ribs hinge like the swing of a bucket handle) increasing the rib cage's volume. It is experienced as a swelling in the armpits. Finally the upper chest lifts—felt as a swelling of the area just below the collar bones. Towards the end of the inhalation when the pressure in the chest reaches capacity, the intra thoracic pressure directs its pressure downward towards the abdominal cavity and the upper abdomen is seen to rise. This happens not because of abdominal bloating but merely as a result of intra abdominal and intra thoracic pressure equalizing. On commencing the exhalation the upper abdomen falls first as the intra abdominal pressure lessens, then the diaphragm regains its dome shape as the floating ribs draw inwards. The ribs gradually regain their shape and the upper chest returns to its resting position. The abdominal cavity can be likened to a liquid-filled container which cannot be compressed, and the thoracic cavity to a gas chamber which can be compressed. This explains why in *uddiyana bandha* it is possible to pull the stomach muscles back and up to compress the thoracic cavity.

Introducing Pranayama

Lying Pranayama

You should begin the practice of pranayama by lying in order to become proficient in the sound, texture and volume of the breath before introducing sitting pranayama. Because sitting requires a stable spine it requires the ability to isolate the sitting muscles from those of respiration. The two most common setups for pranayama are listed below.

(a) Long Blanket. A blanket folded into thirds along the length of the blanket (or two folded blankets set in a stepped arrangement) is laid along the mat. The buttocks remain on the mat while the sacrum and spine is supported by the folded blanket. A second blanket supports the neck and head. The use of these blankets lengthens the front body and separates the movement of the chest from the abdomen. It makes the student aware of the broadening and lengthening of the spinal muscles on the inhalation and their softening and narrowing on the exhalation. It lifts the rib cage away from the abdomen (lengthens the abdomen) and stretches the sternum to the side. This results in a lifted and open chest where the lungs move freely and sensitively.

(b) Cross Blanket. The three-fold blanket is placed horizontally along the mat across the rib cage with the top edge located just below the shoulder blades. This alignment pacifies the abdomen and allows the diaphragm to broaden. This position breaks the tendency to push into the abdomen when inhaling and places greater emphasis on the movement of the rib cage. It is used as an introductory stage to understand the separation of abdomen and rib cage.

Introducing Ujjayi

Savasana is the essential quality from which to begin the practice of prananyama because it lowers the base metabolic rate from which you commence—heart, breath and mind. The following three versions of breathing are often used to progressively introduce Ujjayi.

(a) Longer exhalation / normal inhalation.
Pranayama is normally introduced by first extending the exhalation whilst allowing the inhalation to rebound naturally (find its own level). This allows the beginner student to experience directing the breath whilst observing the effects of this action on the body, mind and emotions. The rebound also lets them recover. It establishes a familiarity in channeling the breath and makes the diaphragm pliable.

(b) Longer inhalation / normal exhalation.
This method follows the previous instructions and whilst continuing to free up the diaphragm it explores the touch in the ribs as the lungs expand.

(c) Long inhalation / Long exhalation.
Here the three stages of the breath are introduced—the lower, middle, upper breath. These are not independent stages (or compartments) but points of observation over the length of the long inhalation and long exhalation. Observe the movement of the bottom side ribs, the band of the middle chest (armpit swelling) and the area of the upper chest just below the collarbones.

Iyengar describes Ujjayi in the following passage:

> "The sadhaka must first direct his body-conscious awareness specifically and intelligently at the lower anterior abdominal wall just above the pelvis. To accomplish this, he has to move the lower abdominal wall towards the spine and against the diaphragm as if massaging from the skin to the muscles and muscles to the inner organs. This sense of active conscious contraction is associated with visible movements of the abdominal wall from the surface skin to its deepest layers, and can be directed at will. After that, direct your attention to

expand the lateral and posterior regions of the chest. Elevate the lower chest wall simultaneously expanding the top chest wall with its skin and muscles. The diaphragm gradually and smoothly resumes its domed shape as it starts to relax towards the end of inspiration. During exhalation the dome moves up again. It is active at the start of expiration to encourage a smooth slow start to the elastic recoil of the lungs.'[6] (LOP p25)

Practicing Ujjayi Pranayama I

Ud means upwards or superior in rank. It also means expanding or blowing, indicating a sense of power. *Jaya* means victory or conquest, in other words restraint. *In Ujjayi Pranayama* the chest and the lungs are fully expanded like those of a hero or a conqueror.

Technique:

I. Lie on a blanket in Savasana.
2. Exhale completely whatever breath is in the lungs.
3. Relax the diaphragm so that it is soft. Deflate the abdominal organs and keep them in contact with the spine. Exert no pressure on the chest. The thoracic cavity will thus be separated from the abdominal cavity. The abdominal organs must not be forcibly pressed in.
4. Inhale through the nostrils slowly, quietly, deeply, and steadily.
5. Fill the lungs with air completely, from the floating ribs to the top brim of the chest. This is called *puraka*. Observe the following points:
(i) keep all other parts of the body relaxed as in savasana;
(ii) let the abdomen remain like a valley; the chest is filled with air and expanded;
(iii) when the lungs are full and no more breath can be taken in, a natural pause will be experienced for a second or two;
(iv) do not allow the ribs to collapse and do not let loose the grip on the diaphragm suddenly;
(v) keep the chest as though tucked up without tightening the throat;
6. Exhale slowly, quietly, steadily, and rhythmically. If the exhalation is sudden there will be tremors of the body.
7. Exhale quietly but fully, till the lungs are empty. This is called *recaka*.
8. This completes one cycle.
9. In the beginning start with 8 to
10 cycles and gradually increase the number of cycles to 15 or 20.
11. After completing the last cycle lie in Savasana with normal breathing.

Cycle

Initially one cycle of Ujjayi is completed followed by 2 or 3 normal rounds of breath. This allows the student to recover their composure for the next cycle and to sweep their attention throughout the body to observe any residual tension or reactions from the Ujjayi breath. Return to Savasana if there is an excess of tension and resume once the tension has abated. Eventually these normal cycles are removed once the student is able to link one cycle to another without wavering.

Asanas which prepare the body for Pranayama

Asanas for the Pelvic Diaphragm.

Supta Baddha Konasana
Setu Bandha Sarvangasana.
Viparita Karani
Rope Sirsasana.
Baddha Konasana and Upavistha Konasana in Sirsasana and Sarvangasana.

[6] [6] BKS Iyengar, Light on Pranayama, Allen & Unwin 1981 p.25

Forward bends—Janu Sirsasana and Ardha Baddha Padma Paschimottanasana specifically. These release the legs, hip and groins.
Sirsasana—with Baddha Konasana and Upavistha Konasana.
Sarvangasana—with Baddha Konasana and Upavistha Konasana.
Savasana.

Asanas for the vocal diaphragm

Halasana and Ardha Halasana.
Ardha Sarvangasana.
Setu Bandha Sarvangasana.

Asanas for the thoracic diaphragm

Viparita Dandasana over backbender or cross bolsters.
Supta Baddha Konasana
Setu Bandha Sarvangasana
Forward bends—stretch the spinal portion of the diaphragm.
Standing poses—prepare the body for pranayama. Whilst not practiced as a preparation they lay a foundation by making the spinal muscles and rib cage pliable.
Sirsasana and Sarvangasana.

Sequences for Pranayama Practice

The following is an example of two sequences of practice in preparation for pranayama practice.

Sequence 1
Supta baddha konasana; Uttanasana—forehead support; Adho mukha svanasana—supported; Prasaritta padottanasana—head down; crossed bolsters; Setu bandha sarvangasana; Supported halasana; Viparita karani. Layout for pranayama.

Sequence 2
Supta baddha konasana; Adho mukha svanasana—supported; Salamba sirsasana—with baddha konasana and upavistha konasana; Salamba sarvangasana—with baddha konasana and upavistha konasana; Supported halasana; Viparita karani. Layout for pranayama.