

Yoga Therapy in Practice

Prânâyâma Can Be Practiced Safely

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Abstract

Recent reports in the medical literature suggest that some vigorous Yoga breathing practices (prânâyâma) may pose health risks. This article addresses the issue of safety in prânâyâma by reviewing traditional cautions and recommendations from Yoga texts such as the Yoga Sûtras and Hatha Yoga Pradipikâ, and by describing the prerequisites for beginning a prânâyâma practice. Prerequisites include the ability to establish a normal breathing pattern with efficient use of the diaphragm, the ability to consciously control the process of breathing without strain or undue tension, learning basic prânâyâma techniques before advanced techniques, and preparation of the body through Yoga postures. Finally, safety precautions are described for practicing more vigorous prânâyâma techniques.

Aims

Two medical journals have reported complications from Yogic breathing practices (*prânâyâma*). One report¹ describes the case of a 29-year-old woman who experienced spontaneous pneumothorax after practicing *kapâlabhâti prânâyâma*, a breathing technique that involves forceful exhalation. The second report² describes the cases of a 40-year-old man who experienced subcutaneous emphysema (swelling in the face and neck), air in the retropharyngeal spaces, and pneumomediastinum following the practice of a vigorous *prânâyâma* technique.

Both cases raise questions about the safety of certain Yogic breathing practices. However, TKV Desikachar, one of the world's foremost teachers of therapeutic Yoga, says, "I assure you that we can practice *prânâyâma* as safely as we practice *âsanas* or anything else."³ This article will address safety issues in practicing *prânâyâma* by describing (a) the traditional Yogic view on appropriate practice, (b) the prerequisites for *prânâyâma* practice, and (c) safety guidelines for the practice of rigorous breathing techniques such as *kapâlabhâti* and *bhastrikâ*.

What is *Prânâyâma*?

Note that *prânâyâma* can be literally translated as "control and expansion of *prâna*." Classical Yogic texts

such as the *Yoga Sûtras* and the *Hatha Yoga Pradipikâ* emphasize control, patience, and discipline in the practice of *prânâyâma*.

Yoga Sûtras

Patanjali viewed *prânâyâma* as the conscious manipulation of breath, by a variety of means, to achieve control and expansion of *prâna*. In the "*Samâdhi Pada*," the first chapter of the *Yoga Sûtras*, Patanjali says *prânâyâma* is "conscious exhalation and restraint of breath and *prâna*" (1:34). In the "*Sâdhana Pada*," the second chapter of the *Yoga Sûtras*, Patanjali says this about *prânâyâma*: "Braking the force and uncontrolled movement of exhalation and inhalation is breath control and expansion of *prâna*" (2:49). In the next *sûtra*, Patanjali describes the technique for control and expansion of *prânâyâma*: "That *prânâyâma* is of three modes; external, internal and the suspension (of breath); observed by locus (place of awareness and concentration in the body), duration, and count, (breath is made) long and subtle" (2:50).

Author Acknowledgments: Gratitude expressed for the advice and technical support to my Yoga teacher Gary Kraftsow, Director of the American Viniyoga Institute; Deane Hillsman, MD, FCCP, Director of Sierra Biotech; and Lawrence Cahalin, CCP, Clinical Professor at Northeastern University.

Hatha Yoga Pradipikâ

Svâtmarâma, author of the *Hatha Yoga Pradipikâ*,⁴ says at the very outset of the *Prânâyâma* chapter that a Yogi should be a master of self-control prior to embarking on the practice (2:1). He goes on to warn practitioners, “Practice with caution and patience! Just as lions, elephants, and tigers are controlled by and by, the breath is controlled by and by, in slow degrees. By being hasty or using too much force, it kills the practitioner” (2:15).

According to Svâtmarâma, the three cardinal maneuvers of *prânâyâma* are *puraka* (inhalation), *rechaka* (exhalation), and *kumbhaka* (controlled end-inhalation breath holding) (2:71). Most *prânâyâma* techniques listed in the *Hatha Yoga Pradipikâ* involve all three maneuvers. Svâtmarâma repeatedly instructs that inhalation, exhalation, and retention should be performed mindfully and skillfully, as is evident from the following text: “*Yuktam, yuktam* expel air, *yuktam yuktam* fill in the air and *yuktam yuktam* hold the breath in *Kumbhaka*” (2:18). The root verb for *yuktam* is “*yuj*,” which has the same cognate as “yoke” in English, and of course “Yoga.” *Yuktam*, which shows up repeatedly in the *Bhagavad Gita* as well, connotes the sense of performing an action skillfully and mindfully in a disciplined manner. Repetition of the word *yuktam* in the context of breath control is intended to place emphasis on the importance of connecting (yoking) the mind and the body with the breath.

In the *Hatha Yoga Pradipikâ*, the author uses a variety of words to convey the importance of control, patience, and discipline. Consider the following translation⁴:

...yogi should fill in the air through the left nostril, hold the breath **according to one’s capacity** and expel it **slowly** through the right nostril (2:7). Then filling in the air through the right nostril **slowly**, perform *kumbhaka* (retain breath) **mindfully**, and then the breath should be exhaled through the left nostril (2:8). (Then) inhaling through the nostril one exhaled (left nostril) and restraining it for as long as one can hold, breath should be exhaled through the other (right nostril) **slowly and not forcibly or rapidly** (2:9). Alternate nostril breathing and restraining of breath should be practiced **methodically** (2:10). Increase the repetitions of *kumbhaka* **slowly** (2:11).

The eight *prânâyâma* techniques, identified in the *Hatha Yoga Pradipikâ* as “Different types of *Kumbhaka*,” are as follows: *suryabhedna*, *ujjayi*, *sitkari*, *shitali*, *bhastrikâ*, *bh-*

ramari, *murccha*, and *plavini*. Note that *kapâlabhâti* is identified as one of six cleansing actions (*shatkarmas*) and not as *prânâyâma* proper.

Kapâlabhâti and *bhastrikâ* are the only techniques described in the *Hatha Yoga Pradipikâ* that require rapid inhalations and exhalations.⁵ The instruction that inhalation, exhalation, and end-inhalation breath retention (*kumbhaka*) should be done slowly (*mandam*), comfortably or with ease (*sukha*), systematically or methodically (*vidhivat* or *yukten*), slowly (*shanaish shanaish* or *mandam, mandam*), not forcefully (*nâ vegâtah*), deliberately or effortfully (*yatnen*), according to one’s capacity (or words to that effect) appear 20 times in the *prânâyâma* chapter. In contrast, the instruction that inhalation or exhalation should be done “rapidly” or “with force (*vega*)” appears only three times in the whole *prânâyâma* chapter, and strictly in the context of *kapâlabhâti*, *bhastrikâ*, and *bhramari*. In *bhramari*, only the inhalation is done rapidly, and the exhalation still must be done slowly.

Prerequisites for *Prânâyâma* Practice

Slow-breathing *prânâyâma*, including techniques such as *bhramari*, *shitali*, *sitkari*, or *nadi shodhana*, pose relatively low health risks as long as the practitioner employs steady attention, patience, discipline, and, above all, does not exceed his or her comfortable capacity. But *kapâlabhâti* and *bhastrikâ*, both rapid breathing techniques, pose greater risk. Some practitioners seem to throw all caution to the wind in their enthusiasm for pumping their breath faster and faster, thereby increasing the risk of hyperventilation. Furthermore, indiscriminant practice of *kapâlabhâti* and *bhastrikâ* may reinforce or worsen preexisting structural or functional problems and excessively strain the cardiopulmonary system. The following breathing capabilities are recommended as prerequisites for a *prânâyâma* practice that includes any form of *kapâlabhâti* and *bhastrikâ*.

Normal Breathing Pattern

In restful breathing, the exhalation should be at least equal to inhalation in volume and duration. Ideally, breathing should be slow and smooth, with exhalation slightly longer than inhalation. The breathing rate at rest should be within normal limits. For healthy young adults, 12-15 breaths a minute at rest is generally regarded as the normal rate of breathing. A rate of 20 or more breaths a minute indicates possible hyperventilation.

Some vigorous *prânâyâma* techniques can exacerbate hyperventilation, and any tendency toward hyperventilation

should be eliminated before practicing *prānāyāma*. The following can all be signs of hyperventilation⁶:

- Complaints of dizziness or lightheadedness
- Complaints of breathing discomfort, shortness of breath, or “air hunger,” expressed in such statements as “I feel winded all the time,” “I never seem to get a satisfying breath,” “I can’t get the breath in,” or “I can’t catch my breath.”
- Frequent involuntary sighs or sighing before speaking
- Prominent chest breathing
- Minimal movement of the abdomen during breathing
- Marked forward and upward movement of the breastbone during inhalation, but little movement in the lower ribs
- Rate of breathing significantly higher than the normal rate of 12-15 breaths per minute

Efficient Diaphragmatic Breathing

Ease and efficiency in diaphragmatic breathing is a prerequisite for *prānāyāma* practice. Based on their survey of cardiopulmonary textbooks and rehabilitation guidelines, cardio-pulmonary physical therapist Larry Cahalin and his colleagues observed that “Diaphragmatic breathing has been described as breathing predominantly with the diaphragm while minimizing the action of accessory muscles during inspiration.”⁷

All muscles involved in inspiration and expiration, other than the diaphragm, are accessory muscles. Sella identifies accessory muscles as those of the neck, the superficial muscles of the thorax, the abdomen, the lumbosacral area, the paraspinal region, and the pelvis.⁸ Breathing at rest should not excessively involve such accessory muscles.

Many structural and functional problems can interfere with the optimal movement and range of the diaphragm. Two common inefficient patterns of breathing are chest breathing and paradoxical breathing. These patterns should be identified and eliminated before beginning *prānāyāma* practice, as some *prānāyāma* techniques can exacerbate these problems.

How to check for the upper chest breathing pattern: In a restful sitting position, place one hand on the chest and the other on your abdomen. If the hand on the chest moves but the hand on the abdomen doesn’t move, this indicates chest breathing and perhaps chronic hyperventilation. Upper chest breathing may be constricted chest breathing. In constricted chest breathing, the diaphragm remains relatively relaxed and immobile during inhalation, while the upper chest moves constrictively, often along with the neck muscles.⁹

How to check for paradoxical breathing: In the supine position, place your hands on the abdomen. If the abdomen is pulled in and up when you inhale, this is a paradoxical movement of the abdomen. Paradoxical breathing occurs when the diaphragm does not contract efficiently during inhalation to expand the abdominal and lower rib region. Instead the chest is lifted by excessive use of the accessory muscles.

An individual who demonstrates chest breathing or paradoxical breathing patterns should consult a pulmonary specialist to rule out structural pathology. If chest breathing and/or paradoxical breathing is due to chronic stress or habit, the individual may be able to correct it by mindfully and systematically contracting abdominal muscles during expiration and eliminating the excessive involvement of the neck and upper chest muscles during inspiration. However, the practitioner should be aware that it often takes a long time to change such faulty breathing patterns.

Conscious and Controlled Breathing

The first and most basic level of breath control is the ability to inhale and exhale slowly, silently, smoothly, and evenly while maintaining a consistent flow of air. It should be possible to breathe consciously and comfortably at the same speed and duration for several minutes without experiencing undue strain, muscular tension, or “air hunger”—the need to take the next breath in a hurry. Because some *prānāyāma* techniques can create tension in the muscles of the trunk, neck, and face, a practitioner must be able to monitor such tension, and be able to relax those muscles during and after the *prānāyāma* practice. These qualities of controlled breathing can be practiced in the slow *prānāyāma* techniques, such as *bhramari* (soft humming breath) or *nadi shodhana* (alternate nostril breathing), which should be learned before attempting rapid and vigorous breathing techniques.

Prānāyāma involves manipulation of both the inhalation and exhalation, as well as breath retention after inhalation and exhalation. However, breathing training should first focus on controlled exhalation. In support of the above, Desikachar writes, “Whichever technique we use, the most important part of *prānāyāma* is the exhalation. If the quality of exhalation is not good, the quality of the whole *prānāyāma* practice is adversely affected.”^{3(p59)} Thus, practicing slow, quiet, smooth, and long exhalations is an important preparatory training for *prānāyāma*.

Strong and Flexible Spine and Muscles

To practice many *prānāyāma* techniques comfortably and efficiently, flexibility and strength of the chest, abdominal muscles, and spine must be developed to a significant

level. Yoga offers excellent *âsanas* to accomplish this objective. The following poses, among others, are good preparatory work for *prânâyâma*: cobra pose (*bhujangâsana*), locust pose (*shalabhâsana*), cat pose (*cakravâkâsana*), fish pose (*matsyâsana*), crocodile pose (*makrâsana*), bridge pose (*setu bandhâsanal/dwipadapitham*), extended standing forward bend (*uttânâsana*), and reclining relaxation pose (*savâsana*).

Skillful use of breathing during *âsanas* can augment breath consciousness and breath control. To prepare for *prânâyâma*, *âsana* practice should involve coordinating breathing with movement. For example, in *uttânâsana*, one may exhale while bending forward and inhale while coming back up in the standing position. One can also practice lengthening inhalation, exhalation, and the pauses between inhalation and exhalations during the dynamic and stationary phases of a pose.

The practice of *âsana* can also prepare the body for a good seated posture in *prânâyâma* practice. In verse 6:13, the *Bhagavad Gita* recommends a straight and well-aligned seated posture for *prânâyâma* and meditation: *Samam kâyâ shiro grivam*, “The body, neck and head should be erect and aligned and balanced.” Skillful use of *âsanas* may help to modify exaggerated kyphosis, lumbar lordosis, or excessive lateral concave or convex curves (scoliosis), all of which can make the posture for *prânâyâma* practice more challenging.

Practicing *Kapâlabhâti* and *Bhastrikâ* Safely

As mentioned earlier, the breathing techniques that appear to pose the greatest health risk are the rapid and vigorous methods, including *kapâlabhâti* and *bhastrikâ*. The following section suggests ways to increase the safety of practicing these techniques. These suggestions assume that the above prerequisites have been met, and that the techniques have been learned from a skilled instructor.

Descriptions of Kapâlabhâti and Bhastrikâ

Because *kapâlabhâti* and *bhastrikâ* should be learned from a skilled instructor, it is not the intention of the article to provide detailed instructions. According to the ancient tradition, only gurus gave detailed instructions. Ancient Yogic texts often provide only highly condensed information to be personalized and elaborated by one’s guru. For example, the *Hatha Yoga Pradipikâ*⁴ simply offers the following instructions regarding *kapâlabhâti*: “When inhalations and exhalations are performed rapidly like a blacksmith’s bellows, it is known as *kapâlabhâti*...” (2:35). The *Hatha*

Yoga Pradipikâ offers a little more detailed instructions on *bhastrikâ*: “For *bhastrikâ*, sit in well aligned lotus pose, keeping the body straight, closing the mouth firmly, expel the air through nostrils, methodically (*yatnen*) (2:60). Breath should be filled up to the heart center by drawing it rapidly and forcefully (*vegân*), making noise, and (the breath) touching the heart, throat and head (2:61). Breath should be expelled and filled again and again just as a blacksmith’s bellows runs rapidly (*vegân*) (2:62).”

A key distinction between the two practices, as they are commonly taught, is the quality of the inhalation. In *kapâlabhâti*, the practitioner exhales actively and forcefully and allows the inhalation to happen passively. But, in *bhastrikâ*, both inhalations and exhalations are performed equally actively and forcefully. Readers may refer to Himalayan Institute’s monograph *Bhastrikâ & Kapâlabhâti*⁵ and Coulter’s discussion of abdominal-pelvic exercises^{9(pp139-206)} for further descriptions of these techniques.

Safety Guidelines for *Kapâlabhâti* and *Bhastrikâ*

1. *Progress gradually and steadily.* *Kapâlabhâti* and *bhastrikâ* should be practiced slowly for a long time (over many practice sessions), until the breathing muscles have become strong and the practitioner has developed a good feel for how the abdomen, ribcage, and diaphragm move in these breathing techniques. It is wise to practice *kapâlabhâti* and *bhastrikâ* at a rate of 20-30 breaths a minute, and certainly not exceeding 60 breaths a minute, and closely observe the movement of the muscles involved. While exhaling, slowly and steadily pull the abdomen towards the spine, allowing the abdominal organs to move up, and then slowly release. While inhaling, watch the side ribs expand and abdominal organs slide down, allowing the movement to descend into the lower belly and pelvis. If all is going well, you may gradually and methodically increase the speed to 60-120 breaths per minute. Do not rush the process, even if it takes you a year or two to reach a level of efficiency. If you feel any adverse effect, return to a lower rate of breaths per minute. You should feel relaxed and energized by the end of the practice. If you notice rapid breathing later in the day, reduce the level of intensity of your practice.

2. *Use moderation.* Do only a moderate number of repetitions (7-20) in a round. After each round, take a few normal breaths. A total of 100-150 repetitions, broken into several rounds with breaks, is plenty. Take frequent breaks between the rounds to restore your normal rate of breathing.

3. *Maintain relaxation throughout the practice.* While practicing *kapālabhāti* and *bhastrikā* repetitions, keep the face, neck, and entire torso as relaxed as possible. Be aware of the jaw, abdomen, and diaphragm, which all have a tendency to tense up during *kapālabhāti* and *bhastrikā*. Keep them relaxed. Keep the shoulders as relaxed and still as possible. Try to keep a gentle smile on your face throughout the practice, which counteracts the build-up of tension. If there is tension before, during, or after the practice, do gentle stretches to ease muscle tension.

4. *End the practice with a gentle and relaxed cool down.* Do not stop abruptly. Gradually slow down your inhalations and exhalations. Practice other *prānāyāma* techniques, such as humming breath or alternative nostril breathing, or simply do slow inhalations and exhalations with or without retention. End your practice with a few breaths in which the inhalation/exhalation ratio is equal. If you feel abdominal tightness, gently rub and massage your abdomen. Do a few repetitions of knees-to-chest pose (*apānāsana*) and bridge pose (*setu bandhāsana*) to stretch and release tension in the back, neck, and shoulders. Do a relaxed crocodile pose (*makrāsana*) to make sure that efficient diaphragmatic breathing is re-established. Always end your practice with reclining relaxation pose (*savāsana*) for at least 10-20 minutes.

Contraindications

Rapid breathing *prānāyāma* techniques may aggravate a pre-existing structural or medical condition, or cause significant pain and discomfort. Avoid practicing *kapālabhāti* and *bhastrikā* if you have any of the following conditions:

- Chronic hyperventilation
- Rigid or immobile diaphragm
- Paradoxical breathing
- Lung disease/impairment, including hyperinflation of lungs
- Pregnancy
- Recent unhealed surgeries, especially of head, neck, and trunk
- Significant degree of scoliosis
- Low or high blood pressure
- Tendency for fainting
- Diabetes
- Kidney disease
- Seizures/epilepsy
- Ear, nose, or eye diseases
- Chronic head pain, migraine, or cluster headaches

Conclusion

The mechanisms and effects of normal breathing and diaphragmatic breathing should be understood in order to perform *prānāyāma* techniques safely and correctly. Unless practitioners exercise out-of-the-ordinary patience and self-control, rapid breathing techniques such as *kapālabhāti* and *bhastrikā* are likely to be performed incorrectly and prove harmful in the long run. Only after ensuring the safety and accuracy of the techniques can we examine whether *prānāyāma* techniques offer unique benefits for respiratory health.

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