

Supplementary Material 1

Recommended yoga practices for hypertension

This manual is part one of the three supplementary materials/appendices of the article “Therapeutic Role of Yoga in Hypertension”

Yoga is a complex intervention with multiple components. Yoga postures, breathing practices, and meditation are the three most important components in the effective management of hypertension. There are multiple variations of these practices and they can be adapted to suit individual requirements. This manual provides a general guideline and a brief description of recommended basic yoga practices for the management of hypertension. It emphasizes cultivating the right psychological attitudes and adopting a yogic lifestyle. The practices include trataka kriya, restorative yoga postures for relaxation, meditative postures, slow pranayama techniques, mudra, and meditation practices. For more information, a few references are suggested for further reading.

It must be noted that the duration of recommended yoga practice, the techniques, and in some cases even the names of some practices differ with different schools of Yoga. The yoga therapy prescription is based on the individual requirements of the patients. For this, a customized, tailor-made approach is required. Although yoga is an effective and promising approach to the management of hypertension, it is not a substitute for standard medical care and it is not for medical emergencies.

Disclaimer: The content in this manual is for informational purposes only and is not intended to be a substitute for professional medical advice, diagnosis, and treatment. The yoga practices mentioned here must be learned under the guidance of a qualified yoga professional. Those who are having any health issues must take a medical opinion before proceeding with various yoga practices.

Index: Yoga for Hypertension- Recommended Practices

Yoga Practice	Details of the Yoga Practice	Brief Description	Fig No.
Yoga As a Lifestyle	Cultivating the right psychological attitudes	Yogic way of approaching day- to- day situations	Fig 1
Shatkriya (Cleansing Practice)	Trataka	Concentrated Gazing	Fig 2
	Shavasana and Variations	Corpse Pose	Fig 3 A-C
	Supta Baddha Konasana	Reclined Bound Angle Pose	Fig 4 A-C
Asana (Restorative Yoga Postures)	Balasana	Child's Pose	Fig 5
	Pashchimottanasana	Seated Forward Bend	Fig 6
	Upvistha Konasana	Wide-Angled Seated Forward Bend	Fig 7
	Salamba Kapotasana	Supported Pigeon Pose	Fig 8
	Supported Viparit Karni	Legs Up the Wall Pose	Fig 9
	Sukhasana	Comfort Pose	Fig 10
	Ardha Padmasana	Half Lotus Pose	Fig 11
Meditative Postures	Padmasana	Lotus Pose	Fig 12
	Vajrasana	Thunderbolt Pose	Fig 13
	Seated in Chair	Keeping the Spine Erect	Fig 14
	Abdominal Breathing	Diaphragmatic Breathing	Fig 15
	Sukha Pranayama	Easy Comfortable Breathing	Fig 16
	Anulom Vilom	Alternate Nostril Breathing	Fig 17 A-B
Pranayama (Regulated Breathing Practices)	Chandra Bhedan	Left Nostril Breathing	Fig 18 A-B
	Slow Bhastrika	Bellows Breath	Fig 19
	Ujjayi	Ocean Breath	Fig 20
	Bhramari	Humming Bee Breath	Fig 21
	Sheetali	Cooling Breath	Fig 22
	Pranava Pranayama	Aum Chanting	Fig 23
	Shanmukhi Mudra	Closing The Seven Gates	Fig 24

Mudra	Brahma Mudra	Divine Spiritual Gesture	Fig 25
(Subtle Gestures)	Apan Vayu Mudra	Mudra of The Heart	Fig 26
	Gyan Mudra	Mudra of Wisdom	Fig 27
	Concentration Meditation	Focus on an Object	Fig 28
Formal Meditation Practice	Mindfulness Meditation (Open Awareness)	Body Scan Meditation	Fig 29 A-D
		Mindful Breathing Meditation	
		Loving-Kindness Meditation	
Informal Practice	Mindfulness During Daily Activities	During Yoga Posture	Fig 30 A-D
		Integrated Into Daily Activities	
Yoga Nidra	Yogic Sleep or Effortless Relaxation	Deep Relaxation to the Body and Mind	Fig 31

YOGA AS A LIFESTYLE

Cultivating the Right Psychological Attitudes

Yoga as a Lifestyle:

Cultivation of the right values and attitudes towards day-to-day stressors and adopting a yogic lifestyle are vital in reducing stress and managing hypertension.

The classical yoga texts describe the concept of chitta prasadanam (happiness of mind) and ways to achieve it. The mental qualities of maitri, karuna, mudita, and upeksha are suggested to achieve a blissful state of mind. They provide a yogic way of approaching a wide variety of people and situations in everyday life.

Maitri: It is an attitude of friendliness toward the happiness of others. It is the ability to share another person's happiness instead of being jealous. Having such a perspective makes it possible for us to celebrate the beauty of human experiences. We can learn, understand, and grow through the friendship of happy and positive people.

Karuna: It means compassion for the sorrows of those suffering. This is essential for spiritual and personal growth. It means helping if someone is upset, and comforting them. Compassion teaches us to be less judgmental and accept others as they are. It also develops an emotional understanding and bond.

Mudita: This is a joyfulness towards the good deeds of others. It is about appreciating the virtuous qualities of others and finding inspiration to cultivate them.

Upeksha: This refers to indifference towards the negative behavior of others. It is the quality of developing equanimity or neutrality towards those who were unkind, or those who have hurt us. Taking the opposite view towards negative thoughts and actions (**pratipaksha bhavanam**) also gives important insights into the management of emotions.

Mindfulness qualities such as living in the present moment, acceptance, letting go, gratitude, and loving-kindness are also effective antidotes for stress and anxiety.

Fig 1: Yoga as a Lifestyle & Cultivating the Right Psychological Attitudes



SHATKRIYA

(Yoga Cleansing Practices)

What is Shatkriya?

Shatkriya, also known as shatkarma is a set of six yogic cleansing techniques described in hatha yoga. Traditional yoga texts highlight many health benefits of these six procedures, namely neti for cleansing of nasal passages, dhauti for the digestive tract, nauli for abdominal organs, basti for the large intestine, kapalhati for frontal lobes of the brain, and trataka for cleansing of eyes. These kriyas remove impurities from the body, offer therapeutic benefits, and prepare the body for higher yoga practices that ultimately aim to attain moksha or liberation.

Trataka (Concentrated Gazing)

What is Trataka?

Prolonged steady fixation of gaze at a point to the moment the tears are shed. Trataka is considered a cleansing technique; however, it induces calmness and leads to a meditative mental state.

Technique:

Place a burning candle at eye level at some distance. Sit in a meditative posture. Focus on the candle flame steadily until tears are shed. Close your eyes and relax.

Caution:

This practice is not suitable for people with glaucoma or chronic eye disorders. Individuals with psychiatric disorders, a tendency towards Schizophrenia, or hallucinations should not practice it.

Fig 2: Trataka



Copyright ©The Author(s) 2023

ASANA: YOGA POSTURES

Restorative Yoga: Yoga Postures for Relaxation

What is Asana?

Asana practice improves the stability of the body and mind. It removes conflicts at physical, Mental, and emotional levels. The vital flow of energy through the body is improved as a result of asana practice. This facilitates a positive sense of well-being. It is a preparatory practice for meditation that fosters a quieting of the mind. Supported and modified stretching is recommended to suit individual needs.

What is Restorative Yoga?

Restorative yoga involves conventional yoga poses with props, to facilitate stretching, provide support and induce relaxation. Poses are held for a longer time as compared to traditional yoga poses so that muscles can relax. They aim to provide physical and mental relaxation. Simple poses held for as long as possible help heal the body and mind. The body is fully supported in poses and staying in the pose for up to 10 minutes is recommended. Slowing down with “do less, be more“ is recommended when feeling emotionally exhausted. It's all about relaxing and surrendering.

Often props such as folded blankets, bolsters, yoga blocks, straps, cushions, or pillows are used in restorative yoga. They provide additional support, facilitate relaxation, and reduce stress. Sometimes, the support of the wall, couch, or chair can also be taken. To enhance the soothing effect further, eye bags or eye pillows for face-up poses can be used. Rose water or aloe vera soaked in cotton as eye bags can be explored as creative options. This rejuvenates tired eyes because of excessive screen time or strain.

The following restorative yoga poses are mentioned here.

Asana for Relaxation (Restorative Yoga)	
Sanskrit Name of Asana	English Name of Asana
Shavasana	Corpse Pose
Supta Baddha Konasana	Reclined Bound Angle Pose
Upvistha Konasana	Wide-Angled Seated Forward Bend
Balasana	Child's Pose
Pashchimottanasana	Seated Forward Bend
Salamba Kapotasana	Supported Pigeon Pose

Restorative Yoga Poses

Shavasana (Corpse Pose)

Technique:

Lie down in a supine position with around a one-foot distance between the legs and toes turned outside. Keep the arms at the side and the palms facing up. Use props such as a folded blanket under your knees, if you have back pain. Support the gentle curve of the neck with a flat pillow or cushion. Cover yourself to feel warm and comfortable.

Place eyebags or eye pillows on the eyes to enhance relaxation. Close your eyes and practice slow and rhythmic diaphragmatic breathing. Become aware of the sensation at the nostrils, the temperature of the inspired and expired air. Relax the muscles, and feel the heaviness of different parts of the body. Continue breathing in a gentle, rhythmic way, and imagine the outgoing breath relaxing all the muscles in the body. You may imagine this as if your body is 'melting' into the surface beneath you. Cultivate a sense of surrendering and letting go as you sink into the relaxation experience.

Fig 3 A: Shavasana



Fig 3 B and C: Shavasana Variations



Supta Baddha Konasana (Reclined Bound Angle Pose)

Technique:

Lie down on your back, bend your knees, and place your feet flat on the mat. Make a diamond shape with the legs by allowing the knees to fall open and allowing the soles of the feet to touch. Close your eyes and relax. Place cushions and folded blankets below the hands, thighs, and back for support.

Caution:

Practice gently, as quick sudden movements can cause sprains. Avoid in case of knee injuries, groin injuries, or pain in the lower back, or the hips.

Fig 4 A: Supta Baddha Konasana



Fig 4 Band C: Variations- Supta Baddha Konasana



Supported Child's Pose (Balasana)

Technique:

Sit on the heels with the toes together and the knees spread out wide. Inhale with a deep breath and exhale while bringing the head down. Place the fingers on the mat, in a comfortable position, allowing your forehead to rest on the folded blankets or a cushion. Gently breathe in this pose for 1 to 5 minutes.

Caution:

Avoid practicing this pose in case of knee injuries, severe neck or back pain, vertigo, or slipped disc. In hypertension, avoid placing the head below the level of the heart.

Fig 5: Supported Child's Pose with Variation



Copyright ©The Author(s) 2023

Restorative Seated Forward Bend (Paschimottanasana)

Technique:

Settle into a seated position with the legs extended. Place a rolled blanket, cushions, or pillows on the thighs for additional support. Inhale deeply and as you exhale, extend the torso over the legs. Allow the shoulders and head to relax and continue to breathe with awareness.

Place the blankets on a chair. Extend the legs and place folded hands on the edge of the chair. Inhale deeply and while exhaling place the head on the blankets. Relax and continue to breathe with awareness.

Caution:

Avoid this pose if suffering from a back injury, slipped disc, sciatica, or gastric ulcer. Pregnant women and those recovering from surgery should not practice this pose.

Fig 6: Restorative Paschimottanasana Variations



Copyright ©The Author(s) 2023

Upvistha Konasana (Wide-Legged Seated Forward Bend)

Technique:

Sit on the yoga mat with legs extended into a “V” position. Place the folded blankets or cushions between the legs. Bend forward from the pelvis and rest the head or hands on the blankets.

Caution:

Avoid in case of low back pain, slip disc, sacroiliac joint pain, knee or hip injury, or recent surgeries of hips, spine, and knees.

Fig 7: Upvistha Konasana



Salamba Kapotasana (Supported Pigeon Pose)

Technique:

Start with the tabletop position (on all fours) and slide the left knee forward toward your left hand. Lower your left hip on a folded blanket. Extend the right leg back. Rest the head on pillows or folded blankets and use your hands for support. Breathe slowly into the pose. Repeat on another side.

Caution: Avoid in case of recent or chronic knee, or hip injury or inflammation.

Fig 8: Salamba Kapotasana



Legs-Up-the-Wall Pose (Viparita Karani)

Technique:

Place your right side against the wall and sit sideways. Gently swing your legs up and place your feet against the wall. Lightly lower your head and shoulders to the floor so that your body forms an L-shape. Place your hands in a comfortable position, on your belly or to the side. Continue to take slow, deep breaths in and even slower breaths out through your nose.

Caution: Injuries related to the hips, spine, pelvis, knees, ankles, shoulders, or recovering from surgery are a few contraindications. According to some yoga experts, women should avoid it during menstruation.

Fig 9: Legs-Up-the-Wall Pose



Copyright ©The Author(s) 2023

MEDITATIVE POSTURES - For the Stability of the Mind

Postures for pranayama and meditation aim to maintain a steady comfortable position for a long time without conscious effort. In these poses, the head, neck, and back are upright in an alert, but relaxed posture. When the body is comfortable and steady with an alert mind, meditation becomes easy. They also enhance concentration, and peace of mind. The feelings of being grounded, centered, and balanced are cultivated during the practice of these asanas.

Posture for Pranayama and Meditation:

Pranayama can be practiced on the mat in cross leg position sukhasana (comfort pose), ardha padmasana (half lotus pose), padmasana (lotus pose), or vajrasana (thunderbolt pose). It can also be practiced while sitting on a chair. The spine should be erect and the shoulders relaxed. The face should be soft, without frowns or tight jaws. A gentle smile can relax the tension in the facial muscles.

The following are meditative postures that are commonly practiced.

Meditative Postures	
Sanskrit Name of Asana	English Name of Asana
Sukhasana	Comfort Pose
Ardha Padmasana	Half Lotus Pose
Padmasana	Lotus Pose
Vajrasana	Thunderbolt Pose

Sukhasana (Comfort Pose)

Technique:

This is a simple cross-legged seated yoga posture. Keep the spine straight and shoulders relaxed. Soften the face and close the eyes.

Benefits:

In sukhasana, the heart slows down and the breath slows down, which lowers the blood pressure.

Precaution:

Avoid practicing in case of severe leg pain, low back pain, sciatica, or severe knee problems.

Fig 10: Sukhasana



Ardha Padmasana (Half Lotus Pose)

Technique:

Sit on the mat with legs stretched out in front. Fold the right leg and place it on the left thigh as high as possible. Lengthen the spine, and straighten the back and neck. Relax the shoulders and close your eyes. It can be alternatively practiced with the opposite side.

Benefits:

This asana improves respiratory rate and breathing capacity. It regulates high blood pressure. It helps in reducing stress and anxiety. The practice enhances mindfulness.

Precaution:

Avoid if suffering from chronic knee and hip injuries or severe sciatica pain.

Fig 11: Ardha Padmasana



Padmasana (Lotus Pose)

Technique:

Sit on the mat with legs stretched out in front. Slowly place the right foot above the left thigh in such a way that the sole faces upwards. Now place the left foot on the right thigh. Place the hands on the knees. Keep the spine straight, your shoulders relaxed, and your face softened.

Benefits:

This posture facilitates the steadiness of the body for a longer period which is required during pranayama and meditation. It reduces stress and anxiety and stabilizes the mind.

Precaution:

Avoid practicing if suffering from sciatica pain, injured knees, or inflammatory knee conditions.

Fig 12: Padmasana



Vajrasana (Thunderbolt Pose)

Technique:

Sit on the mat with legs stretched out in front. Fold the legs and sit on the heels with the big toes touching each other behind.

Benefits:

- Helps in digestion. It can be practiced after meals.
- Facilitates calmness and stability of mind.
- Improves concentration.
- Relieves constipation and acidity.
- Strengthens thighs and pelvic muscles.

Precautions:

- A knee problem or have recently undergone knee surgery
- A spinal cord condition, especially with the lower vertebrae
- Intestinal ulcers, a hernia, or any other intestinal problems such as an ulcer or hernia

Fig 13: Vajrasana



Seated Position in the Chair

Pranayama and meditation can be practiced in a chair if sitting on the mat is not possible. Keep the spine erect, shoulders relaxed and face softened. Place the hands on the thighs in a relaxed manner.

Fig14: Seated Position in the Chair



PRANAYAMA

What is Pranayama?

In yoga, the regulated practice of breathing is called pranayama. According to the yoga philosophy of mind-body connection, the state of mind and breathing are closely interrelated. If we feel sad, angry, or anxious, our breathing is shallow, superficial, and irregular. But if consciously we change the breathing pattern to rhythmic, slow, deep, and gentle, it has a powerful impact on how we feel. That is the essence of pranayama, the vital component of yoga practice.

General Precautions for Pranayama Practice in Hypertension

Pranayama is a safe practice suitable for all age groups. However, If practiced in the wrong way, it may cause harm and even complications. Judicious practice under expert guidance is a must. Caution is required especially for vulnerable patients and those having health issues. No violent or fast breathing should be practiced. No overstraining is required. Gentle, safe,

soothing, and relaxing pranayama practices are effective in the management of hypertension. The ratio of the inhalation exhalation should not be forced. Avoid breath retention and bandha practice during pranayama.

The following practices are recommended for the management of hypertension.

Pranayama	Description
Abdominal Breathing	Diaphragmatic Breathing
Sukha Pranayama	Easy Comfortable Breathing
Anulom Vilom	Alternate Nostril Breathing
Chandra Bhedan	Left Nostril Breathing
Slow Bhastrika	Bellows Breath
Ujjayi	Ocean Breath
Bhramari	Humming Bee Breath
Sheetali	Cooling Breath
Pranava Pranayama	Aum Chanting

Pranayama Practices for Hypertension

Deep Abdominal Breathing

Technique:

Sit comfortably and close your eyes. Keep your shoulders relaxed. Place the palm of one hand on the chest and the other on the abdomen. Start breathing in gently through the nose and breathing out slowly through the nose or mouth. Feel how the abdomen expands as you breathe in and flatten as you breathe out. The breathing can be made interesting by the “inflating balloon” visualization. Think of your abdomen as a balloon that inflates when you inhale. Exhale slowly as you imagine the air escaping from the balloon.

Fig 15: Deep Abdominal Breathing



Copyright ©The Author(s) 2023

Sukha Pranayama (Easy Comfortable Breathing)

Technique: Conscious, slow, and deep breathing is done with equal duration for inhalation and exhalation at the rate of 6 breaths/min. Inhale to the count of 4 and exhale to the count of 4.

Fig 16: Sukha Pranayama (Easy Comfortable Breathing)



Copyright ©The Author(s) 2023

Anulom Vilom/ Nadi Shodhan Pranayama (Alternate Nostril Breathing)

Technique:

Hand mudra: Place the left hand in Gyan mudra (touching the tips of thumb and index finger while other fingers are extended) on the left knee. Use the right hand in Nasagra mudra (folding the index and middle finger into the palm and keeping the thumb, index finger, and little finger extended) to regulate the flow of air in the nostrils.

Pranayama: This is performed by inhalation through the left nostril and exhalation through the right nostril. The next inhalation is done through the right nostril and exhalation through the left nostril. This completes one round of anulom vilom pranayama.

Fig 17 A: Anulom Vilom Pranayama- Hand Mudra



Copyright ©The Author(s) 2023

Fig 17 B: Steps in Anulom Vilom Pranayama

Step 1-Inhalation through the left nostril

Step 2-Exhalation through the right nostril

Step 3-Inhalation through the right nostril

Step 4-Exhalation through the left nostril



Copyright ©The Author(s) 2023

Chandra Bhedan Pranayama (Moon Piercing Breath)

Or Chandra Nadi Pranayama (Left Nostril Breathing)

Technique:

Position and mudra of the hands are similar to Anulom Vilom pranayama (Left hand in Gyan Mudra and right hand in Nasagra Mudra). Gentle slow inhalation through the left nostril is followed by exhalation through the right nostril. The same breathing pattern is repeated during the pranayama.

**Fig 18 A: Chandra Bhedan Pranayama-Variation 1
(Left Nostril Inhalation-Right Nostril Exhalation)**



**Fig 18 B: Chandra Bhedan Pranayama-Variation 2
(Unilateral Left Nostril Breathing)**

Inhalation and exhalation through the left nostril can be performed for an equal count of 5.



Slow Bhastrika Pranayama (Bellows Breath)

Technique:

Breathe at a slow pace with deep inhalation and slow exhalation at the respiratory rate of 6 breaths per minute. Without worrying much about the inhalation and exhalation time, imagine the open blue sky while breathing.

Fig 19-Slow Bhastrika Pranayama



Ujjayi Pranayama (Ocean Breath)

Technique:

The practice comprises deep, slow breathing with slight contraction in the throat area. This type of breathing is referred to as 'the ocean breath' since it resembles the sounds of ocean waves when air moves through the contracted glottis, the part of the larynx. It can be practiced in seated, supine, or standing position.

Fig 20: Ujjayi Pranayama



Bhramari Pranayama (Humming Bee Breath)

Technique:

For Shanmukhi Mudra: Close the ears with the thumbs. Place index fingers on the eyes, middle fingers on the sides of the nose, and ring, and little fingers on the upper and lower lip.

For Pranayama: Take a deep gentle breath, and exhale with a humming sound. Feel the vibrations reverberating in the body.

Fig 21: Bhramari Pranayama



Copyright ©The Author(s) 2023

Sheetali pranayama (Cooling Breath)

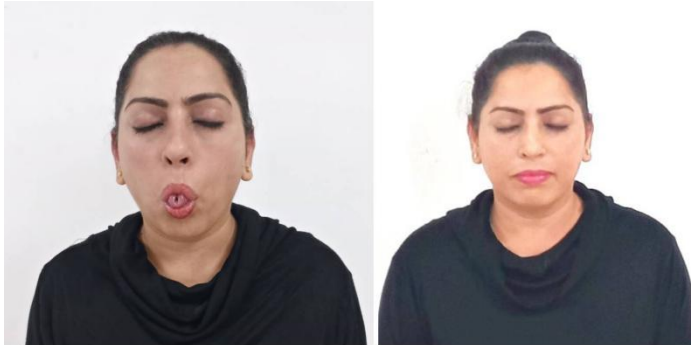
Technique:

In sheetali pranayama, inhalation is done through the tongue folded into the shape of a tube followed by exhalation through the nose. This practice induces a relaxed state of mind and reduces anxiety. Sheetali pranayama has a calming effect on the brain. It is especially recommended in summer to provide a cooling and refreshing effect.

Fig 22: Sheetali Pranayama

Step 1-Inhalation through the curled tongue

Step 2-Exhalation through the nose



Copyright ©The Author(s) 2023

Pranava Pranayama (Chanting AUM)

Technique:

Breathe with slow and deep inhalation followed by the audible vibratory resonance of a prolonged AUM chant.

Fig 23: Pranava Pranayama



Copyright ©The Author(s) 2023

MUDRA (Subtle Gestures)

What is a Mudra?

Mudra is the yogic art and science recommended for health, well-being, and spiritual evolution. Mudra is a term meaning a ‘bodily position’ or ‘gesture’. The word mudra is derived from the root ‘mud’, which means delight, pleasure, and bliss. Therefore, mudra means something that brings happiness. Mudras have a beneficial effect on physical, mental, emotional, intellectual, and spiritual levels. They also alter mood, attitude, and perception. Mudra can be practiced independently or incorporated into yoga postures, pranayama, and meditation. The effects of yoga practice are enhanced with mudra, as they deepen awareness and concentration.

The following are examples of some mudras beneficial in hypertension.

Mudra	
Shanmukhi Mudra	Closing the Seven Gates
Brahma Mudra	Divine Spiritual Gesture
Apan Vayu Mudra	Mudra of the Heart
Gyan Mudra	Mudra of Wisdom

Mudra Practices for Hypertension

Shanmukhi Mudra (Closing the Seven Gates)

Technique:

Closing the ears with the thumbs, placing the index fingers on the eyes, the middle fingers on the nostrils, the ring, and the little fingers above and below the lips. This mudra is practiced during bhramari pranayama.

Benefits:

This mudra encourages ‘pratyahara’, which means withdrawing the mind inwards by blocking some of the sensory distractions of the surroundings. This helps to quiet the mind further.

Fig 24: Shanmukhi Mudra



Copyright ©The Author(s) 2023

Brahma Mudra (Divine Spiritual Gesture)

Technique:

Sit in vajrasana with the spine erect and shoulders relaxed. While breathing in, turn your head towards the right slowly. Exhale while making the sound “aaa” and come back slowly to the center position. Now turn your head towards the left during inhalation and return to the center position while making the sound “Ooo”. Next, tilt the head up. While breathing in and make the sound ‘Eeeee’ while bringing the neck back to the central position. Finally, lower the head and bring the chin down while breathing in. Breathe out making the sound “mmmm” while bringing the neck to the center position.

Fig 25: Brahma Mudra



Copyright ©The Author(s) 2023

Apan Vayu Mudra (Mudra of the Heart)

Technique:

Place the tip of the index finger at the base of the thumb and join the tips of the middle finger, ring finger, and thumb. Keep the little finger extended.

Benefits:

Apan Mudra has a therapeutic effect on heart-related diseases. It is also called Mrit-Sanjeevni mudra and is recommended as an emergency measure in a heart attack. Vayu refers to the air element in the body and is associated with movement, thoughts, and emotions. Apan vayu mudra down-regulates the air element and reduces stress, anxiety, and impatience.

Fig 26: Apan Vayu Mudra



Copyright ©The Author(s) 2023

Gyan Mudra (Mudra of Wisdom)

Technique:

The tips of the thumb and index finger are touched lightly. The remaining fingers are extended. The hands are placed on the lap with palms facing up.

Benefits:

Gyan Mudra induces relaxation of the body and reduces stress and depression. It activates the root chakra and helps in calming the mind. Regulation of the fire and air elements in the body is facilitated with this mudra. It deepens the meditative experience and spiritual practice. Improvements in focus, concentration, memory, and decision-making ability are some of the benefits of Gyan mudra.

Fig 27: Gyan Mudra



Copyright ©The Author(s) 2023

DHYANA (MEDITATION)

Meditation is a powerful technique to align the mind, body, and spirit together. As a result of meditation practice, the mind becomes calmer, peaceful, and joyful. Meditation reduces anxiety and stress. It improves mental and emotional states, mood and quality of sleep. Through exploring our internal environment, meditation helps alleviate the underlying causes of many psychosomatic disorders.

Types of Meditation:

There are two basic components of meditation practice.

- **Concentration Meditation:** A focus on a word, sound, prayer, or phrase
- **Mindfulness Meditation:** Open awareness, developing a passive attitude towards intruding thoughts and a return to focus.

Both types have a significant effect in reducing blood pressure.

Ways to Practice Meditation:

Meditation can be practiced formally or informally.

- **Formal Practice:**

It can be practiced on the mat, chair, or bed by setting aside meditation time.

- **Informal Practice:**

This is “mindfulness in action” or “mindfulness on the go.” It involves experiencing the day with moments of awareness for a few seconds at a time. Mindfulness can be practiced while walking, running, performing a dance, shopping, showering, eating, or doing household chores like cleaning or washing dishes. It is practiced by totally getting immersed in the action of it at that particular moment.

The following examples of meditation practices are mentioned here.

Practice	Meditation Type	Details
	Concentration Meditation	Focus on an Object
Formal Practice	Mindfulness Meditation (Open Awareness)	Examples: Body Scan Meditation Mindful Breathing Meditation Loving-Kindness Meditation
Informal Practice	Mindful Yoga Mindfulness During Daily Activities	Integrated into Daily Activities

Formal Meditation Practice-Concentration Meditation

Technique:

Focus is on a word, sound, prayer, mantra, or phrase. A Sanskrit term for mantra recitation, repeating or recalling is japa.

Examples of Concentration Meditation

- Ajapa Japa Meditation
- Constant awareness of the mantra
- AUM japa
- Repetition of the mantra AUM
- Anahata (heart) chakra meditation with mantra ‘YAM’ (mantra for the heart chakra)

Fig 28: Concentration Meditation



Copyright ©The Author(s) 2023

Formal Meditation Practice-Mindfulness Meditation

Technique: It is practiced with an open awareness of the present moment with kindness, acceptance, and curiosity. This includes non-judgmental awareness of body sensations, thoughts, and feelings.

Fig 29 A: Formal Mindfulness Meditation



Copyright ©The Author(s) 2023

Fig 29 B: Body Scan Meditation

Technique:

Includes scanning parts of the body and sensing bodily sensations gradually from the feet to the head in a lying down position.



Formal Meditation Practice-Mindfulness Meditation

Technique:

Bring your awareness to your breathing. Just notice the physical sensations of the breath. Observe the natural rhythm and flow of the breath. Do not control or change your breathing. Just feel it as it is. Let your attention be light and easy. Too much concentration is not required. Watch the entire cycle of the breath, the complete inhale and exhale. Notice the sensation of the air as it enters the nostril and as it leaves. Observe the subtle movements of the abdomen, chest, and torso area as you breathe. Gently shift your awareness back to the sensations of breath whenever you get lost in thoughts.

Loving-kindness meditation is about having unconditional compassion towards ourselves and all other beings.

Fig 29 C: Mindful Breathing Meditation



Copyright ©The Author(s) 2023

Fig 29 D: Loving Kindness Meditation



Copyright ©The Author(s) 2023

Informal/ Integrated Meditation Practice

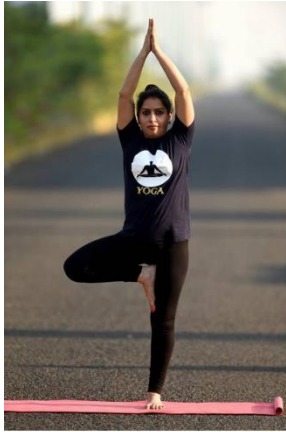
Mindful Yoga

Technique:

Mindful Yoga integrates classical Buddhist teachings of mindfulness into the physical practice of yoga, offering deeper insights into the mind and transforming our experience of yoga. Yoga practice cultivates mindfulness, and mindfulness deepens the yoga practice.

Mindful yoga emphasizes awareness of the mind-body connection rather than details of alignment and precise physical posture. The practice includes simple yoga postures as the aim is to slow down and heighten our present-moment awareness.

Fig 30 A: Mindful Yoga as a Moving Meditation



Copyright ©The Author(s) 2023

Fig 30 B: Integrating Mindfulness in Daily Activities

Technique:

Non-judgmental present moment awareness. It can be practiced anytime, anywhere in a day-to-day life.



Copyright ©The Author(s) 2023

YOGA NIDRA

(Yogic Sleep or Effortless Relaxation)

What is Yoga Nidra?

Yoga nidra is a comprehensive, profound relaxation technique for removing physical, mental, and emotional tensions. It brings a deep state of relaxation to the body and mind, while the conscious mind is clearly alert to realize what is being experienced.

Technique:

This practice is done in a lying down position on a mat or bed. Guided audio instructions can be used for practicing yoga nidra. It includes awareness of different body parts, relaxation, breath awareness, auto-suggestions, and imagery.

Benefits:

Yoga nidra practice reduces systolic and diastolic blood pressure. It reduces anxiety and stress. It improves autonomic functions, activates the parasympathetic nervous system, and suppresses the sympathetic nervous system. It influences the brain's electrical rhythms. Sleep quality is improved with yoga nidra practice. Pent-up emotions and stress patterns are released.

Fig 31: Yoga Nidra



Suggestions for further reading:

- Bryant EF. The yoga sutras of Patanjali: A new edition, translation, and commentary. North Point Press; 2015 Jan 27.
- Desikachar TK. The heart of yoga: Developing a personal practice. Simon and Schuster; 1999 Mar 1.
- Garner G. Medical Therapeutic Yoga. Jessica Kingsley Publishers; 2016 Oct 1.
- Khalsa SB, Cohen L, McCall T, Telles S. Principles and Practice of Yoga in Health Care. Jessica Kingsley Publishers; 2016 May 1.
- Naragatti S. Shatkriya impact on health. Blue Rose Publishers; 2020 Sep 16.
- Saraswati SS, Hiti JK. Asana pranayama mudra bandha. Bihar, India: Yoga Publications Trust; 1996.
- Iyengar BK. Light on yoga: the definitive guide to yoga practice. 1965
- Muktibodhananda S. Hatha yoga pradipika. Sri Satguru Publications; 2012.
- Heyman J. Accessible yoga: Poses and practices for every body. Shambhala Publications; 2019 Nov 5.
- Lasater JH. Relax and renew: Restful yoga for stressful times. Shambhala Publications; 2016 Aug 9.
- Iyengar BK. Light on pranayama: the yogic art of breathing. Crossroad; 1981.
- Sivananda SS. The science of pranayama. Youcanprint; 2017 Mar 28.
- Joshi KS. Yogic pranayama: Breathing for long life and good health. Orient Paperbacks; 2006.
- Rosen R. The yoga of breath: A step-by-step guide to pranayama. Shambhala Publications; 2002 Aug 13.
- Hirschi G. Mudras: Yoga in your hands. Weiser Books; 2016 Jan 15.
- Chopra D. Total Meditation: Practices in Living the Awakened Life. Harmony; 2020.
- Johari H. Chakras: Energy centers of transformation. Simon and Schuster; 2000 Sep 1.
- Ray A. OM Chanting and Meditation. Inner Light Publishers; 2010.
- Hanh TN. The miracle of mindfulness, gift edition: An introduction to the practice of meditation. Beacon Press; 2016 Oct 25.

- Kabat-Zinn J. Wherever you go, there you are: Mindfulness meditation in everyday life. Hachette Books; 2009 Jul 1.
- Kabat-Zinn J. Full catastrophe living, revised edition: how to cope with stress, pain and illness using mindfulness meditation. Hachette uK; 2013 Sep 24.
- Kornfield J. Guided meditation: Six essential practices to cultivate love, awareness, and wisdom.
- Saraswati SS, Hiti JK. Yoga nidra. Munger: Bihar School of Yoga; 1984.

Supplementary material 2

Additional yoga practices for hypertension

This manual is part two of the three supplementary materials/appendices of the article “Therapeutic Role of Yoga in Hypertension”

Yoga is a complex intervention with multiple components. Yoga postures, breathing practices, and meditation are the three most important components in the effective management of hypertension. This manual provides a general guideline and brief description of additional basic yoga practices that can be beneficial in the management of hypertension. It includes jala neti cleansing practice, warm-up yoga practices, and some yoga postures. For more information, a few references are suggested for further reading.

These practices may not have a direct effect on hypertension. However, they aim toward psycho-physiological harmony and balance. As a result, they contribute to the overall sense of well-being. Asana practice regulates hormone secretions, improves sleep quality, and helps in the management of co-morbid conditions such as diabetes, obesity, and dyslipidemia. Yoga postures build strength, which in turn slows the onset of sarcopenia, which is associated with hypertension in older adults. Some other yoga postures can also be effective; however, their description is beyond the scope of this manual.

It must be noted that the yoga therapy prescription is based on the individual requirements of the patients. For this, a customized, tailor-made approach is required.

Disclaimer: The content in this manual is for informational purposes only and is not intended to be a substitute for professional medical advice, diagnosis, and treatment. The yoga practices mentioned here must be learned under the guidance of a qualified yoga professional. Those who are having any health issues must take a medical opinion before proceeding with various yoga practices.

Index: Yoga for Hypertension-Additional Practices

Yoga Practice	Details Of The Yoga Practice	Brief Description	Fig No.
Shatkriya (Cleansing Practices)	Jala Neti	Nasal Cleansing with Warm Saline Water	Fig 32
	Prarambhik Sthiti	Base Position	Fig 33
	Padanguli Naman	Toe Bending	Fig 34
	Goolf Naman	Ankle Bending	Fig 35
Sharir Sanchalana (Warm-Up Practices)	Goolf Chakra	Ankle Rotation	Fig 36
	Janu Naman	Knee Bending	Fig 37
	Ardha Titali	Half Butterfly	Fig 38
	Mushtika Bandhana	Hand Clenching	Fig 39
	Manibandha Naman	Wrist Bending	Fig 40
	Manibandha Chakra	Wrist Rotation	Fig 41
	Kehuni Naman	Elbow Bending	Fig 42
	Skandha Chakra	Shoulder Rotation	Fig 43
	Greeva Sanchalana	Neck Movements	Fig 44
	Surya Namaskara (Sun Salutations)	Series of Dynamic Yoga Postures in a Specific Sequence	Complete Sequence of Steps in Surya Namaskara
Asana:		Tadasana	Palm Tree Pose
Standing Yoga Postures	Tiryak Tadasana	Swaying Palm Tree Pose	Fig 47
	Katichakrasana	Standing Spinal Twist	Fig 48 A-B
	Ardhachakrasana	Standing Backward Bend	Fig 49
Asana: Seated Yoga Postures	Ardha Ushtrasana	Half Camel Pose	Fig 50
	Marjarasana	Cat Stretch	Fig 51
	Gomukhasana	Cow Face Pose	Fig 52
	Vakrasana	Seated Spinal Twist	Fig 53
	Pashchimottanasana	Seated Forward Bend	Fig 54

Asana:	Bhujangasana	Cobra Pose	Fig 55
Prone	Tiryak Bhujangasana	Swaying Cobra Pose	Fig 56
Yoga Postures	Ardha Shalabhasana	Half Locust Pose	Fig 57
Asana:	Uttaanpadasana	Raised Leg Posture	Fig 58 A-B
Supine	Pavanmuktasana	Wind Releasing Pose	Fig 59
Yoga Postures			

SHATKRIYA (Yoga Cleansing Practices)

Shatkriya, also known as shatkarma is a set of six yogic cleansing techniques described in hatha yoga. Traditional yoga texts highlight many health benefits of these six procedures, namely neti for cleansing of nasal passages, dhauti for the digestive tract, nauli for abdominal organs, basti for the large intestine, kapalbhati for frontal lobes of the brain, and trataka for cleansing of eyes. Of these, trataka has a beneficial effect in reducing blood pressure. It is described in the manual of recommended yoga practices. Jala neti, an optional practice is mentioned here, whereas the rest of other cleansing practices are contraindicated in hypertension.

Jala Neti (Nasal Cleansing with Warm Saline Water)

Technique:

A neti pot filled with lukewarm saline solution is used for irrigation of the nasal passages. It is practiced by tilting the head to the side and then pouring lukewarm salt water into a nostril and letting it come out through the other nostril.

Benefits:

It clears the head and neck region producing a sense of lightness by reducing toxic accumulation in this region. It has a beneficial effect in reducing anxiety and depression. Blood circulation and functioning of the nasal mucosa are improved. This kriya has a relaxing effect on the eyes as it stimulates the tear ducts and glands. The practice helps in preventing sinusitis, colds, cough, and allergic rhinitis.

Precautions:

This kriya must be performed under guidance. Practicing once a week is recommended. It should be avoided if suffering from chronic nasal bleeding, nasal polyps, ear infection, and during acute sinusitis.

Fig 32: Jala Neti**SHARIR SANCHALANA (WARM-UP PRACTICES)****What is Sharir Sanchalana?**

For optimal pose performance and injury prevention, it is vital to warm-up before yoga practice. Sharir sanchalana is the preliminary practice of yoga involving simple movements that prepare the body for the practice of asana. They enhance the mobility of joints and improve flexibility. Blood circulation is improved and tension stored in the joints and muscles is released. It is an excellent practice for beginners, the elderly, and those who have stiffness in their bodies. The following practices are described here.

Sharir Sanchalana (Warm-Up Practices)	
Prarambhik Sthiti	Base Position
Padanguli Naman	Toe Bending
Goolf Naman	Ankle Bending
Goolf Chakra	Ankle Rotation
Janu Naman	Knee Bending
Ardha Titali	Half Butterfly
Mushtika Bandhana	Hand Clenching
Manibandha Naman	Wrist Bending

Manibandha Chakra
Kehuni Naman
Skandha Chakra
Greeva Sanchalana

Wrist Rotation
Elbow Bending
Shoulder Rotation
Neck Movements

Prarambik Sthiti (Base Position) for Sharir Sanchalana:

Sit on the mat with the legs stretched in front. Keep the palms of the hands on the sides behind the hips. Keep the elbows straight and lean back a little, using the support of the hands. Breathe slowly and relax. Alternatively, sharir sanchalana can be practiced in the chair.

Fig 33: Base Position for Sharir Sanchalana



SHARIR SANCHALANA

Padanguli Naman (Toe Bending): Flex and extend the toes of both feet slowly. Keep the ankles steady and relaxed. Repeat 10 times.

Fig 34: Toe Bending



Goof Naman (Ankle bending) and Goof Chakra (Ankle Rotation)

Stretch the ankles forward, trying to touch the feet on the mat. Now draw them back towards the knees. Hold both positions for a few seconds. Keep the knees steady. Repeat 10 times. Rotate the ankles in circular movements clockwise and anti-clockwise. Repeat 10 times.

Fig 35: Ankle Bending



Copyright ©The Author(s) 2023

Fig 36: Ankle Rotation



Copyright ©The Author(s) 2023

Janu Naman (Knee Bending)

Technique:

Bend the knee and place the hands under the thigh. Now straighten the leg, pulling up the kneecap. Keep the head and spine straight. Practice 10 rounds. Repeat on the other side.

Fig 37: Knee Bending



Copyright ©The Author(s) 2023

Ardha Titali (Half Butterfly)

Technique:

Bend the right leg and place the right foot as far up on the left thigh as possible. With inhalation, gently raise the right knee towards the chest. With the exhalation, gently move the knee down. Repeat 10 movements. Repeat the same on the left side.

Fig 38: Half Butterfly



Copyright ©The Author(s) 2023

Mushtika Bandhana (Hand Clenching)

Technique: Inhale while stretching the fingers wide. Exhale while closing the fingers into a tight fist. Repeat 10 times.

Fig 39: Hand Clenching



Manibandha Naman (Wrist Bending)

Technique: Inhale while bending the hands from the wrists with the fingers pointing upwards. Exhale while bending the hands downwards from the wrists with fingers directed towards the floor. Keep the elbows and fingers straight. Repeat 10 times.

Fig 40: Wrist Bending



Manibandha Chakra (Wrist Rotations)

Technique: Rotate the wrists in circular movements clockwise and anti-clockwise. Place the palms facing downward and keep the elbows straight. Repeat 10 rounds.

Fig 41: Wrist Rotations



Kehuni Naman (Elbow Bending)

Technique: Stretch the arms at shoulder level with palms facing up. Bend the elbows and place the fingers on the shoulders. Repeat 10 times.

Fig 42: Elbow Bending



Copyright ©The Author(s) 2023

Skandha Chakra (Shoulder Rotations)

Technique: Place the fingers on the shoulders. Rotate the elbows in large circular movements clockwise and anti-clockwise. Repeat 10 times. Keep the neck and back steady.

Fig 43: Shoulder Rotations



Copyright ©The Author(s) 2023

Greeva Sanchalana (Neck Movements)

Technique:

While inhaling, slowly move the neck up. While exhaling gently move the neck down. With inhalation, move the neck to the left side and bring it to the center with exhalation. Repeat on the other side. With the movements, feel the stretching of muscles and the loosening of the cervical vertebrae. Repeat 10 times.

Caution:

Do not strain. In neck pain or cervical spondylosis, avoid forward bending of the neck. If dizziness occurs, open your eyes.

Fig 44: Neck Movements



Copyright ©The Author(s) 2023

Surya Namaskara (Sun Salutations)

What is Surya Namaskara?

This yoga practice is a group of postures that involve dynamic breathing patterns. The practice includes 12 postures as a salutation to the Sun and chanting the twelve names of the Sun God. There are many versions of this practice.

Performing Surya namaskara at a fast pace is more like aerobic exercise, resulting in increased strength and endurance. In contrast, slow-paced practice results in a decline in cardiovascular parameters to normal levels, similar to yoga training.

Indication in Hypertension:

For hypertension, it is indicated only in pre-hypertension and stage 1 hypertension. Recommended to be practiced with meditative awareness, at a slow speed with breath synchronization.

Benefits:

It is an excellent warm-up practice that prepares the body for various asanas and yoga activities. It increases cardio-respiratory efficiency and respiratory capacity. It also results in psychosomatic harmony.

Contraindications:

- Fatigue
- Back pain or injured back
- Recent surgery
- Pregnancy
- Heart disease
- Arthritis
- Wrist Injury

Asana in Surya Namaskara

Sr. No.	Name of the asana	Meaning in English
1	Pranamasana	Prayer Pose
2	Hastauttanasana	Raised Arms Pose
3	Hastapadasana	Standing Hand-To-Foot Pose
4	Ashwa Sanchalanasana	Equestrian Pose, Low Lunge Pose
5	Dandasana	Stick Pose
6	Ashtanga Namaskarasana	Salute With Eight Parts
7	Bhujangasana	Cobra Pose
8	Adho Mukha Svanasana	Downward Facing Dog Pose
9	Ashwa Sanchalanasana	Equestrian Pose
10	Hastapadasana	Standing Forward Bend
11	Hastauttanasana	Raised Arms Pose
12	Pranamasana	Prayer Pose

Fig 45: Complete Sequence of Steps in Surya Namaskara



ASANA (YOGA POSTURES)

Asana emphasizes the relationship between the body and mind with awareness. It also involves focusing on the synchronization of breathing and movement. Asana can bring about the stability of the body and mind. It removes conflicts at physical, mental, and emotional levels.

Asana practice improves the vital flow of energy through the body, resulting in a positive sense of well-being. It is a preparatory practice for meditation that fosters a quieting of the mind.

How to Perform Asana?

Practicing with 'awareness' is the key principle of all yoga practices that separates them from other exercises and fitness activities. The movements during yoga postures should be synchronized with breathing. In the final yoga posture, experience awareness of physical sensations in the body.

Practice Recommendations:

Include simple yoga postures and heighten the present moment awareness. Instead of worrying about getting into the perfect posture, find 'your version' of the asana with acceptance. Don't push yourself beyond limits to get into an ideal posture. Rather, modify yoga poses according to your fitness and flexibility level. It is not about how your posture looks, it is about how you feel in that posture. Respect the limitations of your body without comparing it to others. Use the support of a chair or the wall for a few poses, if required.

Safety Considerations:

Overstraining and excess muscular efforts can increase blood pressure. Therefore, refrain from the stronger forms of practice and avoid holding static postures for long periods. The breath should not be held during a yoga posture. Avoid aggressive and sudden changes in yoga postures such as standing up quickly from a lying down position as they may be stressful. Relax in shavasana at the end of asana practice. While performing a yoga posture, if the breath is rapid, or feeling agitated, flushed, dizzy, or uncomfortable, gradually come out of the pose and rest in shavasana.

STANDING YOGA POSTURES

The following standing postures are described here.

Asana:	Meaning in English
Standing postures	
Tadasana	Palm Tree Pose
Tiryak Tadasana	Swaying Palm Tree Pose
Katichakrasana	Standing Spinal Twist
Ardhachakrasana	Standing Backward Bend

Tadasana (Palm Tree Pose)

Technique: Stand straight with a slight gap between the feet. Raise both arms above the head while breathing in deeply. Interlock the fingers, raise the heels and balance on the toes. Hold the posture while breathing slowly and deeply. With an exhale, return to the base position.

Benefits:

- Improves stability, blood circulation, and posture.
- Strengthens back, legs, and core muscles

Caution: If suffering from vertigo, varicose veins, or heart disease, practice without raising the heels.

Fig 46: Tadasana



Copyright ©The Author(s) 2023

Tiryak Tadasana (Swaying Palm Tree Pose)

Technique:

Stand upright with a slight gap between the feet. Raise both arms above the head while inhaling deeply. Interlock the fingers with palms facing up. With a slow exhale, bend sideways to the left side keeping the elbows straight. Hold for a few seconds while breathing normally. With an inhale, slowly return to the center. Repeat on the other side.

Benefits:

- Gives lateral stretch to the spine
- Tones the muscles of the back
- Relieves constipation
- Reduces the fat from the waist area

Precautions:

Avoid practicing if suffering from a hernia, severe backache, sciatica, or slip disc. In hypertension and heart disease practice slowly with care.

Fig 47: Tiryak Tadasana

Copyright ©The Author(s) 2023

Katichakrasana (Standing Spinal Twist)**Technique:**

Stand upright and place the hands in the front, at shoulder level, palms facing each other. Inhale, twist to the left and look back with an exhalation. With inhale return to the base position. Repeat on the other side. Hold the final position of posture for a few seconds with normal breathing.

Benefits:

- Improves spinal strength and flexibility of the waist
- Relieves stiffness of the back
- Tones neck and shoulder muscles

Precaution:

Avoid if having severe backache, vertebral and disc disorders, or recent abdominal surgery.

Fig 48 A: Katichakrasana-Variation 1

Copyright ©The Author(s) 2023

Fig 48 B: Katichakrasana-Variation 2

Copyright ©The Author(s) 2023

Ardha Chakrasana (Standing Backward Bend)**Technique:**

Stand straight and place your hands on the lower back. Inhale deeply and bend the body back, while opening the chest. Hold the position for a few seconds as per the capacity. Continue to breathe normally. With an exhale, return slowly to the standing position.

Benefits:

- Improves spine flexibility.

- Improves posture by reversing the habitual forward slumping.
- Strengthens the neck muscles and relieves neck pain.
- Being a chest-opening posture, it improves breathing capacity.

Caution:

Do not practice if suffering from vertigo or dizziness. Hypertensive individuals should lean backward carefully.

Fig 49: Ardha Chakrasana



Copyright ©The Author(s) 2023

SEATED YOGA POSTURES

Asana:	Meaning in English
Seated postures	
Ardha Ushtrasana	Half Camel Pose
Marjarasana	Cat Stretch
Gomukasana	Cow Face Pose
Vakrasana	Seated Spinal Twist
Pashchimottanasana	Seated Forward Bend

Ardha Ushtrasana (Half Camel Pose)

Technique: Sit on the heels with a straight back and hands placed on your knees. Now stand on the knees. Keep the hands on the waist so that the fingers point to the floor. Slowly lean back and stretch the neck muscles while inhaling. Hold the pose for a few seconds with normal breathing. Return to the base position while exhaling. Relax.

Benefits:

- Strengthens the back and neck muscles.
- Relieves back pain.
- Has an energizing effect, as it is a chest opening and back bending pose.
- Improves blood circulation .

Precaution: Care should be taken while practicing backbends. Avoid practicing if suffering from a hernia, abdominal surgery, vertigo, and pregnancy.

Fig 50: Ardha Ushtrasana



Marjarasana (Cat Stretch)

Technique:

Start with Bharmanasana (tabletop position), placing the palms and knees on the mat. Place the shoulders over the wrists and hips over the knees. Inhale while raising the chin, tilting the head up, and pointing the tailbone up. Exhale while pulling the abdomen in, lowering the chin to rest on the chest. Complete a few rounds with fluid movements, stretching the spine.

Benefits:

- Improves spine flexibility.
- Strengthens the wrists and shoulders.
- Improves digestive function.
- Tones abdominal muscles.
- Calms the mind and relieves stress, anxiety.

Precautions:

Avoid in case of any recent or deep injury to the spine, knees wrist or neck.

Fig 51: Marjarasana



Copyright ©The Author(s) 2023

Gomukhasana (Cow Face Pose)

Technique:

Sit with the legs extended on the mat. Fold the right leg and keep it under the left buttock. Place the left leg over the right thigh. Raise the right arm and place the palm on the back. Stretch the left behind the back and bend the elbow, trying to touch the right hand. If possible, try to grasp the fingers of both hands behind the back. Keep the back and neck straight. Hold for a few seconds while breathing normally. Repeat on the opposite side.

Benefits:

- Improves posture.
- Relieves sciatica pain.
- Relieves stress and anxiety.
- Improves mobility and flexibility.

Precautions:

Avoid practicing if suffering from an injury to the shoulder, neck, hands, knees or hips. Do not practice in case of severe pain or recent surgery in these areas.

Fig 52: Gomukhasana



Copyright ©The Author(s) 2023

Vakrasana (Seated Spinal Twist)

Technique:

Sit with the legs extended on the mat. Bend the right leg, and place the right foot beside the left knee on the outer side. Inhale and while exhaling, twist the spine to the left. Bring the right arm around the right knee and place the hand beside the right foot. Bring the left arm back and place the palm on the mat. Turn the head towards the left side and look back. Hold the pose for a few seconds with normal breathing. Repeat on the opposite side.

Benefits

- Improves spinal flexibility.
- Relieves constipation.
- Stimulates pancreatic function, so it is beneficial in the management of diabetes.

Precaution:

Avoid practicing if suffering from severe back pain or vertebral and disc disorders and after abdominal surgery.

Fig 53: Vakrasana

Copyright ©The Author(s) 2023

Pashchimottanasana (Seated Forward Bend)**Technique:**

Start in a seated position with legs stretched straight in front. While inhaling, raise both arms above and while exhaling, gently bend forward from the hip joint. Try to keep the back as straight as possible. Extend the hands and try to catch the big toes of the respective sides. Hold the pose for a few seconds while breathing normally.

Benefits:

- Reduces stress and anxiety, and it has a calming effect on the mind.
- Stimulates the internal organs like the pancreas and helps in regulating blood glucose levels.
- Reduces abdominal fat.
- Improves spinal flexibility.

Precautions:

Avoid in case of severe back pain, neck pain, slipped disc, hernia, acute abdominal pain, stomach ulcers, or diarrhea. Not recommended after recent abdominal surgery.

Fig 54: Pashchimottanasana



Copyright ©The Author(s) 2023

POSTURES IN PRONE POSITION

Asana:	Meaning in English
Prone Postures	
Bhujangasana	Cobra Pose
Tiryak Bhujangasana	Swaying Cobra Pose
Ardha Shalabhasana	Half Locust Pose

Bhujangasana (Cobra Pose)

Technique:

Lie down in a prone position. Join the legs together and place your hands beside the chest area, palms on the mat. With slow inhalation, lift the chin and chest up to the navel area. Hold the pose for a few seconds while breathing normally. With an exhalation, slowly lower down to the base position and relax.

Benefits:

- Relieves stress.
- Reduces back pain and improves spine flexibility.
- Reduces abdominal fat.

Precaution:

Recent abdominal surgery.

Avoid if suffering from hernia, or ulcers.

Fig 55: Bhujangasana

Copyright ©The Author(s) 2023

Tiryak Bhujangasana (Swaying Cobra Pose)**Technique:**

Lie down in a prone position. Join the legs together and place your hands beside the chest area, palms on the mat. With slow inhalation, lift the chin and chest upto the navel area. With an exhalation, twist the upper trunk towards the left. Gaze over the left shoulder and try to look at the left heel. Hold for a few seconds with regular breathing. With inhalation, release the twist and return to the center. With an exhalation, lower the body to the floor and relax. Repeat on the opposite side.

Benefits:

- All the benefits of bhujangasana.
- Relieves constipation and improves digestive function.

Precaution:

Avoid if suffering from hernia, ulcers, or have undergone recent abdominal surgery.

Fig 56: Tiryak Bhujangasana

Copyright ©The Author(s) 2023

Ardha Shalabhasana (Half Locust Pose)**Technique:**

Practice this pose after bhujangasana. Lie down in a prone position and rest your chin on the mat. Place both hands below the thighs, with palms facing upwards. With inhalation, raise the left leg off the mat as much as possible without bending the knees. Hold the position for a few seconds breathing normally. With Exhalation, bring the legs down towards the mat. Repeat on the other side and relax.

Benefits

- Relieves sciatica and lower back pain.
- Strengthens and tones the thighs and hip muscles.
- Helps with weight management.
- Improves digestion.

Precaution:

Avoid if suffering from severe low back pain, peptic ulcers, hernia, or recent back injury.

Fig 57: Ardha Shalabhasana



POSTURES IN SUPINE POSITION

Asana:	Meaning in English
Supine Postures	
Uttaanpadasana	Raised Feet Posture
Pavanmuktasana	Wind Releasing Pose

Uttaanpadasana (Raised Feet Posture)

Technique:

Eka Pada Uttaanpadasana: Lie in a supine position on the mat with your legs stretched out. Place the hands by the sides. With inhalation, slowly raise the right leg without bending the knee. Hold the position for a few seconds with normal breathing. With an exhalation, slowly bring the leg down and place it on the mat. Repeat on the other side.

Fig 58 A: Eka Pada Dwi Pada Uttaanpadasana



Dwipada Uttaanpadasana: Follow the same instructions while raising both legs simultaneously.

Fig 58 B: Dwi Pada Uttaanpadasana



Benefits:

- Reduces abdominal fat and tones the abdominal muscles.
- Strengthens the pelvis, hips, lower back, legs, and also perineum muscles.
- Relieves indigestion, abdominal pain, flatulence.

Precaution:

- Individuals with hypertension should practice without holding their breath.
- Avoid raising both legs together in lower back pain.
- Do not practice in case of abdominal injuries or hernia.

Pavanmuktasana (Wind Releasing Pose)**Technique:**

Lie down in a supine position. Lift the right leg, bend the knee, and place the right thigh on the chest. Clasp the shin with both hands and interlock the fingers. With an exhalation, raise the head and touch the nose to the knee. Hold the pose for a few seconds with normal breathing. Slowly bring the head back on the mat and straighten the leg on the mat. Repeat on the opposite side. Practice with both legs following the same instructions.

Benefits

- Removes constipation, relieves flatulence, and improves digestion.
- Exerts internal pressure and massages muscles, ligaments, and tendons in the pelvic region.
- Strengthens the spine and back muscles.

Precaution:

Avoid if suffering from abdominal injuries, hernia, sciatica, or severe back pain. Avoid practicing during pregnancy.

Fig 59: Pavanmuktasana (Single Leg and Both Legs)

Copyright ©The Author(s) 2023

Suggestions for Further Reading:

- Saraswati SS, Hiti JK. Asana pranayama mudra bandha. Bihar, India: Yoga Publications Trust; 1996.
- Naragatti S. Shatkriya impact on health. Blue Rose Publishers; 2020 Sep 16.
- Iyengar BK. Light on yoga: the definitive guide to yoga practice.1965
- Muktibodhananda S. Hatha yoga pradipika. Sri Satguru Publications; 2012.
- Saraswati SS. Surya Namaskara: A Technique of Solar Vitalization. Bihar School of Yoga; 1996.
- Desikachar TK. The heart of yoga: Developing a personal practice. Simon and Schuster; 1999 Mar 1.
- Kaminoff L, Matthews A. Yoga anatomy. Human Kinetics; 2021 Oct 19.
- McCall T. Yoga as medicine: The yogic prescription for health & healing: A yoga journal book. Bantam; 2007.
- Heyman J. Accessible yoga: Poses and practices for every body. Shambhala Publications; 2019 Nov 5.

Supplementary material 3

Contraindicated yoga practices for hypertension

**This manual is part three of the three supplementary materials/appendices of the article
“Therapeutic Role of Yoga in Hypertension”**

Yoga is a safe intervention if practiced according to prescribed safety guidelines. Some yoga practices can be unsafe for hypertension. This manual provides a general guideline and a brief description of contraindicated yoga practices for hypertension. The cleansing practices, asana, and pranayama mentioned here can lead to increased systolic and diastolic blood pressure. They should be avoided by hypertensive individuals. For more information, a few references are suggested for further reading.

Disclaimer: The content in this manual is for informational purposes only and is not intended to be a substitute for professional medical advice, diagnosis, and treatment. The yoga practices mentioned here must be learned under the guidance of a qualified yoga professional. Those who are having any health issues must take a medical opinion before proceeding with various yoga practices.

Index: Yoga Practices Contraindicated In Hypertension

Yoga Practice	Details of Yoga Practice	Brief Description	Figure
Shatkriya (Six Cleansing Practices)	Shankhaprakshalana	Alimentary Tract Cleansing	Fig 60
	Agnisara Kriya	Activating the Digestive Fire	Fig 61
	Vaman Dhauti	Regurgitative Cleansing	Fig 62
	Vastra Dhauti	Cloth Cleansing of the Digestive Tract	Fig 63
	Nauli Kriya	Abdominal Massaging	Fig 64
	Basti Kriya	Yogic Enema	Fig 65
	Kapalbhati	Skull Shining Breath	Fig 66
Asana (Yoga Postures)	Shirshasana	Headstand Pose	Fig 67
	Sarvangasana	Shoulderstand Pose	Fig 68
	Chakrasana	Wheel Pose	Fig 69
	Halasana	Folded Inversion Pose	Fig 70
Inversions And Head- Below- Heart Postures	Adhomukh Shvanasana	Downward-Facing Dog Pose	Fig 71
	Prasarit Padottanasana	Wide-Legged Standing Forward Bend	Fig 72
Modifications Of Inversions	Balasana	Supported Child's Pose	Fig 73
	Viparit Karni	Supported Legs up the Wall Pose	Fig 74
Other Asana	Mayurasana	Peacock Pose	Fig 75 A-B
	Dhanurasana	Bow Pose	Fig76
	Bhastrika Pranayama With Rapid Forceful Inhalation And	Bellows Breath	Fig 77

(Regulated Breathing Practices)	Exhalation		
	Surya Bhedan/ Surya Nadi Pranayama	Right Nostril Breathing	Fig 78 A-B
	Kumbhak	Breath Retention	Fig 79
	Mula Bandha	Root Lock, Pulling the Perineum Inward	Fig 80 A
Bandha (Lock) Practiced With Breath Retention	Uddiyan Bandha	Abdominal Lock, Lifting of the Diaphragm	Fig 80 A
	Jalandhar Bandha	Chin Lock, Pressing the Chin on the Chest and Contracting the Throat	Fig 80 B

SHATKRIYA (Cleansing Practices)

What is Shatkriya?

Shatkriya, also known as shatkarma is a set of six yogic cleansing techniques described in hatha yoga. Traditional yoga texts highlight many health benefits of these six procedures, namely neti for cleansing of nasal passages, dhauti for the digestive tract, nauli for abdominal organs, basti for the large intestine, kapalbhati for frontal lobes of the brain, and trataka for cleansing of eyes. These kriyas remove impurities from the body, offer therapeutic benefits, and prepare the body for higher yoga practices that ultimately aim to attain moksha or liberation. Except for trataka and neti kriya, others are contraindicated in hypertension.

Shatkriya (Cleansing practices) Contraindicated in Hypertension

Practice	Brief Description
Shankhprakashalana	Alimentary Tract Cleansing
Agnisara Kriya	Activating the Digestive Fire
Vaman Dhauti	Regurgitative Cleansing
Vastra Dhauti	Cloth Cleansing of Digestive Tract
Nauli Kriya	Abdominal Massaging
Basti Kriya	Yogic Enema
Kapalbhati	Skull Shining Breath

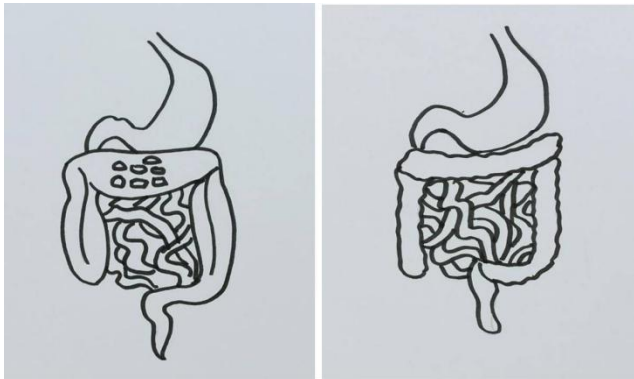
Shankhprakashalana (Alimentary Tract Cleansing)

This kriya involves repeating rounds of drinking salt water, performing a set of asanas, and evacuating the bowels. The asana includes tadasana, tiryakatadasana, katichakrasana, tiryaka bhujangasana, and udarakarshana. Drinking lukewarm saline water with the practice of asanas cleanses the gastrointestinal tract from mouth to anus. It facilitates peristalsis, causing movement of stagnant stool and leading to frequent elimination.

It can be risky for individuals with hypertension because water intake may lead to a rise in blood volume and thus cardiac output. Increased intake of salt is also a concern in hypertension. The physical exertion involved in the procedure may cause further heart rate rises.

This kriya is contraindicated in hypertension. However, its short and simplified version, known as Laghu shankha prakshalana requires lesser physical strain. Preliminary evidence suggests its safety in patients with mild to moderate essential hypertension.

Fig 60: Before and After Shankhprakashalana Kriya



Agnisar Kriya (Activating the Digestive Fire)

As described in Hatha yoga, Agnisara kriya is performed by retaining the breath after exhalation (bahya kumbhaka) and then rapidly flapping the abdominal muscles in and out. It stimulates the digestive fire, promotes improved digestion, and improves gastrointestinal motility. However, this kriya is not safe for practice in hypertension.

Fig 61: Agnisar Kriya



Vaman dhauti (Regurgitative Cleansing)

Vaman dhauti is a yogic cleansing technique that flushes out the impurities from the upper digestive tract by voluntarily induced vomiting. It is performed by drinking a large quantity of saline lukewarm water and after a few minutes, the water is thrown out of the stomach using finger-inducing.

A similar practice called kunjaj kriya also involves induced vomiting. Vaman dhauti is performed 3 or 4 hours after meals, whereas kunjaj kriya is practiced on an empty stomach. These practices increase the efficiency of the abdominal muscles and facilitate the removal of trapped gases and fermented food in the stomach. They also inhibit excess gastric secretions, encourage peristalsis, and improve the functioning of the upper digestive tract. Vaman dhauti is contraindicated in hypertension.

Vastra dhauti (Cloth Cleansing)

Vastra dhauti is a cleansing technique that involves swallowing a long strip of thin cotton cloth (vastra) and removing it, to clean the esophagus and stomach. This helps in removing excess phlegm produced in the upper gastrointestinal tract. Vastra dhauti is contraindicated in hypertension and heart diseases.

Fig 62: Vaman Dhauti



Copyright ©The Author(s) 2023

Fig 63: Vastra Dhauti



Copyright ©The Author(s) 2023

Nauli Kriya (Abdominal Massaging)

This is a yogic cleansing exercise that involves a rolling movement of the abdominal muscles. Nauli is the practice of contracting and isolating the rectus abdominis muscles. When this muscle is isolated on the right side, it is called Dakshina Nauli, on the left it is Vama, and at the center it is called Madhyama nauli. As a result of this practice, the negative pressure within the abdominal cavity is increased.

This kriya improves the secretions of gastric enzymes and stimulates the function of the pancreas. It improves blood circulation in the peripheral part of the stomach. It also strengthens and tones the core muscles.

Nauli kriya is an advanced yoga practice and should be avoided by individuals suffering from hypertension.

Fig 64: Madhyama Nauli



Copyright ©The Author(s) 2023

Basti Kriya (Yogic Enema): Cleansing of Intestines

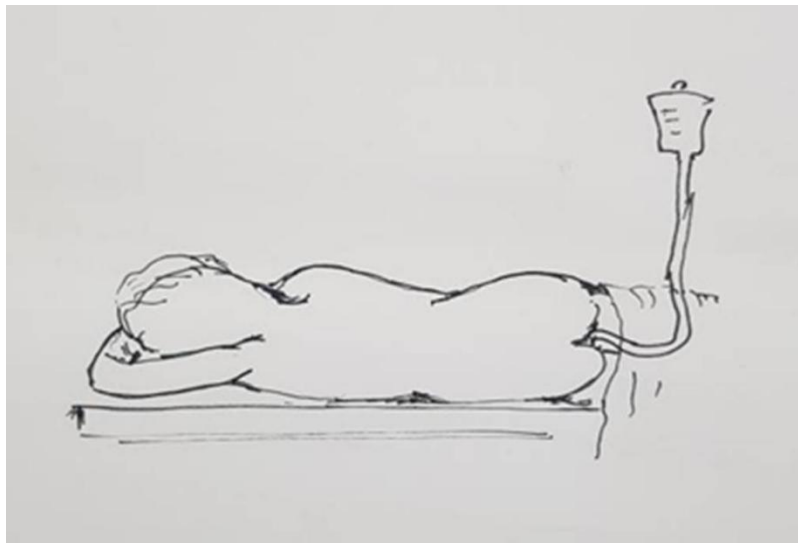
Basti is similar to the enema technique that involves cleansing the large intestine by inserting a tube filled with water into the rectum. The purpose of basti kriya is to evacuate stool and other impurities from the colon. Therefore, it is known as the yogic enema. There are two types of basti, Jala basti, where water is used for cleansing the colon, and Sthala basti, where the air is used.

Traditional practice involves squatting in water and sucking the water into the large intestine by the expansion of the anal sphincter muscles followed by uddiyan bandha and nauli kriya. During the practice, a negative pressure is created within the intra-abdominal cavity that draws the water to the large intestine.

In Sthala basti, the air is sucked into the large intestine which helps to expel the fecal matter through the anus.

These advanced practices are contraindicated in hypertension.

Fig 65: Basti Kriya



Copyright ©The Author(s) 2023

Kapalbhati (Skull Shining Breath)

Kapalbhati is a popular fast-paced breathing exercise where abdominal muscles are used for active, fast, and forceful exhalations whereas the inhalations are effortless. It is a hyperventilation practice having a stimulating, cleansing, and heating effect on the body. Being a breathing process, it is commonly considered a pranayama technique, however, according to classical yoga texts, it is a cleansing technique or kriya.

Kapalbhati increases systolic and diastolic BP immediately in novices. During practice, there is a drastic increase in sympathetic tone whereas parasympathetic activity is reduced. It is contraindicated in hypertension, heart disease, gastric ulcers, hernia, and in individuals with complaints of dizziness.

Fig 66: Kapalbhatai



Copyright ©The Author(s) 2023

YOGA POSTURES (ASANA) CONTRAINDICATED IN HYPERTENSION

Asana	Sanskrit name of the Asana	Meaning in English
Inversions and Head Below The Heart Postures	Shirshasana	Headstand Pose
	Sarvangasana	Shoulderstand Pose
	Chakrasana	Wheel Pose
	Halasana	Plough Pose
	Adhomukh Shvanasana	Downward Facing Dog Pose
	Prasarit Padottanasana	Wide-Legged Standing Forward Bend
	Mayurasana	Peacock Pose
Other Asana	Dhanurasana	Bow Pose

Inversions and Head Below the Heart Postures

Inversions in Hypertension:

They can cause a significant rise in both systolic and diastolic arterial pressures. In inverted yoga poses, the intra-thoracic pressure is increased. Pumping against gravity increases the cardiovascular strain resulting in increased blood pressure. Pooling of the blood in the head and neck region results in the rise of blood pressure.

This can also happen due to the body's inability to make the expected adjustments, even though the baroreceptors detect pressure. Inversions are difficult practices where feeling nervous, unbalanced, or stressed can add muscular tension while trying to hold the poses. This can further cause the blood pressure to rise.

Level of Inversions and Rise in Blood Pressure:

The increase in blood pressure associated with inversion yoga practices depends mainly on how far above the head the heart is, and how far above the heart the legs and trunk are.

Mild inverted poses such as the child's pose, where the head is slightly below the heart level increase pressure a little. Sarvangasana (shoulder stand) will increase the blood pressure still more. Whereas, in shirshasana (headstand), the legs and trunk are elevated to the maximum and the head is at the lowest level below the heart. This can increase blood pressure to a greater degree.

Inverted Yoga Poses Contraindicated in Hypertension

Fig 67: Shirshasana (Headstand)
Stand)



Copyright ©The Author(s) 2023

Fig 68: Sarvangasana (Shoulder Stand)



Copyright ©The Author(s) 2023

Fig 69: Chakrasana (Wheel Pose)



Copyright ©The Author(s) 2023

Fig 70: Halasana (Folded Inversion Pose)



Copyright ©The Author(s) 2023

Fig 71: Adho Mukha Shvanasana



Fig 72: Prasarita Padottanasana



Modifications in Inversions

Inverted yoga poses are contraindicated for hypertension. However, modifications in some mild inversions are recommended. For example, in a child's pose, or adho mukha shvanasana (downward facing dog pose), the head can be supported with folded blankets or pillows, so that it is at the level of the heart. In viparita karni, supported legs up the wall pose can give inversion benefits of lymphatic drainage and improved venous return from the lower extremities without adding the risk of increased blood pressure.

Fig 73: Supported Child's Pose



Fig 74: Legs-Up-the-Wall Pose



Copyright ©The Author(s) 2023

Other Asanas Contraindicated in Hypertension

Other asanas such as Mayurasana (peacock pose) and Dhanurasana (bow pose) compress the front of the diaphragm, which can raise blood pressure.

Fig 75 A: Mayurasana (Peacock Pose) Variation 1

Fig 75 B: Mayurasana (Peacock Pose) Variation 2



Copyright ©The Author(s) 2023



Copyright ©The Author(s) 2023

Fig 76: Dhanurasana (Bow Pose)



Copyright ©The Author(s) 2023

PRANAYAMA CONTRAINDICATIONS IN HYPERTENSION

Component of Details of Practice

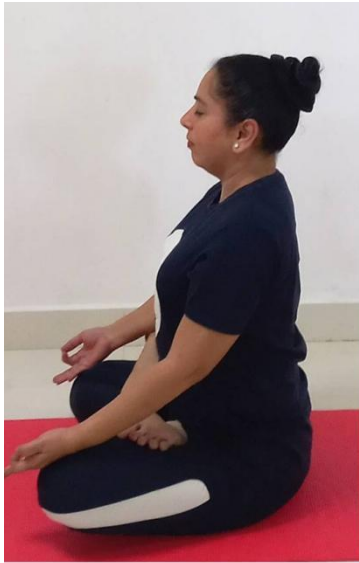
Pranayama

Pace	Fast breathing practices
Type	Bhastrika pranayama (Bellows breath) with rapid forceful inhalation and exhalation Surya bhedan/ surya nadi pranayama (Right nostril breathing)
Technique	Kumbhaka (breath retention)

Fast paced Bhastrika pranayama (Bellows breath)

Bhastrika pranayama (Bellows breath) with rapid forceful inhalation and exhalation increases heart rate and blood pressure, producing vasoconstriction. This hyperventilation practice decreases the carbon dioxide in the blood and reduces blood circulation to the brain. This can result in confusion and agitation. The fast practice of bhastrika can trigger very serious heart problems, particularly in individuals with an existing heart condition.

Fig 77: Fast-Paced Bhastrika Pranayama

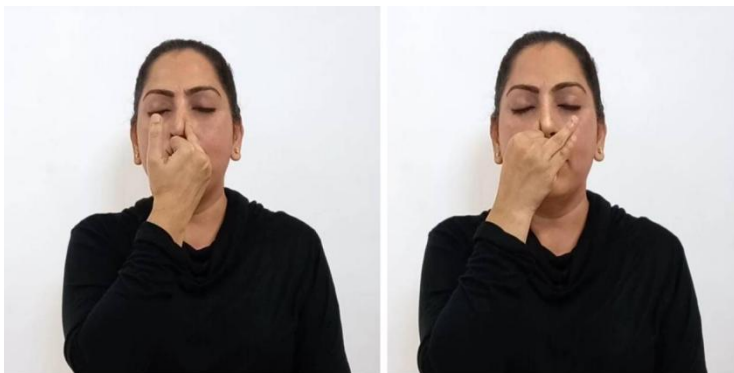


Copyright ©The Author(s) 2023

Surya Bhedan or Surya Nadi Pranayama

Surya bhedan or Surya nadi pranayama (right nostril inhalation, left nostril exhalation, or unilateral right nostril breathing) is an energizing breathing technique that has a sympathetic stimulating effect, which results in increased blood pressure. It is contraindicated in hypertension.

Fig 78 A: Surya Bhedan Pranayama-Variation 1 (Right nostril inhalation, Left nostril exhalation)



Copyright ©The Author(s) 2023

Fig 78 B: Surya Bhedan Pranayama-Variation 2 (Unilateral Right Nostril Breathing)



Copyright ©The Author(s) 2023

Kumbhaka (Breath Retention)

Kumbhaka is the breath retention practiced during pranayama. It can be performed after inhalation, after exhalation, or unaccompanied with a breath cycle. The practice of kumbhaka significantly increases systolic, diastolic blood pressure, and mean arterial pressure. It may be due to the combined effect of an increased level of heart rate and total peripheral resistance during kumbhaka. It is contraindicated in hypertension, heart disease, and individuals recovering from an illness, surgery, or injury.

Fig 79: Kumbhaka



Copyright ©The Author(s) 2023

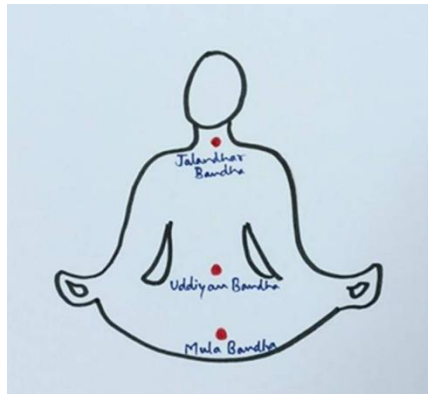
BANDHA (LOCK)

Bandha (lock)	Description of practice
Practiced with breath retention	
Mula Bandha	Root lock, pulling the perineum inward
Uddiyan Bandha	Abdominal lock, lifting of the diaphragm
Jalandhar Bandha	Chin Lock, pressing the chin on the chest and contracting the throat
Maha Bandha	Practicing all three bandhas together

What is a Bandha?

Bandha, which means to lock, close off, or stop, are yoga practices that redirect the flow of blood and lymph to other parts of the body. They consist of neuro-muscular locks and involve changes in internal pressure to a very high degree. In this yoga practice, the blood flow to a particular area of the body is closed. After releasing the bandha, the area is flooded more effectively with blood. With practice, the organs are stimulated regularly, regulating blood circulation and improving function. Bandha practice requires long retention of breath which strains the heart and therefore it is not recommended for hypertension. If the bandha is not performed properly, the blood pressure is raised and it may lead to permanent hypertension.

Fig 80 A: Bandha



Copyright ©The Author(s) 2023

Fig 80 B: Jalandhar Bandha



Copyright ©The Author(s) 2023

Suggestions for further reading:

- Saraswati SS, Hiti JK. Asana pranayama mudra bandha. Bihar, India: Yoga Publications Trust; 1996.
- Iyengar BK. Light on yoga: the definitive guide to yoga practice. 1965
- Muktibodhananda S. Hatha yoga pradipika. Sri Satguru Publications; 2012.
- Naragatti S. Shatkriya impact on health. Blue Rose Publishers; 2020 Sep 16.
- Iyengar BK. Light on pranayama: the yogic art of breathing. Crossroad; 1981.
- Sivananda SS. The science of pranayama. Youcanprint; 2017 Mar 28.
- Joshi KS. Yogic pranayama: Breathing for long life and good health. Orient Paperbacks; 2006.
- Rosen R. The yoga of breath: A step-by-step guide to pranayama. Shambhala Publications; 2002 Aug 13.