

# YOGA AS THERAPY

Yoga is an ideal form of exercise for stretching tight muscles and improving flexibility, gaining strength and also providing psychological benefits. This article describes how yoga can be used in a rehabilitation setting.

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**E**xercise therapy is frequently a keystone to treatment, and one of the original four pillars of the physiotherapy profession outlined in 1922, when the physiotherapy society was first granted a Royal Charter. Much has changed since that time, with various exercise types coming into and out of fashion. Yoga has been around for thousands of years, but over the last 10 years we have seen a rapid growth in yoga classes in the Western world with this type of exercise becoming the latest exercise fashion. In parallel with this growth has been an interest in the use of yoga as therapy, building yoga exercises into a structured rehabilitation programme. In this article we will look at this exercise form, and the evidence of its use in rehabilitation. We will also take a brief look at how yoga exercises are practised, and what modifications are required to bring this ancient exercise form into the fold of evidence-based practice.

## WHAT IS YOGA?

The term yoga literally means union (yoke) and refers to the union between body, mind, emotion and breath. It is a system of exercise originally based on Hindu teaching, but nowadays a modified form of yoga is normally practised, which falls into the category of mind-body exercise alongside

activities such as Pilates, and Tai Chi. Yoga can be seen as mindful activity, in that it combines both physical exercise and a mindfulness approach to movement (Box 1). Participants are encouraged to pay attention to the feeling of their body during exercise with special attention to the breath. This concept of awareness of the breath is central to the mindfulness approach used in stress management (1). Classical yoga postures (*asana*) are linked to breath awareness and control (*pranayama*), concentration (*dharana*) and relaxation/meditation (*dhyana*).

A typical yoga class begins with a centring activity designed to act as a gap between the activities of daily living and the focus required in the yoga class. This is typically a seated posture requiring the participant to close their eyes and focus on their breathing for example, thus turning their attention inward towards their body and away from environmental stimuli. The body of the yoga class uses exercises typically practised on a non-slip (sticky) mat and often uses basic props such as foam blocks, wooden bricks and webbing belts. Exercises are practised in a number of starting positions including lying, floor sitting, chair sitting, kneeling and both free and wall-supported standing. Yoga poses are normally taught within a class format but may also be practised on a one-to-one personal training basis. Exercises are typically practised individually but partner work can also be used.

Generally a yoga class will involve several postures progressing in intensity and finishing with a relaxation and/or meditation session.

The postures are often held for a number of seconds and clients are encouraged to relax and breathe normally throughout performance. Breath-holding (Valsalva manoeuvre), straining, facial expressions of effort and verbal responses are discouraged. Postures are normally practised symmetrically with emphasis on good alignment as well as range of motion. In addition counter poses are often used to prevent stress accumulation within the tissues. For example postures emphasising spinal flexion are often countered by those which emphasise extension.

Body alignment when performing poses is usually compared to an idealised version typically presented by a yoga book, organisation or senior practitioner. Sometimes the reasoning behind the idealised postures lacks clear scientific evidence. Classical yoga usually claims that poses are passed down over the centuries from teacher (master) to pupil, and many organisations claim to represent the true postures. However, scientific scrutiny has challenged the claim of all yoga postures being ancient and the techniques unchanged over millennia (2). Where yoga poses are used for rehabilitation it is essential that an emphasis is placed on good body alignment using knowledge of anatomy, physiology and body mechanics.

## YOGA POSTURES

Yoga postures (*asanas*) have individual names which may describe the general body shape, an animal that the posture is said to resemble or an individual after whom the pose is named. Poses

### BOX 1: DEFINITION: MINDFULNESS

**Mindfulness** is a psychological term inherited from the Buddhist tradition. It is paying attention to the present moment in a non-judgmental way. (C. Norris, 2014)

**TABLE 1: SANSKRIT NAMES USED IN YOGA POSES** (C. NORRIS, 2014)

Bodypart	Animal
<i>Pada</i> : foot	<i>Svana</i> : dog
<i>Hasta</i> : hand	<i>Bheka</i> : frog
<i>Janu</i> : knee	<i>Baka</i> : crow
<i>Sirsa</i> : head	<i>Ustra</i> : camel
<i>Mukha</i> : face	<i>Bhujanga</i> : snake (serpent)
<i>Anga</i> : limb	<i>Matsya</i> : fish
<i>Bhuja</i> : arm	<i>Shalabha</i> : locust (grasshopper)
<i>Sarvanga</i> : whole body	
<i>Sava</i> : corpse	
Object	Position
<i>Parigha</i> : gate latch	<i>Adho</i> : downward
<i>Hala</i> : plough	<i>Urdva</i> : raised/ upward
<i>Vrksa</i> : tree	<i>Utthita</i> : extended, stretched.
<i>Tada</i> : mountain	<i>Parivrtta</i> : revolved
<i>Setu</i> : bridge	<i>Baddha</i> : tied/ bound
<i>Nava</i> : boat	<i>Supta</i> : reclining/ sleeping
<i>Dhanu</i> : bow	<i>Uttana</i> : intense stretch
<i>Danda</i> : rod (staff)	<i>Upavistha</i> : seated
<i>Vira</i> : hero	<i>Prasarita</i> : spread out
	<i>Ardha</i> : half
	<i>Salamba</i> : with support
	<i>Kona</i> : angle

**BOX 2: DEFINITION: SANSKRIT**

*Sanskrit* is one of the original languages of the Indian sub-continent. Classical Sanskrit is rarely used nowadays except in traditional ceremonies in mainly Hindu and Buddhist practice. Versions of the language can be traced back to 1500CBE. (C. Norris, 2014)

“THE TERM YOGA REFERS TO THE UNION BETWEEN BODY, MIND, EMOTION AND BREATH”

using core stability for example.

Good alignment is essential to yoga practice and often props are used to allow an individual to perform a yoga pose even where they have physical characteristics that would limit them. So for example when reaching into a Standing forward bend (*Uttanasana*) an individual with tight hamstring muscles is unable to touch the floor to take their body weight. Wooden yoga bricks may be used to bring the floor up to the student so they can take their

weight onto their hands even though their flexion range is limited (Fig. 1). Similarly, in the Sitting forward bend (*Pashimotonasana*) an individual who cannot reach their feet can be given a yoga belt, and someone who cannot rest their head onto their legs a folded blanket or bolster to allow them to rest in a higher (less flexed) body position (Fig. 2).

Yoga is described as a mind-body activity and mindfulness is an awareness of body sensations

have both Western and Sanskrit names (Table 1), so for example Mountain pose is also called *Tadasana*, from the Sanskrit *Tada* meaning mountain and *asana* meaning posture (Box 2).

**Asana performance**

Several factors should be considered when performing a yoga asana (Table 2). Some of these concern body mechanics and are fairly universal to good exercise practice. Others differ from standard exercise practice due to the mind-body nature of yoga. One of the similarities with modern practice is the use in yoga of bandhas or body locks. These will be familiar to any therapist or exercise professional, although perhaps not in name. *Mula bandha* (root lock) is essentially engaging the pelvic floor, *Uddiyana bandha* (abdominal lock) the lower abdominal muscles, and *Jalandhara bandha* (throat lock) the deep neck flexors through the use of a chin tuck action. *Bandhas* are often used during exercise to aid firmness of a posture and to provide its root; expressions familiar to any exercise professional

**TABLE 2: IMPORTANT FACTORS IN YOGA PRACTICE [C. NORRIS, 2014: SOURCED IYUK (3) AND KABAT-ZINN (4)]**

Factor	Meaning
<b>Alignment</b>	<ul style="list-style-type: none"> <li>Position of body parts relative to each other, and of the body relative to the floor or supporting surface.</li> <li>Use supports such as yoga blocks/bricks/wedges/ blanket/belt to improve alignment of pose.</li> <li>Consider alignment at each stage of pose: going into, holding, and coming out of pose.</li> </ul>
<b>Extension</b>	<ul style="list-style-type: none"> <li>Gradual lengthening (stretching) of body soft tissues.</li> <li>Expansion and lift of chest.</li> <li>Elongation of limbs to create space for movement to occur.</li> <li>Extension occurs from the ground up.</li> </ul>
<b>Direction</b>	<ul style="list-style-type: none"> <li>Connected to both alignment and extension, direction begins at the floor and moves through the body and limb.</li> </ul>
<b>Stability</b>	<ul style="list-style-type: none"> <li>Holding the pose quietly (mindfully) with minimal muscle work, sensitivity, and normal breathing.</li> <li>Stability of the body centre (pelvic and/or shoulder girdle) for the limbs to move upon.</li> </ul>
<b>Precision</b>	<ul style="list-style-type: none"> <li>Subtle adjustments to alignment to refine the pose.</li> <li>An understanding of mental and emotional effects on asana practice (mind/body nature of yoga).</li> </ul>
<b>Mindfulness</b>	<ul style="list-style-type: none"> <li>Focus attention internally to 'listen to the body'.</li> <li>Aim to think in the present rather than focusing attention to the final exercise position (future) or being distracted by thoughts of daily activity (past).</li> </ul>

# “GOOD ALIGNMENT IS ESSENTIAL TO YOGA PRACTICE AND PROPS ARE OFTEN USED TO AID INDIVIDUALS WITH LIMITED FLEXIBILITY”

**Figure 1: Forward bend (Uttanasana) performed with wooden blocks. Yoga aids (such as wooden blocks) allow individuals with limited flexibility to perform the exercises. (Photo credit: C. Norris, 2014)**



**Figure 2: Sitting forward bend (Paschimotanasana) performed with a yoga belt. (Photo credit: C. Norris, 2014)**



**Figure 3: Mountain pose (Tadasana). (Photo credit: C. Norris, 2014)**



**Figure 4: Mountain pose (Tadasana) using a slim yoga block for tactile cueing. (Photo credit: C. Norris, 2014)**



**Figure 5: Mountain pose (Tadasana) using a yoga belt. The belt helps the posture to be performed correctly for individuals with tight, rounded shoulders. (Photo credit: C. Norris, 2014)**

and the breath as you practise the asanas. In traditional gym training there are often distractions that take a user’s attention outside their body. Music, TV screens playing music videos and mirrors are all features that take the attention away from the body. By focusing on bodily sensations such as the firmness of a muscle or the precise position of the limb, as well as noticing the breath and the effect that this has on the posture, the user’s attention is drawn within themselves. Further, anxiety can occur in general life by constantly thinking of what the future may bring or regretting what the past has already brought. One of the aims of mindfulness meditation is to focus attention on the present moment. Again yoga can help with this by stressing to the user that they focus on the body sensations of the exercise stage they are in at the moment, rather than being goal-focused on the end result of an asana performance.

Focusing the attention on body sensation also aids proprioception. This can be further enhanced by the yoga emphasis on movement precision during practice. It is interesting to note that exercises that contain “an intuitive search for

elegance, pleasure and beauty” (5) such as yoga, martial arts and dance have been found to be amongst the most effective at enhancing proprioception.

Yoga is obviously an exercise associated with stretching and a high degree of flexibility in practitioners. In addition to range of motion, the emphasis on extension of an asana is important. Reaching upwards and outwards to lengthen the body and limbs during a pose, and allowing unrestricted chest movement to facilitate unhindered breathing should be emphasised throughout yoga practice.

## POSTURE EXAMPLES

To illustrate the points introduced above, let’s look at five yoga postures and their modifications for use within rehabilitation.

### Mountain pose (Tadasana)

#### Purpose

To teach standing body alignment, is a preparation for further poses and to increase appreciation of optimal posture.

#### Preparation

Begin standing with your feet together and hands by your sides, palms facing inwards.

#### Action

Take your weight equally between your right and left foot, and between the toes and heel on each foot. Tighten your quadriceps to draw your knees straight and together. Lengthen your spine reaching the crown of your head upwards, draw your shoulder blades together slightly to open your chest. Straighten your arms reaching your fingertips downwards towards your lateral malleoli. Maintain the position breathing normally (Fig. 3).

#### Tips

Some individuals hyper-extend their knees when they tighten the quadriceps muscles. To avoid this action, focus on maintaining a straight vertical line from your hips through your knees to your ankles (posture

## BOX 3: DEFINITION: CUEING

A cue is a signal which facilitates an action. Cues may be *verbal* (spoken), *visual* (seen), *auditory* (heard) or *tactile* (felt) in nature. When a number of cues are used at the same time, the approach is termed *multisensory cueing* [see Norris pages 70–71 (6) for more details]. (C. Norris, 2014)

line). In addition avoid over arching your lumbar spine (hollow back posture) by gently drawing your abdominal muscles inwards and tailbone downwards (minimal posterior pelvic tilt towards neutral lumbar position). Tactile cueing can be used by placing a slim yoga block between the inner thighs (Fig. 4) (Box 3). The action is a simultaneous contraction of the quadriceps and hip adductors to squeeze onto the block and draw the knees together.

For those with very tight, rounded shoulders it is helpful to practice the pose with your back against a wall. Focus on drawing the shoulders back to press against the wall (retraction) before reaching the fingertips downwards to the outer ankles. An additional method is to grip a yoga belt in each hand and loop it beneath the feet (Fig. 5). The belt holds the scapulae in a depressed position, preventing elevation as the shoulders are braced.

### Triangle (*Trikonasana*)

#### Purpose

To lengthen the side trunk and outer hip.

#### Preparation

Begin standing on a yoga mat with your feet approximately one leg-length apart, toes facing forwards. Stretch your arms out sideways (shoulder abduction) keeping your elbows straight and palms facing the floor.

#### Action

1. Turn your right leg outwards (lateral rotation of the hip) so that your toes face the short edge of the mat, and turn your leg in slightly (minimal medial rotation of the hip). Reach your right hand out to the side, and then downwards placing it onto your right shin, while at the same time reaching your left hand upwards towards the ceiling. Avoid allowing the left side of your pelvis to roll forwards, or the lower side of your trunk to shorten (side flexion, concave towards the floor). The action of reaching out horizontally with the arm is a useful tactile cue to avoid shortening the lower side of the trunk. Keep the pelvis aligned so that the hip joints are stacked

(right and left joints aligned in a vertical position). Open your chest and extend your thoracic spine into a light shoulder retracted position. Reach with your left arm upwards and press with your right hand onto your shin to come out of the pose. Repeat the action on the left side of the body (Fig. 6).

2. Perform a limited range action taking the right hand down to a chair, placing your hand in the centre of the chair and keeping your arm straight. The upper arm may be straightened as in the classic pose, or kept bent to aid balance (Fig. 7). To increase range further use a wooden yoga block placed with its long edge aligned vertically. The block should be aligned with your centre shin.
3. To improve alignment, perform the pose with your back towards the wall, trying to press the upper pelvis backwards against the wall to maintain the stacked hip position.
4. To reduce balance demand, perform the standard pose but keep your left hand on your hip, or place your hand behind your tailbone (sacrum) to encourage chest opening.
5. To perform the Revolved triangle pose (*Parvritta trikonasana*), begin with your feet wide apart and your arms stretched out horizontally in line with the long edge of a yoga mat. Turn your back (left) foot in well ( $60^\circ$ ) and your right foot out fully ( $90^\circ$ ) and at the same time turn your body to the right to bring your chest and outstretched arms to face the short end of your mat. Place your right hand on your hip and reach your left hand down to the floor on the outside of your leading foot. To maintain the alignment of your spine you may choose to place your hand onto a yoga block, your finger tips, or the flat of your hand depending on your flexibility (Fig. 8). Finally, reach your right arm upwards keeping it straight and point your fingertips to the ceiling.

#### Tips

The Triangle pose requires a combination of leg firmness and



**Figure 6: Triangle (*Trikonasana*).** (Photo credit: C. Norris, 2014)



**Figure 7: Triangle (*Trikonasana*) using a chair.** This allows the pose to be performed with a more limited range of motion. (Photo credit: C. Norris, 2014)



**Figure 8: Revolved triangle (*Parvritta trikonasana*).** (Photo credit: C. Norris, 2014)

stability, with flexibility of the lateral trunk. The pose can be effectively split into two portions, practising leg stability with the hands on the hips initially. Once this has been attained the trunk movement and arm stretch may be brought in.

### Warrior (*Virabhadrasana*)

#### Purpose

To build flexibility and strength in the legs while maintaining upper body alignment.

**Figure 9: Warrior II (Virabhadrasana).**  
(Photo credit: C. Norris, 2014)



**Figure 10: Warrior I (Virabhadrasana).**  
(Photo credit: C. Norris, 2014)



**Figure 11: Warrior III (Virabhadrasana).**  
(Photo credit: C. Norris, 2014)



**Figure 12: Assisted Warrior III.**  
(Photo credit: C. Norris, 2014)

### Preparation

Begin standing on a yoga mat with your feet wide apart (distance approximately one-and-a-half leg lengths). Turn your right leg outwards (lateral rotation of the hip) so that your toes face the short edge of the mat, and turn your leg in slightly (minimal medial rotation of the hip). Reach your hands out sideways so that your arms are straight, elbows locked and palms facing the floor.

### Action

1. Bend your right knee pressing the knee forwards over the right foot ensuring that the knee does not drop inwards into a knock knee position. Stop when the knee is at 90° and your shin is vertical, thigh horizontal. As you bend your right knee, keep your left leg straight, making sure that you do not roll inwards (pronation) onto your foot, but instead maintain the contour of the medial arch. Press on the right foot to straighten the leg and draw yourself back to standing, reverse the movement bending the left leg. This pose is Warrior II (Fig. 9).
2. Lower your arms and place your hands onto your hips. Turn your right leg outwards (outward rotation of the hip) to face your toes towards the short edge of the mat. Turn your trunk to the right aiming to get your pelvis and shoulders facing the short edge of the mat, and turn your left toes well in (45–60° medial hip rotation). Bend your right knee pressing the knee over the right foot. Stop when the knee is at 90° and your shin is vertical, thigh horizontal. Reach both arms overhead keeping them shoulder width apart with your fingers straight, palms facing each other. Press on the right foot to straighten the leg and draw yourself back to standing, reverse the movement bending the left leg. This pose is Warrior I (Fig. 10).
3. Perform Warrior (I), and from the final pose lower your trunk towards your right thigh and step in with your left foot. Press hard with your right leg and lift your left leg into a horizontal position keeping your thigh muscles tight. Reach forwards

with your hands and aim to form a straight horizontal line from your hands through your shoulders, trunk, and left leg. Release the pose by reversing the action. This pose is Warrior III (Fig. 11).

4. Both Warrior I and Warrior II may be performed as limited range of motion poses, bending the knee only as far as is comfortable. To provide additional support the right hand may be placed on a chair when moving to the right. As leg strength increases the knee may bend further until the 90° angle of the classical pose is obtained. Warrior III may be performed with the hands placed on a wall to aid balance and alignment, or with the hands on the seat of a chair, in each case creating three points of balance (single leg and two hands) (Fig. 12). Placing the heel on a wall or on a chair seat also creates two points of balance (single leg on floor, single leg on wall) while the full pose has only a single balance point (single foot on floor) making it an advanced pose.

### Tips

There are three common errors that occur in Warrior I and II poses. The first is allowing the knee to drift inwards into a knock knee position. This places extra stress on the inside (medial aspect) of the knee. To prevent this ensure that the knee passes over the centre of the foot. The second error is allowing the upper body to drop into a round-shouldered position which restricts the chest and breathing. Avoid this by lengthening the spine reaching the crown of the head upwards and keeping the chest open the shoulders drawn back slightly. Finally, the training leg is placed on stretch (hip adductors), but must be active. If the leg is placed on stretch without quadriceps activity, the downward direction of the body weight can force the inside of the knee to overstretch (valgus stress) potentially damaging the inner (medial) knee ligaments. It is important therefore that the action of the trailing leg is to press against the yoga mat to lock the knee and lift the body upwards rather than allowing it to sag.

**Standing forward bend**  
(*Uttanasana*)

**Purpose**

To lengthen the hamstring muscles, hips and spine from a standing position.

**Preparation**

Begin standing in Mountain pose, above.

**Action**

1. Reach your arms forwards and then overhead keeping your hands shoulder-width apart, palms facing inwards. Angle your trunk forwards keeping your spine long and arms reaching in front of you to encourage thoracic spine extension (pelvis moving on hip). Reach forwards and downwards moving your hands towards the floor. Place your hands on the floor and pause in this position, keeping your arms straight and thorax extended.
2. For the final pose, reach your hands behind your heels and draw your trunk downwards onto your thighs. To come out of the pose release your hands from your heels and reach your arms forwards and upwards to extend your spine as you stand back to the upright position. Pause in Mountain pose to recover.
3. To reduce the intensity of the stretch reach your hands downwards onto wooden yoga blocks either placed on their long side (lower lift) or short side (higher lift) (Fig. 13). Where your hips are very stiff, begin the position with your feet shoulder-width apart. If your hamstrings are very tight, allow your knees to bend slightly (unlock or soften the knee) to partially release the pull of the hamstrings onto the pelvis and allow better lumbo-pelvic alignment.
4. Where standing balance is impaired the pose may be performed leaning against a wall (Fig. 14). Stand back towards the wall with your feet slightly forwards. Position your sitting bones (ischial tuberosities) against the wall by anteriorly tilting your pelvis. As you move into the stretch, move your sitting bones up the wall.

**Tips**

This is an intense stretch for the

hamstring muscles, and a high degree of hamstring flexibility is required to allow the pelvis to anteriorly tilt sufficiently to maintain spinal alignment. Where the hamstrings are very tight anterior pelvic tilt is limited and movement downwards can only be obtained by increasing spinal flexion. Where excessive spinal flexion occurs, it is important to reduce the movement range and maintain good overall body alignment rather than sacrificing alignment simply to reach further towards the ankles.

**Downward dog**  
(*Adho mukha svanasana*)

**Purpose**

To mobilise the chest, shoulders and hips while stretching the calf muscles and Achilles.

**Preparation**

Begin lying on your front on a yoga mat. Position your hands at the sides of your chest palms flat, and tuck your toes under tightening your quadriceps muscles to straighten your legs.

**Action**

Simultaneously press with your hands and feet driving your hips upwards. Keep pushing until your arms are straight and level with your ears, and your hips are as high as possible. Tighten your quadriceps and calf muscles lifting high onto your toes. Maintain this high pelvic position and gradually allow your heels to lower downwards placing a stretch on your calf and Achilles (Fig. 15).

**Tips**

Where you find it difficult to press with your arms, place your hands onto yoga bricks positioned against the wall to avoid slippage. The heel of your hands should be at the front edge of the block to provide purchase (Fig. 16). The higher block position encourages greater activity from your arms. Where you are unable to lower your heels to the ground place a block or folded blanket beneath your heels (Fig. 17).

This exercise can also be performed as a partner action. For this your partner stands behind you, grips in



**Figure 13: Forward bend (Uttanasana) with blocks. The use of blocks reduces the intensity of the stretch. (Photo credit: C. Norris, 2014)**



**Figure 14: Assisted Forward bend (Uttanasana). Individuals with impaired balance can perform this stretch against a wall. (Photo credit: C. Norris, 2014)**



**Figure 15: Downward dog (Adho mukha svanasana). (Photo credit: C. Norris, 2014)**



**Figure 16: Downward dog (Adho mukha svanasana) with blocks. For patients who find it difficult to push down through their hands. (Photo credit: C. Norris, 2014)**



**Figure 17: Downward dog (Adho mukha svanasana) with a folded blanket. For patients who find it difficult to lower their heels to the ground. (Photo credit: C. Norris, 2014)**

front of your hips and draws your pelvis towards himself increasing the body weight you put over your heels. Where gripping the hip region in painful (or ticklish) use a yoga belt placed around your hips (at the level of the iliac crest) instead.

## BREATHING EXERCISES

Breathing exercises in yoga are called *pranayama* (from the Sanskrit words meaning extension of the breath or extension of life force) and we will look briefly at different types. Clinically the techniques have been shown to be useful in the management of stress/anxiety disorders and in the treatment of respiratory conditions. Looking at asthmatic patients, *pranayama* practised for 15 minutes twice daily for a two-week period has been shown to improve respiratory variables (forced expiratory volume, peak flow rate and inhaler usage) compared to control (7). Favourable respiratory changes (oxygen saturation) have also been shown in patients with chronic obstructive pulmonary disease (COPD) during a 30-minute yoga breathing session (8).

As *pranayama* involves an expansion of the breath, asana is often used before *pranayama* practice to open the chest. *Pranayama* itself may be practised in a sitting or lying position, with a focus on keeping the chest open (shoulder retraction and thoracic extension). If you have a very round-shouldered posture it can be useful to sit against a wall and straighten your spine to expand your chest. When lying on your back in Corpse pose (*Savasana*) fold a towel or yoga blanket lengthways and place it on the floor beneath your spine to gently press your spine into extension and retract your shoulders.

### Breath awareness

Initially it is important to make the patient aware of their own breathing. They may practise lying flat on their back (*Savasana*) placing their hands on their abdomen to feel the abdominal wall move as they breath, and then locate movement in the lower rib cage, sides of the rib cage and upper rib

cage. Once they are aware of these movements they should relax their arms onto the floor, close their eyes and focus their attention internally on these body movements. To facilitate ribcage expansion (open the chest) *Savasana* may be performed lying over a blanket folded lengthways, or a yoga bolster (supported *Savasana*). The support is placed along the length of the spine so that the sacrum and lower lumbar spine remain on the floor. A blanket or folded towel may be placed under the head to prevent the neck moving into extension.

### Expansive breath (*Ujjayi*)

Expansive breath follows on from breath awareness and the student is encouraged to breathe in through their nose and out their mouth, increasing the volume of the breath. The in breath (inhalation) should be performed slowly and gradually without forcing or gulping air into the lungs. The abdomen is relaxed but not bloated, to allow the diaphragm to move unhindered. Aim to fill the lower (basal) part of the lungs by expanding the lower ribs, before the middle ribs, and finally the upper ribs. Chest expansion should include lifting of the sternum (pump handle action), sideways and backwards expansion of the ribcage (bucket handle movement). Finally the top portion of the ribcage lifts (apical breathing).

As air passes over the roof of the palate it makes a rushing sound 'sssa' said to resemble an ocean, hence the alternative name of this *pranayama* 'ocean breath'. If air is forced in rapidly it will rush over the palate sometimes causing throat irritation and coughing, so the action must be deliberate and controlled.

### Interrupted breath (*Viloma*)

There are two stages to this technique. Firstly interrupted *inhalation* is used. The sequence is to inhale-pause-inhale-pause with each in breath and pause lasting approximately 2 seconds. The breath is held at full inhalation for 3 to 5 seconds. The patient exhales slowly but continuously and then breathes normally for 2 to 3 breaths to recover, and prevent hyperventilation. For

interrupted *exhalation* the sequence is reversed. The patient takes a single deep breath and holds it briefly before the interrupted exhalation cycle begins with the rhythm exhale-pause-exhale-pause with each period again lasting for 2 seconds.

### Alternate nostril breathing (*Nadi sodhana* or *Anuloma viloma*)

Many individuals have blocked sinuses, and it is typical for people to favour one nostril when they breathe normally throughout the day. Alternate nostril breathing helps to clear the sinuses and provide symmetry of breathing through all the nasal passages. In addition research has shown that there is alteration between right and left brain activity during this *pranayama* technique (9). In the sitting position the client raises their right hand and places the thumb against the side of one nostril and the fourth and fifth fingers against the other, bending the middle and index fingers into the palm to allow room for the nose. The right nostril is blocked with the thumb as your client breaths in. Pause while opening the right nostril and closing the left with the fourth and fifth fingers to exhale. Pause and then reverse the technique. Eight to ten breaths should be taken using this alternate nostril method before resting and breathing normally to recover. Commonly the breath is retained and exhalation increased, using a ratio of 1 to inhale, 4 to retain, and 2 to exhale.

## RELAXATION AND MEDITATION

Most yoga sessions finish with a period of relaxation, typically in the Corpse pose. As a mindful activity yoga encourages individuals to relax and this process can be taken more deeply in the relaxation period. Relaxation can then naturally progress to forms of introductory meditation.

With the client in the Corpse pose begin using a process of *progressive relaxation*. This involves repeatedly tightening (isometric contraction) and then releasing the muscles to induce a feeling of relaxation due to reduced muscle tone (post-isometric relaxation).

Begin pointing and then pulling up the toes, followed by tightening the quadriceps, hip abductors, and gluteal muscles. At each point tighten the muscle firmly, hold the contraction briefly and then relax. Progress the sequence through the abdomen to the shoulders retracting the shoulder blades, straightening the arms to tighten the triceps and then forming a fist and straight finger action relaxing forearm and arm muscles. Finally encourage your client to frown, and then bite, to identify and release the facial and jaw muscles.

When the muscular sequences have been completed draw the patient's attention to the general feeling of warmth throughout the muscles due to increase blood flow and finish by bringing their attention to their breathing as a precursor to meditation.

Meditation is introduced by focusing the attention on an internal body rhythm, and breathing is most often used in a classical method called *mindfulness of breathing (Anapanasati)*. Draw your client's attention to their breathing encouraging them to notice movements in the abdomen and rib cage, and to feel the passage of the breath through the nostrils and over the top lip. Ask them to breath in and then out and to count 'one' out loud. They then repeat this action for a second breath counting 'two', and the third breath counting 'three' until they have completed 10 breaths. The sequence is then repeated. This action creates a deliberate pause after exhalation as well as focusing the mind on the breathing sequence. Secondly they change the order counting one before they take a breath, two prior to taking the second breath and continue the sequence for 10 breaths before repeating. This method again inserts a deliberate pause, this time prior to inspiration. Having mastered this technique they then continue counting the breath in their mind, and then progress to simply noticing the passage of the breath through the nostrils and upper lip. It is normal for the attention to waver and they can return to the counting method to draw their attention back within themselves once more.

## YOGA FOR BACK REHABILITATION

A major systematic review of yoga for low back pain was conducted in Essen, Germany in 2013 looking at a total of 967 chronic low back pain patients over ten scientific studies. The analysis showed that there was strong evidence for short-term effects of yoga on pain, back-specific disability, and global improvement. There was strong evidence for a long-term effect on pain and moderate evidence for a long-term effect on back-specific disability. This major study concluded that yoga can be recommended as an additional therapy to chronic low back pain patients (10). A meta-analysis of eight randomised controlled trials (RCT) looking at yoga for chronic low back pain by Holtzman and Beggs (11) showed yoga to have a medium to large effect on functional disability and pain, with follow-up effect sizes remaining significant. The studies involved a total of 743 patients.

Individual studies have shown yoga to be an effective tool in the management of low back pain. In a study looking at 313 adults with chronic low back pain, (12), yoga was given as a 12-week programme and included postures, breathing exercises and guided relaxation. The yoga group recorded better back function at follow-up measured at 3, 6, and 12 months following intervention. A study of a 1-week intense period of yoga for 80 chronic low back pain patients showed it to be superior to a physical exercise programme when measured as spinal flexibility (13). Yoga has been shown to be effective for war veterans with low back pain, improving pain, energy levels and mental health after a 10-week programme (14). An RCT in the USA showed a 14-week yoga programme to give a clear improvement measured on a standard clinical research scale (Roland and Morris Disability Questionnaire or RMDQ) (15) and a study which followed participants for 48 weeks shown improvement in functional disability measures, pain intensity and depression scores (16).

## “INDIVIDUAL STUDIES HAVE SHOWN YOGA TO BE AN EFFECTIVE TOOL IN THE MANAGEMENT OF”

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- What are the benefits of practising yoga?
- How can the practice of yoga be useful in rehabilitation?
- How can you adapt the exercises to suit an individual with a limited range of motion?

## KEY POINTS

- Yoga has been around for thousands of years but interest in the Western world has grown rapidly during the last decade.
- Yoga combines stretching to improve flexibility with holding poses to increase strength.
- The exercises are centred around an awareness of the breath and attention to the body known as mindfulness, which also gives psychological benefits to patients.
- When using yoga for rehabilitation, good body alignment (through a knowledge of anatomy, physiology and body mechanics) is essential.
- Yoga postures (asanas) have descriptive Sanskrit names.
- Individuals with a limited range of movement can use aids (such as blocks and belts) to allow them to perform the exercise.
- Focusing attention on the body also aids proprioception.
- The practice of yoga also includes breathing exercises and meditation, which are useful in stress management.
- Yoga is an effective tool in the management of low back pain.

## FURTHER RESOURCES

1. Norris CM. Complete guide to back rehabilitation. **Bloomsbury** 2015

2. Yoga as Therapy: courses for therapists and Pilates teachers for the Australian Physiotherapy and Pilates Institute by C. Norris. Details are available at his website, Norris Health (<http://spxj.nl/1tDMj59>).

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