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Scoliosis and Yoga

The spine is a series of interconnected bones that form a container to protect the spinal cord, but the **spine is also a place for muscles, ligaments and tendons to anchor onto.**



Under normal conditions the spine is not completely straight. There exists a small curvature in the lower region known as the “lumbar” curve. Higher up between the shoulder blades there is another small curve. This is called the “thoracic” curve. These curves are a normal part of the human anatomy, giving both strength and shock absorption to the body. When the spine begins to curve in a manner beyond what is already described, a condition called “Scoliosis” often develops.

Scoliosis is a disorder in which the spine becomes curved at wrong angles. It comes from the Greek word. **skolios**, meaning crooked. The normal shape of the backbone is such that it is bent forward in the middle and backward at the top and bottom. When you view a normal backbone from the side, you can see the curve. When you view from the front, it looks straight. If you develop Scoliosis, your back will develop more curves, giving the backbone an abnormal

shape. These abnormal curves may develop at the top and bottom of the spine, resulting in a spine that is shaped like a “C” or an “S”

Ten in every two hundred children develop scoliosis between the ages of 10 and 15. Although boys and girls seem equally affected, the curvatures in females are three to five times more likely to progress into more pronounced aberrant postural patterns. As scoliosis is frequently asymptomatic, it is often overlooked, and the parent may only notice that the child’s clothing no longer fits properly.

Most cases of Scoliosis are considered “idiopathic” under Western medical analysis. Idiopathic means that doctors do not know what the cause is. Traditional treatment may include placing a Scoliosis patient in a brace for several years, sometimes twenty-four hours a day. It is estimated that 30,000 children are placed in braces for Scoliosis each year. Another common treatment choice among Western medical doctors is surgery, where the bones of the spine are fused together or metal rods are inserted into the body alongside the spine. More than 38,000 spinal fusion surgeries take place each year.

Scoliosis may occur due to a number of reasons. It can develop from a problem elsewhere in the body, like a shorter leg, or muscle spasm. It can be a birth defect, but these cases tend to be much more severe and more careful and diligent treatment is needed in those cases. It can also occur from trauma, or a crippling disease such as cerebral palsy or spina bifida; and could possibly be hereditary. It is more common in women than men.

The most common form of Scoliosis is called “idiopathic”, meaning that the cause, according to the medical community, is unknown. It usually appears in early puberty without a specific cause and causes little or no disability (“functional” scoliosis), until much later in life, when it becomes degenerative, in older people in their sixties and seventies. It can ultimately restricting breathing and cause heart problems (“degenerative” scoliosis). It may cause severe back pain

and other problems. Spondylitis and fused vertebrae are common among people, in their 60's and 70's.

Kinesiology, describes functional scoliosis as being caused by the way the body is habitually used. The spine becomes distorted by the way a person uses furniture such as sitting at desks in chairs, slouching, or stands habitually favoring one foot or the other. Functional scoliosis is created by changes in the soft tissue. Structural scoliosis is called "neuromuscular" and is created by distortions of the bone.

People with scoliosis may, in reality, not know which way is up.

Proprioception is a term used for our ability to know where we are in space. Our center of balance is in the inner ear where there are nerves that sense not only our position in space, but speed of movement, relationships between space, weight and time, shifts of weight and balance, etc. The receptors for these nerves are in the joints, tendons, ligaments, and muscles.

When the natural subconscious mechanisms for balance and posture are habitually misused, those proprioceptors that deal with sensing vertical and horizontal become skewed from the habitual tilting of the head hips and shoulders. A person with scoliosis has no idea internally when they are straight, because, the nerve endings, called proprioceptors, which give us our orientation in space, need an accurate horizontal plane across the pelvis and shoulders to be able to sense what is straight, or in fact which way is up.

This dramatically affects the balance and gives us a sense of physical disorganization, because we are unable to understand the position of the body in space. In my own experience, it is very difficult for me to understand how to internally organize my body into straightness from the inside

Before one can heal, it is necessary to be realistic about the problem. The most important thing is to understand how the curves work on both sides of the body, in three dimensions.

Because people with scoliosis have no idea when they are straight, the first step is to become conscious, of the way the body is asymmetrical. Understanding the curves, and how to work with them, is the most important tool in working with asymmetrical bodies. There are areas that are convex, which need to be opened. There are areas that are lifted and need to be brought down, and into the spine.

The convex side is always the weak side.

Here is the experience of senior Iyengar teacher Marcia Monroe in learning to deal with her own scoliosis, from her book “Yoga and Scoliosis, A Journey to Health and Healing”

“One side of the body learns and receives information, whereas the other is slower, and there tends to be greater sensitivity to the convex side. Through Iyengar yoga and specific asana sequences that emphasize symmetry and midline, I had glimpses of a centralized sensitivity, and began to focus on balancing and modifying both the con- cave and convex sides in my practice. Going from asymmetry to symmetry required tremendous practice, repetition, and willingness to learn...”

Fascia

There are often muscular restrictions because many of the muscles of the hips and spine, (especially the lumbar, but wherever there is an unnatural curve), are either stressed in a state of hypertension or overstretched.

These muscles are covered with fascia, which also becomes stressed due to habitual, tension in the muscles and the unnatural

curves of the spine. Fascia, is a tissue that, surrounds individual muscles and muscle bundles, as well as groups of muscles blood vessels and nerves. It holds things together like plastic wrap would a sandwich. Fascia is made up of extremely thin layers of collagen, that tear and when they are stressed. These micro tears in the fascia create scar tissue and the fascia loses its elasticity. The scars can become “adhesions”. These adhesions are areas where the muscles stick to themselves, because the fibers have become disorganized.

My Personal Journey

I first noticed that I had scoliosis, in my mid-thirties, when seeing myself in a photograph, I noticed how badly my posture had deteriorated. I knew I had postural problems, but spent much of my life, ignoring them. We don't spend a lot of time looking at our back after all. I spent my teenage years slouching, and wrapped around a guitar. On top of this I kept my wallet in my right back pocket, which lifted my right hip, inches higher than my left.

I had a mid-life crisis in my mid thirties when my first marriage ended, that resulted in a complete mental and emotional breakdown, which caused me to completely re-think my life. I set out to learn how to relax, and when I did, I noticed that I was not just crooked, but in pain. I tried to start meditating, but found myself in a constant state of agony. With my back and hips, I couldn't sit still.

One of my friends was a doctor and he x-rayed my spine, so that I could see exactly what was going on. What I saw was a very convex (kyphosis) hump on my back, a deep concavity (lordosis) in my neck, and my head was pitched forward alarmingly. I didn't even notice the deep concavity (lordosis) in my lumbar spine at the time. The disks were all wedge shaped, and I was shocked by the reality of my own back. I started doing yoga immediately, but had no idea how to work with my specific problems.

I started going to yoga classes, with the faith that doing asana would get rid of my problem. It helped, but it still took me about 25 years,

to fully embrace my problem and actually start to solve it. Until the point in my life where I started practicing yoga, I had been a sedentary person, sitting, and working long hours. I had been running and going to the gym and then all of a sudden I noticed that I had a large kyphotic hump in the middle of my upper back.

Yoga helped me in many ways. I got stronger, more flexible, and I developed a greater sense of my body. The asanas made me feel better, and taught me how to quiet and focus my mind, probably for the first time ever. My scoliosis stopped getting worse, and I got a little straighter. Yoga reduced my pain and stiffness quite a bit, and it really helped my concentration.

But, not understanding the asymmetries of my body, led me to knee and shoulder injuries because I didn't realize that the condition was affecting my range of motion and putting a strain on my tendons and ligaments. I was doing a lot of sports and I began to have injuries. It really took a long time for me to identify the scoliosis, as basis the for many of my physical problems.

For things to really start changing, I had to embrace, my condition, rather than deny it.

A year ago I started taking pictures of my back in a mirror. I feel that this was the first time that I dealt with the reality of my spine's condition.

Previously I had been dealing with my back, only through what I was feeling from the inside, not understanding that I had no idea what my alignment looked like, and my imagination, I thought that the posture I was doing was straight and symmetrical.

Once I started coming to terms with the actual shape of my spine, I began working with it quite differently.

It took me more than 25 years to fully embrace my body's asymmetry.

Even though I had some of the best teachers in the US, they were not well versed in dealing with my condition. Looking back, I know that my biggest problem was that I had not embraced my problem. I

try to ignore it, the same way many overweight people can't think of themselves as fat, because it hurts and if nobody brings it up, it's not really there, but they are still fat. There is a strong emotional component to scoliosis, which I will discuss later, because posture is the physical expression of something larger.

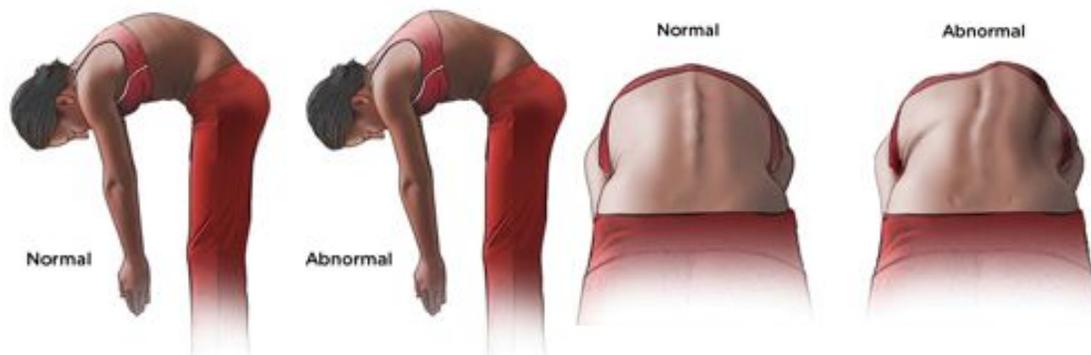
Observing Scoliosis

I am going to present some general guidelines for observing the condition, and working with people with scoliosis, before presenting specific asanas and modifications. It has become clear to me that a teacher needs to understand how to deal with the asymmetries, and then these rules may be applied across the board.



The simple way to tell structural from functional scoliosis is to have the student stand in straight, and just hang forward. In observing her back, if she has functional scoliosis, the stretch will result in the soft tissue releasing, and it will look even from side to side. In structural scoliosis it will be more apparent that one side of the rib cage is higher. Next notice the thickness of the ribcage, from front to back. If she has right thoracic scoliosis, her rib cage will be a little thicker on the right, as it has rotated backward. This means that she is rotated right, and therefore she is bent to the left side. Scoliosis is named for the convex side, and so this would be right thoracic

scoliosis, even though the student is side bent left. Structural scoliosis is much more severe than functional scoliosis, and though many of the techniques for easing back pain will work for these people, this paper mostly focuses on idiopathic, functional scoliosis.



At the risk of this paper becoming too broad, I will provide some guidelines for teacher and student to be able to analyze the asymmetries of the body, which will help the active, experienced practitioner and teacher to understand what needs to happen to correct their body in any pose. I have also made some scoliosis specific modifications of poses, inspired by Marsha Monroe in her book *Yoga and Scoliosis, A Journey to Health and Healing*". These modifications are mostly aimed at increasing the student's proprioception, or ability to feel their position in space, by using the floor and wall as reference.

Next I will include a therapeutic program for a beginner coming to yoga to ease his/her back pain and create some mobility, as well as a phase two practice to increase strength, and flexibility, as well as strength of mind.

In healing my own body, I have found meditation and pranayama invaluable for releasing the tension in my hips and back, and will discuss the techniques I use and my own experience in this.



Observing the Condition

This is my habitual relaxed standing position. From the inside it feels that I am standing straight, but as you can see, I have more weight on my left foot than my right foot. My right foot looks like it's practically off the ground, and yet the weight feels equal to me. My left shoulder is lower than my right and my head is tilted left.

My particular condition is “right thoracic” scoliosis because there is a convexity in the upper part of my back on the right side. This is the most common form of scoliosis. My right hip is higher than my left. My right shoulder is higher than the left as well.

A good way for the student to feel (and the teacher to observe) his asymmetries is to lay down on the floor, in a relaxed position:

Extend the legs. Which extends faster? Where do the backs of the legs touch the floor? How are the feet pointing? Straight up? At an angle?

Does one side of the pelvis come away from the floor and rotate toward the front? Does one side lift toward the ribs? Is the pubic bone centered.

Does one side of the rib cage feel heavier or lighter? Is the light side lifting?

Which side of the front ribs caves in and which puffs out?

Which side of the lower ribs protrudes and rotates? Which side pulls down?

Are the sides of the chest equal? How do the shoulder blades touch the floor?

Which side of the scapula moves in, the back of the arm touching the floor, and which moves out lifting the back of the arm from the floor?

Is one shoulder closer to the ear? Which arm is closer to the body? How do the nose sternum and navel line up? Where are the eyes looking?

For teachers, how does the student lie in relation to the mat? Where are they rolling or tilting?



Once conscious of the asymmetries, I am able to apply the corrections in Tadasana, and arrive at a position that is much straighter. This involves putting more weight into my right foot, (which as you can see is still carrying slightly less weight, even though it feels like I am extending much, much farther and harder with that leg). The action of pressing my right foot down helps me to lift my sunken right chest, while allowing me to relax my right shoulder, drawing the shoulder blade into the spine.

I then rotate my left chest up and to the right, while at the same time, bringing my left bottom ribs in toward my spine and the rear of my pelvis.

The action of the legs, works on the lumbar, while the arms act on the upper thoracic and cervical.



The same corrections must be applied to every pose, because the same areas always need the same counter-rotation, elongation, and traction.

Asanas for Scoliosis

In order to help understand these curves in three dimensions I would like to present some modified asanas and variations, using the floor and the wall. These give the student support and a sense of straightness that increases proprioception. In the very short time that I have been working with these poses, they have made a dramatic difference in my own practice.

It is important to always remember to engage the pelvic floor and the abdominals. In all of these poses the

work comes from the muscles in the front of the body so that the back muscles can relax and release.

Supta Tadasana at the wall, stabilizes the core and provides a central midline that the student can use to organize himself around.

Place your mat perpendicular against the wall and lie with your feet together against the wall with the knees slightly bent and the pelvis slightly tucked. Slightly engage your pelvic floor. Extend the legs to press the thighs toward the floor, and feet into the ground.

Lengthen your back on the floor, moving your hips away from your rib cage.

Extend the arms face up, and press the back of the hand into the floor.

Push the foot on the concave side firmly into the wall to lengthen it.

In cases of extreme scoliosis, widen the feet to the sides of the matt. This provides stability and allows the back to spread more evenly on to the floor.

Supta Hastasana helps with the misalignment of the shoulders.



Lifting the arms toward the ceiling, bring both shoulders down to the floor, the shoulder blades move in toward the ribs (especially the convex side). Hands turn to face each other. As the arms continue to lift, press the feet into the wall and try to spread the back on the floor. The arms can be extended down to the floor as far as the shoulders can be kept stable.

Supta Vrksasana at the wall



From Supta Tadasana, engage the pelvic floor. Raise your right foot up into your left groin and try to place your right hip on the ground while extending the left foot into the wall. Move the upper arms down and the shoulder blades in. Knowing that this is my weak side I am especially conscious of my right shoulder blade relaxing down and in toward the spine.

Lift the arms overhead, pressing the palms together, going only so far as to not disturb the position of the shoulders and pelvis.

Press the left foot into the wall and elongate the left chest, moving the left rib away from the pelvis. Rotate the ribcage to expand and broaden the chest.

Go back to Supta Tadasana and change sides, feeling the differences.

Supta Ardha Kati Chakrasana, at the wall.



From Supta Tadasana, engage the pelvic floor. Bring the hands overhead. Align the arms with the shoulders and open the hands with the palms facing the ceiling. Lengthen the trunk and curve to the right. If there is a right thoracic curve, bring the right ribs in as you lengthen the left side. If there is a lumbar curve, press the left foot into the wall and move the left hump toward the spine, while elongating the lumbar spine.

Return to center and change sides.

If the curve is on the left and the lumbar curve on the right, reverse the directions.

This pose feels great as a final stretch, just before Savasana.

Standing Asanas at the wall.

Tadasana against the wall: provides the student with feedback about what parts of his body are touching it, and which are not.

Stand with your heels together against the wall, toes and ankles touching.

Equalize the weight on both feet.

Bend the knees and lift the pelvis, engaging the pelvic floor, placing as much of your back against the wall as possible, (if not possible the heels can move away from the wall until it is possible).

Extend the legs, and lengthen your back against the wall, trying to flatten the entire spine on the wall, by using your abdominal muscles to push into the wall.

Correct from the front waist to the back.

Relax the front ribs and lift the back.

Convex ribs and shoulder blade in and forward

Concave ribs spread to the side and move towards the wall

Back of the head, top of shoulders and back of upper arms to wall

Extend arms evenly

Lower shoulders. Bring them in and down

To further open the chest turn the palms of the hands forward and press the back of the hands against the wall.



Parvotasana at the wall.

From Tadasana, raise the arms as high as possible without disturbing the back and shoulders, and can be used as a lever to press the upper back into the wall. They should only be lifted as far as to not lift the shoulders.

Even though it feels as though I am sharing equal weight on both feet, the right foot needs to press harder into the floor. From inside it feels as though I am doing the pose symmetrically.



Utkatasana at the wall, builds a strong core, while letting the back muscles relax. It increases symmetry.

Stand with your back touching the wall. Walk your feet out a couple of inches and bend the knees so that the legs are at a right angle over the ankles.

Engage the pelvic floor and lengthen the back on to the wall, trying to flatten the entire spine on the wall, by using your abdominals.

Observe how each side moves away from and toward the wall. On the convex side, the pelvis and shoulders rotate forward. On the concave side, the ribs rotate forward.

Vrksasana at the wall. The wall is a reference to align the pelvis because the knee is fixed against it. The crawling of the fingers creates space for the rib cage and lengthens the external and internal costal fibers, which are important muscles for respiration.



Stand in tadasana with your left side to the wall. Bring the right foot to the left inner thigh, knee out to the side as the standing right leg lifts up like the trunk of a tree. Have the outside hand on the waist, and climb the wall with the inside hand (left). Once you have established your balance, lift both arms up with the hands facing each other. Come out by releasing in the reverse order, lowering the arms and then the leg.



This position is for the convex side, as the fingers climbing up the wall, lifts and straightens the spine.



For the concave side, use the fingers on the wall behind to rotate the ribs and move them into the spine.



Parsva Hasta Padasana and
Trikonasana Variation against the wall.

Follow the directions for the original postures, in the Indea Yoga Level 1 teacher training manual, but against the wall.

The wall offers stability, and provides proprioception. They especially address asymmetries in the lumbar spine. The wide stance helps to equalize the distribution of weight.





Virhabhadrasana A at the wall.

Follow the directions for the original postures, in the Indea Yoga Level 1, teacher training manual.

Face a column or corner of two adjacent walls.

Bend the right knee so that the right groin, touches the corner and the wall supports the front of the body. Lift both arms up in contact with the wall, and push the back foot into the floor. Lift the ribs away from the hips. Lengthen the concave side of the body, the outer shoulder blades move in toward the ribs and the shoulder moves down. The sternum lifts.



Be careful on the concave side because the back can arch too much. Engage the pelvic floor and abdominals to lengthen and support the back.



Prasarita Padotanasana and Variation with hips against the wall.

Follow the directions for the original posture, in the Indea Yoga Level 1 teacher training manual, but against the wall.

Lean against the wall with your hips, letting the torso hang and pull the spine straight.

In the variation stretch the hands forward on the floor stretching and allowing the spine to hang from the hips, providing traction to the spine.



These are just a few of the potential modifications using the wall and floor to help the student understand the organization of her body, and the arrangement of their asymmetries. Many other standing and seated postures may be done in a similar fashion using the wall as a reference to straighten and align the various parts, such as Dandasana against the wall. The point that I'm trying to make is that such adaptations make the practitioner aware of how to make their posture more symmetrical. These adaptations are invaluable to learn how the curves work.

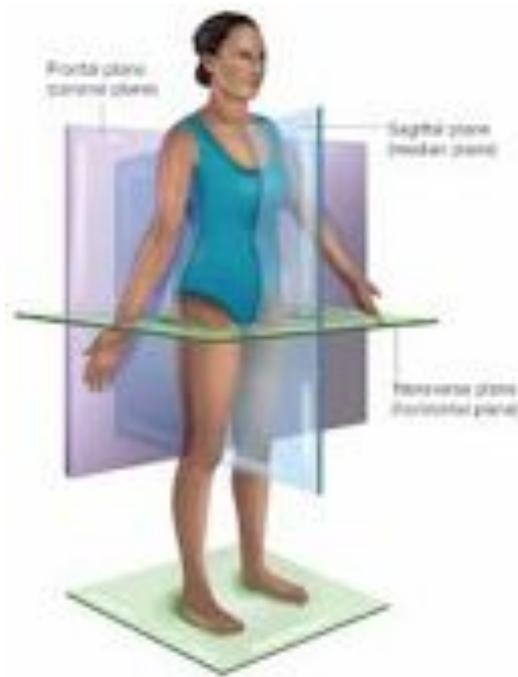
When doing a symmetrical pose with the asymmetrical body, there is a tendency to reinforce the curves of scoliosis, because the student is unaware that he is not using equal pressure on both sides.



The photos above show me doing Ardha Uttanasana against the wall. In the photo on the left, it feels like my feet and hands are using equal pressure, but as you can see, my chest is sinking on the left, and my right foot seems slightly weak. In the picture on the right, I feel like I am pushing harder on my right side, both in pushing the right foot into the floor and my right hand against the wall. The additional pressure on the weak side, straightens my hips, and shoulders horizontally, as well as straightening the curve in my spine.

Yoga Practice for Scoliosis

This practice is based on a beginner coming to yoga to ease back pain caused by scoliosis. This person is fairly active with functional idiopathic scoliosis, and is looking for relief.



It is important to increase the mobility of the spine and relieve the back pain first. A practice aimed at treating scoliosis would have to work with each of the spine's planes, frontal or vertical, horizontal, and sagittal (or median). **The practice should include all of the families of asanas, standing, sitting, prone, supine, and twisting.**

The practice should take all three dimensions into account, with the aim of straightening and stabilizing the body, improving proprioception and balance, and making sure that there is no further progression in the

scoliosis.

These few modifications that I have offered, are necessarily two dimensional. Using the wall and the floor to increase proprioception, the distortions caused by the scoliosis, are more easily understood by the student and teacher. They in no way constitute a complete practice, but rather offer a way to really feel the body's asymmetries.

Follow the directions for the original postures, in the Indea Yoga Level 1 teacher training manual, for all poses not specifically modified here.

The student begins on the floor, and can feel the body's various asymmetries against the floor. This gives the student a sense of organization of the limbs along a central midline, and with the help of gravity, stabilizes the spine.

Practice for Beginner with Back Pain

Working with the wall and floor give the student a sense of balance and equilibrium, providing a guide to self-adjust the pose.

The practice begins on the floor with the student in supine position:

- Supta Tadasana
- Supta Urdhva Hastasana
- Supta Parvotasana

These would be followed by standing poses:

- Tadasana against the wall
- Parvotasana against the wall

From Indea Yoga Level 1 Manual:

- Joint Movement Series, to increase mobility and release tension

Standing Breathing Postures:

- Hands In and Out Breathing
- Hand Stretching Breathing
- Side Stretching
- Spinal Twist
- Parivrtta Trikonasana Stretching
- Sitali Tadasana

- Vagra Svasa

Back Movements from Therapy Series

- Bhujangasana Breathing
- Salabasana Breathing

Dhanurasana Breathing

Supine

Urdvha Prasarita Padasana
Pavana Muktasana Kriya
Setu Bandhasana Breathing
Jathara Parivarasana
Supta Artha Kati Chacrasana

Savasana

Five Minutes of Soham Meditation

Phase 2

As the student progressed, I would add Surya Namaskar and replace many of the therapy series asanas, with foundation postures, once the student has the strength and flexibility to perform them. Always having in mind making the body more symmetrical. The student would again be encouraged to cultivate engaging the pelvic floor in every asana. Engaging the pelvic floor, straightens the spine. This is a seventy five minute class

Tadasana against the wall
Parvatasana against the wall
3 Rounds of Surya Namaskar

Standing Postures against the wall

Parsva Hasta Padasana
Trikonasana Variation against the wall
Ardha Utkatasana
Prasarita Padottanasana
Vrksasana Variation

Standing Postures

Tadasana
Utkatasana

Uttanasana
Vagra Svasa

Prasarita Padottanasana
Ado Mukha Svanasana
Parsva Hasta Padasana
Trikonasana Variation

Seated Postures

Dandasana
Urdvha Hasta Dandasana
Pashimottanasana
Janusirsasana

Back Movements from Therapy Series

Bhujangasana Breathing
Salabasana Breathing
Dhanurasana Breathing

Supine

Urdvha Prasarita Padasana
Pavana Muktasana Kriya
Setu Bandhasana Breathing
Jathara Parivarasana
Supta Vrksasana at the wall
Supta Artha Kati Chacrasana

Savasana

With guided imagery

Meditation and Pranayama

In my own journey, I have found both meditation and pranayama helpful in reducing the tension in my body. I am sure that Soham, and Nadi Shudi would both work extremely well for relaxing the muscles that are locked in a state of hypertension.

These muscles must be allowed to release, so that they may regain their elasticity.

The techniques that I used personally are slightly different, though not a part of this course.

The scoliosis body is out of balance, and in my own experience, It has been a challenge in all parts of my life. The person with scoliosis has trouble organizing their body.

In my particular case, I have had trouble organizing my life for as long as I can remember, although this connection between my physical and emotional self has only recently occurred to me. For years however, the first thing I did when I practice was “organize” my body on my mat, and I have had to scale down my life to make organization easier for me, trying to reduce the number of “loose ends” that I always felt plagued by.

Last year I started doing some energy meditations, and I could feel the difference in the prana on the two sides of my body, showing me distinctly that ida and pingale, are not balanced, but as the body’s organization becomes more normal and as proprioception returns the body can come back towards symmetry, and balance can be gradually restored

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