



Yoga Teacher Training

Anatomy of Asanas in Hatha Yoga

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Introduction

In this section of anatomy of hatha yoga, we will be going more in depth in our understanding of the foundations, biomechanics of movement, and muscles most affected in specific yoga postures. As we noted in the previous manual on anatomy, the spine mainly moves in four directions: 1) flexion (forward bending), 2) extension (back bending), 3) lateral flexion (side bending), and 4) rotation.

In yoga, we have six main foundational (starting) points for any posture: 1) standing, 2) seated, 3) kneeling, 4) arm balancing, 5) prone (front lying), and 6) supine (back lying).

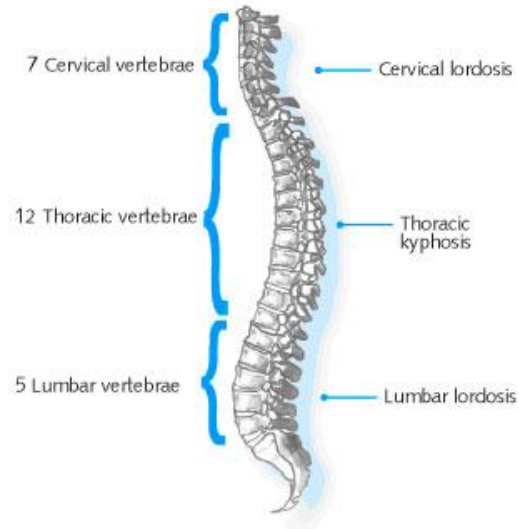
In this manual, we will focus on the general anatomy for each starting point, and then examine postures from each of those foundational points that, grouping them by the final position of the spine in that posture (neutral, flexion, extension, lateral flexion, and rotation). We focus on the muscles most affected and how to properly move into postures based on their foundational starting point. We will examine the general anatomical consideration of each posture and how to use that knowledge to deepen the posture and avoid injury.

The first sections will provide a review of the spine, biomechanics and major muscles groups that you learned about in the first anatomy of yoga manual (from the 200 hour program). Unlike the first anatomy manual that focused on the functions of specific muscle groups and then mentioned a few yoga postures that would stretch or strengthen each group, this manual looks in detail at specific yoga asanas and the anatomy of movement related to each one.

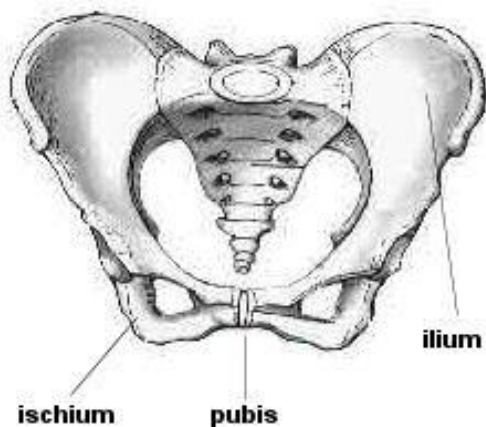
Review of the Spine

The Spine and Pelvic Girdle

The spine has four distinct segments, consisting of the cervical, the thoracic, the lumbar, and the sacral. Each spinal segment contains a given number of vertebrae. The cervical spine has seven vertebrae, the thoracic (mid back) has twelve vertebrae, and the lumbar (low back) has five vertebrae. The vertebrae are separated by the intervertebral discs. These discs absorb shock, permit some compression, and allow movement. There are no discs in the sacrum or coccyx where the vertebrae are fused together. The cervical spine is curved in an extended position (cervical lordosis). The thoracic spine is curved in a flexed position (thoracic kyphosis). And the lumbar spine is curved in an extended position (lumbar lordosis). When there is too much rounding in the thoracic spine (like a hump back), it is called kyphosis. When there is too much arching in the low back (lumbar region), it is called lordosis. When the spine is curved from right to left (rather than straight), it is called scoliosis.



The sacrum is the foundation platform on which the spinal column is balanced. It is attached to the two hip bones at the sacroiliac joint. The rib cage consists of the twelve ribs that attach to the thoracic spine.

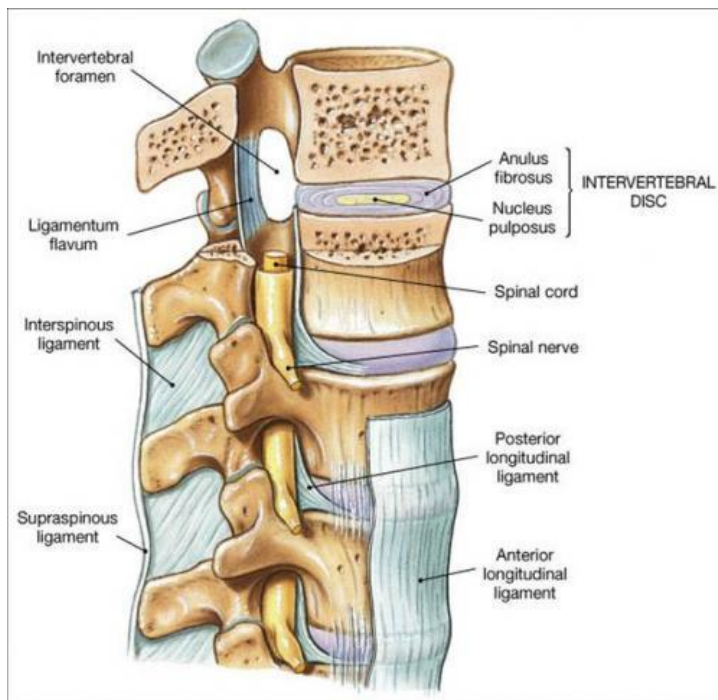


The appendicular skeleton (including shoulders, arms, pelvic girdle, legs) joins the axial skeleton (spinal column) at the shoulders and hips. The collar bone (clavicle) and the shoulder blade (scapula) form the shoulder. Each hip consists of three fused bones: the ilium, ischium, and pubis. This forms the pelvic girdle, which is shaped like a bowl.

Neck and Spine

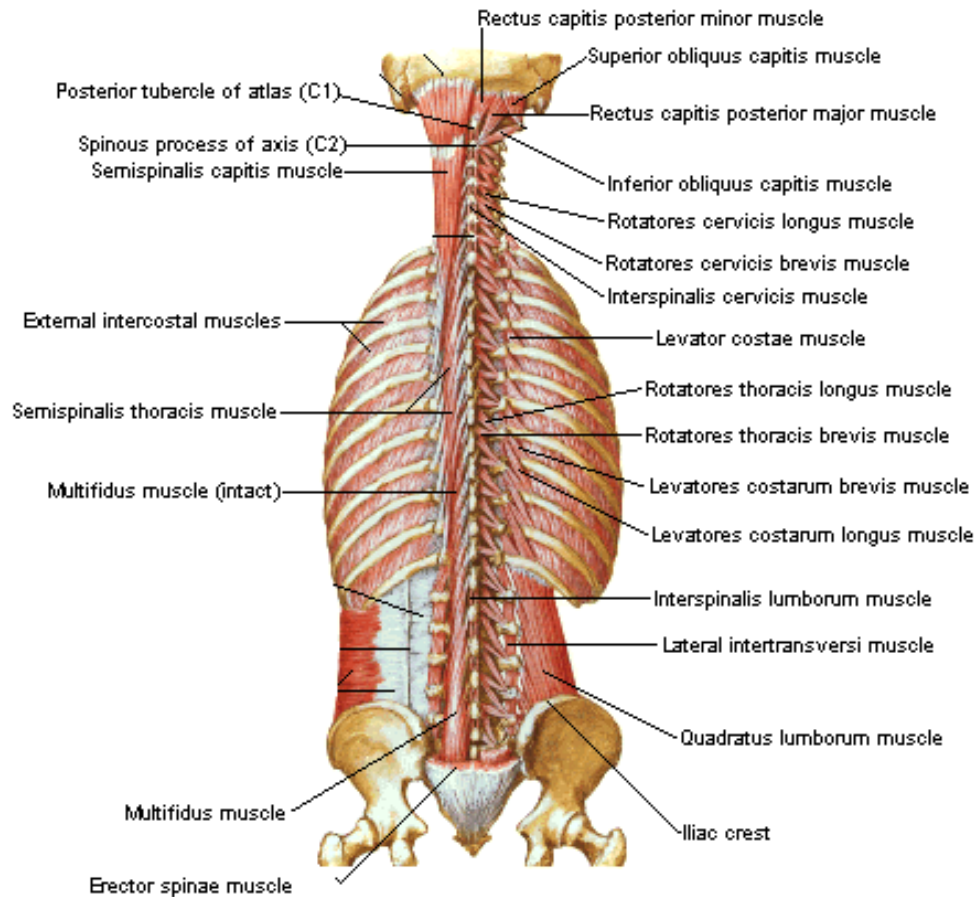
The portion of the spine contained within the neck is called the cervical spine. Unlike the rest of the spine, which is better protected from injury because it is enclosed by the torso, the cervical spine is more vulnerable to injury. This portion of the spine is enclosed in a small amount of muscles and ligaments, but is required to have extensive range of motion.

People often experience neck strain due to repetitive or prolonged neck extension or flexion, often caused by poor posture while sitting or standing. It can also be caused by common habits, such as cradling a phone between the shoulder and ear, or sleeping in an awkward position. By gently strengthening and stretching the neck muscles, strain is reduced. Remember to not roll the head when stretching the neck.



Deep Spinal Muscles (Neck/Back) – Posterior View

Below is a diagram of the deep muscles of the spine.



The group of long muscles along the spine are known as erector spinae. The erector spinae is made up of the iliocostalis, longissimus, and spinalis muscles.

Review of Muscles

Muscle Forms

Muscles have different forms and fiber arrangements, depending on their function. Muscles in the limbs tend to be long. Because of this, they can contract more and are capable of producing greater movement. Muscles in the trunk tend to be broader and to form sheets that wrap around the body. Muscles that stabilize parts of the body tend to be short and squat, like those found in the hip. Muscles are also defined by the number of joints they cross; from their origin to their insertion. Monoarticular muscles cross only one joint, while polyarticular cross more than one joint (for example hamstrings).

Types of Muscle Contractions

Muscles are composed of bundles of fibers held together by very thin membranes. Within these fibers are thousands of tiny filaments, which slide along each other when the muscle is stimulated by a nerve. This causes the muscle to shorten or contract. Muscles that produce a specific movement are called agonists, while the muscles that produce the opposite movement are called antagonists. When we think of a muscle contracting, we tend to think of the muscle shortening as it generates force. While this is one way that muscles contract, there are also other forms of muscle contraction.

Concentric Contractions

In this form of contraction, a muscle shortens in length while contracting. An example is when the biceps brachii muscle in the forearm contracts to lift a book off a table and bring it in close to you to read, or when you perform a bicep curl with a free weight.

Eccentric Contractions

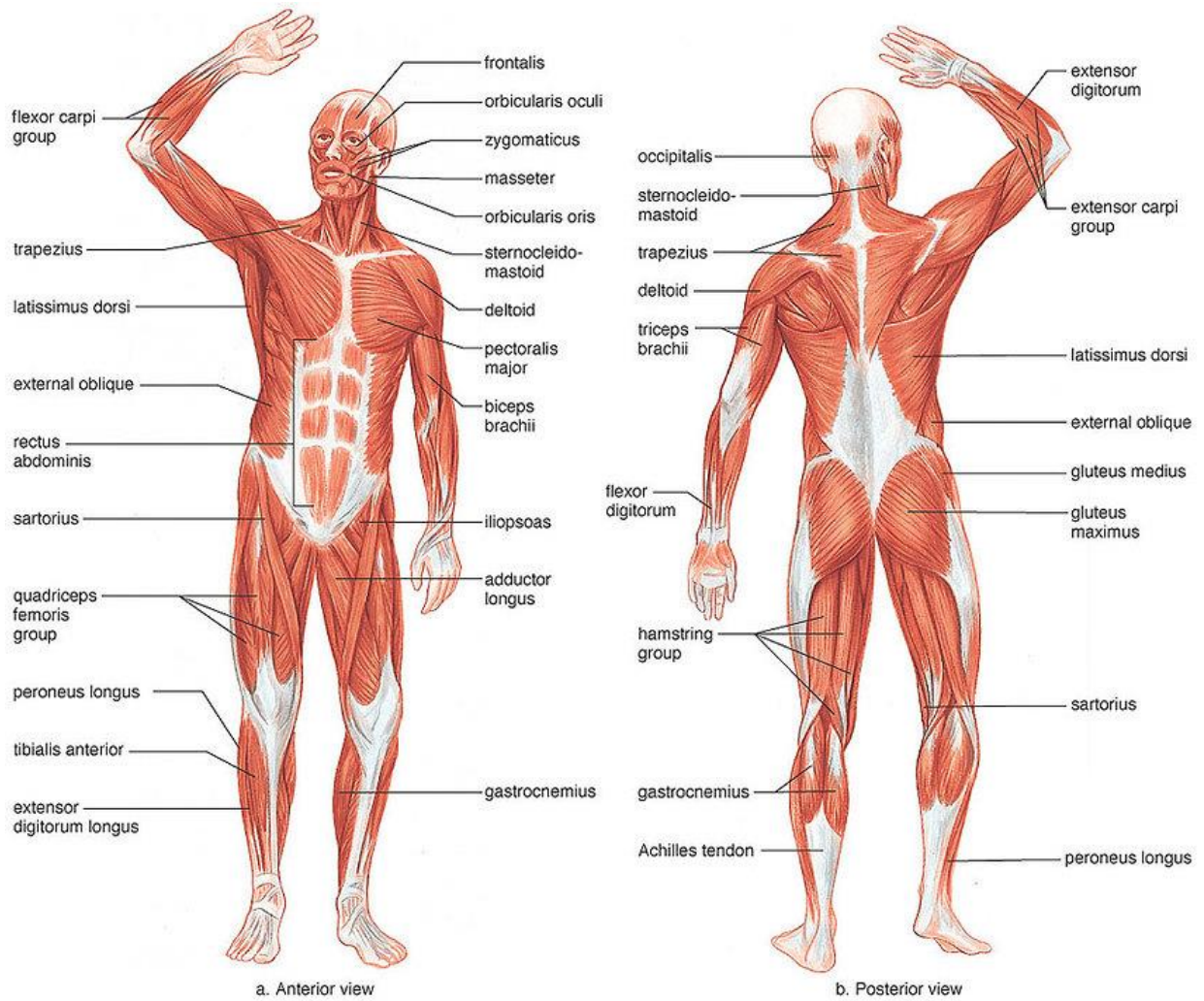
When you slowly extend your elbow to put a book you were reading back on a table, you are lengthening the muscle (biceps brachii) while keeping some of its muscle fibers in a state of contraction. Whenever this happens, we call this movement eccentric lengthening; increasing muscle length against resistance or gravity.

Isometric Contraction

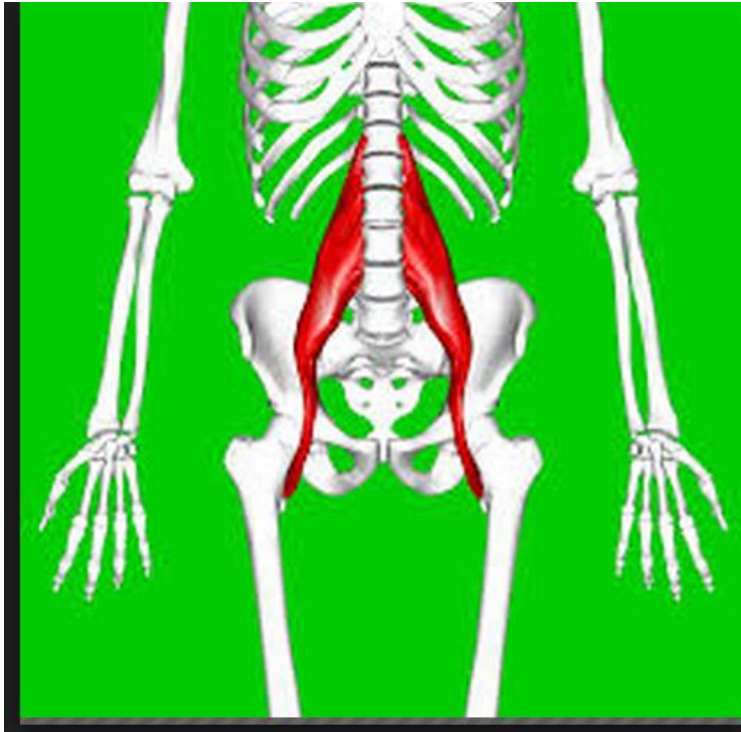
In isometric contraction, muscles are active while held at a fixed length. The muscle is neither lengthened or shortened, but is held at a constant length. An example of isometric contraction would be carrying an object in front of you. The weight of the object would be pulling down, but your hands and arms would be opposing the motion with equal force going upwards. Since your arms are neither raising or lowering, your biceps will be isometrically contracting.

Review of Major Muscles

The chart below is a review of the major muscles you learned about from your previous anatomy module you received during your 200 hour program.



Psoas Muscle



The psoas major muscle contributes to hip flexion and it part of a group of muscles known as the hip flexors.

Review of Biomechanics

Muscular Force in Yoga

When we align the long axis of the bones with the direction of gravity, we decrease the necessary muscular force to maintain a posture. This makes the posture feel more effortless. For example, when sitting in a cross leg position, gravity is aligned with the long axis of the spine. If we sit up tall, stacking the head over the spine, our muscles are less strained, than by rounding our backs and dropping our heads.

Forward bends

Forward bends stretch and strengthen the back portion of the spine, pelvic girdle, shoulders and legs. They also strengthen the abdominal muscles, which contract as we bend forward, and gently compress abdominal organs, which stimulates their function.

Proper Technique in Bending Forward

When folding forward, it's best to maintain a "flat" back, neither arched nor rounded, with the neck in line with the rest of the spine. So, as you bend forward you maintain the normal curvature of the spine. It's important to press the hips back and hinge from the hips, instead of rounding the back, when folding forward. If hamstrings are tight, it is best to bend the knees, so the back can remain flat. Rounding the back due to tight hamstrings can lead to a backwards rotation of the pelvis and a collapsing of the chest over the belly. This can result in intervertebral disc compression in the anterior (front) of the spine.

Low back pain is often a result of poor mechanical relationship between the lumbar spine and the pelvis. Although many chronic back conditions can occur due to improper forward bending, forward bending done properly can also help us strengthen and stabilize our back and body.

Obstacles to forward bends result from tightness in the hamstrings, spinal muscles and gluteals.

Back Bends

Backward bending helps to stretch the front portion of the torso, shoulders, pelvic girdle and legs. In addition, they stretch the abdominal organs, relieving compression. Backbends also help develop more strength in the muscles in the back, which must contract during back bends.

Proper Technique in Bending Backwards

It's important in backbends to control the proportional relation between lengthening the thoracic curve and deepening the lumbar curve. You don't want too much arch in the lumbar spine without any movement in the thoracic spine. Bending that way can cause compression and strain in the lumbar region. Like the lumbar region, the cervical region should not arch excessively in relation to the movement of the thoracic region. One way to maintain a balance between the movement of the thoracic region and the lumbar region is to first expand and lift the chest on inhale (which lengthens the thoracic spine), and then keep the abdominal muscles slightly contracted as you exhale and bend backwards. Keeping the abdominal muscles slightly contracted helps prevent excessive arch in the lumbar region and helps to bring more of the arch into the thoracic region, which keeps the backbend in balance. Students should also be encouraged to keep the legs straight (or slightly internally rotated) to keep the sacroiliac joints stable.

Twists

Twisting creates a rotation between the vertebrae, which builds strength and flexibility in the deep and superficial muscles of the spine and abdomen. Twisting alternating stretches and strengthens each side of the torso, including the intestines, which may help improve digestion.

Proper Technique in Twisting:

It's important in twisting to control the spinal rotation, rather than simply force it through the use of leverage. The key to spinal rotation is to start the twist as you exhale and contract the abdominal muscles. As with forward bends, there can be a tendency to slump forward in the thoracic region of the spine. This can be avoided by lengthening between the chest and belly on inhalation. Lengthening the spine helps create more space between each vertebrae in which to twist. In standing twisting postures (revolved triangle), the pelvis is stabilized to emphasize the rotation of the spine and shoulders. Because the shoulder girdle has more range of motion than the spine, it is best to start a twist without using the arms as leverage, and add the arms at the end.

Lateral Bends

Lateral bends alternately stretch and compress the deep spinal muscles, intervertebral discs, and intercostal muscles of the ribs. They stretch and strengthen the muscles of the spine, rib cage, shoulders, and pelvis. They also help restore balance to asymmetries of the spine. The capacity for lateral flexion of the spine is limited, so it is often not done during daily activities. Because of this, it is an important movement to add to a yoga practice.

Proper Technique in lateral bends

When practicing a lateral bend, people often turn their hips and rotate their chest towards the side they are bending. For example, in Triangle posture, as students slide their hand down their right leg, their chest often turns towards the floor and their hip moves to the right. This causes them to lose the lateral stretch, as it moves towards a forward bending position. In Triangle, as with other postures requiring lateral flexion, the shoulders should stack one on top of the other and the chest should remain open facing forward. One way to make sure that the shoulders remain stacked is to practice Triangle posture with your back next to the wall, keeping both shoulder blades pressed into the wall. To help with lateral bending, again lengthen the spine on the inhale, and then move into the lateral bend on the exhale, keeping the abdominal muscles contracted.

Obstacles to lateral bends include tightness in the shoulder joints or latissimus dorsi.

Reflexes Related to Stretching

The stretch reflex is a muscle contraction in response to stretching within the muscle. When a muscle lengthens, the muscle spindle is stretched and its nerve activity increases. This increases alpha motor neuron activity, causing the muscle fibers to contract and resist stretching. The stretch reflex; which is also often called the myotatic reflex, knee-jerk reflex, or deep tendon reflex, is a pre-programmed response by the body to a stretch stimulus in the muscle. When a muscle spindle is stretched an impulse is immediately sent to the spinal cord and a response to contract the muscle is received. Since the impulse only has to go to the spinal cord and back, not all the way to the brain, it is a very quick impulse. It generally occurs in 1-2 milliseconds. This is designed as a protective measure for the muscles, to prevent tearing. The muscle spindle is stretched and the impulse is also immediately received to contract the muscle, protecting it from being pulled forcefully or beyond a normal range. The main purpose of the stretch reflex is to prevent injury to a muscle from over stretching.

When the stretch reflex is activated the impulse is sent from the stretched muscle spindle and the motor neuron is split so that the signal to contract can be sent to the stretched muscle, while a signal to relax can be sent to the antagonist muscles. Without this inhibitory action, as soon as the stretched muscle began to contract the antagonist muscle would be stretched causing a stretch reflex in that one. Both muscles would end up contracting simultaneously.

The stretch reflex is very important in posture. It helps maintain proper posturing because a slight lean to either side causes a stretch in the spinal, hip and leg muscles to the other side, which is quickly countered by the stretch reflex. This is a constant process of adjusting and maintaining. The body is constantly under push and pull forces from the outside, one of which is the force of gravity. Another example of the stretch reflex is the knee-jerk test performed by physicians. When the patellar tendon is tapped with a small hammer, or other device, it causes a slight stretch in the tendon, and consequently the quadriceps muscles. The result is a quick, although mild, contraction of the quadriceps muscles, resulting in a small kicking motion.

Anatomy Involved in Stretch Reflex

The muscles are attached to tendons, which hold them to the bone. Muscles have tendons at each attachment. At the attachment of the muscle to the tendon is a muscle spindle that is very sensitive to stretch. The motor neurons that activate the muscles are attached here as well. These are considered lower motor neurons. When they are stimulated they can cause the muscle to contract. This frees up the upper motor neurons and other portions of the central nervous system for more important functions.

The motor neurons travel from the spinal cord to the muscle and back again in a continuous loop. Conscious movement comes from impulses in the brain

travelling down the spinal cord, over this loop, and then back to the brain for processing. The stretch reflex skips the brain portion of the trip and follows the simple loop from muscle to spinal cord and back, making it a very rapid sequence.

The stretch reflex is caused by a stretch in the muscle spindle. When the stretch impulse is received a rapid sequence of events follows. The motor neuron is activated and the stretched muscles, and the supporting muscles, are contracted while its antagonist muscles are inhibited. The stretch reflex can be activated by external forces (such as a load placed on the muscle) or internal forces (the motor neurons being stimulated from within.)

When the muscle is stretched, so is the muscle spindle. The muscle spindle records the change in length (and how fast) and sends signals to the spine, which convey this information. This triggers the stretch reflex, which attempts to resist the change in muscle length by causing the stretched muscle to contract. The more sudden the change in muscle length, the stronger the muscle contractions will be. This basic function of the muscle spindle helps to maintain muscle tone and to protect the body from injury.

One of the reasons for holding a stretch for a prolonged period of time is that as you hold the muscle in a stretched position, the muscle spindle habituates (becomes accustomed to the new length) and reduces its signaling. Gradually, you can train your stretch receptors to allow greater lengthening of the muscles. Some sources suggest that with extensive training, the stretch reflex of certain muscles can be controlled so that there is little or no reflex contraction in response to a sudden stretch. While this type of control provides the opportunity for the greatest gains in flexibility, it also provides the greatest risk of injury if used improperly.

What to Avoid When Stretching?

Many people have never learned how to stretch properly. To work with the stretch reflex, prevent injury, and have an overall more effective stretch, here are some of the most common mistakes to avoid while stretching:

Bouncing. Many people have the mistaken impression that they should bounce to get a good stretch. Bouncing will not help your students and could do more damage as they try to push too far beyond the stretch reflex. Every move you make should be smooth and gentle. Lean into the stretch gradually, push to the point of mild tension and hold for a few seconds. Each time you will be able to go a little further, but do not force it.

Not Holding the Stretch Long Enough. If you do not hold the stretch long enough, you may fall into the habit of bouncing or rushing through your stretch to move onto the next posture. Also, by holding the stretch for a longer period of time, the

stretch reflex that inhibits stretching will be reduced. Hold any deeply stretching posture for at least 15 to 20 seconds before moving back to your original position.

Stretching Too Hard. Yoga takes patience and finesse. Some students want to force themselves to get further into a posture. However, each move needs to be fluid and gentle. In hatha yoga, we want to minimize the effects of the stretch reflex. To do this and to increase flexibility, it is best to move into postures slowly. Do not throw your body into a stretch or try to rush through postures. Take your time and relax.

Forgetting Form and Function. It's important to use proper biomechanics when stretching in a yoga posture. This means to hinge from the hips and follow proper alignment principles of the posture. Also remember that to avoid damage to your muscles and joints, avoid pain. Never push yourself beyond what is comfortable. Only stretch to the point where you can feel tension in your muscles. This way, you will avoid injury and get the maximum benefits from your deep stretching postures in yoga.

Imbalances

Most people have some imbalances or asymmetry in their bodies. Most of us were born symmetrical, but our habitual movements and activities cause some imbalances. For example, if carry a purse or backpack over one shoulder, or if you cradle your phone between your same shoulder and ear, or if you play tennis mainly using the same arm, you create habitual tension on one side of the body that eventually results in muscular and skeletal misalignments and distortions. Yoga can help encourage balance and symmetry. The more symmetry we have between our right and left sides, the less strain will be placed on our muscles and joints.

Activity:

Check your own asymmetry.

Stand in front of a full length mirror with your feet about one foot apart and your hands relaxed at your sides. Do your right and left extremities appear to be of equal length? Is one shoulder higher or lower than the other. Do you lean slightly to one side. Do your arms hang in the same way or is one elbow more bent? Does your waistline make a sharper indentation on one side than the other? If you drew an imaginary line from your sternum to your belly button, would it be perpendicular, or is it slightly tilted? Do you feet feel comfortable when standing with them parallel to each other, or would it feel more comfortable if one or both turned slightly out or in? Simply notice, without judgment any differences you notice between your right and left sides.

When practicing yoga, notice when one side is more difficult than the other side. Try the following postures on each side: cows face (gomukhasana), triangle (trikonasana), one-leg seated forward fold (janu sirsasana), dancer (natarajasana). Notice which side is stronger. For the next two weeks, practice these four postures every day, but practice each posture on the weaker side twice as many times. So, if your right side is most flexible in cow's face, practice the posture once each day on the right side, and at least twice or preferably more on the left side. After two weeks, notice if there is less difference between the sides.

Practicing in our weak areas is also helpful for symmetrical imbalances. For example, if you have some lordosis (excessive lumbar extension) and find it easy to arch backwards (extension of the spine), but more difficult to fold forward (flexion of the spine), spend twice as long on spinal flexion until there is more balance and standing with good posture (without lordosis) is comfortable and natural.

Anatomy of Standing

Unlike other animals, humans can relax when we stand upright because we can lock our knees and balance on our hip joints without much muscular activity. Keeping your knees straight has two implications: 1) hamstrings will be relaxed, and 2) any additional extension will be stopped by ligaments. Although you want to be careful not to hyperextend your knees, and you often want to keep a slight bend to the knees during movement, when standing still in standing and balancing postures, it gives us more ease in the posture to maintain straight knees.

Standing postures can form a complete practice on their own by including twists (spinal rotation), forward folding (spinal flexion), side bending (lateral flexions), back bending (spinal extension), balancing and inversions (gentle inversions from deep forward folds).

Movements that can be included in a standing yoga practice:

- Spinal rotation
- Spinal flexion
- Spinal extension
- Spinal lateral flexion

Within those movements, standing postures can also incorporate the following:

- Balance
- Inversion

In yoga practice, some of the most foundational lessons center on standing properly. When you can feel your weight releasing evenly into the three points of contact between the foot and the floor (on either side near the front of the foot, just before the toes, and on the heel), you may be able to feel the support that the earth gives back to you. Standing postures have the highest center of gravity of all the starting points, and the effort of stabilizing that center makes standing postures often very challenging.

Foundation for Standing Postures

It is important to have students plant their feet firmly and stand with moderate tension in their thighs and hips before moving into any standing posture. While it is true that tightening the muscles of the hips and thighs may reduce the range of motion for hip joint, it will prevent pulled muscles or injuries to the knee joint, hip joints and lower back. Practicing this way can also help build up the connective tissue of these joints and as the joints become stronger, it becomes safer to relax the body more and stretch more deeply. After you have practiced yoga for years, it becomes intuitive when you need to apply more tension and when you can relax, but for your beginning students it is important that they maintain some tension in muscles of the hips and thighs to protect their joints.

Once you have your general standing foundation, you want to begin any standing posture by focusing on your feet. The feet are your main foundation and should be set up correctly before moving into the full posture. Any small adjustment in how the feet are placed will affect your posture from head to toe.

Activity: To see how your feet affect the rest of your body, first stand with your feet together and parallel. Use chalk or a pen to draw a line down the center front of each thigh (best to do this when wearing shorts). Keep your knees straight, then, turn both feet out about 45 degrees (so there is a 90 degree angle where the heels meet). Notice how this movement of the feet causes the thighs to laterally rotate the same amount. Next, turn the feet inward, so the toes touch and the heels are apart (with a 90 angle where the toes touch). Notice how this causes the thighs to rotate medially. This experiment makes it clear that most of the rotation of the foot is translated to the thigh. If a foot slips out of position in a standing posture, it indicates a weakness on that side. If you notice this issue with yourself or a student, it is important to correct it, but not force the issue. Instead of hurting yourself or your students by stressing the weak side, ease up on the stronger side and patiently make adjustments to the weaker side, noticing the foot placement, and easing up if you find it difficult to go deeper into the posture while maintaining the proper foot placement.

Importance of Mountain Pose (Tadasana)

Beyond your feet, mountain pose is the foundation from which other standing postures are derived. Therefore, you can think of it as a foundation which is important to proper practice of other standing postures. Mountain pose teaches you how to stand properly and align your bones, so that you can move into other postures without straining your muscles and joints.



To come into Tadasana, stand with your feet together and parallel. Lift and spread your toes before placing them back on the floor, creating a solid base with your weight evenly distributed over both feet. Roll slightly forward and back over your feet until you feel your weight evenly distributed evenly on all sides of both feet. Root your feet and legs into the floor, firming your thighs and lifting your kneecaps and thighs. Lift up through your heart and lift up through the crown of your head. Drop your tailbone down and draw your shoulders back and down. Relax your arms and shoulders, but not so much that they are limp. Let your hands rest at your sides with your palms touching your outer thighs and your thumbs facing forward. Stay in this position for

at least 6-8 breaths, observing your breath and scanning your standing body.

Tadasana is the foundation upon which all other standing postures begin. This may be why tadasana is considered by many people to be the starting point of asana practice. Tadasana is similar to anatomical position with one exception – in tadasana the palms face the sides of the thighs, while in anatomical position the palms face forward.

In tadasana, the lumbar, thoracic and cervical curves are in a very slight extension, but mainly the spine is in a neutral position. The ankle, hip, shoulder and wrist joints are in their neutral positions (between extension and flexion). The pelvic floor, rib cage, and top of the head are all lifted.

Standing without great muscular effort is unique to humans. Humans are the only true bi-pedal mammals. Because of this, we are also the most unstable, since we proportionally have the smallest base of support, the highest center of gravity and the heaviest brain.

The structure of our feet, which support our standing posture, is illustrated by a triangle on the sole of each foot. The three points where the sole of the foot will rest on the floor include the heel and the points just below the big toe and pinky toe (first and fifth metatarsals). In today's society with shoes and smooth walking paths, the arches of the feet can often become weak. The practice of standing postures, and especially of tadasana, provide an important way to restore the natural strength and adaptability of the feet.

Anatomy of Specific Standing Postures

For postures that start from a standing position, make special note of the movement of the spine and final position of the spine within the posture. In any standing posture, the spine will be in one of the following positions: neutral, flexion, extension, lateral flexion, or rotation. The following sections will examine some examples of standing postures based on the final position of the spine in the posture.

Standing Postures with Neutral Spine

Warrior 2 (Virabhadrasana 2)



Muscles Stretching

Back leg – hamstrings (eccentric contraction) and quadriceps
Front leg – iliopsoas, adductors

Muscles Working

Back leg – gluteal muscles and hamstrings
Front leg – quadriceps and hamstrings, gluteus maximus and rotators
Arms/Torso – Pectoralis minor, trapezius and shoulder girdle,

Notes:

The challenge of this posture is practicing abduction and extension of the hip at the same time. It is important to externally rotate the front hip, so the front knee does not turn in and create stress on the knee and ankle joint. It's also important to engage the core and lift through the chest so you are not sinking too much into your joints in your hips, knees and ankles, and placing strain on them.

Tree Pose (Vrksasana)



Muscles Stretching:

Raised leg – Adductors, gracilis

Standing leg – gluteus minimus and medius, piriformis

Muscles Working:

Raised leg – Iliacus and psoas, gluteus maximus, medius, deep rotators muscles (piriformis)

Standing leg and foot – piriformis, gluteal muscles, and muscles of the sole of the foot, ankle and calf.

Notes:

Students may think that tree pose is about balance only and overlook the need for symmetry in the pose. Remind students to press down through the standing leg and level hips, so they are parallel to the floor – not tilted towards one side. If the abductors of the lifted leg are weak, the hip on that side will tend to rise up. Pressing down through the standing foot, while reaching up through the head, also helps improve stability in the pose.

Encourage students to actively practice external rotation of the hip of the raised leg by drawing the bent knee back.

Standing Postures with Spinal Flexion

Forward Fold (Uttanasana)



Muscles Stretching:

Hamstrings, spinal muscles, gluteal muscles, piriformis (rotators)

Muscles Working:

Knee extensors, quadriceps, feet, ankles, abdominal muscles

Notes: Remind students to press back through their hips as they fold forward, so they are folding from the hips rather than rounding down from their back. This ensures that the pelvic bowl tips forward and the stretch is focused on the hamstrings and gluteal muscles, and it protects the back from strain. Students can keep their knees bent, if needed. Encourage students to place their hands on the floor, bending their knees as needed, then drop their head and begin to straighten their knees as they keep their hands on the floor. This ensures that the pelvic bowl will have an anterior tilt (tip forward) which will help to stretch the hamstrings and gluteal muscles.

Pyramid (Parsvottanasana)



Muscles Stretching:

Hamstrings, gluteus maximus, abductors, spinal erectors (long muscles along the spine)

Muscles Working:

Quadriceps, abductors, feet, ankles and lower leg (for balance)

Notes:

Many students tend to shift their hips as they come down, so that the hip of the forward foot is pressed forward, while the hip of the back leg is shifted back. To bring hips back to a balanced position, remind students to draw the right hip back (when the right foot is forward). Making this adjustment will cause greater stretch in the hamstring muscles, but will also improve students' balance in this position. The hamstrings are stretched more deeply in this position compared with a standing forward fold (uttanasana) because separating the legs allows for more flexion in the front hip.

Many students also will begin rounding their backs as the fold forward, attempting to get their heads closer to their front leg. Encourage students to bend their front knee if they need to and press back through the hips, in order to decrease the stretch in the hamstrings. Once they fold forward, they can relax the back and allow the flexion of the spine.

Standing Postures with Spinal Extension

Warrior 1 (Virabhadrasana 1)



Muscles Stretching:

Abdominal, latissimus dorsi, pectoralis major and minor, and calf, ankle and hip flexors (of back leg)

Muscles Working:

Erector spinae (long muscles along the spine), abdominal (eccentric contraction), obliques, hamstrings and quadriceps.

Notes:

One of the greatest challenges of Warrior 1 is squaring the hips to the front. Focusing on the following points can help: 1) Make sure the back foot isn't turned out too much. As you turn your foot in, it becomes easier to turn your hips and torso forward. 2) Focus on the hips. When the right leg is in front, focus on bringing the left hip forward. 3) The arm on the side of the body of the back leg is often under stretched. To counteract this, bring the shoulder into the turn as well as the hips.

Check that students keep their front knee directly over the ankle. This will help protect the knee and ankle joints. Also, Warrior 1 includes a slight back bending movement, so it is fine to notice an arch in students' lower backs. Encourage students to keep the back leg straight and keep the weight evenly distributed between the front and back legs, so they are neither leaning forward or backwards, but the torso is upright and the chest open.

Dancer (Natarajasana)



Muscles Stretching:

Latissimus dorsi, pectoralis major, abdominal muscles, obliques, hamstrings (standing leg)

Muscles Working:

Erector spinae, trapezius, obliques (eccentrically), gluteal muscles, hamstrings (lifted leg)

Notes:

Students are often anxious to begin kicking their raised foot back. When students first bring their raised foot to their hand, have them first bring their knees together. This will bring their body into proper alignment and give them time to find their balance before kicking back. Many students begin tipping forward too much as they kick their raised foot up and back. This, however, reduces the spinal extension that this pose is meant to create. Encourage students to keep reaching their top hand up, as well as forward as they kick their back foot up and back. Also, instruct students to draw their shoulder back (shoulder on the same side as hand holding foot). This will help keep the chest and torso open and more upright. Remind students to keep their hips facing forward. This will increase the stretch in their hip flexor, while also helping them maintain their balance. Encourage students to squeeze their inner thighs towards the midline (adduct their inner thighs). This will help stabilize the sacroiliac joint and prevent strain in the lower back (lumbar region).

Standing Postures with Lateral Flexion of the Spine

Crescent Stretch



Muscles Stretching:

Latissimus dorsi, triceps, intercostals (between ribs), obliques

Muscles Working:

Erector spinae (eccentric contraction on the side that is being stretched), forearm supination (top arm), obliques (eccentric contraction of side being stretched), abdominal muscles

Notes:

Remind students to keep their upper shoulder back and their chest open – not dropped towards the floor. This helps maintain lateral flexion of the spine, and helps prevent strain in the upper back. Encourage students to press down through the foot (on the side that is stretching). This will help deepen the lateral flexion and stretch the side body more. They get a better stretch through their shoulders and prevents strain in the upper back.

Extended Side Angle



Muscles Stretched:

Obliques, triceps, ankle, adductors

Muscles Working:

Hamstrings (eccentric), deltoids, triceps, lower side obliques, quadriceps (front leg)

Notes:

Often students will drop their chest towards the floor and press the tailbone back (so that the buttocks sticks out). Instruct students to stack one hip on top of the other and tuck their tailbone in, while keeping their chest open to the side. Have your students imagine they are between two panes of glass, making their body narrow. Students may not be able to drop down as far into the extended angle, but it will help bring a better stretch to the side of their body and their low back.

Students also often keep their hip raised. Remind them to drop their hips to create one straight line from their hand to the heel of their back foot. This will help to open the hips more.

Finally, encourage students to keep their arm next to their ear and draw their shoulder back. This will help them to keep their chest open to the side, rather than letting the chest drop.

Triangle (Trikonasana)



Muscles Stretching:

Adductors (inner thigh), gluteal muscles of the back leg, obliques, hamstrings

Muscles Working:

Psoas, piriformis, quadriceps, gluteal muscles, hamstrings (eccentrically)

Notes:

Pain or discomfort in the knee of the front leg can be from the gracilis (inner thigh) and hamstrings (specifically the semitendinosus), which are especially lengthened in this position and can cause knee strain. It is important to keep the hamstrings active to avoid hyperextension of the knee, which can be easy to do when the weight of the body is over the leg. Pain on the outer side (lateral side) of the knee of the back leg can be from tightness in the gluteal muscles at the top of the iliotibial (it) band.

The more flexible the hip joints are, the more the spine can stay in a neutral position.

Many students drop their top shoulder and chest towards the floor, while pressing their tailbone out. This reduces the stretch in the low back and can strain the top shoulder joint and upper back. If you notice students dropping their chests towards the floor, have everyone come to the wall with their backs next to the wall and feet in triangle position and arms against the wall at shoulder height. Tell your students to slowly drop their right hand down their right leg, while keeping their left shoulder blade and left sitting bone on the wall. They may not be able to bring their right hand down their right leg very far, but they will feel the stretch in their low back and gain a better understanding of how to properly do the posture to get all of its benefits.

Standing Postures with Spinal Rotation

Revolved Triangle (Parivrtta Trikonasana)



Muscles Stretching:

Gluteus Maximus, hamstrings, latissimus dorsi

Muscles Working:

Erector spinae, obliques (to maintain neutral extension of the spine), gluteal muscles (eccentric contraction), piriformis, teres major

Notes:

Instruct students to reach forward with their head as they press back through their hips. This will help them to lengthen their spine and keep their hips centered between their legs. Encourage students to bend their knees, if necessary, rather than round their back or use a block for support. Rounding the back can place strain on it.

If the abductors and rotators are weak, eccentric control of the rotation will be hard to manage. If this happens, the gluteus maximus may get involved and shift back. This can cause the lower spine to not be in line and the rotation will no longer be around the head to tail axis. Students can use a block or chair seat for support as you remind them to keep their tailbone tucked in.

Anatomy of Sitting

In western culture, we often think of sitting as slouching on a couch or chair. It's no wonder that when we begin to learn to meditate, many of us have trouble with back pain. The key to sitting well is a well-positioned pelvis. The pelvis, which literally means "basin" in Latin, not only holds and protects our abdominal organs but also serves as the anchor for the spinal column. I like to say that the pelvis is the pot out of which the spine grows. Because of this relationship to the spinal column, the position of the pelvis is crucial to sitting properly.

Activity:

Try this experiment. Whatever position you are sitting in right now, move the pelvis an inch in any direction. When you do you will find that your spine moves with it. Unless the pelvis is in a neutral position, the spine is forced to move from its neutral position in order to remain upright. As you know, the vertebral column consists of a series of long curves anatomists call "normal curves," with the lumbar and cervical regions in slight extension, and the thoracic region in slight flexion. In order to sit well and with reasonable comfort, you need to create and maintain these normal curves. If any one of these curves is out of alignment, it affects the entire spinal column. It's like stacking children's blocks; if the second, third, and subsequent blocks are not lined up with the blocks below them, the column soon tumbles.

If you were to draw a straight line down from the top of the head, there should be an equal distribution of the amount of the spine that is behind the line compared to the amount of spine that is in front of that line. When the parts of the spine on either side of this imaginary line are not balanced, increased muscular activity is needed in order to keep us upright. We experience this increased muscular activity as tension, which interferes with our ability to meditate or work in comfort. In order to maintain the spinal curves in neutral, you must place the pelvis in a neutral position. This means that the top rim of the pelvis is neither rocked backward nor forward. To discover this relationship, sit in a chair and place your hands around the top edge of your pelvis with your fingers facing forward and your thumbs in back. Move your pelvic bowl forward and back until you can find that neutral position.

In order to sit well, we must also pay attention to the position of the thighs. The problem is that when our knees are higher than our hip sockets, the pelvis tilts backwards and the lower back rounds. Not only does this position of the lower back become uncomfortable because it strains the muscles, but it also puts pressure on the intervertebral discs. When we sit with a rounded back, we compress and flatten the fronts of the discs, putting pressure on the spinal nerves, which in turn can cause pain and dysfunction of the spinal muscles. Research has shown that when we sit with our thighs at a 125-135 degree angle to the hip sockets, it is much easier to sit comfortably. An easy way to do this in yoga class is to have your students sit on the edge of a blanket or block, so their

hips are raised while their knees and feet are still on the floor in a cross leg position.

Cross-Legged Sitting

To improve your meditation position, first observe. Sit in an easy cross-legged position on the floor without the use of any props and spend a few moments observing your posture. If you are like most of us, your knees will lift up higher than your pelvic rim, and your lower back will round. The first and most important step in correcting your sitting position is to elevate the pelvis. Start with three blankets which have been folded into a rectangular shape. Then sit cross-legged on the corner of the stacked blankets so that your buttocks are on the blankets and your thighs are off. (If you just sit on the edge of the blankets and not the corner, you may have many of the same difficulties you have sitting on the floor; everything is just raised higher.) Adjust the number of blankets in your stack until you find the appropriate height that allows your knees to drop lower than your hip sockets. (Remember the 125 to 135 degree rule!) Spend a moment noticing how your lower back feels. It should be arched slightly inward at the waist.

The next point of concentration is the arm position. If you place your hands on your knees, as is often recommended, the tendency may be for the weight of the arms to pull you forward. The arms can weigh as much as 15 pounds. So try placing the hands on the tops of the thighs near the belly; turn the hands so that the little fingers rest on the thighs and the palms face the abdomen; keep the fingers relaxed. Make sure that the elbows fall behind the side seam on your clothes, and allow enough space under your armpits to hold an egg.

If your forearms are close to a vertical position, place a folded blanket under the hands to elevate them. When the forearms are more horizontal, there will be less weight pulling through the arms and straining the shoulders and neck. Position the head so that you are looking straight ahead, then slightly drop the skull so that the eyes fall about three feet in front of you on the floor.

Squatting

Unlike sitting in a chair while hunched over a desk, squatting in a pose like Malasana (Garland Pose) can actually improve your posture, stretch your back, elasticize your knees and ankles, and help improve your digestive function. Malasana is also a forward bend—the back softens and releases from head to tail as the ankles, knees, and hips flex. The heels root the hips back, and the spine lengthens as it rounds. In addition to strengthening and stretching the feet and ankles and increasing mobility in the hips, the pose allows the back muscles to broaden.

As with all yoga poses, there's a rhythm to Malasana and all its actions. Legendary teacher B.K.S. Iyengar says that asanas become rhythmic when the actions lead to an uninterrupted flow of awareness throughout your entire system. When you're able to coordinate the actions so that no individual area of

your body is overworking—or being neglected—you can experience an inner rhythm and a sense of wholeness in the pose, as if each part of your body is expressing itself equally.

This includes your heels. Your heels, which press evenly into the floor, act as a counterpoint to your head, keeping you grounded as you extend. If you are tight in your hips, groins, calves, and Achilles tendons, your heels may not reach the floor. So we'll begin with some variations to loosen those regions. If your knees ache in the pose, place a blanket behind them, between your calves and thighs, to help decrease the amount of flexion. (The thicker the blanket, the less your knees will have to bend.) Just be sure to use a blanket behind both knees (even if you feel pressure on only one) so that your weight isn't skewed to one side, putting extra pressure on your other knee.

In another variation, use a wall for support, which will help shift some of your weight into your heels while you reach forward. To begin, stand with your feet approximately six inches away from a wall, and your sacrum against it. Bend your knees and slide your bottom down the wall until you're squatting. If your heels don't reach the floor, step your feet a little farther away from the wall. If you find that your bottom touch the floor, come a little closer to the wall. As in the previous variation of the pose, your heels should just barely touch the floor so that you can balance the forward extension of your torso and toes with the backward and downward stretch of your heels. Keeping the feet together, spread your knees apart, press your heels down, and stretch them back toward the wall. With the bottom of your sacrum resting against the wall, extend your arms, side ribs, and waist between your legs and away from the wall. Reach forward from the bottom of your waist to your hands, and extend your arms and chest parallel to the floor. Notice that the more you reach forward with your torso, the more you have to ground your heels back and down. Keep your inner heels down so that the weight doesn't fall onto the outside edge of your foot. For this variation, look down at the floor.

Your knees, of course, separate in a squat, but don't spread your legs so wide that they lose contact with your torso. Move your inner thighs back and down toward your hip sockets while you bring your outer thighs forward and up toward your knees. Lift the front of your shins while you lengthen the back of your calves down. Playing on the edge of sitting and extending, explore the rhythm of balancing the forward stretch of your torso with the rooting of your thighs into your hip sockets as you ground your heels. Similarly, see if you can balance the effort in your inner and outer thighs and the front and back of your lower legs so that you're not working one area more than another.

Anatomy of Specific Seated Postures

The following examples examine the anatomy of specific seated postures based on the final position of the spine, including: spinal flexion, extension, lateral flexion and rotation.

Seated Posture with Spinal Flexion

Seated Forward Fold (Paschimottanasana)



Muscles Stretching:

Erector spinae, latissimus dorsi, calves, hamstrings

Muscles Working:

Quadriceps (work to straighten knees), abdominal muscles (to pull into position)

Notes:

In many yoga texts, you'll find this pose started with arms overhead instead of at shoulder height. Arms overhead is the traditional way to come into this pose, however placing the arms overhead places more weight on the back and can strain the back. Placing the arms at shoulder height eliminates this problem and requires less back strength to keep the back straight, rather than slouched.

Many students desire to get their head to their legs – more than keeping proper alignment for a safe and beneficial stretch. Remind students to keep reaching forward with their head and chin as they press back through their sitting bones. This will help lengthen the spine and tilt the pelvis, so they are folding from the hip joints rather than rounding down from their back. Also, encourage students to bend their knees to start and slowly begin to straighten their legs once they are in position. This helps them bring their pelvis and back into proper position first and then focus on gradually developing more flexibility in their hamstrings.

Butterfly (Baddha Konasana)



Muscles Stretching

Adductors, gluteus medius and minimus, posterior neck muscles

Muscles Working:

Biceps, shin muscles, serratus anterior and rhomboids, abdominal muscles

Notes:

As in any seated forward fold, if there is too much emphasis on getting the head down rather than bringing the belly forward and down, then there will be too much spinal flexion and not enough tilt of the pelvic bowl. The forward folding motion should be generated by the hips and tilting the pelvic bowl forward will help develop greater hip flexibility.

Seated Postures with Spinal Extension

Sun Worshipper



Muscles Stretching:

Pectoralis major and minor, abdominal muscles, deltoids

Muscles Working:

Trapezius, erector spinae, gluteus maximus (in lifted position)

Notes:

Check that students' wrists are directly under their shoulders and that students keep squeezing shoulder blades and open through the chest. For any students with neck problems, have them look forward, rather than let the head fall back, but encourage them to still squeeze their shoulder blades together and lift up through the chest. This will allow them to still stretch the shoulders and chest and relieve upper back tension without compromising their neck. The trapezius muscle will be activated by squeezing the scapula together and will help protect the posterior neck muscles from strain.

Seated Posture with Lateral Spinal Flexion

Seated One-Leg Side Bend (Parivrtta Janu Sirsasana)



Muscles Stretching:

Erector spinae, latissimus dorsi, obliques, hamstrings (extended leg), gluteal muscles, adductor muscles, rhomboids

Muscles Working:

Obliques (other side), quadriceps (extended leg)

Notes:

In this posture, the opposite sitting bone should stay on the floor to keep the action of the posture in balance. Encourage students to open their chest and draw their top arm back to maintain the lateral flexion of the spine.

Seated Postures with Spinal Rotation

Seated spinal Twist (Baradvajasana)



Muscles Stretching:

Rotator muscles (especially piriformis), gluteal muscles, and bottom leg side of erector spinae, obliques, and latissimus dorsi.

Muscles Working:

Obliques, erector spinae (other side), neck strap muscles (sternocleidomastoid), adductors

Notes:

The spine will have the most balanced rotation when in neutral extension. Flexion in the lumbar spine will jeopardize the stability of the lumbar vertebrae and discs, and too much extension can lock the thoracic spine in place and inhibit the rotation there.

The arms can be used to overmobilize the scapula, making it appear that you're twisting more at the spine than you actually are. Therefore, it is a good idea to enter into this posture without using the arms, so the maximum safe action is first found in the spine. Leverage of the arms should come at the end to help deepen and stabilize the posture.

Anatomy of Kneeling

Kneeling or Thunderbolt Pose (Vajrasana) is one alternative to taking a cross-legged position. In addition, it gives the muscles along the front of the legs—the quadriceps, shins, and ankles—a stretch.

Alignment in Kneeling

When kneeling, there is a tendency for the pelvic bowl to tip forward and cause excessive extension in the low back (lordosis). Remind students to drop their tailbone down and sit up tall, lifting up through the crown of the head to lengthen through their spine.

Students who tend to evert their feet (walk with their feet turned out) and who pronate their feet when walking (roll over the inside edge of the foot) will tend to turn their feet out when kneeling. Encourage them to keep their big toes together when kneeling. If this is very uncomfortable, you can make it easier for them through the use of modifications (see below).

Modifications for Kneeling

Kneeling seems pretty simple: place your shins on the floor and sit on your heels. But if you have a tighter athletic body, this can be quite uncomfortable. Here are some ways to support the position for greater comfort.



Blanket for ankle comfort: If you're feeling a lot of pressure on the toe knuckles or have problems pointing your toes to make the front of the ankle rest flat, take a blanket or two and rest your shins on them as your toes hang off the back. In time, you might be able to remove layers of blanket as your flexibility increases.

Blanket for knee comfort: If you're feeling pain in your knees, don't suffer through it! Take one or more blankets and stack them between your calves and thighs. Depending on your body, you might be happier with the blankets' edge coming all the way to the back of the knee, or leaving some space between the edge and

the back of the knee. As your body changes, you might be able to reduce the layers of blanket you need.



Block for knee comfort: Another option for elevating the pelvis and reducing the angle of flexion in the knee is to sit on a block. Run a yoga block on its medium height horizontally under your pelvis, and settle your sitting bones on it like you're riding on a cruiser bike with a broad saddle. Your feet will straddle the block, making this a lighter way to practice Virasana (Hero's Pose).

Once you've found a comfortable kneeling position, tilt your pelvis forward and back a few times, finding a comfortable neutral alignment that's not tipped forward or back. In this sweet spot, your spine should be free to rise up long through its natural curves, making more room for the breath and one less distraction for seated meditation.

Anatomy of Specific Kneeling Postures

The next group of postures examine the anatomy of specific kneeling postures based on the final position of the spine including: spinal flexion, extension, lateral flexion.

Kneeling Posture with Spinal Flexion

Child's Pose (Balasana)



Muscles Stretching:

Erector spinae, gluteus maximus, medius, minimus, tibialis anterior (shin muscle), muscles on the front of the ankle and feet.

Muscles Working:

Muscles are relaxed and gravity draws the body deeper into this posture.

Notes:

The challenge of this posture is to bring the sitting bones to the heels and the forehead to the floor. To do this, students must have sufficient flexibility in the erector spinae, gluteal muscles, rotators (piriformis and others), and tibialis anterior (shin muscle).

For students who have trouble bringing the sitting bones to their heels or resting their forehead on the floor, have them spread their knees apart, which can create more a more neutral position of the spine and make room for the belly.

Restriction may also be felt in the tops of the feet and students may begin to curl their toes under or turn their feet out to compensate. To help with this problem, have students place a blanket under the tops of their feet and ankles, while they keep the tops of their feet on the floor and their big toes touching each other.

Kneeling Postures with Spinal Extension

Camel (Ustrasana)



Muscles Stretching:

Pectoralis major and minor, biceps, anterior deltoids, anterior neck muscles, intercostal muscles (between ribs), muscles of the anterior (front) spine.

Muscles Working:

Anterior neck muscles (working eccentrically to keep neck from collapsing), abdominal muscles (eccentrically), obliques, psoas major and minor.

Notes:

Encourage students to bring their inner thighs towards each other to cause a slight internal rotation of their legs. They should also firm the belly slightly. Both of these contractions will help keep the sacroiliac joints stable and prevent stress or pinching in the low back.

Many students will have a difficult time reaching their hands to their feet. Encourage them to do the modification for camel by keeping their hands on their low back. Pressing the hips forward will help to deepen the extension of the spine. It's important that students keep their hips directly over their knees, regardless of the form of the pose they choose. Otherwise, a person is merely leaning back rather than lifting up and arching the back.

It's important to have students practice a counter pose, such as child's pose, immediately after camel. The intense backbend of camel causes muscles to contract along the spine. Child's pose gives these muscles a chance to relax and prevents muscle spasms or strain.

Kneeling Postures with Spinal Lateral Flexion

Gate (Parighasana)



Muscles Stretching:

Top side of the body – rhomboids, latissimus dorsi, triceps, intercostals (between ribs), obliques, gluteal muscles
Psoas on the same side as the kneeling leg
Extended leg – hamstrings, and gracilis and adductors (inner thigh muscles)

Muscles Working:

Extended leg – piriformis, hamstrings, gluteal muscles, quadriceps, dorsiflexion muscles (muscles on top of the ankle)
Top arm – serratus anterior (front side of the chest) to abduct the scapula, rotator cuff muscles, deltoids.

Notes:

The internal obliques on the upper side and the external obliques on the lower side must be engaged in order to keep the chest open (not dropped towards the floor). The hamstrings and adductor muscles of the kneeling leg must also engage to prevent flexion at the hip joint and to keep the hip extended.

Students often drop their chest, turning their torso towards the extended leg. Remind them to keep their chest open and forward and for them to imagine bringing their side towards the extended leg. Also, instruct students to draw back the shoulder of the raised arm. This helps keep the chest open and stretch the shoulder.

Encourage students to stretch from the side body more than from the shoulder. If the latissimus dorsi is tight, there is a tendency to compensate by overstretching through the shoulder.

Anatomy of Arm Balancing

It seems fairly apparent that, unlike the lower limbs, the highly mobile structures of the hand, elbow and shoulder girdle are not designed specifically for support and locomotion. The heavy, dense tarsal bones in the foot make up half the length of its structure. The metatarsals also provide weight bearing support, which makes about four fifths of the foot's structure dedicated to weight bearing. The foot's phalangeal structures only comprise about one fifth of the foot's length. However, in the hand, about one half of the length is composed of the highly mobile phalangeal (finger) bones, which are not designed for weight bearing support. When you practice arm support postures, you must be careful and understand that your arms and hands are at a structural disadvantage to your legs and feet in their ability to bear weight. One way to help your arms support your body weight is to lift your navel up and in (engage uddiyana bandha) and lift your pelvic floor (mula bandha). Engaging these muscles makes less work for your arms. Also, by properly aligning your body in many arm balancing postures, you can use gravity to your advantage and shift your body weight, so there is less work for your arms.

It's always important to move slowly and with ease into any arm balancing posture to reduce any risk of strain or injury.

Anatomy of Specific Arm Support Postures

The following postures will examine arm balancing postures based on the final position of the spine, including neutral, spinal flexion, extension, and rotation.

Arm Support Posture with Neutral Spine

Down Dog (Adho Mukha Svanasana)



Muscles Stretching:

Hamstrings, calf muscles (gastrocnemius), gluteus maximus, latissimus dorsi, triceps (eccentrically)

Muscles Working:

Quadriceps, dorsiflexions muscles, triceps, serratus anterior, rotator cuff

Notes:

The triceps are active in down dog in order to extend the elbow and prevent collapse in the shoulder. If the latissimus dorsi compensates for lack of strength in the triceps, it can create strain on the shoulder joint, since it may internally rotate the shoulder too much. If there is a lack of rotation between the bones of the forearms (radius and ulna), it could cause internal rotation at the shoulder, or stress at the elbow or wrist joint, which could cause injury at any of these joints. So, it's important for the pronators to remain active. It's important for beginning students to not overdo the practice of down dog, and to often take child's pose as a resting pose instead of down dog until they become more experienced with the posture.

Down dog is considered one of the most fundamental of all yoga postures. It is often used between other postures as a transitional posture to keep the flow of the practice going. It is important to check that your students are doing the following: Hands remain shoulder width apart, not too close or too far away. The distance between the hands and feet is about the same as the distance from the student's heels to their tailbone (the triangle formed is not too narrow or too wide). Again, for beginning students, it is best to limit the number of times they practice down dog during any one session, in order to prevent stress or injury to the joints of the wrists, elbows, or shoulder.

Plank (Chaturanga Dandasana)



Muscles Stretching:

In this posture, there is not much stretching of muscles, and the emphasis is on muscular contraction.

Muscles Working

Obliques, rectus abdominis, hamstrings, adductors, quadriceps, serratus anterior (eccentrically), triceps (eccentrically), and rotator cuff muscles

Notes:

If a student is weak in their core muscles (abdominal muscles and back muscles), it will show up in plank through lumbar hyperextension (belly drops down and back sways), or through flexion of the hips (bottom up higher than the rest of the body). Encourage students to drop their knees to the floor, if needed, and engage their belly to maintain a flat back. To help students check if they are in one straight line, have them look towards their feet. They should be able to just see their thighs and feet. If they can see their knees, their hips are usually too high. If they can't see their thighs, their hips are usually too low. Bringing their hips to the point where they create one straight line from their neck to their heels (or neck to tailbone for modified plank) will better help develop their core strength.



Arm Support Postures with Spinal Flexion

Crow (Bakasana) – spinal flexion for most of the spine, although the cervical spine is in extension



Muscles Stretching:

Erector spinae, rhomboids, trapezius

Muscles Working:

Psoas, abdominal muscles, pelvic floor, hamstrings (to maintain knee flexion), adductors (to adduct and flex the hips), rotator cuff muscles, deltoids, pectoral muscles, and the triceps to extend the elbows against gravity.

Notes:

Because the thoracic spine is in flexion, while the cervical spine is in extension, there is more precision and strength needed from the spine. This is due to the fact that you can not engage the trapezius, which would interfere with the action of the scapula and arms.

Arm Support Postures with Spinal Extension

Up Dog (Urdhva Mukha Svanasana)



Muscles Stretched:

Rectus abdominis, obliques, psoas (eccentrically), pectoral muscles, biceps, deltoids, intercostals (muscles between ribs), rectus femoris (quadriceps)

Muscles Worked:

Erector spinae, psoas, hamstrings, rhomboids, trapezius (to pull the shoulder blades towards each other), adductors (bring together and internally rotate inner thighs)

Gravity also helps create the extension in the lumbar spine

Notes:

Many beginning students keep their knees or thighs on the floor. Encourage them to try pressing down through their feet and hands, so that only their feet and hands touch the floor. Also, many students hunch or round their shoulders in this position. Remind students to draw their shoulders back and squeeze their shoulder blades together, so they can better stretch and open their shoulders and chest.

The goal is to have the spinal extension spread throughout the whole spine, which means there needs to be more effort focused on extending the thoracic spine and engaging the core to protect the lumbar spine from excessive extension.

Often, up dog is only held for a short inhale before moving into down dog. It can be helpful to have your students sometimes hold this posture for several breaths, so you can allow the inhalation to help deepen the extension in the thoracic spine, while the exhalation can assist in stabilizing the lumbar region.

Upward Facing Bow (Urdhva Dhanurasana)



Muscles Stretching:

Psoas, iliacus, abdominal muscles, intercostals, pectoral muscles, latissimus dorsi

Muscles Working:

Erector spinae, hamstrings (to extend hips), adductors (to internally rotate the hips), rotator cuff muscles, deltoids (flex the arms at the shoulders), and triceps (to extend the elbows)

Notes:

Encourage students to stay relaxed as they lift into the pose. This helps many students use their muscles more efficiently and find the strength to press into the pose.

As with bridge, students often turn their feet out as the muscles that allow hip extension also may cause external rotation. Students can neutralize the external rotation by activating the muscles of the inner thigh.

Also, encourage students to press their chest towards the wall behind them (press their chest through their arms). This helps to deepen the stretch to the shoulders and chest and to go further into the posture, while preventing strain in the lumbar region.

Scorpion (Vrschikasana)



Muscles Stretching:

Latissimus dorsi, quadriceps, supinators, abdominal muscles, pectoral muscles

Muscles Working:

Hamstrings (to bend knees and draw them towards the head), serratus anterior (works eccentrically as the scapula adduct), erector spinae (to deepen the extension and lift the head against gravity)

Notes:

Scorpion is considered an easier posture to maintain compared with peacock (straight legs instead of bent) due to the lower center of gravity. Bending the knees lowers the center of gravity and gives you more opportunity to counterbalance your body weight over a center line. It's important to lift the head and press the belly back at the same time as your feet come towards your head to counter-balance each other and keep your center of gravity along a midline.

Arm Support Postures with Spinal Rotation

Cross Leg Arm Balance (incorporates both spinal flexion and rotation)



Muscles Stretching:

Erector spinae, obliques, hamstrings (with hip flexion and knee extension), gluteal muscles, gastrocnemius (calf muscles), trapezius, rhomboids, deltoids

Muscles Working:

Psoas, abdominal muscles, pelvic floor, obliques, adductors (to adduct and flex hips), tibialis anterior (shin muscles), rotator cuff muscles, pectoral muscles, triceps (working against gravity) and biceps.

Notes:

The challenge of this posture is more about flexibility and balance than about strength. The binding of the ankles keeps the legs symmetrical. The bind also means that the rotation must occur more in the spinal column rather than in the hip joints. The twist should occur along the spinal column, rather than incorporating the scapula and rib cage too much in the rotation.

Encourage students to lean forward onto their hands and to drop their head towards the floor as their hips and legs raise up. This shifts the center of gravity and helps the legs lift off the floor.

Arm Support Postures that Invert the Body and Spine

Headstand



Headstands do not generally provide a deep stretch to any specific muscles. The benefits of headstands are in the form of increased venous return from the lower body (improved circulation), improved lymph drainage, and stimulation of the diaphragm and abdominal organs.

Muscles Working:

Erector spinae, psoas, obliques, rectus abdominis, rotator cuff muscles, triceps, adductors (to hold the legs together) and hamstrings (to extend the knees), and the gluteus maximus.

Notes:

Slight asymmetries or slight rotations of the spine become more noticeable in headstands. These asymmetries can be noted and worked on in standing postures. It can be challenging for students to extend their legs, due to weak abdominal muscles. Students can keep their knees bent in headstands to keep the work of the pose in their back muscles instead of in their abdominal muscles.

It's good to note that hip opening is easier with any inverted position. Inversions make hip opening more safe and effective because the hip joints are not bearing the weight of the body when in an inverted position. You can also simply use gravity to stretch the adductors (inner thighs) by bringing your legs into a straddle (abducting the legs). You can stretch the hamstrings in headstand position by bringing one leg down to the floor with the toes curled under, then switching legs. You can also work with your knees and hips by practicing lotus posture in a headstand. Many people actually find it easier to practice lotus in an inverted position.

Activity:

If headstand is appropriate for you (no high blood pressure, not pregnant, no neck issues), come into a forearm balanced head stand (with or without the support of a wall). Bring your attention to your hips. If your headstand takes any effort to stay balanced, then use the wall for support, so you can focus more on your hips. While in your headstand, bring your legs to a straddle and notice how it may feel different than when you are in a seated or standing straddle. Next, bring one foot to the floor while keeping the other foot raised up towards the ceiling. Curl the toes under of your foot that is on the floor. Notice the stretch of your hamstrings. How does it feel different than when you stretch your hamstrings while standing or sitting. Finally, while in your headstand, bend your knees and cross your ankles, like easy cross leg position. If you can begin to move your legs into lotus posture by bringing one foot to the top of your opposite thigh and then the other foot to the top of its opposite thigh. Notice if there seems to be more space for crossing your legs when inverted than when you are sitting.

Lateral spinal flexion is not usually found in most arm balance postures. Therefore, it is important to include lateral flexion of the spine in postures with other foundational (starting) positions, such as seated, standing, and supine postures.

Anatomy of Lying Face Down (Prone Position)

Moving into postures from a prone (belly lying) position requires the use of posterior (back side) muscles. This is why many back strengthening exercises begin from a prone position, and prone postures can be very helpful for your students who suffer from chronic back tension that may be due to weak back muscles.

Because of the pressure that lying on your belly (prone) puts on your spinal curves, it is not an advised sleeping position.

Anatomy of Specific Prone Postures

The following section explores the anatomy of prone postures back on the final position of the spine, including spinal extension and spinal rotation.

Prone Postures with Spinal Extension

Cobra (Bhujangasana)



Muscles Stretching:

Rectus abdominis, obliques, intercostals, latissimus dorsi, pectoral muscles, supinators, psoas (lower fibers)

Muscles Working:

Erector spinae, rectus abdominis (eccentrically), oblique (eccentrically), rotator cuff muscles, triceps, trapezius (to draw shoulders back), hamstrings (to keep the knees extended) and adductors (to keep the legs together)

Notes:

It's helpful to work at using the erector spinae and deep intrinsic muscles of the back in this posture rather than using the latissimus dorsi. Using the latissimus dorsi or other more superficial muscles can interfere with breathing by inhibiting the movement of the ribs. It's also important to engage the abdominal muscles slightly to prevent overexertion of the muscles in the lumbar region.

Bow (Dhanurasana)



Muscles Stretching

Quadriceps (rectus femoris), psoas (lower fibers), iliacus, rotator cuff muscles, pectoral muscles, triceps

Muscles Working:

Rotator cuff muscles (to stabilize, eccentrically), deltoids, rhomboids, triceps (eccentrically), hamstrings, quadriceps (vastus lateralis – to begin straightening the knee)

Notes:

The shoulder blades (scapulae) must be mobilized and assist with this posture, or else the shoulder joint could be at risk of injury. Also, because this is a bound posture (holding the ankles), there is the possibility of placing too much pressure on the knees. It is important to activate the feet to help protect the knees. Have students slightly engage their abdominal muscles to protect the lumbar region from excessive extension and to encourage the extension through more area of the spinal column by squeezing the shoulder blades together.

Anatomy of Supine Postures

Just as tadasana is the foundational standing posture, savasana is the foundational supine (back lying / face up) posture. Moving into postures from a supine position engages the anterior muscles (front of the body). This is why many strengthening exercises also start in this position.

Savasana

The challenge of savasana is to release tension from every part of the body and trust in the support of the floor while you allow gravity to do its work. In savasana, the primary curves have the most weight on the floor. These include the posterior surfaces of the backs of the heels, gastrocnemius (calves), hamstrings, gluteus maximus, sacrum, thoracic spine, scapulae, and occiput (back of the head). The structures that are off the floor are part of the secondary curves of the body and include the posterior (back) surfaces of the Achilles tendons, knee joints, lumbar region of the spine, and cervical spine.



During savasana, it can be helpful to start at the feet and encourage students to consciously relax and release their muscles in each region as you work your way up the body towards the head. Students often hold much tension in their jaw, so encourage them to open their mouths and move their jaw around before allowing their jaw to relax and fall slightly open.

It's important to give students enough time in savasana to allow the muscles time to fully relax.

Anatomy of Specific Supine Postures

The following section will examine specific supine postures based on the final position of the spine, including spinal flexion, extension, and rotation.

Supine Postures with Neutral Spine and Flexion of Spine

Shoulderstand (sarvangasana) – neutral spine except for cervical and upper thoracic flexion



Muscles Stretching:

Serratus anterior, muscles of the shoulders

Muscles Working

Rectus abdominis, psoas, adductors, hamstrings, rhomboids (to adduct the shoulder blades), deltoids, biceps, gluteal muscles

Notes:

Coming into shoulderstand from plow posture is more demanding on the erector spinae because they are in the elongated position before contracting. Entering the posture from bridge is more demanding on the shoulder joints and the flexors of the spine (psoas and abdominal muscles).

Remind students to engage their abdominal muscles and tuck the tailbone in (contracting their hamstrings, adductors and gluteal muscles). This will help prevent too much strain on the arms and wrists.

Supine Postures with Spinal Flexion

Plow (Halasana)



Muscles Stretching:

Erector spinae, gluteus maximus, hamstrings, calf muscles

Muscles Working:

Adductors, quadriceps, tibialis anterior (shin muscles), and dorsi flexion muscles (front of the ankle). Gravity also helps to flex the hips.

Notes:

In full plow when you clasp your hands together on the floor in front of you, it becomes a more difficult posture, since the trapezius and rhomboids must lengthen and the weight fall more directly on the upper spine (cervical, upper thoracic regions).

This posture can create a very intense flexion for the spine, so it is more important to make sure that you properly support the cervical and thoracic regions than to get your feet to the floor behind you. To ensure that your students support themselves, have them continue to support their hips with their hands until their feet can comfortably reach the floor behind them. You can also place a folded blanket on the floor behind your student's head, so there is less distance for them to reach their feet to a support.

It is critical to protect the student's cervical spine. Check with all students before teaching this pose. For any student who has any problems with their neck, it is best for them to simply extend their legs in the air, without lifting their hips off the floor or place their legs up a wall. This will still give them the benefits of being inverted, without placing undue pressure on their neck.

Legs Up the Wall / Legs in the Air



Supine Postures with Spinal Extension

Fish (Matsyasana)



Muscles Stretching:

Anterior (front) neck muscles, pectoral muscles, serratus anterior, deltoids

Muscles Working:

Erector spinae, psoas major, hamstrings (to ground hips), trapezius, latissimus dorsi, triceps

Notes:

If support of the elbows is used, there is less work in the muscles of the torso and usually makes breathing easier. Fish pose is often used as a counter pose to plow or shoulderstand because it reverses the position of the cervical spine and the thoracic spine (for plow).

If a student has problems with their neck, encourage them to not drop their head back, but to keep looking forward, while the continue to squeeze their shoulder blades together and lift up through their chest. Keeping the head forward will not only protect the neck, it will help strengthen the muscles supporting the neck.

Bridge (Setu Bandhasana)

This posture is a mix of spinal extension and flexion (cervical and upper thoracic flexion, and lower thoracic and lumbar extension)



Muscles Stretching:

Psoas, rectus abdominis, obliques, serratus anterior, flexors of the forearm, anterior rib cage muscles

Muscles Working:

Erector spinae, abdominal muscles (eccentrically to prevent over extension of lumbar), hamstrings, rhomboids, rotator cuff muscles, adductors (to internally rotate hips and keep legs from falling away from each other)

Notes:

Encourage students to keep their feet facing forward and to squeeze their thighs together (adduct). This will help stabilize the lower body and place less strain on the cervical and upper thoracic regions of the back. One way to get students to keep their knees close is to place a block between their knees for them to hold with their knees.

Supine Postures with Spinal Lateral Flexion

Reclined Side Leg Lift (Anatasana)



Muscles Stretching:

Adductors (inner thigh), hamstrings, obliques (opposite of lifted leg)

Muscles Working:

Obliques (same side as lifted leg), deep rotator muscles (piriformis), hamstrings (to resist hip flexion)

Notes:

When the leg is lifted in this position, the pelvis and lower body tend to twist backwards. The challenge is to find the counteraction deep in the pelvis rather than by simply twisting the spine. The gluteus maximus and deep rotator muscles can be used in the bottom leg to stabilize the body as long as the bottom leg is well grounded into the floor. Students often have a tendency to roll onto their backs in this position or to turn their knee cap so it fully faces the floor. Remind students to keep working to turn their knee slightly forward. This will help bring the stretch to the inner thigh (adductors).

In side lying postures, the diaphragm shifts slightly. This is caused mainly by the effects of gravity on the abdominal organs, which are pulled towards the floor, taking the diaphragm with them. The lung closest to the floor becomes more supported and the tissues more elastic making it easier to breathe on that side. Practicing this posture on both sides can be helpful for people who tend to always sleep on one side of their body to bring more balance to their breathing on both sides.

To stretch the front of the thigh (quadriceps), have students drop their leg back down and bend the knee of their top leg (bringing their foot to their bottom). Draw the top shoulder back to open through the chest and press the bent knee (top leg) towards the foot of their extended leg (until they feel a stretch in the front of the thigh).

Supine Postures with Spinal Rotation

Supine Twist (Jathara Parivrttasana)



Muscles Stretching

External obliques, intercostals, gluteal muscles, piriformis

Muscles Working:

Mainly gravity is working to pull the body into the stretch. The erector spinae are working somewhat to resist flexion in the lumbar spine.

Notes:

To ensure that the twist is evenly distributed throughout the spine, it is important to maintain a neutral spine. This is a challenge when one or both knees are bent since the tendency is to move into flexion to deepen the rotation. However, this can put too much pressure on the lumbar vertebrae. There is also a tendency to move into spinal extension when trying to keep the opposite shoulder on the floor. Again, this can cause undue strain, and it's best to try to keep the spinal column in a neutral position for the rotation. To do this, you may need to shift your shoulders in the same direction as your bent knees.

Activity:

Pick two postures and present them to your group. Demonstrate each posture and explain the muscles the are working and those that are stretching and any special considerations or guidelines that should be included when teaching each posture.

Posture 1: _____

Posture 2: _____