

## Yoga to Reverse Osteoporosis and Osteopenia: Morning Sequence

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### 3 Guidelines for an effective Yoga for Osteoporosis practice

1. Consistency: Practice each day, ideally all the poses, but at least 2-3.
2. Mindfulness: Don't round your back.
3. Effort: Vigorously try to make each pose better, each time. Better means more challenging, more neutrally aligned, and more spacious, with more core engagement.

### Strong muscular engagement for 30+ seconds is essential for increasing bone mass

To build bone mass it is important that all the poses are being held for at least 30 seconds, and ideally for 45-60 seconds. If that seems too long right now, work your way up to that duration gradually.

It is also crucial that there is significant muscular engagement in all the poses, because strong muscular engagement dramatically increases the physical forces on the bones that are necessary to trigger the increase in bone mineral density. In particular, the engagement of the core muscles is very beneficial for osteoporosis, as it increases the pressure on the bones whose bone mineral density we want to improve the most: the spine, the hip girdle, and the femoral necks.

One way this engagement can be created is through a “hugging in to the midline from the sides of the hips”. Such an engagement tends to result in a feeling of spinal lengthening, so a focus on lengthening the spine will also help create this beneficial core engagement. If you feel like you are “taking a vacation in your hip joints,” then you are not engaging your core enough!

Another way to ensure strong core engagement is to emphasize a free and spacious breath in each pose. The main technique for freeing your breath in virtually all yoga poses (as well as in daily life) is to create more neutral hip and spinal alignment. To do this, you have to engage your core muscles intentionally and intelligently, which again will put more pressure on the hip bones, femoral necks, and spine.

### The right level of effort

How do you know what level of effort is appropriate? One way to create an effective effort is to “challenge your enjoyment of your breath without overwhelming it.” Another way to think of it is that you want to create “therapeutic discomfort” while avoiding actual pain.

### Avoid forward bends to prevent vertebral fractures

Also essential for staying safe with osteoporosis is to avoid forward bending the spine. Vertebral fractures are a common side effect of osteoporosis, and are virtually always the result of forward bends. Avoid forward bending your spine, and learn how to get down to and up from a chair or the floor without forward bending (see detailed instructions for the latter below). Use your arms for support on a chair back or a wall to

get down on your knees, and then come to the floor sideways, supporting your weight on your arms.

There also is a common tendency in many yoga poses to add a forward bend in the torso because it allows us to go farther with less effort. There are three important reasons for not giving in to this pattern:

1. Forward bends can cause vertebral fractures.
2. Countering unintentional forward bends requires the engagement of core muscles that almost certainly will increase the beneficial forces on the hip bones, spine, and femoral necks.
3. Maintaining more neutral hip and spinal alignment also keeps your breath free and spacious, supports a sense of ease and joy in each pose, and thus allows you to hold each pose for longer and to create a more vigorous effort without feeling overwhelmed.

*The importance of learning to listen to your body and your breath cannot be overstated. Learning to listen to your body and breath helps prevent injuries, makes your practice more enjoyable (which means you are more likely to keep it up), and teaches you to reduce your ego's dominance over your true self. Listening to your body and breath is also an effective way to quiet the puppy mind and become more present in the here and now. ☺*

### Morning Sequence

Do this sequence once or twice a day. If you do it twice, do your practices at least 8 hours apart for maximum benefit. But the first order of business is to establish a daily habit. If it helps you to only do 2-3 poses for the first few weeks, until your new yoga habit is ingrained, by all means do that.



Easier

Harder

**1. Vrksasana (Tree Pose) modified,** osteoporosis emphasis 30-45 seconds each side.

If your balance is not great, stand near a wall or a chair or both to have something solid within reach to catch yourself if you start to fall.

Inhale, lift your toes, spread them, and extend them forward. On your next inhale lift your right foot, rotate your knee out to the side, and place the sole of your right foot against the left leg's inner calf. If that proves too challenging, place the right foot against the inner left ankle (1<sup>st</sup> photo).

Exhale press the lifted foot into the standing leg to increase the forces acting on the bones. Placing the foot higher is not necessarily better. Place it where you can generate more power. That said, placing the foot into the inner ankle probably does not



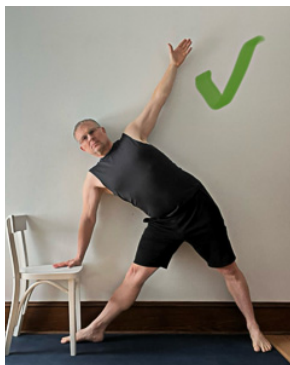
let you press as powerfully, but it may be where you need to start.

Another way to increase the forces going into the bones is to engage your outer thigh muscles to rotate the lifted leg as far out to the side as possible, without rotating your hips. What matters is not the degree of rotation in the hip joint, but that you are applying force to the bones through muscular engagement. In other words, it is important that you engage your muscles as if to rotate the leg farther, even if it doesn't rotate any farther.

Place your hands on your hips and notice that your hips have probably come out of neutral horizontal alignment. We do this subconsciously to avoid any unnecessary stresses on our body, but this is entirely counterproductive, especially for osteoporosis. In order to build bone, we have to place stresses on the bones. One extremely effective way to do that is through intentionally moving your hips back towards more neutral alignment whenever you have (subconsciously) moved them away from neutral. Notice that the hip of the lifted leg has also lifted, and probably rotated backwards as well. Any amount of muscle engagement to move your hips back towards neutral will increase the beneficial forces on the bones, even if very little or no movement is actually happening (compare photos 4 & 5, especially the hand position which indicates hip position). The simple act of engaging core muscles to create more neutral hip placement will make any pose much more beneficial for building bone mass in the lumbar spine, hips, and femoral necks.

Inhale lengthen through the crown of the head by hugging the sides of the hips into the midline to create even more beneficial force on the bones.

To come out of the pose, take a conscious breath, engage your core, and press your left foot into the floor to mindfully return your right foot to the floor without rushing. Repeat on the other side.



Easier



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**How to safely get in and out of poses 2, 3, and 4:**

To put more beneficial forces into the bones in these poses, it is important that you challenge the distance between your feet. For Warrior II and Side Angle, you can do that by sitting on a chair. This compels you to take a long stance. However, if you are not sitting on a chair, place a chair along the long side of your mat, with two chair legs on the mat, and with the chair back facing you. Place your hands on the back of the chair while coming in and out of these sideways-facing standing poses to make sure you are creating a challenging stance without risking a fall. The safest way is to “heel-toe” the back foot farther away from you, lifting the heel while pivoting on the front of the foot, then lifting the front of the foot and pivoting on the heel, etc.

You may feel like you don’t need the chair, but if you don’t use one, the tendency is to make your stance too short.

To come out, place your hands on the chair back first, and then come out slowly and mindfully, supporting the weight of your torso with your hands while you “heel-toe” the back foot back in.

**2. Trikonasana (Triangle Pose), modified, osteoporosis emphasis 30-45 seconds each side.**

Stand on your mat with a wall behind you. Optionally place a chair to your right, also on the mat, touching the wall. Rotate the right foot out 90 degrees and widen your feet enough to make the stance challenging. If you are using the chair, place your right foot partially or completely under the chair. Turn your left foot in very slightly, so that the outside edge of the foot is parallel to the back of the mat. Make sure that the heel of the front foot points at the middle of the back foot. Straighten both legs, and place your hands on your hips.

To come into the pose, lower the front (right) hip and lift the back hip to tilt your torso to the right to bring your right hand to the seat or back of the chair, or to your leg. With an inhale, roll your left shoulder blade



onto your back to float your elbow, wrist, and finally your fingertips up.

Tune into your left hand. If you are reaching your top hand behind you, you are probably trying to pretend that your torso isn't collapsing forward (photo #2). However, reaching the hand behind you will actually contribute to this collapse. Instead, move the hand in the direction of the palm (photo #3), out of the pose, and then broaden across the collarbones and let the arm and hand follow as you undo the collapse in the front of the torso (photo #4).

Notice where your torso is relative to your front leg. If your torso is inside your front leg, and your right knee cap is pointing to the inside of your right foot, rather than aligning with the second toe, you are avoiding an inner thigh stretch. If so, scoop your right sit bone underneath you to externally rotate your thigh (without moving your foot, assuming your foot is parallel to the long sides of your mat).

Notice how this action engages your core, deepens the inner thigh stretch, and frees your breath as your knee, hips, and torso align more neutrally (photo #5). If you are still rounding forward a little, inhale into the front of your chest to lengthen the front of your torso and to move your shoulder blades backwards to undo the collapsing of the front of the chest. If you have a wall behind you, think about moving both shoulder blades towards the wall, with the top shoulder blade as close to the wall as the bottom one.

Optionally place your hand on a block or even on the floor. But notice the very strong tendency to collapse forward to facilitate a lower hand placement (see incorrect action in first dark wall photo). If you do this, you will make the pose LESS effective, even though you might have convinced yourself that you are accomplishing more. You are not. The second dark wall photo shows good alignment with fingertips on the floor. This hand position does not compromise my alignment, but placing my palm on the floor does. For other people, the point where they lose good alignment may come earlier or



Final Pose: Easier

Harder



later. The right place for you is where you can still free your breath by maintaining a neutral torso, but with difficulty. Lastly note the tendency to side-bend the spine visible in the left photo marked with a red 'X'. Remove the side bend from the spine by extending the lower right side ribs towards the right foot, and/or by lengthening the right hip crease away from the right side ribs (right photo). To come out of the pose, take a conscious breath, engage your core, and press your feet into the floor to mindfully return to standing without rushing. Repeat on the other side.

**3. Virabhadrasana II (Warrior II Pose), modified, osteoporosis emphasis: 30-45 seconds each side.**

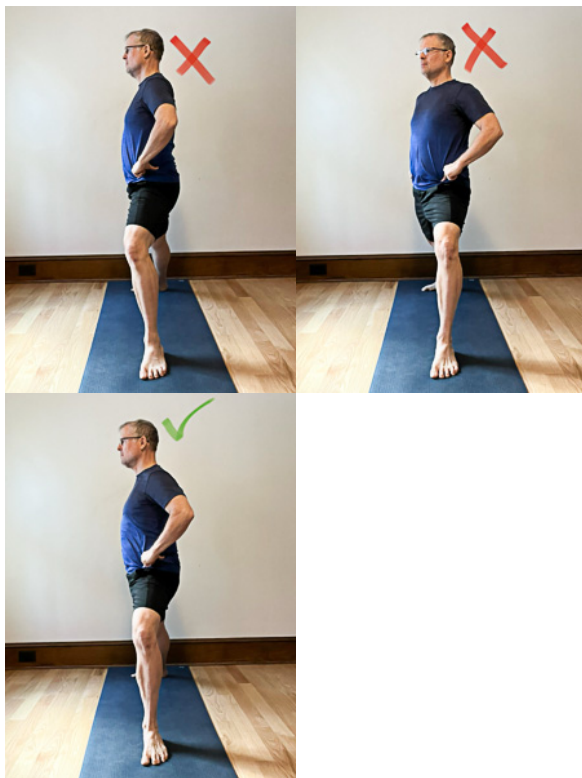
Stand on your mat with the same foot position as for Triangle Pose: Right foot turned out 90 degrees, left foot turned in slightly, and the heel of the right foot pointing at the arch of the left. Lengthen your stance to make it challenging, and place your hands on your hips.

To come into the pose, bend your right knee to place it over or just behind your right ankle.

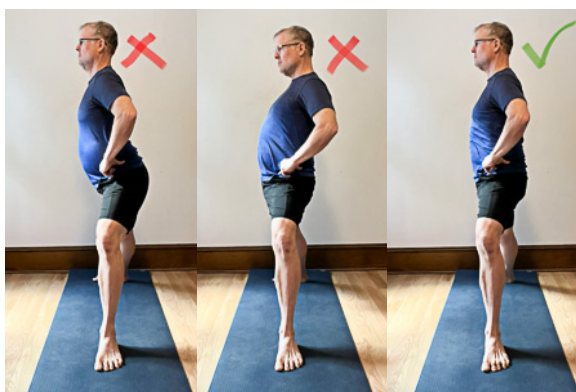
Notice whether the right knee is pointing inside the second toe. If so, lengthen along the inner right thigh to get the knee to align more with the right foot.

Keep your hands on your hips to notice whether you are misaligning your hips to follow the path of least resistance. It is likely that you are misaligning your hips in all three dimensions. We will address them one at a time.

**Left-right hip height:** Notice whether your back hip is higher (left photo). If so, lower it (right photo). When you lower the back hip, keep your shoulders level so that the hip movement can allow your spine to become more neutral. It is common for the shoulders to move along with the hips (3<sup>rd</sup> photo) but this is not helpful as it does not free the breath.



**Hip rotation in the horizontal plane:** If you are keeping your hips parallel to the long side of your mat, your front knee is probably pointing inside of your front foot (left photo). If you are trying to align your front knee over your front foot, the easiest way to do that is to rotate your hips towards the front of your mat (right photo). That is not really beneficial. To increase beneficial forces on the bones, you want engage muscles to turn the front knee out while at the same time engaging muscles to turn your hips to face the long side of your mat (3<sup>rd</sup> photo). Your alignment does not have to be perfect for this to be beneficial. *It's the engagement as if to turn your hips and your knee in opposite directions that is beneficial, even if very little or no movement is happening.*



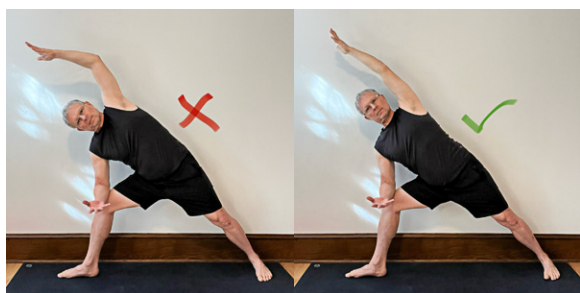
**Front to back hip rotation:** Notice whether your butt is sticking out behind you (left photo), or whether you are collapsing forward into the front of the hips (middle photo). Neither position is helpful as you are simply avoiding stretching what is tight in your body. On an inhale, gently tilt your tailbone up behind you first, and on the exhale scoop your sit bones underneath, finding more neutral hip rotation in the middle. Emphasize the movement in the front sit bone. This will also help align the front knee with the front foot.

To come out of the pose, take a conscious breath, engage your core, and press your feet into the floor to mindfully return to standing without rushing. Repeat on the other side.



Final Pose: Easier

Harder



#### 4. Utthita Parsvakonasana (Extended Side Angle Pose), modified, osteoporosis emphasis; 30-45 seconds each side.

Stand on your mat with the same foot position as for Triangle Pose: Right foot turned out 90 degrees, left foot turned in slightly, and the heel of the right foot pointing at the arch of the left. Lengthen your stance to make it challenging, and place your hands on your hips.

To come into the pose, tilt your hips to the right as you do for Triangle pose. Then bend your right knee until it is above or just behind your ankle, and place your right forearm on your right thigh just above the knee. If that arm position is causing your torso to collapse and round forward, place your hand instead of your forearm on your thigh, at least for now.

Notice whether the right knee is pointing inside the second toe. Lengthen along the inner right thigh to get the knee to align more with the right foot.

To free your breath, lengthen your right side-body by moving the right hip crease down, and the right side ribs up. You can also think of this as moving the right side ribs towards the right knee, if that instruction is more intuitive to you.

Roll your left shoulder blade behind you to avoid collapsing the front of the chest. Keep your left hand on your left hip, or bring your left arm alongside your left ear while leaving some space between the arm and the ear. Extend up through the crown of the head more than your raised hand.

Engage the outer right thigh muscles to rotate the right leg farther out to the side. As in Tree Pose, it's not the rotation that is important, but the engagement as if to create the rotation, as that engagement puts more pressure on the bones, especially the femoral neck. The more you bend the front leg, and the more you lower the front hip to minimize the side bend (similar to triangle pose), the greater the beneficial forces on the bones of the hip girdle.

Notice that lowering the front hip also frees your breath, which means that the additional work required to align your spine more



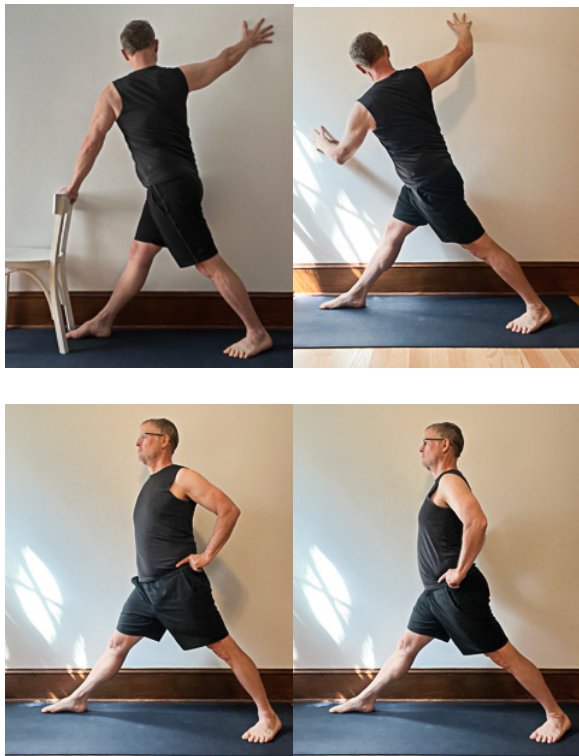
neutrally doesn't feel as terrible as you thought.

To come out of the pose, take a conscious breath, engage your core, and press your feet into the floor to mindfully return to standing without rushing.

Repeat on the other side.

Final Pose: Easier

Harder



### 5. Parivrtta Trikonasana (Revolved Triangle), modified, osteoporosis emphasis: 30-45 seconds each side.

*NOTE: This pose uses a different stance from the three preceding poses.*

Stand with a wall to the right of your body, and optionally a chair in front of you with either the back or the seat facing you, and the chair against the wall. Step the right leg forward. If you are using a chair, place the foot under the chair, centered on the chair. Step the left leg back until the length of your stance feels at least somewhat challenging. Ensure your left foot is farther away from the wall than your right, and that the left toes are rotating towards the front of the mat as much as possible without causing your left heel to lift off the floor.

Place your hands on your hips and as you exhale, rotate your back hip forward so your hips are more perpendicular to the wall. Inhale lengthen through the crown of your



head by hugging the sides of your hips into the midline and fold forward from your hip creases (hip hinge) without rounding your back, and place your left hand on the chair back or seat (if using).

*CAUTION: Do not round your back to place your hand on the chair seat. If you feel like you have no other option, then place your hand on a block on the chair seat or on the chair back, or place both hands on the wall.*



Exhale twist towards the wall, placing both hands on the wall on the diagonal line formed by your shoulders. If you are using a chair, keep the trailing hand on the chair. Inhale lengthen the spine again by hugging the outer hips to the midline. Exhale press the right hand into the wall to rotate the right shoulder blade away from the wall, and the left side ribs towards the wall. Maintain strong core engagement rather than working only the arm and shoulder muscles.



Too much twist in the neck, not enough in the torso

Minimize the twist in your neck so you can maximize it in the lower torso where it matters (compare photos 5 & 6). If you find it difficult to breathe in this deep twist, feel free to reduce the twist as you inhale, and then increase the twist as you exhale, pulsing with your breath.

To come out of the pose, take a conscious breath, engage your core, and press your feet into the floor to mindfully return to standing without rushing.

Repeat on the other side.

*NOTE: The next two poses are poses 10 and 11 in the original sequence. Since I recommend the version of these poses that is not done on the floor, it makes more sense from an efficiency perspective to do them before the floor poses. I have consulted with Dr. Fishman on this and he has no objection to this change.*



### 6. Marichyasana III with osteoporosis emphasis: 30-45 seconds, each side.

Place a chair on your mat along a wall with the left side of the chair touching the wall. Facing the chair, place your right foot on the chair seat, leaving some room between your outer thigh and the wall. Inhale to lengthen your torso as you engage your core and hug your hips towards your midline. Exhale twist towards the wall, initiating the twist by rotating your ribcage relative to your hips, not by craning your neck.

Inhale lengthen through the crown of your head by engaging your core and hugging the sides of your hips towards the midline of your body. Exhale twist towards the wall and place your leading hand on the wall at shoulder height, and your trailing hand on the outer thigh that is closer to the wall. If you find this hand position awkward, you can place both hands on the wall at shoulder height, somewhat wider than your shoulders. However, pressing your hand into the outer thigh will allow you to use both arms to increase the forces acting on the spine, as well as add bending forces in the femoral neck of the leading leg, and tensile forces in the wrist. Inhale lengthen again through the crown of your head. Exhale deepen the twist pressing the leading hand into the wall, and the trailing hand into the outer thigh, while resisting with your outer thigh muscles so that the hand doesn't move the thigh. As you press with your hands, focus on moving the trailing side ribs closer to the wall, while moving the leading shoulder blade farther away from the wall (compare 3<sup>rd</sup> and 4<sup>th</sup> photos). You can press the leading hand into the wall to deepen the twist, but engage your core as well. Keep your neck relaxed and your chin centered between your collar bones. If you are twisting your neck to feel like you are twisting farther, you will actually be twisting less where it matters, namely in the torso. Learning to move from the core: Turn as far as you can, and notice that you are probably leading with your gaze and are looking where you want to go. When you can go no farther, notice how spacious and delicious the pose feels (probably not very). Then, on an inhale, turn your head back towards your legs, and on the exhale notice if you can twist farther in the torso while gazing in the direction of your legs (you usually can).

Then allow the head to follow the torso into the pose, without straining. Notice again how spacious and delicious the pose feels. In all likelihood, the pose will now feel better even though you have twisted farther. Leading with your eyes and chin is not an effective (or enjoyable) way of moving, because focusing on the periphery prevents you from fully utilizing your core muscles for your movements. Unfortunately, we all move that way habitually, but we can learn to disrupt that pattern by learning to move from the core.



Getting down to the floor and back up without rounding your lower back (to prevent vertebral fractures):

*NOTE: Do this every time you get down to the floor and back up from the floor.*

Place a chair against a wall, next to your mat. If you are not next to a wall, place two chair legs on the mat to keep the chair from moving. Place a hand on the back of the chair for stability. If your right hand is on the chair back, step your right foot back and place your left hand on your left thigh for additional stability as you begin bending your knees. Stick your butt out behind you to keep your spine from rounding forward and slide your left hand down your left thigh as you bend your knees farther (1<sup>st</sup> photo). Place the right knee on the mat, bracing yourself with your right hand on the chair back and your left hand on your left knee.

Once you are on one knee, you can place your left hand on the chair seat to bring your other knee to the floor. If your knees are sensitive, you can place a folded blanket where you will place your knees.

Sit on your heels, bring one hand out to the side, slide your hips off your heels and lower yourself onto your side body, again to avoid rounding your spine forward.

*NOTE: If you can't sit on your heels, see the following variation.*

Once your whole side body is on the ground, you can then roll onto your back or your belly, depending on what pose you are doing. To come back up, reverse the steps exactly.



**7. Savasana** with osteoporosis emphasis: 2 minutes (or more).

Lie on your back and snuggle your shoulder blades a few millimeters towards the spine and down the back to create a slight expansion in the front of the chest, but don't move your shoulder blades so far that your spine or back ribs lift off the floor. If it feels like your head is falling back, using your hands, lift your head a millimeter and guide the back of your head away from your shoulder blades, gently lengthening the back of the neck without hardening it. If your head still feels like it is falling back, place a folded towel or blanket under the head, but make sure the support is as thin as it can be while still allowing your head to feel neutral (Goldilocks principle: Not too much, nor too little).

Place your hands off the mat, with your arms at a 30-45 degree angle to the torso. Rotate your arms so your palms are facing up. Bring your feet slightly wider than your hips, and allow your feet to rotate out as you relax into the pose.

**Savasana variation (to address hyperkyphosis):** Hyperkyphosis (“dowager’s hump”, “hunch back”) has many negative effects on long-term health. Furthermore, if you have osteoporosis of the spine, hyperkyphosis significantly increases your risk of vertebral fractures, which you really want to avoid. Doing the following chest stretch instead of a standard Savasana can dramatically improve your posture in a matter of months.



**Wall Test (optional):** Stand 1 inch (2-3 cm) in front of a wall without touching it. If you have a ponytail, take it out. Stand in a way that feels neutral. Shuffle your feet backwards in tiny steps until some body part touches the wall. Note which body part touches the wall first. Note that neutral alignment means that buttocks (actually the sacrum), shoulder blades, and head touch the wall at the same time, with calves and heels *not* touching the wall. This is exceptionally rare but very beneficial. *NOTE: If you have big glutes, use the corner of a post or corner of a doorway to measure your alignment. Technically you want to measure your head relative to your sacrum, not your buttocks.*

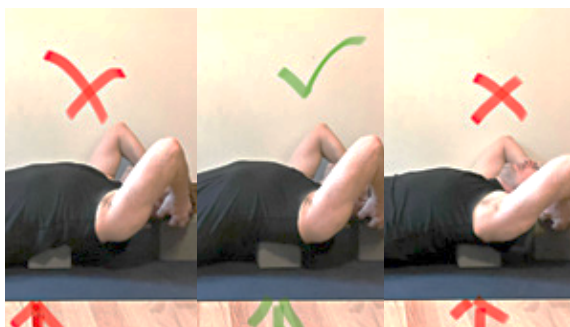
With your buttocks and your shoulder blades touching the wall, measure how far your head is from the wall by counting how many fingers you can insert horizontally between the wall and the back of your head. Don't force the head to the wall. Instead do one of the "Stretch out what has gotten tight" exercises in the "Reducing Hyperkyphosis" section below and then observe if your head quite effortlessly gets closer to the wall over time. As long as your head is forward of your upper back, your head position will worsen your hyperkyphosis and your neck tension.



**A) Reclining Chest Stretch (Savasana variation):** 2-5 minutes, once or twice a day, or as often as feels beneficial.

Use 2 thick (3.5-4", 9-10 cm) yoga blocks. One block sideways on its lowest setting under your shoulder blades (bottom edge of block near the bottom tips of your shoulder blades), the other block on the middle setting under your head. The distance between the blocks is a bit more than a hand-width. If one block is softer than the other, use the softer one under the back.

*NOTE: If you are buying yoga blocks for this purpose, I highly recommend getting one Manduka unBLOK to place under the back. It's curved and thus more comfortable and more effective (3<sup>rd</sup> photo. Alternatively you can place a rolled-up hand towel on a regular block to create*

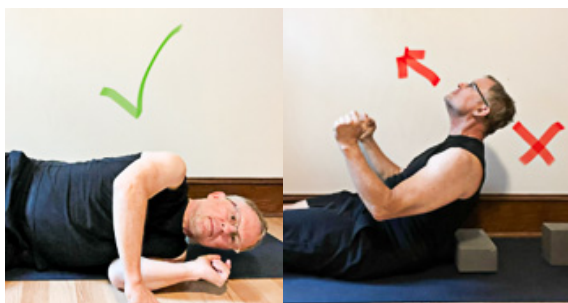


a curved surface for your back (4<sup>th</sup> photo) ). The head can be on a regular block.

Once you have placed your head on the support, lift it again just one millimeter using your hands, and guide the back of the head farther away from your shoulder blades with your finger tips. This will dramatically increase the effectiveness of the pose, as hyperextending the neck allows you to minimize the chest stretch (compare 5<sup>th</sup> and 6<sup>th</sup> photos). When your neck is in its neutral position, there will be a soft space in the back of the neck big enough for three fingers. If there is not enough space for 3 fingers, your neck is still hyperextending. If the back of the neck feels hard and long, you have lengthened the back of the neck too much.

If your hyperkyphosis is more pronounced (5 or more fingers of space between head and wall in the “Wall Test” above), then you may want to stack two blocks on their lowest setting under your head (7<sup>th</sup> photo), or place a folded towel on one block on its middle setting. You can also place the block that supports your head on its highest setting, but with this arrangement it is easy to knock the block over when you lie down on it. To avoid the block falling over, you can place it against a wall (see 8<sup>th</sup> photo). **The key is to make the head support high enough that the head does not feel like it is falling back, but not so high that it is being pushed forward.**

Adjust the position of the support under the back until you feel the biggest opening in the front of the chest. The greatest stretch in the front of the rib cage tends to happen when the lower edge of the block is right under the bottom tips of the shoulder blades, just above your bra strap (if you are wearing one). It is surprisingly easy to put the support either too low or too high on the back. Compare the 3 photos with my hands by my head (so that my arm isn't obscuring the block). Experiment and observe! Don't stress over the block placement too much. ☺ There is a range of at least 2 inches (5 cm) where the block placement is truly effective. Even the 2 relatively extreme block placements in the photos are still somewhat beneficial, as you can see from the curvature of the chest, but they are less comfortable.



Straighten your legs along the floor. If you are tempted to bend your knees and plant your feet, notice if you are doing that to subconsciously reduce the chest stretch. If that's the case, then straighten your legs. However, if you need to bend your knees to allow your lower back to be comfortable, then it is okay to bend your knees. Rotate your arms so your palms are facing up, because palms down also reduces the stretch. **IMPORTANT:** When you are ready to come out, roll down onto the floor and onto your side, then support your weight with your arms to come up sideways, as shown above. Sitting straight up with momentum has the tendency to immediately re-tighten what you just stretched.



Optionally re-do the Wall Test to observe if your neutral head placement has changed. Stand in a way that feels truly neutral before walking backwards to the wall. Measure how many fingers fit between the wall and the back of the head now. Do this from time to time as it is a good measure of your progress in improving your posture. But remember that forcing the head back will not help.