Yoga Teacher CENTRAL

Healthy Posture

Lesson

Lesson Overview

In this lesson, we explore the meaning and implications of healthy posture.

Objective

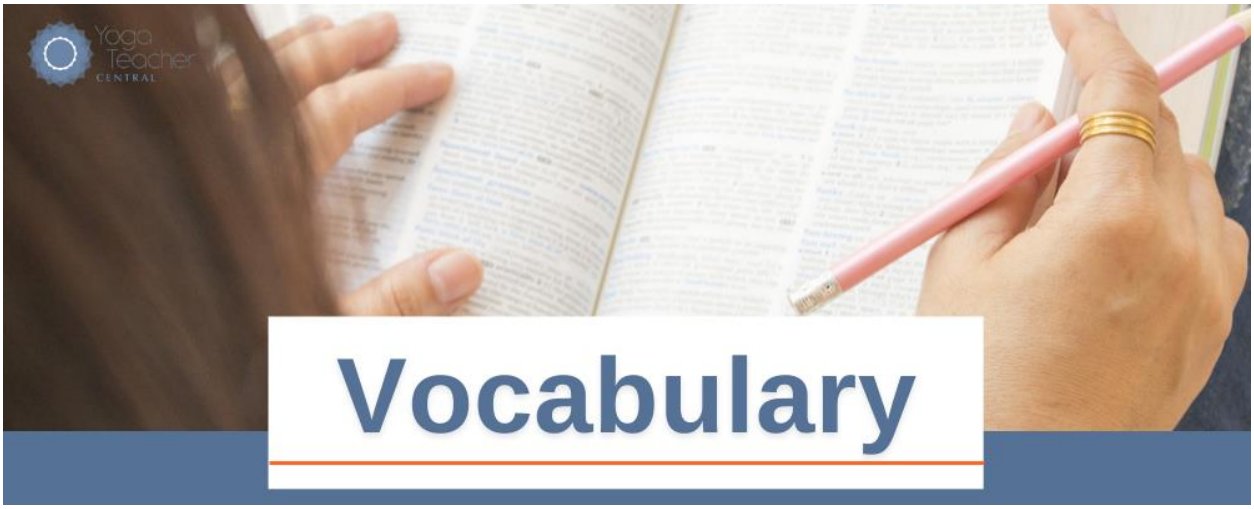
Learn terminology and considerations related to posture including anatomical position, habits and muscle memory, sensory motor amnesia and the attributes and implications of healthy posture.

Description

Define posture and the relationship between habit, muscle memory, sensory motor amnesia, bodily structure and physiology. Name the criteria that is often used when identifying healthy posture. Define the phrase "anatomical position" and what it means to stand in "neutral." Describe why it's inappropriate to idealize body symmetry. Explain why healthy posture matters and why students may find it difficult to identify a neutral spine. Cite research related to posture, pain, function and ROM. Describe four considerations for pelvic alignment in *Tadasana* (Mountain Pose). Discuss the effects of excessive sitting and other issues such as sitting with legs crossed, not changing position, and the technique used for bending over.

Vocabulary

anatomical position, healthy posture, ischemia, muscle memory, neutral pelvis, neutral spine, posture, sensory motor amnesia, standard anatomical position, standing in neutral



1. **ANATOMICAL POSITION** — In humans, defined as "standing up straight with the body at rest" (source)
2. **HEALTHY POSTURE** — A natural bearing of the body that includes a comfortably neutral spine and promotes healthy internal functioning and muscular efficiency
3. **ISCHEMIA** — Insufficient supply of blood to an organ (source); As it relates to posture, refers to the compression of blood vessels resulting from chronic muscular tension, causing pain and damage (source)
4. **MUSCLE MEMORY** — Movement or posture that has become automatic; a result of the nervous system shifting control and memory of a repeated pattern from areas of the brain responsible for making voluntary decisions to making them subconscious (source)
5. **NEUTRAL PELVIS** — A state of equal hip height, a neutral pelvic tilt, a neutral front-to-back placement and the pelvis is pointing straight ahead
6. NEUTRAL SPINE — A state in which the spinal curves are not too much or too little for the individual's healthy norm
7. **POSTURE** — A collection of (typically unconscious) habits and holding patterns (which form our muscle memory) that create "an attitude of the body" or an "orientation to the present moment" which reinforces itself through bodily structures and physiology
8. **SENSORY MOTOR AMNESIA** — The natural way in which bodily movement and posture becomes "automatic and involuntary" leading to loss of sensation, a lack of awareness of the muscular pattern, and a temporary inability to relax tight muscles (source)
9. **STANDARD ANATOMICAL POSITION** — Standing up straight and facing forward with the arms by the sides and palms facing forward
10. **STANDING IN NEUTRAL** — Another way to describe anatomical position; refers to standing with the bones stacked vertically and the two sides of the body displaying symmetry

Defining Posture & Healthy Posture

The word "posture" is often used casually, without a shared understanding of what exactly we're talking about. Even a yoga article with the word posture in the title vaguely refers to "standing tall" vs. standing "hunched over." So, let's begin by defining posture, exploring its vital role in our well-being, and identifying specific attributes of healthy posture.

What is It?

Drawing from the teachings of many sources, we can define posture as a collection of (typically unconscious) habits and holding patterns (which form our muscle memory) that create "an attitude of the body" or an "orientation to the present moment" which reinforces itself through bodily structures and physiology.

> Posture… You know it's distinctive – you can easily and immediately recognize close friends just by how they move and how they hold their collection of arms, legs, torso, and head together – that configuration is as individual to them as their fingerprint. But is posture JUST a description of how someone stands and moves – just a math equation of angles, force, and mass? Or does it go deeper than that? Mary Bond, author of The New Rules of Posture … says that posture is our "orientation to the present moment." It's affected not only by our bones, muscles, and fascia, but by our thoughts, emotions, traumas, history, chemistry, family, work – by all those holding patterns developed over years of living and being on this gravity-endowed planet. – Heather Longoria

How Posture Manifests: Through Habit, Muscle Memory & Sensory Motor Amnesia

> Our bodies adjust to the positions in which we hold them most often. – Heather Longoria

YogaUOnline explains here that posture is the result of physical exploration that began when we were babies, evolving into habits that we engage in repetitively, becoming "written into the brain" and ever "more ingrained."

- Through the evolution of habit, the body itself begins to "adapt to hold that posture."
- As a result, our habits become embedded into our bodily structure which continues to recreate and reinforce itself via our muscular holding and breathing patterns, fascia, nervous system, and mental states.

> POSTURE IS A COLLECTION OF (TYPICALLY UNCONSCIOUS) HABITS
>
> If there's one thing that everyone from bestselling authors to renowned philosophers agree on, it's the power of habits… Small actions, repeated until we do them almost unconsciously, shape our lives. What's less universally acknowledged is that our posture is a collection of habits, almost always deeply unconscious. Like the habits of thought that shape our lives, our postural habits shape our spines. – Eve Johnson

MUSCLE MEMORY DETERMINES OUR HABITUAL POSTURE

When our nervous system notices that we keep repeating the same movement or posture, it begins to make that movement or posture automatic. As the muscular pattern becomes more deeply learned, the control and memory of the pattern shifts to different areas of the brain. This process allows the parts of the brain responsible for making voluntary decisions to focus on new things that require conscious attention… Some people consciously choose to work with their muscle memory, actively training and retraining their muscular patterns in pursuit of a goal. But most of us are unaware that we are engaged in a constant process of subconsciously reinforcing old movement patterns and learning new ones. – Sarah St. Pierre

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Our posture — the way we sit and stand — is rarely genetic or out of our control. It's simply the result of chronic muscle tension pulling our skeleton out of alignment. This muscle tension builds up over time as a result of our daily movement habits and our reactions to stress. In other words, muscle memory determines our habitual posture. I'll tell you how to retrain your muscle memory and change your posture… – Sarah St. Pierre

AT SOME POINT, WE LOSE THE ABILITY TO RELAX MUSCLES UNTIL WE RE-LEARN HOW

The way gravity moves through the body is an unconscious experience. When we sit for too long with our head, bones, and ligaments not properly aligned, our muscles work against gravity. In other words, some muscle groups become overly engaged, intending to keep the body upright and can stay contracted even when the body changes position. This reflex is called sensory-motor amnesia. – James Knight

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Thomas Hanna, the man who developed Clinical Somatic Education, coined this term [sensory motor amnesia] to describe the loss of sensation and motor control that occurs as we learn muscular patterns. As we learn a movement or posture, not only does the control of that movement or posture become automatic and involuntary, but we also lose the sensation of the movement or posture. Our proprioceptive and vestibular systems gradually adapt so that we are unaware that the muscular pattern is even occurring. – Sarah St. Pierre

HABIT BECOMES STRUCTURE & PHYSIOLOGY!

The way posture is changed is a double-edged sword. In the case of the baby, the changes in the fascia that allow the body to move around and physically support itself are positive changes. But if, for example, you are dealing with depression, it's easy to get in the habit of hunching forward… The rest of your body will adapt to that posture, and gradually, it will become more and more ingrained into your nervous system. Your fascia will reshape to help hold that posture, forming a new structure for your body. This can not only reinforce the psychology that started the forward hunch; it leads to shorter, shallower breathing, which affects body and brain chemistry and can lead to more depression or anxiety. In addition, this new imbalanced structure will put certain muscle groups into a state of chronic tension. – YogaUOnline Staff, Explorations in Spatial Medicine

MUSCLES AND BONES ADAPT TO POSITIONS YOU PUT THEM IN

If you slouch for hours on end, or if you always habitually always cross your right leg over your left leg when you sit, your body will start to adapt to that position. Davis's Law states that your muscles adapt to the positions you put them in (getting shorter or longer as needed), and Wolff's Law states that your bones eventually adapt as well. Over time, these adaptations can lead to pain, dysfunction, and inefficient breathing. – Heather Longoria

As With All Conditions, Posture is Cultural, Not Genetic

While many sources continue to propagate the medical system's myth that genes can "cause" conditions, the 2003 Human Genome Project provided irrefutable proof that genetic determinism is false. To believe that one has "bad genes" can cause severe harm through its built-in victimization mindset. (See more here in "Where Mainstream Medicine Got it Wrong.")

In reality, we all have predispositions but also tremendous control over the factors that impact our well-being. Eve Johnson explains this from her experience:

I learned that posture is cultural, and that although every woman in my family had a rounded upper back, our genes weren't the problem. Like all little girls, we had modeled our posture on our mother's, and achieved the same results. – Eve Johnson

AN EXAMPLE OF HEALTHY POSTURE BUILT INTO CULTURAL NORMS & HABITS

[I was on a] train from Lyon to Aix-en-Provence. At one of the stops along the way, a tall black woman, Muslim by her clothing, stopped by our seats to get her suitcase from the rack above our heads. The suitcase was huge. For a moment, I struggled to form the French words for "my husband would be happy to help you with that." (It's true, he would have been). Before I could speak, she had lifted the suitcase from the rack. She centred it on her head for a moment, then lowered it to the floor and wheeled it away. I watched her graceful walk and her long, straight spine, until she disappeared. In its own way, this sight was as moving as Sainte Chapelle, and for some of the same reasons. I had just witnessed a posture as old as time, and as new as a toddler. Her strength had nothing to do with going to the gym, and everything to do with living in Original Alignment. This is our birthright as human beings, our first way of being in our bodies, and our chance to experience lifelong mobility, strength and relaxation. – Eve Johnson

The Components of Posture

One source provides a simple definition of posture as "an attitude of the body" and goes on to say:

> Good posture cannot be defined by a rigid formula; it is usually considered to be the natural and comfortable bearing of the body in normal, healthy persons. This means that in a standing position the body is naturally, but not rigidly, straight, and that in a sitting position the back is comfortably straight. Good standing and sitting posture helps promote normal functioning of body's organs and increases the efficiency of the muscles, thereby minimizing fatigue. – TheFreeDictionary.com

While that definition is fairly helpful, to refer to a "straight" spine can be misleading since the spine is naturally curved. A better term may be "neutral." Thus, we might define healthy standing and sitting posture as:

> A natural bearing of the body that includes a comfortably neutral spine and promotes healthy internal functioning and muscular efficiency.

The identification of healthy posture often involves these criteria:

1. A neutral spine
2. A neutral pelvis
3. Muscular balance
4. Body symmetry – It's common to find bodily symmetry as a stated factor in healthy posture and pose alignment. However, please review Body Symmetry vs. Balance below for important considerations.

Maintaining Healthy Posture

In addition to achieving healthy posture, equally challenging is learning to maintain it.

> REQUIRES ACCESSING DEEP CORE MUSCULATURE
>
> Learning to utilize the core to initiate movement whilst in a neutral pelvic alignment will not only reduce your risk of injury and lower-back pain but also go a long way towards improving your general posture. – TeamUSA.org

> REQUIRES LEARNING NEW HABITS
>
> I learned new habits: sitting with my weight as far toward my pubic bone as possible, turning my feet slightly out instead of keeping them parallel, releasing my chin, and elongating the back of my neck. More problematic, I had to unlearn habits, such as locking my knees when I stood and, most of all, lifting my chest… Over those two days, my new alignment began to feel right. – Eve Johnson

Why it Matters

While posture may be discussed in terms of how it affects appearance, here we focus on the impact that posture has on healthy functioning. Healthy posture promotes healthy internal functioning and muscular efficiency. See this article for many serious conditions that may be related to posture, including testosterone and cortisol levels, plus sciatica, disc degeneration and arthritis.

POSTURAL ISSUES IMPACT MOVEMENT, BREATH, DIGESTION, CIRCULATION & ELIMINATION

> Collapsed posture compromises the alignment of your bones from the center to the periphery of your extremities. This impacts the quality and efficiency of your movement, breath, digestion, circulation, and elimination. It often leads to uncomfortable muscular imbalances. – Jasmine Ellemo

Fundamental to why yoga works is its use of breath practices and the overall effect on the nervous system and stress. The ability to breathe naturally without constriction is a key to promoting health. Poor posture, however, can lead to poor breathing.

> Did you know that your ability to take a deep, full breath is influenced by your posture?... If the muscles that allow your rib cage to expand are tight — due to habitual slouching or other postural problems — your lungs won't be able to expand to their maximum... And if some of your chest or back muscles are weak, your endurance will be affected... To maintain good posture for optimum respiration, cultivating both the flexibility and strength of your torso muscles is vital. – Nina Zolotow

POOR POSTURE AFFECTS BREATHING & CIRCULATION, CAUSING MANY ISSUES

When you're hunched over, your lungs don't have enough room to expand and fill with air. Poor posture can reduce our oxygen intake by up to 30%, leading to brain fog, fatigue, and migraines. Our posture is a symbol of our overall health. Good posture promotes better circulation and communication between your brain and the rest of your body. It's like driving on the freeway with no traffic — your blood, lymph, and neurotransmitters travel smoothly to their destination. Lousy posture is like driving down a road full of potholes. Your blood can't transport nutrients and oxygen as easily, your tissues suffer damage, and you end up with more inflammation...

Before I became a medical doctor, I was a yoga instructor. Yoga serves so many incredible benefits for our minds and bodies, but it's also great to increase our postural awareness. One of my favorites is Mountain Pose... Some other great poses for posture and building the muscles to support good posture are Tree Pose and Hero Pose. Another simple posture-supporting exercise you can do is to get up and walk around every 20 to 30 minutes, especially if you're sitting at a desk all day... Modern-day hunter-gatherer tribes like the Hadza sit just as much as Americans do, yet they don't deal with the same chronic pain and back issues. Therefore, the problem is not how long we sit, but the way we sit. In Functional Medicine, structural integrity is one of the seven core clinical imbalances we look at when assessing a patient's health. If I see someone with bad posture, that tells me that other systems in the body may not be functioning optimally. It's never too late to work on your posture. The first step is increasing your postural awareness and knowing how to correct it. – Dr. Mark Hyman MD

In addition, posture affects energy and mood:

Poor posture also affects your mood and how you respond to stressful events. The field of embodied cognition examines how physical states affect thoughts, emotions, and memory. Slumping or slouching saps your energy, biases you towards negativity, and can even decrease self-esteem. People also respond to you better when you hold yourself upright. – Mark Sisson

And whether posture is cause or symptom, it can be related to vision and balance issues:

Poor posture is ... the dysfunction of various systems in the body that are either over or under functioning. In most bodywork circles, we think of faulty posture as a "tissue issue" and, in many cases problems do arise from strained or overused connective tissues and joints, but what about visual or balance (vestibular) disorders that may be compromising of the brain's sorting and switching stations?... Hours of sitting and staring at screens, lack of exercise, and poor body biomechanics all contribute to the symptom of poor posture and may lead to other conditions such as lack of focus, visual disturbances, depression, poor balance, protective muscle guarding and more. When performing a postural assessment as part of a client's intake exam, I'm not only looking at tissue issues, but more importantly, what the nervous system is doing with this information. – Erik Dalton, PhD

Research

Head & neck position immediately impact breathing (2018) link

- A sample of 15 healthy males, aged 18-35
- "This is the first study exploring the impact of different head and neck positions on respiratory function. Alteration of head and neck positions had an immediate negative impact on respiratory function."

Static standing and prolonged sitting are bad for health; regular postural shifts and movement are vital (2019) link

- "The experts concluded that (a) standing may bring benefits that accrue from postural shifts. Prolonged (mainly static) standing and prolonged sitting are both bad for health; (b) 'the best posture is the next posture'. Regularly breaking up of sitting with postural shifts and movement is vital; (c) health effects of prolonged sitting are evident even after controlling for MVPA [moderate-to-vigorous physical activity], but high levels of MVPA can attenuate the deleterious effects of prolonged sitting."

Postural awareness reduced chronic pain (2018) link

- 512 people with chronic pain were given a Postural Awareness Scale (PAS)
- "Improvements in postural awareness are… associated with reduced pain in patients with [chronic] pain."

Controlled trial: shoulder pain related to kyphosis (2020) link

- "Shoulder impingement syndrome (SIS) is the most common form of shoulder pain and a persistent musculoskeletal problem… The objective of this study was to investigate whether there is a relationship between SIS and thoracic posture.
- Thoracic posture of 39 participants with SIS and 39 age-, gender-, and dominant arm-matched controls was measured using the modified Cobb angle from a standing lateral radiograph. Thoracic range of motion (ROM) was also measured using an inclinometer.
- Individuals with SIS had greater thoracic kyphosis… and less active thoracic extension… Greater thoracic kyphosis was associated with less extension ROM… These cross-sectional data can only demonstrate association and not causation."
- "Individuals with SIS had a greater thoracic kyphosis and less extension ROM than age- and gender-matched healthy controls. These results suggest that clinicians could consider addressing the thoracic spine in patients with SIS."

Previous to the 2020 controlled trial above, a review had found no reliable evidence linking kyphosis with shoulder pain (2016) link

- "Thoracic kyphosis may not be an important contributor to the development of shoulder pain. While there is evidence that reducing thoracic kyphosis facilitates greater shoulder ROM, this is based on single-session studies whose long-term clinical relevance is unclear. Higher quality research is warranted to fully explore the role of thoracic posture in shoulder pain.

No relationship found between lower back pain and low back ROM (2016) link

- Comparisons of ROM between people with and without LBP showed few differences between groups, with reduced relative lumbar contribution to trunk flexion. There was no difference between groups for lordosis. "

Hip extension ROM not shown to relate to posture (1990) link

- 25 healthy adults, age 21 to 49
- "The purpose of this study was to examine the relationships between hip extension range of motion (ROM) and three determinants of postural alignment: standing pelvic tilt, standing lumbar lordosis, and abdominal muscle performance… These results indicate that these variables are not related."

A Neutral Spine

One aspect of healthy posture is the ability to stand or sit with a "neutral" spine. Since the spine is naturally curved, a neutral spine isn't straight but is instead demonstrated when the curves are not too much or too little for the individual's healthy norm.

- Biomechanics experts explain that a neutral spine is where it is "most relaxed." However, a person with chronically poor posture and the related muscular imbalances will typically have a difficult time, at first, in identifying this state. This is in part because the student may correlate what feels "comfortable" or "normal" with "relaxed" despite exhibiting poor posture and spinal stress. (Read more in Bernie Clark's teaching below.)
- How exactly do we maintain a neutral spine? We do this with "postural muscles" (also called "stabilizers") and with the breath. Learn much more about the role of core muscles in stabilization in the Core Anatomy series of lessons.

A NEUTRAL SPINE IS MAINTAINED WITH STABILIZING MUSCLES & WIDE, FULL BREATHING

It is obvious that once the spine is placed in a neutral position it needs to be kept there. It is the postural muscles that achieve this. The muscles that hold the spine in correct alignment are found deep in the body — close to the spine — and are referred to as stabilizers because their function is to help stabilize the spine in readiness for activity. These deep abdominals respond most effectively to a gentle contraction. Together, with a neutral pelvic alignment and a lateral thoracic (wide and full) breath, they create the correct intra-abdominal pressure to assist with spinal stability. – TeamUSA.org

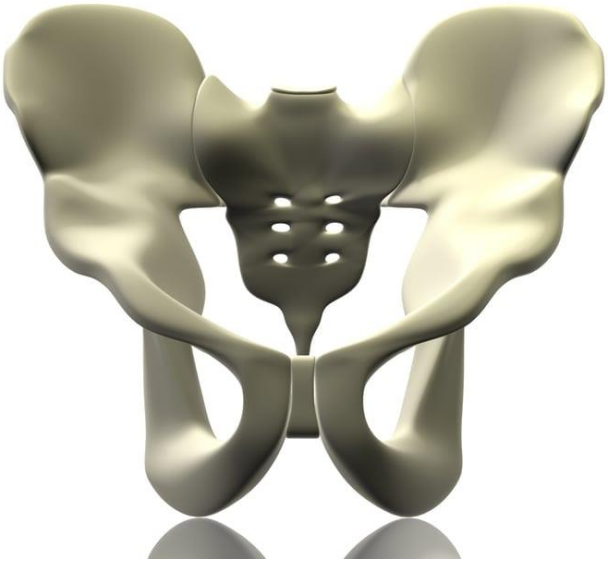
THE CHALLENGE OF IDENTIFYING A NEUTRAL SPINE

When you stand in mountain pose (*tadasana*), can you find the position for your spine that has the least amount of tension? If so, that is likely your neutral position. Unfortunately, chronically poor posture can also feel relaxed, but there may be a lot of stress seeping into the connective tissues because the muscles have lost their tone. When the muscles are weak, the fascia has to do the job of the muscles. When you pay attention to the tension in your spine, you need to notice not just muscular tension, but also the stresses in your joints and fascia… You may have to experiment—try different postures and check out how each position of your spine feels. Where do you feel free, light, long, yet relaxed? That is probably your neutral position. If this experimentation still doesn't work, use a mirror or the eyes of a qualified teacher to help you discover your neutral spine. – Bernie Clark

See Also

- Anatomy of the Spine & The Spinal Curves
- Common Problems in Alignment Cueing for the Spine
- Tadasana Alignment Practice

A Neutral Pelvis



Roger Cole describes these four aspects of pelvis and hip alignment in *Tadasana*:

1. Equal Hip Height
2. Neutral Pelvic Tilt
3. Neutral Font-to-Back Placement
4. Pelvis Pointing Straight Ahead

> Understanding and embodying a neutral pelvis is imperative not just for your Pilates or yoga practice, but for everything you do in life. This is because neutral is the most stable and shock absorbing position. There are many ways to help students find a neutral pelvis with verbal cues. I have found that facilitating an embodied understanding of this concept happens best by palpating some crucial bony landmarks. [See the article for more detailed tips.] – Trina Altman

Another Way to Explore

One way to explore pelvic alignment is to lay supine and press feet to wall. In a YogaUOnline video that appears to have been removed, the following technique was described.

Just as in *Tadasana* when we try to simply notice before changing anything, do the same in this laying down version. Begin by simply noticing asymmetries and sensations. When exploring ways to improve symmetry, avoid beginning with the feet and instead first bend the knee and reposition the whole leg in an effort to reduce any hip rotation. You may also wish to place a block between the thighs and explore the results.

> A NEUTRAL PELVIS: BONES AT THE TOP OF THE PELVIS ARE LEVEL
>
> A neutral spine alignment is when the pelvis is balanced between the two exaggerated anterior and posterior positions. When the pelvis is in neutral, the bones at the top of the pelvis back — Posterior Superior Iliac Spine (PSIS) — and front — Anterior Superior Iliac Spine (ASIS) — are level. – TeamUSA.org

MUSCULAR IMBALANCES

The three main types of pelvic misalignments due to muscle imbalances are:

- Elevated Pelvis: One hip appears higher than the other. This is called Structural LLD and Baxter explained it clearly in his post, Friday Q&A: One Leg Shorter Than The Other.
- Rotated Pelvis: One side of the hip is more forward than the other.
- Tilted Pelvis: A forward tilt that results in an exaggerated curve in the low back.

… I have all three pelvic misalignments, most likely the result of muscle imbalances. After a few minutes of positional neuromuscular magic, he asked me how my hips felt. They felt great! – Beth Gibbs

THE VITAL ROLE OF HIP FLEXORS & PSOAS

Our deep hip flexors, psoas major and iliacus, connect our spine to our pelvis. This is a pretty important connection! … The position of our pelvis impacts everything above it …[and] everything below it. It affects how we carry the weight of our body and how we move it around (walk and run)… Depending on which hip flexors are tight and the fiber direction of those muscles specifically, the tight muscles could pull our pelvis down and forward (anterior tilt)… When one thing changes, the body has to compensate for this in some way. In essence, the body is always trying to get into balance around the gravity line. So, when the pelvis is tilted down and forward in the front, this means that the area above and in the back of the body also has to adapt. And this results in shortening the area around our lumbar spine. – David Keil

See Also

- Aligning Your Pelvis
- Anatomy of the Pelvis
- Common Problems in Alignment Cueing for the Spine
- Tadasana Alignment Practice
- Anatomy of the Spine & The Spinal Curves

Body Symmetry vs. Balance

- Typically, pose alignment includes finding symmetry between the two sides of the body.
- While general symmetry is correlated with healthy posture, Jenni Rawlings lays out the case here why idealizing symmetry is unsupported by research and by the body itself, which demonstrates asymmetry of the lungs and other internal organs.

  > Although an ideal of symmetry seems intuitively valuable in yoga, in reality no strong evidence exists to support this common belief. Countless scientific studies have drawn no link between body asymmetries and pain, dysfunction, and poor health… A look at the inner structure of our body [shows that we] are all asymmetrical on the inside… Our two lungs are innately different from one another in both size and structure… And whereas our heart sits to the left of center, our large liver sits to the right of center… Our diaphragm, our main muscle of respiration, is also asymmetrical! Scientific evidence simply does not support the belief that symmetrical alignment is more ideal than any other alignment… When we idealize the symmetry and "optimal alignment" of a pose like *tadasana*, we are comparing ourselves to the imaginary, symmetrical, vertically aligned person in the anatomy textbook drawing… simply one arbitrary position that is used as a reference point in the medical field. – Jenni Rawlings

- Instead of symmetry Rawlings proposes that the objective be balance:

  > Instead of emphasizing bodily symmetry, a more helpful concept for yoga teachers to focus on is *balance*… Whereas symmetry is the quality of sameness on both sides, balance is about steadiness of position — like the tree that has adapted to its environment and does not fall over. – Jenni Rawlings

See Also

- Introduction to Choosing Cues & The Difficulty with Cueing
- Common Problems in Alignment Cueing for Standing Poses
- Tadasana Alignment Practice

Excessive Sitting & Other Lifestyle Issues

Here we explore the effects of excessive sitting and other issues such as sitting with legs crossed, not changing position, and carrying a heavy backpack.

In this article, expert Eve Johnson explains the damaging effects of sitting with legs crossed and why it doesn't seem to feel bad. cross-legged, why doesn't it feel bad? She explains, "the more attention you pay to sitting evenly in a chair, the more balanced your body will become."

EFFECTS OF NOT CHANGING POSITION

> The longer people sit (or stand) without a change in position and movement, the more likely they will be to develop a postural backache, according to a report in The Journal of Manipulative and Physiological Therapeutics… One of today's most troublesome activities, especially for children and adolescents whose bone structure is still developing, is carrying extraordinarily heavy backpacks to and from school and often throughout the school day. The weight forces them to bend forward, with potentially the same consequences as slouching… For far too many years, I carried everything, including a heavy briefcase and groceries, over my right shoulder, which forced me to raise that shoulder and lean toward my left, clearly an undesirable posture. When carrying heavy items is unavoidable, it is best to balance them on both sides of the body. – Jane E Brody

QL MAY BE INVOLVED

> Tilting the pelvis and leaning to one side while standing or slouching while sitting can cause the QL to overcompensate to stabilize the spine and/or pelvis and aggravate it. Using back support while sitting and finding a more neutral position for the spine and pelvis while performing any activities can protect the QL from this constant contraction and thus, spare a great deal of soreness and discomfort. – Kellen Nyemb

Numerous health conditions are linked with sitting too much, but here we focus on only one: the significant impact on posture.

PROLONGED SITTING AFFECTS THE SPINE

Research indicates that on average, an American adult spends 10-12 hours each day sitting… More than 60 percent of people worldwide spend more than three hours a day sitting down, and the researchers calculated that sitting time contributed to some 433,000 deaths a year among 54 countries… Prolonged sitting affects the architecture of the spine, hips and neck as well putting the individual at risk for skeletal fractures. – Yoga for Healthy Aging

MORE ON THE EFFECTS OF SITTING

"The weight is distributed in a standing position," says Kelly McGonigal, Ph.D… "But when you sit, you distort the natural curve of the spine, which means your back muscles have to do something to hold your back in shape because you're no longer using the natural curves of the spine to lift yourself up against gravity." So alignment of the spine changes in the sitting position, which means that the compressive forces on the lumbar discs change as well, which dehydrates them more rapidly and can create structural problems down the line. Short stretch and movement breaks in the course of the workday are very effective in minimizing the compressive load on the spine. – Olga Kabel

CAN LEAD TO NECK, SHOULDER & BACK PAIN

When you sit and stare at a computer screen for hours, your head tends to move forward out of its neutral position. This puts excessive strain on the cervical vertebrae and can lead to neck, shoulder and back pain. When you sit in a hunched or rounded position, the discs of the spine become compressed. Over time, they will lose their ability to expand and contract with movement, increasing the risk of disc herniation. The good news?… You can counteract the negative impact of too much sitting with simple yoga asanas. By bringing movement back to the spine… [you can] lubricate the vertebral disks, open stiff and sore muscles, and strengthen muscles that are weakened by long sitting sessions. – Christine Malossi

Consider educating students on lifestyle considerations such as their posture while reading and using technology devices, while driving, and while doing activities that include a lot of forward bending and rounding of the spine such as gardening.

IMPLEMENT NEW HABITS FOR BENDING OVER

Most of us in western cultures tend to bend over by first looking down with our heads, then contracting our abdomens and bending over with a rounded back into a C shape, which stresses our back muscles and can lead to back pain. The advice here is to change this habit by bending your knees first and hinging back from your hips so you take a kind of table shape, with your spine remaining in it's natural curves. Here are the instructions from the article:

1. Place your feet about 12 inches apart.
2. Keep your back straight.
3. As you bend your knees, allow your pubic bone to move backward.
4. Fold over by allowing your pubic bone to slide through your legs, down and back.

… If you [have tight hamstrings] and you want to try this method of bending over, you should also be regularly stretching your hamstring muscles. – Nina Zolotow

POSTURAL HABITS TO AVOID

Among other postural habits to avoid are these, listed by Britain's National Health Service.

- Standing with a flat back, with the pelvis tucked in and lower back straight (the normal spine has three curves – in the neck, chest and lower back).
- Standing with chest pushed forward and buttocks pushed back (the so-called Donald Duck posture that exaggerates the lumbar curve).
- Leaning on one leg, which puts undue pressure on one side of the lower back and hip.
- Bending the head back and sticking out the chin while looking at a computer screen or television. Instead, lower the screen or raise the seat.
- Holding the phone on a shoulder. Instead, use a hands-free device like a headset or Bluetooth.

– Jane E Brody

WORK GRADUALLY TOWARD IMPROVED POSTURE

Be patient and work gradually towards your goal of improved posture. It likely took quite a while to get where you are now, and it will take some time to improve… Consider activities that might contribute to slumped posture that you could also address… Be more conscious about maintaining good posture… and, if possible, spend less time in seated activities or try using a stand up desk. – Baxter Bell MD

Online Resources

Please see online version for links to more resources.