



“Discovering the athlete in everyone”

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Posture Perfect Article

If you had to define posture what would the definition say? How about, “the way that a person holds their body or assumes certain positions (i.e. sitting, sleeping, standing or walking). I think it would be accurate to say that the most time spent in a certain position is going to have the most effect on “efficient posture”. Any long term posture position will start to alter muscles and connective tissue that interfere with the efficiency of human movement.

For the body to operate at its most efficient, our posture needs to be in a specific alignment. Correct postural alignment will:

- Stabilize the body
- Improve the breathing
- Improve the joints ability to move freely
- Improve the effectiveness of exercise
- Enhance the body’s ability to generate force
- Encourage muscle balance during training
- Reduce the risk of injury during training

Ideal posture is when in an anatomical position the:

- Head is directly over the trunk
- Ears are over the shoulder
- Chin is level with the ground
- Shoulder is in line with the hips
- Scapula is flat against the back
- Pelvis is neutral
- Tail bone is dropped to lengthen the spine.
Buttocks is relaxed
- Knees are “soft”

- Feet are parallel and shoulder width apart; weight is evenly balanced on both legs and feet

From years of knowledge and science, it has been determined that the body was designed to be in an upright position, with weight bearing on two feet. The hips are in an extended position (neutral pelvis) under the spine to support the torso and head. As the industrial revolution has evolved, the daily tasks we have done for thousands of years has diminished. As we know, computers have taken that even further and now our human movement patterns in multi-planar are becoming more and more unnecessary.

Assessing Static Posture

The four most common methods for assessing static posture are:

- Photos
- Postural Grid
- Plumb line
- Eye observations

It is prudent for a fitness professional to assess posture to ensure a safe program with proper progressions for your clients.

Analyzing Common Over Used Static Postures

Let’s look at sitting and analyze what happens when it is done for long periods of time. When you have been sitting for long periods of time, the joints and connective tissue

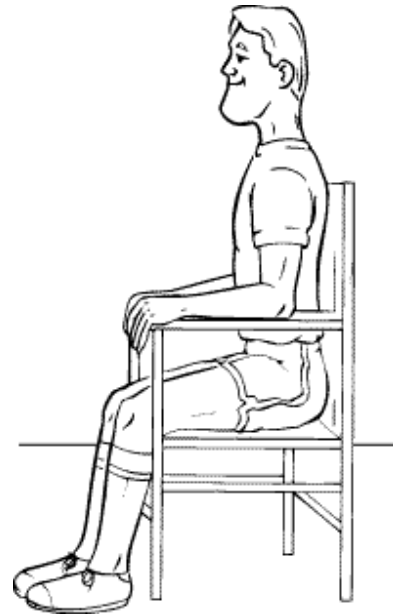
become stiff upon returning to extended positions when trying to stand (for instance the hips and spine). As well when we sit and there is no force on our feet, the arches become weak and our messenger readers become dull resulting in collapsing arches. That leads us to the question of, “what happens to our bodies if we can’t extend and our feet get weak? We start to shift all the time when standing and muscles start compensating for other non functioning muscles

Below is an area analysis of what happens when we sit too long.

Area affected when sitting	What happens	What is wrong with that?
Neck	Adjusts by tilting head upward	You develop poke neck
Spine	Rounds forward to compensate for the head tilting up and supporting it	You develop kyphosis
Shoulders	Rounds forward as they can be used more, and flexes the spine	You develop internally rotated shoulders and tight pecs
Shoulder Girdle	Abducts as chest muscles get tightened and shoulders begin to round	Weakens scapular retraction muscles
Pelvic Girdle	Anterior tilts as the abs get weak and the ESG tightens	weak lower back and core
Hips	Hip flexors tighten from being at a constant 90 degrees angle and the glutes weaken being unable to extend the hip	Tightens hip flexors encouraging anterior tilt
Knees	Affected by the actions of the hip	Hyperextend to compensate for

		tight hip flexors
Ankles	Affected by the action of the knee	Creates weak arch support leading to pronation

Starting with correct sitting positions will help to decrease the effects of sitting for long periods of time. Below is an outline of a good sitting position.



Sit up with your back straight and your shoulders back. Your buttocks should touch the back of your chair.

- All three normal back curves should be present while sitting. A small, rolled-up towel or a lumbar roll can be used

to help you maintain the normal curves in your back.

Here's how to find a good sitting position when you're not using a back support or lumbar roll:

- Sit at the end of your chair and slouch completely.
- Draw yourself up and accentuate the curve of your back as far as possible. Hold for a few seconds.
- Release the position slightly (about 10 degrees). This is a good sitting posture.
- Distribute your body weight evenly on both hips.
- Bend your knees at a right angle. Keep your knees even with or slightly higher than your hips. (use a foot rest or stool if necessary). Your legs should not be crossed.
- Keep your feet flat on the floor.
- Try to avoid sitting in the same position for more than 30 minutes.

- At work, adjust your chair height and work station so you can sit up close to your work and tilt it up at you. Rest your elbows and arms on your chair or desk, keeping your shoulders relaxed.
- When sitting in a chair that rolls and pivots, don't twist at the waist while sitting. Instead, turn your whole body.
- When standing up from the sitting position, move to the front of the seat of your chair. Stand up by straightening your legs. Avoid bending forward at your waist. Immediately stretch your back by doing 10 standing backbends.

As many people spend long periods of time driving, here is a sample of a correct sitting position while driving.

- Use a back support (lumbar roll) at the curve of your back. Your knees should be at the same level or higher than your hips.
- Move the seat close to the steering wheel to support the curve of your back. The seat should be close enough to allow your knees to bend and your feet to reach the pedals.

Sleeping is another area for which our body spends prolonged times in the same position. If you are having posture issues from sitting or standing, it can affect your sleeping effectiveness as well. When you have an anterior tilted pelvis, this puts pressure on your lumbar spine. For many people in this state, sleeping on your back with your legs out straight can pull the lumbar spine forward toward the legs increasing the arch in the lower back even more causing more pain. Sleeping on one's side encourages the dropping of one arm over top of the other increasing rounded shoulders. Over time restriction occur in the chest, front of the shoulders and abdominals. This type of sleeper may experience pain in the shoulders, neck and upper back. If a person sleeps on their stomach, this increases the arch in the lower back more and twists the neck. Below are some ideas for correcting sleeping misalignments.

No matter what position you lie in, the pillow should be under your head, but not your shoulders, and should be a thickness that allows your head to be in a normal position.

- Try to sleep in a position which helps you maintain the curve in your back (such as on your back with a pillow under your knees or a lumbar roll under your lower back; or on your side with your knees

slightly bent). Do not sleep on your side with your knees drawn up to your chest. You may want to avoid sleeping on your stomach, especially on a saggy mattress, since this can cause back strain and can be uncomfortable for your neck.

- Select a firm mattress and box spring set that does not sag. If necessary, place a board under your mattress. You can also place the mattress on the floor temporarily if necessary. If you've always slept on a soft surface, it may be more painful to change to a hard surface. Try to do what's most comfortable for you.
- Try using a back support (lumbar support) at night to make you more comfortable. A rolled sheet or towel tied around your waist may be helpful.
- When standing up from the lying position, turn on your side draws up both knees and swings your legs on the side of the bed. Sit up by pushing yourself up with your hands. Avoid bending forward at your waist.

The above advice will benefit a majority of people with back pain. If any of the above guidelines causes an increase of pain or spreading of pain to the legs, do not continue the activity and seek the advice of a physician or physical therapist.

Dynamic Posture Theory

Good posture is closely related to functional strength and motor control, and is absolutely necessary to produce efficient movement along the kinetic chain.

When posing for photos or giving a presentation, our posture is static. When we are moving, such as in walking, exercising, cycling etc..., posture is dynamic, always moving. Good athletic posture is actually a series of postures linked together to produce efficient movement.

There is a trend today to identify muscular imbalances in static positions and seek to correct them. But static postural measurements are a non-functional baseline. Unless there is some clearly evident pathology or deformity, I have found over the years that static posture has very little relationship to movement.

Think about what happens to postural imbalances when an athlete is asked to move. Are they relevant to the athlete's movement? If they are corrected, will there be a change in performance? I have found that when once one static

imbalance is corrected, another will appear somewhere else.

Currently, posture grids are a very popular way for athletes to assess their posture. The grids and other static analyses of posture are easy to administer and interpret, and profound conclusions are often deduced from them. But such analyses really have little or no carryover to movement. It certainly is simpler to assess an athlete standing still than when he or she is moving, but because performance is not about one posture, the grids have limited value.

We also need to get away from the concept of “ideal posture” and instead think in terms of individual needs and specificity. A posture that works well for one person may not work as well for another.

In athletics, dynamic posture is what’s all-important. Dynamic posture allows the body to maintain normal length-tension relationships among its muscles while the activity is being performed. This leads to the optimum ability to reduce and produce force. For example, the optimum posture for acceleration is the triple extension of the ankle, knee, and hip. This posture allows the body to exert maximum force against the ground to propel the athlete forward.

Proper dynamic posture also leads to coordinated movement. Each posture in movement is a momentary alignment of body segments, and successful movement is determined by the ease of transition from each posture to the next. If one segment or link in the kinetic chain is out of sync, there is potential for a performance error or injury.

Assessing Dynamic Posture

Ultimately, the test of good dynamic posture is whether it results in easy transition to the next posture. So, how do we assess posture in a dynamic environment? The first step is training you to critique key points in movement. To do that effectively, you must know the athlete and understand the demands of his or her sport.

Although it may not seem sophisticated, the next step is simply watch the person in action. The best method is to use a combination of the naked eye and video. View the

person from different angles and then watch him or her in slow motion on the video.

The analysis must be done with the goal of the movement in mind. Remember that posture is highly individual to each person’s body structure and highly adapted to the activity the athlete is engaged in. Observe the flow and pattern of movement, and do not try to pick out small defects. If there is smoothness and efficiency to the movement, then everything is acceptable, even if a defect was detected in a static position.

However, if there is not a flow to the person’s movement—if there are breaks in the movement or there is a lack of rhythm—then there is a problem. When this is the case, observe the person more closely. First, focus on the major movements and see if they are in sync. Then, look at smaller body parts and see if they are working in coordination with the bigger ones. Be sure to start out with a clear concept of what the movement should look like. How does the person you are observing match up to that concept?

Some trainers/coaches like to look at muscular balance when assessing posture and movement. But I think we can go too far with this idea. We must remember that the body is fundamentally asymmetric. It is unrealistic to think of muscular balance right to left or front to back—the body is not designed that way. We must think of proportionality rather than symmetric muscle balance.

For example, quads are bigger than hamstrings. Does this mean that the quads are overdeveloped, or conversely, that the hamstrings are underdeveloped? I would say no, because they are proportional. The pecs are naturally stronger than the muscles of the upper back, but they should not overpower those muscles. If they do, there is high risk of injury.

Building Good Posture

Posture is clearly an integral part of many aspects of movement. In fact, I believe that dynamic postural alignment and subsequent dynamic muscle balance are fundamental movement skills. So it should be no surprise that a training regimen for good posture is very similar to any functional strength and conditioning program.

We need to train strength, flexibility, balance, and movement. We need to incorporate multi-joint and multi-plane work with moderate/high proprioceptive demand. We need to target deficiencies with remedial work whenever warranted.

In the classic text *Anatomic Kinesiology*, authors Gene Logan and Wayne McKinney have termed the muscles that are most active in resisting the force of gravity the “anti-gravity muscles.” They go so far as to state that “the anti-gravity muscles are the most important muscle groups, which make possible the maintenance of body postures in sport, exercise, and dance situations.”

The four primary anti-gravity muscle groups are: the gastroc/soleus group, the quadriceps group, the glutes, and the erector spinae group. When the body is upright, as is the case in most sport activities, the anti-gravity muscle groups work in conjunction with other muscle groups to maintain upright posture. These muscles act on information from three major sensory systems in the body: the proprioceptive, vestibular, and visual systems. Therefore, movements that work these muscles must be given prime consideration in a conditioning program.

Similarly, the abdominal complex, or core muscles, play a major role in dynamic posture. They give the body structural integrity, which allows the limbs to position and reposition themselves according to the demands of the activity. The core must be trained daily. It should be incorporated into a warm-up, have a distinct module within the actual workout itself, and be addressed during cool down. The majority of core work should be done upright and moving to enhance the transfer to postural improvement and to activate the muscles of the core as they are used in movement.

To achieve proportional muscular development, focus the training on movements, not individual muscles. For movement to be efficient, muscles must be recruited in patterns that mirror those demanded by the activity and that allow for optimum firing frequency.

A good distribution of pulling, pushing, and squatting movements should be considered. The body must also be put in positions that force it to work against gravity in

postures similar to those in the person’s activities. An overemphasis on work in a supine and prone position, for instance, will not transfer to dynamic postural improvement.

Tight muscles can contribute to poor dynamic posture, so a sound program of functional flexibility that addresses the target muscles must also be part of the athlete’s daily routine. The gastroc/soleus group must be stretched daily, since it governs the production and reduction of force against the ground. The same is true for the psoas, as a shortening of the psoas will have a profound negative effect on dynamic posturing and movement. Stretching the lats and pectorals, as connectors of shoulders to hips, should also be on the list.

What type of strength training will hinder good posture? Overemphasis on the bench press can, as it causes a round-shouldered posture. This is caused by tight pectorals, which, when coupled with upper-back weakness can lead to shoulder problems. In the lower extremities, an overemphasis on quad work can have many negative results. The glutes and hamstrings are more important in many ways, but tend to be neglected because they can’t be seen in the mirror.

If a person has particularly bad dynamic posture, he or she may need some remedial work. First, analyze the posture to ascertain the cause. If it is a weakness in a particular muscle group, then those muscles must be targeted for recruitment. Postural deviation can also be caused by tightness. If that is the case, then a specific functional flexibility program must be designed to address the problem.

Posture & Lifting

One of the most important times for a person to work on correct posture is during weightlifting. Good lifting posture will significantly enhance the gains made from weight training and help a person avoid injury.

To start, the person must have a good base of support. For pulling movements, the base should be about hip-width apart. For squatting movements, the base should be wider, at least shoulder-width, depending on the person’s body proportions.

The weight distribution should be even and the person should feel like he or she is pressing against the floor. There should be proportional bending of the ankle, knee, and hip. Puffing the chest out will put the back in the correct position, and the head should be neutral.

Training to enhance dynamic posture is all part of a sound, well-rounded athletic development program. Dynamic posture is a major contributing factor to a person's performance, so it must be part of daily training. Remember, we are training a person to move, not to stand still.

In summary, good posture is the corner stone to movement. Knowing how, what, where and when on the posture issues from a client can open a great opportunity to train clients responsibly and as well will reduce many strains that a client feels on a day to day basis.

References

Robert McAtee, 2007, *Facilitated Stretching*, Champaign, IL, Human Kinetics

Michael P. Reiman & Robert C. Manske, 2009, *Functional Testing in Human Performance*, Champaign, IL, Human Kinetics

Price J, 2009. *A Step by Step Guide to the Fundamentals of Structural Assessment*. Educational DVD Series. Space Café Media

Peter Twist, 2006, *Sport Movement Level 1*, Educational Program, North Vancouver, BC, Twist Conditioning Inc.

David C. Nieman, 2003, *Exercise Testing and Prescription, A Health-Related Approach*, Montreal, McGraw-Hill Companies, Inc.