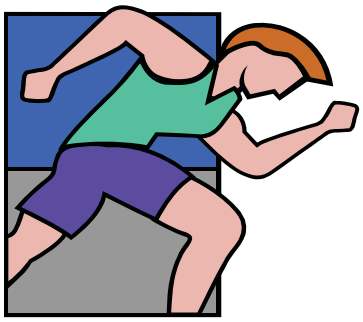
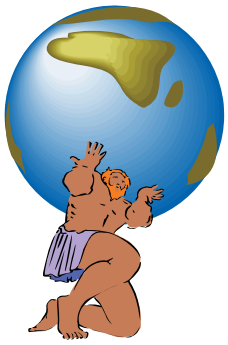
Walking & Running

When you walk or run, with every step your body is working on one of two tasks (Craik '89):



Dynamic movement



Dynamic control of posture

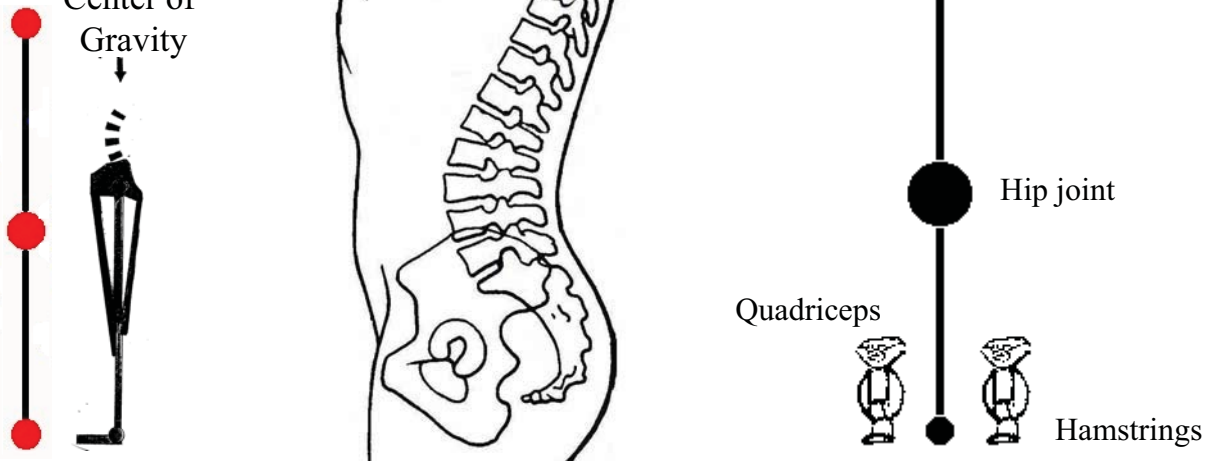
The young and the old, with their poor neutral spinal posture, cannot move well because they are forced to expend their effort in dynamic control of their posture.

The longer a human being has the proper neutral spinal posture, the better dynamic moving machines they are. Spinal Fitness is needed to help move the young forward toward, and the aged back toward, the proper neutral spinal posture so they can be optimally physically capable.

Proper Neutral Spinal Posture

An individual with proper spinal posture (good core stability) will have their center of gravity balanced over their hips. The upper trunk lever arm (the upper body) is 180°, or balanced, over the lower trunk lever arm (the legs). The system is in equilibrium. This system is solely devoted to dynamic movement: Walking and running.

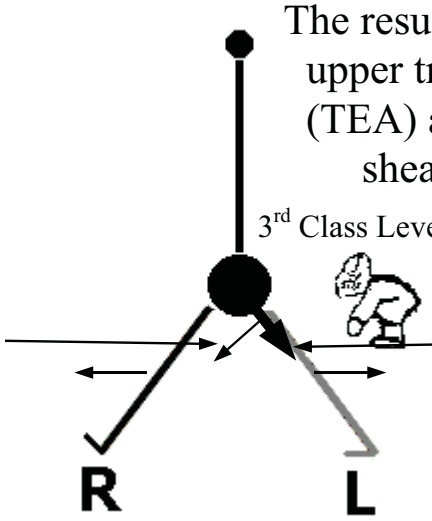
Proper Spinal Posture



The proper neutral spinal posture moving forward allows the body to keep the hamstrings of the rear leg relaxed and therefore able provide good range of motion and agility.

Note, the rear leg in the proper posture is actually not a lever system when there is no need for the hamstrings to produce any force to stabilize the trunk.

The resultant force (TRA) of the upper trunk meets the rear leg (TEA) at an angle that creates shear and compression.



Shear force created at the hip in the rear leg (L) creates movement.

Compression force created by the upper trunk is stabilizing the rear leg (L) while shear forces move the trunk forward.

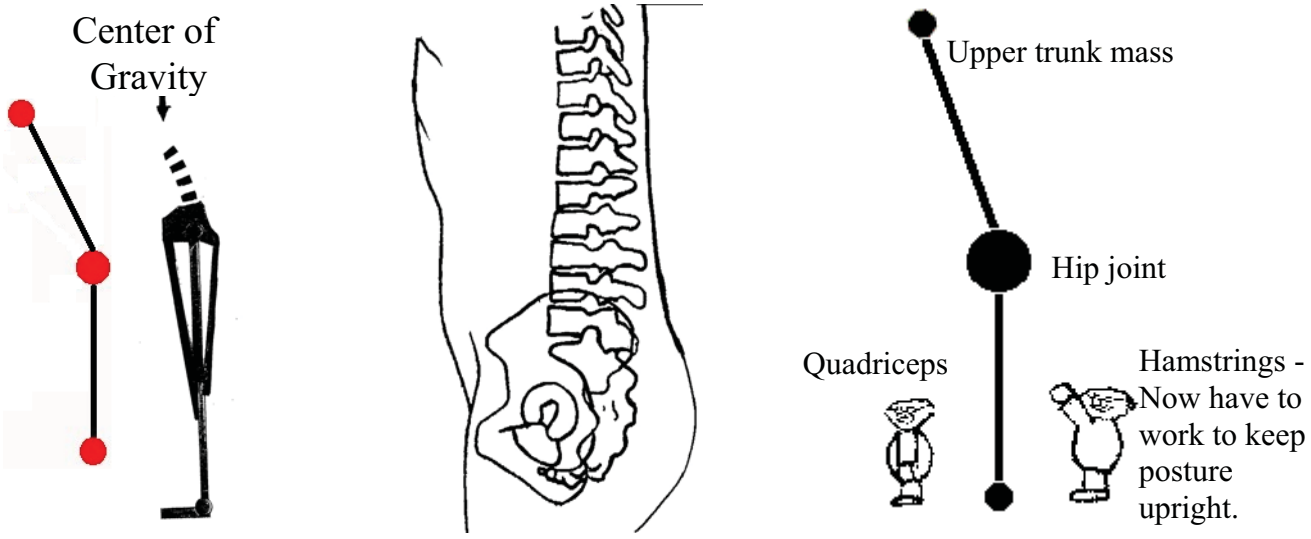
Improper Neutral Spinal Posture

An individual with poor neutral spinal structure (poor core stability) will have the center of gravity unbalanced forward of their hips. Their upper trunk lever arm is forward, or unbalanced at the hip, over the lower trunk lever arm.

This individual has an extra job to do over and above what an individual that has the proper neutral spinal posture; that being they have to expend muscle effort to maintain their unbalanced upright posture.

See the math for this on page 204.

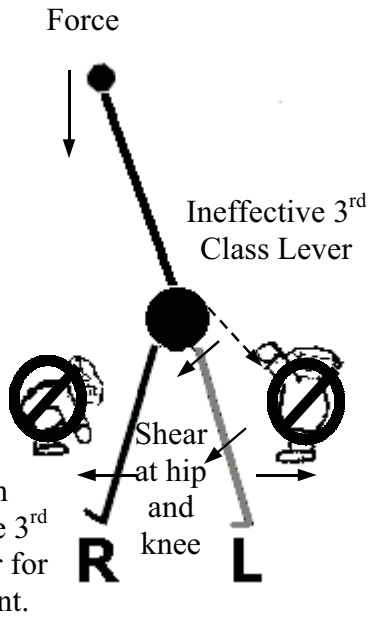
Military Low Back



When moving forward in locomotion, improper spinal posture must use the hamstrings of the rear leg in the role of stabilizing the upright posture. A 3rd class lever is created at the knee and hip causing shear to be directed away from the hamstrings.

As shear and compressive forces increase causing strain to tissue, the body looks for ways to obtain safe stabilization.

It's answer: The front leg (R) is prematurely brought to the ground to provide a 1st class lever for trunk stabilization.



The rear leg (L) must pull to keep the trunk upright, it cannot be used for agility now.

This force created by the 3rd class lever now creates shear forces at the hip and knee straining ligaments and joints.

The result in this type of person is always the same; short strides, fatigue, stiffness, greater chance of injury and eventual degenerative conditions.

See the math for this on page 204.

If you want to be in the business of moving well for sports, work or enjoyment, then stop the business of maintaining upright posture that is draining your ability to move by restoring and maintaining the proper neutral spinal posture.