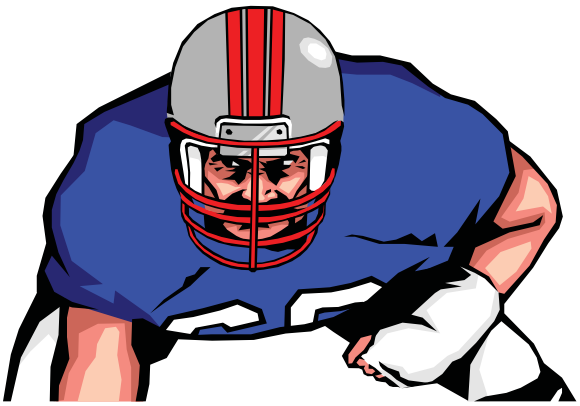
Developing Power & Strength

Proper neutral spinal posture is absolutely necessary to develop power and strength. We will illustrate two football lineman going head-to-head, in what we would consider, an ultimate example of strength and power. However, this example also lends itself to other athletic feats such as hitting a volleyball, throwing a boxing punch or swinging a golf club.

Two 300 lb. lineman collide. Who will push the other back and win the contest of strength and power?

The one with the best genetics?



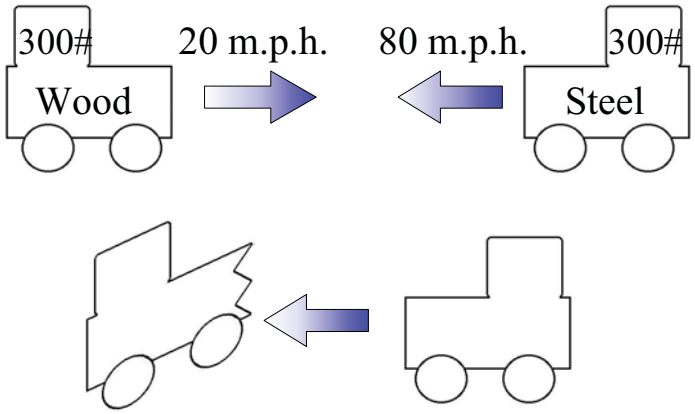
The one with the most desire?

Neither of these answers are correct.

The one who wins is the one who develops the most momentum (power) and the most stability at impact (best leverage and strength); the one with the ideal core stability wins.

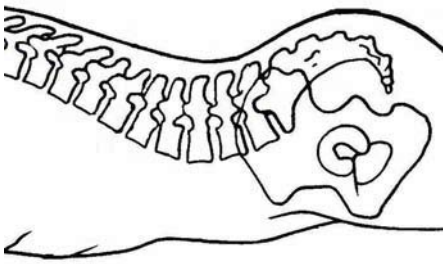
Given equal mass, when objects collide the one with the greatest momentum and most stable mass will win.

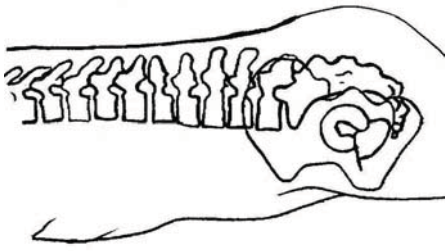
If two cars both weighing 300 lbs. meet head-on, the car with the most momentum and the most stable mass will push the other car back.



In our illustration, the car going 80 m.p.h. and made of steel will push back the car made of wood going 20 m.p.h. given equal masses of 300 lbs.

In the proper football stance, experienced coaches know to look for the player with the dip in his low back. They know that athlete can develop the most power and strength.

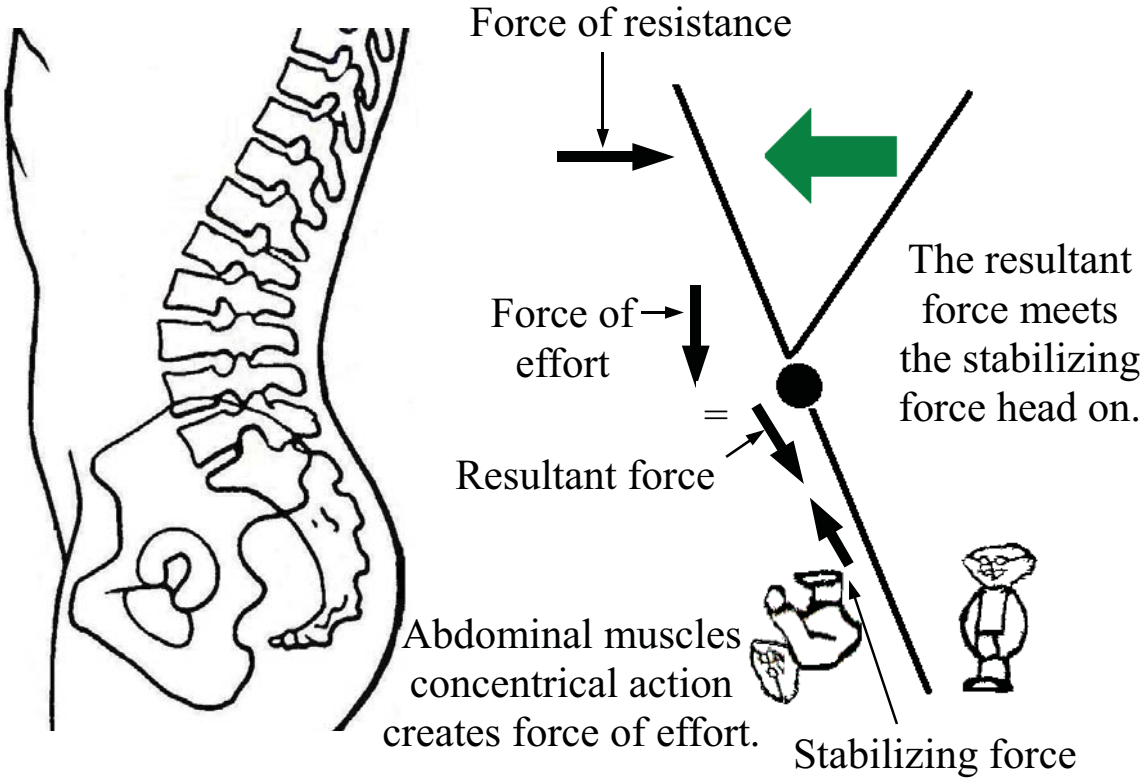
A. 

B. 

Under the skin, Player A is the example of what good neutral spinal posture looks like which gives the proper football stance. Player B is the example of what poor neutral spinal posture (military back) looks like that results in a poor football stance.

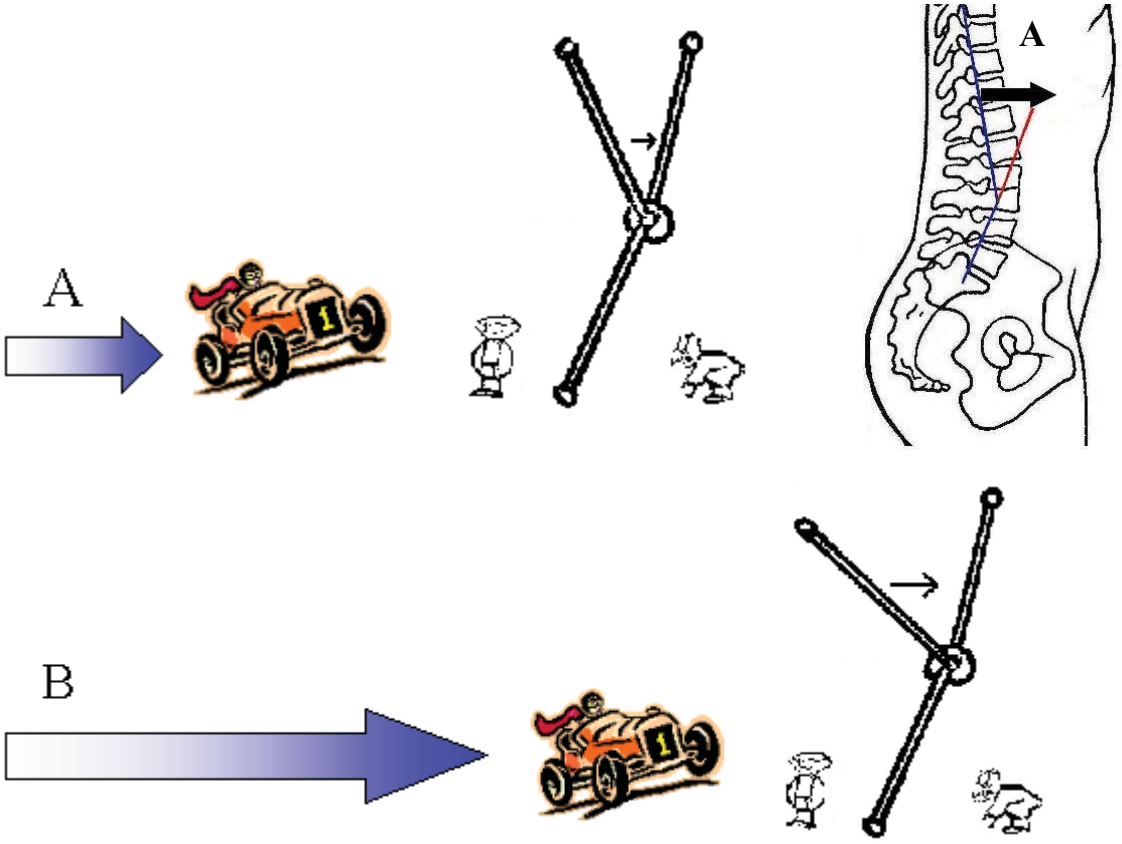
The athlete with core stability has the anatomically correct neutral spinal posture. They have the proper 1st class leverage in place to generate the power and strength necessary to be the winner.

The athlete with core stability generates power by his abdominal muscles concentrically contracting to utilize a 1st class lever to move his upper trunk mass forward.

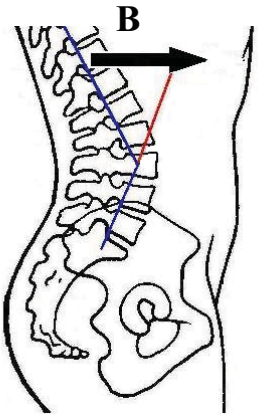


Momentum is equal to mass x velocity (how fast the mass is moving). Velocity is equal to acceleration x distance (or time). The longer the distance, or essentially time you can accelerate, the faster you can potentially go.

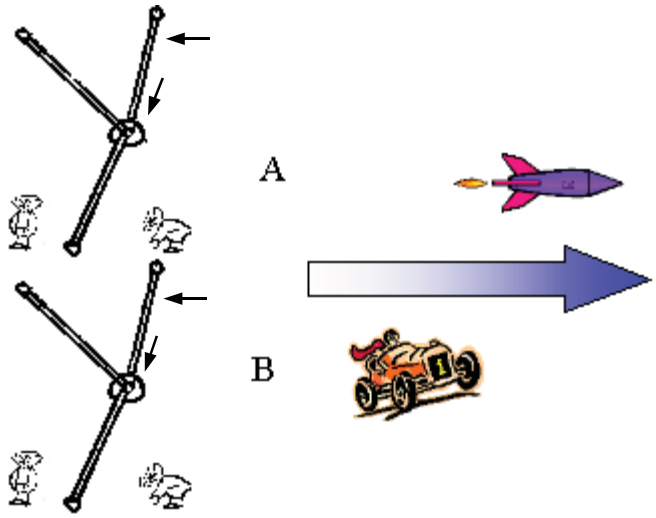
The longer the track (the longer the time) that this race car can accelerate through, the faster and more power it can develop.



The longer the track, or proper neutral spinal 1st class lever arm, that the individual has, the more speed and power they will be able to develop.



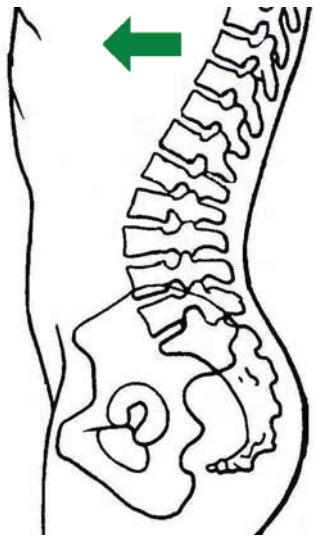
Individual A, who has poor neutral spinal posture as compared to individual B, will never be able to generate the power that individual B can. If car (or individual) A and B are the same mass, car (or individual) B will develop more speed and power.



The above illustration shows how fast twitch muscle fiber recruitment figures into the ability to develop power. Given the same mass and the same lever arm (distance), the more acceleration determines the winner. The individual with the most fast twitch muscle fiber recruitment will prevail. Individual A, with more fast twitch fibers than B, will accelerate faster and, therefore develop more power.

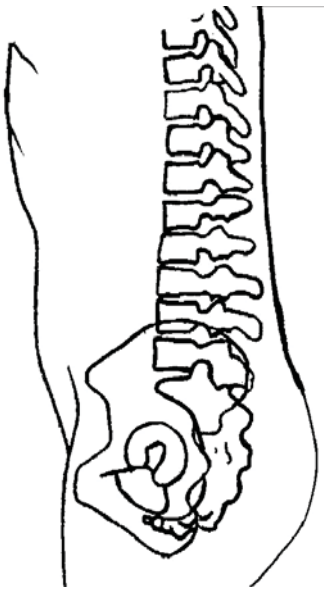
Review: As this individual's muscles contract to move the trunk through the effective distance of the 1st class lever arm, the faster they accelerate. The "faster" the trunk can go, the more momentum (power) it can develop. The ending movement of a 1st class lever results in internal work giving stability. From this stable structure all the power created is ready to be transferred into another object. The lineman with the proper neutral spinal posture is able to develop the power and stability needed to be the winner.

See the math on page 175.



Proper Neutral Spinal Posture

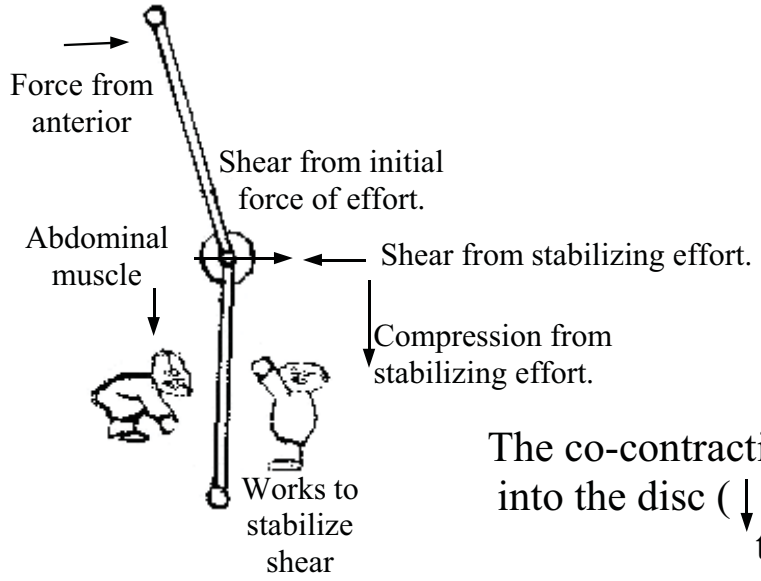
The individual with poor neutral spinal posture (military or straight) has poor core stability. They will be fatigued, weak, stiff and prone to injury. As they move forward from their poor posture to eventually contact and resist the force from the anterior, they will employ weak 3rd class levers that require co-contractions for stabilization. They will not have the 1st class lever systems to develop power and stability that the athlete with proper posture possesses.



Military Posture

They have core *instability*.

3rd Class leverage produces a posterior shear force that must be stabilized by active muscle effort. The co-contraction by the posterior back muscle will pull downward to create enough force to stabilize the posterior shear force while at the same time, produce more compression into the discs. This a fatiguing, poor performing, injury producing situation for the athlete.



The co-contraction produces both more force into the disc (↓) as well as force to stabilize the shear (←).

Upper trunk mass forward: Imbalanced.