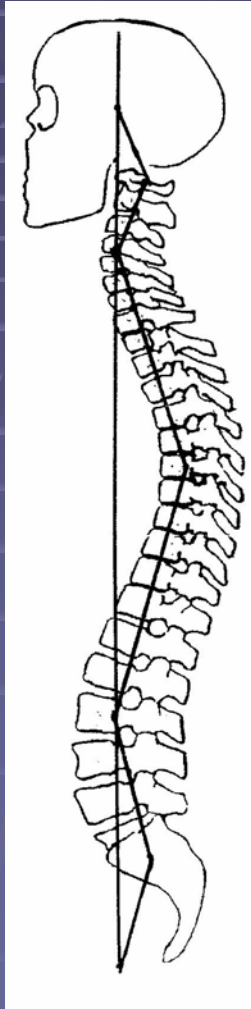


The S-Shaped Spinal Posture Produces Two Musculo-Skeletal Leverage Phenomena That Have Been the Secret Behind Human Beings' Unique Physical Abilities. For the First Time in History, Learn These Two Biomechanical Secrets.

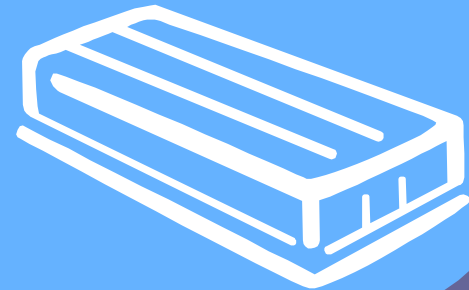
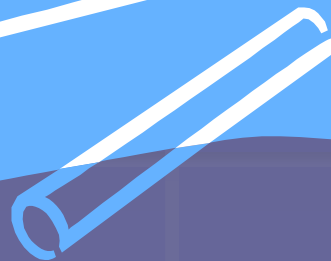
Properly Adapted S-Shaped Posture



This structure provides two biomechanical phenomena that are the cornerstone of the superior athletic human.

The Spine & Human Movement's Two Greatest Secrets:

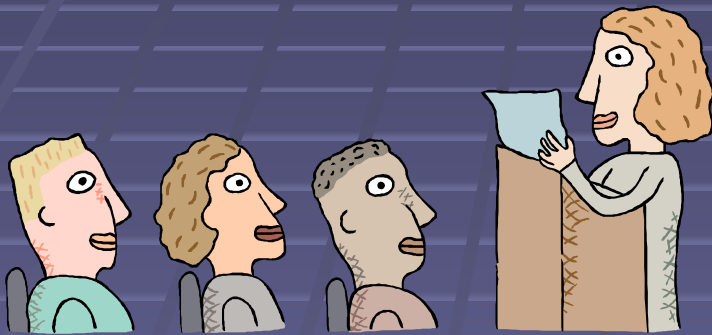
- Energy Expenditure
- Effective Momentum



The Secret of Energy Expenditure



Humans spend their time working and playing with their trunks upright in Earth's gravity.



The spine's musculo-skeletal system must expend energy to stay upright.

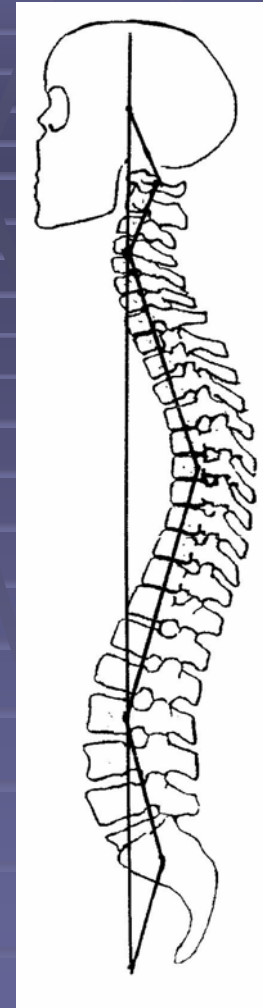


There is a big cost to being upright.

The cost:

Muscles work to hold up posture.

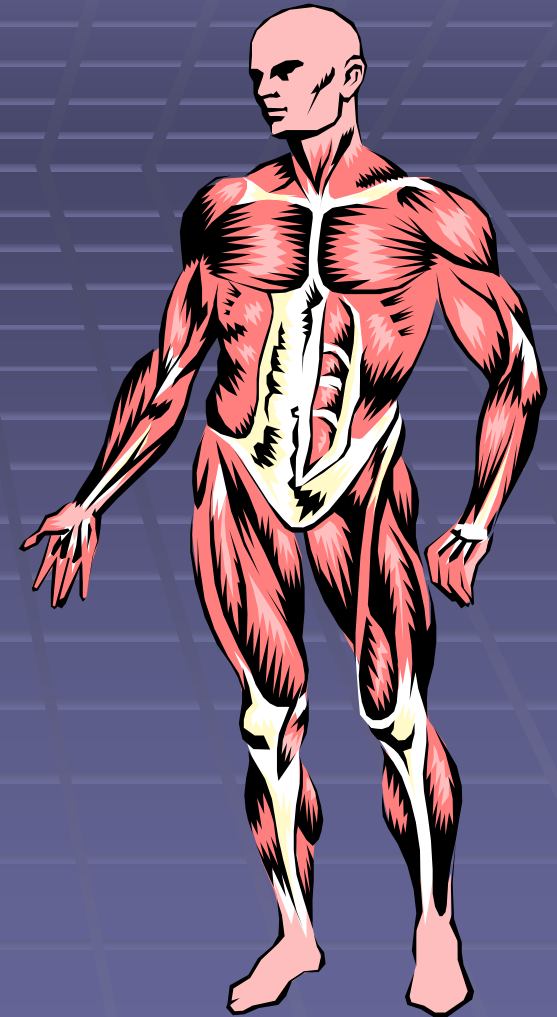
Joints strain to hold up posture.



The least energy expended, the better.

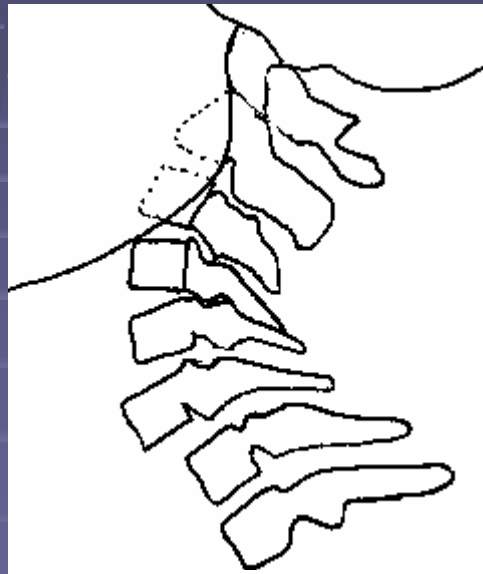
The least amount of muscle fatigue the better.

The least amount of damaging strain on disc joints the better.



Proper posture offers the least amount of energy expenditure.

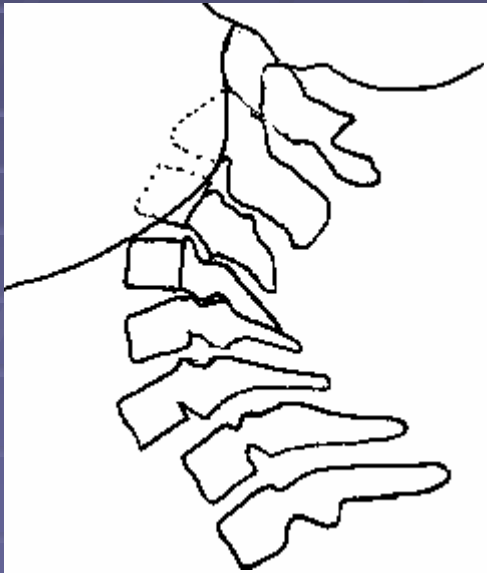
Proper Posture



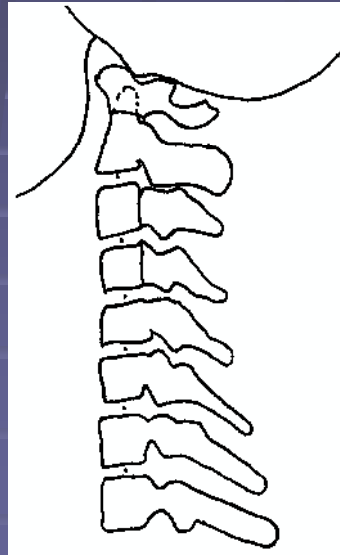
This neck has the proper adaptation. It has the best (lowest) energy expenditure.

Proper posture energy expenditure compared with improper postures.

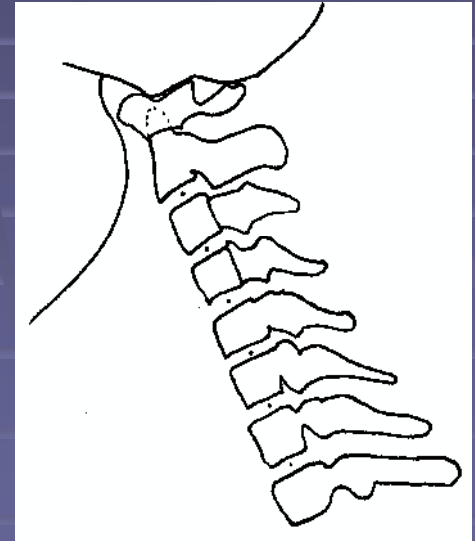
Proper Posture



Straight Posture

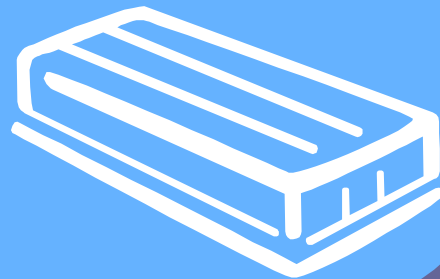
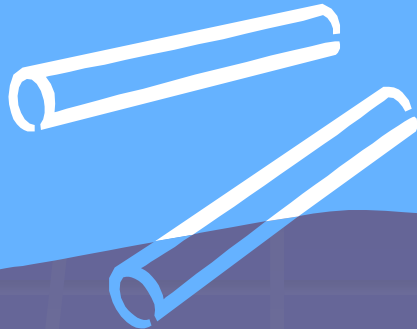


Head Forward Posture

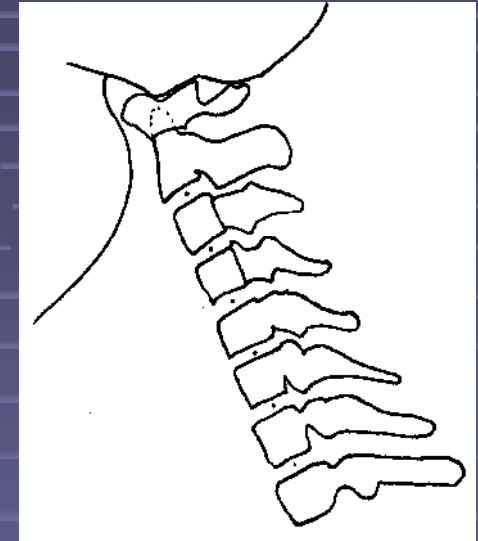
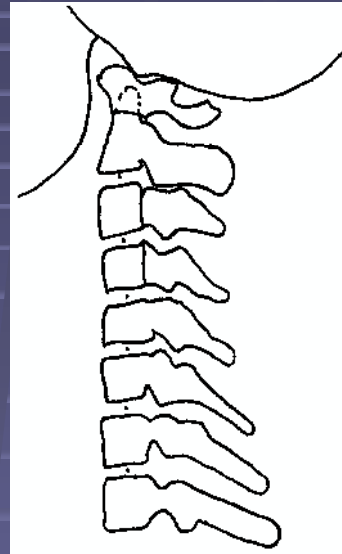
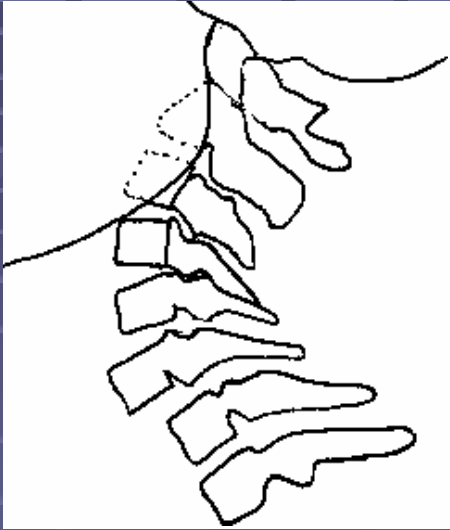


Proper posture beats these poorer postures.

Energy Expenditure:
The Biomechanical
Leverage Comparison –
Muscle Effort



Muscle effort comparison maintaining a 4kg. head upright in gravity:



Proper Posture

$$60 \text{ sec/hr} \times 13.2 \text{ kgs./s} \\ = 792 \text{ kgs./hr}$$

Straight

$$60 \text{ sec/hr} \times 33.1 \text{ kgs./s} \\ = 1986 \text{ kgs./hr}$$

Head Forward

$$60 \text{ sec/hr} \times 55.7 \text{ kgs./s} \\ = 3342 \text{ kgs./hr}$$

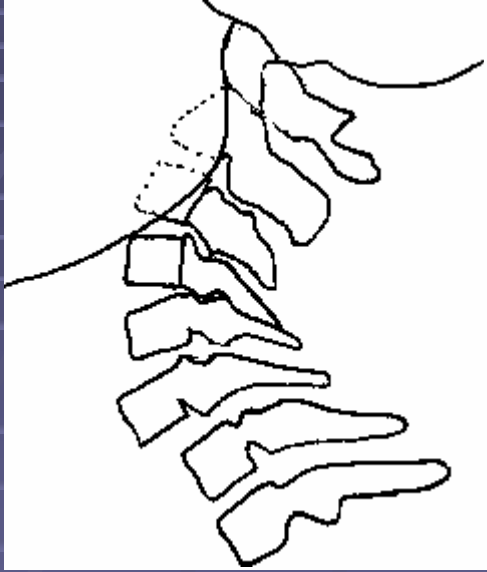
In an eight hour period we get the following:

$$8 \text{ hr} \times 792 \text{ kgs./hr} \\ = 6336 \text{ kgs.}$$

$$8 \text{ hr} \times 1986 \text{ kgs./hr} \\ = 15,888 \text{ kgs.}$$

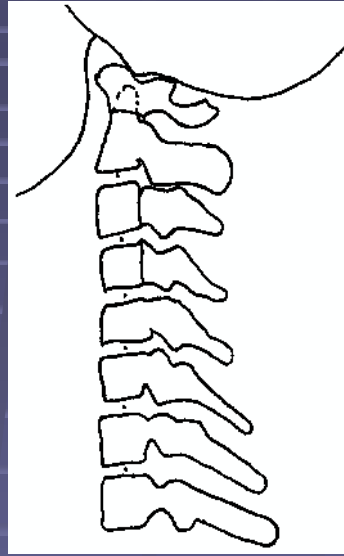
$$8 \text{ hr} \times 3342 \text{ kgs./hr} \\ = 26,736 \text{ kgs.}$$

Proper Posture



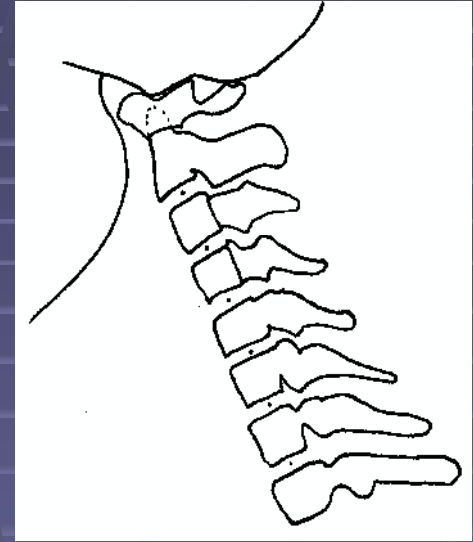
- Less fatigue
- More energy
- More strength
- More speed

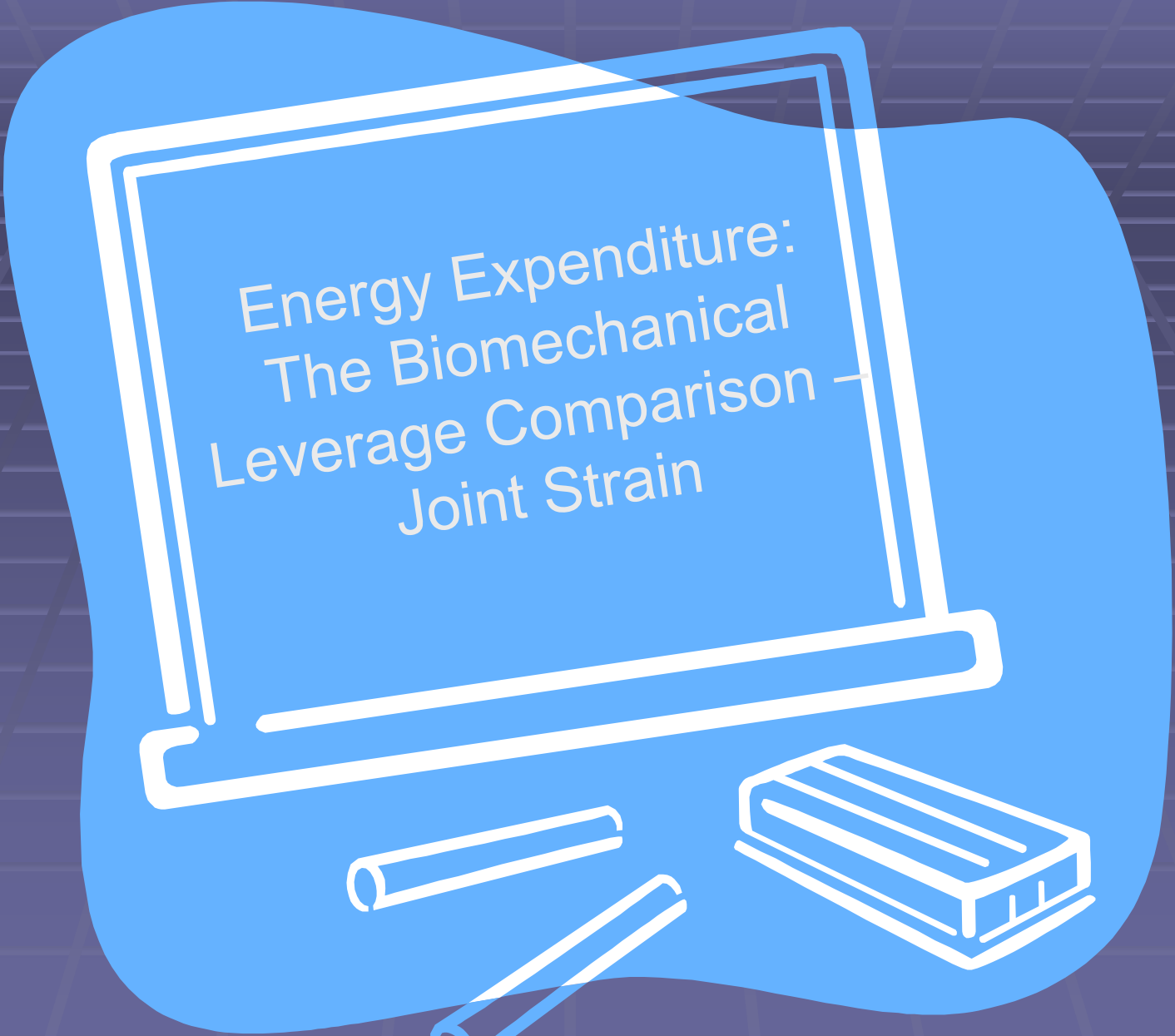
Straight Posture



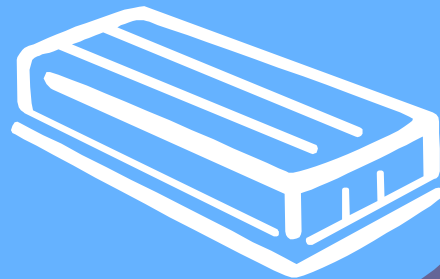
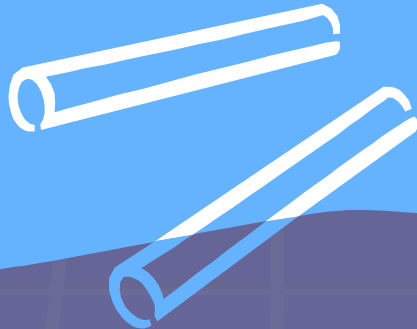
- More fatigue
- Least energy
- Least strength
- Slowest

Head Forward Posture

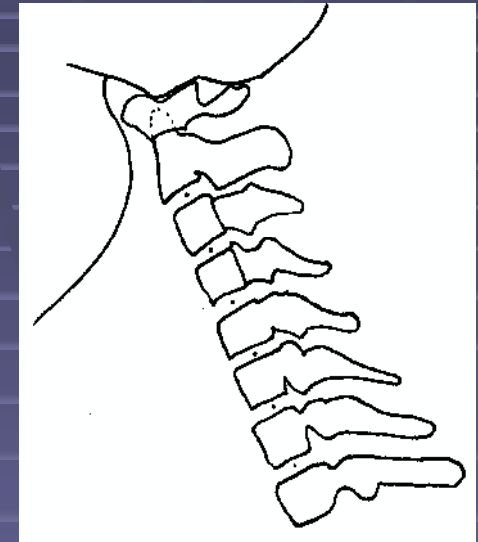
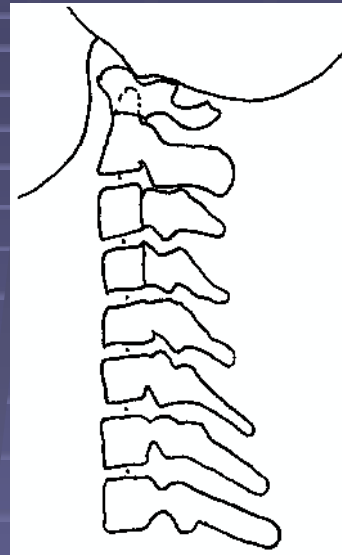
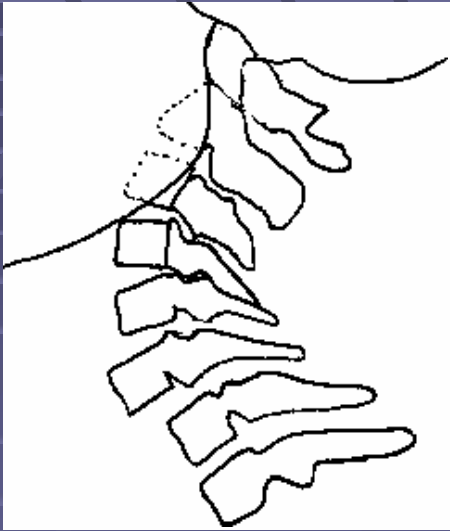


A whiteboard with a white border is tilted on a blue background. The text on the board is white and reads: "Energy Expenditure:
The Biomechanical
Leverage Comparison -
Joint Strain". Below the whiteboard are three drawing tools: two markers and an eraser, all in white.

Energy Expenditure:
The Biomechanical
Leverage Comparison -
Joint Strain



Joint strain comparison maintaining a 4kg. head upright in gravity:



Proper Posture

$$60 \text{ sec/hr} \times 37.6 \text{ kgs./s} \\ = 2256 \text{ kgs./hr}$$

Straight

$$60 \text{ sec/hr} \times 59.4 \text{ kgs./s} \\ = 3564 \text{ kgs./hr}$$

Head Forward

$$60 \text{ sec/hr} \times 74.8 \text{ kgs./s} \\ = 4488 \text{ kgs./hr}$$

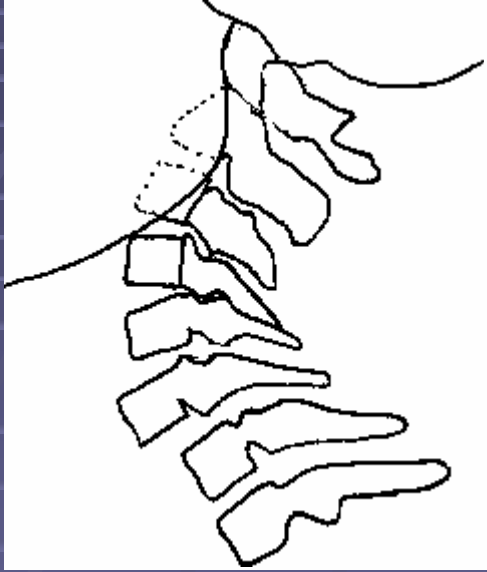
In an eight hour period we get the following:

$$8 \text{ hr} \times 2256 \text{ kgs./hr} \\ = 18,048 \text{ kgs.}$$

$$8 \text{ hr} \times 3564 \text{ kgs./hr} \\ = 28,512 \text{ kgs.}$$

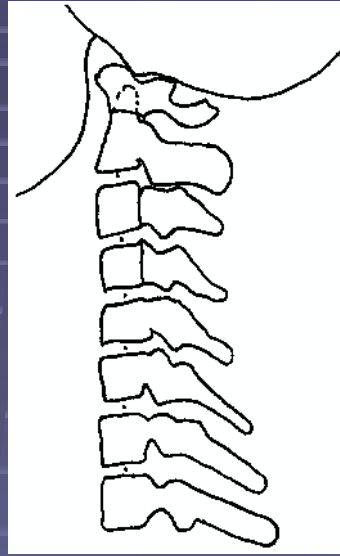
$$8 \text{ hr} \times 4488 \text{ kgs./hr} \\ = 35,904 \text{ kgs.}$$

Proper Posture



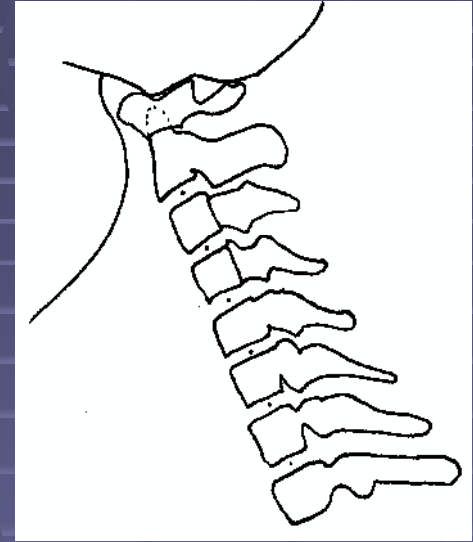
- Least strain
- Least injury
- Least degeneration
- Least disease

Straight Posture



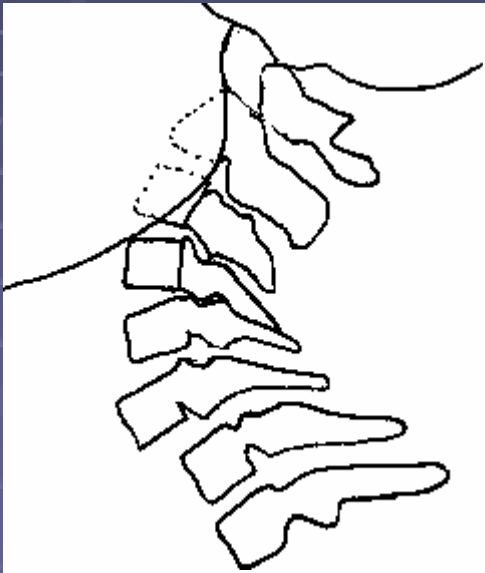
- Most strain
- Most injury
- Most degeneration
- Most diseased

Head Forward Posture

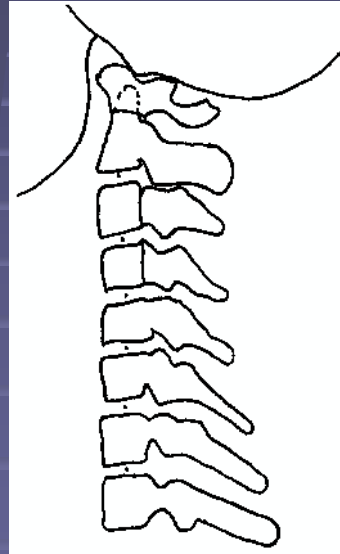


You're an athlete, a strength coach, a doctor,
a housewife.

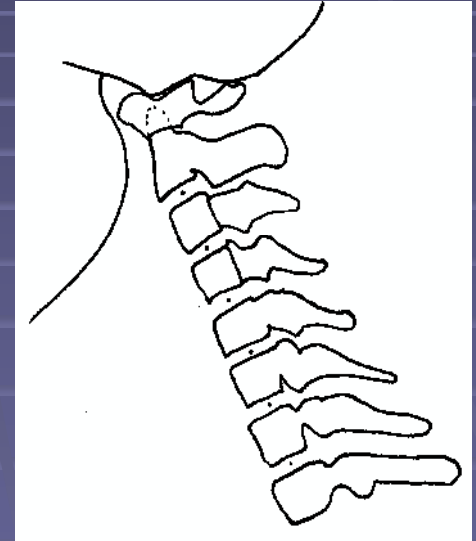
Proper Posture



Straight Posture



Head Forward
Posture



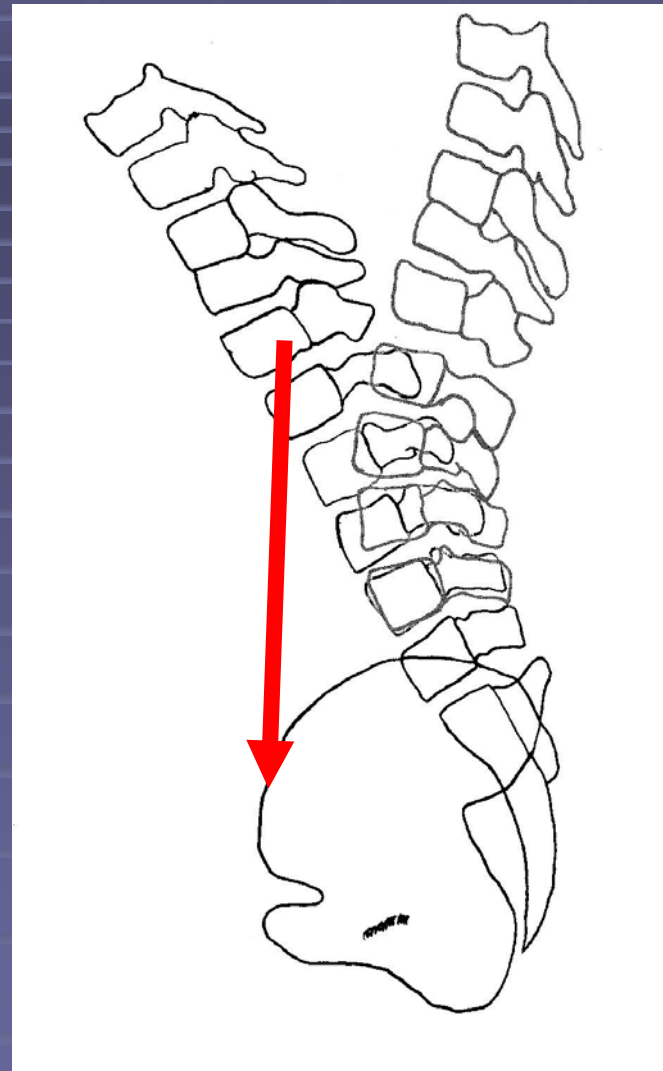
Which posture do you want and need?



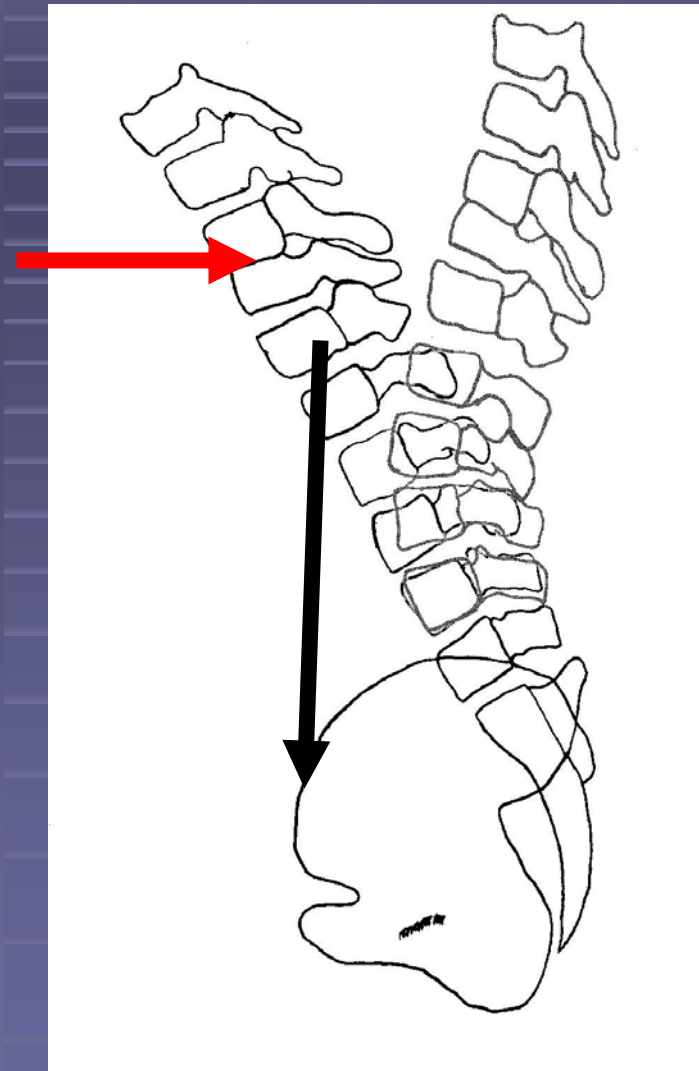
The Secret of Effective Momentum



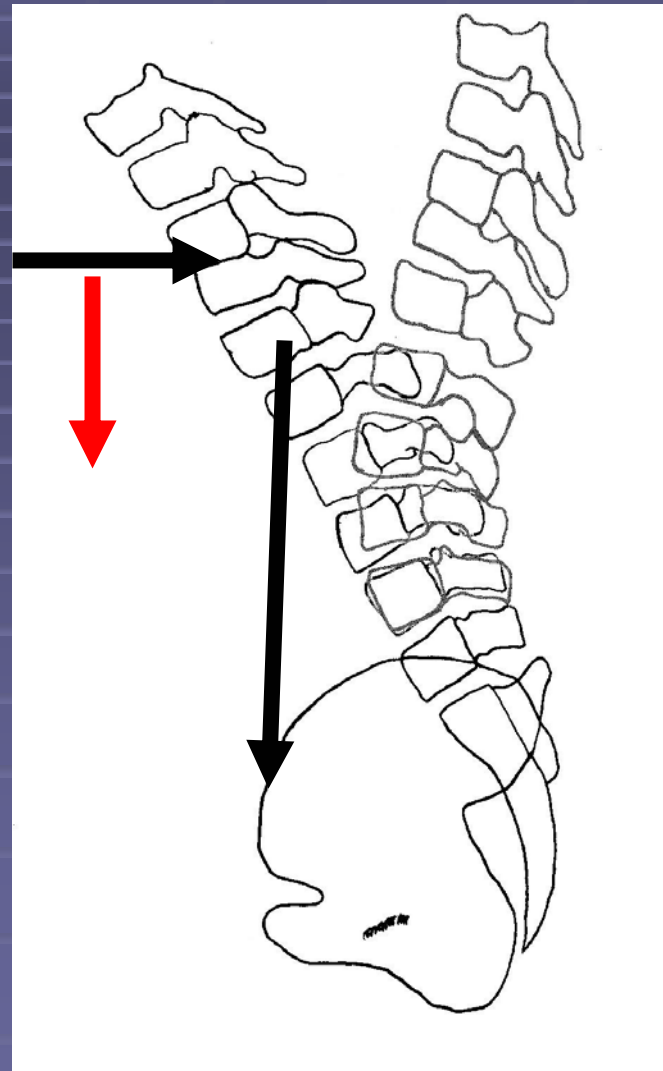
When upright, humans move their trunks forward to gain strength to push or move a resistance. They use the force generated by abdominal muscles.



As contact with a resistance comes into place, they typically have a resistance force meeting their body in a horizontal direction.

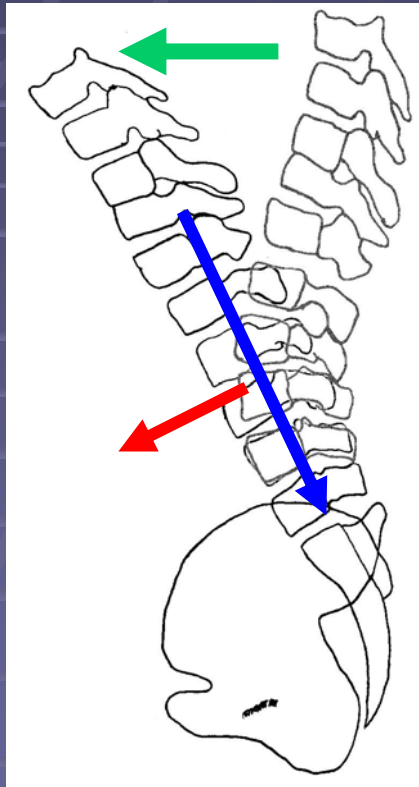


They will also have the addition of their own body weight with its downward force direction.

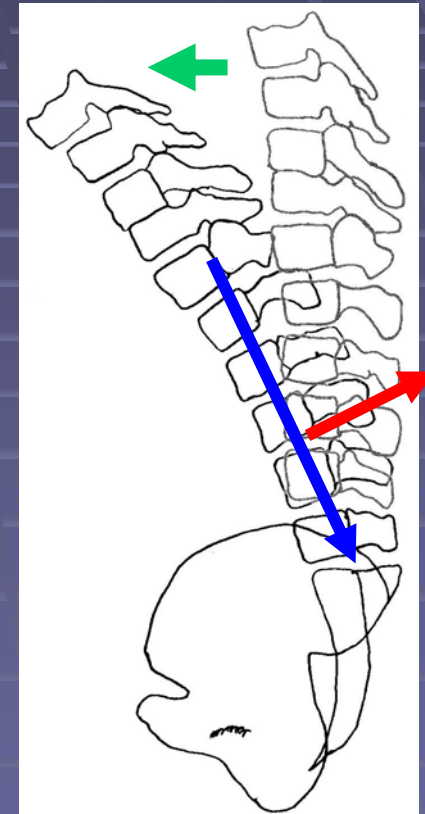


These three forces have the following accumulative directions of force into the vertebral joints as the spine moves forward.

Proper Posture



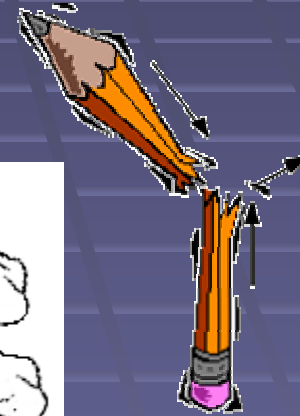
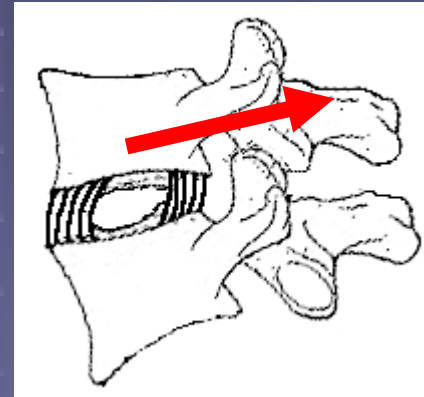
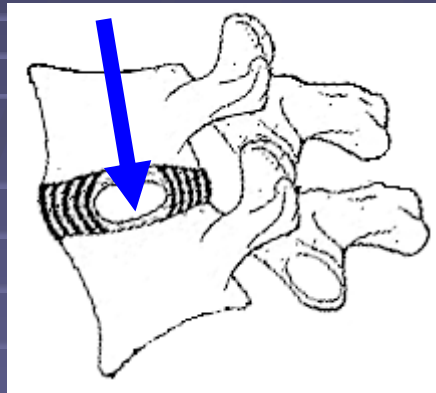
Improper Posture



In both postural cases, compression (blue arrow) is created into the discs.

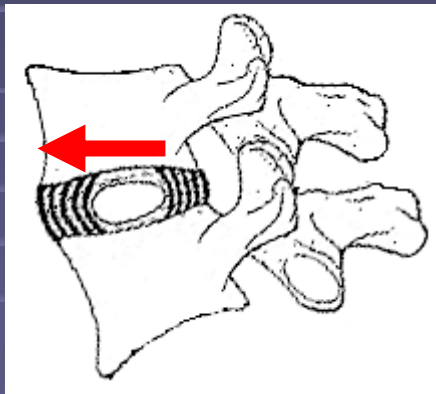
Shear, however is a different matter. In proper posture, shear (red arrow) is anterior. In improper posture, shear is posterior.

A compressive force stabilizes the spine by putting the vertebrae into a vice-like formation.

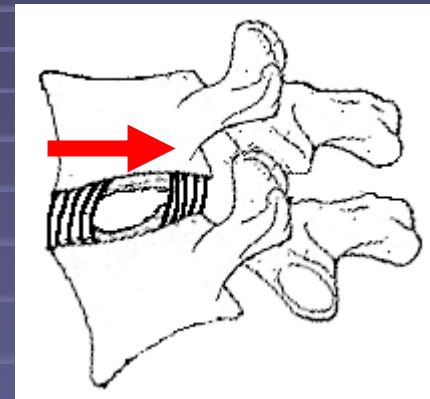


Shear forces make the spine unstable by causing the spine to dislocate.

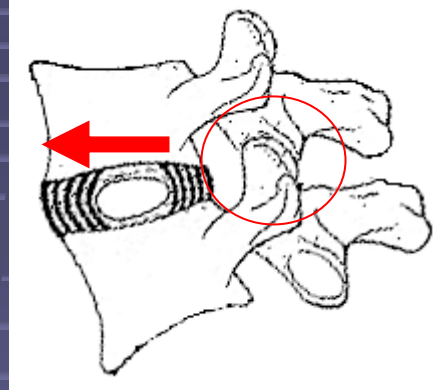
The secret of effective momentum and why proper posture is stronger and more injury resistant:



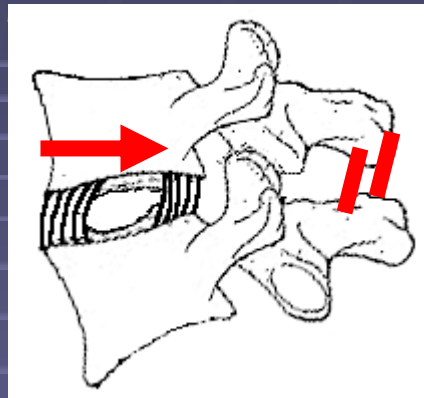
Proper posture has shear that is anterior (forward).



Improper posture has shear that is posterior (backward).



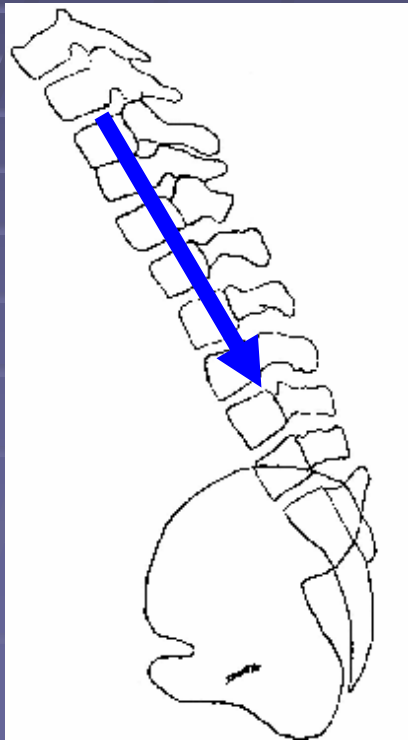
Proper posture stabilizes shear by strong bone-to-bone contact of the facets.



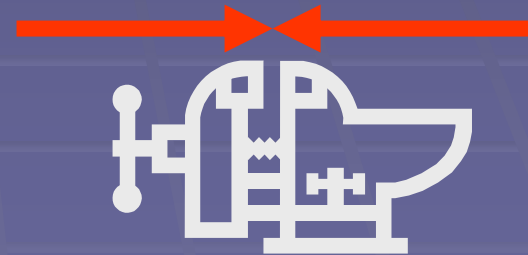
Improper posture has to biomechanically stabilize shear by muscular co-contractions to stop dislocations.

Proper posture can move into a position where all the forces created are compressive.

Proper Posture

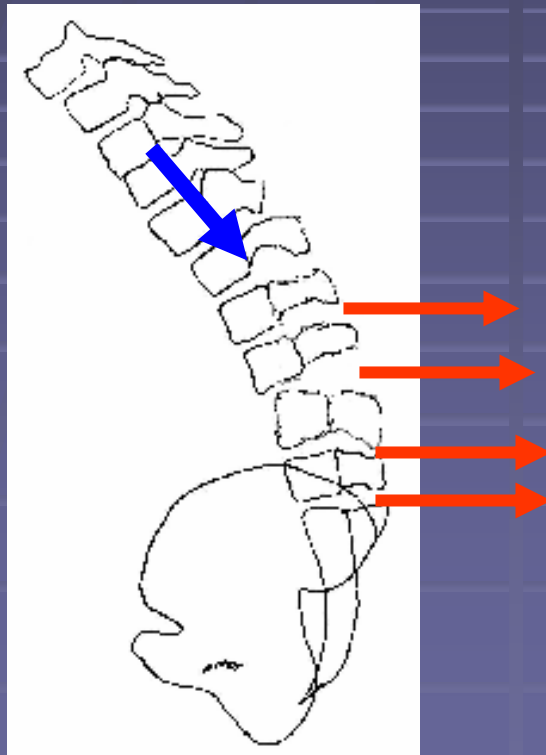


When forces between the vertebrae line up, they are strongly stabilized like a vice.

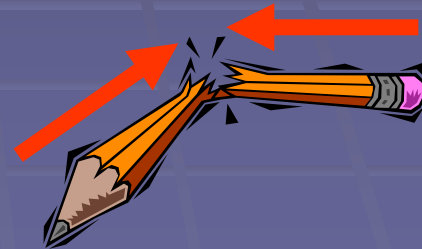


As improper posture moves forward, however, the stabilizing force (compression) into the discs decreases and destabilizing shear forces keep increasing.

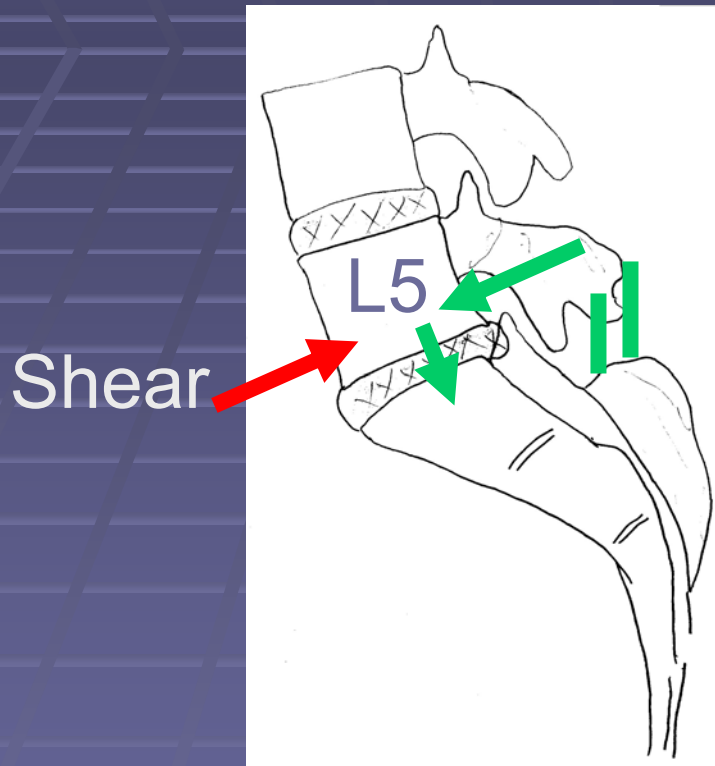
Improper posture



When forces don't line up at the joints, shear is created dislocating them.



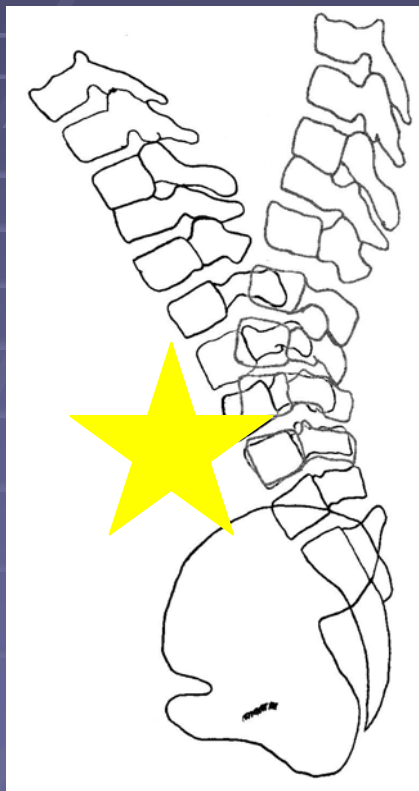
Biomechanically, stabilizing shear takes muscular co-contractions.



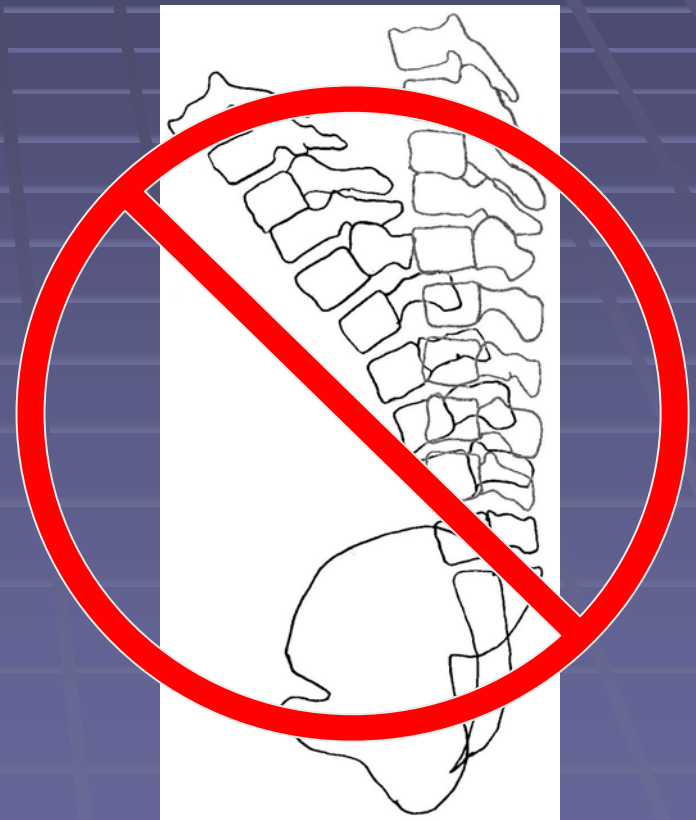
The green arrows indicate the shear and additional compression necessary for stabilization.

Muscular co-contractions increase the overall muscle effort and increases the ultimate forces into joints.

Proper posture produces a simple, strong, stable system. Improper posture produces a weak structure requiring complex shear stabilizing mechanisms.

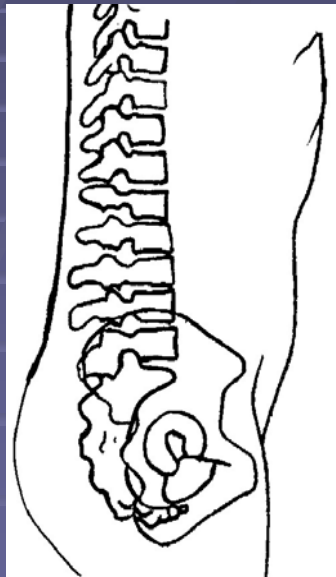


Proper Posture

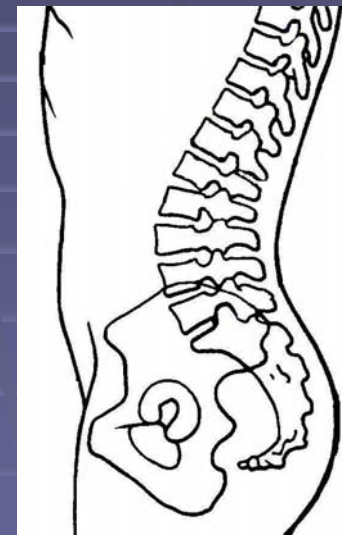
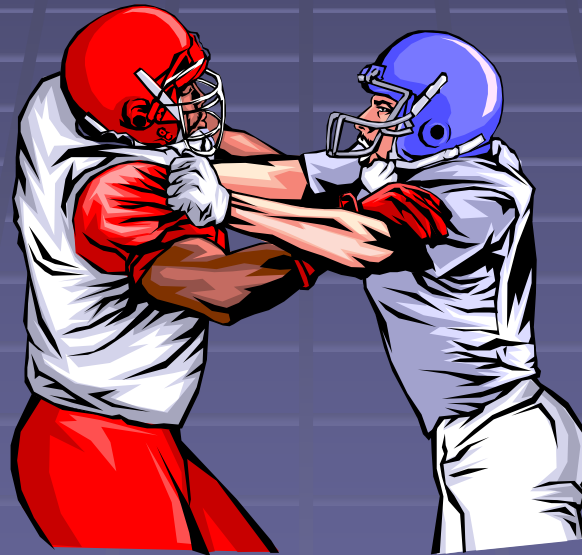


Improper Posture

See the mechanical advantage comparison between proper and improper posture as two athletes go head-to-head in competition.



Improper posture



Proper posture

Mechanical advantage comparison between proper and improper posture as each posture is moved forward against 100 pounds of resistance.

	Improper posture	Proper posture
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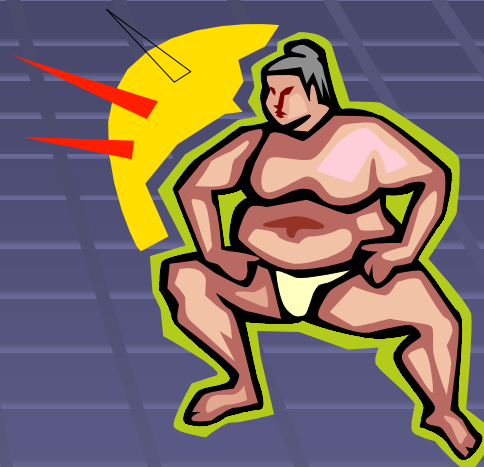
Total force of effort	282 lbs.	77 lbs.
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- Proper posture has 3.5 times better mechanical advantage over improper posture

Forces created into the joint	2166 lbs.	1218 lbs.
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- Proper posture has 1.8 times better mechanical advantage over improper posture.

This is the secret why proper posture will outperform other postures in everything from contact sports to pushing a wheelchair to a take down in wrestling.



Read our other materials on our site to learn more about why humans need to adapt proper posture. Our courses are needed to build the knowledge to more completely understand and explain to others the concepts of Effective Momentum and Energy Expenditure.