

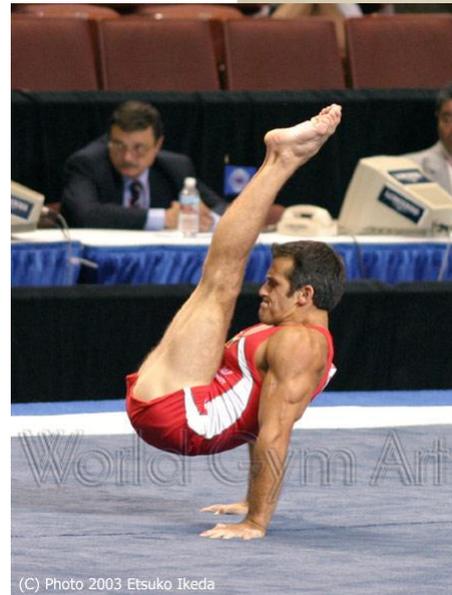
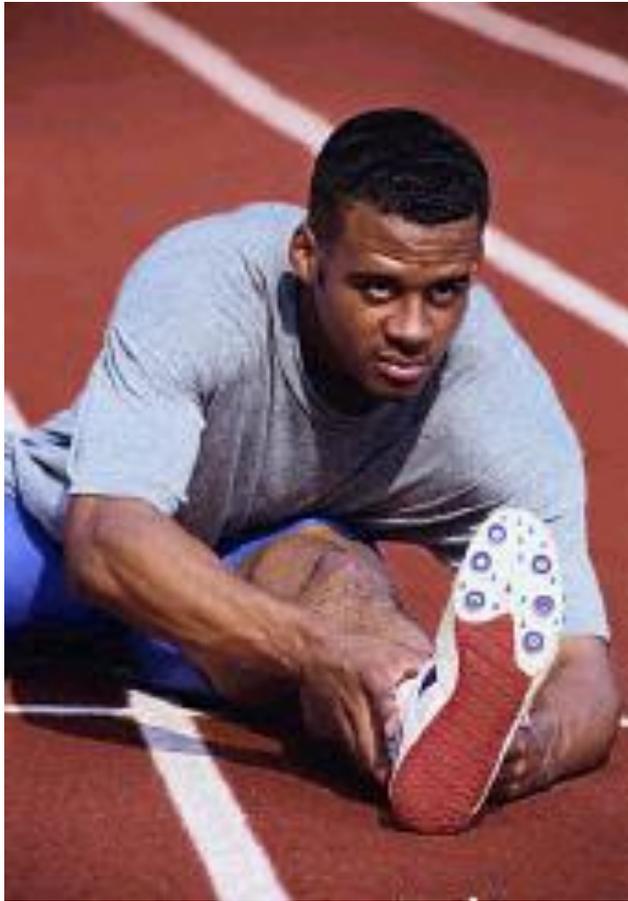
Flexibility

Why do I have to be flexible?, I'm not a gymnast or a dancer.



What Is Flexibility?

- Flexibility is the range of motion possible at a joint. **Not double jointed.**



Factors that Affect Flexibility

- Heredity
- Previous Injuries – Can affect range of motion
- Age – You usually become less flexible as you age
- Lack of daily stretching and practice.
- Improper stretching techniques
- With less physical activity, muscles lose their flexibility and tendons and ligaments tighten and shorten.
- In addition, too much muscle strengthening can off set the skeletal muscular balance.

Warm-Up

- Warm-up is necessary to increase blood flow to the muscles and to increase the core temperature of the body.
- The warm up should last 3-5 minutes and should consist of cardio activity.
- Proper warm-up helps prevent injuries by loosening and stretching muscle fibers and connective tissues (tendons and ligaments).

General Guideline for Stretching

- Frequency: Stretch 3-4 times per week
- Intensity: Stretch until you feel tension but not pain
- Time: Perform each stretch for a minimum of 30 seconds, and a maximum of 60 seconds
- Perform one stretching exercise for each of the major muscle groups of the body
- Stretch for 5-10 minutes
- Complete stretches that are sport specific.

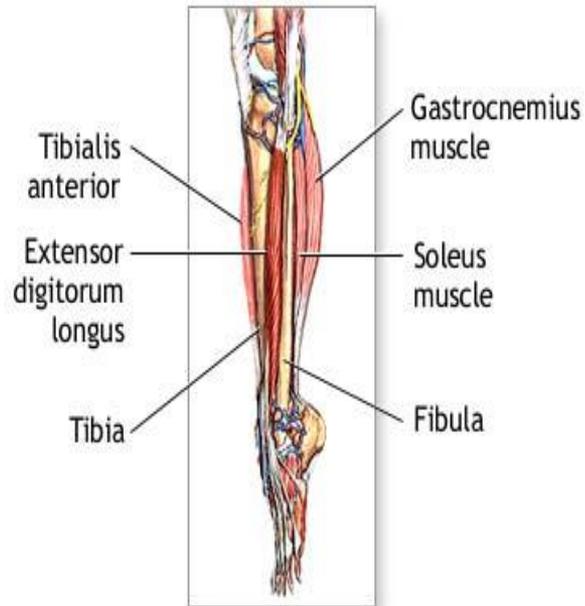


How to use stretching in a workout

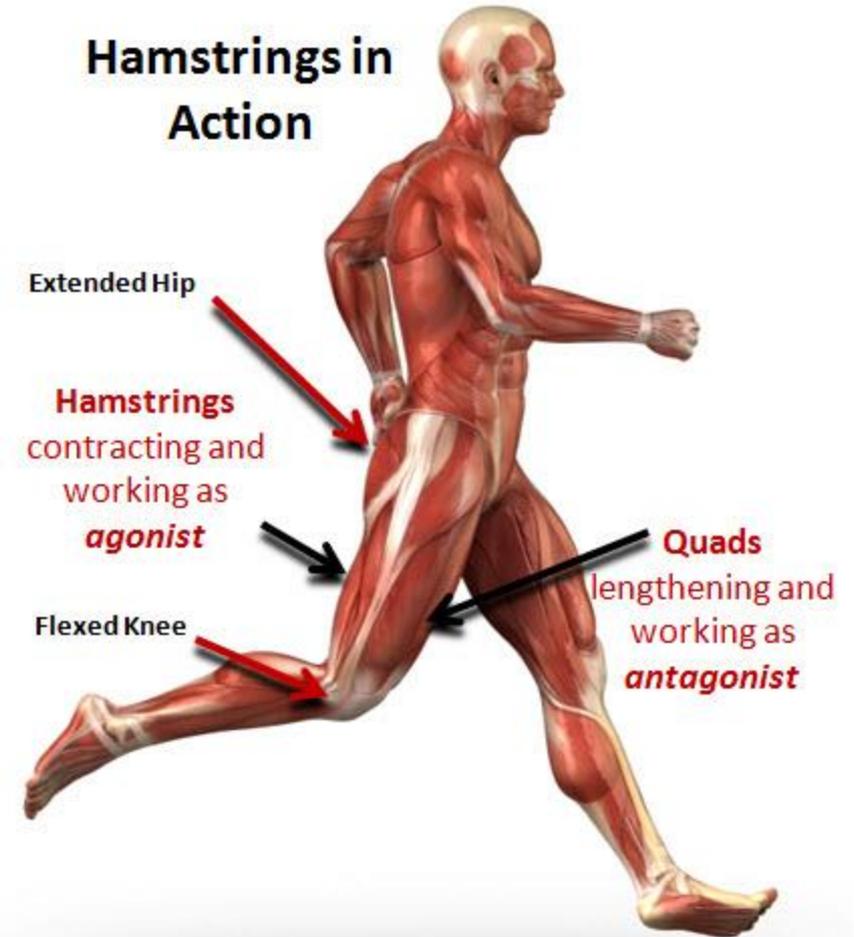
- Increase your heart rate before stretching .
- Stretch muscles for 5-10 minutes.
- Hold each stretch for 30 seconds to 1 minute.
- Static stretching is the best choice for stretching.
- Perform your activity or exercises.
- Cool down until your heart rate has lowered.
- Stretch again for the best results.



The muscle stretches best when it is relaxed.

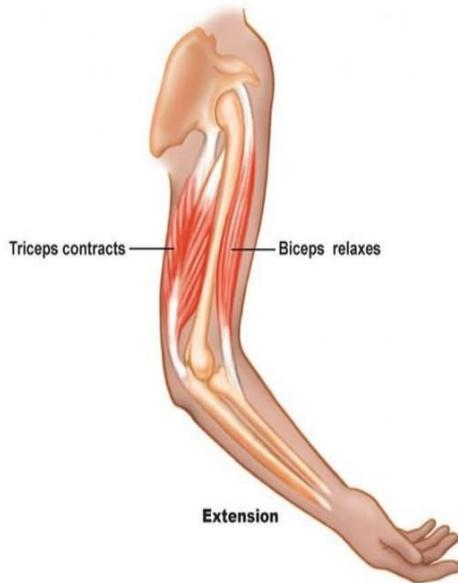


ADAM.



Arm and Quad

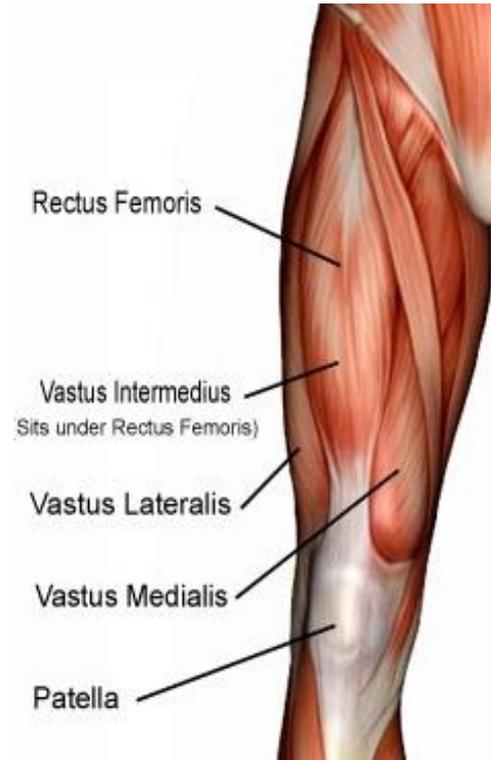
How would you stretch the biceps and then the triceps?



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How would you stretch the quadriceps?

When is the muscle relaxed?



Everyday Stretches: Hold 1 minute each

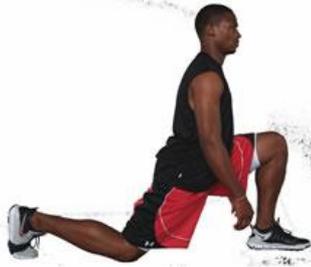
• Neck



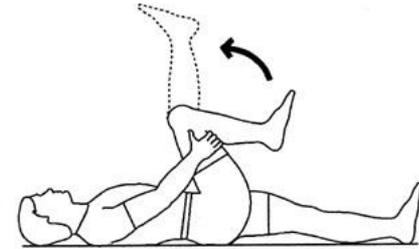
*Triceps



• Hip Flexors



*Hamstrings



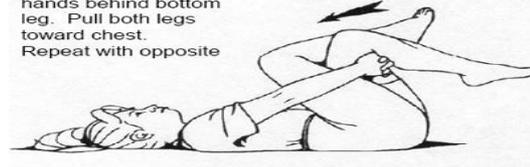
*Quadriceps



*Gluteus/Periformis

Piriformis Stretch

Cross right leg over left @ knee. Clasp hands behind bottom leg. Pull both legs toward chest. Repeat with opposite



• Illiotibial band



*Back



Achilles



Three Basic Types of Stretching

- Static- hold the stretch until tension is felt , not pain.



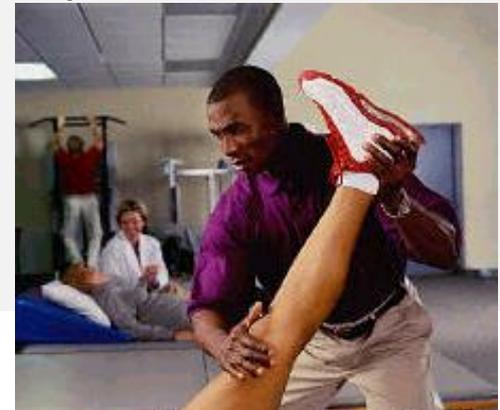
- Ballistic- bouncing or forcing the stretch.
(this causes damage to the fibers)



- Proprioceptive Neuromuscular Facilitation (PNF)

Stretching technique where muscles are stretched using a contract and relax method

- This method requires the assistance of another person



Stretches to Avoid



1. Turning knee out foot back. Overstretches the medial ligaments and tendons.
2. Instead of standing to touch toes- sit to allow the hamstrings to relax.

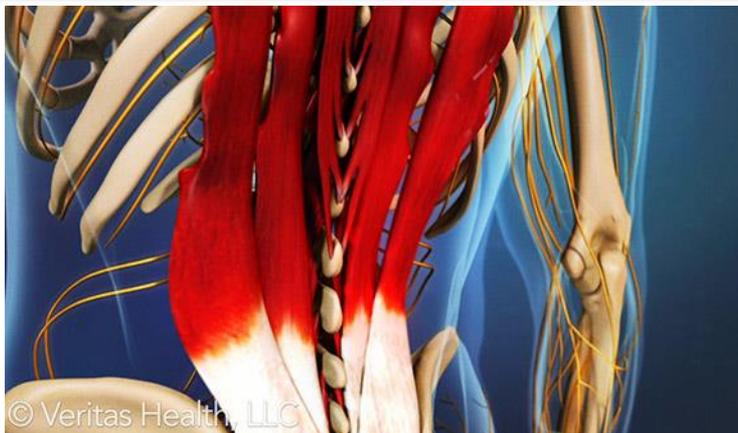
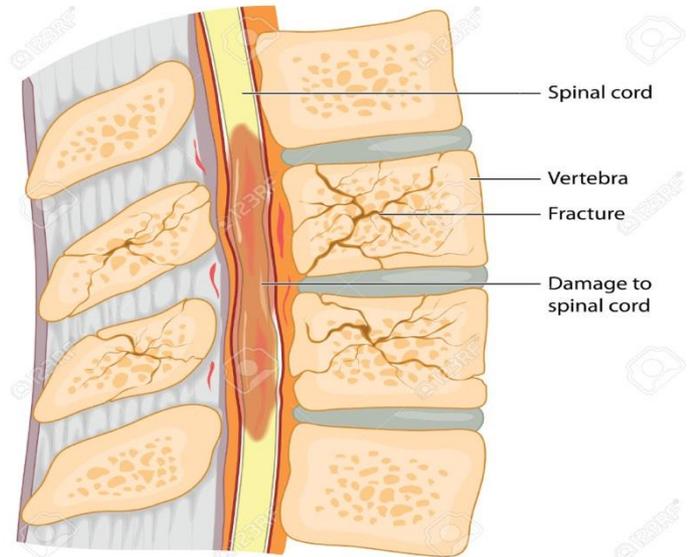
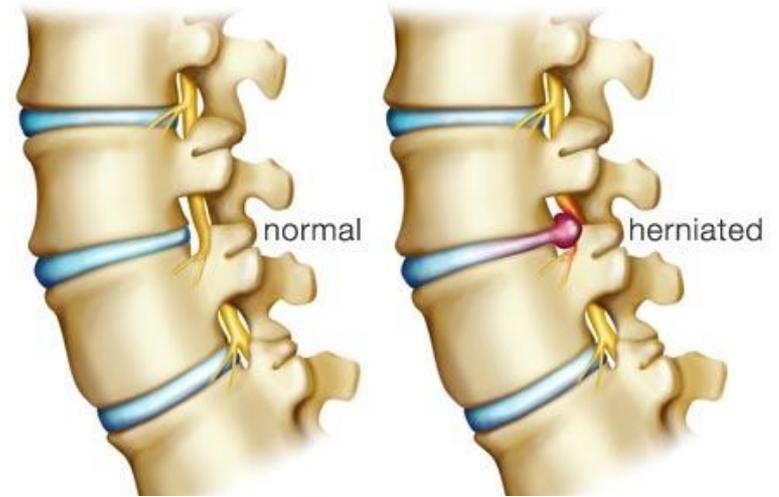
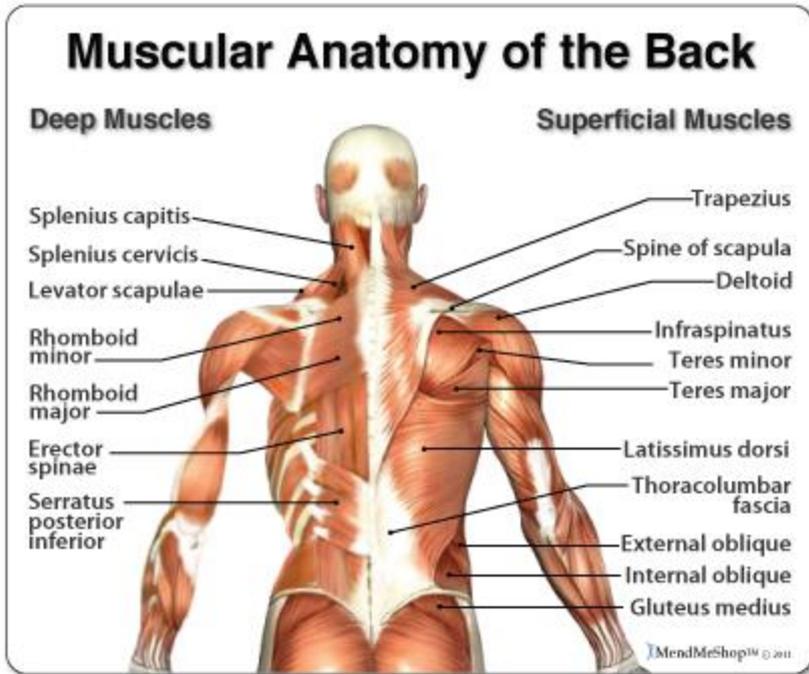


Common Back Injuries



Strain or Sprain

Herniated Disk and Fracture



How Stretching Can Help With Low Back Pain

- You can help prevent lower back pain simply by stretching certain muscles.
- You should stretch hamstrings, hip flexors, and all back muscles especially lower back muscles and gluteus muscles.
- Low back pain can also be prevented by strengthening the abdominals.

Stretching and Low Back Pain

- Nearly 80% of the U.S. population will experience low back pain
- It is the 2nd leading cause of absence in the work force behind the cold
- 70% of all back problems are caused by weak, inflexible muscles

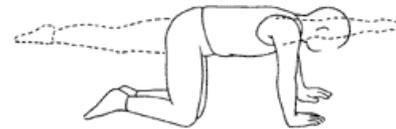
Low Back Pain Exercises



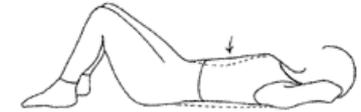
Standing hamstring stretch



Cat and camel



Quadrupedal arm/leg raises



Pelvic tilt



Partial curl



Trunk rotation



Double knee to chest

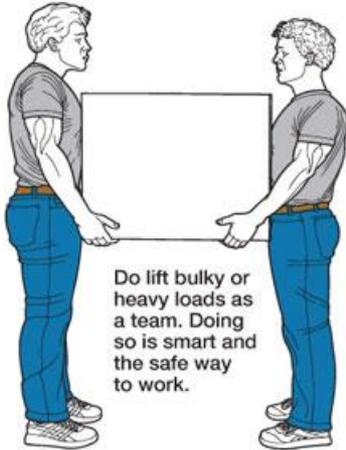


Single knee to chest stretch

Improper Lifting

LIFTING DO'S & DON'TS

DO LIFT AS A TEAM



Do lift bulky or heavy loads as a team. Doing so is smart and the safe way to work.

DO TURN WITH LEGS



Do move your legs and feet when turning or lowering the load. Avoid twisting at your waist.

DO USE YOUR LEGS

Do lift the load using your powerful leg and buttocks muscles. Your feet should be wide apart, head and back upright. Keep abdominal muscles tight and the load in close.



DO USE EQUIPMENT

Do use equipment like hand trucks, dolly's, or forklifts to do the heavy lifting. It's much less work and less risk of injury.



DON'T LIFT BULKY LOADS ALONE



Don't lift bulky or heavy loads alone. Doing so puts great stress on your low back muscles and spine.

DON'T TWIST WHEN LIFTING



Don't twist when lifting, lowering, or carrying any load as this increases your risk of back injury.

DON'T USE YOUR BACK

Don't lift the load with your rear end high and your head low. Use your leg muscles, not your weaker low back muscles.



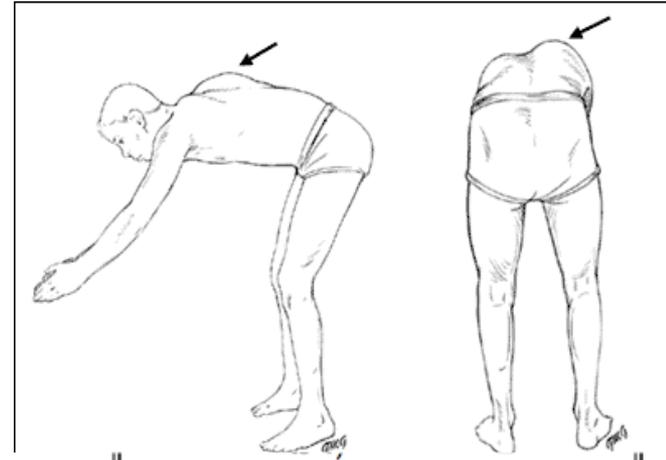
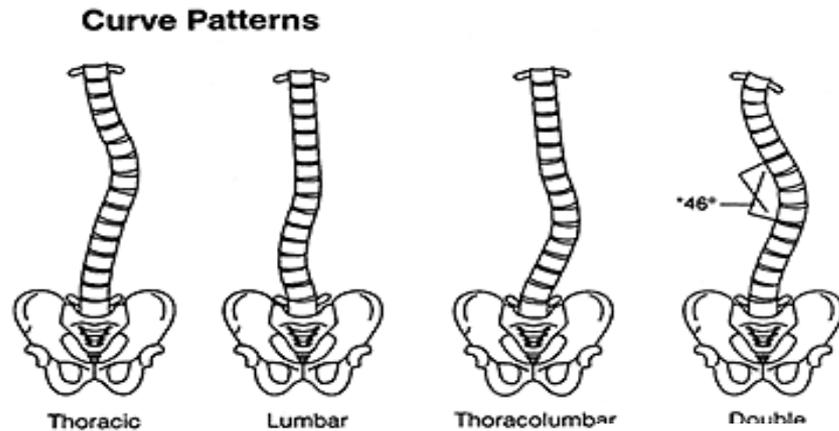
DON'T LIFT HEAVY LOADS



Don't lift heavy loads when you can use equipment. It is less work and less stress on your low back.

Scoliosis

- Scoliosis is an abnormal lateral curvature of the spine greater than 10 degrees.



© 2001 Gilbert M. Gardner

- ◆ What is the likelihood the curve will progress?
- ◆ What degree of curvature leads to medical complications?

TABLE 2
Risk of Curve Progression

Curve (degree)	Growth potential (Risser grade)	Risk*
10 to 19	Limited (2 to 4)	Low
10 to 19	High (0 to 1)	Moderate

20 to 29	Limited (2 to 4)	Low/moderate
20 to 29	High (0 to 1)	High
>29	Limited (2 to 4)	High
>29	High (0 to 1)	Very high

*--Low risk = 5 to 15 percent; moderate risk = 15 to 40 percent; high risk = 40 to 70 percent; very high risk = 70 to 90 percent.

Information from references 5 and 8 through 11.

Osteoporosis

What is it?

- “Silent disease” until complicated by fractures
- Most common bone disease in humans
- Characterized by:
 - Low bone mass
 - Microarchitectural deterioration
 - Compromised bone strength
 - Increased risk for fracture

Risk Factors

Major

- History of fracture as an adult
- Fragility fracture in first degree relative
- Current smoking
- Low calcium intake (lifelong)
- Low amount of physical activity
- > 2 alcoholic drinks per day

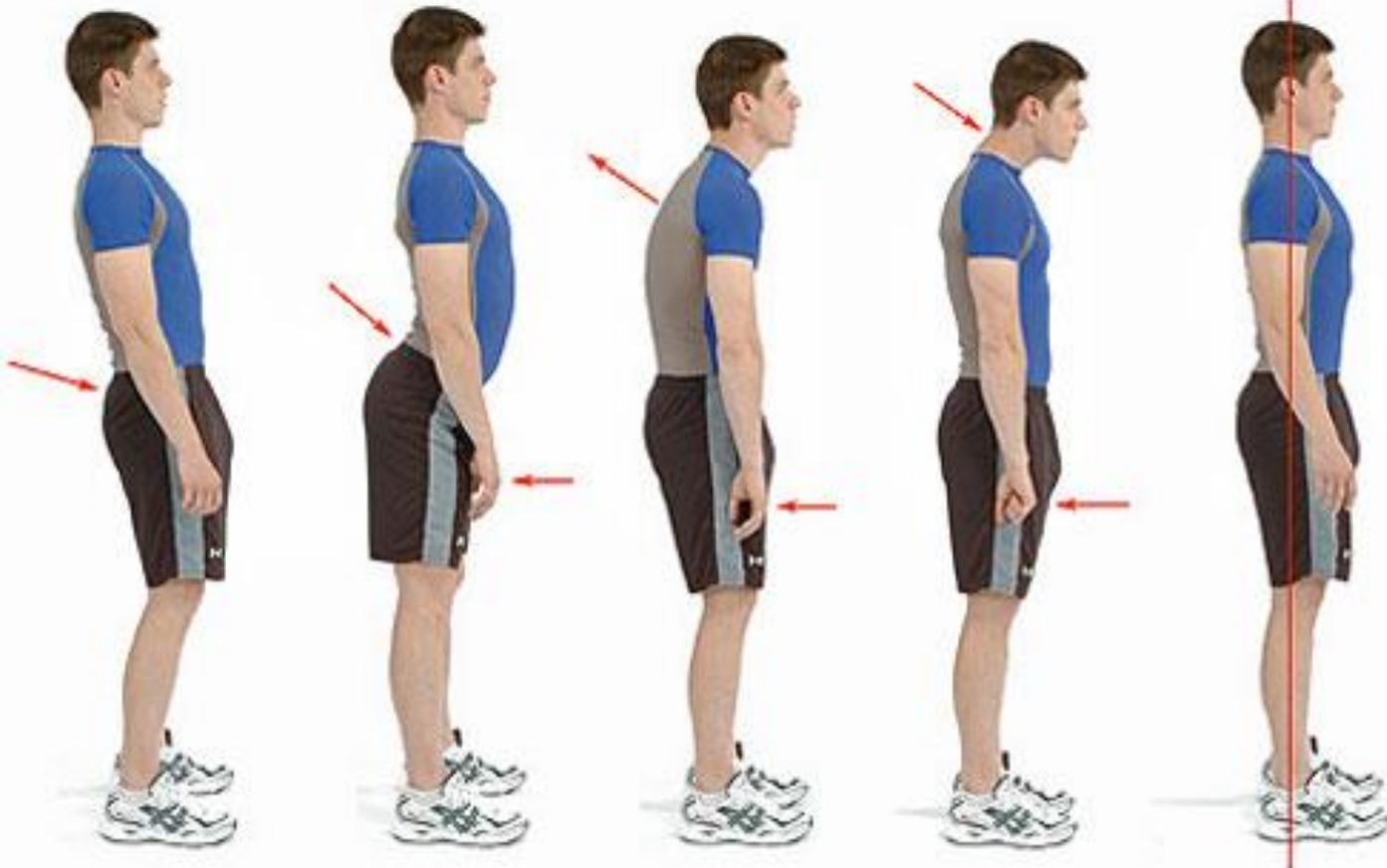


Prevention of Osteoporosis

Regular Weight-Bearing Exercise

- Defined as those in which bones and muscles work against gravity as feet and legs bear the body's weight
- Include walking, jogging, Tai-Chi, stair climbing, dancing, tennis, yoga
- Improve agility, strength, balance
- Increases bone density modestly, reduce fall risk, enhance muscle strength, improve balance

Posture



Sway
Back

Lumbar
Lordosis

Thoracic
Kyphosis

Forward
Head

Good
Posture

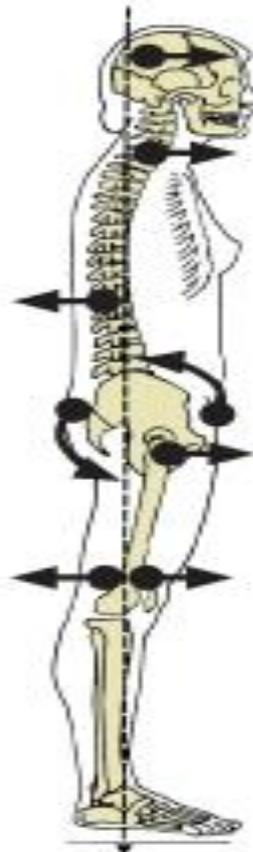
Vertebral Positioning for Postural Stance



a. Lordosis: increased anterior lumbar curve from neutral



b. Kyphosis: increased posterior thoracic curve from neutral



c. Flat back: decreased anterior lumbar curve



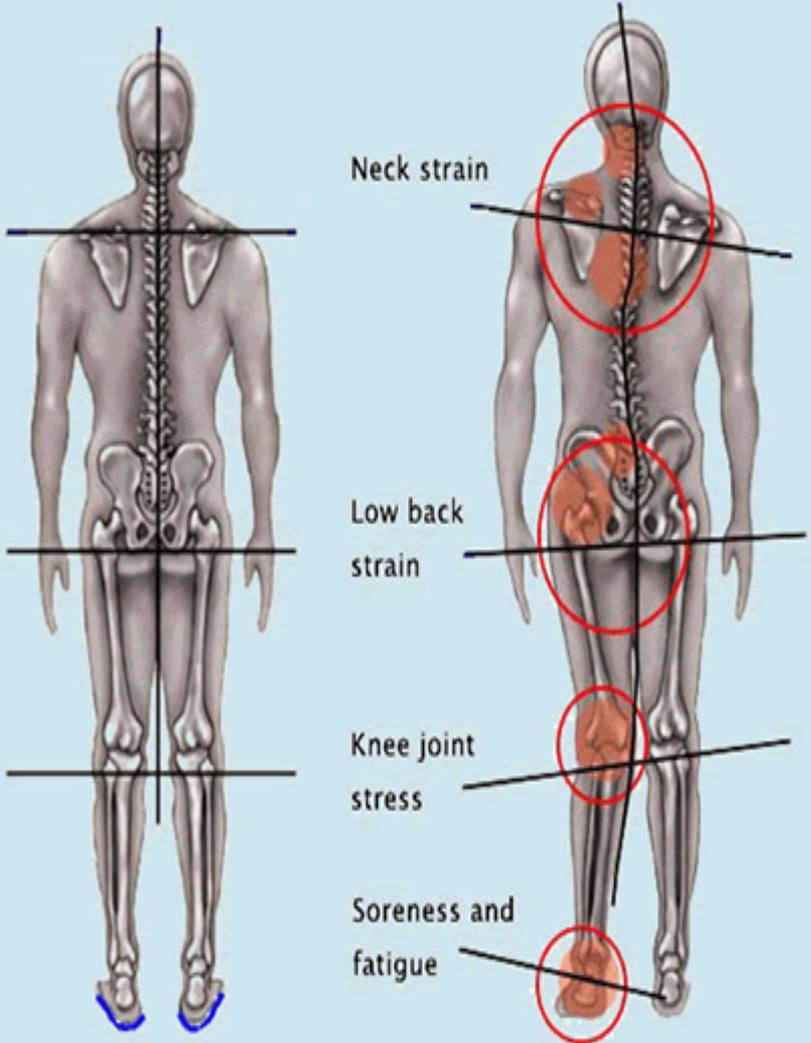
d. Sway back: decreased anterior lumbar curve and increased posterior thoracic curve from neutral

How the Foot Affects the Rest of the Body

The foot aligns the rest of the body.

All shoes should fit to keep alignment of the body.

Shoes affect your health.



Neck strain

Low back strain

Knee joint stress

Soreness and fatigue

Pump bump

The rigid backs or straps of high heels can irritate the heel, creating a bony enlargement also known as Haglund's deformity.

Ankle injuries

High heels impair balance; a wearer is at a greater risk of falling, which could lead to a sprained or broken ankle.

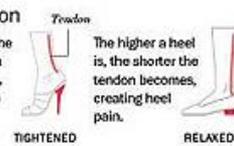
Metatarsalgia

High heels force the body's weight to be redistributed. Prolonged wear can lead to joint pain in the ball of the foot.



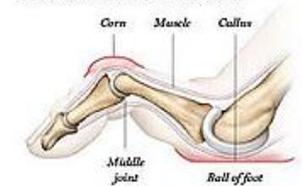
Achilles tendon

When the front of the foot moves down in relation to the heel, the Achilles tendon tightens up.



Hammertoes

A narrow toebox pushes the smaller toes into a bent position at the middle joint. Eventually, the muscles in the second, third and fourth toes become unable to straighten, even when there is no confining shoe.



Full contact into the arch. Can your old orthotic do that?



With Orthotics

Without Orthotics

Conventional orthotics do not support the arch, but use a wedge shape under the heel to affect foot position. Note how heel soft tissue deforms on contact. How can this control the whole foot if it can't move the heel??

Proper Shoe Support

Activity Shoes

- Shoes Should also be based on the structure of the foot.

Activity Shoes should be fit for the appropriate activity.

Some thoughts on shoe selection for Plantar Fasciitis

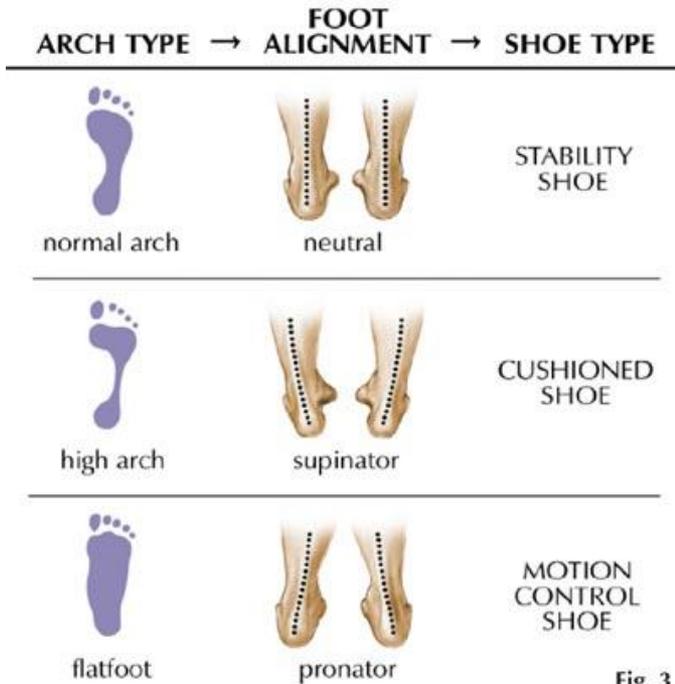


Fig. 3



Good heel section with at least 10mm heel toe drop.
Aim is to reduce dorsiflexion during running and therefore decrease load on the achilles and plantar fascia

Mid section with firm but well cushioned arch support. Excessively firm arch support can be painful in PF but support does seem to reduce symptoms - a balance is needed.

A fairly firm toe section that resists excess bend. Aim is to reduce great toe extension which can increase load on the plantar fascia via the windlass mechanism i.e. **not these!**



1 Heel Support 2 Midsole Stability 3 Arch Support

