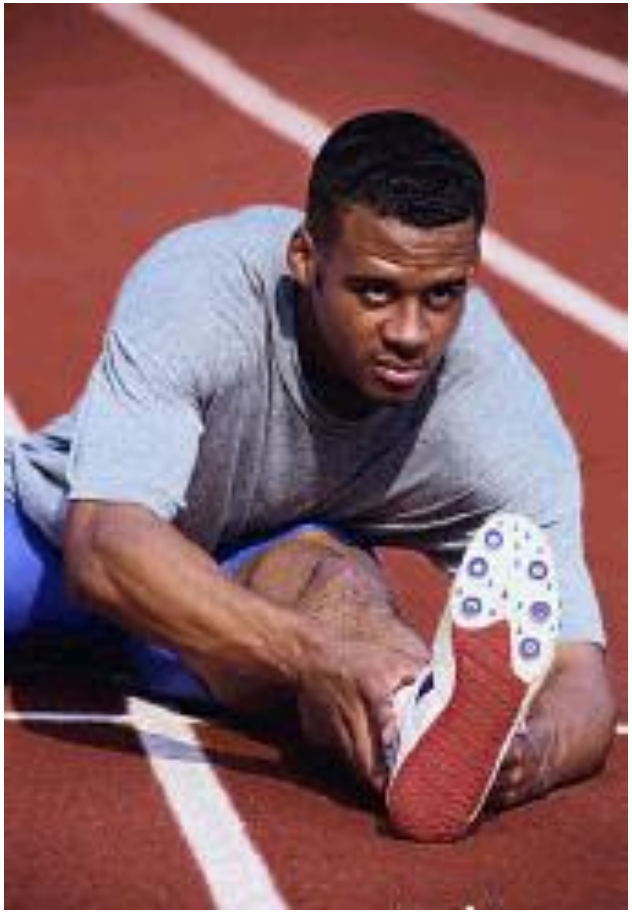
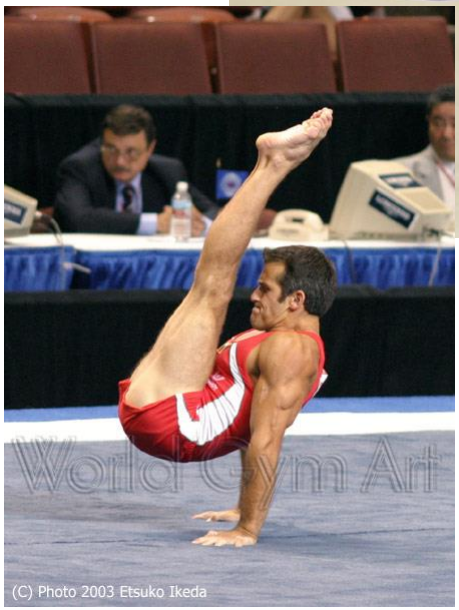
Flexibility

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. ***<u>Not double jointed</u>***.





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).

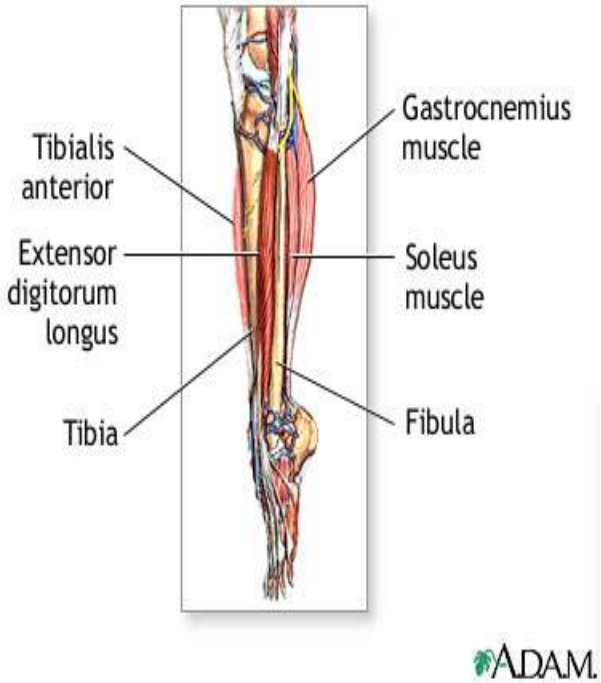
General Guideline for Stretching

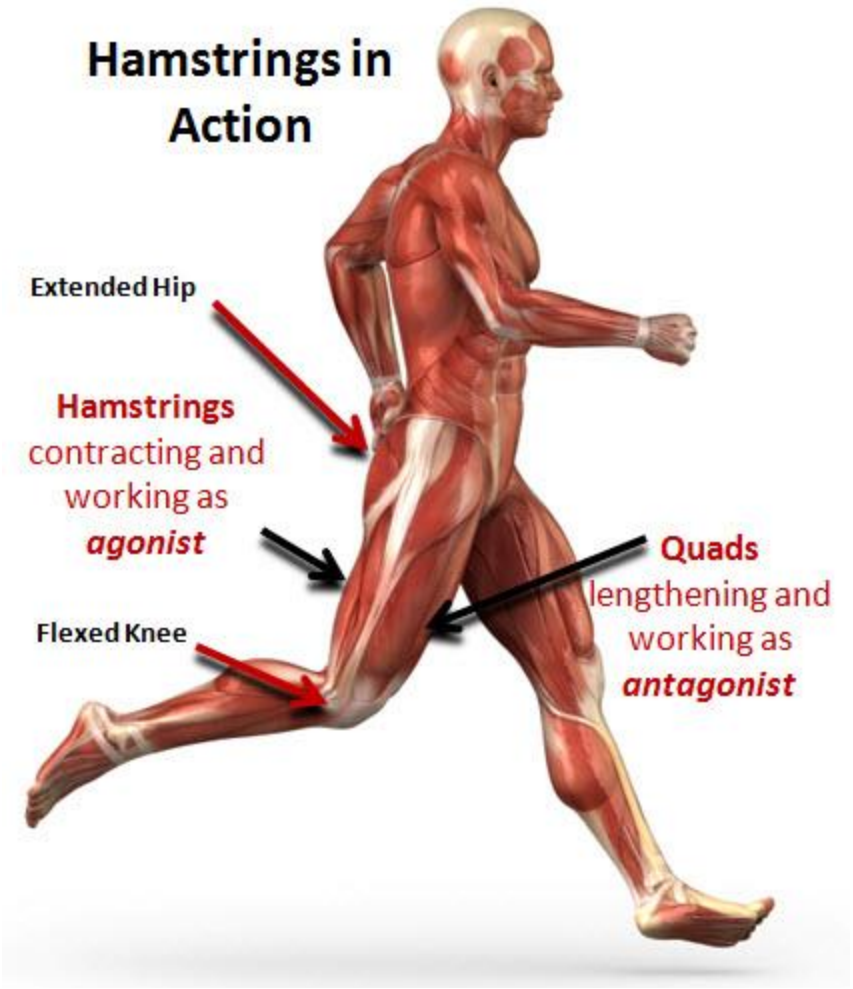
- Frequency: Stretch 3-4 times per week
- Intensity: Stretch until you feel tension but not pain
- Time: Perform each stretch for a minimum of 30 seconds, and a maximum of 60 seconds
- Perform one stretching exercise for each of the major muscle groups of the body
- Stretch for 5-10 minutes
- Complete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

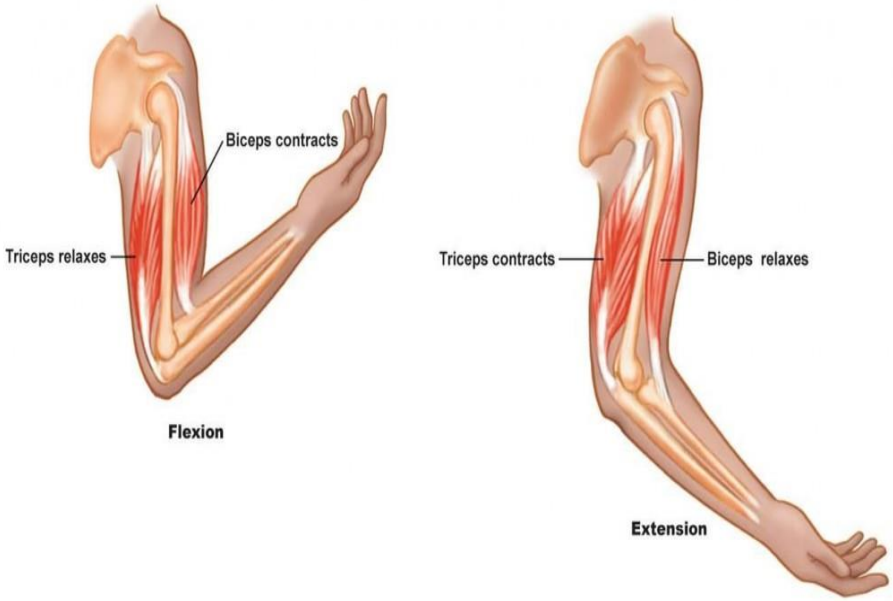
The muscle stretches best when it is relaxed.





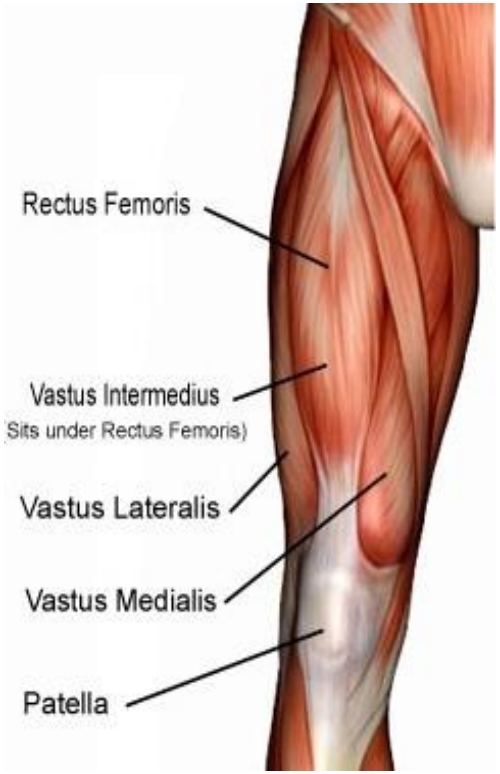
Arm and Quad

How would you stretch the biceps and then the triceps?



How would you stretch the quadriceps?

When is the muscle relaxed?



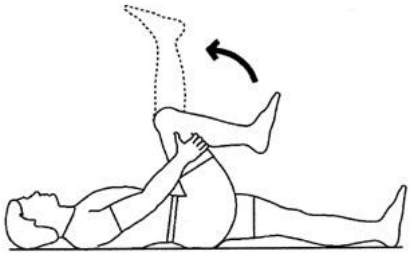
Everyday Stretches: Hold 1 minute each

- Neck

*Triceps

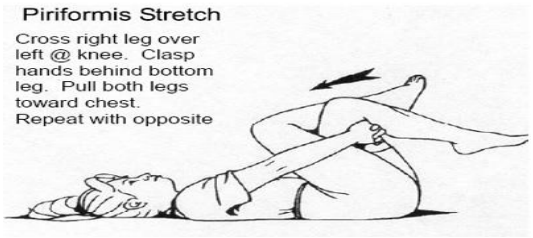
- Hip Flexors

*Hamstrings



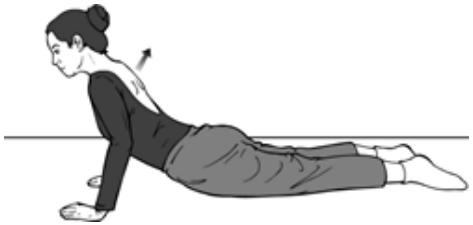
*Quadriceps

*Gluteus/Periformis



- 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

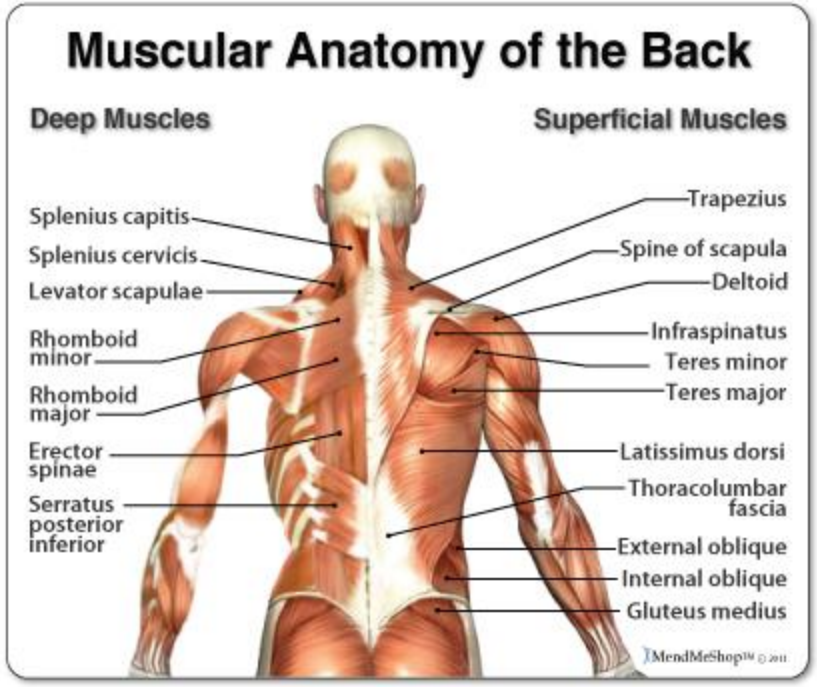
- This method requires the assistance of another person

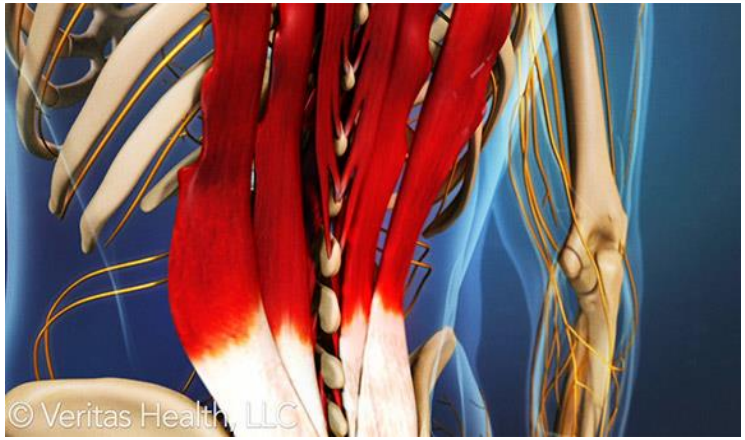
Stretches to Avoid

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.

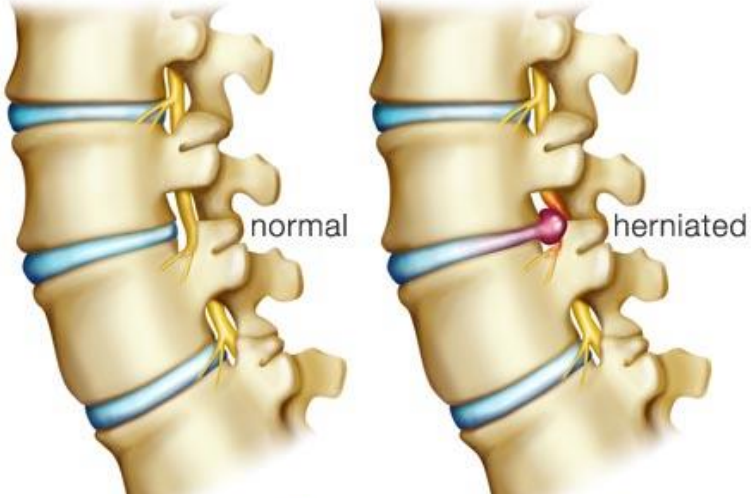
Common Back Injuries

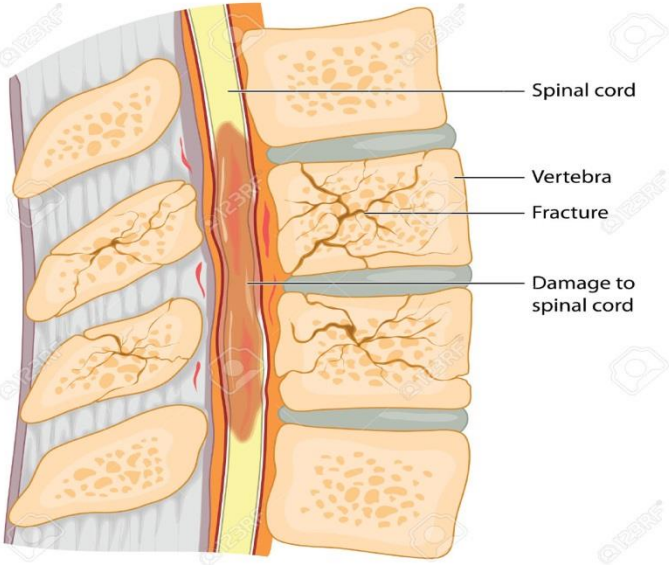
Strain or Sprain





Herniated Disk and Fracture



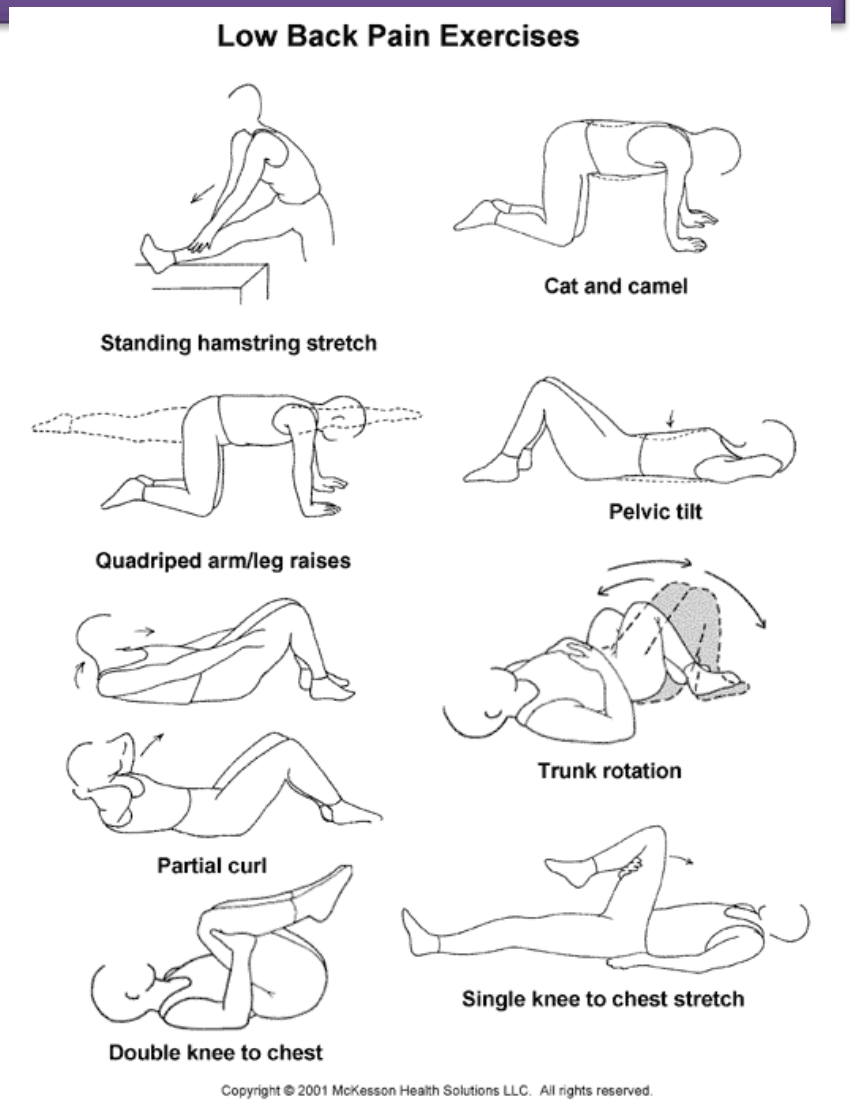


How Stretching Can Help With Low Back Pain

- 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

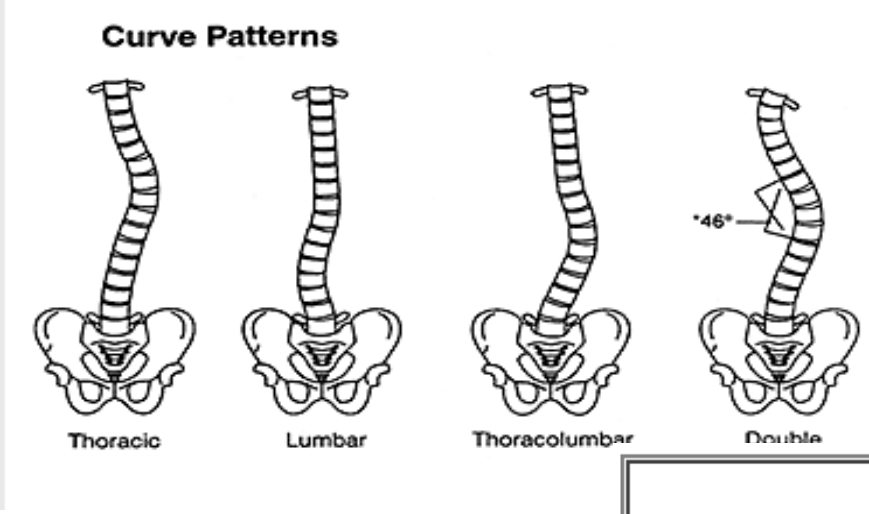
- Nearly 80% of the U.S. population will experience low back pain
- It is the 2nd leading cause of absence in the work force behind the cold
- 70% of all back problems are caused by weak, inflexible muscles

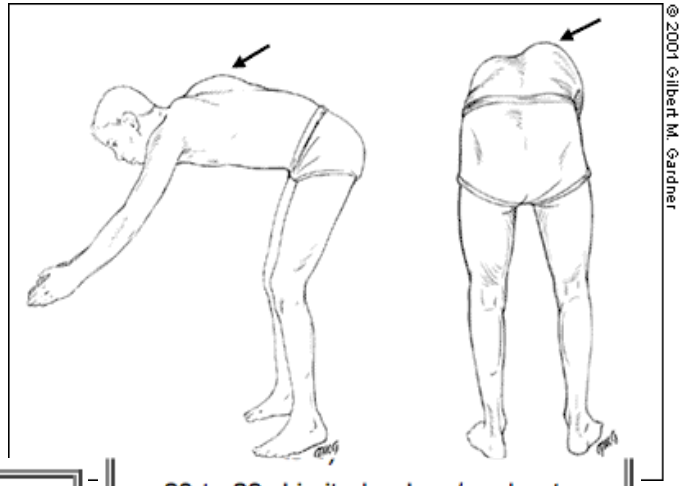


Improper Lifting

Scoliosis

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





- 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

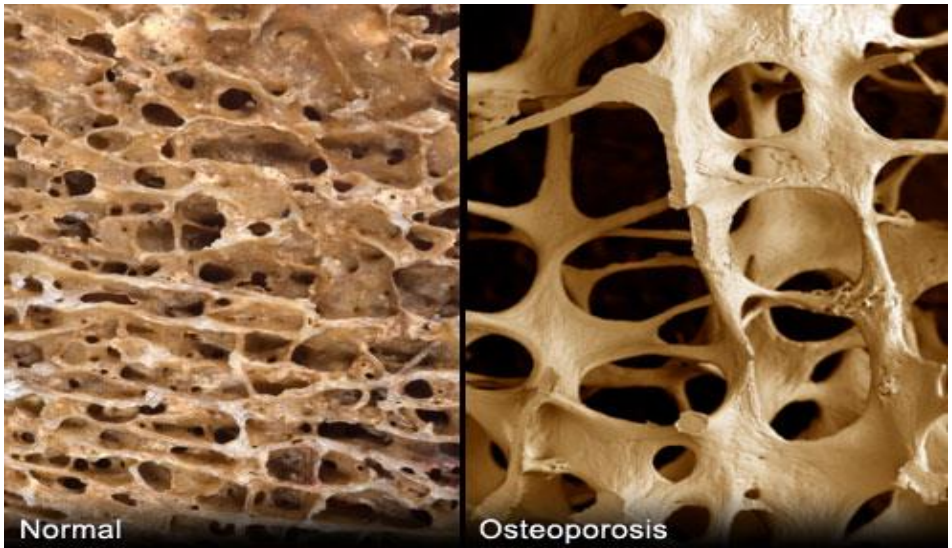
*--Low risk = 5 to 15 percent; moderate risk = 15 to 40 percent; high risk = 40 to 70 percent; very high risk = 70 to 90 percent.

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

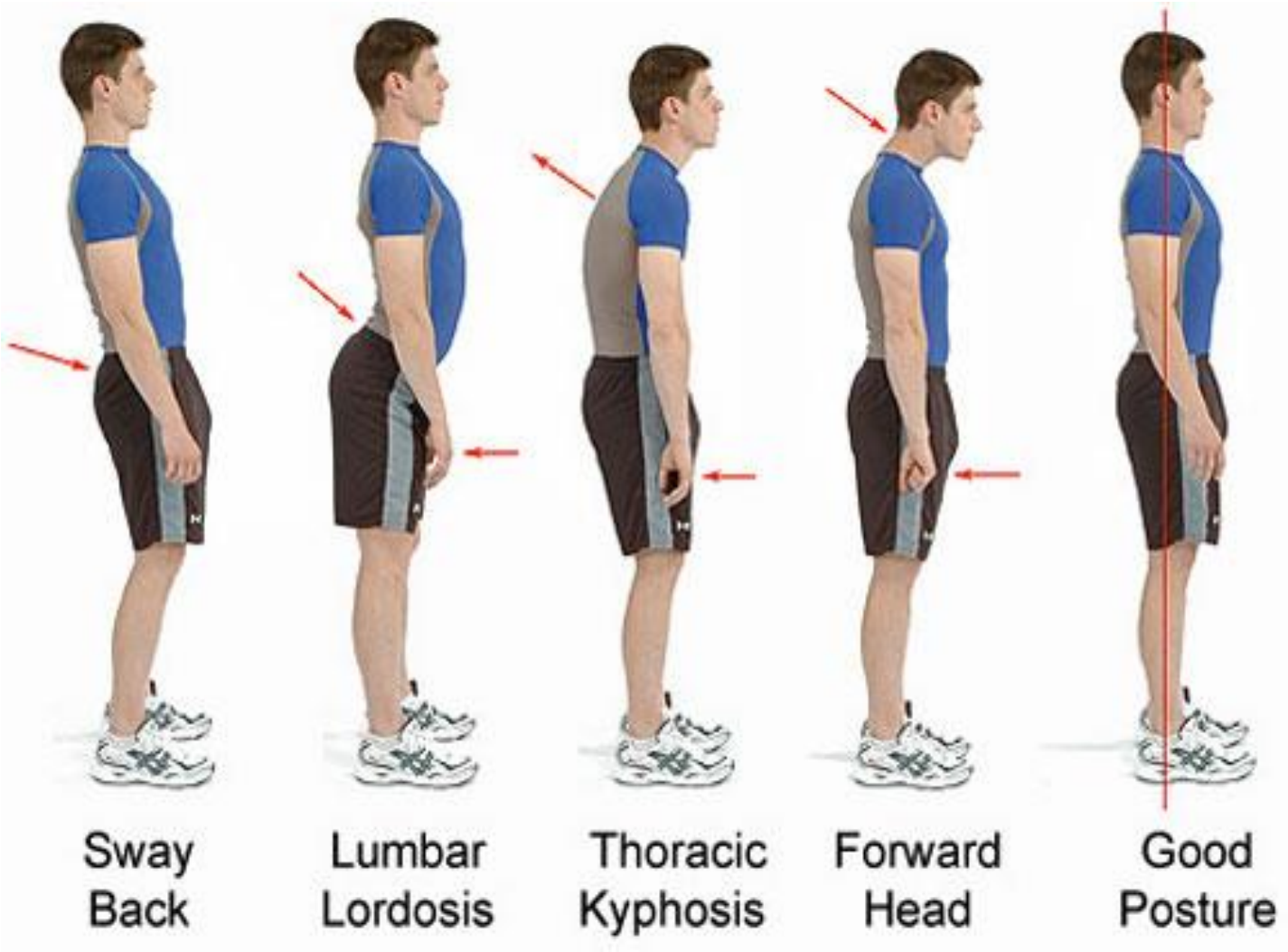
- History of fracture as an adult
- Fragility fracture in first degree relative
- Current smoking
- Low calcium intake (lifelong)
- Low amount of physical activity
- > 2 alcoholic drinks per day

Prevention of Osteoporosis

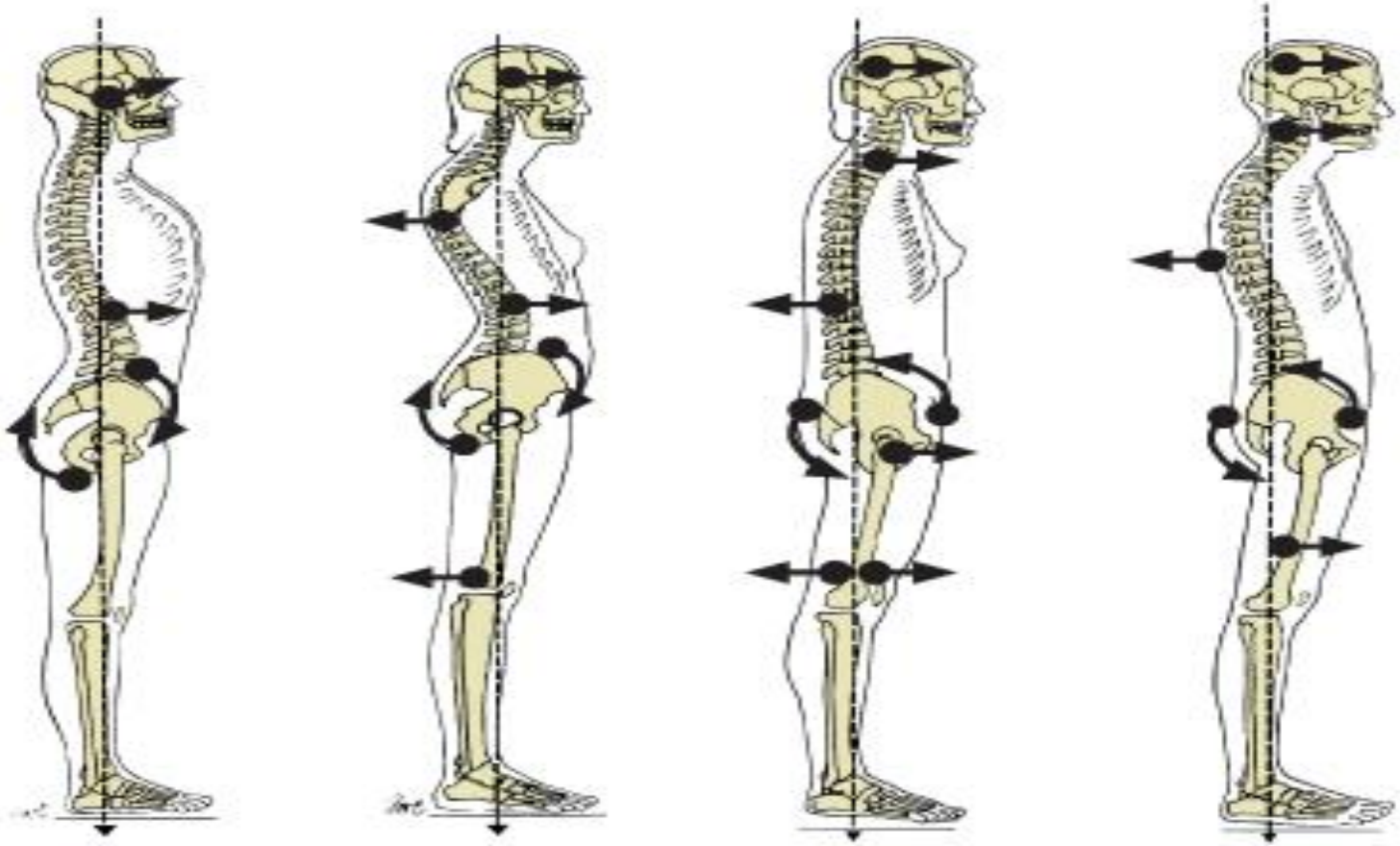
<u>Regular Weight-Bearing Exercise</u>

- 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

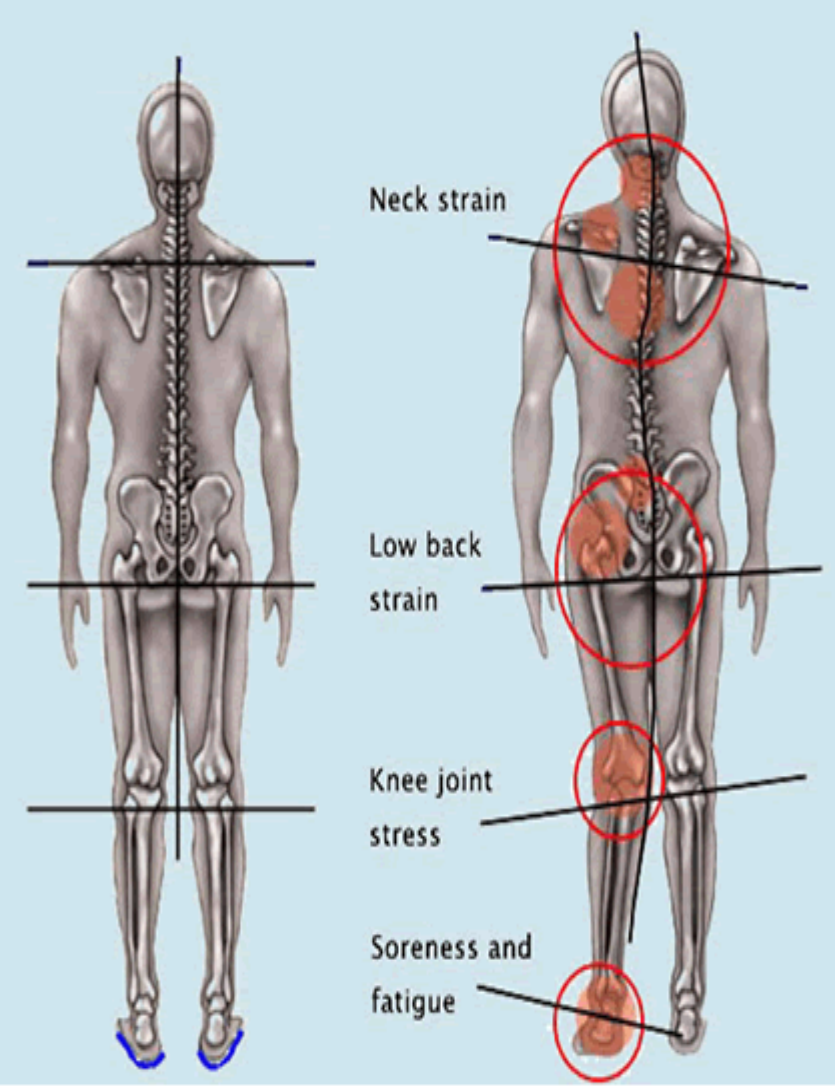
d. Sway back: decreased anterior lumbar curve and increased posterior thoracic curve from neutral

How the Foot Affects the Rest of the Body

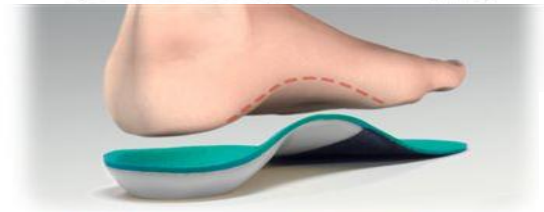
The foot aligns the rest of the body.

All shoes should fit to keep alignment of the body.

Shoes affect your health.



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.

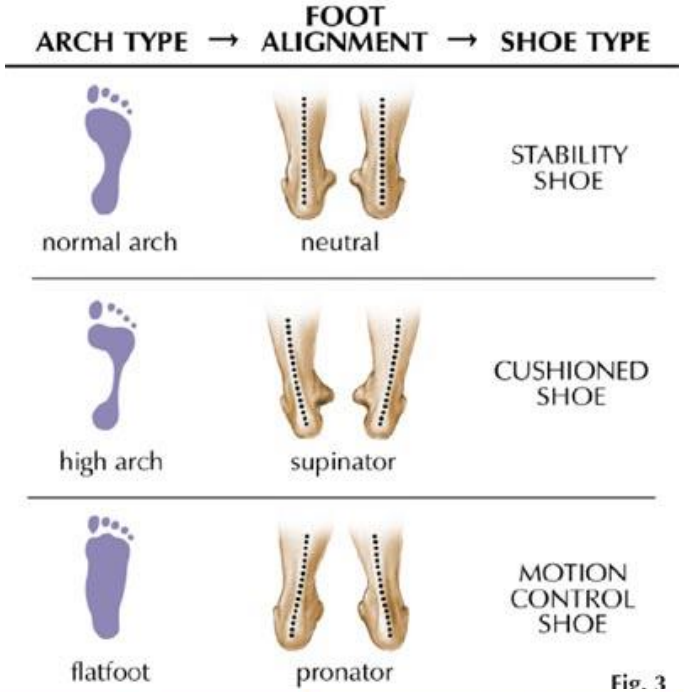
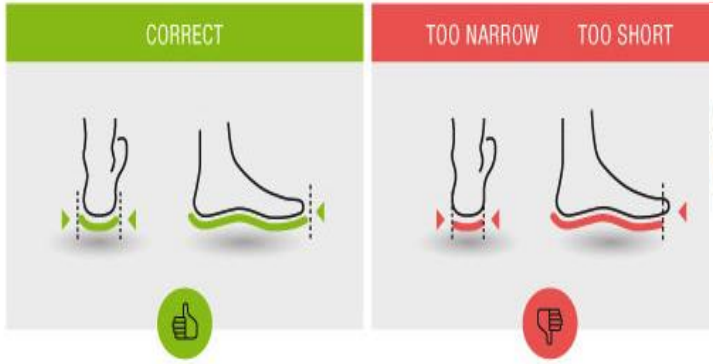


Fig. 3



Activity Shoes should be fit for the appropriate activity.