

Contraindicated and High-Risk Exercises



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Introduction

- ◆ Any activity selected for an exercise program should have some underlying value (e.g., improve flexibility, strength, cardiovascular fitness)
- ◆ However, even some exercises that have underlying value might have elements that can make them inappropriate or even contraindicated if done incorrectly. (e.g., lack flexibility, weak abdominal muscles)

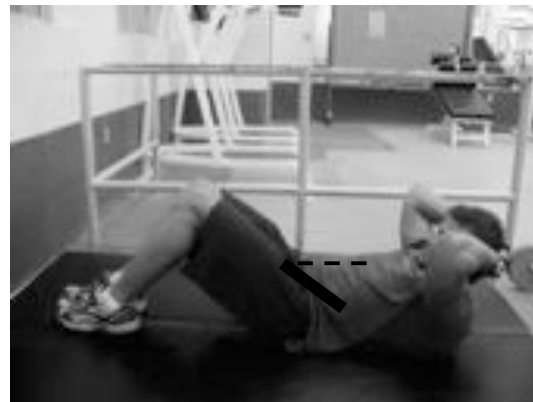
Today's Purpose

1. To describe how some exercises can cause harm (flexibility, weight training).
2. To provide alternatives that are safer.

Straight leg or bent knee full sit-ups with hands behind neck



- Stress on low back
- Loaded neck flexion



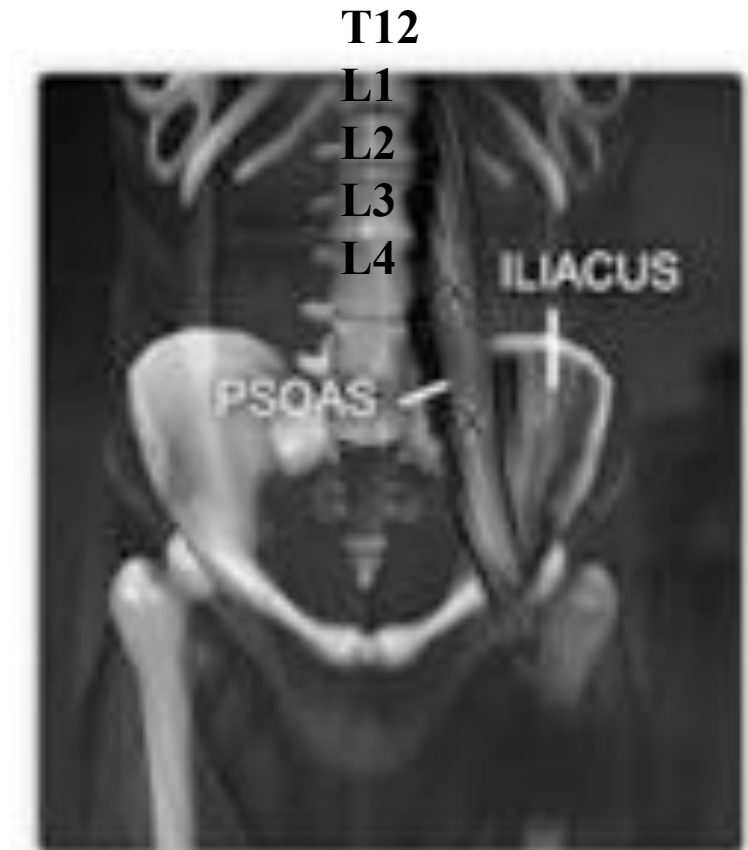
Twisting Sit-Up

- Not beneficial
- Rotational stress on the lower back



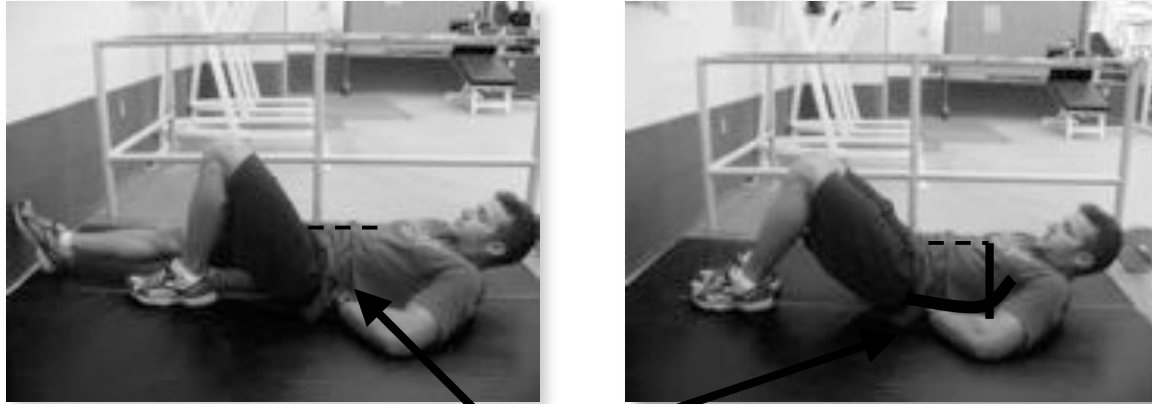
Psoas muscle

- Straight leg
- Anchoring the feet
- Fast contraction





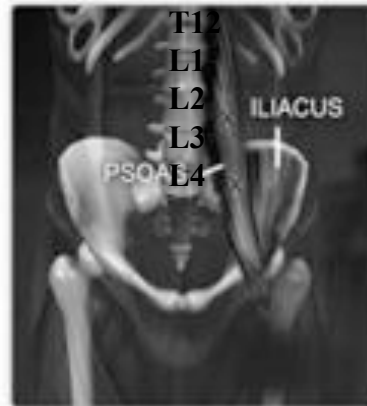
Alternative Exercise



Rounded back

- Don't anchor the feet!
- Hands under lumbar region
- Lift shoulder blades but not low back off floor
- Exercise slowly! (motor unit recruitment)

How about psoas muscle (hip flexor)?



Leg Raise

Rounded back limits abdominal movement

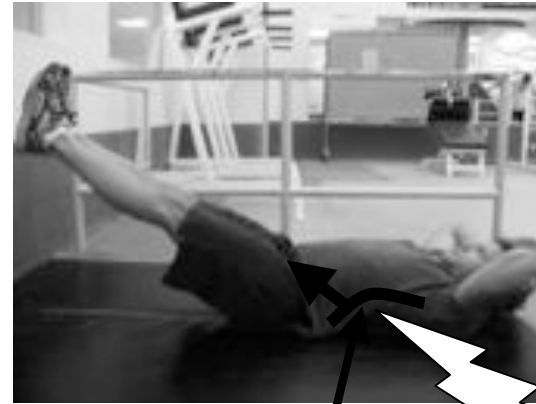
Rounded back is Good



Double Leg Raises



Hyperextends low back



Arched back

Alternative Exercise

Single leg raises



Bench Press (Arched back)

RISK



- Power-lifter style



- **Buttocks firmly and evenly placed on the bench**

Military Press (arched back)

RISK

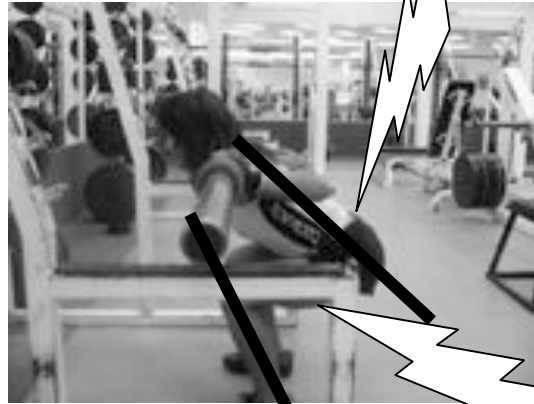


- Improper lumbar hyperextension (arched back)

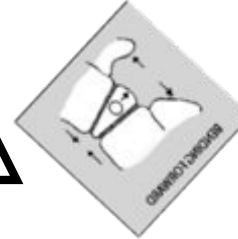


- Prevent hyperextension

Squat (rounded back)



Most lumbar spine injury
(herniated discs)

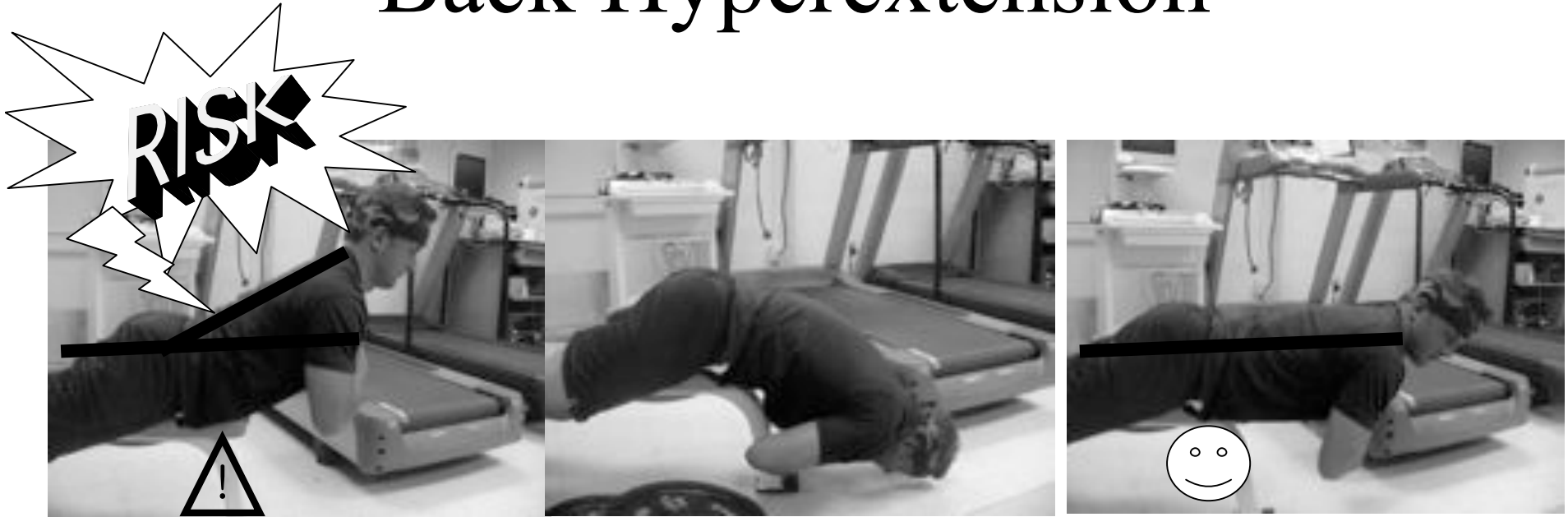


Hamstring muscle injury



- Expanding the chest and holding a deep breath fills the lungs
 - Contracting the abdominal muscles
 - Arching the low back by contracting the lumbar muscles
- “Blocking”

Back Hyperextension



Uncontrolled, ballistic hyperextension of the lumbar spine can damage the vertebrae and spinal discs

Controlled lumbar extension to normal standing lumbar lordosis

Knee Instability

Knee in extension



Knee in flexion



Dumbbell Lunges



Possible patellar compression



- **Knee should be behind the foot**
- **Leading knee less flexion than trailing knee**
- **Lunge depth depends on hip joint flexibility (the iliopsoas muscles)**

Knee Extension

RISK



Hurdler's Stretch for Hamstrings



Knee flexion at end range of motion with rotational forces on hinge joint may stress the medial collateral ligament and menisci



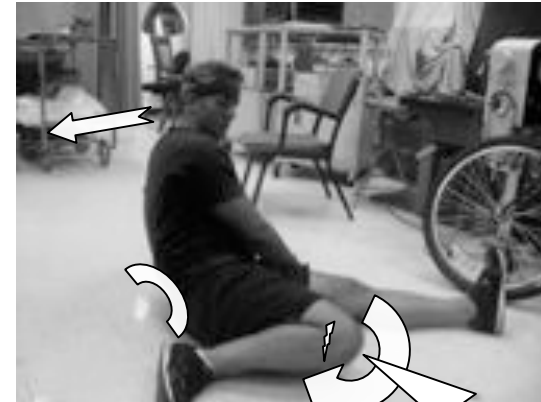
Seated hamstring stretch, back flat with one knee flexed, arms behind back



Hurdler's Stretch for Quadriceps



May stress the medial collateral ligament and menisci, also hyperextension of lumbar spine



**Standing quadriceps stretch
with torso upright; hold ankle, not
foot, with opposite hand; avoid hip
abduction**



Deep Squat

RISK



- Avoid deep squat

Plow



- Loaded neck flexion can sprain cervical ligaments and damage discs, especially in those with spinal osteoporosis and arthritis

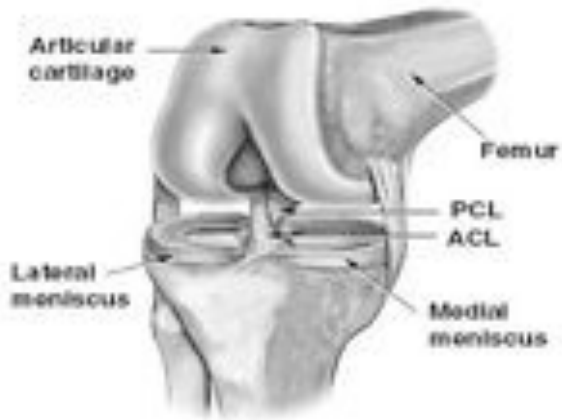


Alternative

Double knee to chest



Standing quadriceps stretch (same arm to ankle with hip abducted)



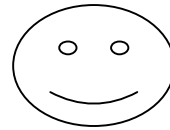
RISK



Bench Press Grip



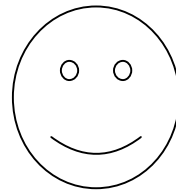
Open grip



Alternative
Closed grip

Biceps brachii tendon tear

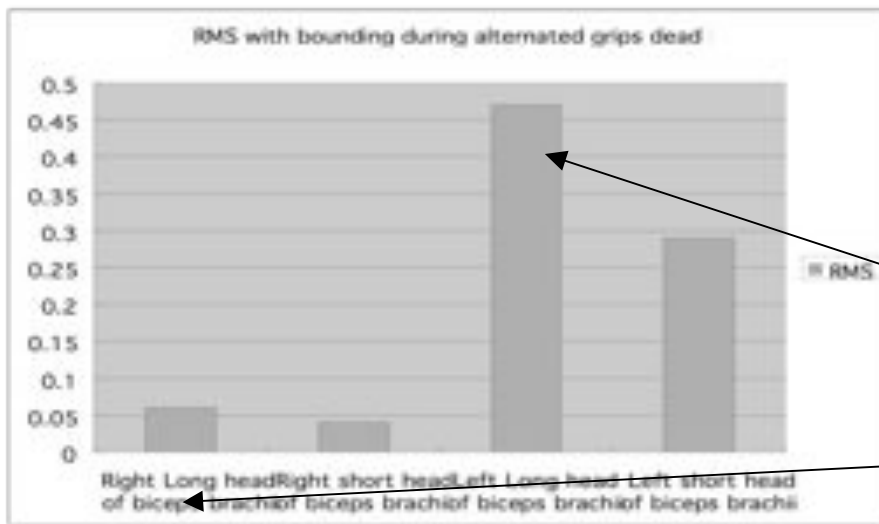
Alternated grip (Reverse power grip)



•This injury occurs at the distal attachment because as the arms hang next to the body, the proximal tension is divided between the short and long heads of the biceps brachii whereas, distally, only one tendinous insertion supports the tension.

- The supinated elbow should extend and relax**
- Use a two-handed pronated grip with straps**
- Dumbbell shrug**

EMG measurement during barbell shrug



Chest Fly



- Hyperextension of the shoulders places the pectoralis muscles at a mechanical disadvantage.



- Elbows are even with or above the frontal plane when beginning the lift and during repetitions.**

Loaded Spinal Flexion with Rotation



Loaded spinal flexion with rotation increases pressure and shear forces on spinal discs, common cause of low back injuries



Crunches with flexion followed by rotation

Latissimus Dorsi

Pull-Down behind neck

RISK



- Lean back slightly at the hips
- Slightly wider shoulder width grip
- Pull down in front of head

- Seated rowing minimizes shear force at the shoulder level
- Never round back when performing seated rows with heavy weight



Standing Toe Touch



- Increases pressure in lumbar disks
- Overstretches lumbar ligament



- Standing hamstring stretch with foot on bench and back is flat**

Full neck rolls



Summary Thoughts

1. Does the exercise have an underlying value that will benefit the target population?
2. Does the exercise present an element that could make it inappropriate for some individuals?
3. Do the benefits of doing the exercise outweigh the drawbacks?

Thank You
Any Questions

