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

- 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
Double Leg Raises

Hyperextends low back

Alternative Exercise
Single leg raises
Bench Press (Arched back)

- Power-lifter style
- Buttocks firmly and evenly placed on the bench
Military Press (arched back)

- Improper lumbar hyperextension (arched back)

- Prevent hyperextension
Squat (rounded back)

- 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”

Most lumbar spine injury (herniated discs)

Hamstring muscle injury
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

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

Possible patellar compression

**RISK**

Lead leg

Trailing leg
Knee Extension
Hurdler’s Stretch for Hamstrings

Risk
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

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

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

- Avoid deep squat
RISK

• 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)
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

- 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