Core Stabilization & Lower Back Pain

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LBP

• One of the most common clinical conditions in Europe and USA

• Reason for seeking care in nearly 50% of all pt. presenting to outpatient PT clinics

• Common causes include trauma, osteoporosis, DDD, disk herniation, compression of intervertebral disks or nerves
Core Stabilization

• “Recent research has provided a somewhat different perspective by emphasizing the importance of spinal muscles in maintaining and restoring spinal stability, shifting from immobilization to stabilization.” (Fritz, Cleland and Childs)

• What does this mean?
What is core stability?

• The ability to control the position and movement of the central portion of the body.
• Core stabilization promotes isolated contraction & co-contraction of the core muscles and the strengthening of large spinal stabilizing muscles
• Core stability training targets the muscles deep within the abdomen which connect to the spine, pelvis and shoulders.
• Creates intra-abdominal pressure, like donning a girdle.
• Assists with maintaining good posture.
Deep Core Muscles

Transverse Abdominis
Lumbar Multifidus
Pelvic Floor Muscles
Diaphragm
Internal Oblique
Transverse Abdominis

One of the most important core muscles.

Origin:
- Anterior 2/3 iliac crest
- Lateral 1/3 inguinal ligament
- Costal cartilages lower 6 ribs
- Thoracolumbar fascia

Insertion:
- Linea Alba

Action: Compresses abdominal contents. Adding stability to lower back and pelvis
Lumber Multifidus

Helps maintain good posture and spinal stability during all movements.

Origin:
Posterior surface sacrum
Posterior borders of superior articular processes

Insertion:
Spinous process 2-4 vertebrae superior to origin

Because it runs on an angle it helps with rotational stability. Research shows that people with chronic lower back pain have significant atrophy of the multifidus.
Pelvic Floor Muscles

Run from the sacrum & pelvis to the pubic bone.

Stabilize the bottom of the abdominal cavity.

The pelvis floor works with the transverse abdominis and multifidus to stabilize the pelvis.

Kegals
Diaphragm

Main respiratory muscle.

Because it attaches to the ribs & spine it helps stabilize the spine.

Forms roof of the abdominal cavity, aiding in abdominal cavity stabilization.
Internal Oblique

Deeper of the 2 oblique muscles.

Origin:
Iliac crest
Lateral 2/3 inguinal ligament
Thoracolumbar fascia

Insertion:
Bottom 3-4 ribs
Linea alba via aponeurosis

Primary role:
Stabilizing the core
Criteria for Core Stabilization Intervention

• < 40 yrs of age

• Greater general flexibility

• “Instability catch” or atypical movements during lumbar flexion/extension ROM

• (+) finding in prone instability test

• Postpartum
Prone Instability Test

- Pt. positioning: Prone, legs over edge plinth, feet resting on floor.
- Therapist applies posterior-to-anterior pressure to lumbar spine.
- Then, pt. lifts legs off floor, pressure re-applied.
- Positive Finding: Pain is present in resting position, but subsides in the second position.
Therapeutic Exercise

• Kneeling Trunk Rotation
  Kneeling, arms ABD 90°
  Rotate trunk, head & UEs in one direction
  Repeat 2x per direction, 30 sec hold.

  * Progression: 1st- Eyes closed, 2nd- Head ext.

• Kneeling shoulder flexion/extention
  – Kneeling, move UEs in flex/ext with simultaneous movement of the head.
  – Position maintained for 3 min, performing 6 reps of UE movement

• Progression: Eyes closed
Ther Ex cont.

• Bridging
  – Supine, feet resting on plinth, lift pelvis
  – Raise 1 LE & extend knee, 30 sec hold, 2x each
  – Progress to eyes closed

• Bird-Dogs
  – Quadruped, ext. opposite upper and lower limbs
  – Hold 1 min, bilaterally
  – Progress to eyes closed, pillow under knee
Ther Ex cont.

• Seated Tilt
  – Sit on side plinth, holding position for 1 min, bilaterally
  – Progress to eyes closed, crossing arms to chest, pillow under lower limb

• Single Limb Kneel
  – Kneeling on edge table, pillow under knee, hold 30 sec, 2x bilaterally
  – Progress to eyes closed, head ext., arms across chest
Quick Quiz

• Name the 5 deep core muscles.

• What is the main goal of developing core muscle strength?

• What is the name of the special test discussed? What is a positive sign?

• Who can demonstrate one of the exercises discussed?
Resourses

  – August 2011, volume 41 number 8, pgs 542-552.
  – June 2007, volume 37, number 6, pgs 290-302.
References

