Healthy Back—Healthy IU!
Week Four
Training Your Core for Stability & Mobility

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Backpacks and Your Back

• When the spine is in neutral, the force on your spine is \(~7.2 \times\) the weight of the pack

• If the spine is flexed \(~20^\circ\), the force on your spine is \(~11.6 \times\) the weight of the pack

• For college-aged adults, the bag should be no more than 15-20\% of BW

• Important! Use a hip belt if possible (or a waist or chest strap)
Notes from Last Week:

1. Toe touch issues

Ideal. Spine is relatively straight, she is completely supported on her hands.

Ouch!

Modify with block or chair

Or, choose a safe alternative
What exercises do you know for core stability?

What does core stability mean?

What, exactly, is the core?
<table>
<thead>
<tr>
<th>Joints:</th>
<th>Key Muscles:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervical Spine</td>
<td>Upper trapezius, levator scapulae, sternocleidomastoid</td>
</tr>
<tr>
<td>Scapulothoracic</td>
<td>Middle trapezius, rhomboids, pectoralis minor, serratus anterior</td>
</tr>
<tr>
<td>Lumbar Spine</td>
<td>Rectus abdominis, erector spinae, obliques, transverse abdominis, quadratus lumborum, multifidi</td>
</tr>
<tr>
<td>Pelvis</td>
<td>Iliopsoas, rectus femoris, gluteus maximus</td>
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</tbody>
</table>
**Muscles of the Core**

**Anterior (front)**

- **Transverse abdominis**
  - Located under the obliques, it is the deepest of the abdominal muscles and wraps around your spine for protection and stability.

- **Rectus abdominis**
  - Located along the front of the abdomen, this is the most well-known abdominal, often referred to as the "six pack."

**Posterior (back)**

**Upper back (muscles that control the scapulae)**
For core stability, muscles are needed to contract *isometrically*, causing no change in joint movement. (Muscles can also contract isotonically and can cause joints to move).
Think of the mid-Core as a Cylinder

- Diaphragm (top)
- Rectus Abdominis
- Transverse Abdominis (front)

Obliques (side and front)

Erector Spinae
Multifidus (back)
Quadratus Lumborum (side)

Pelvic Floor Muscles (bottom)
Joint Stability is defined as the ability to maintain or control a joint movement or position.

* There are ~32-33 vertebrae in the spinal column. Can these vertebrae and their connecting joints remain stable when appropriate?

Technically, core stability isn’t just about the middle torso

- In addition to maintaining a neutral spine, we also need to be able to stabilize the:
  - Neck
  - Shoulder blades (scapulae)
  - Pelvis
The Spinal Column:

Maintain a Neutral Spine throughout daily activities:

A neutral spine has 4 curves, each in an “ideal” relationship to the other curves.
If the pelvis is not aligned properly, neither is the spine. The pelvis needs to be in neutral for a neutral spine.

Reminder: that’s why it’s best to sit on the sitting bones, not the tailbone.

Neutral scapulae: the shoulder blades are down as much as possible; they are also slightly pulled towards each other (partially retracted). In this position, they are said to be “packed”.
For Core Stability, We Want to Train the Core Muscles as Stabilizers

• Generally, this is done while maintaining the spine and/or the scapulae (shoulder blades) in an unmoving, neutral position

• Example:
  * Easier: extremities aren’t moving (just hold)
  * Harder: extremities move, but spine is stable throughout

Check it out! Are the spine, neck, and pelvis neutral? Are the scapulae packed?
PROGRESSIVE EXERCISE CONTINUUM

(can be used to show variations of an exercise from easiest to hardest)

Least skill
Easiest, most stable
Appropriate for almost everyone
Very safe

(Example: Planks)

Most skill
Hardest, least stable
Appropriate only for the very fit
Less safe or controversial
Training the Core Stabilizer Muscles to Do Their Job: Challenge your body in different positions

- Hip hinge
- Hip hinge training, correct neutral spine
- Hip hinge not correct, spine is rounded, not in good neutral position

COURTESY: SHARON STEVENS, PHYSIOFITNESS

[Images of various exercises demonstrating core stabilization]
More Core Stability Exercises

Heel slides

Bridge

Seated knee lifts w/stable core

Bridge w/stability ball
Training Other Core Stabilizer Muscles to Do Their Job: Address scapular and pelvic issues

Train your shoulder blade to stay down even when you are raising your arm.

**NOTE:** when shoulder blades are in neutral they are all the way down and slightly retracted.

If the pelvis is not aligned, neither is the spine!
Training the Core Stabilizer Muscles to Do Their Job: Address neck issues

How Heavy is Your Head?

Tuck the chin in and lengthen the back of the neck
More Exercises for Stability

Idea: look up the Stealth core trainer!
Some Joints Need More Stability; Others Need More Mobility

**Figure 1. Mobility and Stability of the Kinetic Chain**
Mobility Is Also Important! (Mobility is the range of motion around a joint)

• Many daily activities can cause stiffness and poor movement in the thoracic spine, leading to:
  - excessive kyphosis (hunchback)
  - pain
  - shoulder injuries
  - deficient breathing patterns
  - forward head (chin jut) and headaches
Mobility Moves for the Thoracic Spine
Additional Mobility Moves

- Cat/cow stretches
- Double-knee to chest stretch
- Hip flexor stretch
- Spinal rotation
- Spinal extension with chest stretch
Make a Plan!

This week I will ________________________________

Examples:

1) For the next 5 days, I will do some back stretches (mobility moves) for 5 minutes every morning.

2) This week, every time I catch myself slouching, I will stand up and practice good neck, back, and shoulder blade alignment against the wall.

3) For the next week, on M/W/F, I will do three core stability exercises at ______ (pick a time).
• Stay mindful and self-aware.
• You can retrain your body to do the right thing and reduce your risk of back pain!

Good Luck!
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MOVE MORE...SIT LESS...FEEL GREAT!