

Defining the "Core"

Any muscle or CT that creates movement, controls pressure or stabilizes the trunk (spine) in the lumbar region.



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Defining Spinal Stabilization

Spinal stabilization is the natural ability of the **spinal** column to maintain its anatomical structure on physiological loading







Muscle Anatomy

- There are 2 categories of muscle in terms of functional movement:(1)
- Mobilizing
- · Stabilizing
- When talking about imbalance or dysfunction, both need to be addressed.



Mobilizing Muscles

- · Superficial
- · Fast Twitch
- · Often Bi-Articular
- Source of Torque
- · Build Tension Rapidly
- Fatigue Quickly

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- Better Activated at High Levels of Resistance
- More Effective in Open Chain Movements
- In Muscle Imbalance, Tends to Tighten and Shorten



Stabilizing Muscles

- Builds Tension Slowly
- \cdot More Fatigue Resistant
- Better Activated at Low Levels of Resistance
- More Effective in Closed Chain Movement
- In Muscular imbalance tends to Weaken and Lengthen



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Stabilizing Muscles

- Deep, Close to the Joint
- Slow Twitch
- Usually Mono-articular
- No Significant Torque
- Short Fibers

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- · Intermediate Depth
- Slow/Intermediate Twitch
- Usually Mono-articular
- · Often a Source of Torque
- Attachments are Multipennate



Muscles of Spinal Stability

Spinal Stabilizers

- Intertransversarii and Interspinalis
- Rotatores
- Multifidus
- Quadratus Lumborum

Inner Core

- Transversus Abdominus
- Diaphragm
- Pelvic Floor (Kegel)
- Spinal Stailizers (Multifudi)



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Spinal Stabilization

Spinal stabilization is often more subtle than core strengthening. It involves what is not moving rather than what is.



Goals for Spinal Stabilization

- Find and Maintain "Neutral Spine/Pelvis" in supine, relaxed. Breathe and maintain "neutral".
- · Maintain "neutral" in supine while moving an extremity
- Maintain "neutral" while increasing difficulty by moving from Fully supported (supine) to Partially (Quad/Seated) to Unsupported (Standing)
- · Finally maintaining "neutral" while in dynamic motion



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Goals for Spinal Stabilization

- Start with full focus on spine and pelvis staying still in "neutral".
- · Eventually able to maintain "neutral" with less attention
- · Allow pelvis to stay in "neutral" while doing more complex motions/movements
- · Finally maintaining "neutral" without thinking about it at all, while doing the most challenging movements

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Abdominals

- Rectus Abdominus
- External Oblique
- Internal Oblique

Erector Spinae

- Spinalis
- Longissimus
- Iliocostalis
- Quadradus Lumborum *

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Core Influencer

- Gluteus Maximus
- Ant. Shoulder Girdle Latisumus Dorsi
- Hamstrings
- Psoas*

Fascia

- Thoracolumbar Fascia
- Pubic/Rectus Sheath



Core Strengthening

Core strengthening is often, much more dynamic than spinal stability. More contractile force is achieved and more muscles are active. (Compare Statue Ex.)





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To Flex or Not to Flex...

The controversy continues... the industry has changed drastically in the past 30 years.

From Ab Classes with thousands of reps of crunches of every variety to doing planks so we don't every flex our spine.

Which is right, which is wrong?

... That is the question.

If someone has a specific spinal injury (i.e. herniation) Yes, flexion may be contraindicated.

For the average individual??? No. In ADL we have to flex our spine.





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So....?

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Dr. Steward McGill is popularly thought to preach this. His methodology stems from the fact that too much spinal flexion, especially when spine loads are too great in magnitude or high in repetition or speed we will see breakdown (delaminations) in the college fibers of the annulus fibrosis.

However spinal flexion when the spine is under low load and moving under healthy range of motion is fine.

There are too many variables (weight, size, age, injury, load, goal) go into whether an exercise like crunches are inherently bad for someone. But we know that spinal flexion is a motion we need to strengthen in order to perform in ADLs.

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Flexion Movement vs Moment

Flexion Motion involves actual movement. It is a kinematic term. It involves the act of the spine flexing forward regardless of load.

Flexion Moment refers to the creation of torque, or the stiffening of the spine/core. This is a kinetic term. Think stability. The act of the spinal musculature stabilizing the core from the inside out and the outside in. This is a vital component in both athletics and daily living.



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Core Strengthening

Often when focusing on core strengthening we are creating a flexion moment and engage much of the core musculature at the same time in order to resist any torque or flexion.





Core Strengthening

Much like a suit of armor, many core exercises involve creating a rigid core structure in order to resist torque or flexion.

Do we need to "brace" to be strong?

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Bracing

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Bracing involves a forceful maximal contraction of the core musculature.

- This can be useful when beginning to teach someone how to engage their core or early in the rehab process.
- It isn't efficient and should not be the only way for someone to engage their core.

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Strengthening

How strong does you core need to be?

- Your core needs to be as strong as your daily needs require.
- Or as strong as your goals require; 6-pack/athletics





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Conscious Core Engagement

Your core should be able to sustain the amount of force applied to it without allowing the force to deviate position.

- "Putting your mind into your muscle" is good so long as it isn't straining or doing more than is required.
- Allow your muscles to work, don't force them to.

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Conscious vs Incidental

There are many times when your core will become engaged during an exercise, especially in the standing position (ground force/Core off the floor).

- It is vitally important that your core engages in order for you to stabilize your body during the exercise.
- It should do so automatically.

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Programming for Core Strengthening

Programming for the core should include both conscious and incidental core activities.

- Loading from various angles, different intensities and time under tension are all variables that you can adjust.
- This core training applies directly to real life.



Exercise Selection (Conscious vs Incidental)

- All about focus
 - Where your attention goes your energy flows
 - If your focus is on your core, guess what that is where you will feel it.
 - If your focus is on another body part, that is where you will feel it



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Exercise Selection (Stability vs. Strength)

- Supine Series:
 - Bent Knee fall out (no & w/ band)
 - Marching
 - March up

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Leg Lowers

- Quad Series:
 - Foot Slide (no&w/band)
 - Hip Extension (no&w/band)
 - Bird Dog (add perturbation)



Exercise Selection (Stability & Strength)

- Offset Series:
 - Press
 - Drive Lunge
 - Press Lunge
 - Windmill
 - Row w/squat
 - Paddle Board
 - Flag side lunge



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Exercise Selection (Incidental vs Conscious)

- Unitlateral Tube:
- Dead Shift:
 - Sagital
 - Frontal

Off the floor

- Side Step Rotation
- Uni Rear Fly
- Uni Fly

• Press

• Row

• 1 Foot 1 Arm Abduct



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My new book deals is for anyone who has or has a client dealing with low back pain. It goes into depth on specific spinal pathologies as well as non-specific low back pain, explaining each pathology, highlighting the contraindications and prescribing specific exercise programing to train and progress them safely.



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Brian Richey

brian@fit4lifedc.com

backexercisebook.com

facebook: Fit 4 Life DC

Insta: fit4lifedc



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