

Magnetic Body Stimulation



QRS Germany Corporate Head office
Emiel Spiessens, 2023



QRS®

**Magnetic Body Stimulation
&
Lower Back Pain**



Most important Cause for Lower Back Pain is loss of FUNCTION of SEGMENTAL muscles (e.g. Multifidus)
Only QRS-Magnetic Stimulation is able to reach these deep segmental muscles and improve function
(self training does not help ; massage only treats symptoms)

Let's Talk About It: Back & Pelvic Pain

Enjoy a better life with a strong and fully functioning core.

Pain in your lower back, pelvic floor and/or groin can be excruciating and debilitating.

Many people simply learn to 'put up with it', avoiding activities that trigger spasms or pain such as exercise and lifting, and even sex. Some turn to prescription medication to mask the pain.

But many people can significantly improve their situation by having a strong and fully functioning core and pelvic floor.

At the Coregood Institute we specialise in treating the issues that weaken a person's pelvic floor. We do this using a range of treatment solutions including the latest leading edge technology from Germany, the PelviCenter. It's non-invasive and easy - and you do it fully clothed.

So call us today to talk about living a less painful, more active life.

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QRS®-PelviCenter – **Lower Back Pain**



1. According to the WHO
the number 1 cause of global disability
2. **Very high social costs**
3. Especially due to the **High recurrence rate**



Non specific lower back pain
High Recurrence rate & High social costs



- Non specific lower back pain has a prevalence of 80% ^(1,2)
- 90% of the patients with acute low back pain recovering within 6 weeks ^(1,3)
- However, 62% of the persons who experience first episode of low back pain, develop chronic symptoms which last more than a year; and 16% of the persons still listed "ill" and "out of work" 6 months later.
= ; High recurrence rate ! ⁽⁴⁾ and High Social costs !

1. Nachemson A, Jonsson E. Neck and Back Pain: The Scientific Evidence of Causes, Diagnosis, and Treatment. Philadelphia: Lippincott Williams and Wilkins; 2000.

2. Palmer KT, Walker-Bone K, Griffin MJ, Syddall H, Pannett B, Coggon D, Cooper C. Prevalence and occupational associations of neck pain in the British population. *Scand J Work Environ Heal*.2001;27:49–56.

3. Walker BF. The prevalence of low back pain: a systematic review of the literature from 1966 to 1998. *J Spinal Disord*. 2000;13:205–217.

4. Hestbaek L, Leboeuf-Yde C, Manniche C. Low back pain: what is the long-term course? A review of studies of general patient populations. *Eur Spine J*. 2003;12:149–165.

Non specific Low Back Pain Causes



Lower Back Pain
has many different causes

But the most important cause (50%!)
is the **weakening** and **the loss of function**
of **the segmental muscles**
of the lower back
(‘Core Muscles’)
and also of **the muscles of the pelvic floor**

Stabilizing system consists of 3 sub systems



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- Vertebrae,
- Facet joints
- Intervertebral discs
- Spinal ligaments
- Joint capsules
- Passive muscle support

PASSIVE

STRUCTURAL Stability

CONTROL
(nerves)

- Force & motion transducers
- Neural control centers

ACTIVE
(muscles)

- Transversus Abdominus
- MultiFidus
- Pelvic Floor
- Diaphragm

FUNCTIONAL Stability

Non-specific lower back pain

- **Non-specific Lower Back Pain**

= Lower back Pain without an underlying structural issue

A problem with the
Functional support !

- Specific Low Back Pain: LBP caused by specific pathology, such as:

- Systematic inflammatory disease,
- Infections, tumors
- Prolapsed disc; Spondilolisthesis
- Pregnancy related LBP
- Fractures; osteoporosis

A problem with the
Structural support

- 85% of LBP is “non-specific” = Not due to a problem with the technical support (Spitzner, LeBlanc 1987) !!!
- Functional Stability is more important than technical support !!



Structural stability versus Functional stability



- 80% of back pain is NON-Specific
- **Contrary to general opinion, there is NO proven relationship between Lower Back Pain and damages in the structural stability.**
 - Many persons who have "intervertebral disc issue" do not have lower back pain
 - Many persons with lower back pain do not have abnormalities in the structural stability (4)
- **Without muscles, the spinal cord is unstable**



- 4. BIGOS SJ, et al. Back injuries in industry: A retrospective study 11. Injury factors. Spine, 1986. 11

Segmental Instability (2)



- “Research reveals that the primary impairment of the muscular system in individuals with low back pain is not one of strength or functional capacity but rather one of motor control of the deep muscles of the trunk”

- *Jackie Whittaker BScPT, FCAMT, CGIMS, CAFCI*



Functional stability



Christine Hamilton
Caroline Richardson
Paul Hodges
Julie Hides

University of Queensland,
Australia

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Lower Back Pain & Current Treatments



Why existing treatments for Lower Back Pain are not effective

Why only QRS-PelviCenter is able to reach and train the muscles responsible for
Spinal Segmental Stability & Lower Back Pain

Non Specific Low Back Pain - Treatment

- **Physiotherapy:**

- In Europe, patients with Lower Back Pain are routinely referred to physiotherapy (6)
- Various treatments including (9):
 - Spinal manipulations
 - Mobilisation
 - Advise
 - General exercises
 - Specifically tailored exercises

- Most common form of physiotherapy treatment in Europe for back pain are
“muscle activation” / “core stability” exercises (9, 13-15)

6. National Institute for Health and Care Excellence . *Low Back Pain. Early Management of Persistent Non-Specific Low Back Pain [CG88] 2009.*

9.. Liddle SD, David Baxter G, Gracey JH. *Physiotherapists' use of advice and exercise for the management of chronic low back pain: a national survey. Man Ther. 2009;14:189–196.*

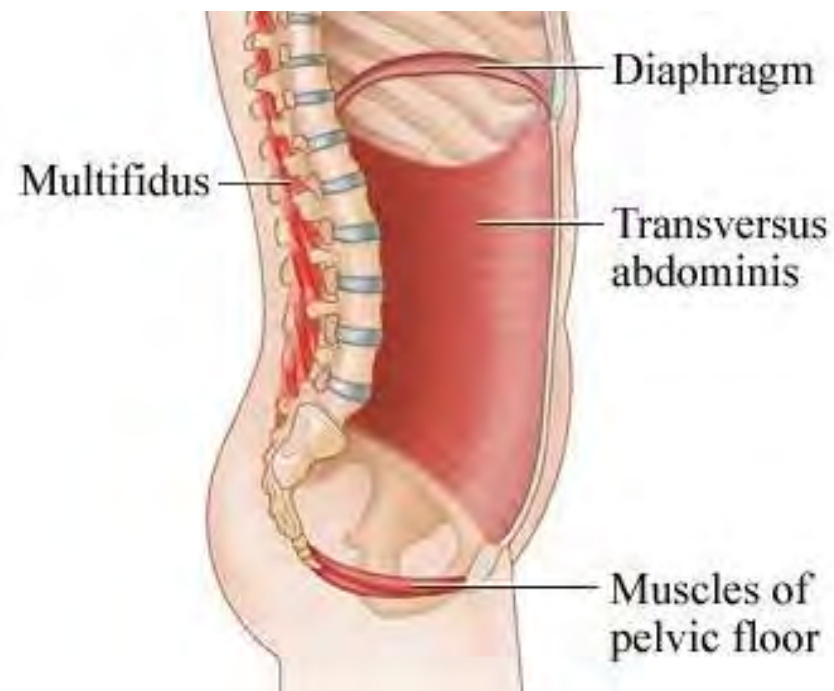
13. May S, Johnson R. *Stabilisation exercises for low back pain: a systematic review. Physiotherapy.2008;94(3):179–189.*

14. Mannion AF, Pulkovski N, Schenk P, Hodges PW, Gerber H, Loupas T, Gorelick M, Sprott H. *A new method for the noninvasive determination of abdominal muscle feedforward activity based on tissue velocity information from tissue Doppler imaging. J Appl Physiol. 2008;104:1192–1201.*

15. Vasseljen O, Fladmark AM, Westad C, Torp HG. *Onset in abdominal muscles recorded simultaneously by ultrasound imaging and intramuscular electromyography. J Electromyogr Kinesiol. 2009;19(2):e23–e31.*

Non Specific Low Back Pain – What are “Core Stability” exercises?

- “Stabilisation exercises”
- “Muscle activation”
- “Retrain the motor skills and the activation dysfunction” ⁽¹²⁾
- Assumption: There is a link between the dysfunction within the activation and timing of local spinal stabilization muscles and back pain ⁽¹⁰⁻¹²⁾
- Facilitation of deep muscles of the spine (primarily “Transversus Abdominis” or “Multifidus”) at low level, integrated into exercise, progressing into functional activity ^(12,24,25)





Massage



- 1) The muscles responsible for lower back pain lie very **deep** and are very **small**
- 2) Only professional physiotherapists are able to reach these **deep** small muscles
- 3) Massage is only able to reduce the **symptoms** (pain), but is not able to treat the **cause** (restoring the **function** of the segmental muscles).
So there remains a high risk of recurrence (risk that back pain comes back after few weeks)

What evidence is there for Core Muscle Exercises?

- Systematic review May & Johnson in 2008: Core stability exercises may be beneficial over no treatment, but it was unlikely to produce an outcome better than any other form of exercise (13)
- Macedo et al (17): Stabilisation exercises are no better than general exercises
- Wang et al in 2012 (21): there was no significant difference between core stability and general exercise.
- Byström et al (22): Stabilisation exercises are more favorable than general exercises
- Systematic review Ben Smith 2014: Meta analysis shows significant benefits for stabilisation exercises versus any alternative treatment or control for long term pain and disability. But no statistical or clinically significant difference.

Strong evidence that Core Muscle Exercises are Effective

Weak evidence that it is more effective than other treatments/ physical exercise

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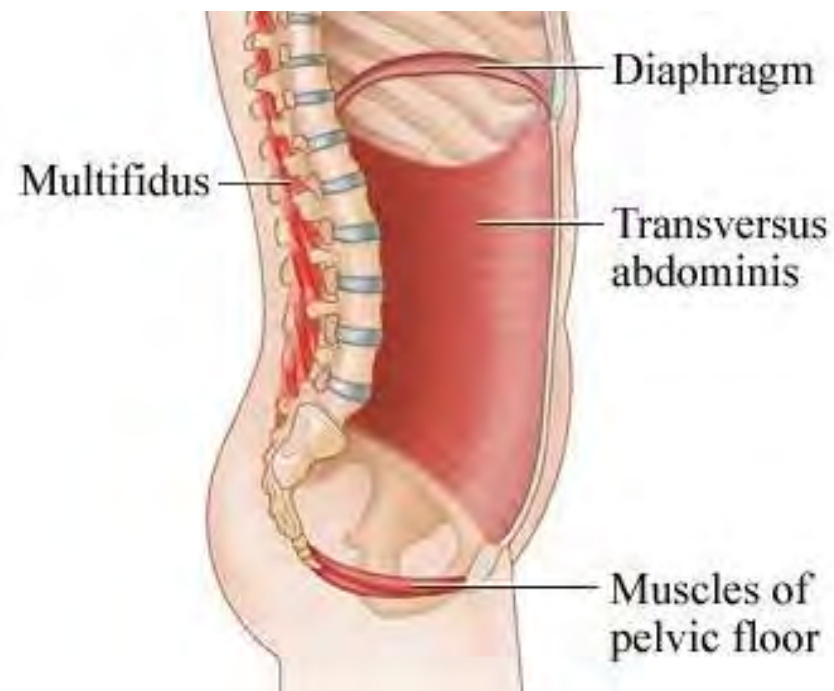
**Core Stability Training can
only be done effectively with
Magnetic Stimulation**



If you have Lower Back Pain you can NOT “self-train” your muscles to reduce LBP
Massage only treats symptoms and is not able to train function of deep small muscles
Only Magnetic Stimulation is able to reach and train function of Multifidus and other Core muscles

Non Specific Low Back Pain – The “Core”

- The “torso” / the “trunk”
- Functions of the “Core”:
 - Contenance
 - Pregnancy
 - Valsalva maneuver
 - Spinal Stability
 - Posture



Segmental instability



Stability = Control of Movement

Control of movement = Pain Control

Muscle Control = Pain Control

White & Panjabi 1990

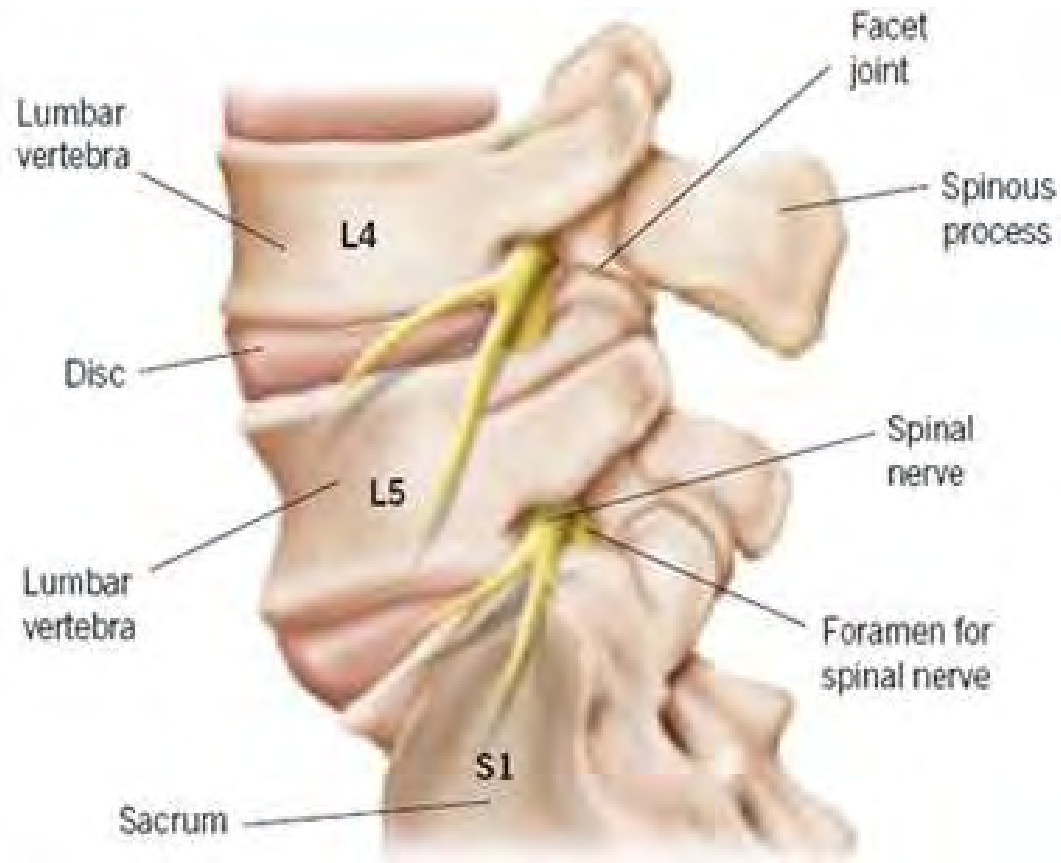


Segmental instability



- Definition American Academy of orthopaedic surgeons:
 - An abnormal response to applied loads, characterized by movement of **spinal segments** beyond the normal constraints.
- When there is too much movement between 2 vertebrae in your spine
- The excess movement of the vertebrae can cause **pinching or irritation of nerve roots**
- It can also cause too much **pressure** on your facet joints, resulting in **inflammation**
- It can also cause muscle spasms
- The instability eventually results in faster degeneration of your spine
- Instability of lumbar spine often occurs in **L4-L5** or **L5-S1**
- Pain made worse by maintaining one posture for a long period of time (standing or sitting)
- Often the pain is lower at rest but will recur with a small amount of movement such as a twist or sprain.

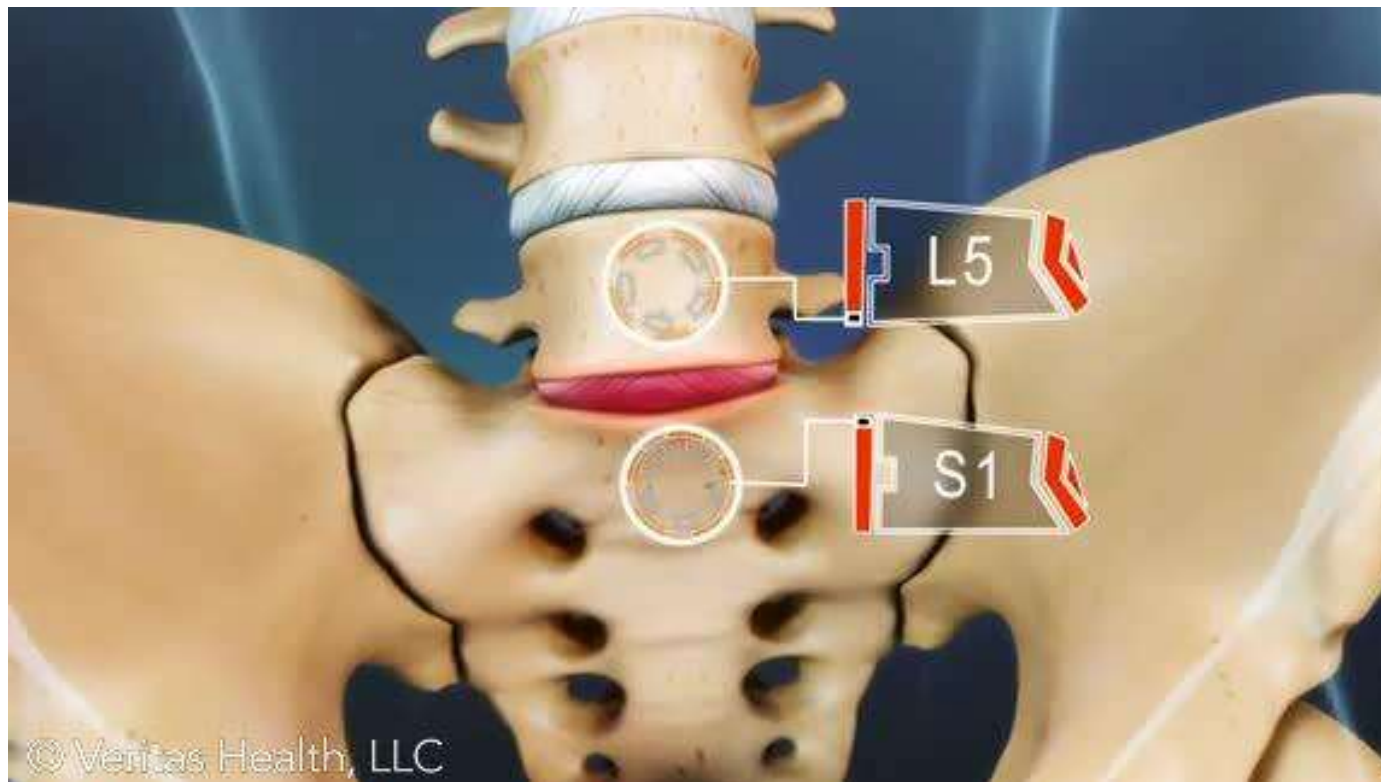
A spinal segment



- Spinal cord has 24 segments
- Lumbar Back Pain often at L4-L5 or L5-S1
- Normal "range of motion" of neutral zone of spinal segment 1.5 mm



L4-L5-S1



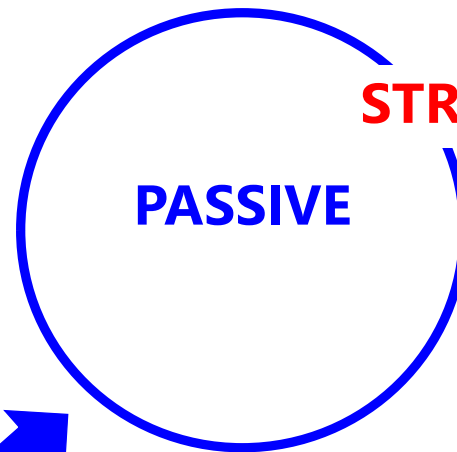
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STRUCTURAL Stability

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(nerves)

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ACTIVE
(muscles)

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FUNCTIONAL Stability

Functional Stability



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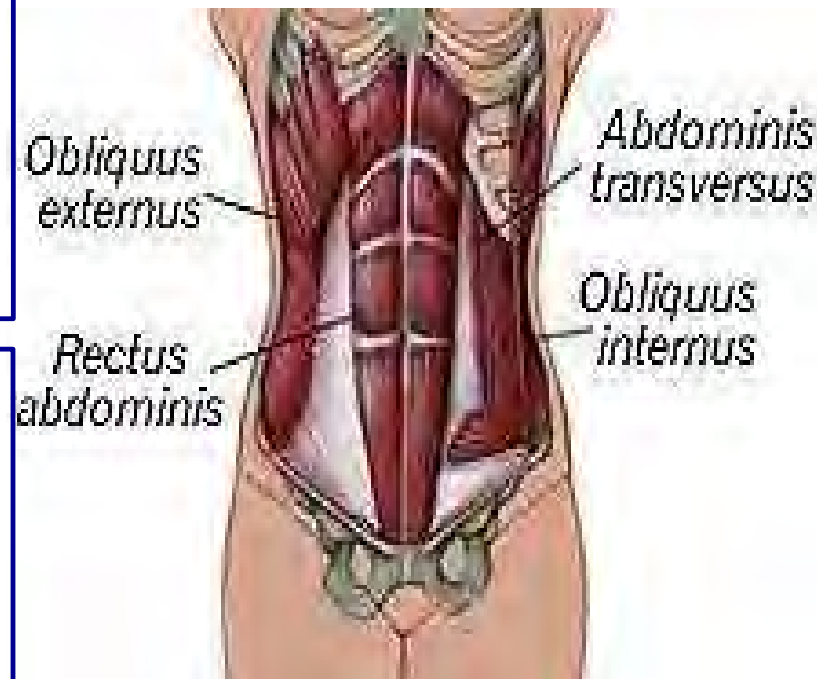
Core Muscles: Global Muscles vs Local Muscles

Global Muscles

- Obliquis externis
- Rectus Abdominis
- Erector Spinae

Not connected to spinal cord but between shoulders and pelvic floor

Focus on MOVEMENT and BALANCE / Posture



Local Muscles

- Transversus Abdominis
- Multifidus
- Obliquis internis
- Rotators

These muscles are connected on the SEGMENTS.

They center around the joints and protect the joints from stress.

Focus on SEGMENTAL STABILITY

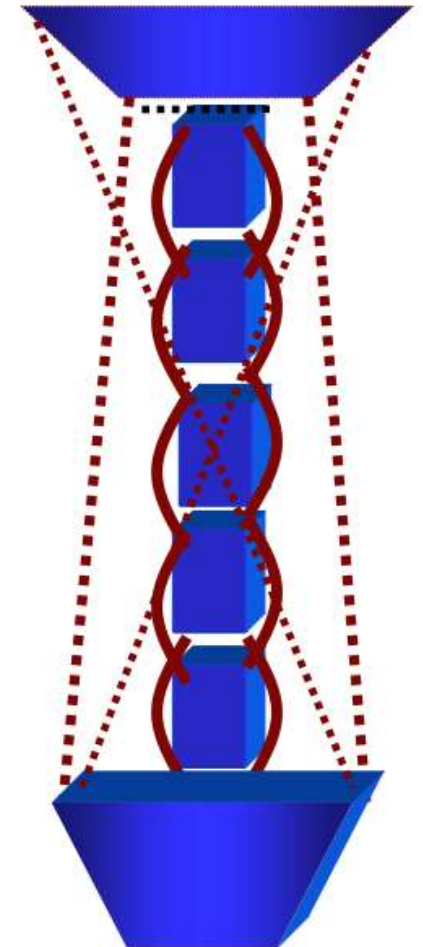
Core Muscles: Global Muscles vs Local Muscles



Long Global superficial strong muscles are NOT able to ensure Segmental stability, not even when they are very strong

The Small Local Deep (small strength) muscles are responsible for Segmental Stability

- *Cholewicki (1997), Bergmark (1989), Lucas (1976)*
- **BERGMARK** A. *Stability of the lumbar spine. Acta Orthopædica Scandinavica, 1989. 60 (supplement 230): p. 1-54*



Core Muscles:
Global Muscles vs Local Muscles

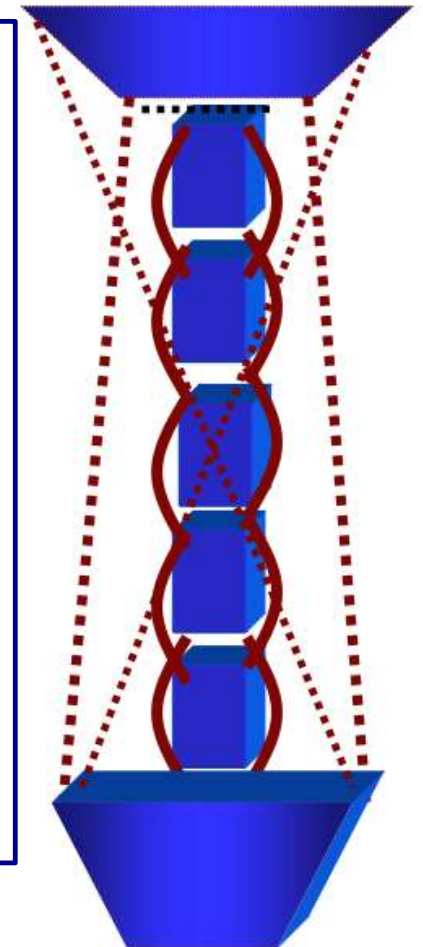


You can not train local muscles in a fitness studio.

These muscles are not so strong and not focused on strength.

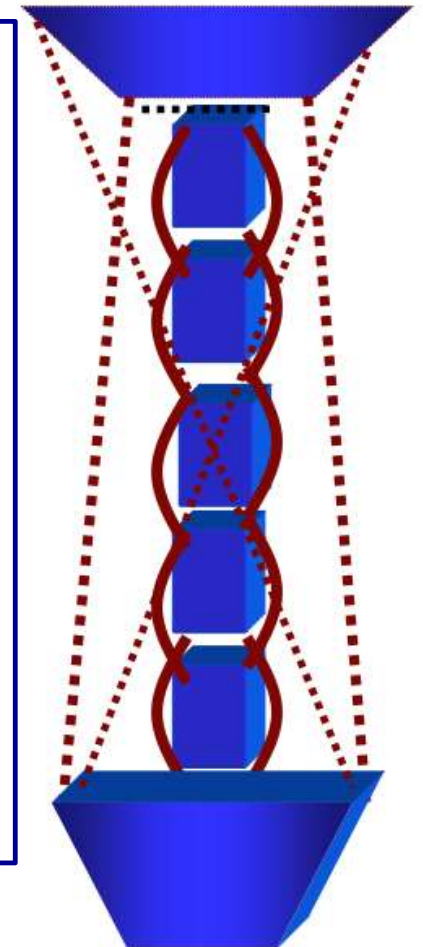
Lack of movement results in atrophy of these local muscles.

Requires training to ensure improved control



Core Muscles: Self-training of local muscles is very difficult

- Difficult to train these muscles voluntarily (not responsible for movement)
 - E.g. you have to contract both Transversus Abdominis & Multifidus but are not allowed to contract Obliquus internus/externus & rectus abdominis
- Muscles lie deep and are small
- Muscles not focused on strength but on function
- Requires long time and active commitment to train every day



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**The important
“Feed-Forward”
mechanism
for spinal stability**



The most important FUNCTION of Multifidus is to ANTICIPATE movement of other muscles and to ensure that spinal segments stay in position.

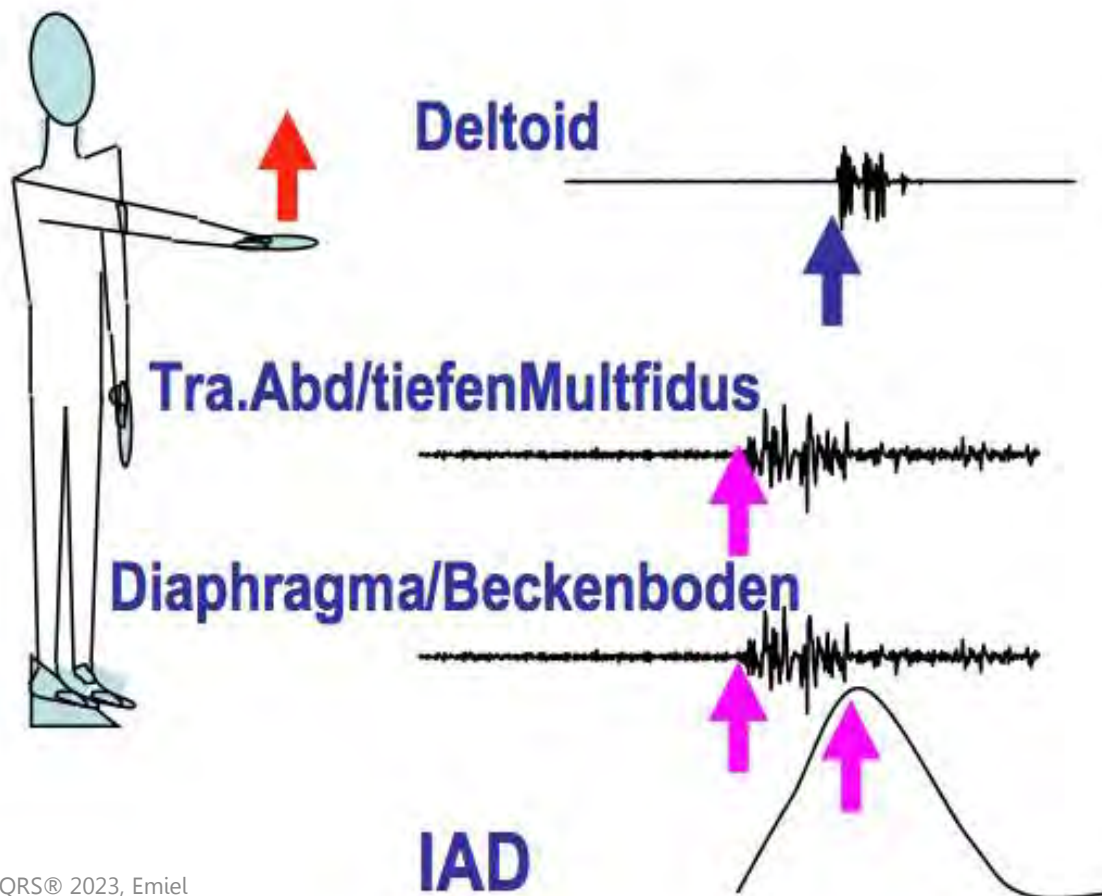
For patients with Lower Back Pain this “anticipation” function does not work anymore.

Core Muscles:



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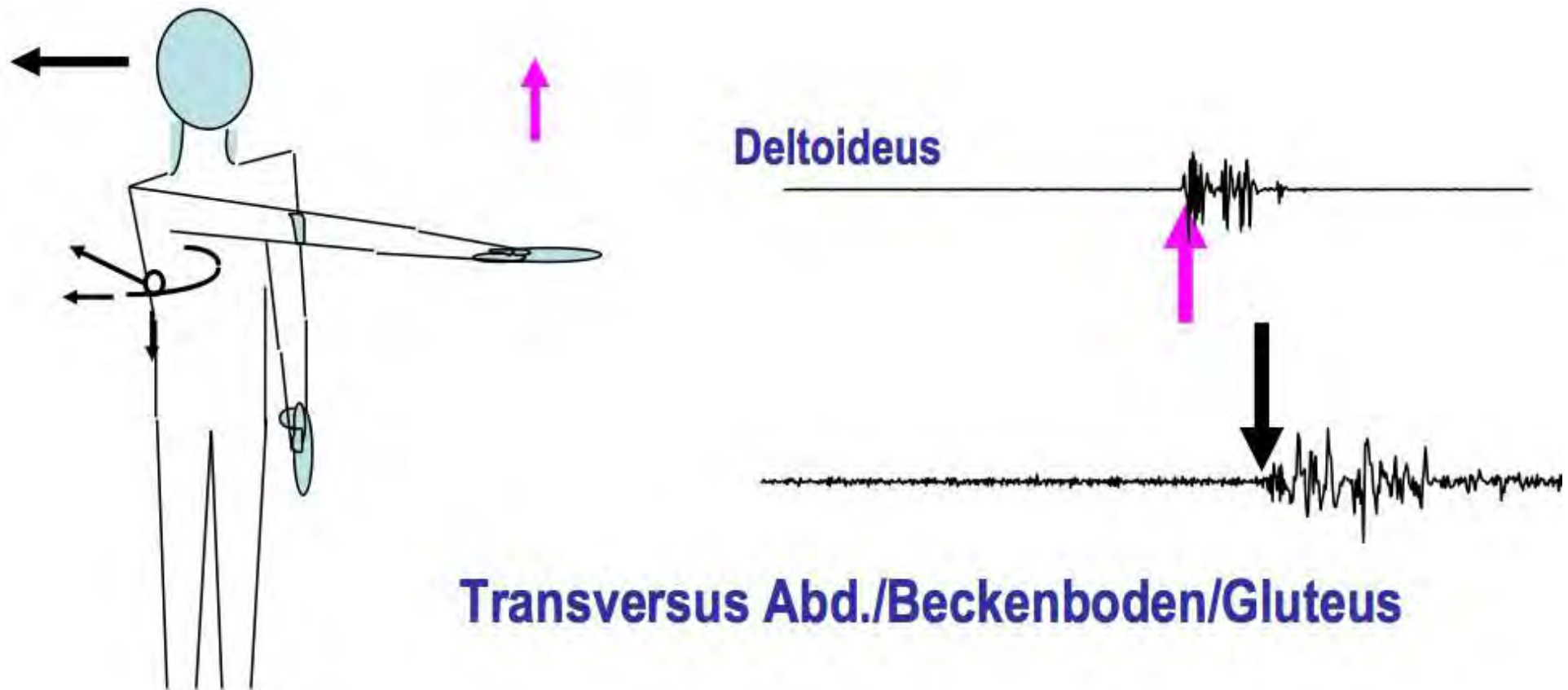


- Core muscles anticipate movement of body and contract BEFORE other muscles to ensure Spinal Stability
 - Shirley 2003; Hodges 1997/2003, Mosely 2001, Smith 2006/7
- Independent of breathing pattern
 - Hodges 1997, 2003 Smith 2006/7

“Feed-Forward” mechanism

(Urguhart 2005)

Core Muscles: Lower Back Pain: Core muscles are too late



Core Muscles: Lower Back Pain: Core muscles are too late



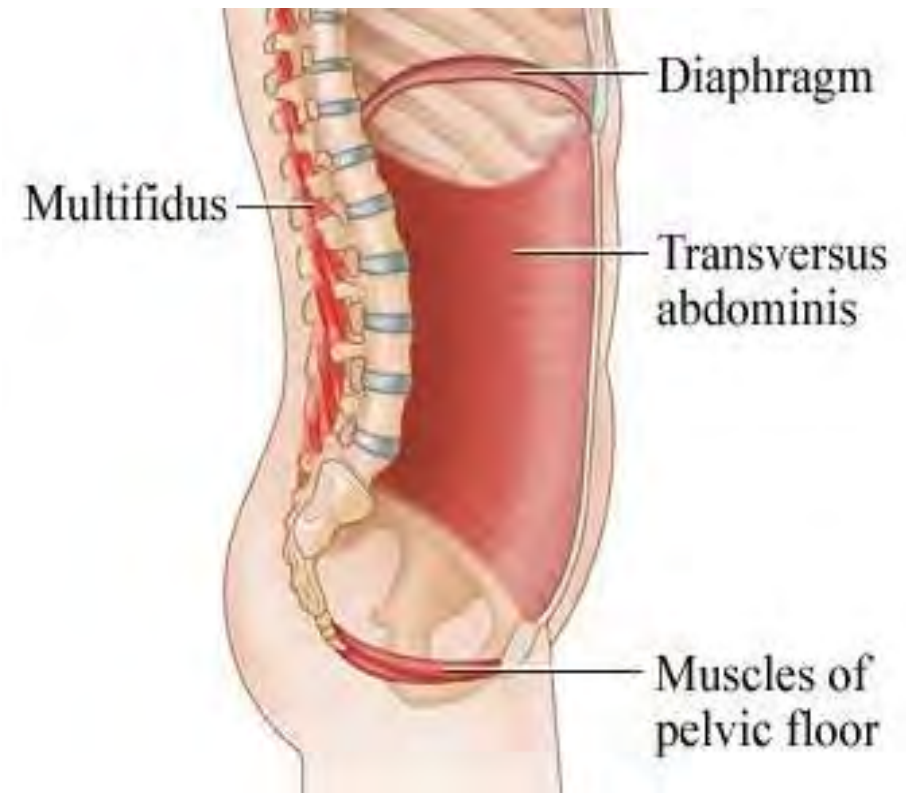
- **Transversus Abdominus 150 milliseconds later than other muscles** (Hodges)
- So spinal cord receives a load without ensuring Segmental Stability (17)
- Cause: Loss of Function of Segmental Muscles due to insufficient physical activity resulting in Atrophy
- Solution: Retrain the muscles with key focus on training **COORDINATION** and **FUNCTION** (focus not on Strength)
- Problem: These deep muscles can not be trained in a fitness center
- Solution: Train with Magnetic Stimulation which reaches deep into the muscles and which ensures re-learning muscle Function in a Co-ordinated way



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Core Muscles: Transversus Abdominis & Lumbar Multifidus

- Both are **Primary Stabilizers**
- Located close to the joint
- Are SLOW twitch muscles
- Consist of short fibers
- Reasonable fatigue resistant
- Normally does not lengthen so much
- Normally tonic and always active during all movements
- Weaken and lengthen and get tired quickly with muscle imbalance
- **Normally anticipating the movement of other muscles !**



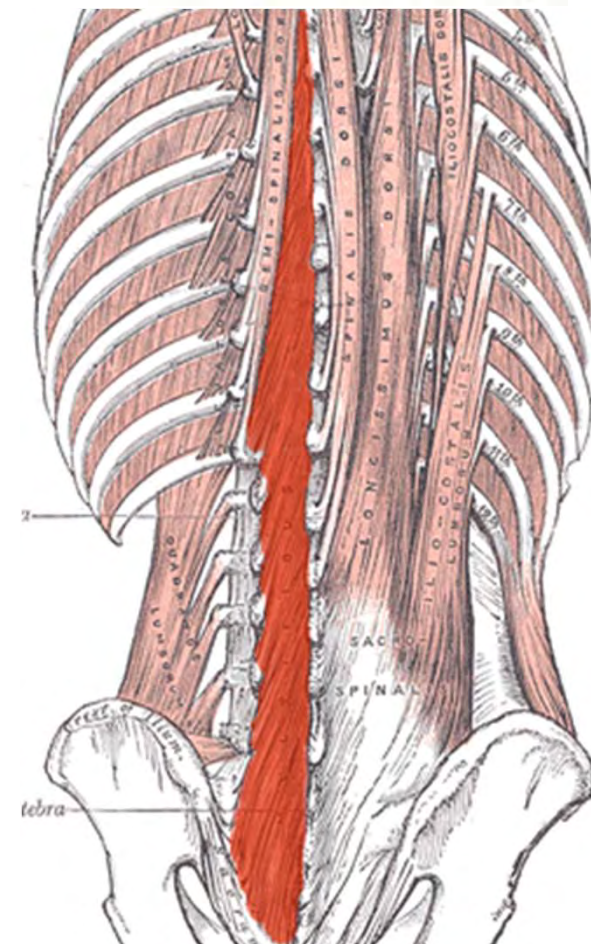
Core Muscles: Multifidus



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- Much more research available on Multifidus as compared to Transversus Abdominis
- Patients with Lower Back Pain, the muscle function of the Multifidus has changed (18):
 - Atrophy
 - Lower number of capillaries
 - Increased connective tissue
 - Increased Fat
 - Change in muscle spindle function
- Also, Muscles of LBP patients get **tired** very quickly
 - This indicates a reduction of type 1 fibers (19,20)
- Atrophy of muscle fibers very fast after injury and pain (21)
- Training of Multifidus after 1st case has proven to be effective:
 - Creation of new muscle fibers.
 - Lower recurrence of LBP after first incidence

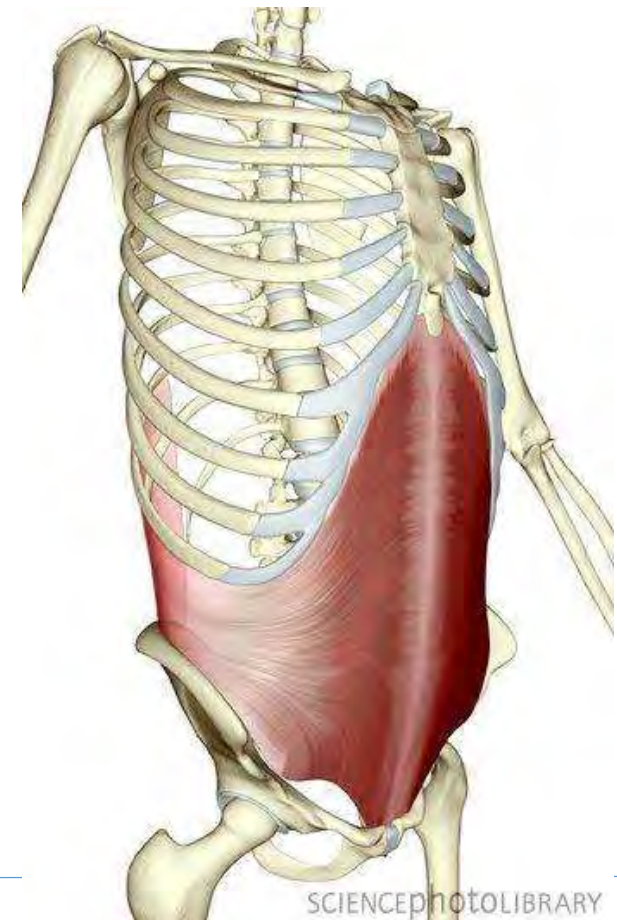


Core Muscles: Transversus Abdominis



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- Most **deepest** and most thinnest muscle of the abdomen
- **Horizontal** muscle fibers to all Lumbar spine segments
- Horizontal, allowing little lengthening to ensure stability
- **Tonic muscle** works best at 25% of its maximum power.
- Is acting and is controlled independently of other abdominal muscles
- Involved in:
 - Breathing, especially strong expiration
 - Intra-abdominal pressure
 - Visceral grip
 - Segmental Stability !

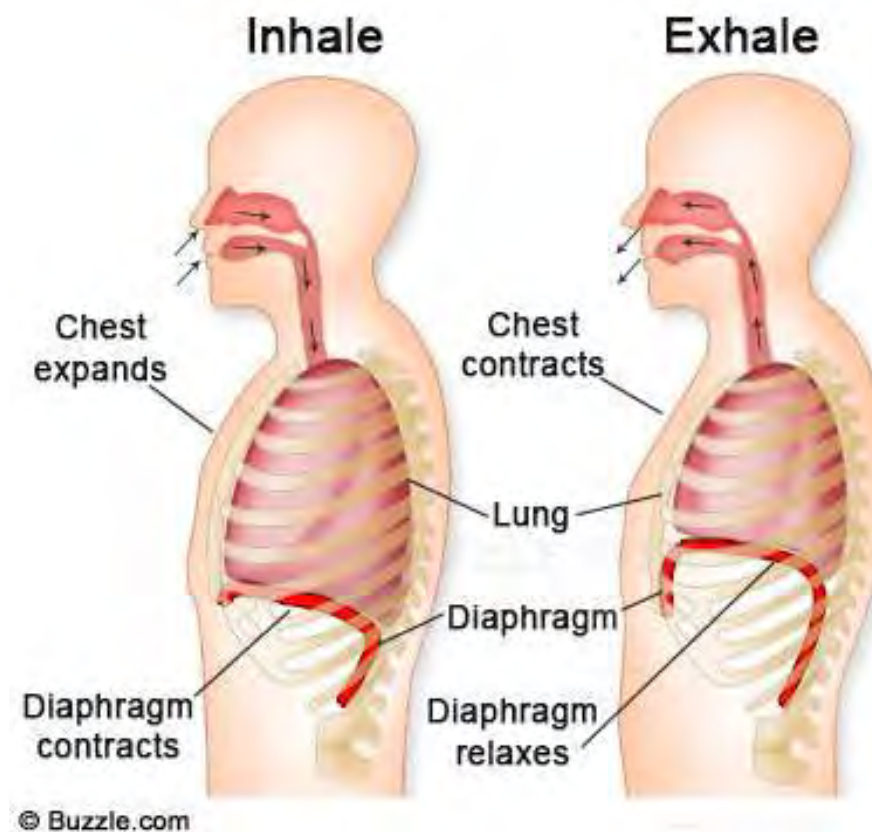
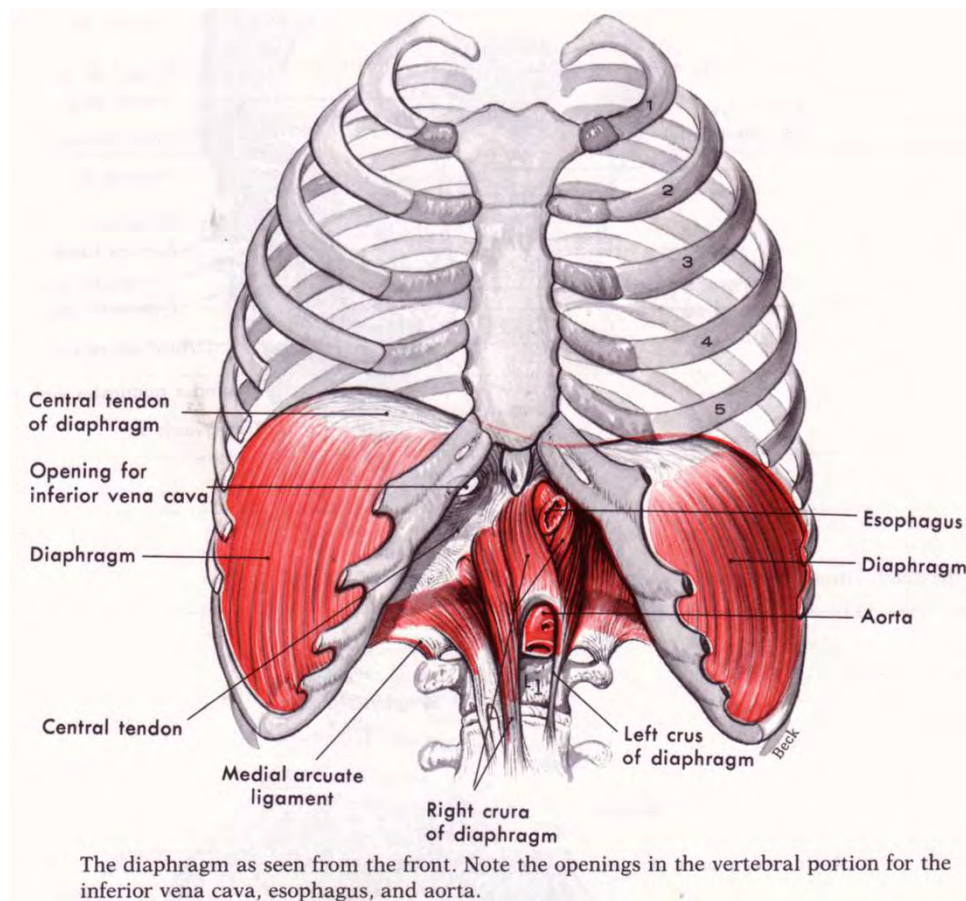


Core Muscles: Diaphragm

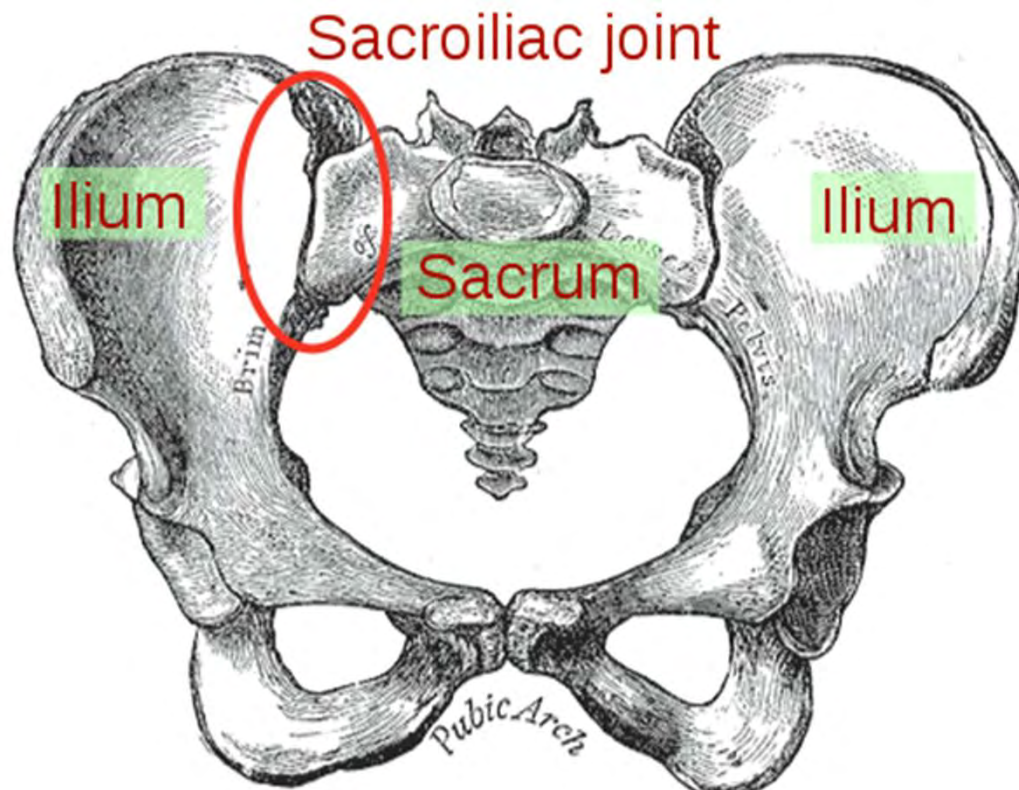


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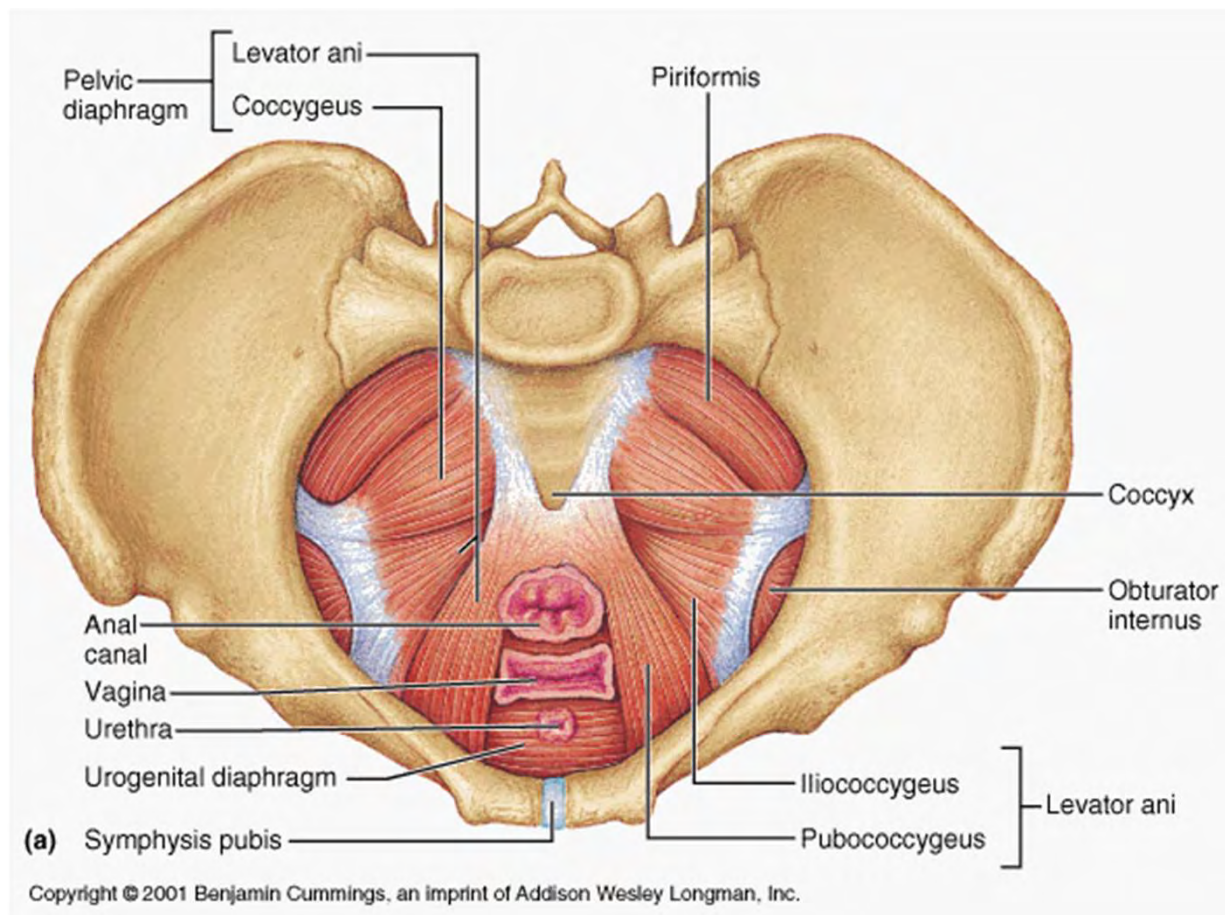


Core muscles Iliosacral joint



Spinal Cord
+
Pelvic Floor
+
Sacroiliac Joint
=
Stable Structure

Core Muscles: Pelvic Floor Muscles



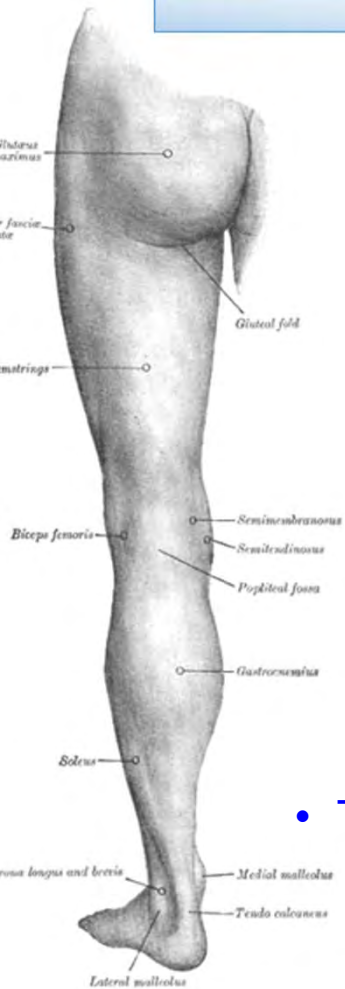
- All core muscles are connected and work together (Lewit 1999)
- Pelvic Floor is co-active connected to Transversus Abdominis & Multifidus
- Training of Transversus Abdominis indirectly trains the Pelvic Floor.
- Training of Pelvic Floor indirectly has positive effect on Segmental Stability (Sapsford et al 2001)

Other muscles which are trained by the QRS-PelviCenter

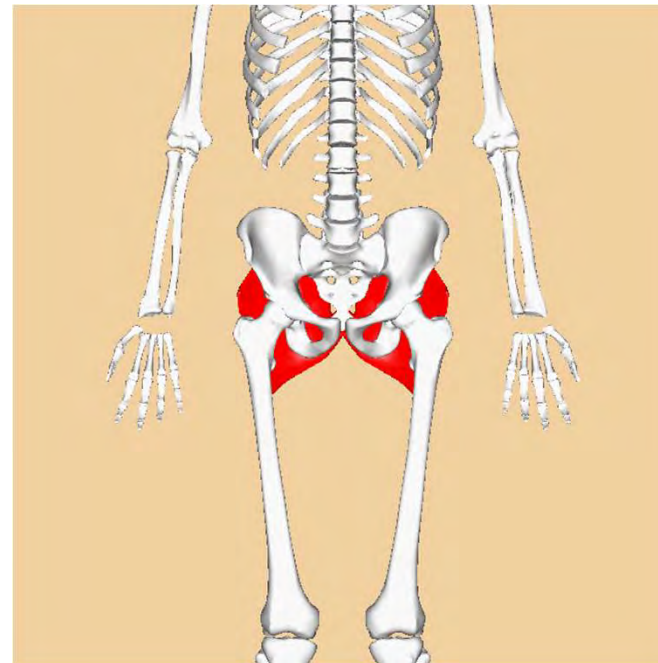


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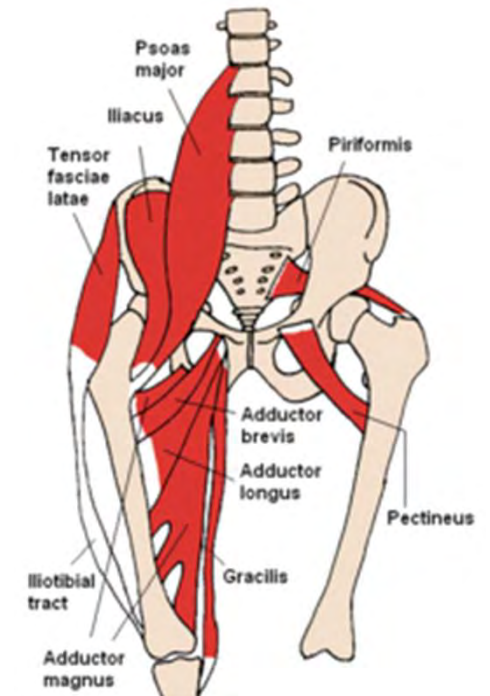
Human Health Design



- Thigh muscles

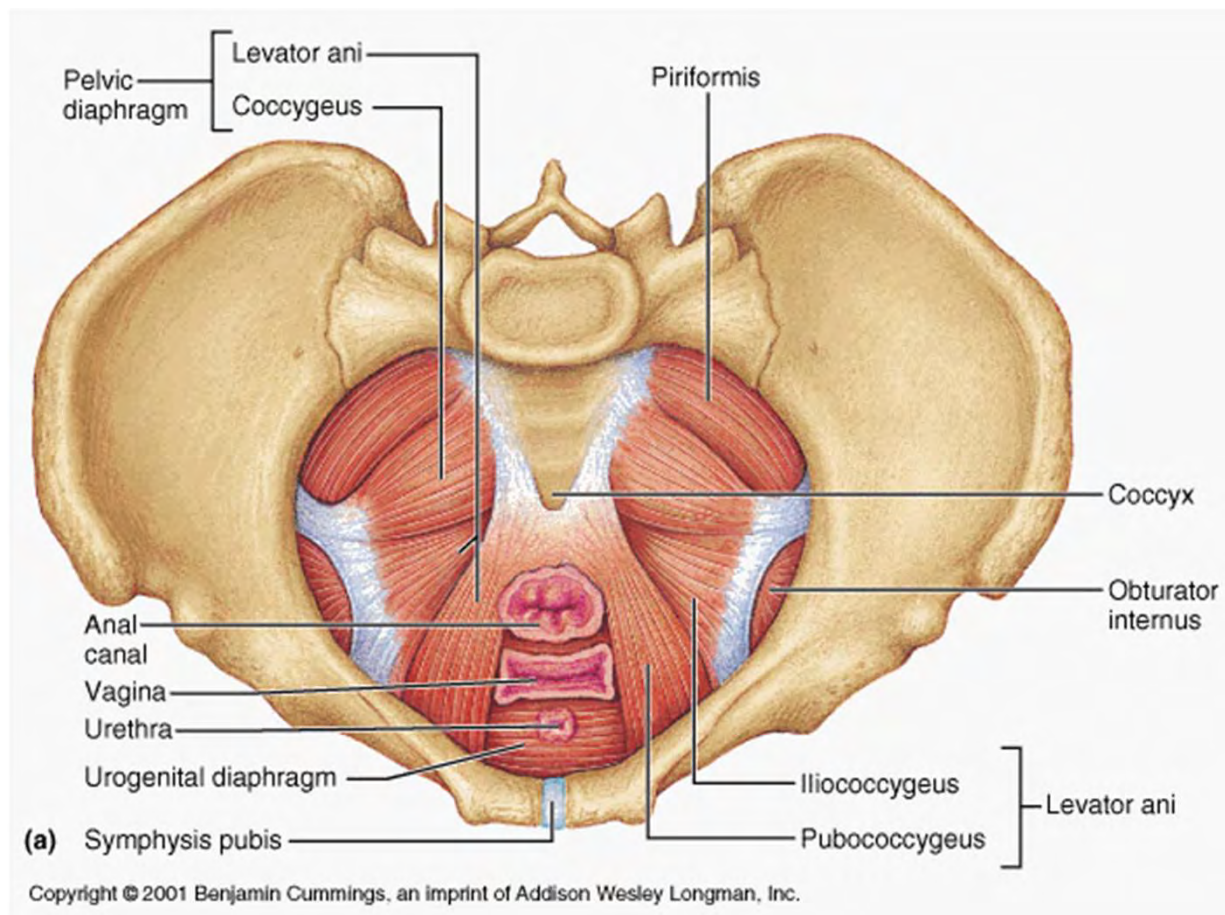


- Glutes



- Hip-bone muscles

Core Muscles: Pelvic Floor Muscles



- All core muscles are connected and work together (Lewit 1999)
- Pelvic Floor is co-active connected to Transversus Abdominis & Multifidus
- Training of Transversus Abdominis indirectly trains the Pelvic Floor.
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Clinical Evidence shows a strong relation between
“persons with weak pelvic floor muscles”
and “lower back pain”



- Clinical evidence shows that people who have weak pelvic floor muscles have a high risk of having low back pain.
- The risk of getting Lower Back Pain with weak Pelvic muscles is higher than:
 - persons who have a high Body Mass Index (BMI)
 - persons who have only limited physical activity



Clinical Evidence shows a strong relation between “persons with weak pelvic floor muscles” and “lower back pain”



- A study in 2010 shows that individuals with low back pain have a significant decrease in pelvic floor function compared to individuals without low back pain
 - Arab A, Behbahani R, Lorestani L, Azari A. Assessment of pelvic floor muscle function in women with and without low back pain using transabdominal ultrasound. *Manual Therapy*. June 2010;15(3):235-239.
- A study in 2008 of 200 women with Lower Back Pain reported that 78% of women with Lower Back Pain reported Urinary Incontinence.
 - Urinary incontinence in women with low back pain. Eliasson K, Elfving B, Nordgren B, Mattsson E, *Man Therapy* 2008 Jun;13(3):206-12. Epub 2007 Mar 23.
- A large prospective study from 2006 followed 38.050 women over a 5 year period. This study showed that the 2 strongest co-morbidities for lower back pain are Pelvic Floor Dysfunction and Respiratory Dysfunction. So these two co-morbidities were stronger associated with Lower Back Pain than BMI and inactivity!
 - Smith M., Russell A., Hodges P. Disorders of breathing and continence have a stronger association with back pain than obesity and physical activity. *Australian Journal of Physiotherapy*. March 2006; 52(1)11-16
- A study from 2013 of 1.636 patients. 63% of women with Pelvic Girdle Pain (PGP) had Pelvic Floor Dysfunction (PFD). 57% of women had combined Lower Back Pain (LBP) and Pelvic Girdle Pain (PGP) and Pelvic Floor Disorders (PFD)
 - VanWingerden et al (2013):

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**Summary:
Magnetic Stimulation is
the most effective
non surgical solution for
Segmental Stability**



QRS-Magnetic Stimulation is the ONLY method to reach the deep small segmental muscles of the spinal cord (Multifidus) and improve the FUNCTION (= anticipation of movement).

More effective than "self-training" or "massage"

Summary:

Why is QRS-PelviCenter effective in Spinal Stability?



1. Magnetic Stimulation penetrates **DEEP** into the body and reaches the important small deeper local muscles that can not be trained by self-training and normally requires a specialised physiotherapist
2. Magnetic Stimulation is able to reach **WIDER** and thereby training **COORDINATION** and **FUNCTION** of the muscles (more important than strength)
3. **CO-CONTRACTION** can be realised effectively
4. All "Core muscles" are connected and must work together and QRS-PelviCenter **stimulation on thigh muscles** and pelvic floor muscles also has positive effects on Transversus Abdominis and Multifidus
5. Building strength is only possible with increasing the intensities. Only possible with magnetic stimulation.



Summary:
QRS-PelviCenter is Complementary treatment



Muscle Control = Pain Control

