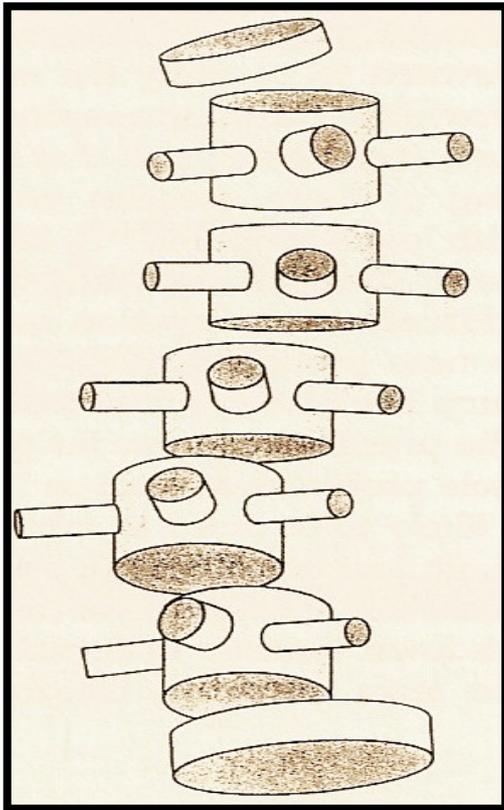


# 3D-NEWTON

TRAINING SOLUTION  
Surgical bio-skills laboratories



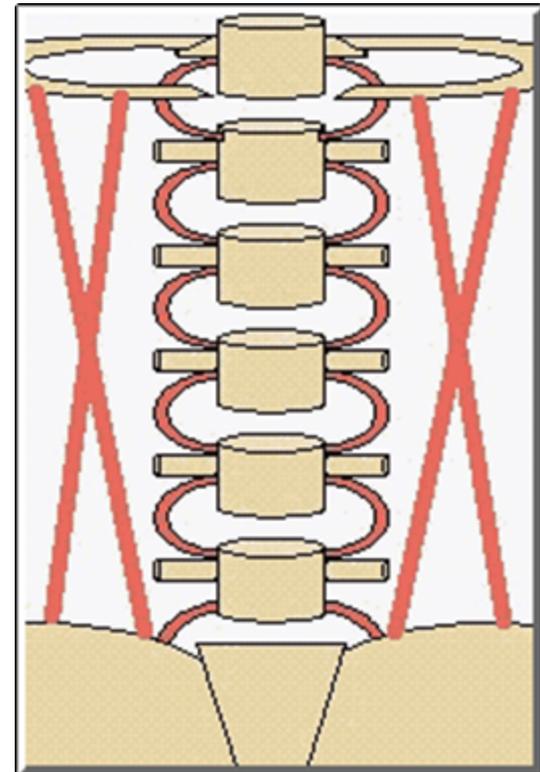
# Why is spine stabilization exercise necessary? - 1



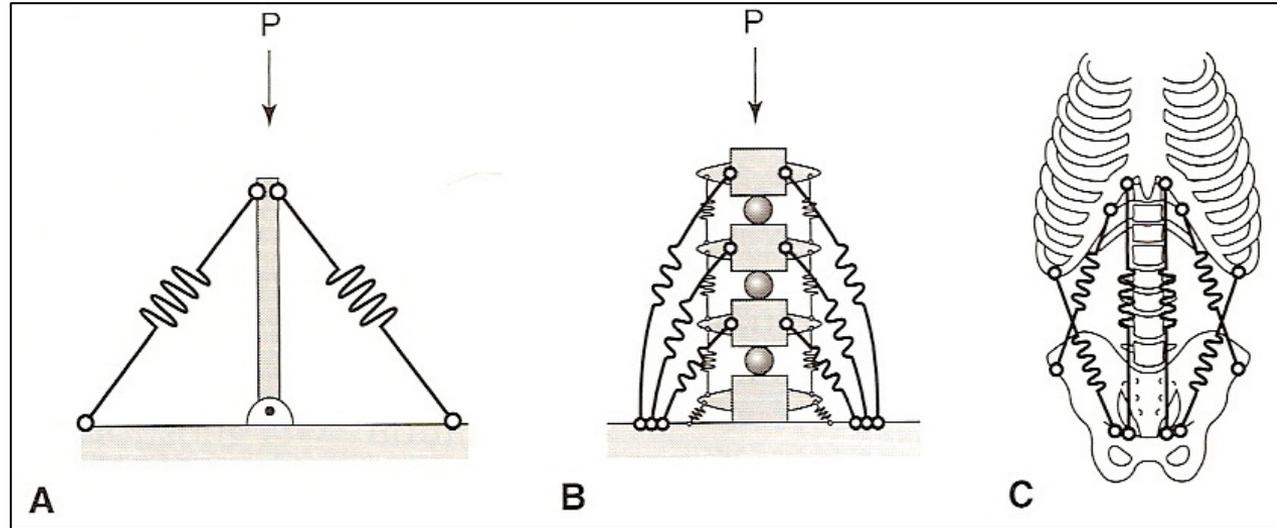
Spine consists of a few segmentations.

# Muscle Control of Orientation and Intervertebral Motion

- Bergmark(1980) defined muscles as either “local” or “global” based on anatomical characteristics=> control of motion and stability

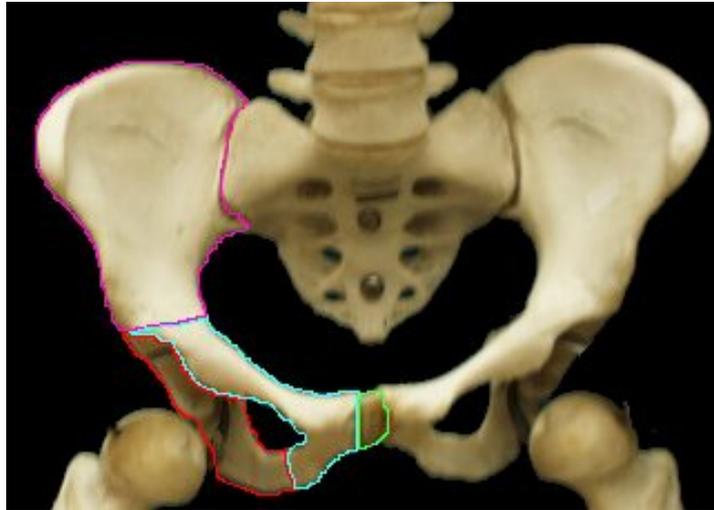


# Spinal Stiffness



Spine stiffness (stability) is achieved by a complex interaction of stiffening structures along the spine

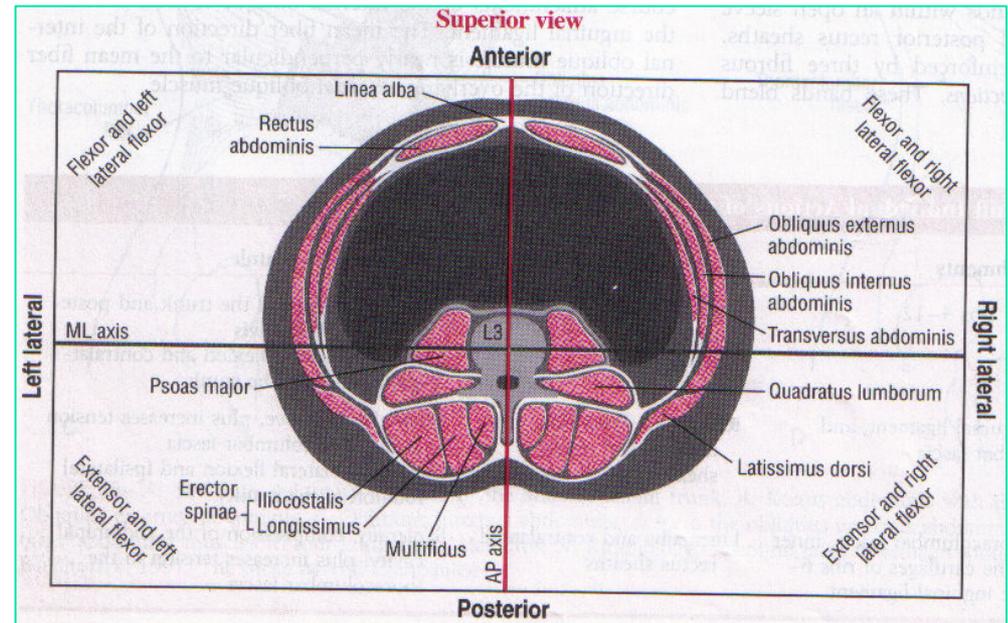
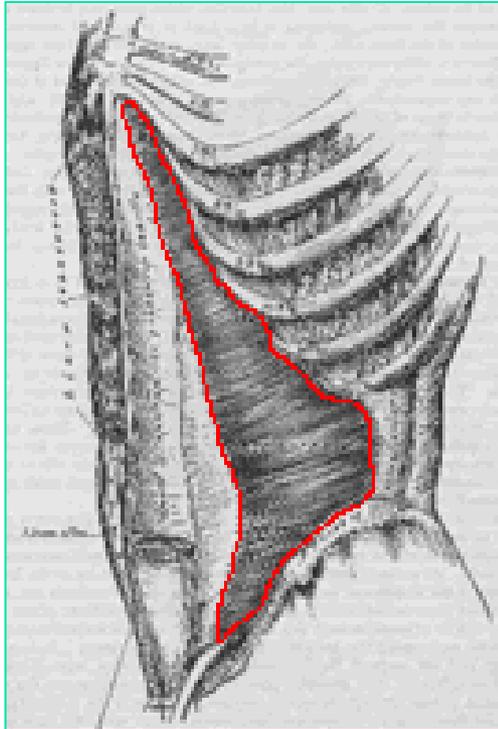
# Why is spine stabilization exercise necessary? - 2



Pelvis supports the spine. Due to its 3 pieces, it may distort anytime.

# Muscle to help spine stability - 1

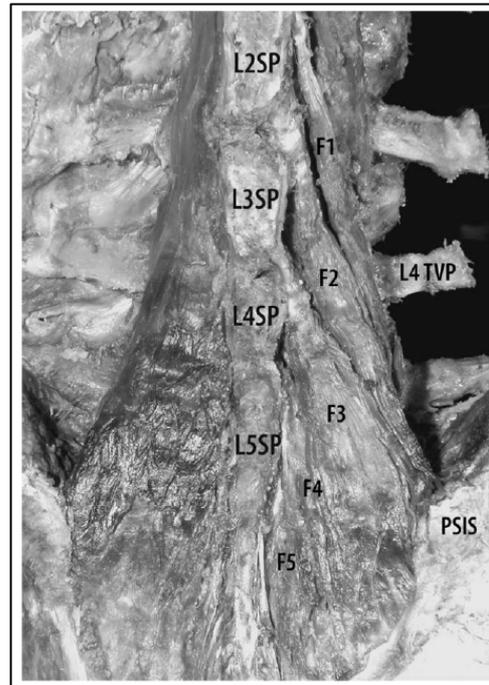
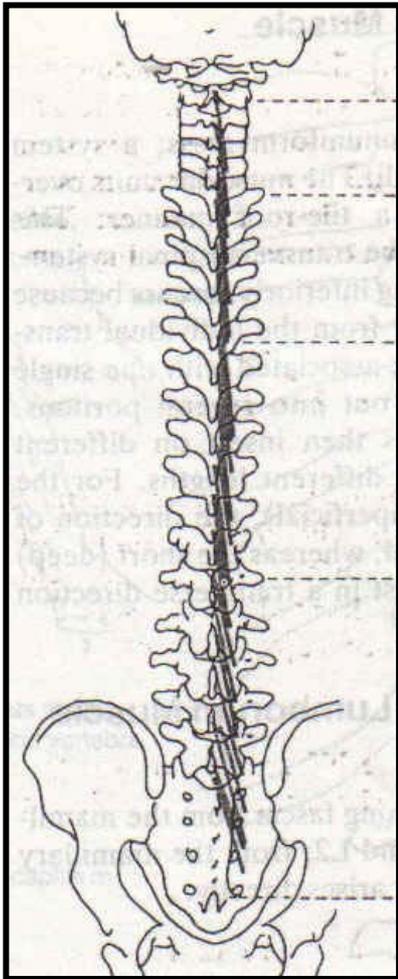
## : Transverses abdominus muscles



Its nickname is the corset muscle which wraps from outer front side to thoracolumbar fascia in the back to attach to multifidus muscles and pleurapophysiss, processus spinosus of spine.

# Muscle to help spine stability - 2

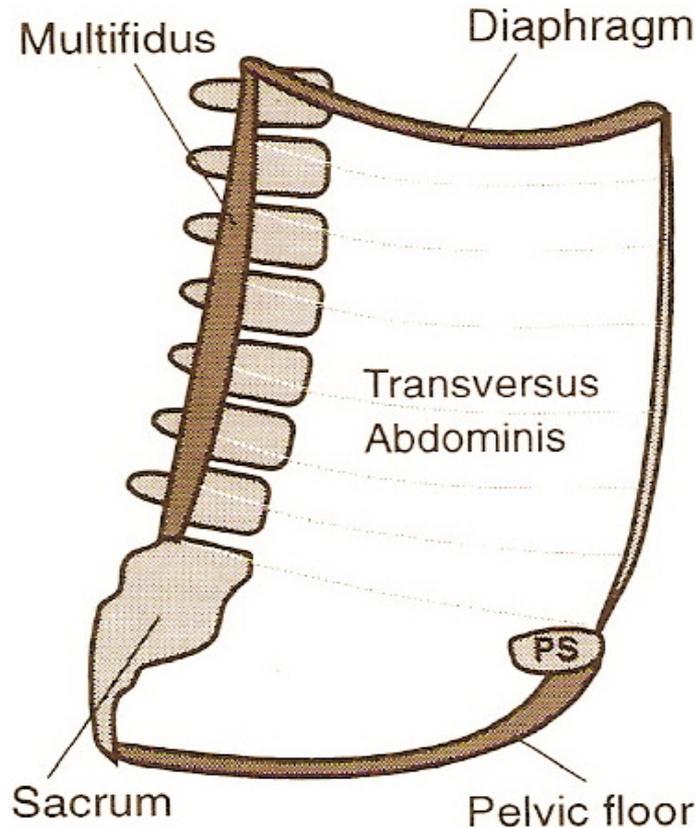
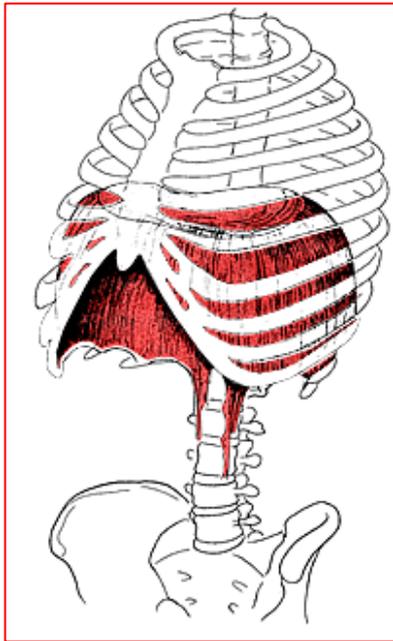
## : multifidus muscles



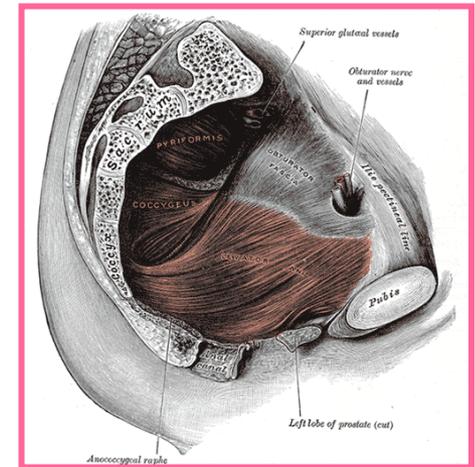
Multifidus muscles of the spine stick to the pleurapophysiss, processus spinosus of spine to connect the segmentations and has many neuroceptors to deliver sensory information

# Muscle to help spine stability - 3

➤ Upper part: Diaphragm



➤ Lower part: Pelvic floor muscle

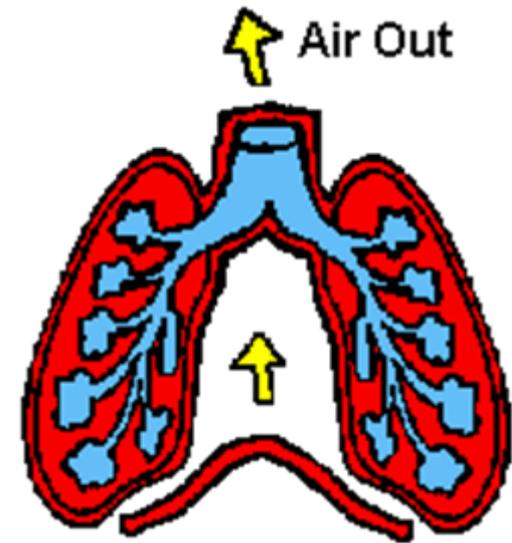
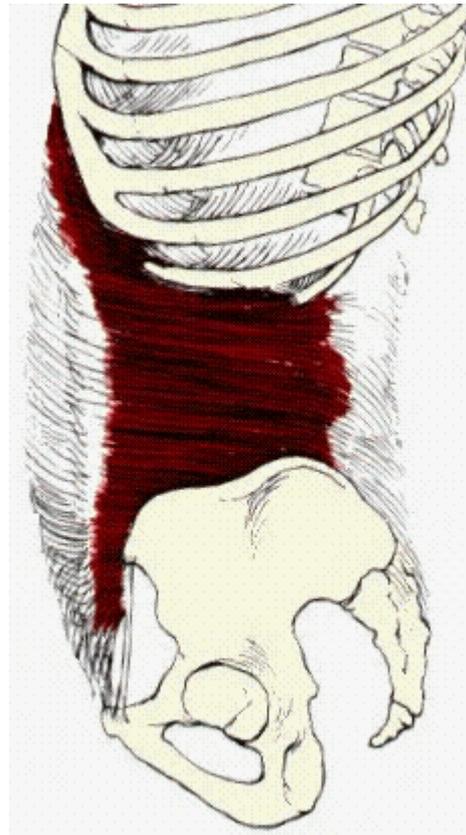
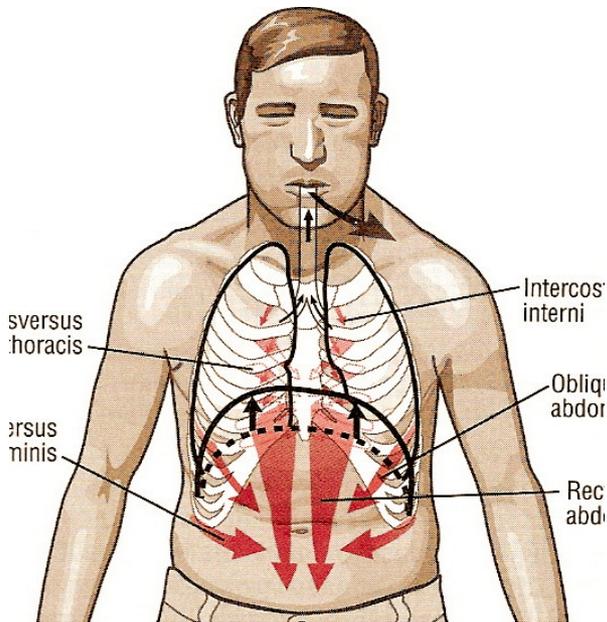


**Simultaneous contraction of muscles** increases intra-abdominal pressure of truncus.

# Phenomenon of spine stabilization - 1: Increase of pressure inside the belly through contraction of Transverses abdominus muscles and oxybiotic respiration at the same time.

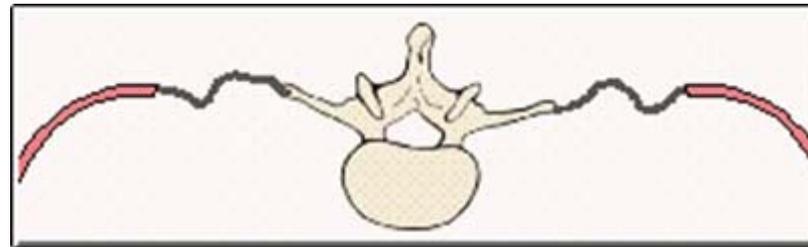
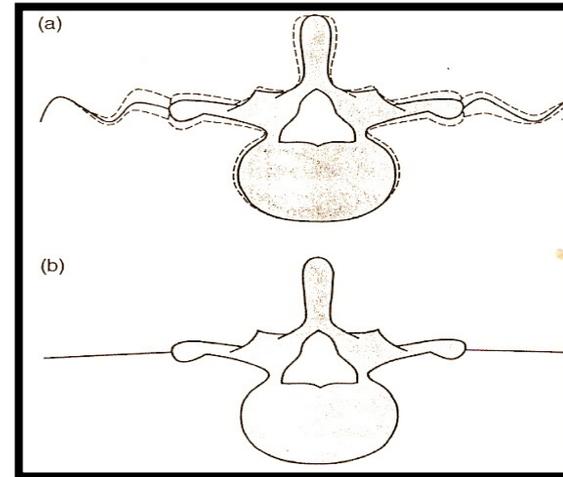
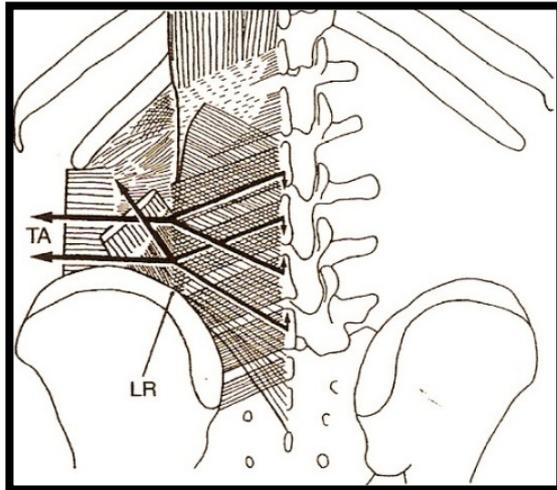
➤ Front outer part: Transverses abdominus muscles

➤ Upper part: Diaphragm



# Phenomenon of spine stabilization - 2

Simultaneous contraction of transverses abdominus muscles and multifidus muscles lead to tension of thoracolumbar fascia.

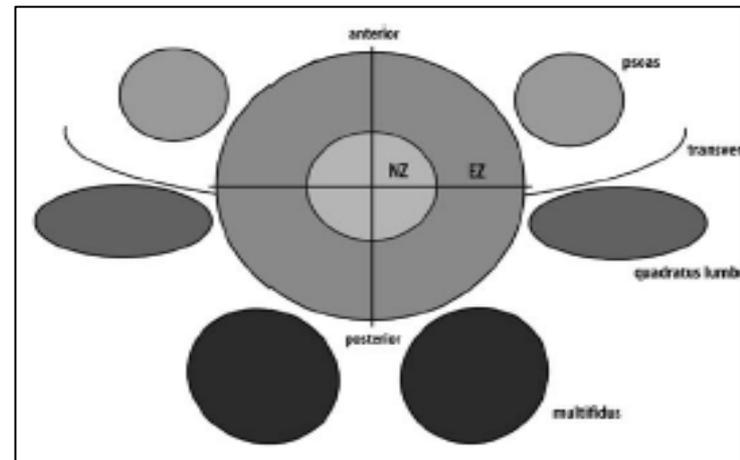
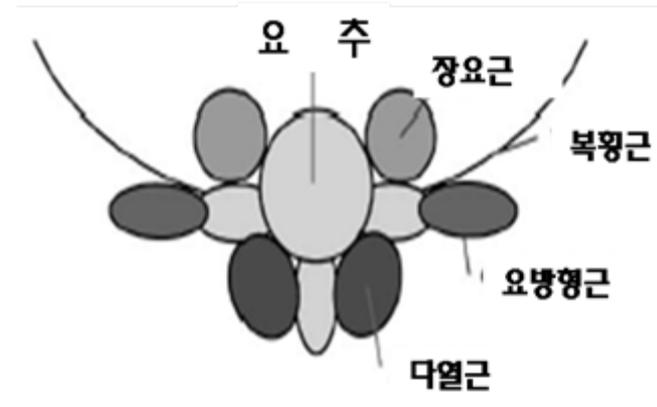
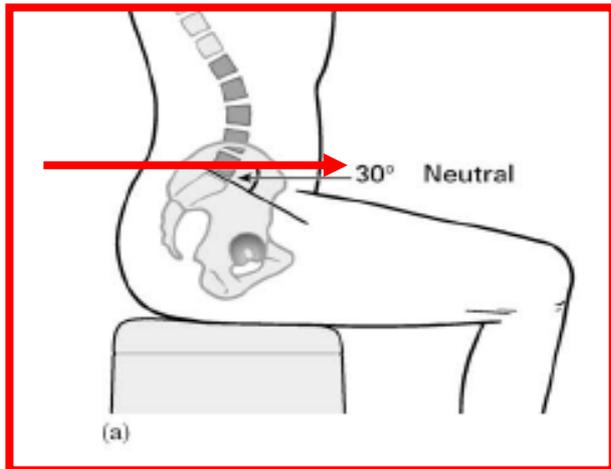


Multifidus muscles may reinstate and rearrange the spine.

# Phenomenon of spine stabilization - 3

:Maintenance of neutral area

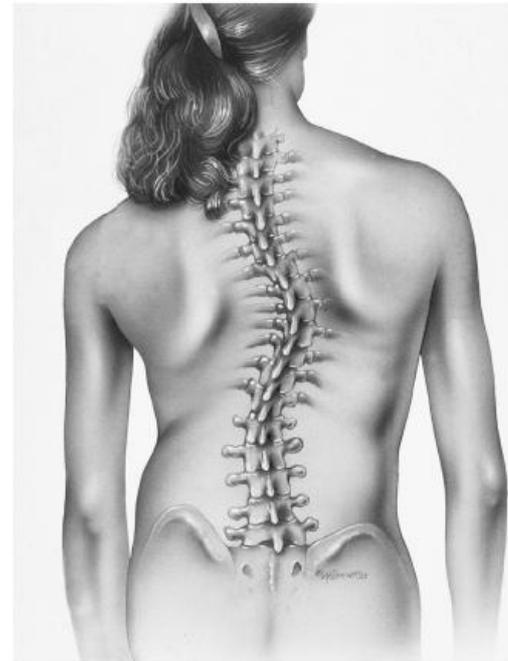
Neutral area means the area which allows mobility without pains.



# Application of 3D Newton

## Scoliosis Patients

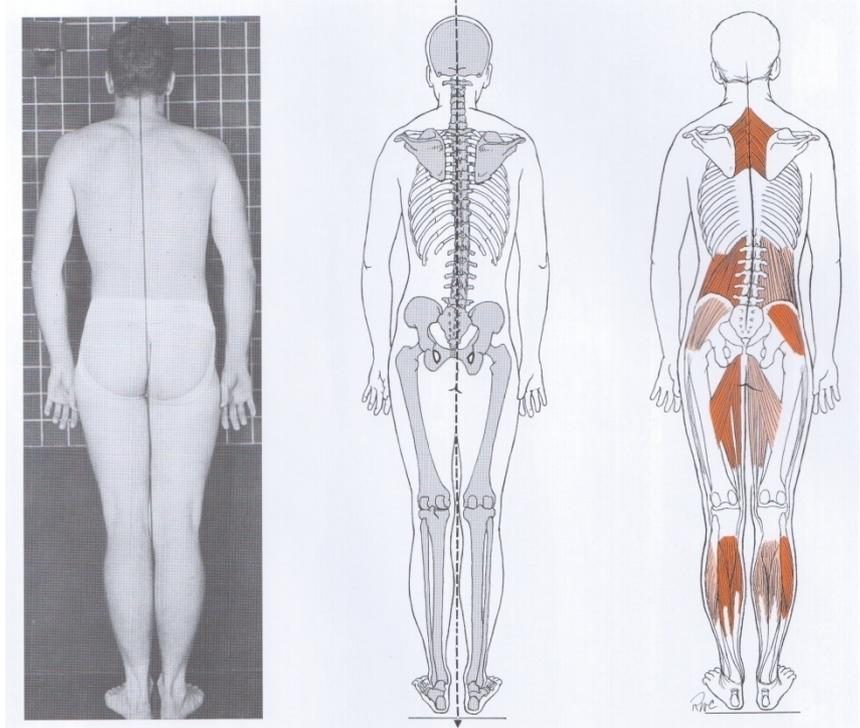
- Habitual or structural scoliosis may cause short spinal muscle or weakness which cause distortion of spine.
- Shortened and extended muscles need to **muscle coaching training**



# Application of 3D Newton

## Imbalanced Patient

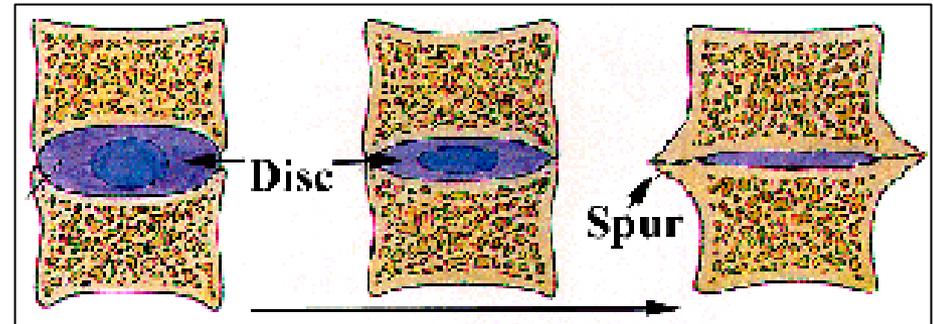
- Asymmetry results from keeping a certain posture for a long time.
- Imbalanced pelvis and different length of legs.
- Exercise on the weak side is necessary after diagnosis.



# Application of 3D Newton

## Osteoporosis

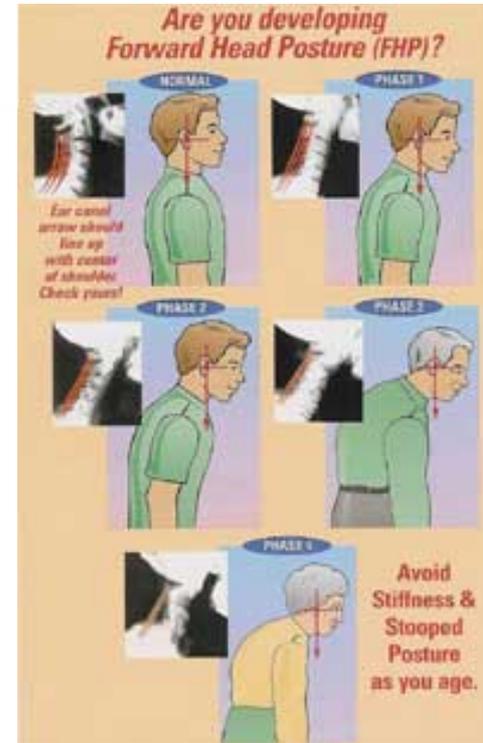
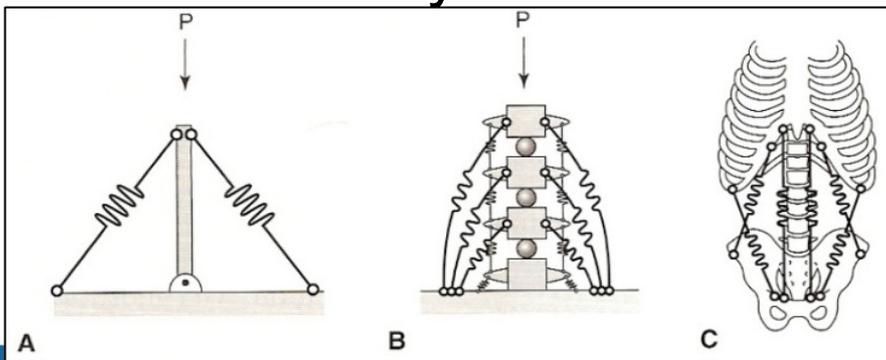
- Due to low bone density of spine of older people, spine gets shortened and develops into retrogression.
- Multilateral exercise reinforces the muscle and minimizes the regression of ligaments and joint



# Application of 3D Newton

## Senile forward head posture patients

- Human body resists against gravity. Getting older, the muscle gets weaker and the head starts to lean forward.
- Spinal erection muscle and belly muscle for anti-gravity shall be necessary.



# Application of 3D Newton

## Lumber pains of sports players and correction of posture

- Some sports players easily get into lumbar pains or imbalance due to repeated same movement.
- Exercise for balanced muscle is necessary after diagnosis of wrong posture or repeated movements.



Gymnastics

12% incidence rate of spondylolysis

## Influence of Deep Muscle on the Body

- ✓ Weakening or imbalance may cause spinal instability.
- ✓ Lowered proprioceptive sensors result in imbalance of sense of reposition

## Effects to cause deem muscle to develop

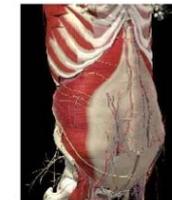
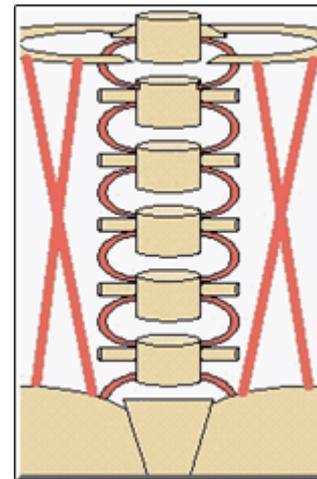
- ✓ Using the changes in gravity and weight burden
- ✓ Inducing stable spine out of changes in each part of the body.



3D-CENTAUR



3D-NEWTON



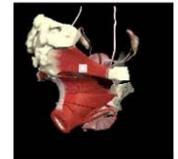
복횡근  
(Transvers Abdominis)



다열근  
(Multifidus)



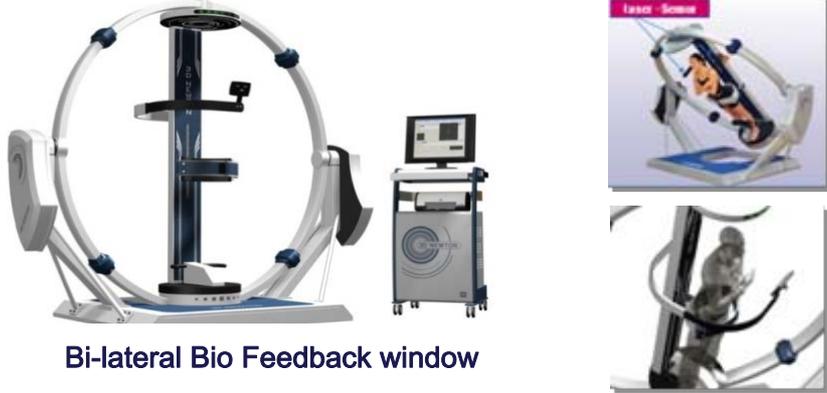
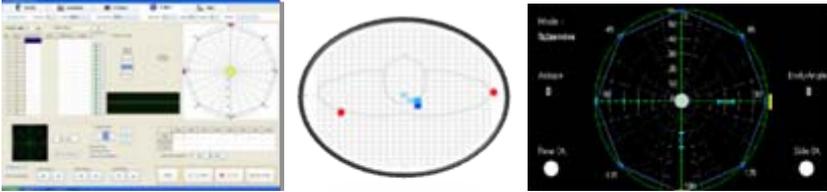
골반저근  
(Pelvic Floor muscles)



골반저근  
(Pelvic Floor muscles)

3D- spatial rotator system adopts 360-degree change of repositioning which allows to sense the gravity and weight burden to identify the stabilizer muscle groups which you are usually unaware during normal times. This device of new concept helps proprioceptive sensors (nerve roots) get stimulated and recover.

# Comparison of Technologies of 3D Spatial Rotators

Name of Model	3D-CENTAUR	3D-NEWTON
<p>Equipments Display with Spatial Rotator Function</p>	 <p>Window to identify movement</p>	 <p>Bi-lateral Bio Feedback window</p>
<p>Patient Diagnosis Bio Feedback Automatic sensor</p>	 <ul style="list-style-type: none"> <li>- No feedback sensor</li> <li>- Objective <b>data not available</b></li> <li>- <b>Verification of equipment</b>, not on the patient</li> </ul>	 <ul style="list-style-type: none"> <li>- Laser Dt measuring sensor up to 0.1mm</li> <li>- <b>Bi-lateral type muscle training</b> coaching system</li> <li>- <b>Objective data</b> on changes in 3D anti-gravity muscle</li> </ul>
<p>Differential Technology</p>	<ul style="list-style-type: none"> <li>- No patient <b>monitoring function</b></li> <li>- <b>Subjective</b> data of curers</li> <li>- Subjective sthenometry</li> <li>- <b>Unilateral adaption</b> on the device</li> </ul>	<ul style="list-style-type: none"> <li>- Objective data of the training results</li> <li>- <b>Forecast of curing schedule</b> after analysis on data of the sensors after analysis on data of the sensors</li> <li>- <b>Real-time monitoring</b> on physical movement by patient for better efficiency</li> </ul>