

BACK STRONG AND BELTLESS

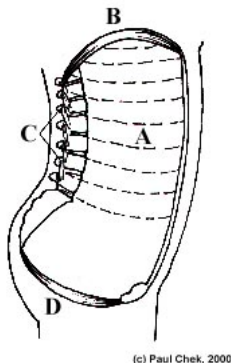
Presented by Donal Carr & Cameron Nell

CHEK Faculty & Team CHEK Presenter

When Did Belt Use Get Started?

Corsets have been used since early 1900's for the treatment of Scoliosis (9) and back pain (10) and quite possibly much longer. Therefore it is logical that a lifter, wanting to make the right decision, would choose to use a belt based on the medical establishment's use of belts, especially considering the history and treatment of back pain dates all the way back to 1500 BC (1)!

A Look At The Belt Your Were Born With!

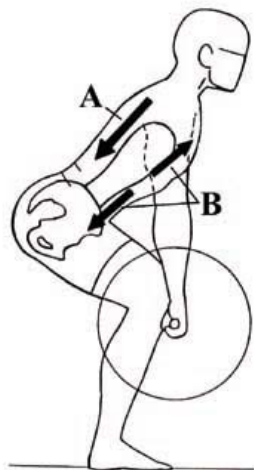
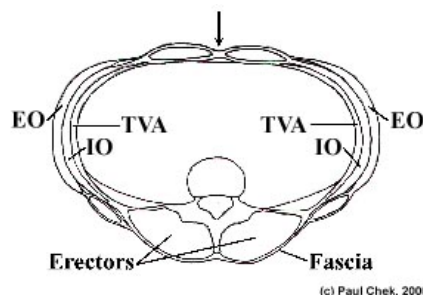


The Inner Unit – Saggital View

The Inner Unit serves to stiffen the axial skeleton in preparation for work. The Inner Unit muscles are A) Transversus Abdominis and the posterior fibers of obliquus internus, B) Diaphragm, C) Deep Multifidus, D) pelvic floor musculature.

The Inner Unit Transverse View

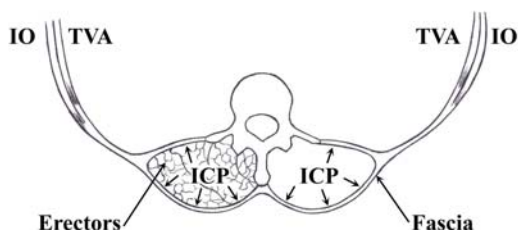
When activated, the transversus abdominis and posterior fibers of the obliquus internus draw the umbilicus inward toward the spine (see arrow). This creates intra-abdominal pressure and hoop tension, which serves to stabilize the lumbar spine.



Intra-abdominal Pressure Mechanism Applied

When lifting any heavy object, the load is transmitted downward through the spine to the legs (A). To stabilize the axial skeleton and minimize compressive loading of the lower lumbar segments, the transversus abdominis and posterior fibers of the obliquus internus should draw the umbilicus inward. The hoop tension created by activation of the deep abdominal wall pushes the viscera upward into the diaphragm and downward into the pelvic floor (B). Because of the innate tendency to hold one's breath while under load, there is increased tension in the diaphragm, producing a lift force via the tendons of the diaphragm. Wirhed proposes this mechanism may decompress the L4 and L5 segments by as much as 40%.

Hydraulic Amplifier Effect

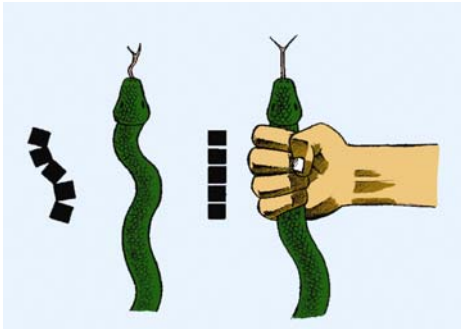
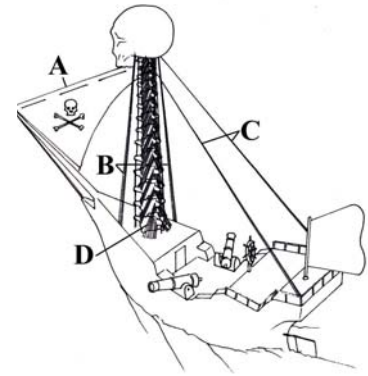


The Hydraulic Amplifier Mechanism

Gracovetsky has demonstrated with mathematical modeling that the extension force produced by expansion of the erector spinae muscles within the compartment created by the thoracolumbar fascia and lamina groove of the spine is a significant contributor to one's ability to lift a load. The expansion of the muscles within the thoracolumbar fascia produces intra-compartmental pressure (ICP). The cylinder is stabilized by synergistic activation of the transversus abdominis (TVA) and posterior fibers of the internal oblique (IO).

The Inner and Outer Units Simplified

The outer unit muscles of the trunk demonstrated here are (A) rectus abdominis, (B) internal and external oblique, (C) erector spinae; the outer unit actually contains other muscles, which have been excluded for simplification. The inner unit is demonstrated here as (D); the multifidus acting as segmental stabilizers for the purpose of controlling joint stiffness. To tighten the guy wires (A-C), which provide *gross stabilization* of the ship's mast without synergistic tightening of the *segmental stabilizers* (D) would obviously result in increased potential to buckle the mast. The mast represents your spine!



Hoop Tension Demonstrated

Left: Without external influence from hoop tension, the snake's spine (like the lifter's) is free to move, under direct influence of the snake's muscles.

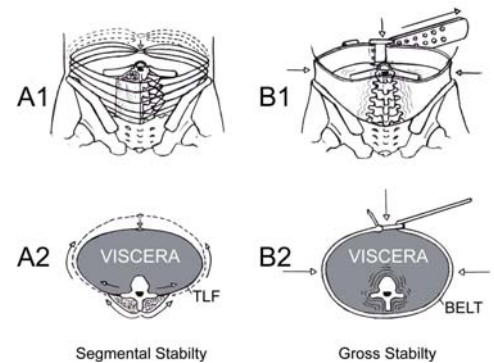
Right: When you grasp a snake, you create hoop tension around the snake's body with your hand, immobilizing the snake's vertebra. Although the snake will continue to try and wiggle out of your hand, it will be unable to produce gross movements of its spine in the region of hoop tension as produced by your hand. If filmed with motion X-ray, you would see that the vertebra are demonstrating small segmental movements (compression, torsion, sheer) as a result of muscle actions.

Intrinsic Hoop Tension vs. Extrinsic Hoop Tension and Spine Stabilization

A1) Because the transversus abdominis and internal oblique muscles place lateral tension on the thoracolumbar fascia, which is intimate with the transverse processes and spinous processes of the lower lumbar segments

(A2), *intrinsically generated hoop tension actually provides segmental stability.*

B1) Tightening a weight belt around the waistline compresses the abdominal viscera, but there is no direct connection to the spine itself.



B2) Although the belt provides gross stability/immobility through increased intra-abdominal pressure (much like the snake above), the compressive loading and faulty recruitment patterns often associated with lifting with belts may continue to produce aberrant motions at segmental levels of spinal joint structures. Once the belt is removed, the same faulty recruitment patterns, unaided by the gross stability of the belt often result in joint derangement, particularly in the L4/5 and L5/S1 motion segments.

Sensory-Motor Amnesia

The Formula For Freedom From Belts

Find The Weakness And Kill It!

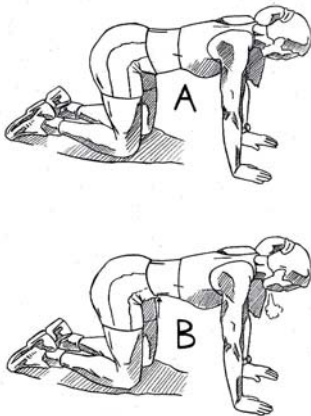
Transversus Abdominis Conditioning

Week	Exercise	Rest	Intensity	Reps	Tempo	Sets
1	4-Point	<1:00		10	10/10	1-4
2	BP cuff	<1:00	- 10 mm Hg	10	10/10	2-4
3	BP cuff	45 sec	- 10 mm Hg	10	10/5	2-4
4	BP cuff	30 sec	- 10 mm Hg	2-4	=/>100 sec	1



Transversus Abdominis Testing

To begin, place the bladder of the blood pressure cuff (BPC) placed directly under the client's umbilicus. Pump the BPC to read 70mmHg after exhalation; if 70mmHg is uncomfortable, any even number between 40-70mmHg will work. Instruct the patient/client to completely relax, exhale and *draw their umbilicus off the BPC*. Watch carefully to make sure they are not pressing downward with their arms, flexing their hips or activating their gluteus maximus muscles. An indicator of normal TVA activation is demonstrated by the ability to reduce the pressure reading by 10mmHg. Those with faulty recruitment patterns commonly increase the pressure registered on the BPC, which is an indicator of rectus abdominis dominance; a common finding among belt users.



The 4 Point TVA Exercise

- A) Positioned on your hands and knees with neutral spinal alignment, inhale deeply. Be sure to use a diaphragmatic breathing pattern. This means that as you inhale, your umbilicus should move away from your spine and your belly should relax and expand.
- B) To exercise the TVA, as you exhale through pursed lips, draw the umbilicus toward the spine. Draw the umbilicus as close to your spine as possible, holding the TVA contraction for 10 seconds. If you need to breathe during the ten-second contraction, try to hold the umbilicus inward toward the spine while you do so. Always preface each contraction with a diaphragmatic breath, repeating the cycle as described here. Ten repetitions, holding each for 10 seconds would constitute one set. Work up to three sets with one minute rest between them.

Lower Abdominal Coordination Testing

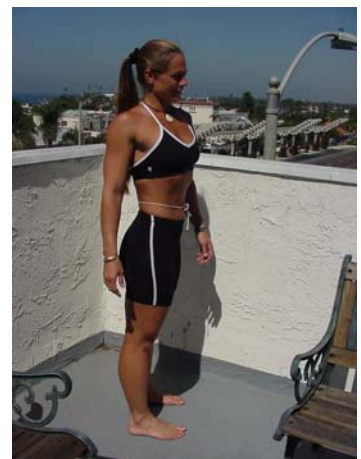
Lower Abdominal Coordination Test. To test yourself, lie on your back and place your hands under your spine (palms down). When your fingertips are just behind your umbilicus (L3), flex your hips to 90° and keep your knees fully relaxed. From this position, roll your pelvis posteriorly until you can feel the spinous process of your spine pressing on your fingers. Now, while holding the pressure on your fingers with your spine, begin lowering your feet to the floor, always keeping the knees fully bent. If you have normal lower abdominal coordination, you should be able to slowly lower your feet to the floor and bring your legs back to the point of 90° hip flexion without the pressure of your spinous processes at the L3 level ever coming off your fingers. The pressure can also be monitored using a blood pressure cuff, as shown.



The World's Greatest Weight Belt!

Once you have passed the lower abdominal coordination test and can decompress the BP cuff for 100 seconds or longer at 10 mmHg less than where the needle started, it is time to integrate your deep abdominal wall into your general movement schema and gym exercises.

It is well documented that coordinative patterns of the abdominal wall are *task specific*; one may have normal abdominal wall function during a squat pattern, but not a push pattern for example. Additionally, loss of abdominal wall coordination is easier to *prevent* than to *restore*. This should give those of you considering use of a weight belt adequate reason NOT TO!



To best condition your body, it is important to focus first on learning to activate the abdominal wall while performing “Primal Pattern® Movements”. Primal Pattern® Movements are the movement patterns most likely to have been necessary for our developmental survival as dictated by the selective pressures of nature.

The seven Primal Pattern® Movements are:

- Squatting
- Lunging
- Bending
- Pushing
- Pulling
- Twisting
- Gait (walk, run and sprint)

Conclusion

Once you have implemented the training techniques described here, you will be free from training with the belt and have full confidence that your body now works correctly. If you have any orthopedic problems at all, it would be wise to consult a C.H.E.K Practitioner or a skilled rehabilitation professional that understands the science of corrective exercise to aid you in your quest to be “BACK STRONG AND BELTLESS!”

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For a complete list of references, please e-mail the C.H.E.K Institute.



Presenter Contact Details

Place of CHI
71 Mona Vale Road
Mona Vale, NSW 2103, Australia
Phone: 02) 9986 0840
Fax: 02) 9986 0284

www.placeofchi.com chek@placeofchi.com



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