

The Core Training Revolution



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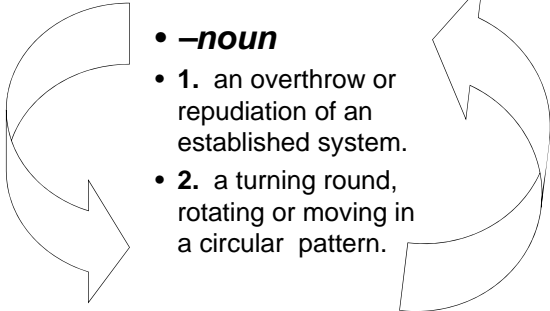
- Master's Degree in Education
- Certified Strength & Conditioning Specialist
- Exercise Science Instructor at Grossmount College, San Diego, CA
- Over 20 years experience as a group fitness instructor & personal trainer.
- Currently integrates kickboxing, aquatics, interval training, weight management & senior fitness.
- Nationally & internationally fitness presenter.
- Formerly the Professional Development Administrator for the American Council on Exercise (ACE).



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“Revolution”



- **-noun**
- **1.** an overthrow or repudiation of an established system.
- **2.** a turning round, rotating or moving in a circular pattern.

Infusing “Core” Into Training

- Incorporate select exercises into extreme intervals, obstacle courses, games, etc.



The Core Revolution: “Breathe Freely”

- Breathing recommendations that emphasize exhalation with exertion may cause spinal destabilization **when the spine is loaded**, especially under near-maximal loads
- Pressurizing the abdominal cavity is essential to maximize spinal stabilization
- When you inhale to prepare, and exhale to exert it causes an abrupt decrease in intra-abdominal pressure leaving the spine vulnerable to injury

Low Back Disorders, 2nd ed, Stuart McGill, pp 219-220.

Use Valsalva Wisely

- The Valsalva maneuver is a natural reflex that increases intra-abdominal pressure to support and stabilize the lumbar spine during heavy lifting
- Common sporting actions such as jumping, throwing, pushing against an opponent, striking a ball, standing from a squat or kicking usually elicit involuntary breath-holding

Safe & Effective Use of Valsalva

- Breath-holding should precede and accompany maximal efforts, which should be followed by brief exhalation-inhalation
- Exercise with sub-maximal loading may be executed with longer phases of normal exhalation-inhalation and shorter phases of breath-holding
- Use of the Valsalva maneuver may be contraindicated for some pre-existing conditions (hypertension, pregnancy)

The Breathing Continuum

Activity	Breathing Pattern
Resistance training, passive spinal stabilization	Breathe freely
Resistance training, active spinal stabilization	Inhale on exertion
Resistance training, near maximal or maximal exertion, active spinal stabilization	Valsalva

“To Core or Not To Core”

Indiana State University, 2011

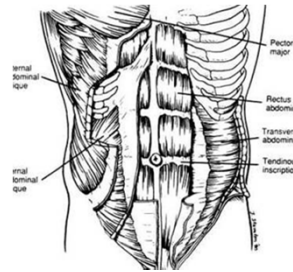
- Core training for highly conditioned athletes did **NOT** improve performance OR reduce injury rate.



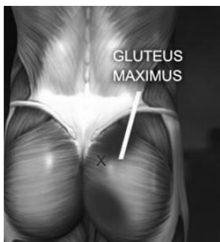
- Core training for deconditioned or recreational athletes improved performance **AND** reduced injury rate.

Getting to the Core

- The Inner Unit
 - Transverse Abdominus
 - Pelvic Floor
 - Multifidus
 - Diaphragm



The Superficial Side of Things



- The Outer Unit
 - Internal/External Oblique
 - Rectus Abdominus
 - Gluteus Medius
 - Gluteus Maximus
 - Quadratus Lumborum
 - Pectineus & Adductor Brevis

The Function of the Core



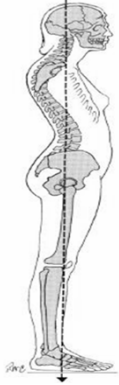
- To create and sustain sufficient *intra-abdominal pressure* to counteract compressive forces resulting from axial loading
- To resist forces that move the spine out of its preferred neutral position

Neutral Spine

- Defined as the position where the pelvis is level and not tilted. This position allows for the joints to be at midrange, the ligaments to be neither taut nor loose, the muscles to be at their anatomical length and the bony surfaces to have the greatest congruity to tolerate compression.
- Neutral spine is important to safely and effectively dissipate forces that move through the body.


Ideal Spinal Alignment





Kyphosis/Lordosis Posture

- Kyphosis: “Rounded” shoulders, exaggerated outward (thoracic) curve
- Lordosis: Exaggerated inward (lumbar) curve




Flatback Posture

- Reduced inward curve often accompanied by a posterior pelvic tilt.

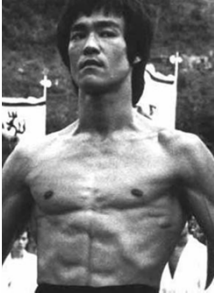
Putting Your Core in Neutral

- Awareness
- Range of Motion to achieve the correct position
- Strength/Stamina to maintain the position
- Coordination to hold the position during dynamic movements



Neutral

Building Your Own Belt



- Bracing optimizes stability during compressive loading
- Contract all of the muscles in the abdominal wall, low back and hips without drawing in or pushing out the belly
- Enhances and sustains intra-abdominal pressure

Observe Your Participants for...

- Excessive lumbar curvatures
- Pelvic rotation or lateral tilting
- Protruding head
- Rounded shoulders



Stability Before Mobility



- Isometric exercises in "core"-neutral position precede dynamic exercises designed to stress the "core"
- Hold static contractions for ~7 seconds
- Repeat up to 5 times

PROGRESSIONS

Progression Variables

- Position
Progress from supine to seated, to kneeling, to 2-legged stands, to single leg stand.
- Resistance
Progress from no resistance to resistance held on the chest, to resistance held over the head

Progression Variables

- Speed of movement
Progress from slow speeds, to explosive speeds, to explosive speeds with resistance
- Stability
Progress from stable surfaces, to unstable surfaces, to unstable surfaces with resistance

Pointers for Performing Core Exercises

- Maintain Lumbar Curve
- Watch Pelvic Rotations
- Watch Pelvic Tilts
- Note Head & Shoulder Positions

Isometric exercises in “core-neutral” position



Back Bridging

- Butt Squeeze
- Single Leg
 - Alternating
- Swiss Ball



Supine Bridge Challenges



Piriformis Stretch



Piriformis is an external rotator of the hip; make sure not to lift butt off the floor. Maintain neutral spine.

“The Pillar”



Plank

- Progressions:

- Incline Position
- Push-Up Position
- Feet Wide, Elbows Narrow
- Neutral
- One Leg Up
- Opposite Arm/Leg Up
- Full Extension



- Tips:

- Abduct Scapulae
- Tighten ALL anterior muscles

Oblique or Side Plank

- Progressions:

- Kneeling
- Legs Staggered
- Feet Together
- Top Leg Abducted



- Tips

- Retract and depress scapula

V-Sits



The Quadruped (Bird dog) Stance



- Start with all 4 limbs down, spine neutral
- Hands beneath shoulders, knees beneath hips
- Raise 1 limb while spine remains neutral
- Raise opposite arm & leg
- Add movement, challenges, destabilizing devices

Trainer Challenges



Kneeling Challenge



Dynamic Exercises to Stress the Core



Rotating Side Plank

- Maintain stiff core
- Start with side plank
- Transition to traditional plank
- Rotate to other side
- Try to do this rapidly while maintaining alignment

Rotating Side Plank



The "Rotating Pillar"



1.



2.



3.



4.

Lateral Plank Crawl

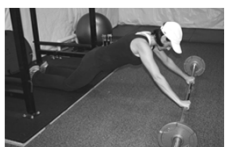
- Push-Up Position
 - Incline to Flat
 - Slow to Fast
- Elbows vs. Hands
- Want a Challenge?
 - Add Push-Ups



The Abdominal Rollout

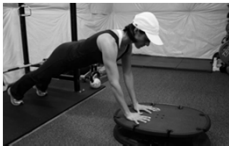


- Swiss Ball
- Ab Wheel
- Barbell



Combine with
Lateral Rolling

Prone Hand Stepping



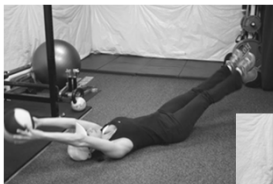
- Push-Up Position
 - Climb up & down on low step minimizing torso rotation
 - Incorporate varying heights
- Add Push-Ups
- Combine with Lateral Plank Crawl

Supine Arm & Leg Lift Options

- Progressions:
 - One Arm Only
 - One Leg Only
 - Opposite Arm/Leg
 - Ipsi-lateral Arm/Leg
 - Both Arms
 - Both Legs
 - Both Arms/Legs
 - Add Resistance



Full Body Limb Lift



Emphasize Neutral Alignment
with No Spinal Flexion



Hip Thrust



- Partner Assisted
- Control Up-Control Down
- Explosive Up-Control Down
- Corkscrew

Partner Resisted Leg Lifts



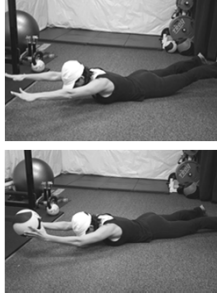
Back Extension Progressions

- Extension stress from neutral spine position
- Ground vs. Bench vs. Roman Chair
- Progression Off Bench

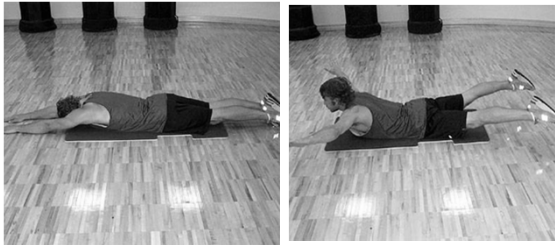


Superman Challenge

- Prone Arm Lift
- Prone Leg Lift
- Prone Arm/Leg Lift
- 15 reps of each
- Use a Med Ball



Flying X



Extreme Core Challenges: Asymmetrical Loading

- Add resistance to one side only

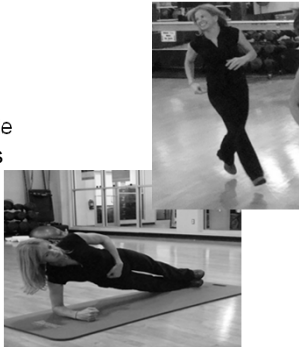


Using Asymmetrical Loading



Stability after Exertion

- Have client perform high intensity cardio work for 30 seconds
- Immediately hold side plank for 30 seconds
- Repeat sequence with plank on other side



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