

ISOMETRICS TO IMPROVE STRENGTH AND SPEED PERFORMANCE IN FEMALE BASKETBALL ATHLETES

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THANK YOU

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- Wisconsin Basketball Coaching Staff

GREAT FIGHTERS, DIFFERENT STYLES



WHY THE TOPIC?

- ▶ My experience
- ▶ Lack of understanding
- ▶ Rarely used in most S/C programs
- ▶ Effective in developing strength and power
- ▶ Improve movement efficiency
- ▶ Injury reduction
- ▶ Tools in the toolbox
- ▶ Simple



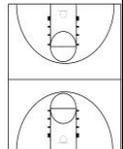
THE FEMALE BASKETBALL ATHLETE

- ▶ Novice (freshmen)
- ▶ Play year-round
- ▶ Basketball specific athleticism
- ▶ Misconceptions
- ▶ At a disadvantage physiologically vs. males
- ▶ Relative strength vs. males
- ▶ Static – Spring Continuum
- ▶ (Kelly Baggett)
- ▶ **Need to GET STRONG!**
- ▶ (Bigger Class: Cressey)
- ▶ Weak → injuries



BASKETBALL COURT ACTION

- ▶ Wisconsin Women's Basketball
 - ½ court game (2350 sq. ft.)
 - Pack defense; 3 out – 2 in motion offense
 - 10 bodies confined to small area/Physical
- ▶ Movement
 - COD
 - Closeouts, pop-backs, slides, rebounding, flares, transitions, hedging, step-back, stutter go, jump stops, crossovers, cuts, pivots, screens, positioning, drop sets, post-up, curls, box-outs, etc.
 - Acceleration + Deceleration = Need STRENGTH Base



HISTORY

- ▶ Not re-inventing the wheel
- ▶ Not a new phenomenon
- ▶ Eastern Bloc training
- ▶ Used since the 1950s (Old School)
- ▶ York Barbell (1960); Bob Hoffman
- ▶ Bodybuilding publications
- ▶ Notable authors/coaches
 - Siff, Zatorisky, Verkoshanky, Yessis
 - Schroder, Poliquin, Tate



Definition

- ▶ ISOMETRICS: producing muscle tension without moving; fighting a source of resistance without altering its position.
- ▶ YIELDING ISO (ECCENTRIC): holding a weight or object and preventing it from going down, intent is to no longer move resistance but to stop movement.
- ▶ OVERCOMING ISO (CONCENTRIC): push/pull against immovable object; intent to move resistance.

WHY ISOMETRICS?

- ▶ Meets components for developing strength
 - Overload, Intensity, Progression
- ▶ Research
 - **Strength and muscle growth is influenced by maximal muscle tension**
 - **Maintain tension longer when compared to dynamic exercises**
 - **Recruit over 5% more motor units (Babault et al. 2001)**
 - Strength gains of 14–40% over 10 week period (Kanchisa et a. 2002)
 - Improved strength gains at specific joint angles (Kurz 2001)
 - Avg. muscle size improvement of 12.4% for maximal isometric contraction training after 10 wk. training period (Kanchisa et a. 2002)
 - Greater strength gains with dynamic movement (Thibaudeau, 2006)
 - **The INTENT and effort to accelerate a load is just as effective as the actual acceleration of a load when stimulating neural and muscular adaptations**

ISOMETRIC TRAINING (1)

Physiological	Tactical	Psychological
<ul style="list-style-type: none"> • ↑CNS Efficiency • ↑Motor Unit Recruitment • ↑Strength • ↑Muscle Growth 	<ul style="list-style-type: none"> • Safe • Energy Free • Strengthen Weak ROM's at multi positions • ↓Stress on Joints • Faster Recovery 	<ul style="list-style-type: none"> • ↑Toughness • ↑Concentration • ↑Confidence • Team building

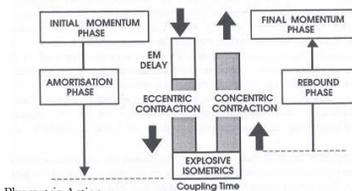
ISOMETRIC TRAINING (2)

- ▶ More..
 - Improve flexibility (EQI)
 - Eccentric Quasi Isometrics
 - Improve stability/body positioning
 - Improve landing strength
 - Most effective with dynamic work (high-speed)



TRIPHASIC MUSCLE ACTION

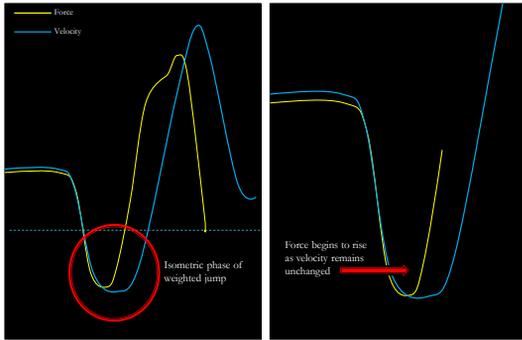
- ▶ All dynamic muscle action is Triphasic
- ▶ Triphasic = eccentric, concentric, ISOMETRIC
- ▶ Impossible to initiate, control, terminate, then repeat a movement w/o Iso contractions
- ▶ Newton's Law of Motion



Phases of a Plyometric Action

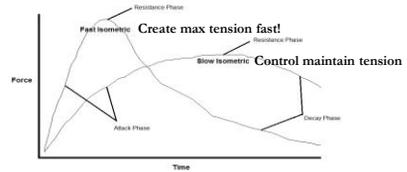
Supertraining, 2009

COUNTERMOVEMENT JUMP FORCE TIME CURVE WITH VELOCITY - DETAIL



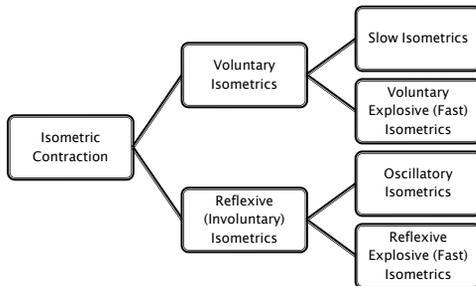
ISOMETRIC RFD CURVE

- ▶ How quickly can Iso force be developed?
 - Dependent on specific Iso action
 - Overcoming (fast) vs. Yielding (slow)
- ▶ Initiate, control/sustain (absorb), terminate



Siff, 1993

TYPES OF ISO CONTRACTIONS



Supertraining, 2009

DRAWBACKS

- ▶ Boring; not exciting
- ▶ Perception of not working hard (coaches)
- ▶ Athletes must show intent
- ▶ Strength gains only at specific ROMs
- ▶ How do you measure gains in strength?
- ▶ Strength drop off after 8 weeks of training



STRENGTH TRAINING METHODS

- ▶ Yielding
 - (Duration) (Rep Effort)
 - Hypertrophy (20 - 60 seconds)
 - Strength Endurance (60 seconds or +)
- ▶ Overcoming
 - (Intensity/Ballistic) (Max/Dynamic Effort)
 - Strength (5 - 7 seconds); Speed (3 - 5 seconds)
- ▶ Mixed Regime
 - Iso with dynamic activity
 - High speed
- ▶ Reflexive
 - Reactive Strength
 - Joint stiffness



STRENGTH TRAINING METHODS (2)

- ▶ 10-20% of training volume
- ▶ Yielding
 - First progression
 - Bodyweight
 - External loading for increase intensity
 - Overcoming method (for time)
- ▶ Overcoming
 - CNS intensive
 - Same precautions as if a max/dynamic effort day
- ▶ Mixed Regime/Reflexive
 - CNS intensive
 - Strength base required

Mixed Regime (Video Demo)



Reflexive (Explosive Iso) (Video Demo)



THANK YOU!
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