## ISOMETRICS TO IMPROVE STRENGTH AND SPEED PERFORMANCE IN FEMALE BASKETBALL ATHLETES

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#### THANK YOU

- Family and Faith
- Art Horne
- Dan Boothby
- Jim Snider
- Aaron Van Lieshout
- Mike Boykin
- Colin Griffin
- Derrick Millender
- Mike Curtis
- Brijesh Patel
- Wisconsin Basketball Coaching Staff



### 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 <sup>(Kelly Bagett)</sup> Need to GET STRONG! <sup>(Bigger Class: Cressey)</sup> 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, Verkhoshanky, 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)

• Safe

- Physiological
- tCNS Efficiency
- ↑Motor Unit Recruitment
- ↑Strength
- 1 Muscle Growth
- Weak ROM's at multi positions •↓Stress on

Faster Recovery

Joints

Tactical

• Energy Free

Strengthen

on

## Psychological

- ↑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)







#### **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





#### 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



# <section-header> STREENGTH TRAINING METHODS Yielding (Duration) (Rep Effort) Hypertrophy (20 - 60 seconds) Strength Endurance (60 seconds or s) Overcoming (Intensity/Ballistic) (Max/Dynamic Effort) Strength (5 - 7 seconds); Speed (3 - 5 seconds) Mixed Regime So with dynamic activity High speed Peflexive 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

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## Reflexive (Explosive Iso) (Video Demo)



THANK YOU! RDE @ athletics.wisc.edu 608 576-1727