

Past, Present, and Future Applications of Kettlebell Training!

ACSM's 20th Health & Fitness Summit & Expo

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3 Major 'Takeaways': 1) Kettlebell training has been used as an effective training tool to promote improvements in muscular strength and power for centuries, 2) The most recent research demonstrates their potential to elicit benefits in muscular strength, power, aerobic and functional capacity, as well as safely managing orthopedic injuries, 3) Foundational kettlebell movements can be used in conjunction with other resistance design principles to implement effective total body resistance training programs.

I. What is a kettlebell?

- a. Cast iron or steel "cannonball" with thick handle and flat base
- b. Originally appeared in the Russian dictionary in early 1700s as "girya"
- c. Evolved through many uses until it was popularized as a foundational Russian strength training tool in the early 1900s, Dr. Vladislav Krayesvky
- d. 1998: "Modern King of Kettlebells" Pavel Tsatouline
- e. 2001: "The Russian Kettlebell Challenge"
- f. 2006: "Enter the Kettlebell! Strength Secret of the Soviet Supermen"
- g. 2011: Literature review resulted in ~5 published peer reviewed research manuscripts
- h. 2016: 30+ peer reviewed research manuscripts!

II. Fundamental Kettlebell Movements

- a. Swing: Two or One handed, swinging the kettlebell between your legs, and using your hips to propel the kettlebell to chest level
- b. Clean and Press: One handed, swing the kettlebell between the legs just as in the swing, but bring it up more vertically to a racking position, gather, press vertically
- c. Snatch: Similar to a swing until a high pull and punch through, locking out at the top
- d. Turkish Get Up: Starting on the back, kettlebell pressed and extended upwards. Slowly stand up while keeping the kettlebell straight and vertical, then reverse

III. Biomechanical Demand of the Kettlebell

- a. During eccentric phase of the swing, the success of the swing depends on the active flexing of the hip and governing hamstring to break the kettlebell, immediately followed by ballistic concentric triple extension of the hip, knee, ankle to propel the kettlebell in an upward arc
- b. The impulse (magnitude and rate of applied force) of 32kg kettlebell is greater than VJ or BS
- c. Snatch emphasizes greater vertical rather than horizontal displacement
- d. Swing similar horizontal impulse ratio similar to that observed in sprinting mechanics
- e. Snatch may be more appropriate for activities involving vertical movements
- f. Novice users have tendency to under-extend the hips, important for instruction
- g. Many fundamental movements elicit shear forces rather than compressive forces on the spine

IV. Muscular Fitness

- a. Intensity during fundamental movements high enough to elicit positive changes in strength
- b. Acute bout stimulates hormone response (C,T,GH) associated with strength and hypertrophy
- c. Similar improvements as traditional power training (jump squats) in 1RM squat and vertical jump height
- d. May provide a safe and effective alternative to develop muscular power

V. Cardiorespiratory Fitness

- a. Traditional protocol produce aerobic intensity ~80-90% HRmax and ~50-65% VO₂max
 - i. Intensity high enough to produce CR benefits
- b. Improvements in aerobic fitness (↑6-14%)

VI. Rehabilitation

- a. Excellent for many phases of rehabilitation and for individuals in need of power development with hip strength imbalances
- b. Lower loads can reduce potential damage to newly forming fiber and vessel networks
- c. Less restriction in movement planes compared to many traditional equipment
- d. Potential to isolate hamstring development to address knee imbalances
- e. Huge dependency on core stabilizers during exercise promotes positive changes in postural control, and neck/back pain

VII. Suggestions for Future Applications

- a. Movement specific training in sport
- b. Clinical Populations
 - i. Management to decelerate sarcopenia
 - ii. CVD risk factor modification
 - iii. Glycemic control in T2DM
 - iv. Maintenance of QOL via performance of ADLs

VIII. Recommendations for Kettlebell Training Design:

- a. Master the fundamentals with minimal equipment
- b. Concentrate on multi-joint, multi-plane movements rather than muscle group philosophy
- c. Manipulate design variables based on certain physiological principles
 - i. Eccentric training
 - ii. Dynamic isometrics
 - iii. Work : Rest
 - iv. Power and Explosion
 - v. Drop Sets and Super Sets