



Coaching Success For The Seated Thrower

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Session Objectives

- Identify similarities and differences between ambulatory and seated throwers
- Improve athlete performance by identifying throwing frame features, athlete position, and placement
- Discuss techniques to improve performance from a seated position
- Identify key athlete flexibility and postural characteristics to gain performance advantages

Ambulatory and Seated Throwers Similarities and Differences - The Throw

- Complicated movements
 - Ambulatory thrower > Seated Thrower
- Limited space
 - Seated thrower > Ambulatory Thrower
- Athletic individual - speed, power, agility, flexibility
- Release parameters
 - Ambulatory thrower > Seated thrower

~ *Individual differences and varying techniques*



Ambulatory and Seated Throwers

Similarities and Differences - Phases of Throw

- Starting Position (preparation phase)
 - Body position prior to initiating the attempt
 - Proper grip on the implement
- Preliminary Movements
 - Ambulatory Thrower
 - Glide - Shot Put
 - Rotation(s) - Discus or Shot Put
 - Run-up / crossovers – Javelin
 - ~ *Develops momentum and velocity*
 - Seated Thrower
 - Rock(s) - Shot Put
 - Swing(s) - Discus or Club
 - Draw(s) – Javelin
 - Athlete will either twist or tilt or twist/tilt torso
 - ~ *Favors throwing rhythm*

Ambulatory and Seated Throwers

Similarities and Differences - Phases of Throw

- Power Position
 - Best possible body position to execute the delivery phase of the throw
 - Separation, torque, ROM favor the ambulatory thrower
- Delivery
 - Actual beginning of the throw (goal - create force)
 - Ambulatory thrower - lower and upper body movements
~ *Seated thrower - only upper body movements*
 - Strike (release)
- Recovery
 - Maneuver that enables the thrower to follow-through
 - Ambulatory thrower - reverse or non-reverse / recovery & balance to prevent fouling
~ *Seated thrower - only non-reverse*



Ambulatory and Seated Throwers

Similarities and Differences - Biomechanics

- Consistent Acceleration of the Implement
 - Preliminary movements favor the ambulatory thrower
- Lengthening the Path of the Implement's Acceleration
 - Preliminary movements favor the ambulatory thrower
 - Delivery phase favor the ambulatory thrower
 - ~ *Improve flexibility/mobility and rate of force development for the seated thrower*
- Summation of Forces
 - Delivery phase favor the ambulatory thrower
 - ~ *Kinesthetic seated thrower - firm seat cushion, firm strapping, foot plates, holding bar*

Ambulatory and Seated Throwers

Similarities and Differences - Biomechanics

- Separation and Torque
 - Power position favor the ambulatory thrower
 - ~ *Improve thoracic spine and shoulder flexibility for the seated thrower*
- Blocking
 - ~ *Frame pole/holding bar may enhance seated thrower block*
- Posture
 - Release height favor the ambulatory thrower
 - ~ *Improve posture and maximize throwing frame height for the seated thrower*

The Seated Thrower



- Paralympic Classifications
 - Separate divisions for men and women F31-F34 and F51-F57
 - Applicable to athletes with cerebral palsy, spinal cord injuries, leg amputees, polio, and impaired limbs of varying degrees
 - Some seated throwers can walk however, do not present the leg strength or balance to throw from a stand, running approach, standing glide or rotation
- Historically, throwing frames are bespoke to optimize athlete support and throwing characteristics
 - Need(s) for back support, pole/holding bar, footplates, number and location of lap straps
 - Assessments of athlete performance characteristics, such as, range of motion, throwing velocity, and body position are considered

Throwing Frame Specifications

- Maximum seat height, including seat padding, is 75 cm
 - ~ *Maximize athlete height of release*
 - The seat must be square or rectangle in shape
 - Seat size needs to be at least 30 cm in length
 - Seat surface must be level or the front higher than the back (chair dump)
- Backrest, if used, may incorporate padding which cannot exceed 5 cm in thickness
 - The backrest cannot incorporate springs, movable joints or other feature which assists athlete propulsion

Throwing Frame Specifications

- Throwing frame may have a rigid vertical pole/holding bar
 - Pole/holding bar must be a single, straight piece of material without curves or bends. Cross-sectional profile that is circular or square, not oval or rectangular
 - Must not incorporate springs, movable joints or other feature which assists athlete propulsion
 - Used for support and stability by low classification athletes (F51-55, F31-34)
 - Used by higher class athletes based on performance outcomes
- Footplates, if used, are for support and stability
 - Footplates must stay behind the front of the throwing circle



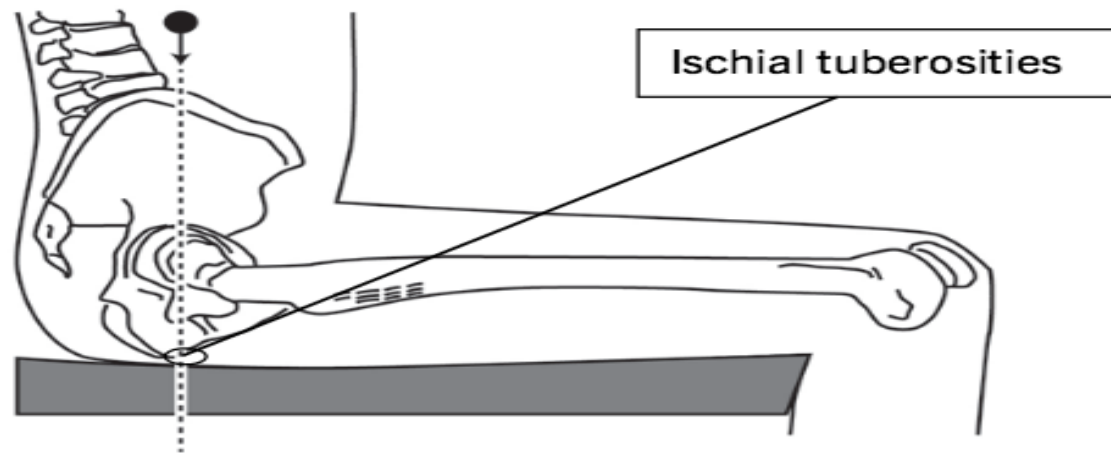
Throwing Frame Specifications



- Strapping can be used around lap, legs and/or knees for stability and support
- A daily wheelchair is acceptable providing it meets throwing frame rules criteria
- Time to secure frame and athlete set-up should be efficient and minimized
 - ~ *Requires complete and well-organized equipment*

World Para Athletics Throwing Rule 36

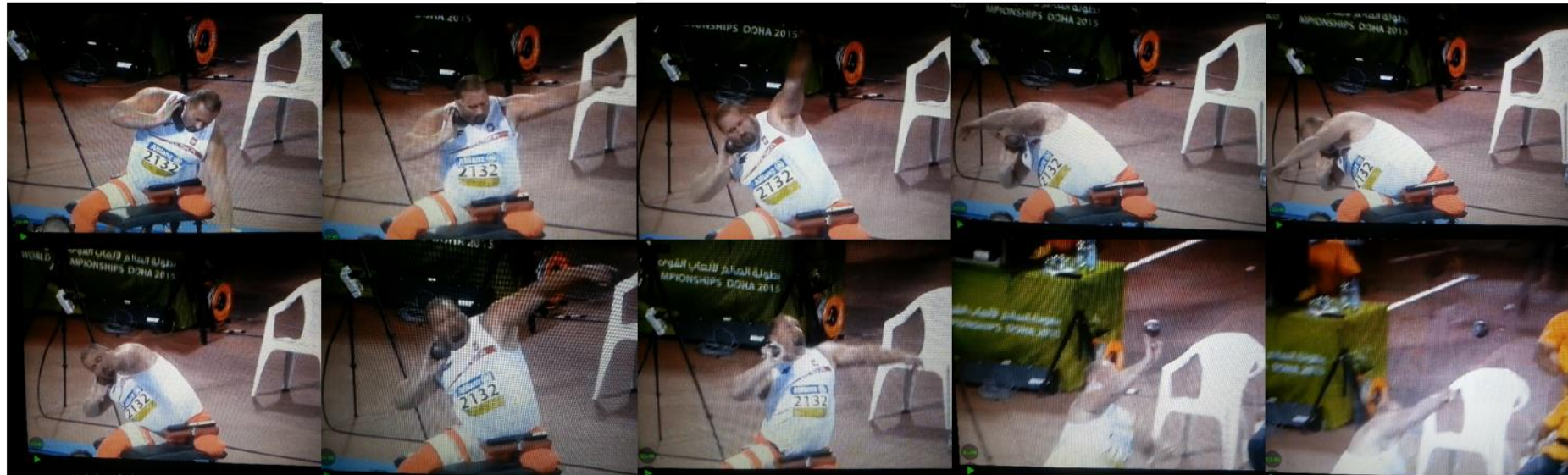
- The athlete must be in a seated position
 - Defined as athlete legs are in contact with the seat surface from the back of the knee to the back of the buttock (ischial tuberosity)
 - The sitting position must be maintained throughout the throwing action until the implement has landed



Athlete Position in Throwing Frame

- Athlete will assume one of two positions in throwing frame
 - Forward facing position with legs forward in throwing frame or
 - Straddle position with legs straddling one corner of the throwing frame
- Regardless of the athlete seated position, throwing frame position/orientation may vary in throwing ring
 - ~*Coaching consideration – an offset frame orientation allows athlete to pass body mid-line at release, lengthening the path of the implement's acceleration*
- Considerations for forward facing vs. straddle position is influenced by athletes requirement/preference for chair dump, seated stability, throwing technique, flexibility, and performance outcome

Athlete Position - Straddle vs. Forward Facing Technique - Linear Tilt and Rotation



Athlete Position - Forward Facing Technique - Linear Tilt, Rotation, with/without Holding Bar



Athlete Position - Straddle

Technique - Linear Tilt, Rotation, with/without Holding Bar



Athlete Position - Straddle

Frame Orientation Difference - Javelin vs. Discus



Seated Discus - Wu Goushan, China



Preparation phase

- Straddle position
- Established posture
- Recovery pre-stretch

Preliminary movement

- > body mid-line twist



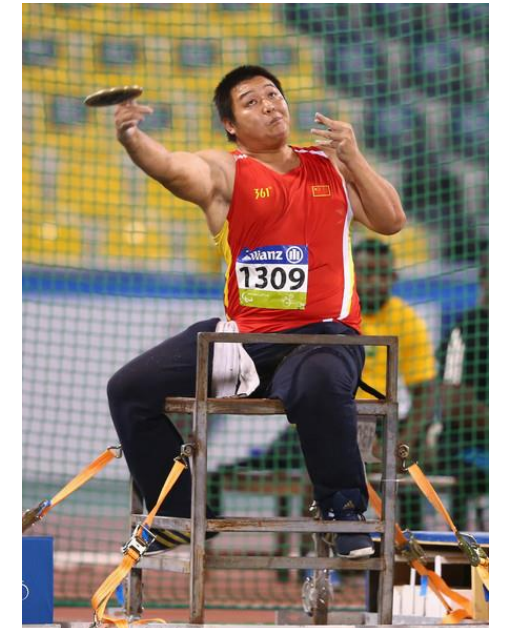
Power position / Delivery phase

- Max. T-spine/shoulder flexibility
- Min. torso tilt
- Max. implement radius



Delivery / Recovery phase

- Maintained posture
- Established block
- Max. implement radius
- > body mid-line release



Seated Shot Put - Angeles Ortiz Hernandez, Mexico



Preparation phase

- Forward facing position
- Established posture
- Pole/holding bar / established block position

Preliminary Movement

- Forward rock



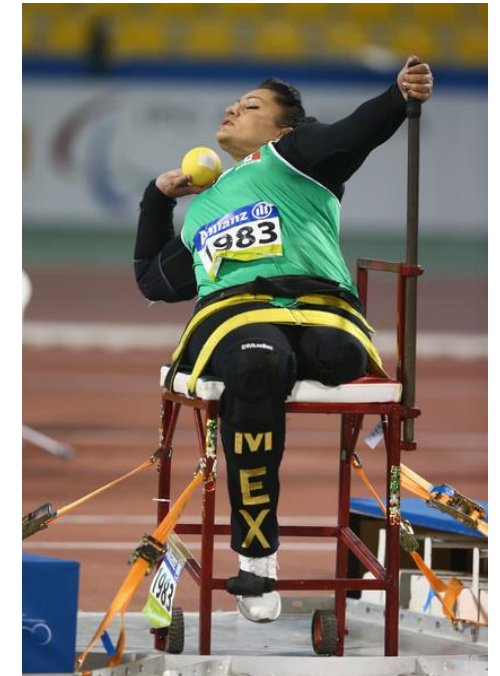
Power position / Delivery phase

- Linear tilt with rotation technique
- Max. extension blocking arm
- Straight-line application of force



Delivery / Recovery phase

- Max. pull / push effort
- Maintained posture
- Established block
- Release over toe-board



Seated Javelin - Claudiney Batista Dos Santos, Brazil

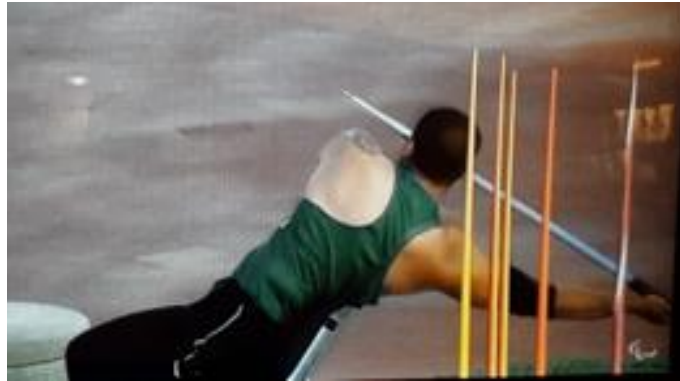


Preparation phase

- Straddle position
- Established posture
- Forward implement position

Preliminary Movement

- Forward rock



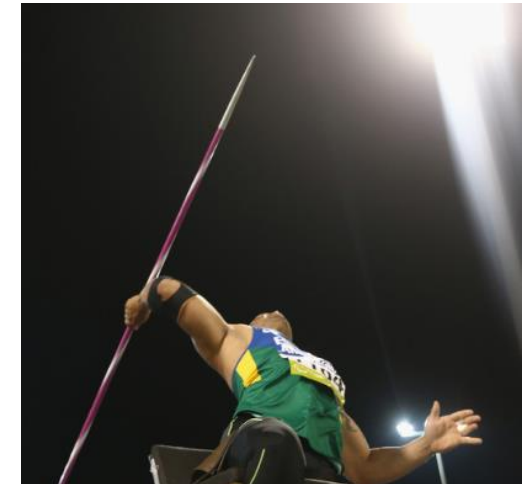
Power position / Delivery phase

- Linear tilt with rotation technique
- Maintained posture with backrest
- Max. wrap blocking arm



Delivery / Recovery phase

- Max. forward movement
- Maintained posture
- Established block
- Thrown through the point
- Segmented arm strike



Key to Success - Good Posture

- Athletes with rounded shoulders; excessive kyphosis, lordosis; forward and/or side tilt neck; tight/sore shoulders, back or neck
 - Tight anterior/chest muscles and weak over-stretched posterior/back muscles
 - All create significant muscular imbalances, which can lead to injury
 - ~ *Athletes value posture awareness/training for improved performance*
- Improve athlete posture to:
 - ✓ *Increase athlete seated height - implement height at release*
 - ✓ *Improve athlete endurance and flexibility*
 - ✓ *Reduce injury*



Key to Success - Thoracic Spine Mobility

- T-spine is designed to provide a high degree of mobility although if compromised, problems may occur
 - Lower back, which is meant to be stable, to become mobile
 - Impede skill mechanics, decreased strength, power, and movement accuracy
 - Excessive stress on shoulders leading to injury
- Improve athlete T-spine mobility to:
 - ✓ Increased flexibility lengthens the path of the implement acceleration
 - ~ *Shoulder flexibility, and athlete awareness to use it, enhances effectiveness*



Assessment - T-Spine / Shoulder Flexibility

- Athlete assessment - Arm elevation through forward flexion
 - Lift arms straight over head
 - Is movement possible without bending elbows?
 - Are Biceps in-line with the ears?
 - Experience tension in T-Spine during movement?



~ Does athlete present T-spine / shoulder mobility issues?

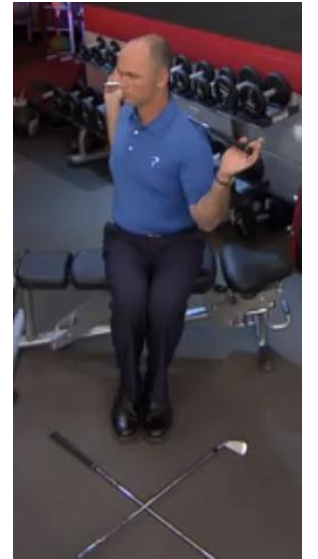
Assessment - Thoracic Spine Mobility

- Athlete assessment - seated truck rotation
 - Cross two dowels, place on floor to create 45-degree ROM reference angles
 - Rotate the upper body both to the right and to the left
 - Above average score > 45-degree reference angle

Normal thoracic rotation ROM 35-50 degrees

Normal lumbar rotation ROM 3-18 degrees

~ Does athlete present thoracic mobility issues?



Key to Success - Posture & Shoulder Mobility

- Band Dislocates

- Dislocates are a great starting point for improved posture and mobility
- Keep your arms straight and elbows locked
- Use a wider grip to make this easier and a narrower grip to make it more difficult



Key to Success - Posture & Shoulder Mobility

- Band Pull-Aparts

- Strengthening the chronically under-trained rear delts and lower traps
- Keep the shoulders down and back as you pull the band apart, and avoid "shrugging" to keep tension on the mid back and not shift it to the upper traps



Key to Success - Posture & Shoulder Mobility

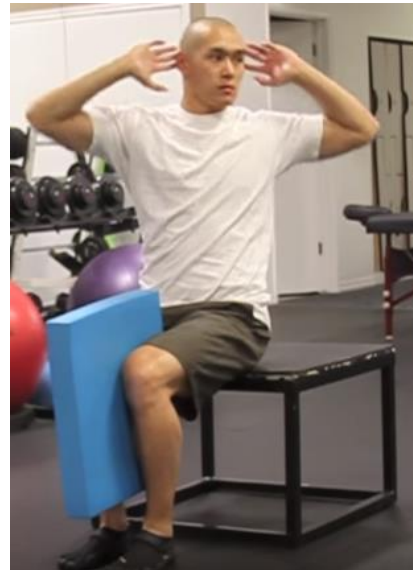
- Band Around-The-World

- Take your shoulders through a wide range-of-motion, helping to open up the pecs and lats. Keep your arms straight and elbows locked throughout this posture-restoring movement



Key to Success - Thoracic Spine Mobility

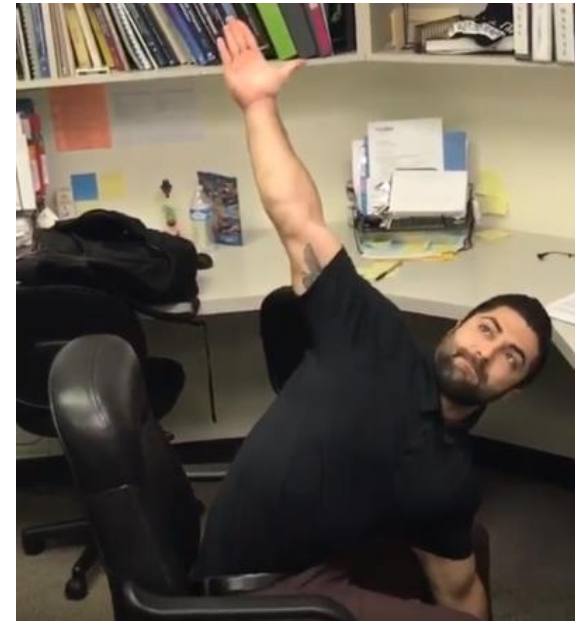
- Seated Trunk Rotation with Side Bend
 - From a seated position, immobilize hips
 - With hands touching/behind head and good posture, rotate upper body
 - Incrementally, pause rotation and hold position - perform side bend(s) at position



Key to Success - Thoracic Spine Mobility

- Seated T-Spine Rotation

- From seated position place arms and apply outward pressure against inside of thighs
- Mobilize t-spine by rotating/windmill arm and torso
- Focus on exhaling as you rotate



Key to Success - Thoracic Spine Mobility

- Seated T-Spine Extension
 - Place a ball or similar round object and place mid-way down the back
 - Cross arms over chest and fulcrum over ball
 - Avoid lumbar spine extension by engaging core
 - Incrementally, relocate ball upward on T-spine



Coaching Considerations

- Ensure athlete has set and rehearsed preliminary movements
 - ~ *Seated thrower achieves rhythm in the absence of momentum*
- Explore technique variations
 - ~ *Athlete ability to separate and develop torque by training posture and flexibility*
 - ~ *Gain release height and lengthen the path of the implements acceleration*
 - ~ *Technique linear tilt vs. rotation vs. both - seek optimal implement range of motion*
- Have athlete understand throwing frame is not for “sitting”
 - ~ *It’s “throwers” lower body and must be used to summon force*
 - ~ *Identify throwing frame for footplate(s), firm cushion, and adequate strapping*

Coaching Considerations

- Experiment with holding bar to improve athlete acceleration and block
 - ~ *Ensure proper hand placement on holding bar*
 - ~ *Parallel to throwing arm for optimal pulling action and implement application of force*
- Explore changes to throwing frame orientation
 - ~ *Discus - challenge athlete to release beyond body mid-line*
 - ~ *Lengthens the path of the implements acceleration*
- Prioritize posture awareness and flexibility exercises into athletes training routine
 - ~ *Assess your athletes and prescribe*
 - ~ *Exercises serve as both pre-throwing activation movements and post-throwing restorative movements*

Throw Far!

