Long Toss and Weighted Balls

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Conte Injury Analytics
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Velocity is King

• Increase velocity = Increase Performance
• Increase velocity = Increase Varus Torque
• Can you find a balance???
• Do these programs actually increase velocity and are they safe

Long Toss

• Define it first!
• Distance
• Intensity: Perceived versus real
• Loft of the ball: on a line or "loop"?
• Number of throws at each distance
• Rehab versus Non-Injury
Jaeger Long Toss Program

- Designed as a Warm Up to Stretch out the arm.
- 3 Phases
  - Stretching Out
  - Pull Down
  - Radar Gun
- Start at 60 feet
- Maintain loose/relaxed arm action. Not throwing hard
- Throw on an arc rather than on a line.
- Done at own pace. No set numbers or duration.

Jaeger Program-Second Phase

- Once reach maximum distance start Pull Down Phase.
- Change arc of the ball and release point. Throw on a line.
- Radar Gun Phase.
- Pitch to the gun to increase velocity.

Biomechanical Comparison of Baseball Pitching and Long Toss: Implications for Training and Rehab

- 17 College Pitchers
- 2 sessions
- Flat ground: 120’, 180’ and Max distance. 5 throws at each
- Lab: 60’6”, 10 max throws
Biomechanical Comparison of Baseball Pitching and Long Toss: Implications for Training and Rehab

RESULTS

• At Foot Contact
  • @ Max: Elbow Flex increased
  • ↑ distance=upper trunk tilt ↑ and front knee flex and foot position ↓
• When arm was cocked (MER)
  • @ Max: ↑ ER, Elbow Flex
• At Ball Release
  • @ Max: Forward Trunk Tilt and front elbow knee flex ↓

Opinion/Conclusions on Long Toss

• Rehab is a different animal
• Good warm up to stretch out arm
• Questionable as to how often and circumstances of the Pull Down Phase

Underweight and Overweight Baseballs

• Overweight
• Underweight
• Overweight with Hold
• Do they increase velocity
Weighted balls increase Velocity and Accuracy

**Velocity:**
- 10 studies specifically on baseball players:
  - Increase in velocity seen in 9 studies
  - Duration of studies range from 6-12 weeks and average 8.67 weeks

**Accuracy:**
- 3 studies tried to determine if weighted implement training increases or decreases pitching accuracy:
  - Used a grid and a number system correlating pitch location to accuracy
  - No significant difference in throwing accuracy found in any studies³²

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**Studies with result in Increase in Velocity**

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Age</th>
<th>Implement</th>
<th>Duration</th>
<th>Increase?</th>
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<tbody>
<tr>
<td>DeRenne et al.⁵</td>
<td>High School</td>
<td>6oz.</td>
<td>10 weeks</td>
<td>Yes</td>
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<tr>
<td>DeRenne et al.⁶</td>
<td>High School</td>
<td>6oz.</td>
<td>10 weeks</td>
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<td>Van Huss et al.⁷</td>
<td>College</td>
<td>11oz.</td>
<td>6 weeks</td>
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<tr>
<td>Straub (Warm-up)⁹</td>
<td>High School</td>
<td>10 &amp; 15oz.</td>
<td>6 weeks</td>
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<td>Straub (Training)⁹</td>
<td>High School</td>
<td>7-17oz.</td>
<td>6 weeks</td>
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<tr>
<td>Litwhiler and Hamm¹⁰</td>
<td>College</td>
<td>5-12oz</td>
<td>12 weeks</td>
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<tr>
<td>Bagonzi¹¹</td>
<td>High School</td>
<td>??</td>
<td>Yes</td>
<td></td>
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<tr>
<td>Elias¹³</td>
<td>College</td>
<td>??</td>
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<td></td>
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<tr>
<td>Carter et al.¹⁴</td>
<td>College</td>
<td>Ballistic Six</td>
<td>8 weeks</td>
<td>Yes</td>
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<td>Edwards van Muijen et al.¹⁵</td>
<td>National Level</td>
<td>15 (+25%)</td>
<td>8 weeks</td>
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<tr>
<td>Mikkelsen and Olesen¹⁶</td>
<td>Recreational</td>
<td>20 (+100%)</td>
<td>8 weeks</td>
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</table>

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**Biomechanical Analysis of Weighted Ball Exercises for Baseball Pitchers**

- 25 High School and Collegiate Pitchers
- Used 4,5,6,7 oz balls from mound and flat ground.
- Used 14, 32 oz balls on flat ground with “hold” exercises
Results and Conclusions
Fleisig Study

• Increase velocity occurred with **decrease** mass (underweight)
• No differences in arm/trunk velocity with standard (5 oz) vs underweight.
• Decrease arm/trunk velocities with **increase** mass (overweight)
• Kinematics and kinetics similar between standard and underweight balls.
• Overweight balls: decreased arm forces, torques and velocities.

Clinical Relevance

• Pitching with slightly under and overweight produce variations in kinematics without increases in kinetics and seem reasonable for training pitchers.

References:
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