Efficient and Effective Methods for Preparing to Pitch

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4th Annual UW Sports Rehab Baseball Conference
Dynamic Warm Up

Throwing Progression
What is “dynamic warm up”?

• A progression of *active* exercises designed to prepare athletes for the demands of their sport / activity.
What is “dynamic stretching”?  
• Active and repeated elongation of a specific MTU

What is “static stretching”?  
• Passive and long duration elongation of a specific MTU
Dynamic Warm Up vs. Static Stretching

Dynamic Warm Up BEFORE Static Stretching

-4.2%

+1.4%
Significant decrease in agility time with Dynamic warm up vs. Static stretching
Table 3. Balance, agility RT and MT values of the three protocols. Values are mean (± SD).

<table>
<thead>
<tr>
<th></th>
<th>Static</th>
<th>Dynamic</th>
<th>No stretching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance (sec)</td>
<td>15.34 (5.54)*</td>
<td>17.49 (5.11)</td>
<td>16.97 (5.16)</td>
</tr>
<tr>
<td>Agility (sec)</td>
<td>3.11 (.21)</td>
<td>3.00 (.20)*</td>
<td>3.08 (.18)</td>
</tr>
<tr>
<td>RT (ms)</td>
<td>.187 (.036)</td>
<td>.186 (.035)</td>
<td>.187 (.032)</td>
</tr>
<tr>
<td>MT (ms)</td>
<td>.419 (.055)</td>
<td>.394 (.053)†</td>
<td>.404 (.051)</td>
</tr>
</tbody>
</table>

*Significant difference from the other two protocols (p<.05).
†Significant difference from static protocol (p<.05).
Static Stretching

Club head speed -4.2%

Distance -5.6%

Accuracy -31%

Consistent ball contact -16.3%
Review

Does pre-exercise static stretching inhibit maximal muscular performance? A meta-analytical review

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We applied a meta-analytical approach to derive a robust estimate of the acute effects of pre-exercise static stretching (SS) on strength, power, and explosive muscular performance. A computerized search of articles published between 1966 and December 2010 was performed using PubMed, SCOPUS, and Web of Science databases. A total of 104 studies yielding 61 data points for strength, 12 data points for power, and 57 data points for explosive performance met our inclusion criteria. The pooled estimate of the acute effects of SS on strength, power, and explosive performance, expressed in standardized units as well as in percentages, were −0.10 [95% confidence interval (CI): −0.15 to −0.04], −0.04 (95% CI: −0.16 to 0.08), and −0.03 (95% CI: −0.07 to 0.01), or −5.4% (95% CI: −6.6% to −4.2%), −1.9% (95% CI: −4.0% to 0.2%), and −2.0% (95% CI: −2.8% to −1.3%). These effects were not related to subject’s age, gender, or fitness level; however, they were more pronounced in isometric vs dynamic tests, and were related to the total duration of stretch, with the smallest negative acute effects being observed with stretch duration of ≤45 s. We conclude that the usage of SS as the sole activity during warm-up routine should generally be avoided.
5 Goals of Dynamic Warm-Up

1. Increase core temperature
2. Increase heart rate and prime the CV system and the energy “delivery” systems utilized for a given sport, activity or training session.
3. Elongates MTU’s actively with the goal of preparing or improving dynamic flexibility
4. Improve timing, rhythm and coordination.
5. Increases neuromuscular reflex sensitivity and promotes “psycho-motor” readiness.

Most biomechanical pitching faults are related to timing and coordination.
Guidelines of Dynamic Warm-Up

1. After general warm up
2. Static stretching should be after practice or if needed before practice then before dynamic warm up. Any static stretching should be less than 30 sec.
3. For youth baseball = 10 – 20 min
4. Players should break a sweat
5. Include lower / upper / core
6. Use multi-joint movement patterns --- age related
7. Progressive build up of speed
Exercises

- Skipping – forward, backward, cross, pitch
- Carioca
- Side shuffle
- Forward lunge walk and opposite arm reach & lift
- Lateral lunge windmills
- Inchworms
- Spiderman crawl
- Egyptians
- Hummingbirds – short and long
- Lateral leaps / skater leaps
- Side plank punch unders
Preparing to Throw vs. Throwing to Prepare
The Effect of Pitching Biomechanics on the Upper Extremity in Youth and Adolescent Baseball Pitchers

J. T. Davis,* MD, Orr Limpisvasti,†‡ MD, Derrick Fluhme,§ MD, Karen J. Mohr,† PT, Lewis A. Yocum,† MD, Neal S. ElAttrache,† MD, and Frank W. Jobe,† MD

From the *Southern Illinois Orthopaedic Clinic, Carbondale, Illinois, †Kerlan Jobe Orthopaedic Clinic, Los Angeles, California, and §South Hills Orthopaedic Surgery, Pittsburgh, Pennsylvania

• Evaluated 5 parameters
• 169 pitchers, 13.4 yrs (9-18)(Y=9-14, A=14-18)
• 80.7% of the adolescent pitchers performed 3 or more parameters correctly, compared with only 64.0% in the youth group
Figure 1. A, leading toward home plate with the hips—defined as the pelvis leading the trunk toward home plate during the early cocking phase; B, any pitcher who remained vertical in the early cocking phase did not lead with the pelvis. The authors thank Maxwell C. Park, MD, for the illustrations.

Figure 2. A, hand-on-top position—defined as the throwing hand being on top of the ball (forearm in pronation) as it comes out of the glove during early cocking; B, hand under the ball (forearm in supination). The authors thank Maxwell C. Park, MD, for the illustrations.
Figure 3. A, arm in throwing position—defined as the elbow reaching its maximum height (glenohumeral abduction) by stride foot contact; B, any pitcher whose elbow was not at its highest point by stride foot contact did not have the arm in throwing position. The authors thank Maxwell C. Park, MD, for the illustrations.

Figure 4. Parameter 4: A, closed-shoulder position—defined as the lead shoulder being in a closed position and pointing toward home plate at stride foot contact; B, open position. Parameter 5: A, stride foot toward home plate—defined as the stride foot being pointed toward home plate at stride foot contact; B, foot not pointed toward home plate. The authors thank Maxwell C. Park, MD, for the illustrations.
• Youth w/ only 1 or 2 parameters correct had higher nHIRT (shoulder stress) and nEVL (elbow stress) and lower nHIRT/velocity (efficiency) when compared with those who performed 3 correctly.
• Same w/ 3 vs 4 correct
• Not true for Adolescent group
Throwing Progression

• Wrist Flicks
• Wrist-Elbow Flicks
• Trunk Rotation Throws
• Gorilla Throws
• Closed Step Progressive Long Toss
  – Avoid grenade throwing
Questions?

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