Treating Glenohumeral Internal Rotational Deficit

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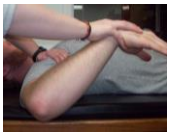
National Athletic Trainers' Association Annual Meeting & Clinical Symposia, Las Vegas, NV

Outline

- Defining and diagnosing glenohumeral internal rotation deficit (GIRD)
- Consequences of GIRD
- Treating GIRD

Common Shoulder Deficiencies

- Lack of scapular upward rotation
- ✓ Glenohumeral internal rotation deficit (GIRD)
- Postural deviations


Overhead Athletes

- Studies have found changes in glenohumeral ROM due to high velocities and repetitive forces associated with throwing/overhead mechanics

(Brown et al. 1988; Bigliani et al. 1997; Ellenbecker et al. 2002; Downar and Sauers 2005; Meister et al. 2005; Borsa et al. 2006)

Defining GIRD

- Glenohumeral internal rotation deficit (GIRD)
- Broad definition:
  - Loss in degrees of glenohumeral internal rotation of the throwing shoulder compared with the non-throwing shoulder. (Burkhart et al, 2003)

Explaining GIRD

- If the loss of internal rotation is equal to external rotation gained = osseous (bony) changes
  - Total arc of motion is relatively unchanged (Crockett et al, 2002; Reagan et al, 2002)

Explaining GIRD

- If the loss of internal rotation is greater than the gain in external rotation = soft tissue changes
  - Pathological (Lintner et al, 2007)

Defining GIRD

Clinically Significant GIRD:

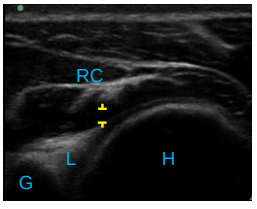
- 1) Loss of IR that exceeds the ER gain in the dominant arm
- 2) Loss of IR with a loss of total arc of motion in the dominant arm
- 3) Loss of IR greater than 25° vs. non-dominant

(Burkhart et al, 2003)

Cause of Pathological GIRD

- Potential Mechanism: Forces during the deceleration phase (follow-through) may result in thickening and tightening of the posterior rotator cuff and capsule

(Burkhart et al, 2003; Wilk et al, 2011)



Cause of Pathological GIRD

- Tightened posterior-inferior capsule moves the humeral head superiorly and posteriorly with the arm in the cocked throwing position (Burkhart et al, 2003; Grossman et al, 2005)

The Problem with GIRD

- GIRD in overhead athletes is believed to be a strong contributing factor to shoulder injuries

  (Borsa et al, 2008; Laudner et al, 2008; Wilk et al, 2011)

GIRD and Injuries

- Verna (1991) first to describe relationship between GIRD and injury
  - Followed 39 professional pitchers during a single baseball season
  - GIRD of $\geq 35^{\circ}$ vs. non-throwing side
  - Of which, 60% developed a shoulder problem that required them to stop pitching during the season

Severity of GIRD Does Matter

- Arthroscopy on 124 (pro, college and HS) baseball pitchers with symptomatic type 2 SLAP lesions
  - All presented with GIRD ≥25°
  - Average GIRD was 53°: range = 25° - 80°

  (Burkhart et al, 2003)

- Compared to 19 asymptomatic professional pitchers with average GIRD of 13° at preseason and 16° at postseason (Donley and Cooper, 2000)

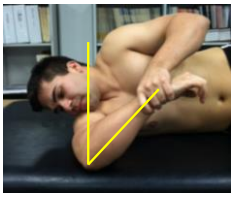
Measuring for GIRD

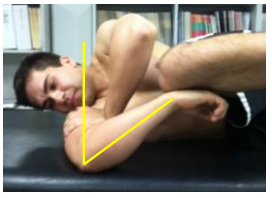
Treating GIRD

- Recommended treatment is posteroinferior capsular stretching

- Approximately 90% of throwers with symptomatic GIRD will respond positively to a posteroinferior capsular stretching program. (Burkhart et al, 2003)
  - The other 10% tend to be older elite athletes

Sleeper Stretch





Sleeper Stretch Research

- 33 college baseball players
- 3 x 30 seconds passive sleeper stretch to the dominant arm
- Acute increase in IR (3.1°)
- Authors concluded the change in motion may not be clinically significant

(Laudner et al, 2008)

Cross Body Stretch

Cross Body Stretch Research

- 30 participants with 10° GIRD (right vs. left)
  - Sleeper stretch group (N=15)
  - Cross body stretch group (N=15)
- 5 x 30 seconds daily for 4 weeks
- Found a significant increase in IR (pre vs. post) for both stretching groups
- No difference between the two stretching groups

(McClure et al, 2007)

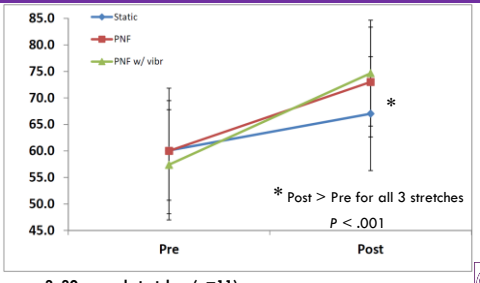
Static IR Stretch


Hold-Relax PNF Stretch

Hold-Relax PNF with WBV

Hold-Relax PNF with WBV

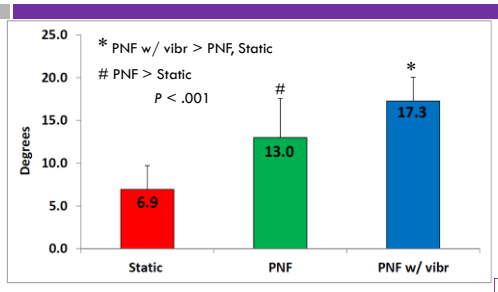
Acute Effects: Pre vs. Post



- **3x30 second stretches (n=11)**

Tucker and Slone, unpublished

Acute Effects: Degree of Change



- 3x30 second stretches (n=11)

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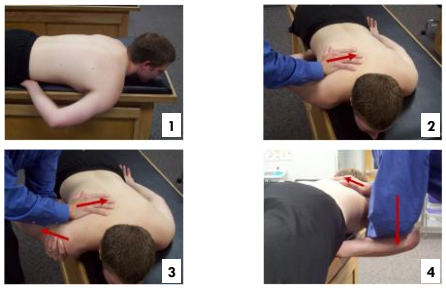
Prone Stretch



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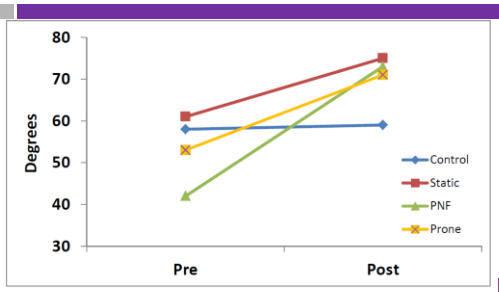
Standing Version

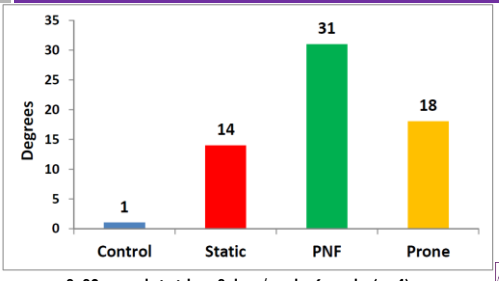
6 Week Pilot Study



- 3x30 second stretches, 3 days/week x6 weeks (n=4)

Tucker, unpublished

6 Week Pilot Study



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Clinical Implementation & Prevention

- Catch it early (ie: high school)
- Pre-season screening of overhead athletes
- Identify at-risk athletes
- Implement an injury prevention program
  - Which stretch?.....Anything is better than nothing

Thank You

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Static IR Stretch & Hold-Relax PNF

Prone Stretch

Tucker and Stento, 2010

Standing Version