Clearing the Kinetic Chain in the Throwing Shoulder

Sunday, January 9, 2005


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Gary Gray: MOSTABILITY
The ability to functionally take advantage of just the right motion, in just the right plane, in just the right direction, at just the right time. The opposite is instability, which is any degree of mobility which cannot be controlled.
Movement is not an isolated event that occurs in one plane of motion. Rather, it is a complex event that involves synergists, stabilizers, neutralizers, and antagonists all working together to reproduce efficient, triplanar movements.
Top New Jersey Prospects

1. Corey Smith, ss, Piscataway (N.J.) HS
2. Bobby Hill, ss, Newark (Atlantic League)
3. Kevin Cust, c, Immaculata HS, Flemington
4. Chris Buglovsky, rhp, College of New Jersey
5. David DeJesus, of, Rutgers
6. Shaun Stokes, rhp, William Paterson College
7. Mark Michael, rhp/3b, Gloucester Catholic HS, Gloucester City
8. Chris Young, rhp, Princeton
9. Kevin Barry, rhp, Rider
10. Bryan Edwards, rhp, Newark (Atlantic League)
11. Darren Fenster, ss, Rutgers
12. Anthony Giarratano, ss, Christian Brothers Academy, Marlboro
13. Casey Cahill, rhp, Immaculata HS, Flemington
14. Greg Burke, rhp, Gloucester Catholic HS, Gloucester City
15. Jamell Rosario, of, St. Augustine Prep, Vineland
16. Carlos Ferreiro, c, Elizabeth HS

Carlos Ferreiro, Elizabeth: The senior catcher has returned in grand style from what was feared to be a career-ending shoulder injury suffered early last season. Ferreiro, who may be chosen in the June draft, appears to be better than ever after a year of rehabilitation.

With several major league scouts watching closely, the 6-1, 195-pound Ferreiro opened the season on an 8-for-10, six-RBI tear for Elizabeth (3-0). Three days after delivering the game-winning hit in a season-opening 9-8 victory over arch-rival Union on Saturday, Ferreiro hit for the cycle in a 15-3 victory over Plainfield on Wednesday.

"And the best thing about him to me is the way he handles our pitching staff," Elizabeth coach Ray Korn said. "I think he's the first kid I've ever let call an entire game."
The scapula & rotator cuff are weak! Let’s isolate them from the rest of the body & teach them a lesson!
**Question:** Should we be training the shoulder in an isolated environment?

- Blasier et al 1992: “…if tension on any one of the components of the cuff was omitted or significantly reduced, there was a substantial reduction in anterior joint stability compared with when tension was applied to all components”

- Siff, 2001: “…rotator cuff injuries are not necessarily a consequence of rotator cuff muscle weaknesses or imbalances, but often due to defective technique and timing of the production of force over the range of movement.”
Evaluating the shoulder by way of the Kinetic Chain
Kinetic Chain Testing - What are we looking for?

✓ Is a particular segment hypertonic & tight?
  ➢ Is there enough ROM to get the job done?
  ➢ Is the athlete guarding because of pain?

✓ Is the segment’s ROM adequate, but moving too slow?
  ➢ Is the athlete overweight? What is their overall fitness level? Is more power training required?

✓ Is the segment spending too long in the loading, or eccentric phase (collapsing)?
  ➢ Is the segment just not strong enough?
  ➢ Could a foot orthosis be necessary?
Early Windup Phase: Front hip flexed, horizontally adducted, internally rotated.
Common Fault: Thigh cannot pass midline

| Correct | Common Compensation | Test: Pitcher's prayer position c/ relative R hip int. rotation, subtalar joint in./eversion |
Late Windup Phase: Stand Tall, Butt Tucked In Tight
Common Fault: Weight back on heel or forward torso

Correct

Common Compensation

Test: Knee, ankle excursion c/ overhead reach
Why is the gastrocnemius important to the shoulder???

Your foot bone connected to your ankle bone,
Your ankle bone connected to your leg bone,
Your leg bone connected to your knee bone,
Your knee bone connected to your thigh bone,
Your thigh bone connected to your hip bone,
Your hip bone connected to your back bone,
Your back bone connected to your shoulder bone...
Stride Phase, Arm Cocking: Shoulders level, “heavy” on support leg
Common Faults: High Lead shoulder, backward lean to torso, pushing off of support leg.

Correct
Incorrect: Backward lean to torso, high lead shoulder.
Bad Front Plane Hip Load
Incorrect: Pushing off the rubber
The Serape Effect- (Logan, 1960)

The myofascial sling created by the rhomboids, serratus anterior, external & internal obliques.
Early Stride Phase Tests

Test: Frontal plane R. hip excursion

Test: Frontal plane balance c/ R. leg medial reach
Late Stride/Late Acceleration Phase

Correct

Incorrect:
Poor hip extension & rotation, compensates c/ lumbosacral flexion. Stress to ant. capsule

Incorrect:
Same as above, but stress at medial elbow due to low arm angle
Test for the Late Stride/Late Acceleration Phase:
Rotational Lunge and Reach

*Common Compensations:*

1. Short Step (lack of hip extension).
2. Long Step, but compensates with hyperlordosis (look for the “bowstring” effect in the rectus abdominus).
3. Flexing at the waist (sacroiliac, iliosacral dysfunction).
4. Arm(s) & Elbow(s) drop and/or move forward in the sagittal plane (tight pectoralis minor and/or latissimus dorsi, kyphotic thoracic spine).
The Deep Arm Lines & The Functional Lines
The Follow Through Phase: Are the Clutch & Brake working correctly?

Who Will Rescue the Posterior Capsule, infraspinatus, Teres Minor, and Rhomboids?
The Posterior Shoulder’s Best Friends

The Posterior Spiral Line
(as shown in a left handed pitcher)

1. “Inside” Hamstrings
2. Sacrotuberous Ligament/Sacrum
3. Piriformis, Gemelli
4. Gluteus Maximus
5. Erector Spinae, Multifidus, Rotatores, Intertransversarii
6. Latissimus Dorsi/Thoracolumbar Fascia

The Posterior Functional Line
Improper Follow Through

- Poor "Relative" Internal Rotation of Femur
- Foot Still in Pronation

Ouch!! Don’t blame me! Look down the kinetic chain!
Functional Testing for the Follow Through Phase:

Left Leg Balance with Anterior Lateral Right Arm Reach
Link Sequencing (Kibler 1998)

“The scapula is pivotal in transferring the large forces and high energy from the major source for force and energy—the legs, back, and trunk—to the actual delivery mechanism of the energy and force—the arm and the hand.” Forces that are generated in the proximal segments have to be transferred efficiently and must be regulated as they go through the funnel of the shoulder.”
The Thoracic Spine- The Scapula's Home!
Part II: Techniques for Clearing the Kinetic Chain
Clearing the Kinetic Chain

• Muscle Energy Technique-
  – Joint Dysfunction (spine/pelvis), Muscle Spasticity

• Myofascial Release
  – Muscle, Tendon Dysfunction, Nerve Entrapments

• Functional Joint Mobilization
  – Joint Dysfunction

• 3D Strength & Flexibility Training
  – Muscle strength, endurance, power, flexibility
  – Axonotmesis & other nerve injuries
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REFERENCES


