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**NATIONAL STRENGTH AND
CONDITIONING ASSOCIATION**

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Thank You's

- NSCA
- University of Denver
 - Sports Performance
 - Sports Medicine
- Cal Dietz
- Nick Studholme



Goals of Glute Layering Model

- Address and correct compensation patterns
 - Create a state of “explosion”
- Maximized movement efficiency
- Reduced injury likelihood
 - Soft tissue and catastrophic
- Transfer of optimal pattern to competition
- Implement appropriately throughout the annual plan



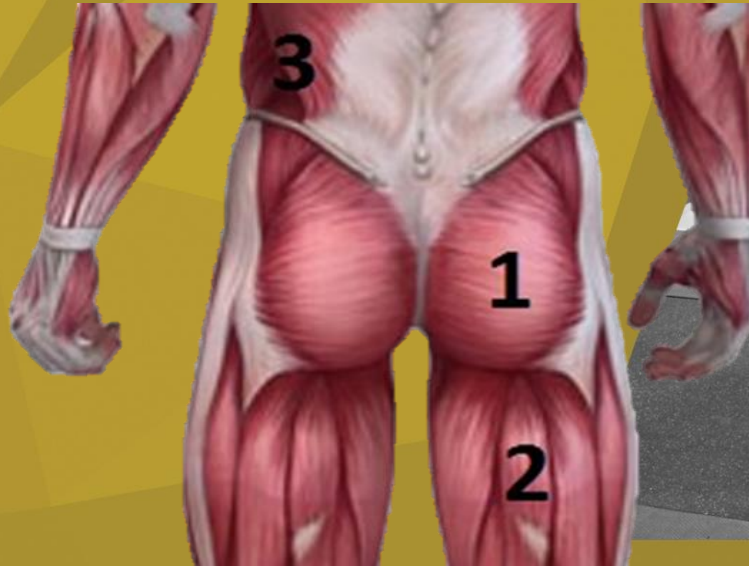
Why the Glutes?

- Not just for aesthetics
 - Biology basics, survive and reproduce
 - Major hip extensor
 - Good function = desirable mate/gene pool
- Critical for hip function in all three planes
 - Hip extension
 - Abduction
 - External Rotation
- Why coaches place so much emphasis on “activating glutes”



Hip Extension Firing Patterns

- Hip extension and flexion are required for any locomotion pattern completed
 - Each movement to a different extent, but still present
- 3 possible methods an athlete can use to complete hip extension



Optimal Firing Pattern

- Glute – hamstring – opp. QL
- Creates a state of “explosion”
 - Goal is to always fire from inside-out
 - Critical to prevent “overuse injuries”
- When this pattern is not utilized, the body will compensate
- Body must do two things to survive
 - Breathe and move
 - Will find “cheat patterns”, even if they are inefficient
 - Lead to overuse of non-major muscle(s)



Hamstring Drivers

- Hamstring – opp. QL – Glute
- State of “implosion”
 - Forces driven back into hips
 - Hamstring “pulls” body forward
 - “Major” movers, no longer utilized as majors
 - No glutes
- More likely to sustain injury
 - Hamstring pulls
 - Chronic “tightness”



QL Drivers

- Opp. QL – Hamstring – Glute
- Another “implosion” state
 - Forces driven back into hips
 - Tight lower back
 - Overdeveloped Erectors
 - The athlete that complains of a sore back after longer conditioning sessions
 - Also potentially never sore in the back as the stress placed on it is always high
- Coach’s eye is critical



Why Different Patterns Occur

- Two theories: Structure and Stress
- Structure
 - Without structural alignment, body limits force production
 - SI issues and groin
 - Paraspinal nerves “choked off”
- Why?
 - Class, sedentary lifestyle, poor posture
 - Posture to address structure is #1 aspect coached, especially hip and foot



Why Different Patterns Occur Cont.

- Stress – fight or flight
 - Body shifts to “defense position” under chronic stress
 - All important organs front of body
 - New length tension relationships (structural)
- Cannot “attack” if always defending
 - Stress system still responds in same manner as when it was developed
 - True life threatening situations, seeing a threat and either fighting or running
 - Stressors are no longer physical in our world
 - Email
 - Social Media



Why Different Patterns Occur Cont.

- Regardless of stress type (academic, family, money, etc.) response is same
 - Release of catecholamines
 - Catecholamines must be cleared through lymph system
 - Lymph system directly tied to nervous system
 - Stress also changes breathing to apical (chest) rather than diaphragmatic
 - Cascade effect leading to dysfunction
 - Cheat patterns that are inefficient and create “implosion”



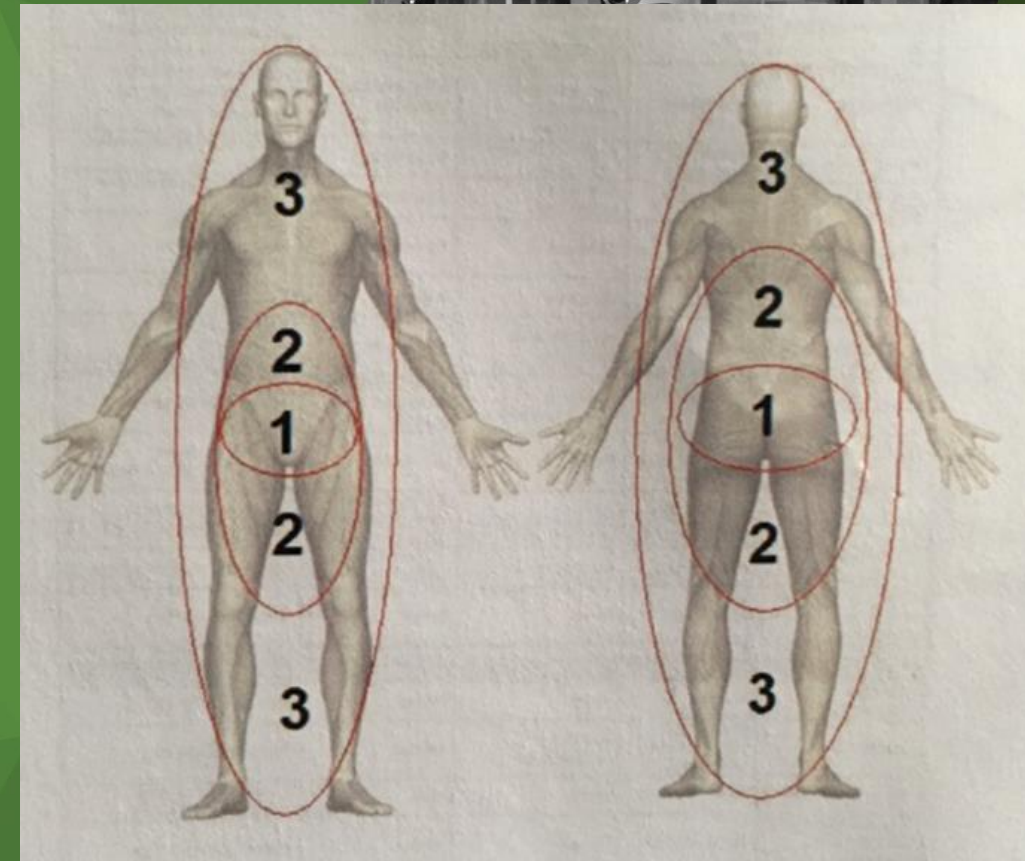
Why Different Patterns Occur Cont.

- CEO vs. Surfer
 - Different sympathetic drives
 - CEO bombarded with meetings, emails, etc.
 - Not physical fight or flight stress
 - Inappropriate lymphatic clearing due to excessive catecholamine production
 - No diaphragm breathing further creates compensation
 - Increased sedentary lifestyle further creates structural issues



Compensation Patterns

- Ultimately dysfunctional patterns arise as body always finds a way to breathe and move
- No longer state of “explosion”
 - “major” muscles no longer major muscles



Testing for Pattern

- Must realize an inefficient pattern one can address
 - Athos
- Hip Extension Patterning
 - Can't tell athlete what you are testing
 - Repetitive testing
- “Coach’s eye” test

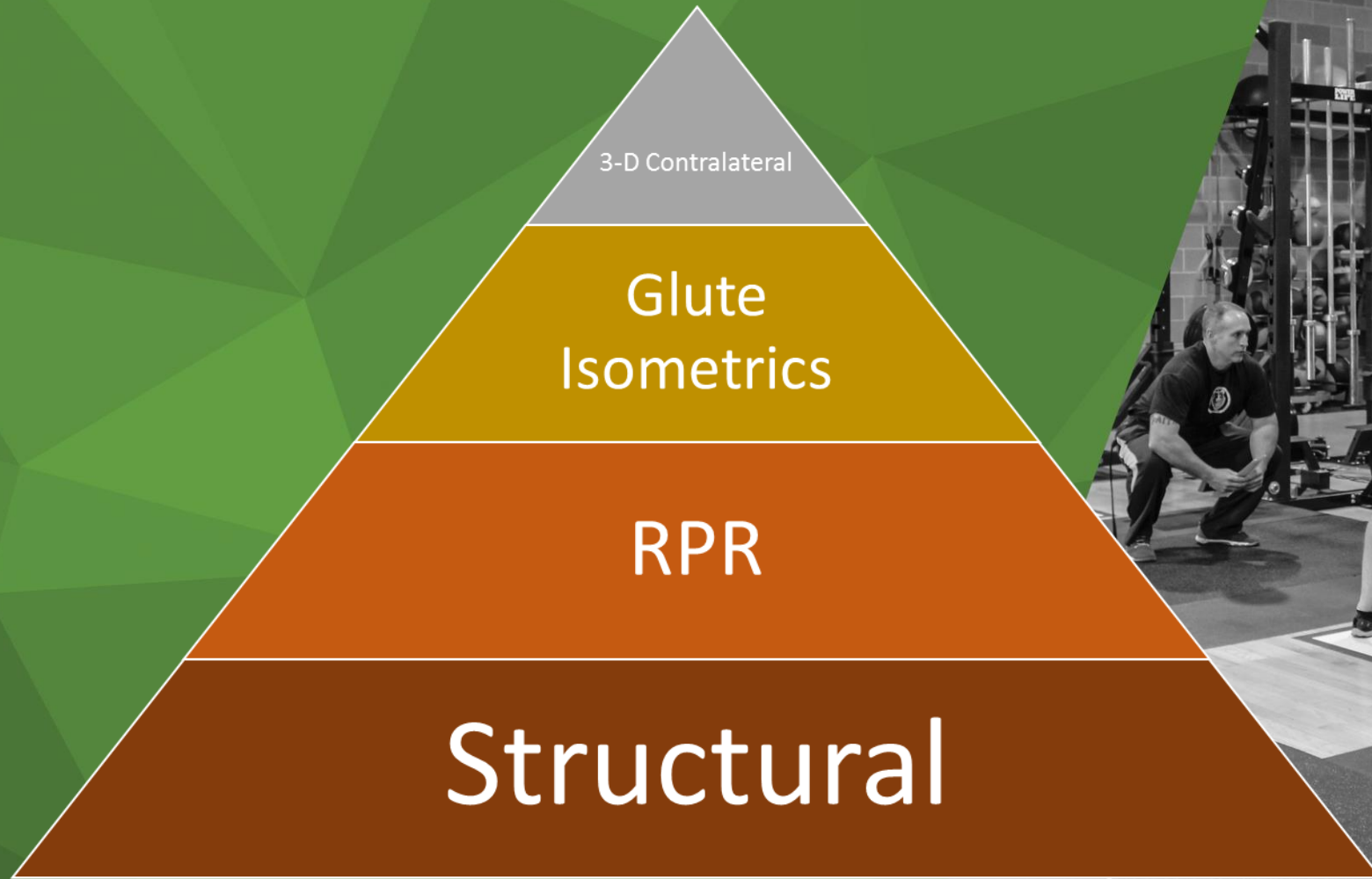


Glute Layering Model

- Systematic approach to glute function
- Goal: Consider and correct inefficient hip firing patterns with a systematic approach
- Consists of 4 “layers”
- Ultimately many systems within a system
 - Nothing new, but a new model to implement many concepts



Glute Layering Pyramid



Structure

- Covered earlier, without structure “protect” mode is utilized
 - Altered biomechanics means inappropriate range of motion and/or loading mechanism
- Denver in a really fortunate setting
 - Use of chiropractor (Nick)
 - Open relationship with athletic trainers
- Hip and foot structure are critical
 - Subtalar is a torque converter

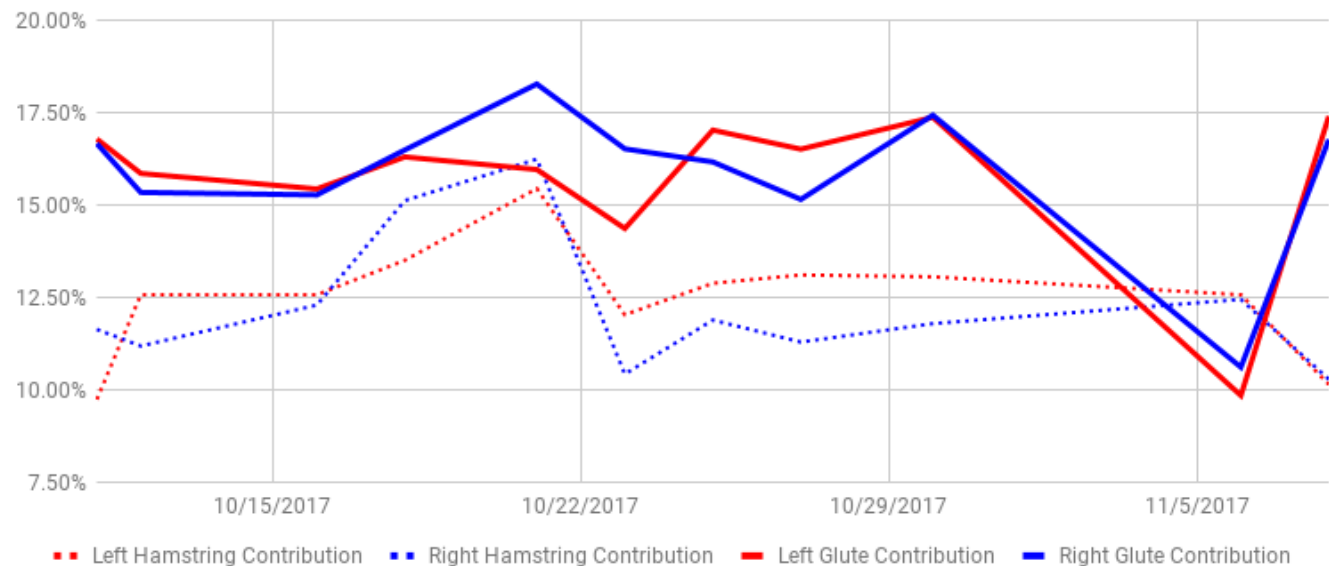


Spotting Structural Issues

- Coach's eye
 - View hip position in gait
 - Stuck in relative flexion or anterior pelvic tilt?
 - This will create compensation pattern that can be predicted
 - Bring ribs down to match pelvis, more hamstring stress
 - Drive ribs up, more stress on low back
 - Easy to spot once you have seen it
 - Lateral sling
 - Supination and re-supination
- Athlete awareness
- Athos



Hamstring & Glute Contribution



Reflexive Performance Reset (RPR)

- Must correct incorrect patterns, otherwise poor pattern is engrained
- Belly breathing is critical
 - Sympathetic breathing = no psoas & glutes
- Making major muscles major muscles again
 - Removal of compensation patterns
 - Explosion
- Honest relationship with Sports Med.
 - Athletes can reset themselves



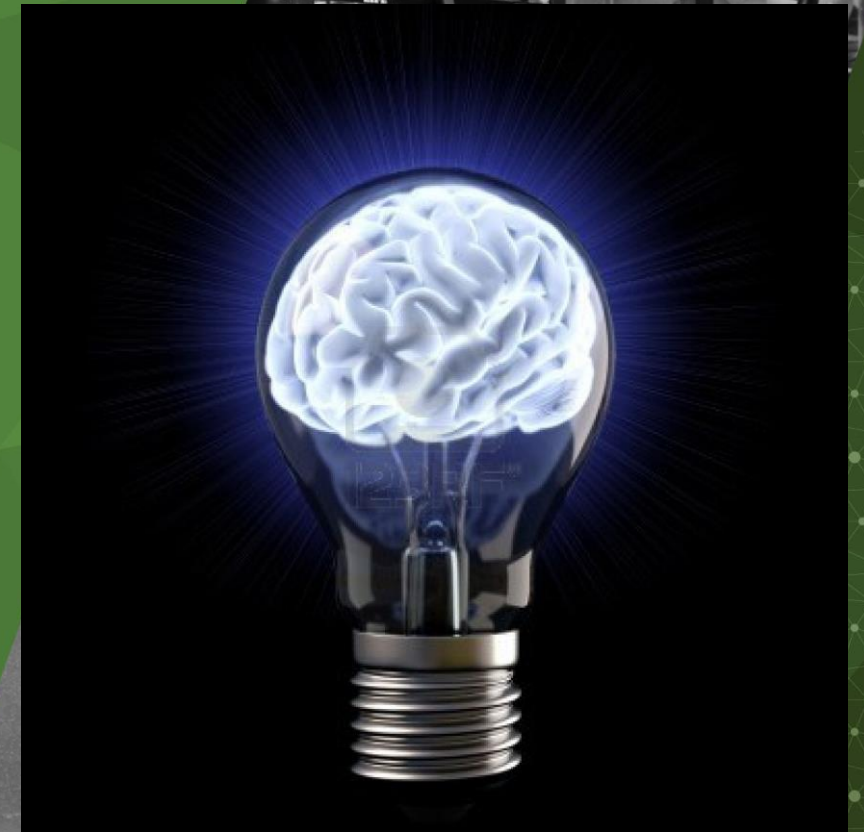
Glute Isometrics

- Goal: Increase utilization of glutes
 - Isolated at first
 - “Sore butt”
 - If not then problems, applies to sprinting as well
- Used after appropriate firing patterns are achieved
 - Structure and RPR
 - Ensure no compensation patterns



Corticomotor Excitability

- Increased drive after isometric training
 - More “real-estate” for recruitment
 - Glutes now “primed”
 - Increased ability to learn appropriate pattern



Progressions

- Increase isometric time
 - 20 min threshold is goal, but progressed
 - Use movements early (Cross-Crawl)
 - Continuous, maintain excitability
- Mid range/Muscle belly first
 - Overactive GTO's, work spindles first
 - Progress to lengthened/shortened ranges
 - Iso neural/tissue strength only good for $\pm 10^\circ$
- Ground to standing
 - Isolated to full kinetic chain + gravity



Glute Iso Takeaways

- Nothing new exercise wise, but may not be enough time under tension
- Also won't see results/change if they are running the incorrect pattern
 - Why Structure and RPR must be addressed
 - If athlete is already “cheating” just driving bad pattern



3-D Contralateral

- Applies previous concepts in full kinetic chain
- Transfer use of glutes in all three planes
 - Increased volume
- Goal: “sore butt”
 - If hamstrings or back, then compensating
- Cues
 - Squeeze glutes
 - Drive through big toe
 - Finish as tall as possible



Transfer of Training

- Continue to coach and cue explosive pattern
 - Every exercise should reinforce this
- Goal is always “sore butt”
- Start in the warm up
 - Exercises for structure
 - “prime glutes”
- High-Level coaching required



Putting it All Together

- Glute dysfunction does not mean you will be paralyzed
 - Must breathe and move to survive
 - Body will always find a way
- System of systems
 - Taken from many different coaches/professionals



Putting it All Together

- Top-Down and Bottom-Up Approach
 - Glute work
 - RPR and glute iso work
 - Without foot though, does not matter
 - Ankle rocker, subtalar function
 - Constant game of telephone



Putting it all together

- Circuit breaker example
 - 3 light switches, only one is optimal
 - Eventually, the other two will lead to system failure
 - Optimal is only available when all components function
- Structure
 - Flipping circuit breakers “on”
 - Can still function without, just not efficiently
- RPR
 - Improve wiring
 - Increased efficiency/function
- Glute Iso
 - Upgrading to energy efficient light bulb
 - More light, less energy
- 3-D contralateral
 - Firing correctly, repeatedly
 - 3 lights



Putting the System in Place

- Coaching
 - Breathing patterns
 - Immediately upon campus arrival
 - Relative hip position
 - Hip extension
 - Neutral head
 - Drive through big toe



Implementation in the Annual Plan

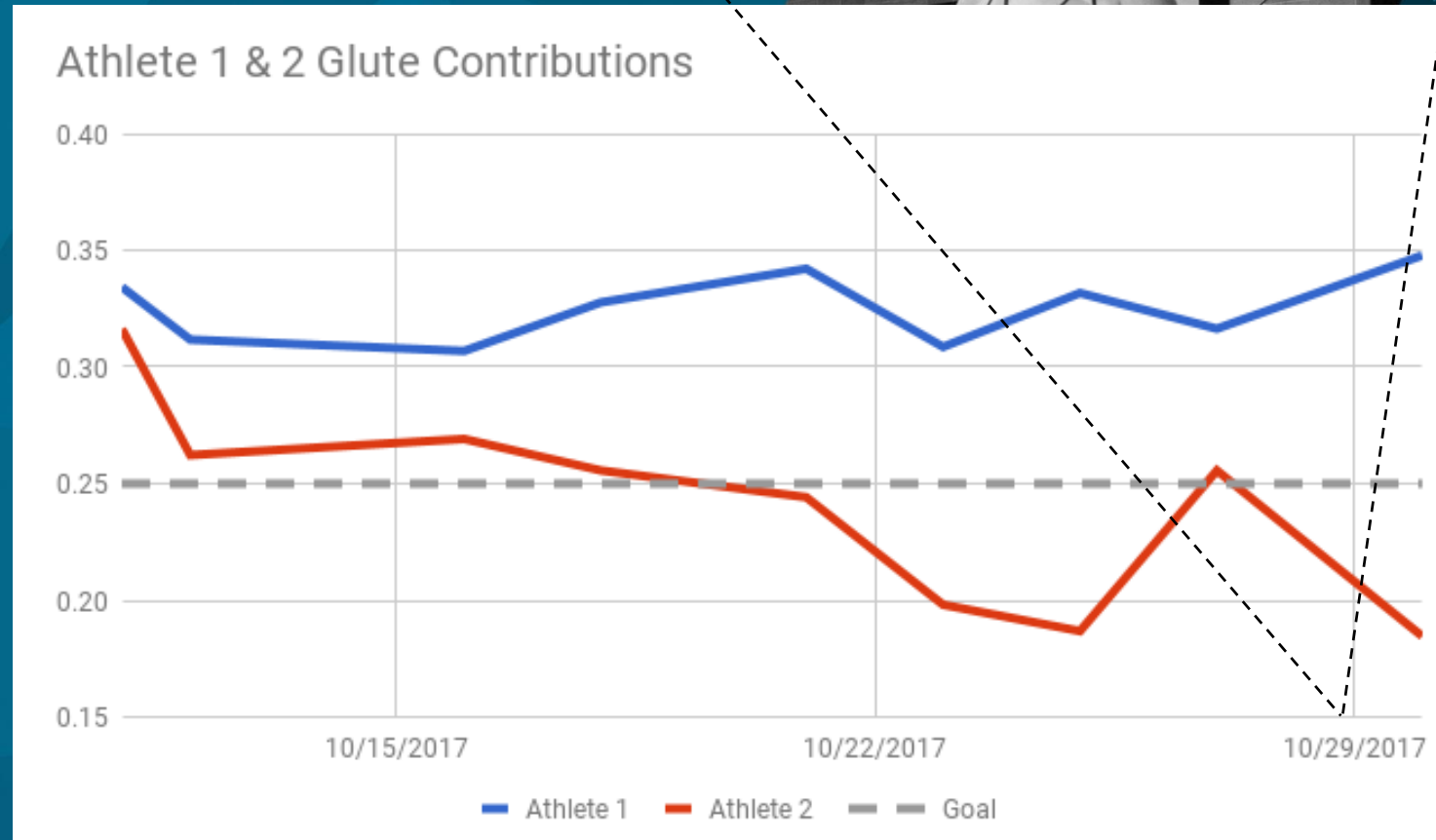
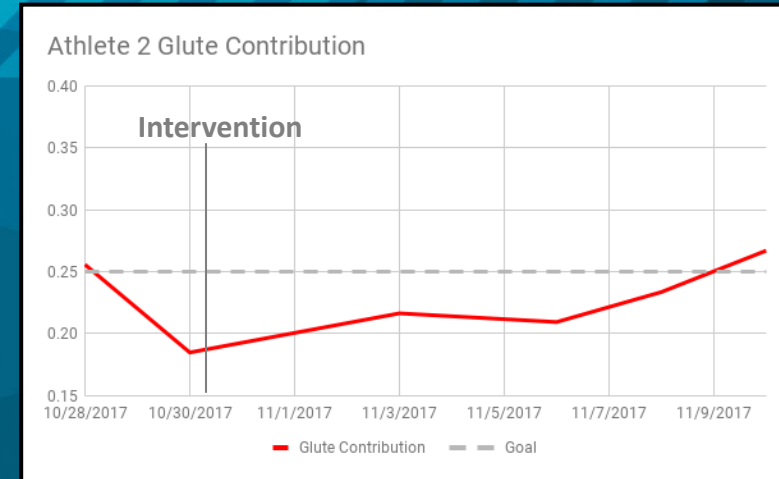
- GPP (first off-season phase)
 - Aerobic and glycolytic (5 weeks)
 - 3-D Contralateral fits aerobic
- RPR addressed year round
- Download: Glute iso and 3-D contra
- Strength, Power, & Speed phases
- In-Season
 - Individualized warm-up
 - [Travel and postural reset](#)
 - [Pre-game implementation \(warm-up\)](#)



Tracking Performance

- 2 Elite Level Performers
 - Identical Program
 - Different Responses
 - One ideal, other not
 - Intervention?
 - Movement testing
 - Hip structure work
 - 8 min of glute iso
 - 3% improvement daily
 - red athlete

	Athlete 1	Athlete 2
Average	32.5%	24.1%



Other Resources

- RPR
 - <https://www.reflexiveperformance.com/>
- FNOR
 - <http://fnor.net/>
- Van Dyke Strength
 - vandykestrength.com
 - All glute progressions



*Learn
more*



Contact & Questions

- matthew.k.vandyke@gmail.com
- Questions?



Demo Portion



Structure

- Hips
 - [PNF Diagonals](#)
 - [Band Traction/Hanging](#)
 - Hip Gapping (chiro)
 - Thomas Test
 - [FE Hip Flexor Stretch](#)
- Foot
 - [Subtalar rotation](#) (wall, [standing](#), add reach)
 - Dorsiflexion exercises (ankle rocker)
 - [Big Toe](#) & [Other](#) 4 (band)



Glute Iso

- Fire Hydrant (mid-range)
- Cross-Under lunge (lengthened)
 - Coach's eye here
- Cross-Crawl & Lateral (movement)
- Staggered Stance Squat (gravity)
- Can add ankle rocker in this as well
 - More specific joint angles
 - Ensure hip loading



3-D Contralateral

- [Reverse Lunge + Band Row](#)
- [Lateral Lunge + DB OH Press](#)
- [Rotational Lunge + Band Press](#)
- [RDL + ViPR Rot. Press](#)
- [Full 3-D Contralateral Circuit](#)



Early Transfer of Training (Low Force)

- Glute Wind Up
 - Glute Loading in all three planes
 - Flexion, adduction, internal rotation
 - Glute Wind Up to Jump
- Valslide/Cable Training (add Band Knee)
 - Valslide 45° Eccentric
 - 3 Way Valslide + Lateral Banded Knee (Eccentric)
 - Glute forced to function to prevent knee valgus
 - 4 Way Cable & Valslide Hip (Eccentric)
 - 4 Way Cable Hip (Eccentric)
 - Increased stability demand



Transfer of Training (Moderate Force)

- JOP Matrix
 - BW Hip Stability plus different landing angles
 - Can progress in any desired method (Endless Progressions)
 - Change Direction (FWD 45° JOP)
 - Forward/Lateral/Rotational 45°
 - Change height/length of jump
 - Angle of landing
 - Greater distance precursor to deceleration work
 - Change Foot (Lateral JOP + Opp. Foot Stick)
 - Inside vs. outside stick
 - Add COD & Reactive COD work from 'stick'
- Lunge + Lateral Banded Knee
 - Can load/progress to DB RFESS



Transfer of Training (High Force)

- ANY movement in training
 - Create “explosion” from hips
- Split Stance Cable Rotary Row
 - One of favorites for transfer in all three planes
- Cable Rotary Pull to Press (low to high)
 - Force production through entire chain
- Can add eccentric/isometric/power to all of these



Transfer of Training (High Velocity)

- Any version of sprinting
- [SL Depth Drop to Rotary Jump](#)
 - Pause progress to reactive
- [Sport Back Squat](#)
- [St. Leg Banded Glute](#) or [Band Paw Back](#)
 - Hips as “series” not hamstring initiating
- Measure progress with Athos

