TRAIN SLOW TO BE FAST
UTILIZING ECCENTRIC AND CONCENTRIC TRAINING

DYNAMIC ATHLETES

We play ultimate, arguably one of the most dynamic sports in athletics. From the neck up, we aim to be receivers, throwers, offensively capable, defensively adept and competitive thought. And from the neck down, we strive to be fast, quick, agile, explosive, powerful, resilient and markedly well-conditioned. Every movement in our sport, like most, is dynamic in nature. Ultimate athletes are constantly accelerating, decelerating, or sponging and then accelerating again. It is easy to identify an athlete's entire body moving through these phases during cutting. But can we also go through each of these phases in jumping, pivoting, marking and throwing? As you reach back to throw a backhand, your arm has to accelerate, decelerate, stop and reload, and then go to accelerate the disc.

WE IDENTIFY THREE PHASES IN DYNAMIC MOVEMENTS:
eccentric (lengthening), **isometric** (sponging), and **concentric** (accelerating). **Since we play the sport dynamically, we should tailor our training preparation to reflect these three phases of training. It is time to discuss "Triphasic Training" and why it is a game-changing.**

THE TECHNICAL BIT

For the sake of science and precision, let's clarify what each phase means. *Isometrics means anatomically. An eccentric movement describes a muscle lengthening while working under load or contracted. Isometric describes a muscle that is neither lengthening nor shortening while working under load or contracted. Well, that's the easily simple version. The muscle fibers in fact move quite a bit, but the surrounding joints do not. Finally, a concentric movement describes a muscle shortening while working under load or contracted.*

As ultimate players, we should tailor our training to reflect all three phases of dynamic movement.
Photo: Billy Downsborough/Flickr

For better understanding of each of these phases, let's use a common training movement as an example: the squat. The squat is a lower-body dominant muscle movement. As you lower the weight toward the ground, your quads are lengthening. This phase of the squat is the eccentric phase. Once you reach a stopping point, just prior to standing back up, you have an *isometric* phase. The concentric phase is lifting the weight upward, during this lifting portion, your quad is shortening. So, we can squat example, in the lowering operation, you have eccentric, isometric and concentric phases. The concentric portion is the part we want to train exclusively. And that is an oversight.

To further expound using a dynamic movement we see in sport, let's think about field cutting. When an athlete initiates a cut, we can identify their acceleration as a concentric movement. As the athlete continues to change direction and begins deceleration, we can identify this as an eccentric movement. And we can identify the very moment of inertial stop as an isometric phase. And of course, the athlete then resumes his change of direction with another concentric phase. The important thing to understand is that the athlete who can navigate all three phases of movement the quickest is going be dominant.

MY TRIPHASIC REALIZATION JOURNEY

Working out has been part of my life for 17 years. I began in the 90's, thanks to active parents. My father spent a lot of time learning and teaching the fundamentals—things like not sacrificing form in favor of heavier weights and not completely ignoring the "negative" (eccentric) portion of lifting.

In college, I discovered ultimate. I was more athletic than most people I played against, and it dawned on me that training could help me become a more athletic head start. Maybe I could jump higher and run faster with training. I read everything I could find on training for athletic performance.

However, in 2004, there was practically nothing available, and something nothing doesn't take very long. Reluctantly I looked at resources tailored for other sports and tried to figure out what would do the trick. "Lift heavy" and "plyometrics" are what I distilled from the Internet resources of the day. And it actually worked; I ran faster and jumped higher. I also started to gain some knee pain, but I'll come back to that later.

Fast forward to 2011. I landed a spot on Chicago Machine, one of the deepest and the fastest guy on the team. I had the highest vertical leap, 35" standing, 40.5" double-leg approach. I was pretty pleased until I started playing against the best players in the world and found it difficult to get open anywhere other than in wide-open spaces. Or on offense, I remember thinking

"I'm faster than this guy. Why is he able to slam on the brakes and change directions more effectively than me?"

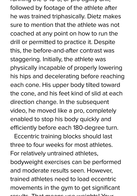
The answer to that question was buried in my training. I had been lifting concentrically for 10 years. It never occurred to me that the capacity to stop more quickly than an opponent would translate into receiving more passes or generating more blocks. In hindsight, I feel a bit foolish having not understood that increasing eccentric strength would help my eccentric game. Once I started triphasic training, training all three muscles phases, I noticed a massive increase in my capacity for rapid deceleration, stopping and getting to the disc first.

Every week, athletes tell me they want to run faster and jump higher but is that really always what you need to have game-changing performance? It's cool and it's flashy. Performance is dependent on athlete who can change directions on a dime or body out for Hammer Time on one who can just run really fast and jump really high. Trust me, I've been that second athlete. The reality is you can be both.

TRAIN SLOW TO BE FAST

What is eccentric training? It is loading a movement during which the primary muscle group is lengthening. Also deceleration, in rudimentary terms.

Many of us at this point have heard that eccentric training is important for injury prevention. This is absolutely true. But in my concentric-only days, I spent a frustrating a couple of times. The second time, Tim Morrill came to the rescue. He recommended one of his eccentric-heavy injury prevention and rehab exercises out there: sliding eccentric hamstring curls. Why is this such a great exercise? Most field hamstring injuries occur when the hip is heading into flexion, and the knee comes forward as a part of the athlete's running stride. During this movement, the hamstring is lengthening, undergoing an eccentric phase. An underinvested hamstring will eventually fail to fulfill this requirement. So we train our hamstrings to be compliant to the stress during lengthening.



The three phases of dynamic movement are easy to see while cutting, but we also experience all three phases while pivoting, marking, and throwing. **Photo: Billy Downsborough/Flickr**

Scary knee injuries like ACL and meniscus tears also typically occur during force absorption, like landing after a jump or slowing from a sprint. We must train our bodies to handle this force absorption, or something is going to break. Remember that knee pain I mentioned having developed in college? It spawned from new, more powerful force creation with a deficit in force absorption. That pain is long gone now.

Injury prevention isn't the only reason we train eccentrically. We need to develop force absorption to be complete athletes.

Much like my former self, if we are incapable of capitalizing on explosive acceleration by only decelerating slowly, we will have a lot of performance potential on the table. The guy that literally wrote the book on triphasic training, Cal Dietz, recently made a video contrast of a traditionally trained athlete running the 5-10-5 vs. a triphasic trained athlete, followed by footage of the athlete after he was trained triphasically. Dietz makes sure to mention that the athlete was not coached at any point on how to run the drill or permitted to practice it. Despite this, the before-contrast performance was staggering. Initially, the athlete was physically incapable of even slowing down his hips and decelerating before reaching each cone. His upper body tilted toward the cone, and his lower body lagged at each direction change. In the subsequent video, he moved like a guy completely enabled to stop his body quickly and efficiently before each 180-degree turn. Eccentric training blocks should last three to four weeks for most athletes. For relatively untrained athletes, bodyweight exercises can be performed and moderate results seen. However, trained athletes need to load eccentric movements in the gym to get significant results. That means use weights! Your body has to learn how the stress in the gym to be amply prepared for the stress it will see on the field. Both bilateral (two-limb sided) and unilateral (one-limb sided) movements should be trained with eccentric emphasis. As ultimate athletes, lower-body movements are more mission critical than upper-body exercises.

Be aware—eccentric training is very taxing; moving slowly through a movement for roughly five to eight seconds is hard. As far as execution is concerned, immediately upon completing your eccentric movement, you want to load into a strong, explosive concentric finish. So if you are performing a squatting down, finish the squat by lifting the weight as quickly as possible on each rep.

Training Ideas for Ultimate Athletes:

LOADS of 55% to 85% 1RM, 5–6 SECONDS

- ✓ Squatting Variations
  (Single Leg Squat, Rear Foot Elevated Squat, Split Squat, Front Squat)
- ✓ Horizontal Pushing Variations
  (One-Arm DB Bench Press, Bench Press)
- ✓ Heel Drops
  (Opposite of Calf Raises)
- ✓ Chin Up
- ✓ Sliding Hamstring Curls
  (Double or Single Leg)

Training Ideas for Ultimate Athletes	Bodyweight	55–80% 1RM	80–85% 1RM (w/ Spotter)
Squats	6–8 Seconds, 8–10 Reps	6–8 Seconds, 3–6 Reps	5–6 Seconds, 1–3 Reps
Horizontal Pushes	6–8 Seconds, 8–10 Reps	6–8 Seconds, 6–8 Reps	5–6 Seconds, 1–3 Reps
Heel Drop	6–8 Seconds, 10–15 Reps	6–8 Seconds, 6–8 Reps	
Chin Up/ Pull Up	6–8 Seconds, 8–10 Reps	6–8 Seconds, 6–8 Reps	
Sliding Hamstring Curl*	6–8 Seconds, 8–10 Reps		

*I have most athletes skip the concentric portion

For heavy eccentric training loads, please have a trainer or at least a spotter on hand. If you are training hard, you will sometimes experience muscle failure. Remember, it is imperative to finish every eccentric movement with a forceful concentric conclusion for proper nervous system development.

If you haven't started training with eccentrics yet, you are missing out. Not only are they essential for certain rehab protocols and injury reduction, but with the right implementation, your change-of-direction capacity will drastically improve.

QUICK! DON'T MOVE!

Isometric training is training a contracted muscle group while no real movement is taking place locally. The surrounding joints do not move. Isometric moments during games happen all the time, but are very, very brief. Actually, the isometric moments are virtually instantaneous. Isometric strength is really the ability to seamlessly transition from force absorption to force production. Think of it as the transfer of potential energy created in an eccentric movement into the actualization of that energy output in a concentric movement. Isometric strength is imperative in force production.

Let's use an example to hit the concept home - jumping. Athletes should be able to drop into a quarter squat and instantly change the direction of bodily momentum from downward to upward. Think of it like a ball bouncing off a concrete floor. A lot is happening in that fraction of a second when the ball hits the floor, but the structural integrity of the ball allows it to absorb the force and propel itself in the opposite direction. So too should our bodies be structurally ready to reverse inertial forces acting on them.

Implementing isometrics into your workout program isn't rocket science, but there are a few things you should know. Spend two to three weeks in a phase of isometric training. Think about the angles of your body or joints at which you need to have strength to stop. Those positions need to be trained. Back to our squatting athlete – sport-specifically, it is totally useless to spend time with the femur deeper than parallel at the bottom of a squat. An ultimate athlete does not need isometric strength there. Stay above parallel. Again, we are looking to add serious strength, so load the position (use weights), especially for your lower body. In this training block, be sure to spend as little time in the eccentric and concentric part of the movement as possible. A squatter should lower the weight quickly, hold it there for roughly three seconds, and finish the squat by lifting the weight as quickly as possible.

Training Ideas for Ultimate Athletes:

LOADS of 55% to 85% 1RM, 3 SECONDS

- ✓ All Squatting Variations
  (Single Leg Squat, Rear Foot Elevated Squat, Split Squat, Front Squat)
- ✓ Horizontal Pushing Variations
  (One-Arm DB Bench Press, Bench Press)
- ✓ Chin Up
- ✓ Calf Raise

Training Ideas for Ultimate Athletes	Bodyweight	55–80% 1RM	80–85% 1RM (w/ Spotter)
Squats	6–8 Seconds, 8–10 Reps	4–5 Seconds, 3–6 Reps	3-4 Seconds, 1-3 Reps
Shoulder Elevated Hip Lift	6–8 Seconds, 8–10 Reps	4–5 Seconds, 3–6 Reps	3-4 Seconds, 1-3 Reps
Horizontal Pushes	6–8 Seconds, 8–10 Reps	4–5 Seconds, 3–6 Reps	3-4 Seconds, 1-3 Reps
Chin Up/ Pull Up	6–8 Seconds, 5–10 Reps	4–5 Seconds, 3–6 Reps	
Calf Raise	6–8 Seconds, 10–15 Reps	4–5 Seconds, 3–6 Reps	

TRAINING IS EFFECTIVE!

If you want to run fast and jump high, concentric weightlifting will help you do those things. If you want to have powerful, dynamic movements on the field with a side perk of injury reduction, incorporate eccentric and isometric lifting as well.

For those of you who want to learn more about this topic, read Triphasic Training by Cal Dietz. It is a tremendous resource for those whose minds are geared toward exercise science.

About the Author

Jonathan "Goose" Helton is a certified functional strength coach at Morrill Performance and co-founder of Functional Performance Training, LLC.

As an athlete, Goose has played ultimate at every level of the sport, from pick-up to world championships, since 2003. In 2015, he tied for third at the National Championships with Chicago Machine, won gold at the World Championships of Beach Ultimate in Dubai in both competition and spirit and was named to Ultiworld's Club Division First Team.

As a coach, Goose has led the Chicago CUT Camp conditioning sessions from 2012-2015, seeing over 400 young athletes. He was a head coach at Neuqua Valley High School and Wheaton College in 2011 and 2012. He has led clinics in New York, Illinois, California and the Philippines. He has led in-season and off-season training programming as well as practice and game-day warm-ups for Chicago Machine and the 2015 Beach Worlds U.S. men's team.

Goose currently resides in Ocean City, Md., and is training for the 2016 Beach National Championships with Humiliswag and the 2016 World Ultimate and Guts Championships where he will compete with the U.S. Men's National Team.