

Running around cones and jumping over hurdles

By

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Jumping before you can run? Running before you can walk? Walking before you can crawl? Sound familiar. It is amazing how in the strength and conditioning industry, marketing seems to pervade sound methodology. Take a peek at fitness seminars or catalogs, or even look in ever so popular health and fitness magazines and what do we see. Athletes doing all varieties of new “functional” exercises on even more “amazing” equipment. Gone are the days of athletes utilizing only conventional training methods which have been effective for decades. Now in their place are the heavily marketed, highly variable (and often misunderstood) “functional training” strategies. The basic premise, if the movement mimics the sport, recruits the active musculature, and/or requires similar neuromuscular activity/patterns, then it may be considered “functional” in terms of transfer-ability with regards to the actual sporting event. Some proponents have even taken it so far as to preach that no matter the force applied or what type of surface it is on, as long as it is similar to the movement pattern seen in sport then it must be good for increasing on field ability.

The idea that movements must be trained rather than muscles has engrained itself way beyond what many in this industry thought possible. One needs to remember that the muscles are what create the forces to pull on the bones, which then initiates the movement. Somehow, strength and hypertrophy training has been overlooked, and in it’s place we now have every balance contraption imaginable, cones for running around and hurdles to jump over, bungee cords to provide resistance for every conceivable sporting movement imaginable.

Let’s get back to the jumping over hurdles and running around cones. Far too often as a strength coach and owner of a strength and conditioning facility, I see many parents walk though our doors and ask the desk staff about our speed, acceleration, and agility protocols, SAQ for short. Commonly, parents

are expecting to hear the running around cones and jumping over hurdles answer that has been heavily pushed through aggressive marketing programs. This running around cones and jumping over hurdles (rather than strength training) mentality has permeated the public through the advisement of “overzealous” SAQ specialists and centers, which seems to have gained considerable media coverage over the past few year, at least prior to many of them going bankrupt.

The idea behind these “centers” is for potential business franchisees to invest in minimal equipment, including small turf areas, cones, low, medium and high hurdles, medicine balls, low weight dumbbells, bands and chords galore, balance pads, mats, disks, BOSU’s, plyo-boxes, and if you are lucky pushing and dragging sleds. From this small investment one must then market the hell out of classes and group training (ie: groups of 5 or more athletes) to increase the hourly earning rate while keeping the cost low for the parents whom are sporting the bill. Think about it, how much do you think the previously mentioned equipment actually costs? Besides the small turf, many of these gadgets can now be bought at sporting good stores, even wal-mart, or even ebay. I can recall once reading an article on the fact that these SAQ centers require at least 25% new sign-up each month due to the 25% + loss of clientele each month.

Jumping Over Cones

With regards to the exciting cones and hurdles workouts, it only makes sense to be sure the athlete is both safe and stable enough to perform these “functional” exercises prior to participation. Looking at the hurdle jumping, what if the athlete is not strong or stable enough to perform the exercise? Often athletes are required to perform the exercises anyway, even though they may be detrimental to their health (13,19,26), never mind the negative impact they may have on their field performance. Doesn’t it make more sense to test the athlete first, to determine if the athlete has an structural imbalances which may need to be addressed prior to partaking in jumping and agility training (6,12,18,24).

For example, during testing an athlete may be found to have valgus (knee collapsing inward) stress in the knees during impact absorption testing. This combined with a lack of torso stability and tight hip flexors may open the door to potential injuries (1,6,22,24) during training and actual sporting



movements. Not only does this example show the need for what the world's most accomplished strength coach Charles Poliquin refers to as Structural Balance testing, but also the need to follow proper progression in order to achieve athletic potential and decrease injury risk.

You see, far too often, young athletes are just thrown into training programs with no real testing prior to participation. These programs may consist of dynamic movements when less dynamic muscle strengthening exercises should be prescribed. Back to the athlete with the valgus knee stress and unstable torso/tight hip flexors. When performing any one of the multiple flavors of low hurdle jumps (double leg, single leg, lateral, etc..), each impact can lead to an improper movement compensation due to the lack of strength in the athlete's VMO or lateral hip musculature (3,15,17,18,19,20). Combine this internal rotation /valgus stress (which can cause excess strain on the knee capsule) with the excessive forward and lateral lean during the impact, and here you have the potential for further injury to the low back or hip musculature, never mind the potential for an ACL tear (1,20,22,24).

If the coach training the athlete had tested for structural balance, rather than assuming this athlete was like the other five in the training "group" they would have realized that maybe this individual may need a different approach to their training. Perhaps unilateral strength training focusing on strengthening the weak/inactive musculature to ensure a proper foundation has been built prior to progressing to more dynamic, "exciting" exercises. Far too often, we are in a rush to get to the "good stuff", forgetting about the more important foundational work that got us here in the first place. How do I know this, well, as a strength coach with 16 years under my belt, I fell into the "functional training" trap back in the late 90's early 2000's.

Thanks to a study by Richardson and Hodges (1996) the TVA (transverse abdominis) and core training became quite popular in the training industry. Many seminars promoted the benefits of training these muscles, touting the increased stability for athletic performance and the decreased potential for back injury/chronic problems. Jumping on board, the way some of us approached athletic training almost did a complete 180, choosing lighter "core training" and stabilization exercises over conventional strength and power training methods.

During this time all the "exciting" functional exercises were making their way to mainstream training. Swiss balls, airex pads, resisted sprint devices, and Monica Lewinsky were making heads turn. Due to a select few highly publicized studies on therapy patients, the media hype regarding the stabilization and functional training



phenomenon was gaining momentum. At the time, I personally thought this made sense, choosing to hop on the board to ride the functional training wave. Less resistance but more instability, or less weight but more “sport specific” range of motion, and instantly you were the next Barry Sanders (mind you, I had seemed to forget the 1994 Sports Illustrated article touting his ability to squat 600 lbs back at Oklahoma State). With these decreases in resistance, many, including myself, became weaker, and of all things, less functional. If only I had realized that Sanders, one of the most agile running backs to ever play in the NFL, also had a pair of the strongest legs in the league, which I am sure he did not develop thru airex pad exercises and core stabilization training.

Realizing this, it was time to stop attending the highly publicized seminars touting the benefits of functional training and stabilization methods, and get back to more conventional wisdom. After all, the conventional methods worked for many decades prior to the most recent “training phenomenon”. Anyway, it was time to dust off “Supertraining”, re-read and study the collection of Charles Poliquin’s writings, and get back to what really works. After all, if it ain’t broke, why fix it.

As a strength coach, we are constantly bombarded with mailing for seminars touting the latest and greatest in sport specific training and functional training modalities. Now don’t get me wrong, some of these highly publicized seminars do have extremely knowledgeable and respected speakers, but there can also be a lot of recycled information to sift through. For instance, recently my staff and I received a



mailing for a seminar on “essential med ball training”. I cannot remember the last time I found med ball training to be truly essential for our athletes, especially in place of modalities to increase structural balance, functional strength, injury prevention, relative strength, vitamin/mineral/nutrient deficiency, correction of nutritional shortcoming and sport specific metabolic conditioning. Med ball

training can be an effective **supplement** to training, but when used as a training means unto itself, an athlete may be limiting their strength and power development potential.

As structural balance is corrected, an athlete has the opportunity to come closer to reaching their true athletic potential because the corrected weaknesses will no longer limit them from increasing strength and power. You know the old adage, you are only as strong as your weakest link, well that holds true here. For instance, if the previously mentioned athlete (valgus stress right knee, hip flexor tightness, weak low back musculature right side) decides to partake in a squat workout prior to correcting the structural imbalances, results may stall prematurely and the risk of injury may increase dramatically (1,4,13,17,22).

For example, when the previously mentioned athlete loads the spine while squatting, the right knee may constantly collapse inward, thus creating a weight shift toward the left leg. Accompanying this weight shift may be a hip hike, thus furthering the stress on the already weak low back. Not only are compensatory muscles and ligaments being heavily stressed and forced to absorb greater stresses than they are mechanically able to handle. Now upon the descending phase of the movement, those tight hip flexors can make themselves known awfully quick. As the body drops down, they exert a pulling force on the torso (due to their attachment to the thoraco-lumbar fascia), causing the torso to lean excessively forward, thus creating even greater strain on the back ligamentous structure. To compensate for this lean, the body may compensate with a torquing movement (as seen by the rotating of the bar toward the weak side). This can all lead to reiteration of the improper movement patterns, leading to chronic pains, stalled gains, and increased potential for a serious acute or chronic injury.

Now if only, the athlete had gone to a strength coach whom performed proper structural balance testing prior to training, this may have been corrected. The strength coach would have designed a protocol to correct the imbalances so when the athlete was ready to perform unilateral or more dynamic movements, their foundation would have been ready to partake in this level of training, and the compensations would have been minimal if present at all. During the squat, the right knee would not have collapsed inward due to the increased strength in the weakened musculature. The weight shift would not occur due to the proper activation and coordination of the musculature in both the thigh, hip, and back musculature. The hip shift would not occur due to the correct pulling action of the glute complex down on the pelvis, as well as the spinal stability caused by the hooping action of the intra-abdominal musculature, spinal extensor activation and the tension created on the thoraco-lumbar fascia. Here you have the combination of proper muscle activation patterns, muscle strength, muscle length, spinal stability, and range of motion (deep squats), leading to achievement of athletic potential.

RUNNING AROUND CONES

What about running around cones? To start, did you know that you could buy cones at home Depot and run around them in your back yard? So why utilize your time with a strength coach, performance enhancement specialist, or personal trainer zig sagging through these? Beside correction of technique, one can only wonder why. And how does one develop correct technique in running around cones? Lets look at a different athlete this time. One with everted feet and valgus stress on both knees. As this athlete decides to sprint from cone to cone, each cut can place excessive torquing stress

on the knee, leading to increased potential for an ACL tear (4,19,22,24). You see, with the feet everted (pointing outward) and the knees pointing inward, there is already excessive torque stress on the knee capsule, particularly the ACL and to some extent the PCL. Due to lack of muscle strength (possibly in the VMO, hamstrings, or lateral hip musculature) in the leg, the knee is unstable during those cutting patterns, allowing for an even greater torque stress (1,17). Combine this with the dynamic nature of the movement, and the risk of knee trauma is



Keep your VMO strong

markedly increased (1,22,24), or at the very least, the compensatory movement pattern is re-iterated over and over again.

Once again, if this athlete had gone through a proper evaluation and treated as an individual, rather than one of the “group”, they would have realized that hurdle jumping and cone running may be out of the question until corrections are made to the muscular imbalances. Proper low back/hip



extensor training, hamstring and quadriceps musculature strengthening (*yes, contrary to popular belief, it is possible to target the VMO with specific standing strength training exercises*), and lateral hip activation would then provide the athlete with a stable platform to then build their more dynamic movement training upon. It is really not rocket science, but a common sense approach to proper progressions of strength and conditioning.

FUNCTIONAL BAND RESISTANCE TRAINING?

Next, let's delve into the band resistance at every movement method of functional training. Does this truly make sense? First one must understand the fact that resistance applied to actual sporting movements can cause improper muscle recruitment patterns along with slower, less powerful motions (16,25). The bands also apply an accommodated resistance, in that they provide different resistances according to the amount they are stretched. One end range of motion will have the least if any resistance, while the further end range of motion will have the greatest resistance, and everything else in between will have varied resistance. Take for instance the ever so popular “baseball band swing”, seen at many of these specialized baseball performance centers.

At the beginning of the swing, there is very little resistance due to the lack of stretch in the band. So the muscle fibers initiating the starting strength aspect of the movement are exposed to minimal if any resistance, when in reality, this beginning range of the movement should be considered

one of the most important. Next, during the middle of the swing range of motion, where torquing momentum would combine with even more rotational power, the band begins to exert its resistance, little as it may be. Then finally at the end of the range of motion, when momentum and deceleratory actions begin to take place, the band tension increases to its greatest resistance. It is almost as if the resistance applied by the bands is inverse to the way it should be.

Next, let's look at the muscle activation patterns of the "swing movement". Try this simple test. If you are right handed, hold a bat in your left hand, with your right hand across your left oblique and rectus abdominis musculature. Perform a modified swing, rotating through as if swinging through with both hands. Did you feel a lot of activation out of your oblique and rectus abdominis musculature?

Next, hold the bat in the same starting position, but this time, put your right hand across your low/mid back, particularly the left side. Now perform the swing movement? Did you feel more activation from the back musculature than the oblique musculature? Hmmmm. And all those countless hours spent prone plank holding and rotational band exercises were supposed to increase your rotational power.

Perhaps low back strengthening exercises may have been better suited to increase this athlete's rotational power, rather than the band applied resistance baseball swinging. *(I can't give away all the secrets, but there are some very specific back strengthening exercises that we teach our clients to improve on their rotational power, strength, and range of motion.)*

Another popular "band resistance" motion is the boxing punch or baseball pitch. Ouch. The best thing these repetitive athletes could do is the exact opposite range of motion in order to correct structural imbalances, provide stability throughout the joint, and strengthen braking musculature to ensure proper mechanics and avoid injury. During the punch, once again, the tension is inverse to the way it actually should be, with the highest resistance at the distal end range of motion and the least resistance at the proximal/starting strength range of motion. Never mind the fact that the braking musculature is improperly deactivated at the distal end range, leading to increased injury potential.

LOW RESISTANCE/LIGHT WEIGHT TRAINING

Space saving, light resistance dumbbells that is. A quick review of physics can provide some insight. Power is defined as force divided by time ($P = F/T$). Understanding that force is product of mass X acceleration, therefore the greater the mass, the greater the force, and likewise for the acceleration.

In the most optimal situation, a large mass is accelerated quickly. In order to accelerate a greater mass, we need stronger muscles (as well as neuromuscular adaptations) to exert their pull on the bones to create the motion. To build stronger muscles, progressive resistance is required. How can we continually become stronger, if the available dumbbells only go up to a weight we can handle for 20-30 repetitions. This rep scheme is not a strength or hypertrophy rep range, rather a muscle endurance based range. Many of those previously mentioned SAQ training facilities invest in these light weight dumbbells, allowing for quick acceleration movements or muscle endurance rep ranges, rather than strength and hypertrophy based training.

BALANCE DEVICES

And what about the balance gadgets, aren't they supposed to increase our ability to balance on the field of play as well as recruit more muscle fibers than stable ground based training. (*Last I checked, gymnasts had some pretty good balance without training on airex pads and Bosu trainers.*) The problem here lies in the fact that if you are not strong, even a stiff wind could knock you over, no matter how good you are at balancing on one leg while standing on an airex pad juggling bodyblades and medicine balls. Without structurally balanced leg strength, the foundation of support upon which your torso must absorb impact is compromised. The ability to stabilize on each leg, while maintaining spinal stability is a key element in many sports, and unstable surface training may not be the most effective method for developing this skill, especially with regards to on-field transfer-ability. For example, some of the most agile and well balanced athletes myself and many of my colleagues have worked with did no unstable surface training, rather choosing to increase their structural balance, unilateral leg strength, bilateral leg strength, and low back strength through conventional and strongman training methods, as well as Olympic lifting/power training modalities. These highly efficient strength building methodologies were chosen over the heavily marketed gadgets (whose sales line the pockets of the manufacturers), allowing many athletes to achieve remarkable on-field success.

Ahem.....“CORE TRAINING”.

Lastly, the cutting edge “core” training methods which guarantee your success. Just out of curiosity, if jumping over hurdles and running around cones is supposed to be so great, then why are so many of these heavily marketed SAQ centers closing or going bankrupt? Perhaps a little too much spent on advertising, marketing, and recruiting (yes, the athletes are contacted by the company “athlete

recruiter” either via mail or phone call to invite/recruit them to come and train at their center so they can advertise that athlete X trains there), and not enough dinero spent on continuing education, product quality assurance, staff education, and truly effective equipment.

The core, according to Wikipedia is, basically “the body minus the arms and legs”, including the muscles of the pelvic floor (muscle fibers of the levator ani, the coccygeus, and associated connective tissue which span the area underneath the pelvis), anterior carriage abdominal musculature (rectus abdominis, TVA, internal/external oblique), Dr. Stuart McGill’s term: “the deep 6” (piriformis, obturator internus and externus, gemellus superior and inferior, and quadratus femoris), spinal erectors, multifidi, lats, glutes, diaphragm, and traps. So here we see a balance between anterior/posterior/and lateral musculature which creates spinal stability. The problem with “core” training as we know it is that most of it is done in a horizontal prone or supine position, when most sport is played in an erect/upright posture (*more on that in future readings on “core” training*). A second problem with “core” training, is it seems there is a general misunderstanding as to which muscles make up the core, and an overemphasis on training only the anterior carriage musculature including the rectus abdominis, TVA, and obliques, while “forgetting” about the ever so important musculature of the low back. After all studies have shown, it is the hooping effect of the TVA/Obliques leading to increased spinal pressurization and low back muscle strength which creates spinal stability during compressive and shear forces (ie; pushing or absorbing lateral impacts about the torso).

With that in mind, are the “core” supine plank holds, “core” seated rotational movements, “core” med ball throwing exercises, “core” stability ball exercises, “core” balancing exercises, and many other horizontal “core” exercises really as effective at increasing on field stability as advertised? Or are there more effective and transferable methods to achieving upright on-field stability? *Stay tuned for our future readings!*

Enjoy, work.....and succeed!

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