

TEXAS
Coach

January 2011

2010 FALL
STATE CHAMPS

5A-Div I Football
Pearland

4A-Div I Football
Lake Travis

3A-Div I Football
Henderson

2A-Div I Football
Daingerfield

1A-Div I Football
Mart

6-Man-Div I Football
Garden City

5A-Div II Football
Cibolo Steele

4A-Div II Football
Aledo

3A-Div II Football
Carthage

2A-Div II Football
Idalou

1A-Div II Football
Falls City

6-Man-Div II Football
Richland Springs

5A Boys Cross Country
The Woodlands

4A Boys Cross Country
Cedar Park

3A Boys Cross Country
Lucas Lovejoy

2A Boys Cross Country
Luling

1A Boys Cross Country
Sundown

5A Volleyball - Hebron

4A Volleyball - Lake Travis

3A Volleyball - Lucas Lovejoy

2A Volleyball - White Oak

1A Volleyball - Round Top-
Carmine

5A Team Tennis
New Braunfels

4A Team Tennis
Highland Park

5A Girls Cross Country
Humble Kingwood

4A Girls Cross Country
Highland Park

3A Girls Cross Country
Lucas Lovejoy

2A Girls Cross Country
Spearman

1A Girls Cross Country
Gruver

A CRITICAL LOOK AT FUNCTIONAL TRAINING

*Matt Brzycki
Princeton University*

Over the course of the past 25 years or so, athletes have been encouraged to do ground-based training, balance training, stability training, core training and rotary training. Each arrived with much fanfare and was touted as the latest and greatest method of training. These types of training are a bit related with some degree of overlap and, in a certain sense, evolved from one another probably beginning around the mid-1980s with the promotion of closed kinetic chain exercises (essentially, multiple-joint movements).

The latest step in this evolutionary process is functional training. In fact, one of the most popular – and overused – buzzwords in recent memory is “functional.” Nowadays, athletes are told that they must do functional training to increase their functional fitness by performing functional exercises with functional equipment while wearing functional shoes and then eat functional foods and drink functional beverages. You get the idea.

Ironically, the term “functional training” really isn’t all that new. Edith Buchwald, a physiotherapist, wrote about functional training long before it became fashionable. Her article on the subject appeared more than 60 years ago in the November 1949 issue of *The Physical Therapy Review*.

WHAT IS IT?

“Like many other catch phrases, there’s no clear definition of functional training,” says Chip Harrison, Director of Strength and Fitness at Penn State. “That’s my biggest problem. Huge assumptions are made as to what it means and how it’s applied.”

Indeed, ask 10 fitness professionals to define functional training and you’re liable to get 10 different answers. In a nutshell, though, most would say something to the effect that functional training simulates or resembles movements and activities that are done in “real life.” (It follows, then, that “functional” describes a movement or an activity that simulates or resembles another movement or activity that’s done in “real life.”)

The fuzzy definition of functional training has spawned huge criticism from a diverse group of fitness professionals. “Based on the definition and so-called theories about functional training, I could go into the weight room and bang my head against the wall and that should help make me functional for a car crash,” says Sunir Jossan, the Fitness Director at the National Counterterrorism Center in McLean, Virginia. “It just makes no sense.”

“The truth is that any exercise is functional if it helps one to achieve their movement goal,” says Paul Juris, Ed.D., the Executive Director of the Cybex Institute for Exercise Science.

Tom Kelso, an exercise physiologist with the Saint Louis Metro Police Department, agrees. “Any activities that are safe and appropriate can be considered functional,” says Kelso. “What should not be considered functional are the gray-area activities that are alleged to improve balance, coordination, speed-strength, stability and other performance variables. These activities do not replicate specific skills or daily tasks that are done in real life.”

Countless movements and activities are performed under the pretense of

being “functional” or done in “real life.” But there are scores of supposed functional exercises that don’t fit the definition of “functional” or resemble anything in “real life.” For example, what’s “functional” about sitting on a stability ball, rotating the torso to the left, bouncing a medicine ball off the ground twice, rotating to the right, bouncing a medicine ball off the ground twice and then repeating this for a prescribed number of times? What’s functional about holding a medicine ball with the arms straight and parallel to the ground, stepping forward with the left foot into a lunge, rotating the arms to the left, standing up, stepping forward with the right foot into a lunge, rotating the arms to the right, standing up and then repeating this for a prescribed number of times?

These are just two examples. A multitude of other “functional” exercises are regularly performed by athletes that really aren’t done in “real life.”

CLOSED KINETIC CHAIN EXERCISES

Another point of contention with functional training is the reliance on closed kinetic chain exercises (multiple-joint movements) and avoidance of open kinetic chain exercises (single-joint movements). Consider two exercises for the legs: the leg extension and squat. It’s thought that the leg extension isn’t “functional” because it’s an open kinetic chain exercise (and resembles no movements that are ever done in “real life”). On the other hand, it’s thought that the squat is “functional” because it’s a closed chain kinetic exercise (and resembles movements

that are often done in "real life").

However, this viewpoint is the subject of considerable debate. "The argument that open kinetic chain exercises somehow erode physical performance bears very little merit," says Juris. "There is little to no empirical evidence that leg extensions are in any way detrimental to motor function. It is difficult to argue, for example, that the inclusion of leg extensions in an exercise regimen would negatively affect one's ability to climb stairs. Likewise, given the critical role of the knee joint during gait, it is more likely that leg extensions would provide a substantive benefit to runners."

Dan Riley has a unique perspective on this matter, having spent 27 years as a strength coach in the National Football League (NFL), 19 with the Washington Redskins and 8 with the Houston Texans. "I have trained hundreds of athletes in my career," Riley states. "Some came from colleges and some came from other NFL teams. It is shocking how weak some of these players were on single-joint, isolation exercises. Athletes who only did the squat, lunge, leg press or other multiple-joint exercises for their hips and legs were extremely weak in single-joint exercises for their hamstrings, quadriceps and hip flexors."

"Goal acquisition may be difficult if one has specific muscular strength deficits or imbalances," Juris adds. "Accordingly, one may need to isolate those muscles in a controlled environment in order to become functional."

The issue actually goes beyond single-joint versus multiple-joint exercises. Riley notes, "Advocates of functional training often say, 'Train movements, not muscles.' When I give presentations on rehab, one of my slides states, 'Train muscles, not movements.' That's because it takes muscles to perform movements."

"The function of skeletal muscles is to produce movement," explains Dave Durell, President of Sports and Fitness Training Systems in Clearwater, Florida. "Therefore, any exercise or movement that strengthens the muscles

will improve the body's ability to move during the activities performed in real life, whatever those activities may happen to be."

SPECIFIC . . . OR JUST SIMILAR?

At the heart of functional training is the notion that it adheres to the Principle of Specificity, one of the most frequently cited doctrines in the science of motor learning and skill development. This principle states that an activity must be specific to an intended skill in order to produce a maximal transfer of learning.

The word "specific" means "exact" or "identical" not "similar" or "like." So, squatting on a BOSU (half-dome) ball may be "similar" to leaping for a rebound but squatting on a BOSU ball will only help an athlete get better at squatting on a BOSU ball. Remember, it's the Principle of Specificity not the Principle of Similarity.

"It is a mistaken belief that functional exercises carry over to everyday movements in real life," states Luke Carlson, the Chief Executive Officer at Discover Strength Personal Fitness Center in Plymouth, Minnesota. "The scientific research in the area of motor learning and control definitively indicates that doing exercises in an attempt to mimic everyday movements does not carry over to everyday movements."

"The ideology of performing an exercise that attempts to mimic a skill seems to be pointless, at best," notes Brian Wilt, Ph.D., a professor at Lock Haven University of Pennsylvania. "Most authorities who have some grasp of the motor-learning literature support the principle of practicing a skill in exactness under environmental conditions that replicate what will happen in real life."

"The truth is, functional training clearly violates the Principle of Specificity and skill transfer," adds Kelso. "Tossing a yo-yo is a functional exercise . . . but only if your goal is to get better at tossing a yo-yo," explains Harrison.

On a related note, athletes are

often told to perform exercises while balancing on a variety of objects. Yet, name one sport that's played on a surface that in any way resembles a BOSU ball, stability ball, wobble/rocker board or foam roller.

What determines if one skill is specific to another? The two skills must employ the exact same muscles, have the exact same movement pattern, use the exact same speed of execution and involve the exact same resistance. In order for an exercise to be specific to a skill, all four of these elements must be true. An exercise may resemble a skill in terms of using the exact same muscles, movement pattern, speed of execution and resistance. But at best, an exercise can only approximate a skill, not duplicate it. There's no exercise done in the weight room – with free weights, machines, medicine balls, resistance bands/tubing or anything else – that will expedite the learning of a skill.

The late Arthur Jones once stated, "Add resistance to a skill and it becomes a different skill; add enough resistance to a skill and it becomes an exercise."

That's why it's a mistake to combine skill training and strength training. Skill training is specific but strength training is general.

Kim Wood, who was the strength coach of the Cincinnati Bengals for 28 years, says, "I believe that strength training's proper place is to train the 'raw material' of the body safely and efficiently and, at another place and time, practice the athletic skills in a specific fashion – a far cry from the functional training of today."

Michael Bradley, the Basketball Strength Coach at Florida State University, makes an important observation. "Attempting to mimic movements distracts enormously from the task of training hard," says Bradley. "And training hard is what we want and need athletes to do."

Juris concludes, "As it relates to the development of skill, we are better off diverting ourselves from the notion that we should improve performance in the weight room by loading complex movement patterns."

FUNCTIONAL BUT FOR WHOM?

It's interesting to look at the growth of functional training. At first, functional training was used by therapists who worked with unhealthy people in rehab facilities. At some point and for some reason, functional training was adopted by personal trainers who worked with healthy people in fitness facilities and then strength coaches who worked with athletes in sports facilities.

So, functional training has its roots in the rehab/therapy industry. And in fact, the vast majority of scientific research on functional training has examined individuals who require or undergo some form of rehab/therapy. For instance, studies on functional training that were published in 2010 looked at "frail institutionalized older persons," "school-aged children with cerebral palsy," "boys with Duchenne Muscular Dystrophy," "patients with total knee arthroplasty" and "pediatric and adolescent patients with osteosarcoma."

Because functional training was meant for unhealthy individuals, it's difficult to understand why it has become so popular with healthy individuals when their needs and goals are so markedly different.

THE "GOOFY STUFF"

Initially, functional training may have had the best of intentions but it has gone horribly awry. Wood states, "When I used the term 'functional,' it was in the context of talking about training to do things: training as a means to an end, not an end in itself. The 'end' being a better football player or wrestler or other athlete." He adds, "It was certainly never the goofy stuff they are doing today."

Walk into most places where people are exercising and there's a good chance that you'll witness "the goofy stuff." In a circus-like atmosphere that would make P. T. Barnum proud, "performers" squat on stability balls (sometimes with a barbell on their shoulders); push and pull on rainbow-colored resistance bands/tubing; play catch with medicine

balls; execute "woodchoppers" with kettlebells; balance on one leg with their eyes closed on wobble boards; do alternating, one-arm rows with dumbbells while in a push-up position; stand on foam rollers while bent over at the waist with one leg held out to the side; and even juggle tennis balls. The only thing that's missing is a trapeze.

In most cases, functional training has minimized or eliminated the use of traditional equipment like selectorized and plate-loaded machines; even the venerable barbell is sometimes shunned, especially when used in exercises that aren't ground-based. Instead, functional training emphasizes a wide variety of "functional equipment" including medicine balls, stability balls, BOSU balls, wobble/rocker boards, foam rollers, kettlebells and resistance bands/tubing. Thus, some exercises are eschewed and others are espoused.

Mark Asanovich, who spent 14 years as a strength coach in the NFL with four different teams, states, "Since the inception and acceptance of functional training into mainstream exercise, heaving medicine balls and kettlebells and balancing on stability balls have, unfortunately, become the norm."

It seems that as long as an exercise is performed with one of these stage props, it's deemed "functional training." But in reality, doing an exercise with a BOSU ball or other gadget instead of a barbell or machine doesn't necessarily make an exercise more functional. "Advocates of functional training give the impression that if you train with traditional equipment you are going to end up weak and uncoordinated," says Durell. "It doesn't work that way."

"A stronger muscle is a more functional muscle," notes Doug Scott, the Strength Coach and Fitness Director at The Pingry School in Martinsville, New Jersey. "Since you can get stronger with any type of equipment, including barbells and machines, why aren't traditional exercises considered to be functional? For example, why is doing a bench press on a stability ball perceived as functional but doing the same exercise on a stable bench is not?"

THE FORGOTTEN PRINCIPLE

Good, old-fashioned strength training has taken a backseat to functional training. And the Overload Principle, one of the foundational concepts in exercise physiology and cornerstones of progressive training, has fallen by the wayside.

"Functional training ignores the Overload Principle," states Kelso. "It's almost as if overload is considered old school. But old school works: The wheel is round, so keep it round."

There are other key components of productive training that are often absent from functional training. "Tried and true programs emphasize the quality of work and intensity of effort," Asanovich says. "This is not the case with functional training."

How critical is this? According to Carlson, "Functional training has a glaring flaw that seems to be ignored by nearly all of its advocates: Both the tension and load to which the muscles are exposed are minimized and in doing so, the many health benefits associated with strength training are minimized or eliminated."

"Muscles respond and adapt best to high-effort, heavy exercise that puts mechanical stress and tension on the fibers," adds Bradley. "Without these conditions, functional training is a giant step backwards."

This assertion is echoed by Harrison who states, "The absence of overload, intensity and progression basically ensures that functional exercises/programs can't work over time. The lack of those components guarantees it."

So what's the best way to become "functional"? Simple. "First, identify the muscle used to perform the movement," says Riley. "Next, determine the primary function of each muscle. Then, find an exercise that provides resistance through each muscle's greatest range of motion."

THE BOTTOM LINE

Oddly enough, functional training has denigrated into something that

might best be described as dysfunctional training. Coaches should spend more time implementing programs that are based on overload and intensity and less time sitting around trying to think of 1,001 things to do with a stability ball.

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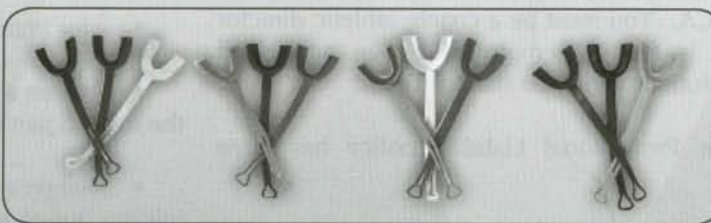
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