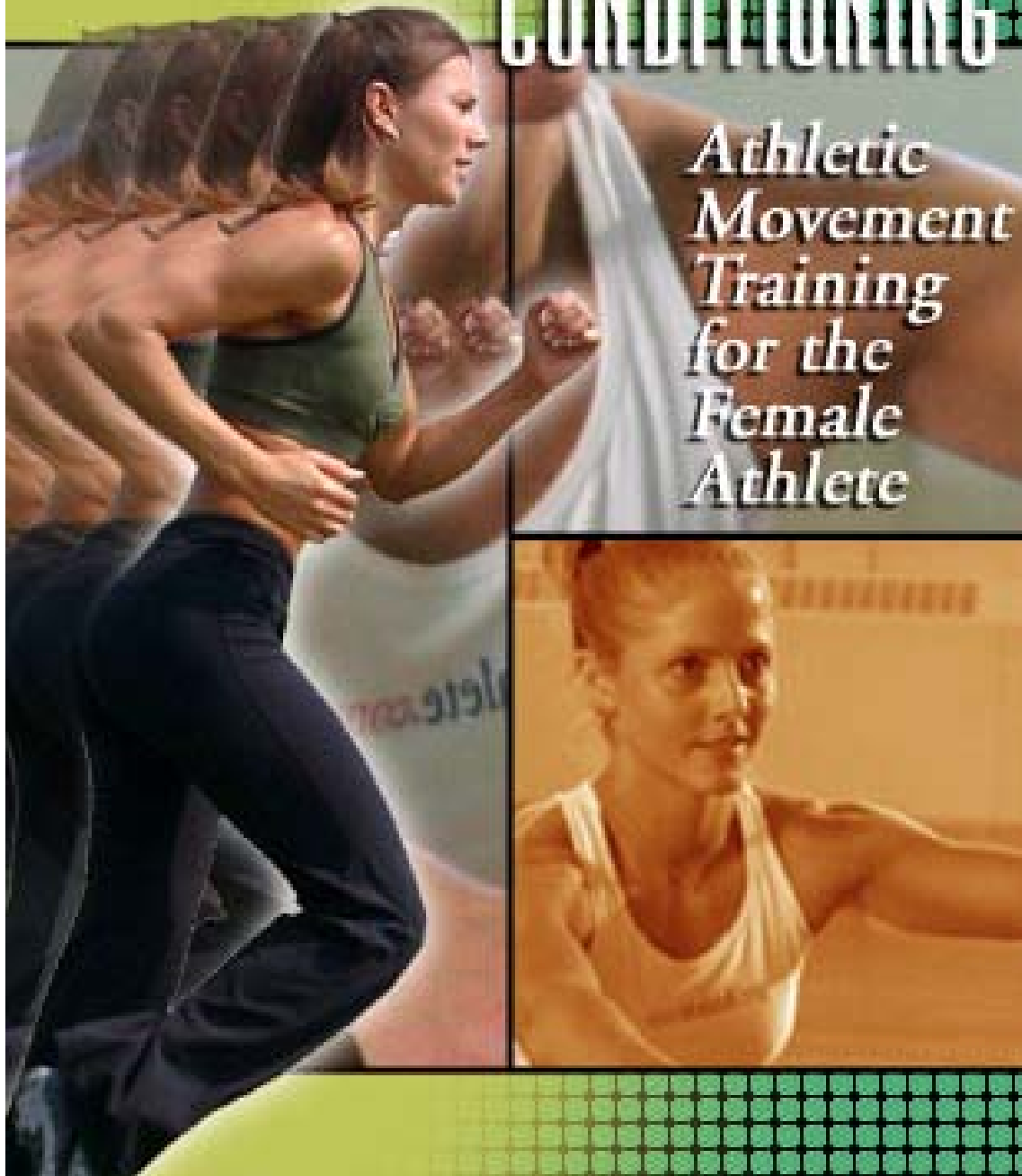


*grrlAthlete.com* presents *Secrets of*  
**FEMALE STRENGTH AND  
CONDITIONING**



*Athletic  
Movement  
Training  
for the  
Female  
Athlete*

# **SECRETS OF FEMALE STRENGTH & CONDITIONING**

Athletic  
Movement Training  
for the  
Female Athlete

[www.grrlAthlete.com](http://www.grrlAthlete.com)

*This book is intended for educational and informational purposes only. Please see a qualified medical professional if you have any questions about your health.*

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# **FORWARD**

By: Andrea Leand

The principles of athletic development for women are finally revealed in *grrlAthlete.com's* best-selling book, "Secrets of Female Strength and Conditioning."

With a keen understanding of sports science and vast experience training hundreds of athletes at all levels, your authors - some of North America's best-known and most respected personal trainers and strength coaches- have created for you an effective, fun and practical outline of the principles needed for women to achieve their personal athletic goals.

This book demystifies strength and conditioning and offers proven principles and plans to achieve increased speed, strength, power and conditioning along with injury prevention strategies.

This book integrates all aspects of training including sports nutrition and injury prevention, and speed, strength and agility programs, to provide women with an easy- to-understand way of getting conditioned and into shape for virtually any sport.

Leading fitness experts - Stephen Holt, Rachel Cosgrove, Erin Perry, Ryan Lee, Alwyn

Cosgrove, Mike Gough, Brian Grasso, Jeremy Boone, and the Team at *grrlAthlete.com* - bring to you insider tips and sport-specific training methods. This book fuses fitness and health into a winning formula for coaches, athletes and women of all ages.

- - - -

Andrea Leand has written extensively on tennis for USA Today and Tennis Magazine. She played on the professional tour for 13 years ranking as high as a number 12 and reaching the quarter-finals at Wimbledon. For the past four years, she has worked with your Core Training author, Stephen Holt.

## **About *grrl*Athlete.com**

***grrl*Athlete.com** is a unique on-line training resource dedicated to helping female athletes become stronger, faster, and overall better athletes. The *grrl*Athlete motto, “Strength through Knowledge”, is the philosophy of our website and is the foundation of our approach to training athletes.

The *grrl*Athlete team is available for seminars, program design, training camps, and consulting for University, amateur, and elite athletes in the Greater Toronto Area and throughout Southwestern Ontario.

For more information, contact [\*grrl@grrlathlete.com\*](mailto:grrl@grrlathlete.com), or visit [www.grrlAthlete.com](http://www.grrlAthlete.com).

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## **Introduction**

We are thrilled that you have taken the opportunity to learn more about becoming stronger, faster, more agile, and injury free. It is our goal to provide the most comprehensive resource available to athletes, coaches, and parents involved in female sports.

Our experts have written exciting chapters covering a number of topics, but it's important to note that the opinions of strength and conditioning coaches are like snowflakes. No two are alike. When reading “Secrets of Female Strength and Conditioning”, you'll notice that differences in opinion exist even among the experts. These opinions are based on science, anatomy of the human body, and thousands of hours of experience held by each expert in the area of training female athletes.

What they do all agree on is that female sport preparation has a long way to go in order to reach optimal levels. You will learn that there are far too many preventable injuries taking place. You will also hear that some forms of common and traditional training methods are inefficient or even ineffective.

The goal of this book is to provide you with the theory and application of strength and conditioning methods for the female athlete. In covering the range from injury prevention to



optimal performance, we believe that the experts cover all the topics important to the female athlete.

Enjoy the book and be sure to visit all of the web sites mentioned so that you can learn even more about the “Secrets of Female Strength and Conditioning”.

Sincerely,

The Team at *grrl*Athlete.com

[www.grrlathlete.com](http://www.grrlathlete.com)

Strength Works, Inc.

## **Evaluating the Female Athlete**

by Alwyn Cosgrove

*“Failing to prepare – is preparing to fail”*

*“The only difference between you now, and you in five years time will be the people you’ve met and the books you’ve read” – Charlie ‘Tremendous’ Jones.*

Read the above statement again. Kind of profound. But the longer I am involved in this field, the more this quote has made perfect sense. Whenever your progress in life comes to a plateau, the problem may be physical, emotional, financial, but it’s roots are almost always a result of your level of knowledge. With that maxim firmly in place, I commend you for purchasing this training manual. Let me be the first to welcome you to the journey ahead.

This is the chapter that most of you will skip by – to get to the good stuff that comes later. However, when you get right down to it, this might be the single most important part you are going to read. *This is where the road to the championship begins.* If you want to have what most people will never have, you’ve got to do what most people will never do.

A wise man once said, “the only place success comes before work is in the dictionary”. But you can add that before success, and before work, comes planning and preparation.

Picture the scenario: you are in Los Angeles and need to get to New York. You have two options; get in your car and head off, hoping you'll get there, or you can map it out – design your plan and ensure that you'll arrive.

Most of you I hope will choose option two – using a plan. However when it comes to athletic preparation, most athletes and coaches use a “wild guess” approach to training, but that is not the most scientific method.

Think about it. Why are you doing anything in training? To improve on the field, ice or court, right? So how can you be sure that what you are doing is what you NEED to be doing?

Paul Chek is known for saying, “Exercise is a drug”. To further explain what Paul means, understand that the correct drug, in the correct dose, will give the correct result. However, the wrong drug, or even the right drug in the wrong dose, can cause harm.

So how do we determine what exercises we should use? What methods will work for me? How can we be sure we have the correct ‘map’ so to speak?

The answer is to know where you are now. Know your starting point.

I run a fitness and sports training facility in Southern California. Now whether your goals are to qualify for the national championships, improve your jump shot, or just lose ten to fifteen pounds of body fat, my staff and I can help you. I guarantee it – every time. We produce results by design, not by coincidence. Our secret? EVERYONE – athletes, moms, and grandmas all start with an evaluation that determines the ‘blueprint’ for the training program.

Whether it's by athletes, coaches or magazine editors, what I get asked for most is not the theory behind program design or any of the workouts I design, but for copies of the workouts. But these "one-size-fits-all" training programs make as much sense as having a one-size-fits-all shoe. Different people need different training programs, as they tend to have different goals, different starting points, different strengths and weaknesses and different time frames to achieve their goals. There is no such thing as a magical program (although bodybuilding magazines have attempted for years to propagate the idea of secret workouts). The only way to guarantee success in training is to perform a thorough evaluation prior to beginning to train.

I see many coaches give lip service to testing. They test regularly. However, the results don't seem to change anything. The programs are never adjusted – they test just to 'keep score' or test for testing's sake. The ONLY purpose for any kind of testing or assessment is to evaluate and orientate training.

The evaluation at my facility consists of several parts – a training history evaluation, a postural evaluation, a range of motion evaluation, the Functional Movement Screen (as designed by Gray Cook) and several performance tests.

Most athletes have done some kind of performance testing. Vertical jump, 40yd-dash time, bench press, etc., are all familiar to the athlete and the coach. But as you can see above, they are the least important factors in the evaluation that we use.

Consider the following example. Two eighteen-year-old female athletes both have slow 40-yard dash times. However no fundamental postural, range of motion or functional movement testing has been carried out. With only the running time information, we have to conclude that both athletes have the same problem – they need speed training.

However if we had carried out the other tests, we reveal that athlete A has good range of motion in the hip structure, excellent muscle balance, and good core stability and athlete B does not. Therefore the athletes do not have the same problem. Athlete A needs speed training. Athlete B would need a period of mobility and corrective exercise work first. In other words, before we race the car, you should align the wheels! Therefore, the speed of the movement is secondary to the quality of that movement.

To fully describe each of these tests, and how to administer and interpret the entire spectrum of results is beyond the scope of this chapter – and to be honest requires extensive training under qualified supervision.

So the tests I am about to describe have been carefully chosen to allow even the most inexperienced coach to gain valuable information from the assessments, and be able to fine-tune and customize the athlete's conditioning program.

## Tests

### **Deep Squat test:**

(taken from The Functional Movement Screen by Gray Cook – test and scoring modified by Alwyn Cosgrove)

The Deep Squat - to assess bilateral, symmetrical, mobility of the hips, knees, and ankles. The dowel held overhead assesses bilateral, symmetrical mobility of the shoulders as well as the thoracic spine.

The client assumes the starting position by placing her feet shoulder width apart. The client then adjusts their hands on the dowel to assume a 90-degree angle of the elbows with the dowel overhead. Next, the dowel is pressed overhead with the shoulders flexed and abducted, and the elbows extended. The athlete is then instructed to descend slowly into a squat position. As many as 3 repetitions should be performed. The squat position should be assumed with the heels on the floor, head and chest facing forward, and the dowel maximally pressed overhead.



(Correct)



(Incorrect)

A perfect score would include

- Upper torso is parallel with tibia or toward vertical
- Femur below horizontal
- Knees aligned over feet
- Dowel aligned over feet

Any one of the above qualities not present results in a failed test.

The ability to perform the Deep Squat requires closed-kinetic chain dorsi-flexion of the ankles, flexion of the knees and hips, extension of the thoracic spine, as well as flexion and abduction of the shoulders.

Poor performance of this test can be the result of several factors. Limited mobility in the upper torso can be attributed to poor glenohumeral and/or thoracic spine mobility. Limited mobility in the lower extremity including poor closed-kinetic chain dorsi-flexion of the ankle and/or poor flexion of the hip may also cause poor test performance.

### **Modified Thomas Test:**

The client lies supine (on her back) on a massage or treatment table, with both legs bent to 90 degrees (the gluteal fold should be on the edge of the table). Stabilize the pelvis by placing your hand under the athlete's lumbar spine. Hold one leg to the chest and let the other leg down as far as it can go. If the thigh of the hanging leg is not aligned with or below the table edge, the client fails the test for hip flexor flexibility.

Additionally we also attempt to flex the knee on that side. If the knee flexes easily, the tight hip flexor is the iliopsoas (positive test for iliopsoas). If you are unable to flex the knee, or resistance is felt, the rectus femoris is also tight. Obviously the test needs to be repeated on both sides. A positive finding should lead to the inclusion of a stretching routine emphasizing the hip flexors and quadriceps groups, and a strengthening routine for the hip extensors - the glutes and hamstrings.



**Waiter's bow – lumbopelvic rhythm assessment:**

To perform this test, stand erect with your feet together. Take a pinch of skin between your fingers at the lower back at the L3 position (directly opposite the belly button). Bend forward with the knees locked straight (like a waiter serving wine, hence the name of this test).

- With normal upper hamstring length, you will be able to bend the trunk 50 degrees forward at the hips while holding the pinch of skin (i.e. maintaining a curve in the lumbar spine).
- If you do not have adequate hamstring length then you will not be able to bend forward and maintain the lumbar curve. The pinch of skin will be pulled from your fingers.



- If you fail this test, merely holding the position at the end range of your motion for 60 to 90 seconds will be helpful.



### **Upper Abdominal Test (Janda's upper abdominal test)**

(taken from Kendall & Kendall – modified by Chek)

Performing the test:

- Client lies supine with their knees bent to 15 degrees and the balls of the client's feet resting in the tester's fingertips. The toes remain pointed during the entire test.
- When pressure is on the ball of the foot, and the knee is bent to 15 degrees the ITB switches on, the glutes switch on and therefore the iliopsoas switches off – meaning we are seeing a true test of upper abdominal strength.
- Ask the client to maintain constant pressure on the tester's fingertips as she performs an abdominal trunk curl (lifting the shoulders 1-2 inches from the floor)
- The client fails the test when she cannot keep pressure on the tester's hands and her feet lift up.



Results:

- Completion of a trunk curl with arms outstretched = 60% of normal strength
- Arms across chest = 80% normal strength
- With fingertips touching mastoid process = 100% or normal strength

#### **Lower abdominal Strength test:**

Performing the test:

- Client lies supine with her legs outstretched and pointing straight up at 90 degrees. The tester's hand should be under her back at the level of L3.
- With the legs held perpendicular to the floor (pointing straight up), ask the client to maintain constant pressure on the tester's fingertips and maintain that pressure throughout the test.
- The client slowly and under full control lowers her legs.
- The client fails the test when they cannot keep pressure on the tester's fingertips (i.e. the spine begins to lift up).



Results:

- Lowering the legs to 45 degrees = 70% normal strength.
- Lowering the legs to 30 degrees = 80% normal strength
- Lowering the legs to 15 degrees = 90% normal strength
- Lowering the legs to 0 degrees (flat on floor) = 100% normal strength

Obviously failing this test will require the addition of lower abdominal strength work.

## **Conclusion**

Results by design and not by coincidence are brought up one way only – with correct planning and program design. The entire process falls apart if we don't start with a good evaluation. However, with a good evaluation you cannot fail.

Good luck with your training – know your start point and you can predict your end point!

Alwyn Cosgrove

Please note:

It would be unprofessional of me to not mention those that have taught me these tests and evaluation, either in person or through their work. The following are my teachers in this field: Gary Guerriero, Charles Poliquin, Ian King, Gray Cook and the Functional Movement Screen team, Paul Chek and the staff at the Chek Institute, Mike Clark and the NASM, Jim Liston, Robert dos Remedios, and the teachings of the late Mel Siff. For those of you I have forgotten to mention – my humble apologies. I am still a student and you are all my teachers whether you know it or not.

I would also like to thank the photo model, Jackie Hines. Thanks for the demonstrations Jackie!

# **Overview of Sports Specific Training**

By: Ryan Lee, MS, CSCS

*"Success must be felt within before it can be seen on the outside." - Unknown*

When I was asked by the [grrlathlete.com](http://grrlathlete.com) team to write a chapter for a book about sport specific training, I jumped at the chance.

Female athletes are finally beginning to receive respect in the sports world. No longer are male football players the only athletes working with strength coaches and athletic preparation coaches.

This chapter will give you an overview of what's been happening in the world of sports training.

## **What is Sport Specific Training?**

Whether you're a coach, trainer, parent or athlete, chances are you've heard the term 'sport specific training' recently. So what does it really mean?

Sport specific training is essentially a training program designed based on the movements and energy demands of a particular sport. For example, a female soccer player would

train with exercises ‘specific’ to soccer. She would work on improving hip flexor strength, overall lower body power and emphasize a combination of anaerobic and aerobic training, (you’ll see some sample programs later in this chapter).

This type of specialized training has been very popular lately in the strength and conditioning industry. It’s showing up in all the major magazines and newspapers. It began as a backlash against traditional body building workouts being used for athletes, and with high-profile athletes like Barry Bonds using these advanced training methods it’s literally exploded.

Unfortunately, parents and coaches are taking the concept of sport specific training and sport specialization too far. I’ve had parents ask me to train their seven year old for just one sport. I firmly believe kids should not specialize in one sport until they are at least in their late teens.

Why?

First, when a child trains for only one sport, they’re not developing as fully as they should be. They’re often neglecting any number of important components of their athletic development, including flexibility, agility, muscle balance, or power. If you examine any professional female sports team, I guarantee almost all of the players were incredible multi-sport athletes in jr. high and high school. The reason they made it to the professional leagues is because they developed as complete athletes.

With early sport specialization you are almost certainly to have overuse injuries. Performing the same movements day after day and year after year takes its toll on the athlete's body.

Last and most importantly, I've seen thousands of kids experience burnout with their sport at a young age and often they quit sports altogether. We want to ensure our female athletes are physically active for their entire lifetime.

When I speak with parents and coaches about the problems with sport specialization at a young age, the most common question is: "What about athletes like Serena Williams and Tiger Woods who started playing one sport when they were very young?"

Those athletes are simply exceptions to the rule. For every Serena Williams, there are tens of thousands of female tennis players who never make it to the pro tour because of injury or simply burnout.

So when should athletes specialize in only one sport? I recommend the late teens.

Bottom line: the goal of any training program should be to develop well balanced, healthy female athletes.

With that being said, let's take a close look at the most common types of training programs.

### **Sport Specific, General Training and Athletic Development**

I like to break down training programs for athletes into three categories.

1. Sport Specific
2. General Training
3. Athletic Development

#### **Sport Specific**

As I just explained, sport specific training is simply training for a sport. The types of exercises tend to be very movement specific. While there are benefits associated with sport specific training, you must be very careful when explaining this training philosophy with young female athletes.

#### **General Training**

This type of training tends to be more of the traditional strength training and conditioning which has been used for decades. The exercises are usually more 'body-building' type exercises and chances are you'll still see many athletes training like this in many high schools across the country.



You'll see lots of bicep curls, leg extensions, leg curls, triceps extensions, lat pull-downs, and bench presses. The conditioning programs usually consist of long slow running programs.

While this type of training is good to build overall strength and hypertrophy, its merits for athletic enhancement have been hotly debated.

### **Athletic Development**

More and more strength coaches are starting to embrace the idea of building a better all-around athlete. These types of athletic development programs usually involve more 'functionally based' and body weight exercises. For example, you will often see a lot of emphasis on running mechanics, balance, core strength and stability.

Conditioning programs are more agility and movement oriented. Numerous shorter sprints and interval training as well as body awareness drills are common.

### **Training in Action!**

Let's take a closer look at sport specific training, general training, and athletic development in action. Below is a sample workout program for a high school female **softball player** utilizing the three training categories:

#### **Sport Specific Workout**

##### *Strength Exercises*

- Medicine Ball Rotational Throws

- External Shoulder Rotation
- Seated Rows
- Dumbbell Angle Lunges
- Modified Bench Flyes

### *Conditioning*

- 5 sprints from home to first base
- 5 sprints from home to second base
- 5 sprints from home to third base
- 5 sprints around all the bases

### **Athletic Development Workout**

#### *Strength Exercises*

- Stability Ball Rotational Crunch
- Forward and Reverse Lunge and Reach
- Single Leg Squats
- Standing Cable Press
- Plyometric Pushups

### *Conditioning*

- 5 dynamic flexibility drills
- Running Mechanics Skill Work
- 3 sets of speed ladder drills
- 360 degree sprints

### **General Training Workout**

#### *Strength Exercises*

- Bench Press
- Squat
- Bicep Curls
- Triceps Extensions
- Shoulder Press
- Situps

### *Conditioning*

- ½ Mile Warmup
- Static Stretching
- 3 Mile Run

## **Speed/Agility training**

Improving your speed and agility is another major topic in the world of strength and conditioning.

You really don't need a lot of expensive equipment to improve speed and agility. A couple of cones and maybe some small hurdles along with open space is all that is necessary.

When training female athletes, it's important to carefully examine running form and mechanics. Watch for extra movements such as the arms crossing in front of the body.

Remember the rule of KISS (Keep it Simple, Silly!). Create different zig zag movement patterns with the cones and have your athletes run through these movements (again, be sure to watch for poor form).

Be careful when using bungee cords and speed chutes for speed development. Instead, have your athletes run 'across' the crown of a football field. There's a slight incline and decline that's a safer alternative.

Moreover, when training teams, make speed work fun. Try relay races or group races where the entire team has to work together to beat a pre-determined time.

Don't forget the 'old school' games like tag and capture the flag. They're great for speed, agility and endurance – plus they're lots of fun too!

### **The Future?**

So what does the future hold for female sports training?

I'm hopeful the trend will continue towards more complete athletic preparation programs for females. As long as parents and coaches begin to have access to great resources like this e-book and start to look more closely at what's best for the athlete (and not them), we have no choice but to be optimistic!

## **Improving Your Warm-up Using Dynamic Flexibility**

By: The Team at [grrlAthlete.com](http://grrlAthlete.com)

*"Get fit to train before training for competition" - Unknown*

It's the start of practice and the girls want to begin with some type of explosive drill. But before this can happen, a proper warm-up is necessary. Elsewhere in this book authors will discuss sport-specific training, functional conditioning, and speed work, but similar to a well structured training session we will first start with what is the most important part of any workout – the warm up.

Athletes, coaches, and trainers are familiar with slow jogging and static stretching, but they may not be familiar with dynamic flexibility. Dynamic flexibility is the process of moving a joint through a full range-of-motion (ROM). By using a variety of movement patterns, dynamic flexibility drills can be a wonderful and effective warm-up for competition, practices, speed-agility training, and conditioning sessions.

With dynamic flexibility, you can also reap the benefits of greater mobility, strength, balance, and range-of-motion. A short slow jog may slightly increase the blood flow to the quadriceps, but it doesn't address all of the sport-specific movement patterns that will take place in a speed-agility session. Most importantly, a straight-ahead jog doesn't adequately prepare the groin for lateral movement of any kind.

An athlete that is weak or lacking co-ordination can markedly improve their movement ability by using dynamic flexibility drills on a regular basis. In addition, while the athletes perform these warm-up movements, an experienced coach will be able to visually identify movement errors, weaknesses, co-ordination difficulties, tight muscles, or other concerns.

There are a couple of things to consider before beginning this warm-up.

- 1) Dynamic flexibility drills move the limbs through a full range of motion and provide a progressive warm-up. The exercises should start at a low-intensity and gradually build-up. It's tempting to get carried away with the intensity of these drills, so make sure the athlete begins slowly in terms of speed, intensity, and range of motion.
- 2) Coaches must teach and rehearse the drills safely with the athletes. Important factors in meeting this objective are using a proper progression in intensity and limiting the number of advanced movements in weak or untrained athletes. Athletes shouldn't race through the drills and should focus on quality, not quantity, during the warm-up.
- 3) Weak or untrained athletes should limit the number of lunges performed in a session to less than 12 because higher volumes might result in delayed-onset muscle soreness and premature fatigue.

## **Dynamic Flexibility Warm-up Checklist:**

- Emphasize the number of repetitions an athlete can perform with good technique over a short distance, not how fast the athlete can finish 10 yards.
- Make sure the athlete uses arm action (“arm drive”) because this is important for proper running mechanics.
- Go through the Movement Circuit three times and then go through the Range-of-Motion Circuit three times.
- Start at a low-intensity in the first circuit and increase the intensity with each successive circuit.
- Use the same principles with the Range-of-Motion circuit.
- The Dynamic Flexibility Warm-up will require 10-20 minutes.

### **Movement Circuit**

- High-knee (10 yards)
- Butt-kicks (10 yards)
- Side-shuffle (10 yards each way)
- Backpedal (10 yards)
- Crossovers (10 yards each way)
- Hip Twists (10 yards)
- Hurdle-walk Rotate-In (10 yards)
- Hurdle-walk Rotate-Out (10 yards)



## **Range-of-Motion Circuit**

- Forward Lunge Walk (10 yards)
- Diagonal Lunge Walk (10 yards)
- Side-step & Pull (10 yards each way)
- Frankenstein Walk (10 yards)

## **Movement Circuit Exercise Descriptions:**

### *High-knees*

- Perform with a slight forward upper body lean.
- Keep your head up and move your arms in rhythm with your legs.
- Exaggerate the knee lift so your thigh goes above parallel.
- Use a short stride length and perform many fast repetitions on the balls of the feet.
- Start with a light intensity and increase the intensity in each successive circuit.

### *Butt-kicks*

- Perform with a slight forward upper body lean.
- Jog forward and touch heels to butt without lifting the knee or moving it forward.
- Maintain a fast tempo and stay on balls of feet.

### *Side-shuffle*

- Start in the athletic position with the head up, back straight, hips pushed back, & knees flexed.
- Bend your knees but do not lean forward at the waist.
- Start with your feet slightly wider than hip-width apart and do a basic shuffle stride.

- Keep your hips and shoulders facing forward throughout movement.

### *Backpedal*

- Start on the balls of your feet with your butt pushed back.
- Keep your chest and head up.
- Use a short stride length and fast tempo while pushing off the balls of your feet.

### *Crossovers*

- Start in the athletic position and keep your head up.
- Limit the amount of upper body rotation during the movement.
- Move off the balls of your feet.
- Rotate your hips so that your left leg crosses in front of the right leg.
- The next step is to bring right leg back to a natural athletic position and then cross left leg behind right leg and then return to athletic stance.
- Repeat.

### *Hip Twists*

- Assume the athletic position and keep the feet close together in the start.
- Jump forwards and twist the hips 90 degrees to your right. The feet should move in unison and should land perpendicular to their start position.
- The hips should face in the same direction as the feet, but the upper body should remain facing forwards.
- Reverse the twist 180 degrees to the left, maintaining the same landing position.
- Repeat the hip twist for 10 yards, getting in as many repetitions as possible.

### *Hurdle-Walk Rotate-In*

- Bring your right knee up as high as possible while rotating your right leg out to the side. The knee should be pointing to your right.
- Now rotate the leg back in so that the knee is pointing forward.
- Put the foot back on the ground and step forward.
- Repeat for the left leg for a total of 10 yards.

### *Hurdle-Walk Rotate-Out*

- Bring the left knee up as high as possible. It will be pointing straight ahead.
- Rotate the left leg out to the side while keeping the knee up as high as possible.
- Put the foot back on the ground and step forward.
- Repeat for the right leg for a total of 10 yards.

## **Range-of-Motion Circuit Exercise Descriptions:**

### *Forward Lunge Walk*

- Step forwards and lower your body until your thigh is parallel to the ground.
- Push off your front leg with your quadriceps to return to the starting position.

### *Diagonal Lunge Walk*

- Step diagonally at a 45° angle with one leg and lower your body until your thigh is parallel to the ground. Keep your torso upright.
- Return to the top by contracting the quadriceps, groin, and hip extensors of lead leg.

### *Side-step & Pull*

- Athlete gets in a “sumo squat” position.
- Step laterally with the right leg.
- “Pull” yourself to the right with the right leg.
- Repeat. Each step should increase the range of motion and stretch the adductors.

### *Frankenstein Walks*

- Keep the legs almost straight for this drill.
- Step forward with the right leg. With a small bend in the knee.
- Slowly bring the right foot up to waist level. A slight stretch should be felt in the hamstring.
- Increase the range of motion slightly with each successive circuit.

- At the same time, the left arm should swing forward, thus resembling a “Frankenstein” walk.
- Athletes with tight hamstrings should be ultra-conservative with this drill. These athletes will need to work on their flexibility on their own time as well.

The dynamic warm-up is a missing link in many programs. While it is much different than the traditional method of warming up, athletes often get a greater benefit from this warm-up that will carry over to game play.

Warm ups are the part of a workout or training session that is most often neglected when there are time constraints; however, it is easily the most important part of ANY workout as it will increase the effectiveness of the workout, decrease chance of injury and even help increase co-ordination and movement ability.

## **Speed & Agility Training**

*"If you want to run with the big dogs, you've got to get off the porch" - Unknown*

By: Mike Gough BSc, CSCS

In today's sports arena, athletes are looking for every edge they can get on the competition. Athletes that are quick, agile and who possess high levels of speed and acceleration separate themselves from their competitors. Recently, speed and agility training has become popular among athletes looking to take their sports performance to the next level. This type of training may be used to increase speed, acceleration, quickness, foot-speed, agility, body awareness, and motor skills; along with the ability to exert maximal forces during high speed movements.

The ability to rapidly accelerate, decelerate and change directions at high speeds is crucial to optimal performance on the field of play. Athletes rarely reach maximum speed during play, instead relying heavily on acceleration and short explosive agile movements. Short bursts of speed, quickness and agility are used throughout sport to cover, elude and master the movement patterns of the opposition. This is where an athlete's training should be focused. Where do we start? What is proper running technique? How do we enhance speed and agility? Let's take a look...

## **Getting Started**

To begin speed and agility training, a foundation must first be developed, meeting the metabolic demands, acceleration and deceleration development, and movement techniques.

## **Metabolic Demands**

Metabolic demands must be met in order to execute technical cues while training. If the athlete is not conditioned then training will occur in a fatigued state, which will promote bad technique. With the athlete being fatigued during a training session, improper motor skills are utilized, ultimately impeding speed enhancement. Speed endurance training is designed to achieve repetitive speed and agility movements, with no drop off in performance and technique, with proper rest intervals given. This type of training can be sport specific, conditioning the athlete's anaerobic system to the needs of her sport and training.

## **Acceleration/Deceleration**

To begin speed and agility training, athletes must have the ability to decelerate from various speeds when changing direction. This “braking” demands highly trained levels of strength and power. Start off with basic deceleration drills to train the nervous system to react in different directions: straight ahead, backward, lateral, and finally multi-directional.

For basic deceleration drills, a change of direction drill or zig-zag drill is a good start. Make sure to start off with short distances between cones for limited deceleration, progressing to

greater distances with increased speed development and greater deceleration. While the speed and braking distances differ, it is important to address each athlete's ability to decelerate from different speeds while sprinting straight ahead before implementing multidirectional movements.

## **Movement Technique**

To move efficiently and at maximal speed, technique is essential to enhancing speed and agility. During the initial stages of speed and agility training, technical errors must be addressed so that the athlete can train with flawless form which the neuromuscular system can memorize. There are four technical cues to key on during speed and agility training:

- Visual Focus – The athlete's head needs to be in a neutral position and her eyes focused straight ahead, regardless of the movement pattern, unless needed to react to an opponent, object, or teammate. Directional changes should be initiated with a turning of the head and an establishing of a new point of focus. Once the head is turned in a new direction, the shoulder and hips will follow, as this is the most efficient means of changing direction.
- Arm Action – Arm action is crucial to sprinting and accelerating the body forward. Explosive arm action is a means of quickly achieving high stride frequency and stride length. The arms are a function of the leg movement. During multi-directional movements arm action is important; an “upper cut punch” through a change of direction will enhance acceleration out of the turn. A 90° arm angle should be kept at all times with the movement of the arm swinging at the shoulder, pulling the elbow



back. The cue of moving the arm from the “hip pocket” to “eye socket” is a great key when sprinting.

- Leg Action – Explosive leg action is crucial to running fast. A powerful triple extension of the hip, knee, and ankle joint is key in acceleration enhancement. The greater the running speed, the higher the heel kick will be. Stride length and stride frequency optimize speed potential. Shorter strides are taken during acceleration to accumulate speed.
- Body Lean – Forward body lean while running can be described as a controlled fall. The longer the athlete can maintain a forward body lean, the faster the athlete will run because acceleration is still occurring. Once maximum speed is established, the torso is erect and tall and the head is held high. The powerful triple extension of the hip, knee and ankle joint aids in maintaining body lean throughout acceleration.

### **Guidelines for Speed & Agility Training**

- A proper dynamic warm-up should be completed at the beginning of each training session to warm muscles and prepare them for speed and agility training.
- Workouts should only be performed when the body is fully recovered from previous training sessions.
- Proper sprinting technique must first be mastered through repetition.

- Every speed workout must include adequate rest intervals between reps and sets. A fatigued athlete cannot improve her speed capabilities. A 1:4 or 1:6 “work to rest” ratio is suggested.
- Athletes must be relaxed when performing speed and agility drills.
- Quality over quantity should be used as a motto for speed and agility workouts

## **Enhancing Speed and Agility**

### **Speed Training**

Think of how many sporting events are won or lost by the ability, or lack of ability to shift to a higher gear to make a game winning play. Speed in sport is key to athletic success. First, let's examine some definitions for a better understanding of the components of speed. Speed incorporates three elements:

**Reaction Time** – reaction to a stimulus (movement of an object [object, opposing player, defensive strategy, etc.] )

**Stride Frequency** – is the number of strides taken in a given amount of time.

**Stride Length** – distance covered in one stride while running.

There are two variables that make up an athlete's speed potential: stride length and stride frequency. Very few athletes have optimal stride frequency and stride length. Quite often the athlete possesses one of the two. Through training we can optimize both of these variables so that speed will be enhanced. Dynamic flexibility is essential in enhancing both stride length and stride frequency.

When discussing speed training, we have to understand the two following training techniques: resisted and over-speed training. The first being resisted training- where the athlete is resisted from behind. This resistance can be applied from various sources: sprint cords (latex tubing), Parachute, Rope, weighted sled, etc. can be used.

Over-speed training occurs when the athlete is pulled faster (increased turnover) than they are accustomed to. This fires the neuromuscular system to respond to this increased turnover rate and enhances the body's ability to accelerate.

As a general rule; when using resistive and overspeed training, no more than 10 % Resistance or Assistance should be applied (No more than a 10% increase or decrease in time for a given distance).

**Resistive and overspeed training should only be performed under the supervision of a Certified Strength and Conditioning Specialist. These training techniques can be difficult to master and should be supervised by a strength coach that understands speed and agility training concepts.**

Listed Below is a selection of speed training drills used for speed enhancement components such as Running Mechanics, Stride Frequency, Stride Length, Acceleration, Resisted, and Over-speed training.

### **Running Mechanics (Form Running – Perform to 15 yards and back)**

- A's (Walk, Skip, Resisted)
- B's (Walk, Skip, Resisted)
- High Knees
- Butt Kicks
- Arm Swings (Seated, Standing, Weighted, Contrasted)

### **Stride Frequency/Length**

- Ladder Speed Run (Running through the ladder, every square; enhance timing and frequency with quick turnover)
- Ladder Stride Run (every other square, or every third square to increase stride length)
- Stride Tape (Frequency/Length)
- Lean Fall Run (lean forward until gravity initiates first step then accelerate)

### **Acceleration Training**

- Lean Fall Run (lean forward until gravity initiates first step, then accelerate)
- Stadium Steps (sprint up stadium steps, try every step/every other step)
- Gears (20 yard bursts)

### **Resisted Speed Training**

- Sled Pulls (With weighted sled attached to waist or harness)
- Parachute Run
- Incline Sprint (1-3 degrees incline)
- Sand Running
- Sprints Against the Wind

### **Overspeed Training**

- Sprints With the Wind
- Decline Sprint (3-7 degrees decline)

### **Agility Training**

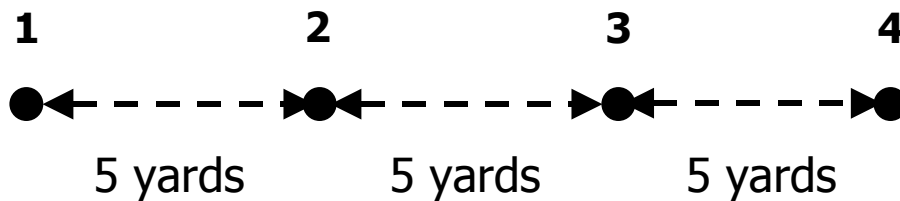
As mentioned earlier in this section, sport is made up of starting, stopping, multi-directional changes, and reactions that make it unnecessary to train at maximal speed. As speed is changed during the starts and stops for the given sport, the body must manage motor skills, co-ordination, specific strength, stability and balance.

An athlete's neuromuscular efficiency is the body's ability to collect, modify, recall, and execute muscular reactions while in the constant process of processing visual and proprioceptive information of what is taking place at that moment on the field of play.

Agility training takes the flexibility, strength, stability, power and balance enhancements and packages them into useful sport specific applications. Agility training can occur in all planes

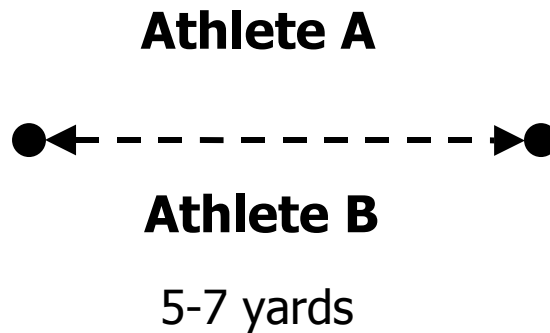
of movement. It can be used in forward running, backpedaling, multi-directional movements and sport specific movements. Here are a selection of exercises and drills to enhance multi directional agility.

### **Multi Cone Drill**



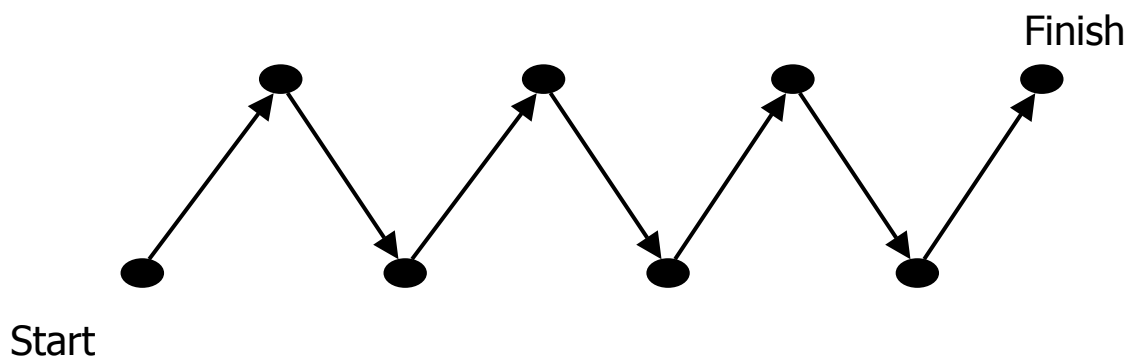
Athlete starts on cone 1. Coach starts stop watch and gives athlete random cone numbers as the athlete touches each cone. Athlete has to react to the cone number, sprint to that cone, touch the cone while receiving a new command from the coach. Athlete can sprint from cone to cone or move laterally in a low side shuffle. Duration: 10-15 sec.

### **Lateral Shadowing Drill**



Within a confined space of 5-7 yards, Athlete A moves laterally shuffling while Athlete B tries to mirror A. Athlete A can change direction and cut as often as the athlete desires while Athlete B attempts to stay with Athlete A step for step. If only one athlete is available, coach can provide directional cues and athlete has to react laterally to those cues.

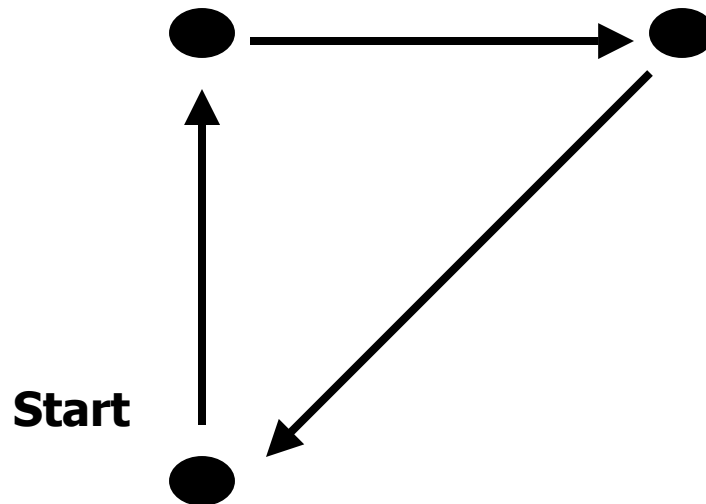
### **Zig Zag Drill**



Athlete starts by sprinting forward to the first cone staying low, touching each cone and laterally pushing off towards the next cone.

Variations: Side Shuffle, Back-pedal, Sprint/Back-pedal, Circle around each cone.

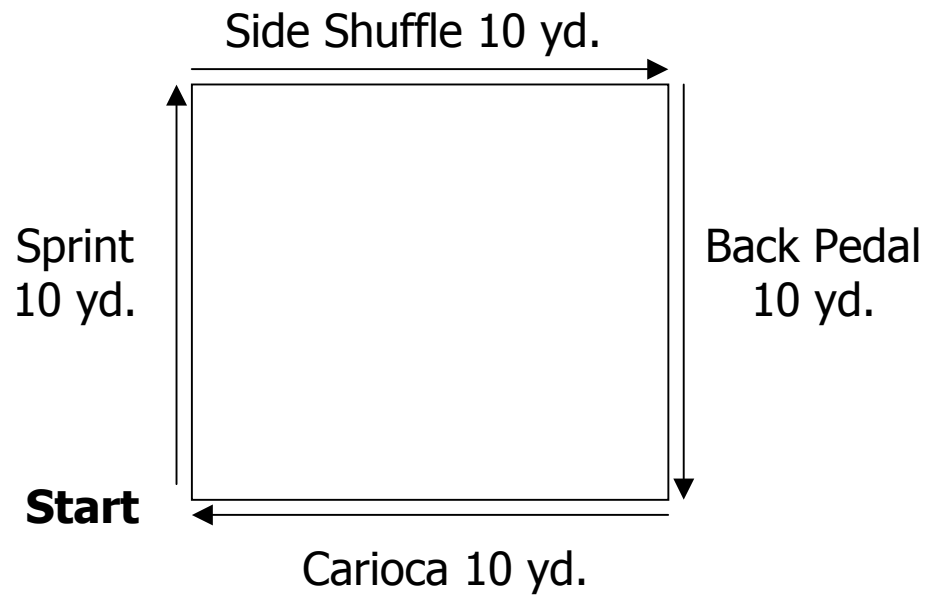
## 15 Yard Turn Drill



Sprint forward 5 yards to the first cone, make a sharp right turn around it. Sprint to the second cone making a left turn around it then sprint through the finish. Variations: Change the distance of the cones, Backpedal, place hand on ground when cutting around cones.



## 40 Yard Square



Placing cones 10 yards apart in a square, the athlete starts by sprinting 10 yards to the first cone, transitions into a low side shuffle for 10 yards, transitions into a low back pedal for 10 yards, then completes the square with a 10 yard carioca through the finish line.

## **Secrets of Sport-Specific Conditioning**

By: The team at [grrlAthlete.com](http://grrlAthlete.com)

*"I've always felt that long, slow distance produces long, slow runners." - Sebastian Coe*

The goal of the off-season is simple: Get in shape! When it comes to conditioning, most athletes use long, tedious sessions of sub-maximal exercise, regardless of the sport-specific metabolic demands. Most team sports **are not** characterized by slow movement speeds like that found in a typical 10 km run but consist of a series of high-intensity sprints!

Soccer, hockey, and basketball (and many other sports) require you to do lots of sprints interspersed with moderate activity or periods of inactivity. Take soccer for example. A player may move at a moderate speed for minutes while following the play and then sprint at their maximal pace for the ball. After that, the player could be faced with a stoppage in play of 30 seconds or more.

We've just described two different kinds of fitness. One is known as aerobic fitness - this is traditionally trained with long runs, and the other is anaerobic fitness - the ability to perform and repeat intense bursts of activity. According to Greg Brittenham, a professional strength coach in the NBA, "Basketball is 80% anaerobic and 20% aerobic".

Clearly, both aerobic training and anaerobic training are necessary for optimal performance. When it comes to team sports, some coaches use only aerobic training, but we've found that the key to superior performance is anaerobic training. Later in the chapter we'll let you in on the biggest secret about this type of training!

### **What is aerobic training?**

Aerobic training refers to the type of training that utilizes the aerobic energy system. The aerobic system produces energy in the presence of oxygen. Aerobic training generally takes the form of long runs (i.e. 20 minutes and longer), bike rides, or sessions on indoor "cardio" equipment. The intensity of traditional aerobic training is by no means easy, but it's comfortable enough that you are able to train and hold a conversation with your training partner.

### **What is anaerobic training?**

Anaerobic training is uncomfortable, intense, and causes rapid fatigue! It's similar to the demands of your sport. Anaerobic training refers to the production of energy in the absence of oxygen. Through a complex pathway in your muscles, stored carbohydrate is broken down to provide energy during periods of high-intensity activity.

Anaerobic training can be done in a number of ways. Athletes might do repeated sprints of various distances under 400 meters or a number of cycling intervals. Skipping, stair

sprints, “line drills”, skating the length of the ice repeatedly, and total-body complexes are other ways of conditioning the muscles via anaerobic training.

It’s important to point out that anaerobic training is most beneficial when you train the muscles specific to your sporting movement. Therefore, the best method of anaerobic training for a hockey player is to skate. For a cyclist, it’s best to use the bike. For a soccer player, running is the best option.

The clinching argument for the importance of anaerobic training is an astonishing fact that most coaches and athletes don’t even know: **You can increase aerobic power with anaerobic training, but you can’t increase anaerobic power with aerobic training!** Athletes that perform only aerobic training find that they still have to “play themselves into shape” over the first couple of months of the season.

### **Before you get started**

- A proper warm-up is critical to safe training. Dynamic flexibility is a great preparation for the training session. Please refer to the dynamic flexibility section of the book for more information.
- Finish each session with static stretching. See Erin Perry’s chapter on Injury Prevention for more stretching information.

- Drink lots of water before, during, and after training. Train in a controlled environment. Don't train in the heat of a summer afternoon. Train smart, train safe!
- Fluids in the form of water and/or sports drinks should be available at all times throughout the training session to help combat dehydration. Most athletes won't feel comfortable consuming a high-volume of water while undergoing this intensity of training. To compensate, ensure adequate pre-hydration (make it a habit to drink sufficient fluids daily) and post-exercise fluid intake.
- Don't overdo it! Intervals deplete your muscles of energy and are mentally stressful. You shouldn't train intervals on back-to-back days. Get good nutrition and recover before training with hard intervals again.

### **So how does an athlete use Anaerobic Intervals for conditioning?**

- Have a Certified Strength and Conditioning Specialist design an interval training program for your sporting needs.
- Anaerobic training should always be performed at the end of a training session. For example, it would be done after speed training, skill training, or weight training.
- A variety of movements can be included in sport-specific interval programs.

- Sport skills can be included for advanced conditioning and as the season draws near (for example, soccer or basketball dribbling).
- Anaerobic interval length is between 1 and 90 seconds in duration. Typically, the anaerobic intervals will be 30 to 45 seconds. This depends on the needs of your sport and the phase of your off-season training cycle.
- Rest intervals should be of equal or greater length than the work interval. Early off-season training requires longer rest intervals as the athlete is just beginning to “get into shape”.
- In the early off-season, coaches might use rest intervals that are 5 times longer than the work interval. This is known as a 1:5 work-to-rest interval. During the rest interval, athletes should perform active rest (i.e. slow walking).
- As the athlete becomes more conditioned, rest interval length can decrease. Advanced conditioning programs may use equal interval length for work and rest. The program is dictated by the needs of the sport.
- Don’t sacrifice interval intensity by using insufficient recovery intervals. Using a shortened recovery interval or a recovery interval that is too intense will only end up reducing the quality of the work interval.

- Prior to beginning a "full-blown" anaerobic training regimen, athletes have a strong base of muscular strength and endurance. Athletes should already be participating in regular aerobic exercise (3 sessions per week; 20 minutes; moderate-intensity).
- Athletes should expect muscle soreness from the initial sessions. To reduce muscle soreness, use only 3 intervals in the first week's sessions.
- Here's a sample session for an intermediate off-season athlete:
  - Dynamic warm-up.
  - 3 intervals of 45 seconds.
  - Rest 90 seconds between each interval.
  - Add one interval per training session to a maximum of 6 intervals.
  - Cool-down and stretch.
- You'll become fit very fast! It requires less than 4 weeks (8-12 sessions) for scientifically noticeable improvements. You'll be amazed after only two sessions how much more anaerobic endurance you have developed.

### **Flexibility**

- Static stretching is most effective at the end of a training session. If necessary, athletes may do a 10 second stretch for each muscle before training.

- During the static stretching portion of training, each stretch should be held for 30 seconds or 2x15 seconds for each muscle (depending on athlete's attention span).
- Post-session flexibility sessions should be "relaxation focused". Coaches can spend this time motivating the athletes or praising them for the training session.
- Additional static stretching sessions for "inflexible athletes" can take place any day after the athlete has completed a 5-10 minute warm-up (i.e. walk home from school).
- For injury concerns, athletes must consult with a therapist before stretching.

Interval training defines what this book is all about - giving you the Secrets of Female Strength and Conditioning. If you want to come into the season in top physical condition, lean, and fast, then intervals are the answer to your sports conditioning questions.



# **Introduction to Resistance Training**

By: The team at *[grrlAthlete.com](http://grrlAthlete.com)*

Resistance training is a misunderstood training method dominated by myths and misconceptions. The image of heavy weights and huge muscles intimidates many female athletes and fitness enthusiasts from learning more about the benefits, but resistance training is much, much more than big biceps and bench presses!

Resistance training, or strength training as it is also known, has a variety of health benefits for women. It has been shown to help increase bone mineral density, strength (obviously!), performance, body composition, and quality of life. These are just some general reasons for all women to start using some form of resistance training (and later we'll show you there are more forms of resistance training than just pumping iron).

For female athletes, it's important to make the distinction immediately that sport-specific resistance training is not going to instantly create the stereotypical female bodybuilder physique, but rather it will build strength in the legs, core, and upper body to help make a better athlete. First, let's go over some general guidelines for resistance training.

### **Program Design**

A Certified Strength and Conditioning Specialist (CSCS) or certified personal trainer should design your training program. Even before this is done, you should discuss your goals with the trainer and you should have a thorough physical assessment from a health professional (doctor, physiotherapist or chiropractor). Only then can your training program be truly individualized for your needs.

### **Proper Instruction**

Before you begin your training program, you should have your certified trainer teach and demonstrate all of the exercises that are in your program. You should have a thorough understanding of all the muscles used in each movement.

### **Proper Form**

Once you have received instruction on performing the exercise correctly, make sure you always use proper form in your workouts! Always have your training partner or the training supervisor watch closely as you perform each exercise.

### **Supervision**

Always train with supervision. In a commercial gym, you can ask a personal trainer to help you. At school, make sure there is someone monitoring the gym while you train. At

your team's training facility, make sure one member of the coaching staff is present at all times. At home, make sure you train with at least one partner.

### **Lift with a Partner**

In addition to the supervision provided by a coach or personal trainer, you should also have a lifting partner. The lifting partner can watch your form, give you a spot if necessary, and motivate you during the workout.

### **Warm-up**

Resistance training requires a “specific” warm-up. That means that you need to prepare for the specific task at hand. For example, running for 5 minutes will not adequately prepare you for an upper body workout. Instead, you need to perform warm-up sets for each exercise to prepare the muscles and joints that are involved in each exercise.

### **Hydrate**

Resistance training, like any other form of exercise, will lead to sweating and the loss of body water. Dehydration can impair performance (i.e. you will lose strength) and severe dehydration can lead to even more severe consequences. Do all of your training in a controlled environment and make sure to drink plenty of water during the course of a training session.

## **What muscle groups should be covered?**

The purpose of a sports-specific resistance training program is to make you a stronger, faster, and better athlete, not to simply make you a superstar at squatting, push-ups, or abdominal exercises.

In most athletes, certain muscle groups demand more attention. Female athletes (in traditional team sports) need to get stronger legs to help them be faster and more explosive. In particular, the hamstrings and glutes (the muscles of the back of the legs and butt) are muscle groups that should be addressed through resistance training. These muscles are part of the “posterior chain” – an area of the body regarded as producing sport-specific power.

Dave Oliver, a former strength and conditioning coach for the United States women’s soccer team recommends that female training programs include exercises like lunges and squats, which work muscle groups in concert rather than in isolation. It is believed that this training approach will help protect against injuries, such as the ACL knee injury that is common in so many female athletes. These exercises are also great for strengthening the hamstrings and glutes. Have a certified trainer demonstrate these exercises for you and show you where to incorporate each in your workout program.

### **What other muscles should be covered?**

The abdominal (abs) and lower back muscles are part of the “core” area. While everyone wants a nice set of abs, it’s also extremely important to train both the abs and lower back to build a better athlete. Many coaches are spending more and more time on strengthening this area of the body. Your initial physical assessment will give you feedback on the strength and endurance of these areas and your certified trainer will show you how and when to include them in your workouts.

Don’t rely on traditional ab crunch machines as the mainstay of your ab program. According to Strength Coach Brian Grasso, “we are designed for rotation, yet machines don’t allow for it.” Rotational exercises using medicine balls, cables, or tubing help athletes develop rotational power for golf, hockey, baseball, and many other sports.

Finally, when it comes to training the upper body, the key is balance. It’s similar to the training of the lower back and abdominals. You can’t do one and neglect the other. In this case, you can’t only do “pushing” exercises and neglect the “pulling” exercises. If you do, this can lead to shoulder and postural problems down the road.

Pushing exercises consist of push-ups, bench presses, and the like, while pulling exercises include rowing exercises, chin-ups, and pull-ups. Have a certified trainer design a balanced upper body training program for your needs.

### **But what about arms, bench presses, or machines?**

If you are already a regular gym user, you'll recognize these as common components of general training programs. Bodybuilders especially use these training methods to help increase the muscle mass of specific muscle groups. While bodybuilders train individual muscles, athletes need to train the muscles of the body to move together as a unit. That often rules out arm training and the use of machines from an athlete's program.

For athletes, these methods of training aren't necessary, although some programs might include some bench press or limited machine work. Depending on your sport, you might even have a small amount of arm training or "grip" training in your workouts. It all depends on the individual, the goal of training, and the equipment available.

As you'll see in chapters by Jeremy Boone and Brian Grasso, there are alternative methods for resistance training besides traditional machines. According to Stephen Holt, "With cables, you get to move the way your body wants to move." Free weights, tubing, body weight exercises and medicine balls also allow more freedom of movement than machines.

### **Take Away Tips**

1. Leg training must not neglect the “posterior chain” that includes the back of the legs.

One of many excellent exercises for this is the Reverse Lunge.

### **Reverse Lunge**

- Stand with your feet shoulder-width apart and hold a light dumbbell in each hand.
- Step backward with left leg, resting the toe on the ground.
- Squat straight down with the right leg supporting the body weight. Lower yourself until your right thigh is parallel to the floor.
- Return to the start position by pushing with the muscles of the right leg.
- The emphasis of this exercise is on the hamstrings and buttocks of the right leg.
- Perform all of the repetitions for your right leg and then switch legs.

2. Rotational exercises build power in the core. Here's one exercise that you can do with cables, tubing, or a medicine ball.

### **Cable Twist Crunch**

- Stand beside the pulley system with your right shoulder closest to the weight stack.
- Use both hands to grab the small handle attached to the highest pulley setting.
- Your hands should be over your right shoulder like you are swinging a golf club.
- With a slight bend in the elbows, curl your trunk forward and rotate toward the left ankle in a “wood-chopping” motion.
- Slowly return to the start position. Perform all repetitions to one side then switch.



3. Balance your upper body training with an equal volume of pushing & pulling.

### **Upper Body Pull – Dumbbell Row**

- Hold a dumbbell in your right hand and rest your left knee and hand on a flat bench.
- Your right foot remains on the floor.
- Bend your right knee and keep your back flat at all times.
- Hold the dumbbell at arm's length and row the dumbbell up to the lower abdomen, bringing your right shoulder blade back.
- Keep your lower back flat and your right elbow tucked into your side.
- Pause at the top and slowly lower the dumbbell back to the starting position.
- Perform all of the repetitions to one side then switch.

### **Upper Body Push – Traditional Push-ups**

- Place your hands on the ground slightly wider than shoulder-width apart.
- If you can, support the rest of your body weight on your toes. If you aren't strong enough, then perform the push-ups from the kneeling position.
- Keep your feet and knees close together and keep your head, neck, and back in a straight line. Slowly lower yourself to the floor by bending the elbows.
- Pause briefly at the bottom and then push up to return to starting position using your chest, shoulders, and triceps.

In conclusion, resistance training can be a very effective tool for increasing the strength and explosiveness of an athlete. There are dozens of different exercises that can be done utilizing weights, including some very advanced lifting techniques. These exercises should always be taught first hand by a Certified Strength and Conditioning Specialist.

## **Functional Conditioning for Female Athletes**

By - Brian Grasso

*“The climb to the top of the mountain may be difficult, but the view is so much better from up there”*

The concept of functional conditioning has become a very misunderstood and misused phenomenon within the world of strength and conditioning over the past several years. Common perceptions would have an athlete or coach believe that in order for an exercise to be designated as ‘functional’ it would involve a Swiss Ball, Wobble Board or some other kind of unstable device.

The reality is that for an exercise or activity to be referred to as ‘functional’, it needs merely to relate to the function in which you intend to use it. For example, contemporary definitions of functional conditioning suggest that doing a standard preacher curl for biceps strength or an isometric (muscular action void of movement) biceps exercise would not be considered functional. But what if you are training for an arm wrestling competition? Certainly arm wrestlers have tremendous biceps strength and would likely engage in static styles of biceps training because that is the type of strength they would need to display during a match. For arm wrestlers, a standard biceps curl would be considered functional conditioning.

The dichotomy in my mind is not from whether any particular exercise can be classified as functional or not functional but, more appropriately, is the exercise in question functional to a

particular sport (or athlete). The definition of functionality is not a classification of exercise but moreover a classification of exercise as it relates to a task - the task (sport) is the crucial determinant of functionality, not the exercise.

For athletes whose sports are movement based (and this would include virtually every sport imaginable) one of the key ingredients to functional conditioning is movement based training. In this respect, the advent of fitness-based machines may have been one of the worst 'advances' in the history of the strength and conditioning industry. At this time however, **numerous** female athletes throughout North America spend an inordinate amount of time developing non-functional strength via these means. We can examine this from several perspectives:

- Fitness machines were designed and manufactured to fit the 'average person' (whatever that means) and typically allow for one to three adjustments in order to help make it more appropriate for your body type. With roughly 700 muscles and 206 bones in each of us, can any machine adapt to truly fit our unique structures or accommodate our distinctive movement patterns?
- Machines direct your force production through a pre-guided motion. There are several problems with pre-guided motion. First, athletically speaking, nothing is pre-guided. When producing force, YOU must control its direction. The other issue is that the linear pre-set path you are forced into may or may not be biomechanically efficient for you. Our movement patterns are as unique as our thumbprints and the pre-set pattern you are producing force through isn't necessarily allowing your body to move the way it needs to. Biomechanically speaking, no two pitchers pitch the

same way and no two hockey players take a slap shot the same way. Because most sports are free flowing movement-based activities, we inevitably involve our own biomechanical individuality while performing them. By restricting your biomechanical freedom, you are training at a sub-optimal level and setting yourself up for a potential biomechanical dysfunction or injury.

- Unilateral simply means one side of the body at a time. If you examine a given motion in any particular sport, you will see that force/power is most often produced on one side of the body and then transferred to the other side. With their limited motion, machines are not able to effectively train unilateral strength which renders them very non-functional from a sporting perspective.
- Machines work in one plane at a time. To keep things simple, there are three planes to human motion: 1) Sagittal - movement which is parallel to the midline of your body. The sagittal plane divides the body into left and right portions 2) Frontal - movement which is perpendicular to the midline of your body. The frontal plane divides the body into front and back portions. 3) Transverse - movement which involves rotation. The transverse plane divides the body into top and bottom portions. All sports require movement and stabilization through all three planes of motion. Not only can machines not accommodate the ever-changing multiplanar requirements of sport, but they also do not necessitate stabilization at all. Sports are dynamic, movement oriented, and variable. Unfortunately, machines are very fixed, stable and static structures.

- Machines cannot accommodate the transverse plane at all. Pursuant to the point above, I wanted to make one reference to our body and its composition. This is particularly of concern when examining the structure of the human body. As referenced in many Kinesiology based books, over 85% of our core musculature is oriented horizontally or diagonally, which means that we are built for rotational movement - a movement that machines cannot service.

One last point I wanted to discuss regarding the functionality of a particular exercise is whether or not it involves integrative strength. This concept is reasonably simple in that it requires strength or force production to occur synergistically (concurrently) with the lower and upper parts of the body and in conjunction with the core musculature. Simply put, no movement in sport involves isolating force production from one or two muscles at a time. Sport involves fluidity of motion and force production (along with stability) over several joints and muscles - your training should reflect this.

Now that we've discussed at length what not to do from a functional conditioning perspective, I want to give some important information as to what female athletes should be doing. The first and most important thing to understand about movement and functional styles of conditioning is that one must train the human body for the movements that it is able to do inherently.

One very common term that gets mentioned in the strength and conditioning world is 'sport specific', as in train under sport specific parameters. While I don't disagree with specificity of training wholeheartedly, I do think that it is becoming thought of as too key of an issue and that far too many coaches, parents and athletes are concerning themselves with 'sport

specific' concepts on too large a scale. Especially with young female athletes, any conditioning effort should reflect natural movement and create as much athletic based proficiency as possible. Specific injury prevention as well as distinctive energy system development should always be a part of any sport specific efforts; however, athletes, especially young athletes, should concentrate on developing and maintaining conditioning through functional and athletic means.

Juan Carlos Santana, a very well known figure in the strength and conditioning industry, has developed a theory of functional, athletic-based conditioning. He suggests that all human movements are composed of four basic patterns (or combinations of the four patterns) and that in order to develop optimal athletic proficiency and conditioning one must train the human body for these movements. He refers to this theory as the 4-Pillars: Locomotion, Level Changes, Push/Pull and Rotation.

- Locomotion - Simply put, locomotion means movement. All sports are comprised of movement. The key from a functional conditioning perspective is that sport involves **multi-directional** movement. Contemporary methods of conditioning (strength and power as well as metabolic) typically involve linear exercises which contain no multi-directional movement. Treadmills and stationary bikes are two examples of linear metabolic conditioning with zero multi-directional influence.
- Level Changes - All sports require athletes to change levels (i.e. altering your distance from the ground). Baseball players fielding a ground ball; a keeper in soccer diving to make a save; a hockey player drilling a slap shot. All of these movements require some degree of level change with respect to your center of mass. The key

with regards to a functional conditioning perspective is that standard fitness exercises typically promote good biomechanical alignment and shortened ranges (such as when squatting ‘don’t let your knees go over your toes’, or ‘only squat to 90 degrees’). The issue resides in the fact that the functional movement necessary to perform an athletic endeavor does not likely follow ‘gym-based’ biomechanical restrictions. For instance, it would be considered weight training suicide to perform a squat with a kyphotic curve (rounded upper back), while allowing your knees to go over your toes and with knee flexion greater than 90 degrees. Nevertheless, that’s exactly what a baseball player does when she fields a ground ball. Functional conditioning suggests that we train for level changes in the manner through which we will inevitably use them.

- Push/Pull - Very simply, sports require some degree of strength/power production via pushing and pulling motions. Of note from a functional conditioning standpoint is that these efforts often come via unilateral means (one side of the body at a time). Whereas most gym exercises are two-handed/two-footed efforts with equal force being produced from both sides, most sports require force production unilaterally: A baseball player transfers force from one side of the body to the other when throwing a ball or swinging a bat. A soccer player during kicking stabilizes with one side of the body while producing force with the other.
- Rotation - As we mentioned during the ‘no more fitness machines’ portion of this chapter, the human body is designed for rotational movement. Functionally speaking, most conditioning efforts are linear and do not involve rotational strength or stability. Unfortunately, sports require a great degree of both rotational strength



and stabilization, for example, a baseball player swinging a bat, a hockey player taking a slap shot, or a tennis serve.

While the 4-Pillars concept is a product of Juan Carlos Santana, I added my own thoughts into each category within the above text.

### **Functional Ideas for Female Athletes**

- **Try training energy systems through multi-directional means and game formats**

1. Multi-directional movement patterns for conditioning (i.e. sprint 40m, carioca 40m, run backwards 40 m. Rest 30 seconds and repeat).
2. Block off a small area and play an intense game of tag with your teammates.
3. For longer aerobic based training, perform multi-lateral movement patterns on a large open field or around a track. Every 30 seconds, switch what you are doing (i.e. jog, backward run, carioca, jumping jacks, single leg hops etc.).

- **Incorporate medicine balls and pulleys (Therabands, cable pulleys, etc.) into your training**

1. These tools allow you to incorporate rotational movements into your training.
2. Medicine balls in particular can be held in various positions during exercises such as squats or lunges in order to develop stabilization in a multiplanar format.

- **Utilize concepts of integrative strength during training efforts**

1. Try to avoid external stabilization during any weight training activity (external stabilization includes sitting or lying on a bench or machine). Sports are played in a dynamic format and require YOU to provide multiplanar stability for your body while it produces force.

**REMOVE**

**ADD**

Seated Shoulder Press

Standing Push-Press

Leg Press

Multi-Directional Lunge

Smith Machine Squat

Free Squat or Deep Dumbbell Squats

Lat Pull Down

Pull-ups

- **Train using unilateral exercises**

1. Developing strength, power and stability in one side of the body at a time is crucial for sport application. Squats, back rows, cleans (with dumbbells), push-ups, push-press - almost every exercise you will think of can be performed unilaterally.

### **Three Key Points to Remember**

1. Stay off machines while performing or designing conditioning programs for female athletes.
2. Incorporate natural human body motions into your training routines - Don't get stuck into machine based or fixed free weight based exercises.
3. Train to move and move to train!

Brian J. Grasso

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## Cutting-edge Circuit Training for Female Athletes

By: Jeremy Boone

What comes to mind when you hear the words “strength training”? Most athletes respond immediately with answers such as “going to the gym”, “using machines”, or “lifting heavy weights”. Even more common is the thought that strength training for female athletes means always performing 3-4 sets of 14-16 repetitions of each exercise. While this may be effective, there is another way to train which can help you get stronger, faster, and fitter at the same time!

### A Tried & True Method

I began using circuit training consistently in the mid to late 1990’s with all of my female athletes. This was in response to training time constraints imposed by teams’ head coaches. Many of these coaches feared that “time away from practicing sport specific skill was time wasted”! My use of circuit training was also in response to many female athletes’ fear that their bodies would get too big if they strength trained.

Implementing the concept of circuit training was the solution. Not only could I now develop all



**Jeremy Boone taking the Atlanta Beat through warm-up**

components of athleticism, but I could also include sport specific skill where appropriate (more on that later). This, in turn, made the coaches and female athletes extremely happy.

The coaches saw that their players continued to improve their athleticism combined with technical skill work, all in one, and the female athletes had fun training for their sport.

### **So What Is Circuit Training?**

Circuit training can be used to help get you in shape and become stronger at the same time. This method of training involves performing a series of exercises designed to improve strength, fitness, speed, and other athletic qualities in which the athlete performs one set of each exercise within the circuit, and moves on to the next exercise. The example below has the athlete performing three times through a workout.

Exercise A > Exercise B > Exercise C > Exercise D

Exercise A > Exercise B > Exercise C > Exercise D

Exercise A > Exercise B > Exercise C > Exercise D

There are numerous benefits from using circuit training in your workout program. Circuit training:

- Improves strength
- Improves stamina
- Improves sports skill
- Is time efficient
- Can be done anywhere
- Doesn't require expensive equipment
- Is FUN!
- Helps decrease body fat
- Helps increase lean body weight

## Circuit Training Templates



**Jeremy Boone taking Cindy Parlow and teammates through a mini-band routine**

The great thing about circuit training is that you can apply it to just about any type of workout you do. The following training templates can be adapted to all sports. When designing your workout, pay close attention to the level of difficulty of each exercise, the prescribed rest periods, the total training volume, and level of training intensity.

### **1. Push-Pull-Core-Leg** (used for strength)

- a. Set up the circuit so the exercises apply to each category. Example:  
pushup- pull-up- medball chop- body weight squat  
DB Press- DB Row- medball twists- body weight lunges  
DB Overhead press- upright row- mb sit-up- jump squats

### **2. Push-Run-Pull-Run-Core-Run-Leg-Run** (strength endurance)

- a. The same as above except now add a 25 yd run in between each exercise

### **3. Agility- Core- Active Recovery** (speed emphasis)

- a. Perform an agility drill lasting 5-15 seconds
- b. Next perform a core exercise (medball sit-ups, medball twists, medball throws, etc)
- c. Finally perform an active recovery exercise (light jogging, juggling with a soccer ball, shooting free throws, etc.)

## **“How Do I Use Circuit Training?”**

There are many different types of circuits in which to choose. You can perform circuit training for time or for repetitions. For example, if you want to improve fitness, perform circuit training for time. If you want to focus on strength, perform circuit training for repetitions. There are also partner circuits or even team circuits.

These are good for training with a friend, a teammate, or your entire team. For example, you and your friend can both do one set of exercise A, then move on to exercise B and so on. This type of circuit training is a lot of fun!

## **Circuit Training Has No Boundaries**

By following certain key training principles, you can apply the method of circuit training to just about anything!

- **Specificity-** Your workouts should reflect the demands of your sport and your position. If your sport requires short bursts with many changes of direction, your circuit will not include exercises with a long duration of time.
- **Overload-** As your body quickly adapts to training, be sure to progressively increase your training load over time. This is accomplished by increasing volume or intensity but never both simultaneously.
- **Recovery-** Your body is only as good as it's ability to recover from work. Plan your recovery periods long enough so that you will not get too tired too quickly in your workout. Many athletes burn out too soon during circuit training due to lack of recovery time.

- **Variation-** Add variety to your training. Your body will become quickly accustomed to your routine so be sure to change up your exercises every so often.

In the following examples you will find a variety of circuit training workouts I have used with many of my female athletes, including the Atlanta Beat.

Date: n/a	Name/Group: Basketball
Training Focus: Speed Endurance	Location: n/a
# of Exercises: 3	Work Interval: 15
Recovery between Sets: 2	Rest Interval between Exercises: 45
Total # of Circuits: 2	
Total Training Time: 6 Minutes and 30 Seconds	
<u>Exercises</u>	<u>Description</u>
Suicide	Half court & back
X-Out	Corner to opposite corner half court
Full Court Sprint	Baseline to baseline for reps
Total Volume Load = 0	
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Date: n/a Name/Group: Soccer  
Training Focus: Strength Location: n/a

# of Exercises: 4 Work Interval: 15 Rest Interval between Exercises: 15  
Recovery between Sets: 1 Total # of Circuits: 4

Total Training Time: 10 Minutes and 0 Seconds

<u>Exercises</u>	<u>Description</u>	<u>Reps</u>	<u>Sets</u>	<u>Volume</u>
Rotational Pushup	Point to the sky			
Medball Pike	Alternate legs			
Incline Pull-up	Set bar at chest height			
Medball Squat	Press overhead			

Total Volume Load = 0

Date: n/a Name/Group: Soccer  
Training Focus: Fitness Location: n/a

# of Exercises: 4 Work Interval: Rest Interval b/t Exercises:  
Recovery B/t Sets: Total # of Circuits: 2

Total Training Time: 4 Minutes and 30 Seconds

<u>Exercises</u>	<u>Description</u>	<u>Reps</u>	<u>Sets</u>	<u>Vol</u>
ABC Speed Ladder	shuffle			0
Poles	slalom			0
Mini-hurdles	double-in lead right foot			0
Cones (4)	plant & cut			0

Total Volume Load = 0

#### Training Notes

Distance between each station is approximately 12 yds. Run at 75% effort between stations. Complete two times through no rest. Followed by 3 min. recovery and then complete two times through again.

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## **Where To Go From Here...**

This chapter is only the starting point to help you on your way to designing Cutting-Edge Circuits. You now have the structure of circuit training. The next step is to attempt using circuit training to see what works for you.

Remember, circuit training can be a lot of fun! Even more so, it is a method that can help you be the athlete you want to be!

## **Core Training that Makes a Difference**

By: Stephen Holt, CSCS

*“You can observe a lot just by watching.” - Yogi Berra*

Take a look at virtually any sport and ‘observe what you see.’ You’ll notice that most athletes – not counting bad football players and really bad wrestlers – don’t play their sport on their backs. Too many athletes make the mistake of equating core training with crunches and, maybe, back extensions. The problem with this is that this is not how your core muscles have to work in order for you to become a better athlete.

Core training is not just working the abs and low back. Core training is teaching your trunk muscles to work as a unit, to turn your torso into a virtually solid cylinder to transfer force between your lower body and upper body, and to create a firm foundation against which your arms and legs can work most effectively.

Standard ‘core training’ programs tend to focus on movement from front to back (e.g., crunches and back extensions) in only the sagittal plane. To truly develop core strength that can be applied to all forms of athletics, athletes must develop stabilization in all planes of movement. In fact, the power in most sports comes from the transverse plane, yet few athletes EVER train in this plane.

Remember, your sport is played standing up. Your goal should be to perform your core exercises standing up.

Core stability will improve your strength, speed, agility and vertical jump by giving your arms and legs a firm foundation to push and pull against.

Here's a description of core stability for those coaches and athletes interested in a deeper understanding; however, you don't have to study the ab muscles in order to have a stronger core.

For optimal function, your transverse abdominis (TVA) should be the first muscle to fire when you move your arms or legs. Next comes the multifidus, then your obliques. It's clear that your brain attempts to stabilize your spine FIRST, then recruits your limbs in accordance to your level of stabilization.

Your core strength, specifically your ability to stabilize your core, is the limiting factor in your ability to display speed, power and strength in your extremities.

I'm sure you've heard people say that your abs protect your back. The truth is that your deep abdominal muscles, the transverse abdominis and internal obliques, are the ones that truly protect your back through their connection to the thoracolumbar fascia.

Stop overworking your "six-pack" and start focusing on stabilization using your deep abdominal muscles.

Here are the steps you must go through to reach peak performance in your season:

- Assessment
- Restore Movement Patterns
- Inner Unit Isolation (if necessary)
- Basic Stabilization
- Inner/Outer Unit Integration - stable spine/dynamic extremities
- Dynamic Inner/Outer Unit Integration
- Integration of Strength
- Integration of Power

Note that I have purposely left out sets, reps, length of phases, etc. to emphasize that all training must be individualized. We each have different needs, goals and baselines. Work with a Certified Strength and Conditioning Specialist (CSCS) or a Certified Performance Enhancement Specialist for optimal results from your individualized program.

### **Assessment – Flexibility**

Your first step is to determine which muscles are too tight. Tight muscles in this region will inhibit the deep abdominal muscles.

Of course, the best way to discover what's too short is to have an advanced personal fitness trainer or licensed medical professional perform a complete musculoskeletal assessment.

As a shortcut, here's a list of commonly tight muscles

- Lats
- Quadratus Lumborum
- Lumbar Erectors
- Psoas
- Rectus Femoris
- Piriformis
- Hip adductors
- Hamstrings

**In many cases, these muscles become tight because they are compensating for a weak core.** Your core-conditioning program should start with stretching and inhibiting tight muscles attached to your pelvis.

Make sure that you stretch your tight muscles before the rest of your core work. My clients begin with some type of dynamic warm up to raise their body temperature. Then we stretch whatever is tight. Next we go straight to their core conditioning to activate these muscles before any heavy lifting. (Yes, this is different from the traditional Save Your Abs for Last philosophy and is based largely upon research by the National Academy of Sports Medicine.)

#### Stephen's Workout Order

- Dynamic Warm-up
- Stretch **Your** Problem Lumbo-Pelvic Muscles
- Core Training
- the remainder of your Strength Training program

Here are two of my most effective stretches for common problems:

### **Active Straight Leg Raise**



### **Swiss Ball Active Hamstring Stretch**



In both the **Active Straight Leg Raise** and the **Swiss Ball Active Hamstring Stretch** we use the phenomenon of Reciprocal Inhibition to let our neurological system relax the tight hamstrings. We're stretching the hamstrings of the one leg by contracting the opposite muscle, the quads.

At the same time, we're contracting the opposite hamstrings by pressing the down leg into the ½ foam roller in the Active Straight Leg Raise or by squeezing the ball with knee flexion in the Swiss Ball Active Hamstring Stretch.

Think of what happens when you run. As you contract the hamstrings of one leg, the hamstrings of the other leg are relaxing (to a degree).

### **Lat Stretch on Wall.**



Your goal here is to keep your arms straight and your palms together. You should touch your thumbs to the wall without increasing the curvature of your low back.

This position stretches your lats which will try to increase the arch in your back. Keep your back neutral.

### **Kneeling Hip Flexor Stretch**



This position stretches your psoas and rectus femoris, two of the most problematic hip flexors. The foam roller under your ankle increases the stretch on your rectus femoris. The overhead reach stretches your lats and encourages hip extension to stretch your psoas. A slight lean and rotation both away from the down leg stretches your psoas in all three dimensions.



## **Assessment – Strength**

### **Lower Abdominal Strength.**

Very few people pass this test, so don't be surprised if you don't do well.

You don't absolutely need a blood pressure cuff for this one but it helps.



Lie down on your back with the blood pressure cuff, if you have one, in the small of your back. Pump it up enough to get some reading on the dial. (The exact reading doesn't matter as long as you feel comfortable.)

If you don't have a cuff, turn your palms down and slide your fingertips just under the small of your back.

For optimal back safety, bend both knees then flex one hip so that one leg is pointing straight up in the air. Then do the same with the other leg so that both feet are now pointed toward the ceiling.

From there, flatten your low back just enough that you feel a little pressure against your fingertips. If you're using a BP cuff, note whatever reading there is on the dial.

This is just the starting position. (See first diagram). Now here's the test.

Gently lower both legs toward the ground while maintaining the SAME AMOUNT of pressure on your fingertips or maintaining the SAME READING on the BP cuff.

The split second that you feel the natural arch in your back increase (as indicated by a loss in pressure on your fingertips or a drop in the BP cuff of over 5 mm), that trial is over. Immediately bend both knees then bring your feet back down to the ground.

Make note of how close you got your feet to the floor. Ideally, you should be able to bring your legs all the way to the ground without losing the pressure on your fingertips or on the BP cuff.

### **Transverse abdominis strength**

You'll need a standard blood pressure cuff for this one. Lie face down with the cuff directly under your navel. Pump the cuff up until the dial reads 40 mm.

By contracting your transverse abdominis, 'drawing in your stomach', 'bringing your navel toward your spine', 'abdominal hollowing', 'making yourself skinny', or whatever cue you need, make the needle drop to 10 mm.

The contraction of your transverse abdominis should bring your abdominal wall inward taking pressure off of the cuff. That's what makes the needle drop.

## **Restore Movement Patterns**

In general, you want to make sure that your fundamental movement patterns are intact and symmetrical. This section alone could fill an entire book (as in **Athletic Body in Balance** by Cook). Get more information on this from the master, Gray Cook, at <http://functionalmovement.com>.

## **Inner Unit Isolation (if necessary)**

If you haven't worked your transverse abdominis before or if you performed poorly in the TVA test, you may need to re-train it to contract properly.

## **Tummy Vacuum**



In the 4 point stance, the weight of your internal organs cause increase the stretch on the deep abdominal muscles and activates them.

I simply tell my clients to "make yourself skinny." The point is to slightly draw your navel toward your spine, not to suck your stomach in. Too strong of a contraction recruits the rectus abdominis - exactly what you DO NOT want to do.

Make sure that your spine does not move at all throughout the exercise. The tendency will be to let your back sag during the rest period and to excessively round the spine in the active periods of this exercise.

Placing a dowel rod down the middle of your back helps you keep the neutral curvatures of your spine in both the active and rest phases of this exercise. Performing this exercise while *occasionally* glancing at a mirror on the side helps maintenance of proper form, also.

(Never perform any symmetrical, bilateral exercise with the head turned toward one side throughout the exercise. *Tonic Neck Reflexes* will help one side of your body while hindering the other side.)

Strength Coach Mike Boyle recommends that you progress to doing the Tummy Vacuum in an athletic stance and later in a hurdle step position (stand on one leg with the other hip and knee flexed to 90°).

### **Active TVA**

You also need to teach your transverse abdominis to react as opposed to consciously contracting it.

(Note: The only time you ever consciously contract a muscle is probably in the weight room. Our muscles usually *react*.)



Squeezing a small ball with your hip fully flexed forces your TVA to stabilize your spine to provide a firm foundation for the hip flexors to work against. Straightening the other leg further challenges your TVA to stabilize your spine.

## **Tall Kneeling TVA.**



(You don't *need* the med ball.) The overhead position stretches your lats and the kneeling position stretches your rectus femoris. The combination increases the demand on the core stabilizers to maintain a neutral spine.

## **Basic Stabilization**

### **The Plank and Side Plank**

Stuart McGill's book "Low Back Disorders" showed that the Plank and Side Plank yielded high levels of muscular activity with low levels of stress on the spine. In other words, these are among the safest AND most effective core exercises.



A basic exercise for building frontal plane strength and transverse plane stability is borrowed from Pilates.

There are two ways to do this exercise. First, lie on your side with your legs and trunk in a straight line. This is vital. Flexing at the hip will force you to recruit muscles you don't want to recruit.

- 1) Leg Beats. Lift your top leg just a few inches and keep it there. You want the motion to come from your hip and not from your spine. Now bring your bottom leg up to meet the top one. Squeeze your legs together gently to activate your hip adductors (helps to recruit your pelvic floor and deep abdominal muscles).

Gently bring both legs back to the ground. Your top hip should never move forward or backward.



- 2) Side Lift. The rules are basically the same. You simply lift both legs at the same time. Again, if you have muscle imbalances, there'll be a tendency to let your top hip move backward. Keep your form no matter what!



### T-Stand Push Up (with optional hip abduction)



When we perform this exercise, the actual “push up” doesn’t matter. What we’re looking for is a smooth rotation and for your body to turn as a solid unit. In other words only a strong core makes this possible. Do not separately turn your arms, then your trunk, then your hips.

### Basic Back Stability



The progression here is one arm, then one leg, then the opposite arm and leg. Your goal is to move gracefully and precisely. Don’t simply flail your arms and legs. The key is spinal stability while your arms and legs are moving.

Using a dowel along your spine teaches efficient movement. The dowel should touch your head, mid-back and tailbone at all times. Make sure that you maintain the *exact* same three spots of support. Do not let any of the curves in your spine either increase or decrease.

**Inner/Outer Unit Integration** - stable spine/dynamic extremities

### **Cook Chop and Lift**

**This is perhaps the most important step and one that most trainers and coaches know nothing about.**

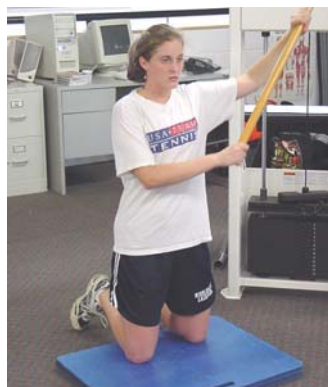
The Chop and Lift are multiplanar exercises based upon Proprioceptive Neuromuscular Facilitation (PNF) patterns. The point in these exercises is to allow your arms to transfer force diagonally through your stable trunk. You're associating core stability with upper body mobility on a stable base of lower body stability – a common pattern in many sports.

Gray Cook first published these exercises in the April 1997 issue of the Journal of Strength and Conditioning. These exercises enhance dynamic balance and efficient weight transfer while challenging your spinal stability in all three planes.



The Chop starts with a downward pull with your outside arm followed by a push with your inside arm.

The Lift works the opposite diagonal pattern and starts with a pull with your outside arm followed by a push with your inside arm.



You can perform this exercise in a:

Half-kneeling

Tall kneeling (pictured)

Seated on bench

Seated on Swiss ball

Deep Lunge

Seated on bench

Staggered

Athletic position depending on your particular needs (from the assessment) and your phase of training.

The stick, a simple dowel with an eyehook on one end, increases the load on the core.

You can perform this exercise (in order of decreasing effectiveness) using one long rope held just like the stick, the triceps-style rope, or just a regular cable handle.

Your performance should look and feel exactly the same on both left and right sides.

Although left/right imbalances are to be expected in many sports, symmetrical movement should always be your goal. Left/right imbalances inflict asymmetrical forces on your spine with virtually every movement you make.

## Dynamic Inner/Outer Unit Integration

### Woodchop and Reverse Woodchop

The main difference between these and the Chop/Lift exercises is that now we have more motion in the legs and trunk.

Instead of maintaining a rigid base of support, we're encouraging more flexion/extension and lateral flexion in the spine, and more active weight shifting in the legs. The degree of weight shifting depends on your sport, your skill at doing the exercise, and your training phase.



You can do this with any cable crossover machine in virtually every gym. Since most athletes are already doing too much spinal flexion, I like my clients to stay tall as they pull the cable across.

In the Reverse Woodchop, I prefer my clients to start in a squat position at the bottom with their hips forward and their hands just outside their knees. Come up and diagonally across your body. This should not feel like an arm exercise. The power should come from your legs, hips and trunk.



## **Millers**

I had no other name for this so I named it after seeing Reebok Master Trainer Gin Miller. In the tougher version, called, of course “Killer” or “Killer Millers”, you drop your hip to the floor (from the position shown in number 4), then come back up.



## **Integrated Strength**

By now I hope you understand that virtually any standing exercise becomes a core exercise. Here’s how you can get a little more core conditioning out of a couple of your favorite exercises, though.

### ***One Arm Lunge and Press***



This is more of a core strengthening exercise than it seems on the surface. Asymmetrical loading, arm overhead (lat stretch), deep lunge (rectus femoris and psoas stretch), and narrow base of support all increase core demand.

### ***One Arm Step Up and Press.***



The key in this exercise is to come up to a tall position. “Being tall” requires you to contract your transverse abdominis. (Think about what happens when you squeeze a tube of toothpaste in the middle.)

This exercise is an exaggeration of your running form. Make sure that you keep your spine vertical at all times. There’ll be a tendency to lean to one side – don’t let that happen!

In summary, here are your keys to a successful core-training program:

- Forget about your “six-pack”  
(it comes mostly from genetics and nutrition anyway)
- Emphasize stabilization
- Emphasize your transverse plane
- Don’t forget your frontal plane

And make sure you go through all of these steps

- Assessment
- Restore Movement Patterns
- Inner Unit Isolation (if necessary)
- Basic Stabilization
- Inner/Outer Unit Integration (dynamic stabilization)
- Dynamic Inner/Outer Unit Integration
- Integrated Strength
- Integrated Power

Thanks to Gray Cook, Mike Boyle, Chuck Wolf and Gary Gray for blazing the path and showing me the light.

## **Optimal Nutrition for Performance and Health**

By Rachel Cosgrove, BS, CSCS

When it comes to females and nutrition, I have noticed that there are two different types of athletes. I have had them both as clients. One has no idea about food and doesn't give a thought to what she is putting in her body or that it has any impact on her performance. The other type of female athlete is very conscious of what a calorie is and what she eats every day.

The first type of female athlete described above has always been athletic and has never had a weight or body fat problem because of the sports she plays. These athletes get away with eating whatever they want, whenever they want. As a matter of fact they have a hard time eating enough calories. Why would an athlete like this benefit from improving her nutrition? Eating fuel that her body can better utilize will give her more energy, optimal recovery and an overall improved performance.

The calorie-conscious female athlete is usually a gymnast or ice skater or athlete from other sports where there is extra emphasis placed on the athlete's body weight and shape. I have also seen it in other sports that you would never suspect such as soccer and basketball. These athletes were never taught about good nutrition or how to eat properly. They were only told that they should look a certain way and these athletes will take drastic measures to attain that 'look'. They usually know a lot about which foods are "fattening" and which aren't but don't

know how to use food as a source of energy or to improve the way they look and feel. Learning how to eat properly can help these athletes attain both the look and the energy they need to be successful in their chosen sport in a healthy way and in addition hopefully replace any disordered eating habits they have picked up.

I hope that in this chapter I can reach out to both of these groups of female athletes by discussing the basics of how to use food in an athlete's diet to increase energy, improve performance and to look and feel better. Most athletes don't realize how powerful food is. Food can have drug like effects and if you are eating the wrong foods or not enough of the right foods for your body, you are short-changing yourself and your career as an athlete. When you figure out the foods that work best you will see dramatic changes in your energy and performance and you will perform at your optimal level. This chapter will give you some guidelines and help you figure out what is optimal for you. This information is giving you the power to maximize your health, your well being and your performance over the course of your lifetime!

Following are the basic guidelines for improving your performance with optimal foods. If you have any questions or want more information, please meet with a certified nutritionist or registered dietician.

1. You must eat regularly throughout the day, usually 5-6 meals a day. Don't wait more than 30 minutes to eat something upon awakening in the morning. For the rest of the day, eat something every 3-4 hours.



Eating breakfast as soon as you can upon waking is very important. You have been in a fasting state all night long and your body needs fuel to bring your blood sugar up and get you out of a catabolic state. A catabolic state is when your body thinks it is starving and it will start breaking down your own muscle tissue for fuel. This is not good for an athlete who needs every ounce of her hard-earned muscle tissue. You want to try to eat before you become hungry in order to keep your blood sugar stable and feed your muscles all day long. Frequent meals are also necessary if you are trying to lose body fat. If you don't eat throughout the day your blood sugar will drop and so will your metabolism. You need to take in optimal foods throughout the day at regular intervals.

2. Eat protein at every meal and eat a mixture of different proteins. Eating protein at each meal will maximize your energy, trim your waist, and help you reach peak performance. This means all 5-6 meals need to have some source of protein along with a good carbohydrate. This will keep your blood sugar stable throughout the day.
3. Try to eat different foods every day. You need to eat a wide variety of foods and it is important to eat daily from all types of foods. Don't eat the same things every single day. You receive different nutrients from different foods so try different vegetables, fruits and meats. Have you ever tried Ostrich or Buffalo meat? They are very lean meats with good quality protein. Most people get into the habit of eating the same thing every day and miss out on vital nutrients and vitamins.
4. Eat whole, natural foods and stay away from processed foods. Moreover, eat organic when possible.

5. Pay attention to the percentages of proteins, fats, and carbohydrates in the foods you eat at each meal. These percentages do make a difference in your energy production, in your physical and mental performance, in your weight control, etc. It is definitely worthwhile to fine tune your diet to meet your specific, individual needs. Everyone is different. Listen to your body.
  
6. Watch dairy products containing lactose and products containing wheat and gluten. These are very common for food allergies or food sensitivities. Talk to your doctor if you think that you may have a food allergy.
  
7. Use grains in moderation. Try to avoid any refined grain products made with white flour or enriched flour. All baked goods should contain only whole grain flours. No white flours!
  
8. Use fats and oils freely. Use olive oil to cook with. Some types of fats are essential to the body. You will feel better eating a moderate amount of fat in your diet.
  
9. It is a good idea to follow every workout session with a liquid protein and carbohydrate drink. You want to replenish your glycogen stores and give your body protein to help rebuild the tissues after a hard workout. This will help with your recovery. Glycogen is the storage form of carbohydrate in your muscles and liver and it is usually depleted after a workout. Replenish your body with some nutrients after any weight training session, hard interval training session or sports training session. Liquid is best because it will get into your system quickly.

10. Stay away from alcohol. Your body must detoxify it and neutralize its adverse effects. It is a simple sugar and will wreak havoc on your metabolism.
11. Limit caffeine to no more than one to two cups per day. This includes coffee, tea, and diet sodas with caffeine. You don't want to be dependent on caffeine for energy.
12. Avoid fruit juices. I would rather you eat the fruit than drink the fruit! You get more fiber and vitamins from whole fruit than you do from juices!
13. Drink lots of water. You should aim to drink 0.6-0.7 ounces of water per pound of body weight. So if you are 130 pounds drink 78-91 ounces of water throughout the day.
14. Avoid or minimize sugar as much as you can. Check labels for grams of sugar! Anything over 20 grams is generally too much!
15. Use a diet journal to focus on changes in your appetite, cravings, energy and moods following each meal. Write down everything... what you ate, how you feel, if you're hungry, if you're tired, if you have energy, etc... It's just a matter of understanding your body language - listening to your body talk to you and paying attention to what it's telling you. Writing your food down is an excellent way to keep track and figure your own body out.

## **AVOID:**

- Candy, soft drinks, and other processed food sources of sugar
- Beer, wine, or any other alcoholic beverage
- Fried foods
- Margarine, hydrogenated oils or fat substitutes
- Overcooking vegetables
- Eating overcooked meat or eating blackened, charred meat

Taking the time to fine-tune your diet at each meal will pay off quickly for you. You'll know when it's 'right on' because you'll feel great. You'll be amazed at the results.

Follow these guidelines and gone will be the days of feeling uncertain about what you should eat! Now you'll know precisely what's right for you. The best news is that you won't have to count calories, or weigh your food, or starve yourself to try to be at your ideal weight, or fight those horrible cravings for sugar any longer. Think of food as fuel and use it to your advantage.

Giving your body exactly what it needs to allow it to maximize its energy production can produce astonishing results in your health, your weight and your well being. You will see a huge difference in your athletic abilities with an increase in energy and an ability to use your body at its optimal performance. Just wait and see!

Most of all, have fun exploring and coming to know your metabolic individuality. Enjoy the good days that lie ahead for you! Eat lots of whole natural good tasting food!

## **Injury Prevention and Awareness**

By: Erin Perry CAT(c)

Preventing injuries is important for athletes to stay on their game, increase their training efficiency and be the best that they can be. Athletes need to have very good knowledge of their bodies and coaches need to understand the biomechanics required for a certain skill. Understanding what the body will and won't do is key to keeping an athlete healthy and strong.

Taking care of an ache or pain is very important. This does not mean that you need treatment; it simply means that your body is trying to communicate with you. Having an ache or a pain will cause your body to compensate – the body likes to be symmetrical (equal left and right sides) which makes us efficient and strong.

Let's take a look at the example of a slightly sprained ankle. Your body will immediately start a compensation pattern so that you do not appear to be limping. This involves shortening your stride so that the weight bearing time is shorter. Your hips on both sides are not going through a full range of motion and that will cause them to tighten slightly, which will be further amplified by the fact that you are sitting more to give your ankle rest. When you sprain an ankle, the ligament is injured, as are the muscles that tried to pull you back out of rolling it at the time, and everything attached from there on has been affected in some way.

Having the little things taken care of at the time is not a sign of a hypochondriac, it is in fact an athlete who knows what her body is saying, and is just trying to stay in control of it. It is better to have a 3 minute treatment when you need it rather than letting everything get out of control and end up missing training time.

### **A torn ACL**

This is a female athlete's greatest fear. They want the pain checked, but they don't want to hear the answer. They know that it means a 6-12 month commitment of hard work – after surgery!

The Anterior Cruciate Ligament (ACL) is located inside of the knee joint where it crosses with the Posterior Cruciate Ligament (PCL). It is tight when the knee is bent, it is slack when the knee is straight. It is vulnerable to a rupture with hyperextension (knee straightening too far or too fast) or having your knees “taken out from under you” (when someone comes up behind you and literally pushes your knees forward). However, the most common mechanism of injury is a plant and pivot with that foot on the ground. This is a common action done in sports and everyday life.

The ACL is a major ligament of support and stability. If ruptured, it is almost impossible to heal on it's own without surgery. This injury, however, is preventable to a certain degree. There are reasons why a particular knee would be vulnerable to an ACL tear.

The incidence of injury is higher in particular sports, with particular ages, or with a Q-angle, which is greater than normal. The Q-angle is the angle at the knee between the thigh (femur) bone and the shin (tibia) bone, in other words – more “knocked kneed” than normal. What is normal? In males it is 9-13° and in females it is 13-17°. So through puberty, as a female’s body is changing to broader hips, the angle that the femur meets the tibia is increasing, causing her Q-angle to increase. This is a fact of life.

So how do we help the body adapt to its new biomechanics while respecting the training program? As the body changes, staying active with whatever activities were done previously is important. There is a transition time while the body is undergoing any kind of growth spurt or adaptation. Understanding this, it is important that stretching some areas, or strengthening others, will help your body through this adaptation. These modifications can be given by a family doctor, a coach or a therapist who works with young athletes, and understands that planning preventive care is key to developing an athlete.

That being said, the causes of many ACL injuries are termed ‘non-traumatic’. A female soccer player running down the side of the field with the ball, anticipating the cross to the other forward for a shot on net feels a pop and crumples immediately to the ground. Nobody touched her; she didn’t run into anything; her ACL just had had enough.

This type of mechanism is totally preventable. When the foot is in contact with the ground, the ACL stops the femur from sliding forward on the tibia. If for any reason, that

position is not “perfect” – the ligament becomes vulnerable. The action of the ACL as a structural stability link acts the same way as the hamstrings, they being the dynamic control. With the foot planted on the ground, the hamstrings contract to prevent the femur from sliding forward on the tibia. If the hamstrings are already tight, the tibia is further back on the femur than it should be and the position is not perfect, which means that it is vulnerable. This is preventable.

Hamstring flexibility is an important assessment done by doctors, therapists and coaches. It is a simple test that gives us a lot of information about the pulling on the tibia that causes a structural misalignment. A straight leg raise is done passively, until the ilium starts to move. When the ilium starts to move, this indicates that the hamstrings have met their end range of motion, and that we are now into the gluteus group of muscles. The normal range of passive movement for a female athlete is 80-90 degrees. If the passive range of motion is less than that, then specific hamstring muscle stretching is indicated.

The three hamstring muscles can be stretched separately by changing the leg position slightly. With the leg straight in front of you, and heel up on a stair, or bench – stand up nice and tall – now take the toes on that foot, and point them up toward your nose. During this stretch, please pay attention to the quadriceps, as they should remain relaxed. The stretch you are now doing is for the middle hamstring, the semitendinosus. At this point take the whole leg from the hip, and keeping the back tall and the toes up, turn the whole leg to the left and hold, and then to the right. As you rotate the leg through



different positions, you are able to specify the stretch to the other hamstring muscles (biceps femoris with the leg turned in and semimembranosus with the leg turned out).

Muscle imbalances between the quadriceps (front of the thigh) and hamstrings (back of the thigh) also make the ACL vulnerable. Misalignment occurs when whichever muscle is stronger pulls the tibia either forward (when the quadriceps are stronger) or backward (when the hamstrings are stronger). With most sports being forward in action, it is logical that there is a muscle imbalance. This is not desirable. We work to achieve stability and control of all joints in the body, which is based on balancing the forces that act upon them.

Athletes that change sports, seasons, or training programs are susceptible to muscle imbalances (strength is out of balance or flexibility is out of balance). Imbalances allow the body to be influenced by stronger muscles in the front of the body while we move ourselves forward, leaving the back tighter or weaker in comparison

Female athletes, by virtue of their physiology, are vulnerable to ACL tears. Besides the changes of maturity on the Q-angle, growth and increased training as we excel in our sport, it is suspected that hormone changes contribute to the occurrence of ACL tears in females.

Research is being done, and though inconclusive, seems to demonstrate that ligaments become more lax through the monthly hormonal cycle. If during this time a female

athlete's joints are more flexible and pliable, then care must be taken during aggressive activity to prevent injury. Watch for updates as more long-term studies are done. In summary, most ACL injuries are preventable, and these steps of stretching, strengthening and diverse treatments are all key to ensuring a balanced, healthy athlete.

### **Low back Pain**

Lumbar (lower back) pain is common, unnecessary and definitely something you should pay attention to. The pelvis is a key base of support for the spine and trunk. If the pelvis is not in perfect alignment, the spine will have no choice but to follow.

If for example, there is one hip flexor that is tighter than the other, that side of the pelvis may be pulled forward. The largest hip flexor, the iliopsoas is attached to the front side of 5 vertebrae and attaches high on the femur (thigh bone). If it is tight, then the distance between the two attachments will become closer, which will pull the vertebrae forward (creating a larger low back angle, called lordosis), or a functional leg length discrepancy, making the leg on that side appear shorter.

'Functional' means that the discrepancy is based on muscle imbalances (tighter, weaker) and can be corrected with treatment, whereas 'structural' means that the skeleton has been disrupted. Manual treatment and exercise prescription will aid, but not totally correct. With the hip flexors being tight, and now having one leg slightly longer than the other, the pelvis will compensate by tilting to that side, which makes our spines compensate by side bending to allow the eyes to be parallel to the floor.

Starting with a perfect pelvis alignment is the key to perfect posture. Perfect posture allows proper muscle efficiency. This will definitely improve biomechanics. Imagine the pelvis from a side profile as a wheel. The movement that it is capable of doing is rotation forwards and backwards. If the muscles on the four quadrants could be imagined as the abdominal muscles in front at the top, the hip flexors in front on the bottom, the low back muscles in the back at the top, and the hamstrings at the back on the bottom, it is easier to see the pull lines with the pelvic wheel movement.

If one of these muscles is stronger, weaker, tighter or more flexible, then the wheel is vulnerable to be pulled by the tighter muscles of the wheel. If the hip flexors are tight, which is very common because we typically tend to move forward and spend a lot of time sitting, the hip flexors become “posture tight”. They may pull the wheel forward. With this being said, it is easier to imagine why, the first thing that will happen is that the muscles of the low back will become short as well, and the abdominal muscles and hamstrings simply go with the movement, and are put on stretch.

It is very hard for a muscle that is on stretch to contract, especially if this is now a resting posture, and not an active movement. Therefore, the abdominal muscles and hamstrings will not be able to work as well. Starting with hip flexor and low back flexibility to return the pelvic wheel to normal is the key with exercise prescription when the lumbar spine starts to ache. When the alignment is restored, it is then time for the strengthening of the abdominal muscles and hamstrings to guarantee that the body is ready for activity.

## **Growing pains**

A large number of young female athletes have knee problems. The knee is a very important structural component of the body taking up to 8 times our body weight with every step we take while running. The muscles attaching to the knee are very important as most of them cover two joints, allowing us to have a lot of lower body power and control. However, if there is a muscle imbalance, the knee is vulnerable to minor imperfections.

For example, humans are not born with a bone kneecap. The patella (kneecap) starts as cartilage and becomes bone by the time we are four years old. The patella grows and develops inside of our quadriceps (front of the thigh) muscles. As we grow taller, the skeleton lengthens and the muscles attaching to it get pulled tight. We amplify this by being active and getting stronger. Tight quadriceps will pull the patella up slightly, which will cause pain when we move our knee, especially if we are loaded, with our feet on the ground (i.e.; stairs). Stretching while going through growth spurts or when our training changes is key. Taking the pressure off of the muscles so that they are more efficient is easy to do.

Growing athletes have tighter muscles than normal because as the skeleton grows, the muscles are being pulled from point A to point B. They remain taut as the body adapts. We always emphasize stretching during any growth spurt.

## **Stretching**

Everyone does it, or knows that they should, but few athletes have ever asked me why. A long time ago, someone said that stretches should be held for 30 seconds. It depends on when and what you are doing. Stretching this long is for rehabilitation – it turns off the muscle. You do not want the muscle to be “off” when you are about to use it, so before activity the stretch should be held for only 10 seconds, with many repetitions, and only if you need to. Needing to would be based on rehabilitation suggestions from your doctor or therapist, growth spurt, different training session or technique being covered, or a feeling of tightness in that muscle.

Dynamic flexibility is more functional, and a better way to warm-up prior to activity. Movement of muscles through a range of motion that starts small, but as the range of motion increases, there is more blood flow to the muscles, allowing more oxygen to get to the muscles. Moving a lot of muscles with dynamic flexibility is more activity oriented as we are not using muscles in isolation with sports or activities – they work together, through ranges of motion, so warming them up like that makes sense. Static stretches (the ones that are held in a position for a period of time) need to be done at the end of a session. Holding muscles on stretch for 20-30 seconds will allow for relaxation, so this should be done at the end of training, as rehabilitation or in a stretching session once a week.

## **Self Treatment**

What do you do when you have a pain or an ache? Do you go to the hospital now? Do you go to the Doctor's office tomorrow? Or do you try some self-treatment? Always seek a medical opinion if the pain or injury has altered your active daily life. Using judgment is key. A proper diagnosis will ensure a more efficient return to your sport or activity. That being said, there are always aches and pains that can be taken care of with proper treatment.

RICE protocol is very common for acute (brand new) injuries, standing for Rest, Ice, Compression and Elevation. These are the tried and true basics of where to start, but as these are reviewed, there are a few key facts that have been updated.

**Rest** is very important, but knowing how long to rest, and how much you can do while not fully active in a sport should be discussed with the health care practitioner that is taking care of you. Resting a 2<sup>nd</sup> degree sprained ankle for 2 days on crutches may get the athlete back to their activity just slightly faster than limping around on it, but it also saves the body from the compensations from doing so. Well worth it down the line. A short investment in resting – albeit active rest is very good for recovery. Modifying the activity as to not aggravate the injury will keep the athlete active and in shape while recovering.

**Icing:** When do you use ice and when do you use heat? Icing will decrease the circulation to the area, which is important in acute injuries that are swollen and painful.

Icing can be done with ice cubes, a bag of frozen vegetables or a gel pack. The ice is usually accessible, the frozen vegetables form nicely to the contours of the body, and the gel packs are very convenient.

Which to use is based on personal opinion and availability, though, each come with a few pieces of advice. Icing should only be done until the area is numb. A lot of clients want to hear length of time as a prescription for icing – which is very hard to do. Treating a superficial ankle ligament versus a deep Charlie Horse of the thigh are very different, as is whether the injury happened 10 minutes ago and is very swollen or if it happened 3 weeks ago and you are icing to prevent a flare-up.

The length of time that you ice is based on the sensations that you feel. As the tissue gets colder, the body will feel different sensations – cold, burning, ache, numbness. When the area feels numb, remove the cold compress. When the area is warm again to the touch, icing can be done again. If the time between sessions is shorter, the length of time to become numb in the area will become shorter as well. Paying attention to how cold the tissue is getting is key to icing properly. Please note that gel packs freeze much colder than water, so please use something between the gel pack and your skin – a T-shirt, sock, tea towel, paper towel, wrap the gel pack in a pillow case – any kind of buffer is recommended. This is not as necessary with an ice pack, but patient comfort is very important.

What position should you be in to ice? Great question – it depends completely on the injury. If a muscle is involved – the muscle should be on slight stretch while icing. This allows the muscle fibers to be slightly separated, so the cold penetration is better. If the muscles are iced in a shortened position, the fibers are vulnerable to further injury if the muscle is stretched while frozen. For example, needing to ice the quadriceps muscle on the right side would have the athlete lying on their back, with their right foot on the floor, or as close to it as possible, and supported in that position. If the injury is a ligament or a bone bruise, then icing in a comfortable position is important, which is usually with the ligament or joint in a shortened position.

Heat can be from warm water flow from the shower, jets from a whirlpool, a hot pack (moist heat), heating pad, or exercise. Heat serves the function of increasing the temperature, getting the circulation flowing and getting us ready for something. If the area is swollen, heat should be avoided unless prescribed by a health care practitioner.

***Compression:*** Wrapping an area, with a stretch based bandage is very good for keeping out swelling. As an area is wrapped, it is important to watch for signs of the bandage being too tight that would impede circulation. The idea is that the bandage has some compression to it, while allowing normal sensations. Pressure pads may also be used by your health care practitioner to direct the swelling out of the area of injury.



***Elevation:*** This will also decrease the circulation by keeping the injury site, if possible, above the heart. Keeping further swelling out of the injury site will also aid in the speed of recovery.

Athletes have a world of potential, and if we can give them anything at all, knowledge and power about their own bodies should be first on the list. Understanding what normal posture, ideal muscle balances and proper biomechanics are is something that athletes are searching for. Knowledge of how to treat themselves and how to interpret an ache or a pain empowers an athlete to take care of it. Reducing the distractions is important to successful performance.

## **Motivation & Tying it all together**

By: The team at [grrlAthlete.com](http://grrlAthlete.com)

*The will to win means nothing if you haven't the will to prepare." - Juma Ikangaa, 1989  
NYC Marathon winner*

Chances are that if you are reading this you are at least one step ahead of 95% of the rest of the population when it comes to motivation. This may sound exaggerated but it is true. The fact that you are reading this proves that you are motivated to learn more about training.

The best thing about strength training and conditioning is that it does work. You will improve. In addition, the more you read about training the more you will understand and the more it will help you improve as an athlete.

More importantly, not everyone knows that training improperly can actually weaken your performance. This sounds hard to believe, and the common notion is that when an athlete looks “in shape” they will be able to perform better. Unfortunately this isn’t always the case. So it’s not just as simple as ‘training will improve help you improve’, but rather ‘the *right* training will help you improve’.

Athletic movement training is for everyone. If you learn how to train properly you can improve your sport. Whether you are a runner, play a team sport, or compete

individually, structured strength training and conditioning will help you. All female athletes can benefit from being faster, stronger, quicker, more explosive and conditioned.

You may have noticed that this book does not contain a set program or exercise prescription. The team at *grrlAthlete.com* does not believe any program that was designed for everyone can ever properly address the needs of the individual athlete. The exercise choices, intensity, and even number of sets and reps an athlete needs to meet her goals are different than those needed by any other athlete.

One message clearly reflected in all of the chapters of Secrets of Female Strength and Conditioning is that of individuality in training. As athletes, coaches, teachers, trainers or parents, you have to adopt this philosophy when preparing yourself or others for sport.

This book has taught you an approach to training that is different from what everyone else is doing, and this is reasonable, considering it has been developed to meet individual goals designed for the purpose of improving athletic ability.

With clearly defined and understood goals, set in place by identifying individual athletic needs, and the application of the knowledge within this book, Strength and conditioning can help anyone, from novice to elite, become a better athlete.

If you are a young athlete with no formal education in training, then it is important for you to seek a qualified professional to help you reach your potential. For coaches,

strength coaches, and personal trainers, you must use these chapters as a starting point to further your education so that you can help young women become the best, injury-free athletes that they can be.

We have compiled for you a review of the key points from each individual contributing author. These summaries should only be used as a quick reference and not as a replacement for the lessons in each chapter. As always, athletes should discuss their training program with a physician, CSCS, certified personal trainer or therapist.

**Take away message:**

**Alwyn Cosgrove** emphasizes the individuality of training as superior to “one-size-fits-all” training programs. “Different people need different training programs, as they tend to have different goals, different starting points, different strengths and weaknesses and different time frames to achieve their goals,” explains Cosgrove. “The only way to guarantee success in training is to perform a thorough evaluation prior to beginning training.”

He concludes that coaches and trainers accept the challenge of individualized programming, “Results by design and not by coincidence are brought up one way only – with correct planning and program design.”

**Ryan Lee** identifies the distinction between general, sport-specific, and athlete development training methods. Ryan discusses the positives and negatives of each approach and gives direction on how to implement optimal program design.

**Mike Gough** provides his expert opinion on elite athlete speed and agility development. This is one of our true performance-oriented chapters for athletes that have already addressed all physical limitations. “In today’s sports, athletes are looking for every edge on the competition. Athletes that are quick, agile and who possess high levels of speed and acceleration separate themselves from their competitors.”

**Stephen Holt** applies unconventional and effective methods to the very popular topic of core training. “Core Training is not just working the abs and low back. Core training is teaching your trunk muscles to work as a unit...and to create a firm foundation against which your arms and legs can work most effectively.”

Stephen Holt also emphasizes the importance of rotational movements for training athletes. Stephen’s recommendations go far beyond those found in generic crunch-and-sit-up workouts and he breaks down core training like you’ve never seen it before.

**Brian Grasso** gives an expert opinion on the common term of functional training. For many athletes and coaches, functional training may appear unconventional. The chapter details how athletes and coaches can, “Incorporate natural human body motions into your

training routines - Don't get stuck into machine based or fixed free weight based exercises. Train to move and move to train!"

**Jeremy Boone** details the simplicity and effectiveness of circuit training. You don't need thousands of dollars in booster money to develop better athletes. Out of his need to appease female athletes and their coaches, he designed his circuit training routines. "Not only could I now develop all components of athleticism, but I could also include sport specific skill where appropriate. The coaches saw that their players continued to improve their athleticism combined with technical skill work all in one, and the female athletes had a lot of fun training for their sport."

**Erin Perry** emphasizes how the body works together as a unit. If one part is damaged, weak, or inadequate, the body as a whole may suffer. Strength and flexibility must be adequately addressed for optimal performance. "Athletes have a world of potential, and if we can give them anything at all, knowledge and power about their own bodies should be first on the list."

**Rachel Cosgrove** addressed the key topic of nutrition and simplified it so female athletes could have a healthy and performance enhancing diet. Says Rachel, "Giving your body exactly what it needs to allow it to maximize its energy production can produce astonishing results in your health, your weight and your well being. You will see a huge difference in your athletic abilities with an increase in energy and an ability to use your body at its optimal performance."

## Author Biographies

### Alwyn Cosgrove



For the past fourteen years Alwyn Cosgrove has been committed to achieving excellence in the field of fitness training and athletic preparation.

Specializing in performance enhancement, Alwyn has helped countless individuals and athletes reach their goals through sound scientific training.

Alwyn has an honors degree in Sports Science from Chester College, the University of Liverpool, is certified with distinction as a strength & conditioning specialist with the National Strength and Conditioning Association and has been recognized as a Master of Sports Sciences with the International Sports Sciences Association.

Alwyn is also recognized and certified by the National Academy of Sports Medicine, the American College of Sports Medicine, the British Association of Sports And Exercise Sciences, Kingsports International Australia, the Society for Weight Training Injury Specialists, USA Weightlifting and the Chek Institute of Corrective High Performance Exercise Kinesiology.

A former Taekwon-do international champion, Alwyn has utilized his personal experience as an athlete and combined it with the advanced theories of European Sports Science and the principles of modern strength and conditioning systems.

Through the years in this field Alwyn has been recognized as a specialist in Athletic Preparation by The United States, the United Kingdom and Australia and has studied extensively each country's approach to athletic preparation.

During his career as a strength and conditioning coach, Alwyn has worked with a wide variety of clientele, including several Olympic and national level athletes, five World Champions and professionals in a multitude of sports including boxing, martial arts, soccer, ice skating, football, fencing, triathlon, rugby, bodybuilding, dance and fitness competition.

A sought after 'expert' for several of the country's leading publications including Men's Health magazine, Alwyn is available to develop physical preparation programs to take you to a new level of development. Alwyn can be reached at [www.alwyncosgrove.com](http://www.alwyncosgrove.com)

### **Mike Gough BSc, CSCS**



A world class strength and conditioning specialist who has trained athletes that have competed in the Olympics, World Championships, NHL, MLB, NBA and NFL. Mike has held previous positions as Strength and Conditioning Coach with the Toronto Raptors NBA and the Cleveland Indians MLB. Mike is a graduate of Concordia University's Exercise Science Program and is a Certified Strength and Conditioning Specialist by the National Strength and Conditioning Association.

Mike currently consults with elite amateur and professional athletes looking to elevate their sport performance conditioning. His innovative training methods and unyielding dedication



to his athletes maximizes their performance to the highest level of excellence. The effectiveness of Mike's work is best measured by his client's success. After training with him many of his athletes have gone on to compete at the highest levels of amateur and professional sport. His style of coaching exudes passion and energy that physically and mentally motivates those around him. He can be contacted through his website

[www.optperformance.com](http://www.optperformance.com)

### **Brian Grasso**



Brian Grasso graduated from the Fitness Management Program at George Brown College in 1997 and has gone on academically to qualify for registration as a Nutritionist through the International Organization of Nutritional Consultants by completing over twenty nutritionally based courses and writing two comprehensive examinations. He is also a certified massage therapist specializing in sport massage and a member of the American Massage Therapists Association.

As a professional in the sport and fitness industries, Brian has had an extremely diverse and successful career. He served as a conditioning coach at the High Performance Specialists in Toronto, and was later promoted to Director of Football Operations. Brian was named Director of Athlete Development for Sportscience, which was an athletic consulting firm based in Toronto, and went on to be hired as Director for the International Sport Performance Center. Brian has traveled the world as a Conditioning Coach and consultant to several National Team athletes from various countries.

Developing Athletics is a progressive company which specializes in educating athletes, coaches, trainers and parents on the concepts of functional conditioning and athletic development. Brian has produced several educational based products all of which are available on his website - [www.DevelopingAthletics.com](http://www.DevelopingAthletics.com)

### **Rachel Cosgrove**



Rachel Cosgrove has a BS in Physiology, and is certified by the NSCA, NASM, USAW, ISSA, Apex and the CHEK Institute as a Nutrition and Lifestyle coach.

She and her husband own a fitness facility in Santa Clarita, California where they work with clients. The name of the gym is Results Fitness Training because that is what they are all about, achieving results!

Having studied under several of the world's top training and nutrition specialists Rachel brings a holistic approach to health, fitness & nutrition. Repeatedly producing fast effective results in all of her clients fitness and nutrition programs, Rachel can take any clients progress to an unforeseen level. You can check out their website at [www.results-fitness.com](http://www.results-fitness.com).

### **Stephen Holt**



Numerous athletes at all levels - including Olympians and professionals in numerous sports - credit Stephen Holt for greatly improving their performance. Stephen was named 2003 Personal Trainer of the Year by the American Council on Exercise and 1999 Expert of the Year by allExperts.com. Get his insider secrets FREE at [subscribe@CoreTrainingExercises.com](mailto:subscribe@CoreTrainingExercises.com)

### **Erin Perry**



Erin Perry is an Athletic Therapist and Acupuncturist (TCM) based out of Etobicoke, Ontario. When home from traveling with the Women's National Soccer Teams for Canada, she is in private practice specializing in elite pediatric athletes and preventative medicine in terms of orthopedic injuries.

### **Jeremy Boone**



Jeremy Boone, founder of the Carolina Athletic Development Institute ([www.carolinaadi.com](http://www.carolinaadi.com)) and speed consultant for the Atlanta Beat (WUSA) and Carolina Panthers (NFL), works with individual athletes, teams, and youth clubs who struggle with getting fit, fast, and strong. He also writes for numerous print and web publications including his own column in the National Soccer Journal. If you would like to learn more about how

Jeremy can help improve your performance, sign-up for his free Training newsletter at [www.athletebydesign.com](http://www.athletebydesign.com) or email [jeremy@carolinaadi.com](mailto:jeremy@carolinaadi.com).

If you have any questions, or if you come up with some really creative and cutting-edge circuits, please contact me: [Jeremy@carolinaadi.com](mailto:Jeremy@carolinaadi.com) or visit [www.athletebydesign.com](http://www.athletebydesign.com).

### **Ryan Lee, MS, CSCS**



Ryan Lee, MS, CSCS is recognized as the world's leading expert on sports training marketing. He's the founder of SportSpecific.com, the world's largest strength and conditioning membership site, and Personal Trainer University - the leading resource for successful personal trainers.

On the training side, Ryan is the former Director of Training at the Sports Medicine Center for Young Athletes and was the Director of Strength and Conditioning at Wildcat 3 High School in New York City. He has also created hundreds of successful training programs and consulted for organizations such as the United States Tennis Association, US Figure Skating Association, LifePlex, and Yale University. You can check out his website at <http://www.SportSpecific.com>