USC

Soccer

Summer

Conditioning

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The primary goals of a physical development plan are the prevention of injuries, faster recovery from injuries, maintaining a high skill level and improving the performance of the athlete.

Conditioning is very specific. The demands of running a series of sprints are different from running in a game situation. Specificity of conditioning is a term used to describe the specific adaptations that take place physically from a particular activity.

The best way to condition for soccer is to play soccer. The closer your conditioning comes to simulating the demands of the game, the greater the conditioning carryover will be.

The running we do in the off-season is designed to get the athlete in shape to start practice. The only way to get into shape for the game is to actually experience the demands on the body in a game situation. The purpose of the off-season conditioning program is to prevent injury and to give the athletes a "base level" of fitness that will allow them to make the specific game level adaptation in a few days instead of a few weeks.

One must work at a certain level of effort in order to stimulate the body. Once improvement has occurred, the work must be made progressively harder to force further improvement. Therefore, the name of the game is overload and progression. There is evidence that training intensity, not duration is the most important factor in improving VO2 max.

Long, slow distance exercise involves performing exercise at low intensities (ie. 57%VO2max or 70%MHR) for durations that are normally greater in length than normal competition distance. Research suggests that this technique is inferior to short-term high intensity exercise in improving VO2max.

It used to be a common belief that improvements in endurance were proportional to "volume". Athletic achievement was thought to be only possible by doing "more". Costil and colleagues contradicts this belief. In a study of two groups (One training for 3 hours and the other for 1.5), the 1.5 hour group performed as well as the 3 hour group. In fact the 3 hour group performed poorly in some events. Therefore, please consider the volume of training required to reach the benefits.

It is believed that high intensity intervals lasting longer than 60 seconds are more effective in improving aerobic power and perhaps lactate threshold, than low intensity intervals.

Conditioning of the soccer athlete, due to the varying distances the soccer athlete typically covers during a game (somewhere between 2,000-10,560 yds) can lead to slow, long distance running to meet game demands. This is problematic as slow, long distance running does not meet the energy demands of soccer. Soccer players perform high intensity sprints, alternated with jogging, walking and striding.

An evaluation of soccer's movement demands revealed the following:

1. Most runs vary in length between 5-30 yards, the most common distance about 10 yards.

2. Runs are usually made without a ball, although ball contact may occur at the beginning or end of a run

3. Players' movements involve turning quickly, dodging, weaving, twisting, jumping, leaping, and accelerating from stationary or near stationary positions

4. Exercise intensity during a game ranges from walking to jogging to sprinting. Also integral to the game are kicking, heading, passing, dribbling, tackling and jumping with quick agile movements.

Although it is important to remember soccer is an interval-type sport and that developing the ability to run long distance at a moderate pace is not specific to soccer demands; the opposite misconception can lead to focusing only on speed training (short sprint) ignoring the development of an aerobic base. Low endurance development results in early muscular fatigue during games.

What is needed is a sport specific conditioning program that meets the energy demands of soccer. This means the athletes must both the aerobic and anaerobic energy systems.

In terms of training the aerobic system for soccer,it is recommended that the aerobic conditioning program be at least 5 weeks in duration, divided into 2 phases, general and specialized.

General aerobic training lasts 3 weeks in which players run 4 times per week at a a medium to light intensity for approximately 30 minutes at a pace that allows conversation. This time period can be broken into segments, maybe 2 15 minute or one 30 minute segment between segments players can work on flexibility. The objective of this is to improve the body's fat-burning ability. Also, alternate aerobic activities can be utilized such as bicycling, swimming, etc.

Following this 3 week general training period, specialized aerobic training is initiated . Practice running now begins to relate more closely to soccer fitness. Once again players run 4 times per week in 30-35 minute segments. Unlike the general preparation period, the intensity is varied as the athletes combine walking, jogging, and sprinting in 1 workout. This will variously increase and decrease the athlete's heart rate. During this period, the players sprint/stride until they are nearly out of breath, recover with lower intensity movements, and then return to higher intensity training. This specialized aerobic period should be a minimum of 2 weeks.

At the completion of these 5 weeks of general and specialized aerobic training, the athletes should have developed a good training base. Because of the need for training specificity, emphasis now shifts from longer duration towards interval training, which is considered one of the most effective methods for enhancing the physical conditioning of soccer athletes.

Interval training occurs when periods of work are alternated with periods of rest (work:rest ratio) Interval training subjects the body to short, but regular, repeated periods of work stress, interspersed with adequate periods of relief, as is frequently the case in soccer. Through interval training the athletes can work, for example at an all out effort for a short time (85% of max. heart rate) followed by a period of active recovery.

Because soccer combines endurance, sprinting and skill, the interval training must be designed to incorporate and achieve:

1. meeting skills of soccer
2. improving energy systems to support the skills and demands of soccer
3. depending upon this season, allowing for changing of training volume and intensity

One of the most accomplished and effective protocols to apply interval training specific to soccer is soccer metabolic conditioning.

Complete information regarding soccer metabolic conditioning follows on the next page.

Summer Conditioning Program

PHASE ONE
GENERAL AEROBIC TRAINING

WEEKS 1-3
- 4 times a week
- 30 minute session (can do 2 - 15 minute sessions, with stretching in between)
- Sustained Running, Biking or Swimming
- Medium to Light Intensity
  (You should be able to hold a conversation while exercising)

PHASE TWO
SPECIALIZED AEROBIC TRAINING

WEEKS 4-5
- 4 times a week
- 30-35 minute session
- Combine Walking, Jogging and Sprinting
- Sprint/ Stride until nearly out of breath, recover with lower intensity movement (walk or jog) then repeat

PHASE THREE
INTERVAL TRAINING - SOCCER METABOLIC CONDITIONING

Refer to the Soccer Metabolic Conditioning diagram sheet

- 3-4 times a week on non-consecutive days
- 10 sprints is one set
- 4 sets with 2 minute break between each set is one half
- Work up to a complete game with a 5 minute half time

USC LADY PANTHER SOCCER

TO BECOME FAMILIAR WITH THIS YEAR'S FITNESS ASSESSMENT (FORMER BEEP TEST), PLEASE GO TO THE FOLLOWING WEB SITE:

TOPENDSPORTS.COM

FIND "YO-YO INTERMITTENT TESTS"

FIND "YO-YO INTERMITTENT RECOVERY TEST LEVEL 1 (YO-YO IRTL1)

BE SURE TO "VIEW"

TO BECOME FAMILIAR WITH A DYNAMIC WARM UP THAT WE WILL UTILIZE THROUGHOUT THE SEASON, PLEASE GO TO THE FOLLOWING WEB SITE:

USCLUBSOCCER.ORG

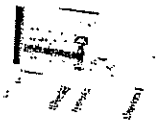
FIND "PLAYERS FIRST"

FIND "OFFERINGS"

FIND "FIFA 11+

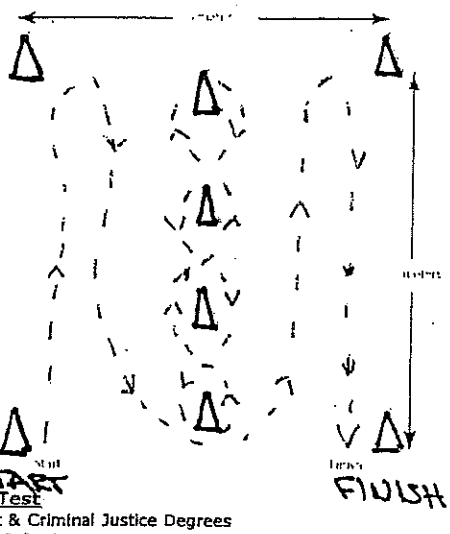
WE WILL INCORPORATE THIS "ACL" WARM UP WITH OUR DYNAMIC WARM UP THROUGHOUT THE SEASON.

BE SURE TO BECOME FAMILIAR WITH THE FIFA11+



Illinois Agility Test

- **purpose:** Agility is an important component of many team sports
- **equipment required:** flat non-slip surface, marking cones, stopwatch, measuring tape, timing gates (optional)
- **description:** The length of the course is 10 meters and the width (distance between the start and finish points) is 5 meters. Four cones are used to mark the start, finish and the two turning points. Another four cones are placed down the center an equal distance apart. Each cone in the center is spaced 3.3 meters apart.



- **procedure:**Subjects should lie on their front (head to the start line) and hands by their shoulders. On the 'Go' command the stopwatch is started, and the athlete gets up as quickly as possible and runs around the course in the direction indicated, without knocking the cones over, to the finish line, at which the timing is stopped.
- **results:** The table below gives some rating scores for the test

Agility Run Ratings (seconds)		
Rating	**Males**	**Females**
Excellent	<15.2	<17.0
Good	16.1-15.2	17.9-17.0
Average	18.1-16.2	21.7-18.0
Fair	18.3-18.2	23.0-21.8
Poor	>18.3	>23.0

- **Advantages:** This is a simple test to administer, requiring little equipment. Can test players ability to turn in different directions, and different angles.

300-YARD SHUTTLE

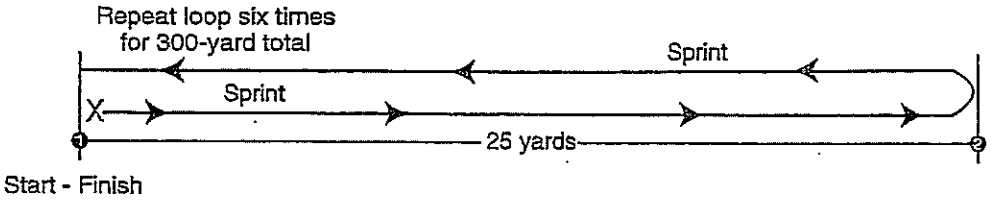
This test measures lactate threshold. Lactate threshold is important for measuring an athlete's game readiness. The ability to recover over repetitive intervals of running is the best measure of game fitness. When athletes produce lactic acid in the muscles, performance may be diminished significantly if they are unable to recover quickly. This test is best for sports like basketball, field hockey, soccer, and others that require similar energy needs. This is one of our favorite tests.

1. Place two cones 25 yards apart. Mark a short line perpendicular to the straight line formed by the cones near each cone.
2. Sprint six complete trips (from cone one to cone 2 and back to cone 1 equals one trip) for a distance of 300 yards. Touch the foot to the short line at each end of the 25 yards. The test begins on the timer's command and ends when you pass the start-finish line.

Raw score (sec) Average of two trials	Points
≤59.9	10
60.0-61.9	9
62.0-63.9	8
64.0-65.9	7
66.0-67.9	6
68.0-69.9	5
70.0-71.9	4
72.0-73.9	3
74.0-75.9	2
≥76.0	1

1 yard = 0.9144 meters

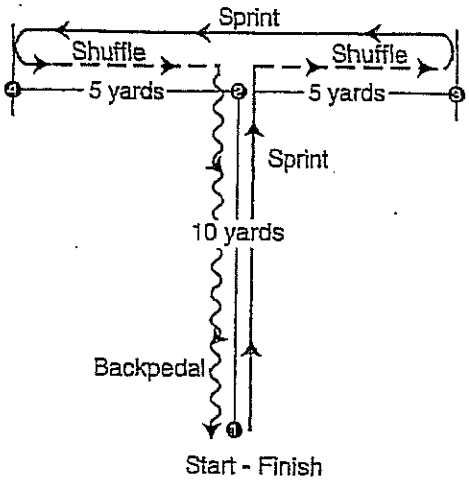
You will have 5 minutes to recover before starting the second trial. Your score is the average of the two trials. For example, if you complete trial one in 65 seconds and trial two in 67 seconds, your score is 66 seconds. A coach can use the difference between trials as an indicator of fitness. For instance, athletes who are in game condition usually will score on the second trial within 1 to 2 seconds of the first trial. A difference of 4 seconds suggests that the athlete does not clear lactate from her system efficiently. Interval training sessions are the best way to enhance your lactate threshold and increase your rate of recovery.



T-TEST

This test measures forward, lateral, and backward agility.

1. Set up the test by measuring two 10-yard lines to form a T. Place cone 1 at the base of the T and cone 2 at the other end of the vertical line, where the two lines meet. Place cone three on the right end of the horizontal line and cone four on the left end. The start-finish line is at cone 1.
2. Sprint forward from cone one to cone 2.
3. Run just past cone 2, and shuffle right to cone 3.
4. Plant the right foot, turn, and sprint to cone 4.
5. Change direction at cone 4, and shuffle right to cone 2.
6. At cone 2, backpedal to the start-finish line. The timer starts the clock on the first movement and stops the clock when the back crosses the line.



Raw score (sec)	Points
≤9.00	10
9.01-9.25	9
9.26-9.50	8
9.51-9.75	7
9.76-10.00	6
10.01-10.25	5
10.26-10.50	4
10.51-10.80	3
10.81-11.10	2
≥11.11	1

1 yard = 0.9144 meters

BROAD-JUMP TEST

The broad jump measures explosive power of the lower extremity. It differs from the three-hop test because it removes the transition between the jumps and takes out the balance and timing elements. Sports like swimming and diving might test the broad jump to evaluate explosiveness off the blocks or platform. Set up the test by extending a tape measure on the floor about eight feet.

1. Position yourself at one end of the measuring tape.
2. When set, explode off the line, pushing with both legs.
3. Measure the end of the jump from the back of the heel. If the you fall back, the test does not count, and you must retest.

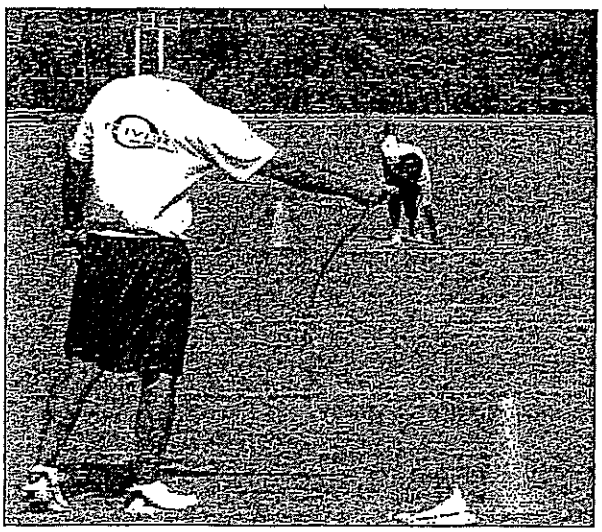
Raw score (ft, in)	Points
≥7'0"	10
6'8"-6'11"	9
6'4"-6'7"	8
6'0"-6'3"	7
5'8"-5'11"	6
5'4"-5'7"	5
5'0"-5'3"	4
4'8"-4'11"	3
4'4"-4'7"	2
≤4'3"	1

1 inch = 2.54 centimeters; 1 foot = 0.3048 meters

20-YARD SPRINT

This test measures acceleration.

1. Mark a start and a finish line 20 yards apart on a court or playing field. Place the timer at the finish line.
2. Using a standing start or a three-point start (with one hand down), sprint from the start line to the finish line.
3. The timer should start the watch on your first movement and stop the watch as the chest breaks the plane of the finish line.



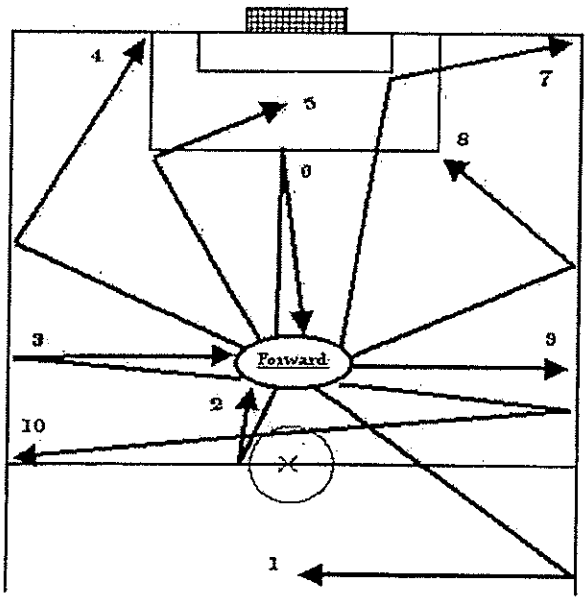
Raw score (sec)	Points
≤3.00	10
3.01-3.05	9
3.06-3.10	8
3.11-3.15	7
3.16-3.25	6
3.26-3.35	5
3.36-3.50	4
3.51-3.70	3
3.71-3.80	2
≥3.81	1

1 yard = 0.9144 meters

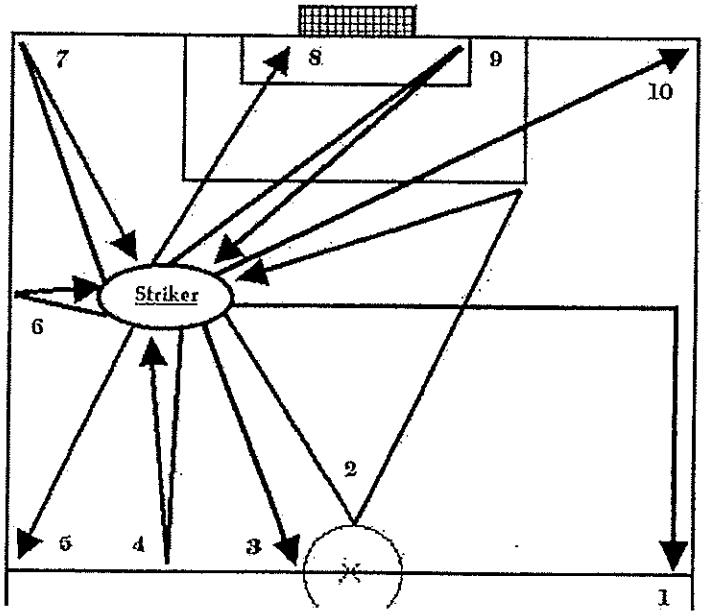
Soccer Metabolic Conditioning

Before starting any workout, please remember to warm up and stretch properly. Take five to ten minutes to get your heart rate up and "break a sweat". Then, take ten to fifteen minutes to stretch your entire body. Again, following a workout take time to cool down and stretch.. Five to ten minutes is an adequate time for a cool down. Stretching after a workout is more beneficial and should not be taken lightly. Stretching for fifteen minutes every day will increase the resting length of muscles, restore normal range of movement, encourage proper blood flow, and permit increase of power with strengthening exercises.

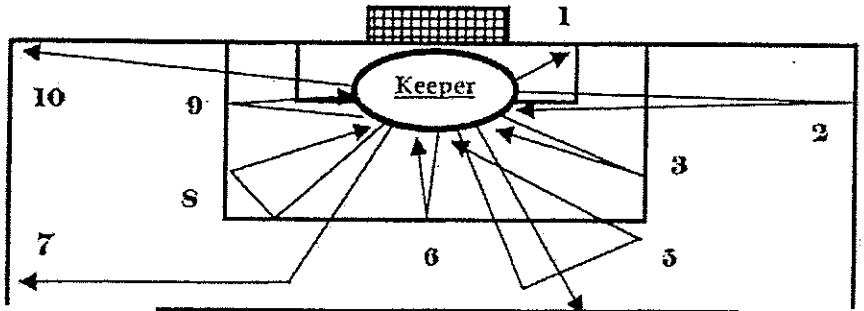
Follow numbers in order. Arrows finishing at the "start position" are sprints away and back. Arrows that do not come back to the "start position" are sprints and recovery jogs. These should be two distinctively different speeds. Walking should not be tolerated. Cuts should be hard and with a purpose. Visualize defense and teammates throughout simulations. Completing all ten is considered one set. Completing four sets, with two minute breaks between sets, is considered one half. Work your way up to a complete game, with a five minute half time. More than 60% of total workout should be spent in the 80% or higher range of your predicted maximum heart rate.



790 total yards, Goal: <4:30



730 total yards, Goal: <4:10



460 total yards, Goal: <4:00

The purpose of the soccer striking program is to help develop foot-eye coordination, expose the body to the stresses of striking a ball on the dominant and non-dominant leg increased accuracy and touch, as well as, enhance the techniques used in various game situations.

Soccer Striking Program

The purpose of the soccer striking program is to help develop foot-eye coordination, expose the body to the stresses of striking a ball on of the dominant and non-dominant leg, increased accuracy and touch, as well as, enhance the techniques used in various game situations. Technique is even more important when you begin to fatigue. Stay focused throughout the workout. Take time to work on your strengths and weaknesses to become a more complete player.

Before starting any workout, please remember to warm up and stretch properly. Incorporate speed drills into your warm up to help master the skills associated with proper running mechanics. A good warm up should last between five to ten minutes with the goal of increasing your internal, core body temperature. This increase in core temperature is normally defined when a substantial sweat is achieved. Then, take ten to fifteen minutes to dynamically stretch your entire body. Following the workouts, again, take time to warm down and stretch. Five to ten minutes is an adequate time for a warm down. The use of a static stretching program after a workout is more beneficial and should not be taken lightly. Stretching for fifteen minutes each day will increase the resting length of muscles, restore normal range of movement, encourage proper blood flow and permit increase of power with strengthening exercises.

Participate in a year round strength and conditioning program. A comprehensive program should take into consideration the specific sport and position, the time of year, physical capabilities of the athlete, and provide sound nutritional and body composition guidelines. See the sections on Muscular Strength, Cardiovascular Fitness, Performance Flexibility, Sports Nutrition, Body Composition, and Skill Development to maximize your opportunity for getting the most out of the soccer striking program.

Week #12	*Week #11*	*Week #10*	*Week #9*
50 Juggle Touches	75 Juggle Touches	100 Juggle Touches	125 Juggle Touches
25 Penalty Kicks	50 Penalty Kicks	75 Penalty Kicks	100 Penalty Kicks
75 Week #1 Total Shots	*125 Week #2 Total Shots*	*175 Week #3 Total Shots*	25 Shots, Outside 18
			250 Week #4 Total Shots
Week #8	*Week #7*	*Week #6*	*Week #5*
150 Juggle Touches	175 Juggle Touches	200 Juggle Touches	175 Juggle Touches
125 Penalty Kicks	150 Penalty Kicks	100 Shots, Outside 18	125 Shots, Outside 18
50 Shots, Outside 18	75 Shots, Outside 18	25 Shots, Outside 30	50 Shots, Outside 30
325 Week #5 Total Shots	*400 Week #6 Total Shots*	*325 Week #7 Total Shots*	*350 Week #8 Total Shots*
Week #4	*Week #3*	*Week #2*	*Week #1*
150 Juggle Touches	125 Juggle Touches	100 Juggle Touches	75 Juggle Touches
150 Shots, Outside 18	25 Shots, Outside 18	25 Shots, Outside 18	50 Shots, Outside 18
75 Shots, Outside 30	100 Shots, Outside 30	125 Shots, Outside 30	150 Shots, Outside 30
375 Week #9 Total Shots	25 Shots, From Half Field	50 Shots, From Half Field	75 Shots, From Half Field
	275 Week #10 Total Shots	*300 Week #11 Total Shots*	*350 Week #12 Total Shots*

Soccer Control and Juggling Program

Before starting any workout, please remember to warm up and stretch properly. Incorporate speed drills into your warm up to help master the skills associated with proper running mechanics. A good warm up should last between five to ten minutes with the goal of increasing your internal, core body temperature. This increase in core temperature is normally defined when a substantial sweat is achieved. Then, take ten to fifteen minutes to dynamically stretch your entire body. Following the workouts, again, take time to warm down and stretch. Five to ten minutes is an adequate time for a warm down. The use of a static stretching program after a workout is more beneficial and should not be taken lightly. Stretching for fifteen minutes each day will increase the resting length of muscles, restore normal range of movement, encourage proper blood flow and permit increase of power with strengthening exercises.

Participate in a year round strength and conditioning program. A comprehensive program should take into consideration the specific sport and position, the time of year, physical capabilities of the athlete, and provide sound nutritional and body composition guidelines. See the sections on Muscular Strength, Cardiovascular Fitness, Performance Flexibility, Sports Nutrition, Body Composition, and Skill Development to maximize your opportunity for getting the most out of the Soccer Ball Control and Juggling program.

1 minute - Jog while dribbling ball with quick touches, changing direction and speed. Do this in a confined space where many changes and touches are necessary.

1 minute - Head juggling

1 minute - Throw ball up, jump and while you are in the air trap the ball with your head, settle the ball to your feet, and move off quickly - repeat.

1 minute - Thigh juggling

1 minute - Throw ball up, jump, and while you are in the air trap the ball with your chest, settle the ball to your feet, and move off quickly - repeat.

1 minute - Foot juggling with no spin on the ball.

2 minutes -Starting in a sitting position, throw ball up, get up and stop the ball before it hits the ground, settle it to your feet, and move off quickly - repeat using head, chest, each thigh, each foot in that order to trap the ball.

2 minutes – Full body juggle. Goal is to have more than 90 touches.

Running Mechanics

There are many factors involved in helping you reach your maximum speed. Technique is one of the most trainable factors and one of the most important. With solid technique, you will be a faster, more efficient runner. Many athletes with poor running mechanics will have several technical problems. Try to focus on one thing at a time. If you try to change too much, too quickly, it will most likely be overwhelming to you. Try to point out the good things that you are doing, and then introduce one thing to work on at a time. When that aspect is mastered, add another correction.

Before starting any workout, please remember to warm up and stretch properly. Incorporate speed drills into your warm up to help master the skills associated with proper running mechanics. A good warm up should last between five to ten minutes with the goal of increasing your internal, core body temperature. This increase in core temperature is normally defined when a substantial sweat is achieved. Then, take ten to fifteen minutes to dynamically stretch your entire body. Following the workouts, again, take time to warm down and stretch. Five to ten minutes is an adequate time for a warm down. The use of a static stretching program after a workout is more beneficial and should not be taken lightly. Stretching for fifteen minutes each day will increase the resting length of muscles, restore normal range of movement, encourage proper blood flow and permit increase of power with strengthening exercises.

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Check Point 1: **The Head and Eyes**

When sprinting, focus your eyes straight ahead.

Biomechanic Principle:

1. The eyes control the head.
2. The head controls the spine.
3. The spine controls the hips.
4. The hips control the glutes (the key muscle group for maximizing speed.)

If the glutes are not aligned properly, speed is reduced. If the eyes look down, the head tilts. This causes the spine to round, allowing the hips back and taking the glutes out of proper alignment.

When sprinting, focus your eyes on some point in the distance that is at eye level.

Check Point 2: The Shoulders and Back

The shoulders are back (shoulder blades pulled together) while maintaining an arch in the lower back.

Biomechanic Principle:

Remember the sequence mentioned above. If the shoulders are forward, the spine will round. If you do not maintain an arch in the lower back, the hips will drop back out of alignment and speed will be reduced.

Check Point 3: The Hands

The hands should be relaxed, not loose, with the thumb placed on the forefinger and can be held in a variety of ways depending on which way the athlete feels most comfortable. Some runners like to touch the thumb and middle finger together gently. Some like to straighten the fingers so the hand is in a "fin" position (Carl Lewis does this), while still others prefer a loose fist. Whatever grip you prefer is okay as long as it is relaxed and does not create any tension that might tighten up the movement of the upper body.

Biomechanic Principle:

If the hand is loose, it will rotate. This causes rotation in the lower arm as well as the ankle of the opposite leg. By eliminating this rotation, you eliminate a side to side motion and add to forward speed.

Check Point 4: The Arm, Shoulder Rotation and 90° angle at the Elbow

The path that the hand travels is easily taught using the "chest to hip pocket" cue. What this means is that the hands will travel from a position where the finger tips are even with the chest, about eight to ten inches away from the face (this will depend on the length of the arm since the elbow will be bent at 90°). The hand should not cross over the mid line of the body, but should travel out to the sides of the body instead of crossing slightly to the mid line of the body. This can be effective, but the slight cross of the arm to the mid line of the body helps balance the rotational forces on the spine caused by the movement at the hips during knee drive. An easy way to bring your arm up to the right spot is to hold your one hand out about ten inches from your sternum. Then, simply pump the other arm as if you were running, lightly touching your hand at the top of each swing.

Biomechanic Principle:

If the hand travels above sternum level, the body will naturally follow the upward motion. This creates a vertical lift to your sprint and reduces forward speed.

If the hand fails to extend past the hip on the backward motion, the opposite leg will not extend completely. Example: If the left hand stops at the hip, the right leg will not extend completely. The hand extending past the hip will aid in complete extension of the opposite leg and increase the stride length.

Check Point 5: The Arm and Breaking the Angle (Hand below Hip)

As the hand travels backward, it should be pushed rather forcefully, yet relaxed, back to just above an imaginary pocket on the back of your pants. If you were wearing jeans, you would be in a position to put something into your back pocket. The hand may be slightly higher than the pocket, but it should travel backward far enough that it is slightly behind the

body. NOTE: The arm does not straighten completely. It should always remain bent. The forceful throwing of the arm backwards helps pull the same side leg upward quickly without losing balance. While it sounds strange to talk about balance during a high speed activity, if you are wasting energy trying to maintain body position or balance, it could slow you down significantly.

Biomechanic Principle:

If the hand travels at or above the hip level, the shoulder will raise and lower. This will create a vertical lift to your sprint and reduce forward speed. Breaking the angle past the hip increases the backward extension of the arm and therefore increases the "snap" of the recovery leg upward. More importantly, it causes the extended leg to "push off" more forcefully. Stride length and stride frequency are both improved.

Check Point 6: The Wrist

At the end of each upward motion of the arm, the wrist should be cocked as it comes up to sternum level. As the hand travels past the hip, the wrist should be "cracked" backwards as if cracking an imaginary whip. Proper timing will allow you to crack the wrist as the fist travels past the hip.

Biomechanic Principle:

Cracking the wrist joint allows you to apply more force to the extension motion of the arm thereby maximizing the "opposite reaction" mentioned in Check Point 5. As the wrist cracks, make sure you maintain the arm angle. Do not allow the arm to straighten completely.

Check Point 7: The Glutes

The glutes must be underneath the upper body versus being rotated back and out of alignment with the spine.

Biomechanic Principle:

The glutes are the key muscle for maximizing speed. In order to obtain maximum leg drive and complete extension, the glutes must be properly aligned with the spine. If the glutes are in the proper position, you should feel more power from your leg drive.

Check Point 8: The Foot Placement

Many athletes will either over stride or under stride because they are unsure as to where their foot should contact the ground. Some people will try to extend the leg too far in front and will end up wasting energy. The foot should make contact with the ground directly below the hips. Draw a line from the bottom of your pelvis to the ground, the foot should make contact less than a foot in front of that line (depending on the size of the athlete). It may appear that contact is being made farther in front of the body, but the leg will be swinging backward quickly at this point of the stride.

Biomechanic Principle:

If the foot lands in front of the body, "striding out", your body will be blocked by the extended leg and forced upward. This creates a vertical lift to your sprint and reduces forward speed. Do not reach out with the front leg.

You increase stride length by extending the leg below and behind you, not in front.

Check Point 9: The Foot Strike

As the foot strikes the ground, the ankle will be slightly extended and will fully extend during the push off. Some runners will make the mistake of keeping the ankle extended as the foot pulls back through. Actually, you want to flex the ankle after the push off and keep it flexed as the knee drives upward.

Many athletes will look down at their feet while they are running and say that it looks like they strike the ground with the outside of their foot. This is normal. The foot will actually roll slightly from the outside to the inside as it contacts the ground and pushes off.

To summarize the basic teaching points of the foot strike:

1. Stay on the ball of the foot. The heels never touch the ground while sprinting.
2. Feet point straight forward in the direction you are running.

One out of every 100 high school female athletes will suffer a serious knee injury this year

Serious knee injuries are sidelining athletes at an alarming rate with over 100,000 anterior cruciate ligament (ACL) injuries occurring in the United States each year. Most of the injuries are non-contact injuries occurring in sports such as basketball that involve pivoting, cutting or jumping. Over a decade ago, the physicians at Cincinnati SportsMedicine and Orthopaedic Center recognized the need for prevention programs for female athletes to address these serious knee injuries.

In conjunction with the findings by Cincinnati SportsMedicine the NCAA has stated that "prevention programs designed to increase neuromuscular control, improve balance and teach avoidance strategies for at-risk situations appear to be effective in decreasing injury rates."

Take action so you don't have to spend a season on the sidelines

GET TRAINED! Dr. Frank Noyes and the doctors and researchers at Cincinnati SportsMedicine Research and Education Foundation have been leaders in developing programs to ensure female athletes play well and stay well. Sportsmetrics™ is a scientifically proven jump training program that incorporates proper stretching, special Plyometric exercises and strength training.

It is proven to help athletes:

- Significantly reduce the risk of serious knee injury
- Jump Higher
- Improve leg strength, especially the hamstrings and quadriceps strength ratio

Sportsmetrics™ can protect the knee while increasing jump power and performance!

Greg Wagner is a Cincinnati SportsMedicine Sportsmetrics™ certified instructor.

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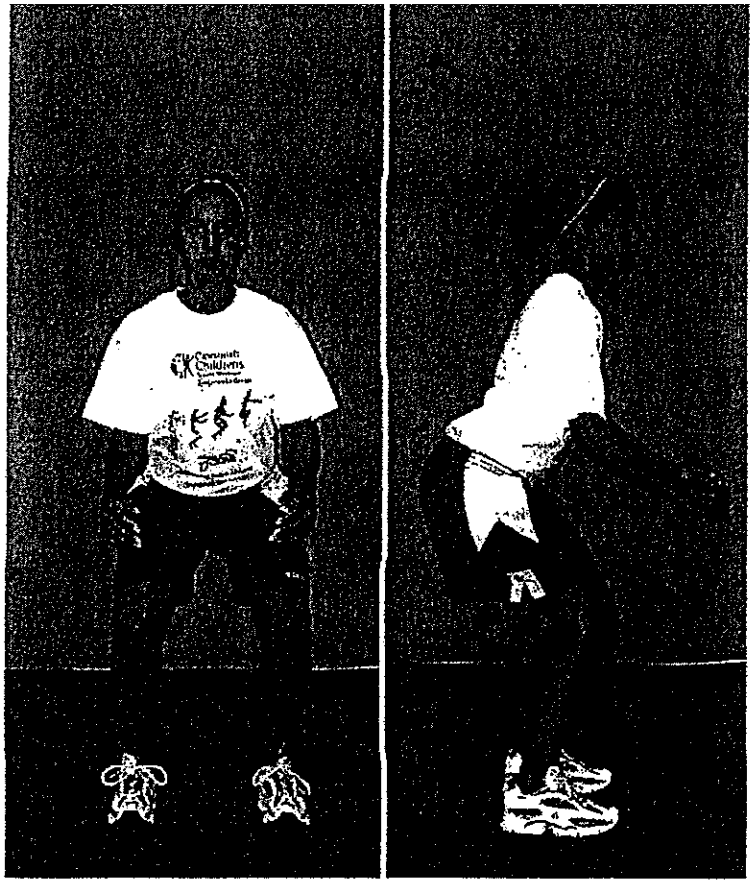

Figure 2. The athletic position is a functionally stable position with the knees comfortably flexed, shoulders back, eyes up, feet approximately shoulderwidth apart, and body mass balanced over the balls of the feet. The knees should be over the balls of the feet and the chest over the knees. This athlete-ready position is the starting and finishing position for most of the training exercises. During some exercises, the finishing position is exaggerated with deeper knee flexion in order to emphasize the correction of certain biomechanical deficiencies.

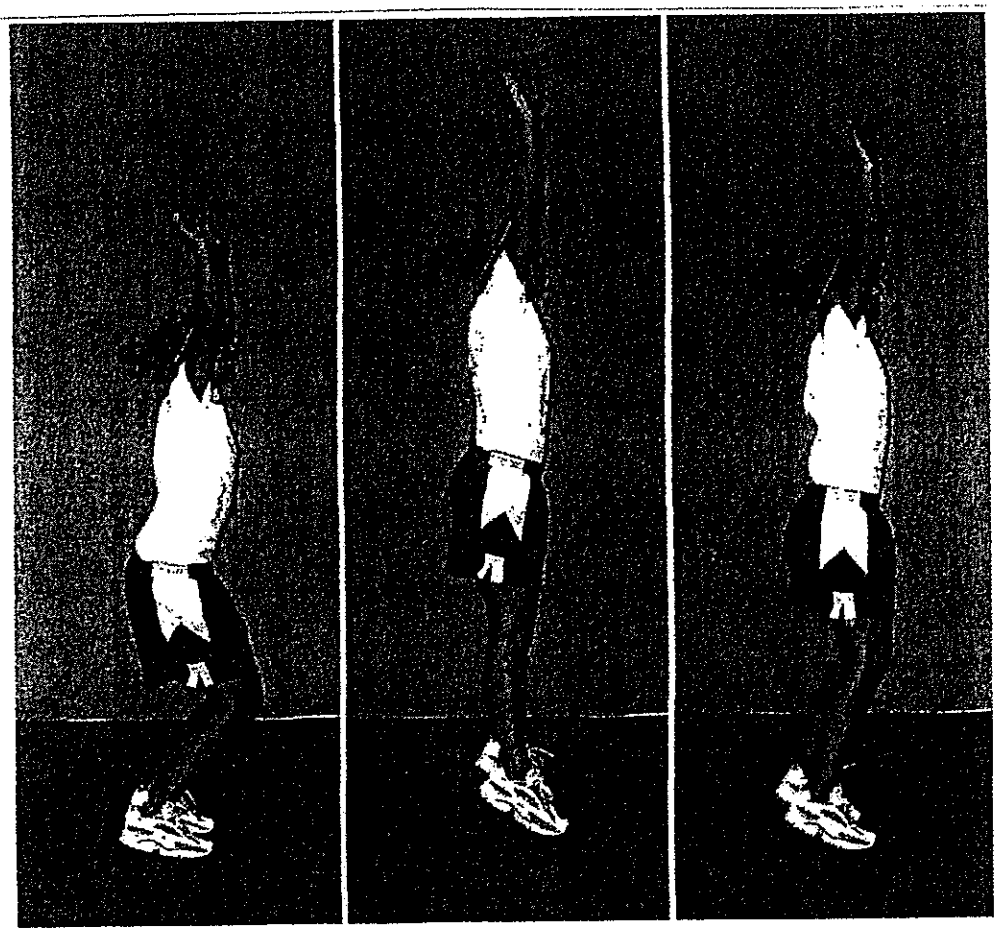

Figure 3. Wall jumps. The athlete stands erect with the arms semiextended overhead. This vertical jump requires minimal knee flexion. The gastrocnemius muscles should create the vertical height, and the arms should extend fully at the top of the jump. Use this jump as a warm-up and coaching exercise, as this relatively low-intensity movement can reveal abnormal knee motion in athletes with poor side-to-side knee control.

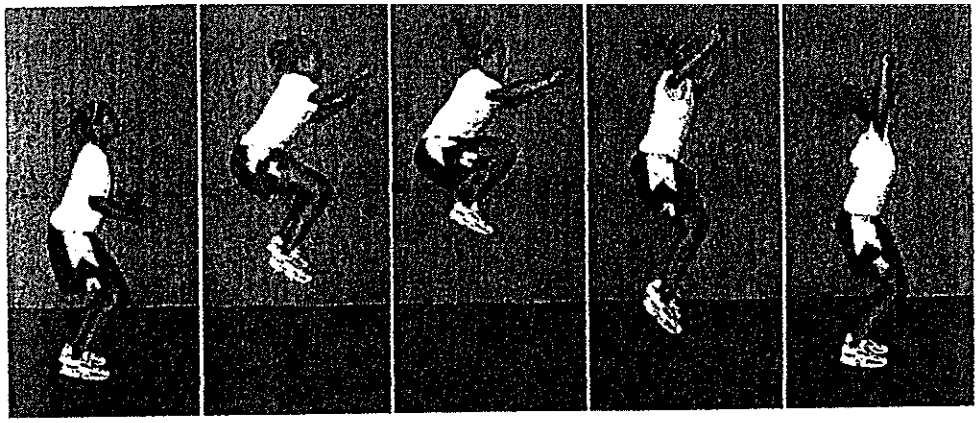

Figure 4. Tuck jumps. The athlete starts in the athletic position with her feet shoulderwidth apart. She initiates the jump with a sligh crouch downward while she extends her arms behind her. She then swings her arms forward as she simultaneously jumps straight u and pulls her knees up as high as possible. At the highest point of the jump, the athlete is in the air with her thighs parallel to th ground. When landing, the athlete should immediately begin the next tuck jump. Encourage her to land softly, using a toe-to-midfoo rocker landing. The athlete should not continue this jump if she cannot control the high landing force or if she uses a knock-knee landing.

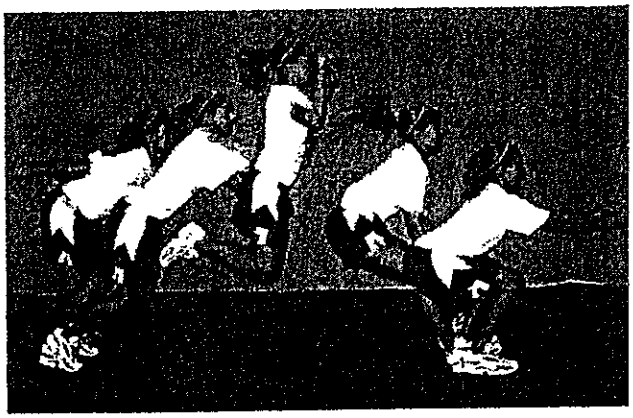

Figure 5. Broad jump and hold. The athlete prepares in the athlet position with her arms extended behind her at the shoulder. Sh begins by swinging her arms forward and jumping horizontally ar vertically at approximately a 45° angle to achieve maximum hor zontal distance. The athlete must "stick" the landing with h knees flexed to approximately 90° in an exaggerated athletic p sition. If she cannot stick the landing during a maximal effort jun in the early phases, have her perform a submaximal broad jum sticking the landing with her toes straight ahead and no inwa motion of her knees. As her technique improves, encourage her add distance to her jumps but not at the expense of perfect tec nique.

Figure 6. The 180° jump. The starting position is standing erect with feet shoulderwidth apart. The athlete initiates this 2-footed jun with a direct vertical motion combined with a 180° rotation in midair, keeping her arms away from her sides to help maintain balanc When she lands, she immediately reverses this jump into the opposite direction. She repeats until perfect technique fails. The goal this jump is to achieve maximal height with a full 180° rotation. Encourage the athlete to maintain exact foot position on the floor t jumping and landing in the same footprint.

Figure 7. Single-leg hop and hold. The starting position is a semi-crouched position on a single leg. The athlete's arm should be fully extended behind her at the shoulder. She initiates the jump by swinging the arms forward while simultaneously extending at the hip and knee. The jump should carry the athlete up at an angle of approximately 45° and attain maximal distance for a single-leg landing. She is instructed to land on the jumping leg with deep knee flexion (to 90°) and to hold the landing for at least 3 seconds. Coach this jump with care to protect the athlete from injury. Start her with a submaximal effort on the single-leg broad jump so she can experience the level of difficulty. Continue to increase the distance of the broad hop as the athlete improves her ability to "stick" and hold the final landing. Have the athlete keep her visual focus away from her feet to help prevent too much forward lean at the waist.

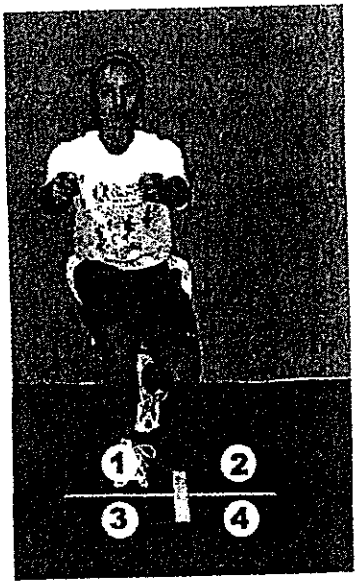

Figure 9. X hops. The athlete faces a quadrant pattern and stands on a single limb with the support knee slightly bent. She hops diagonally, lands in the opposite quadrant, maintains forward stance, and holds the deep knee-flexion landing for 3 seconds. She then hops laterally into the side quadrant and again holds the landing. Next she hops diagonally backward and holds the jump. Finally, she hops laterally into the initial quadrant and holds the landing. She repeats this pattern for the required number of sets. Encourage the athlete to maintain balance during each landing, keeping her eyes up and the visual focus away from her feet.

Figure 8. Squat jumps. The athlete begins in the athletic position with her feet flat on the mat and pointing straight ahead. She drops into deep knee, hip, and ankle flexion; touches the floor (or mat) as close to her heels as possible; and then takes off into a maximal vertical jump. The athlete then jumps straight up vertically and reaches as high as possible. On landing, she immediately returns to the starting position and repeats the initial jump. Repeat for the allotted time or until her technique begins to deteriorate. Teach the athlete to jump straight up vertically, reaching as high overhead as possible. Encourage her to land in the same spot on the floor and maintain upright posture when regaining the deep-squat position. Do not allow the athlete to bend forward at the waist to reach the floor. She should keep her eyes up, feet and knees pointed straight ahead, and arms to the outside of her legs.

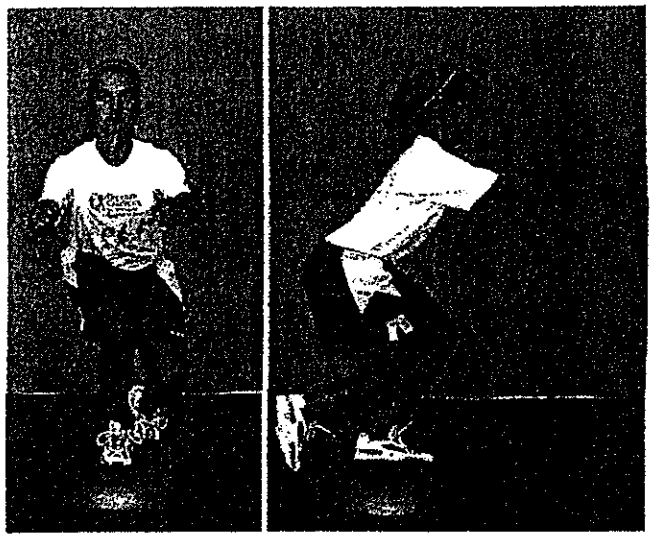

Figure 10. Single-leg balance. The balance drills are performed on a balance device that provides an unstable surface. The athlete begins on the device with a 2-legged stance with feet shoulder-width apart, in athletic position. As she improves, the training drills can incorporate ball catches and single-leg balance drills. Encourage the athlete to maintain deep knee flexion when performing all balance drills.

Figure 11. Bounding. The athlete begins this jump by bounding in place. Once she attains proper rhythm and form, encourage her to maintain the vertical component of the bound while adding some horizontal distance to each jump. The progression of jumps advances the athlete across the training area. When coaching this jump, encourage the athlete to maintain maximum bounding height.

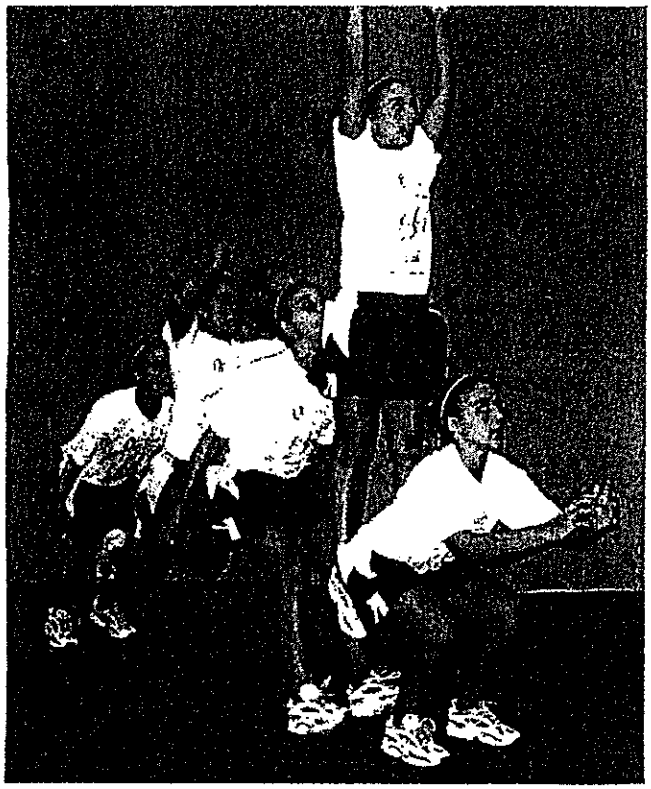

Figure 12. Jump, jump, jump, vertical jump. The athlete performs 3 successive broad jumps and immediately progresses into a maximum-effort vertical jump. The 3 consecutive broad jumps should be performed as quickly as possible and attain maximal horizontal distance. The third broad jump should be used as a preparatory jump that will allow horizontal momentum to be quickly and efficiently transferred into vertical power. Encourage the athlete to provide minimal braking on the third and final broad jump to ensure that maximum energy is transferred to the vertical jump. Coach the athlete to go directly vertical on the fourth jump and not move horizontally. Use full arm extension to achieve maximum vertical height.

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