TOTAL SOCCER CONDITIONING

VOLUME 1

A Ball Oriented Approach

WORLD CLASS COACHING

BY JUSTIN CRESSER

TABLE OF CONTENTS

PREFACE

Soccer is a high-intensity, multi-dimensional sport that is physically, mentally and technically demanding. In addition to the many skill requirements, elite soccer players cover approximately 10 to 12 km per game – 2 of them at ***maximum*** speed. These activities are not simply back and forth movements. In fact, time motion analysis studies show that outfield players in the English Premier League, one of the most exciting and watched soccer leagues in the world, perform a variety of locomotive actions including backpedaling, lateral shuffles, curved runs, skipping, sliding and jumping. These requirements mean that soccer players need excellent i) muscular endurance, ii) explosive power, iii) speed and iv) agility; in addition to being able to manipulate the ball and maneuver within the environment.

In comparison to elite (college, professional, etc.) teams that have at least 4 training days per week, and sometimes twice-a-day sessions, most North American youth clubs as well as competitive teams at the amateur level practice twice – and sometimes only ONCE – per week. Frequently, the coaches of these teams complain that there is insufficient time for fitness training. Conversely, coaches, especially at the youth level, often dedicate too much time to conditioning and not enough time to the technical and tactical development of their players. Although it is necessary for a soccer-training program to incorporate a fitness component, it is important that this is not done at the expense of other aspects of player development. Establishing a sound technical base is essential, especially for younger players, and this must not be neglected.

In Volumes 1 and 2 of *Total Soccer Conditioning: A Ball-Oriented Approach,* we introduce a comprehensive coaching methodology for soccer fitness that integrates physical conditioning with the technical and tactical components of the sport. In **Volume 1** of this book series, we identify the various components of fitness and present a variety of training exercises that can be used to develop each of these components.

Chapter 1 begins with an introduction to the physical components and basic physiological aspects of soccer, and provides simple yet valid tests to assess each component in your players.

Having good balance and range of motion enhances stability and coordination, and is essential for building a solid fitness base and in the prevention of injuries. **Chapters 2** tells us when to incorporate static and dynamic stretching into the training routine to enhance whole-body flexibility, while **Chapter 3** describes how to challenge the balance threshold and presents exercises to enhance 3-dimensional balance.

Dribbling to beat an opponent or trying to lose a marker are situations that frequently occur during a game and highlights the importance of superior speed and agility for soccer players. **Chapters 4** presents exercises guaranteed to increase maximum speed and acceleration whereas **Chapter 5** discusses ball-oriented exercises that will improve the various elements of agility such as stop-and-go capability, reaction time, and coordination.

Chapter 6 outlines the most effective callisthenic exercises to build whole body strength and **Chapter 7** addresses how plyometric training can be used to develop and enhance explosive power. All the exercises included have been modified to include technical training.

In addition to the high endurance levels needed to cope with the various physical requirements of a 90-minute match, soccer players need to be able to perform repeated high-intensity actions such as sprints and vertical jumps. In **Chapter 8** we present ball-focused drills to increase both aerobic and anaerobic endurance.

Chapter 9 describes how to integrate all the information of the previous chapters into an effective training schedule and gives detailed examples of off, pre and in-season training plans.

In **Volume 2**, we explain how traditional technical and tactical training drills can be optimized to enhance conditioning. **Volume 2** also includes chapters on position-specific fitness training, ball-oriented warm-up routines and fitness activities for goalkeepers

Total Soccer Conditioning: A Ball-Oriented Approach is written for coaches (including parent coaches), strength and conditioning trainers, and athletes who want to maximize limited practice time or who want to add variety to their conditioning, functional or technical training sessions. The exercises listed in each chapter are clearly explained with the aid of diagrams, and include coaching points for both the physical and technical (or tactical) components.

These activities are geared towards senior youth players and adults. However, we have also provided exercises suitable for players in the pre-puberty (7 to 11 year olds) and adolescent (12 to 14 year olds) age groups where appropriate.

Readers who have a limited knowledge of physical training will be guided with clear explanations of the appropriate work-to-rest-ratios, sequencing of exercises, exercise intensity and training volume, guaranteed to improve conditioning without overtraining. Similarly, persons whose limitations lie in the area of coaching will find useful information on functional training with detailed ball-oriented drills that target the technical requirements of the various playing positions.

Total Soccer Conditioning: A Ball-Oriented Approach is distinctive in its approach and offers a number of benefits. It is the only book series devoted to soccer conditioning in which **ALL** exercises (except stretching) involve a ball. It is also the only book series dedicated to soccer conditioning that includes ball-oriented exercises for goalkeepers, in addition to describing how small-sided games (SSG) and functional training activities can be modified to enhance fitness. Finally, it recognizes the challenges faced by most youth and amateur coaches, and thus provides comprehensive and straightforward details on how to structure training sessions to make them as economical as possible.

Undoubtedly, performance in soccer is affected by the level of conditioning in each player as well as the ability to perform skilled movement patterns at high speeds of play. This book provides a comprehensive and unique approach for coaches and players with limited training time to improve soccer-specific fitness without compromising technical and tactical development.

CHAPTER 1: FITNESS REQUIREMENTS OF SOCCER

Soccer is arguably the most popular sport in the world with competitions such as the World Cup and European Champions League attracting enormous television audiences worldwide. It has now become one of the most popular sports in the US and Canada, especially among children, with millions of registered youth players in organized leagues.

Soccer is a very physically demanding sport and conditioning has become an integral part of soccer training, as tactics and systems of play have changed over the years. Indeed, counter attacks and high-pressure defending are key parts of the high-tempo, modern-day game, and attaining high levels of fitness is critical to succeeding. Players today are quicker, stronger and have greater stamina than ever before. In fact, one of major differences between top class and mediocre players is the amount of high-intensity actions they perform during a game.

The greater contribution of fitness towards soccer performance has placed an added emphasis on designing and implementing effective strength and conditioning programs. Several factors have to be considered in the design of these programs; most importantly, you must understand the various physical requirements of the sport. Soccer is a multi-dimensional and dynamic sport that incorporates speed, agility, balance, endurance, power as well as repeated sprint ability; and it is essential that conditioning coaches choose exercises that closely resemble game situations. The different positions will also have specific fitness requirements, especially with older and more advanced players, and this also needs to be considered when planning your conditioning program.

FITNESS COMPONENTS OF SOCCER

Soccer is an intermittent, labor-intensive sport that requires players to perform repeated high-intensity bouts over the course of a game. This is illustrated by the extraordinary heart rate values players maintain during matches, which averages close to 85% of their maximum heart rates. Performing sprints, jumps, dives and other explosive actions throughout the match increases blood lactate levels, and is largely responsible for fatigue experienced during, and especially towards the end of, a match.

High-intensity Actions

Although soccer also involves lower intensity activities such as walking, jogging and even standing still, it is having a detailed understanding of the amount and nature of the ***high-intensity actions*** that is critical to the conditioning coach. This is because the amount of high-intensity actions performed has a significant impact on performance and match outcome. In fact, teams in the highest divisions of European leagues perform significantly more sprints and high-intensity runs than teams in lower divisions. Such a difference is also evident between higher- and lower-ranked teams within the same division. Undoubtedly, having a higher capacity to perform these actions will prove beneficial.

Of particular concern to the conditioning coach is the ***duration*** of each high-intensity action as well as the ***recovery time*** between each bout. Knowledge of these parameters is important especially in terms of assigning work-to-rest ratios for the various exercises in the workout program. Most high-intensity bouts last a few seconds, but can range from a vertical jump of less than a second to full-field sprints over 10 seconds in length. More importantly are the recovery times between bouts that range from a few seconds to over a minute in length, and involve anything from standing still to walking or jogging briskly back into position. With this information, it has been determined that the average work-to-rest ratio, as it relates to performing high-intensity actions over the course of a game, is approximately 1:7.

Movement Patterns

A critical task for the conditioning coach is recognizing the various movement patterns that occur during play. Soccer players are constantly on the move and cover distances that range from 8 to 12 km over the course of a 90-minute game, depending on the standard of play. Importantly, the actions that contribute to the distance covered occur in multiple directions and patterns. Examples of these movements include: lateral shuffles, backpedaling, zigzag sprints, and curved runs; in addition to the general sprinting, running, jogging and walking done in a linear fashion.

What is frequently overlooked when examining the movement requirements in soccer are braking and turning movements. Players continuously have to change direction, turn with and without the ball, and stop suddenly. In fact, research shows that players may perform hundreds of braking and turning movements during a game, many of which occur after high-intensity acts such as short sprints or intense runs. Such actions place a tremendous amount of stress on the joints and muscles of the lower body and require a great deal of agility and coordination to execute properly.

Players also perform many non-locomotive actions such as vertical jumps, stationary turns, and shoulder to shoulder challenges that do not contribute to the total distance covered but require a high energy input.

Conditioning Elements

Based on the multiple actions and movement patterns involved, it is clear that the development of specific elements of conditioning is necessary for successful performance in soccer (Figure 1.1). These elements include: ***balance***, ***flexibility***, ***speed, agility, strength, explosive power, anaerobic capacity***, and ***aerobic capacity***.

Designing an effective fitness program for soccer is no easy task and the coach needs to consider all the different elements of fitness when choosing the various exercises. In addition, it is imperative that the coach selects soccer-specific conditioning drills that reflect the demands of the sport and not just general fitness drills, especially with older and more experienced players.

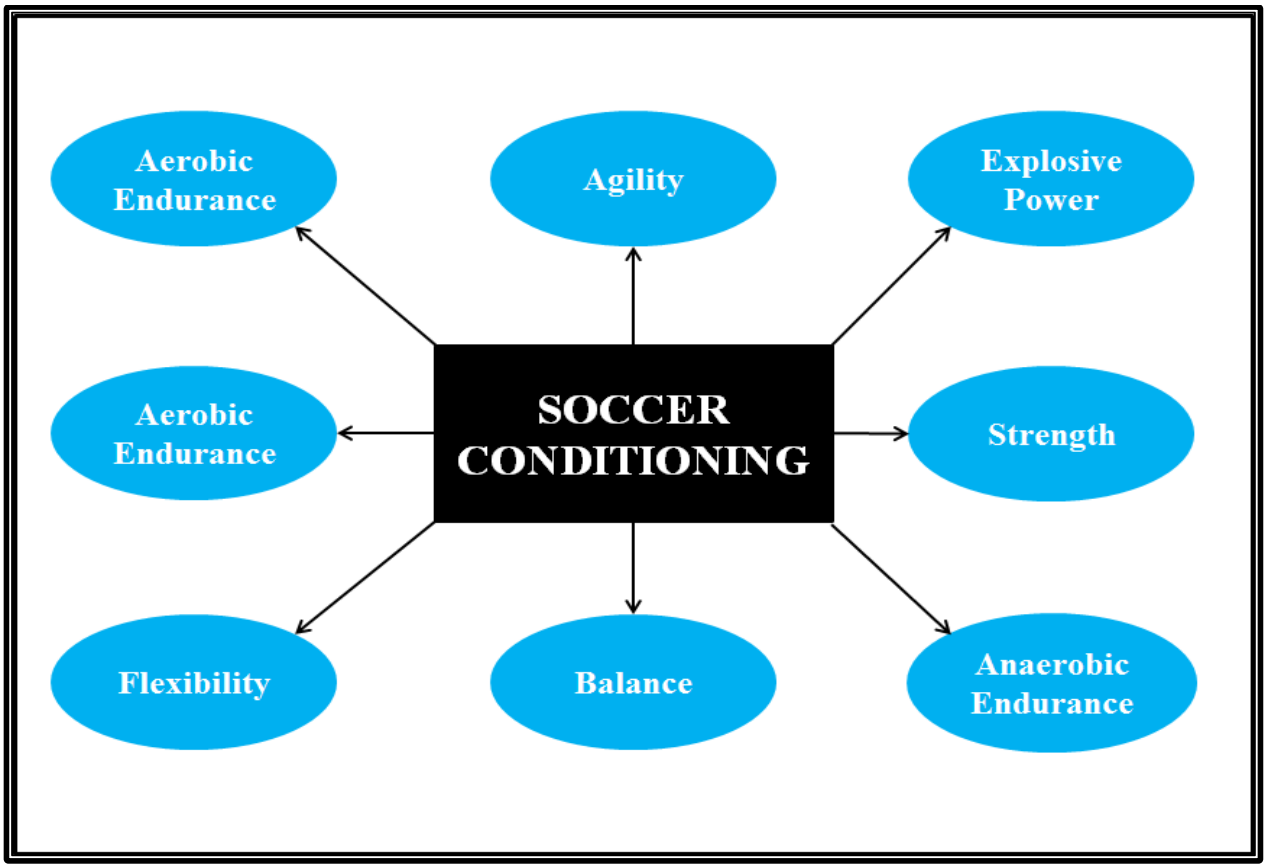


FIGURE 1.1 Conditioning Components of Soccer

FITNESS REQUIREMENTS FOR YOUTH SOCCER PLAYERS

The physical requirements of soccer at the youth level are also great and attaining high levels of fitness is certainly a vital requirement for successful performance, especially for more advanced junior players. One important distinction however, is that the duration of games for younger players is usually less; with many leagues using a 60-minute match length instead of the 90-minute time frame used for senior players.

Nonetheless, similar to their adult counterparts, youth players have to perform and recover from repeated high-intensity bouts over the course of a game, and the amount and type also appears to vary depending on player position. Elite youth players, ages 11 to 14 years old, have been shown to cover approximately 6 km during a 60-minute match, approximately 10 to 15% of which was done at a high-intensity. Like adult players, youth players are also likely to suffer from fatigue and cover significantly less distance in the second half.

Interestingly, research studies show that both elite and non-elite youth players also maintain an average heart rate between 80% to 90% of their maximum heart rate (although elite players are capable of achieving a higher value), illustrating the heavy work load experienced by soccer players even at the junior level.

Although the conditioning demands for younger players are quite similar to those for an adult, coaches must realize that youth athletes are not just smaller and younger adults and that you cannot simply assign a toned-down version of an adult conditioning program to youth players. Young athletes are complex and have different physiological characteristics. Most importantly, technical development should be the major priority for youth players, especially those in the ***pre-puberty*** (8 to 11 year olds) age groups. For younger players, general fitness and technical development should be the focus, rather than soccer-specific conditioning. Fitness exercises can be incorporated into training sessions but should be in the form of fun games and should not be high in intensity. When children start puberty and enter into the ***adolescent*** phase (11 to 14 year olds), their work capacity naturally increases and coaches may start incorporating structured and soccer-specific conditioning exercises. More specific details on how to design activities for the various components of conditioning are given in the upcoming chapters.

ENERGY SYSTEMS OF THE BODY

Soccer involves performing multiple actions at varying intensities over the course of 90 minutes (sometimes less for youth players). Carrying out these movements requires energy in the form of a small molecule known as adenosine triphosphate or ATP.

The body's stores of ATP are quite small and there needs to be a system(s) in place to regenerate ATP in times of high demand, such as during exercise. ATP required for muscular work can be generated either ***anaerobically*** (does not require oxygen) or ***aerobically*** (requires oxygen to be present) and the body has three metabolic systems that are responsible for this regeneration process: i) the phosphagen system, ii) the glycolytic system and iii) the oxidative system.

The ***phosphagen system*** uses the breakdown of another high energy molecule known as phosphocreatine (PCr) to produce ATP. This system provides ATP rapidly for high-intensity actions such as short sprints and jumps. However, because the stores of PCr in the muscle are very limited, the phosphagen system can only provide energy for very short periods (< 10 seconds) at a time.

Glycolysis refers to the breakdown of carbohydrates (either glucose in the blood, or glycogen in the muscle) to produce a molecule known as pyruvate, which is further broken down by one of two processes. The process by which pyruvate is converted to lactate (lactic acid) is referred to as ***anaerobic*** or ***fast glycolysis*** and provides ATP for high intensity actions that last approximately 10 to 90 seconds. ***Aerobic*** or ***slow glycolysis*** occurs when pyruvate is transported to a part of the muscle cell known as the mitochondria, and provides ATP for exercises at moderate intensities that last approximately 90 seconds to three minutes.

The ***oxidative*** or ***aerobic system*** provides ATP from the breakdown of fats and carbohydrates, and to a lesser extent proteins, in the mitochondria. As the name suggests, the aerobic system depends on the availability of oxygen and is the major provider of ATP for low to moderate intensity exercises that last longer than three minutes.

The nature of soccer involves deriving ATP from all three metabolic systems. The phosphagen system produces ATP at a rapid rate, but for very short durations. It is therefore the predominant supplier of energy for very high-intensity soccer activities such as slide tackles, diving saves and sprints over short distances. The glycolytic system produces ATP rapidly, but not as quickly as the phosphagen system. In comparison to the phosphagen system however, it can produce ATP for durations lasting up to two and half minutes. The glycolytic system is the predominant supplier of energy when your team chooses to enforce high-pressure defending and players are asked to make repeated runs to win the ball as quickly as possible. Of the three systems, the oxidative system has the greatest capacity to produce ATP, but does so at the slowest rate. This system provides energy for low-intensity activities such as walking and jogging that occur during the recovery period between high-intensity bouts. Table 1.1 summarizes the main features of each energy system.

TABLE 1.1 Key Characteristics of the Body's Metabolic Systems responsible for Energy Production

Metabolic System	Relative Rate of ATP Production	Exercise Intensity and Duration	Soccer-Specific Example
Phosphagen	Very Fast	Very High Intensity (0 – 10 seconds)	- Diving Save - Slide-tackle - Short sprint
Glycolytic (Fast)	Fast	High Intensity (10 – 90 seconds)	- High Pressure Defending
Glycolytic (Slow)	Moderate	Moderate Intensity (90 to 120 seconds)	- Continuous defending by midfielders during long spells of possession
Oxidative	Slow	Low Intensity	- Walking or jogging back into position

By understanding how these metabolic systems work, we can design exercises with the appropriate work-to-rest ratios that will enhance both the capacity and efficiency of each system to produce ATP. Inducing both changes will have a beneficial effect on soccer performance as they will lessen the likelihood of fatigue.

FITNESS ASSESSMENT OF SOCCER PLAYERS

The aim of a conditioning program is to develop and enhance the various components of fitness that should correspond to an improved performance on the pitch. As a coach, it is critical to know if the program you have implemented is effective, and conducting fitness assessment tests at the beginning and at appropriate points throughout the training year will aid in this objective. In addition, results gathered at the start of the season can be used to i) identify specific areas of weaknesses on an individual and team basis; and ii) establish target goals to be achieved by set points in the season.

TEST SELECTION

A very important question to ask yourself before conducting a fitness assessment on your players should be: "what tests should I use and why?" Fitness assessment tests are designed to measure a particular component of athletic performance. For example, the 12-minute run is a very common test used to assess aerobic capacity. Because each test assesses a different characteristic, it is important that you choose a variety of tests that will allow you ***comprehensively*** assess your players. As discussed earlier in this chapter, the fitness components of soccer are multiple and range from balance and flexibility to anaerobic and aerobic endurance.

Regardless of the tests chosen however, they need to meet certain requirements: they must be i) valid and ii) reliable. ***Validity*** is the degree to which a test measures what it is supposed to. Ensure that the test you select is specific for the element of conditioning you are evaluating. For instance, the 12-minute run is a good indicator of aerobic capacity, but poorly assesses lower body power. Tests also need to be ***reliable*** and therefore able to produce accurate results consistently. Tests that give inconsistent results are no good to the conditioning coach and can actually be counterproductive. To ensure reliability, the test should be administered using the same protocol, with the same equipment, under similar conditions and ideally with the same tester on each occasion. More information on test administration is given at the end of this section.

Multiple fitness assessment tests exist to evaluate the various components of soccer fitness. Some however, require bulky and complicated equipment that only qualified testers can administer. Many youth and amateur coaches do not have access to or the knowledge to conduct such tests. For these coaches, choosing tests that are relatively simple to conduct yet valid and reliable is the main priority. The tests presented below are valid (for the component of conditioning listed) and reliable, provided they are administered appropriately. Importantly, they are all easy to conduct in that they do not require complicated or expensive equipment and can be administered in the average-sized gym or on a regular playing field.

TESTS TO ASSESS COMPONENTS OF SOCCER CONDITIONING

Assessing Balance

Single Leg Squat: The single leg squat is an excellent way to assess balance in addition to core strength.

Equipment: Flat open space on a field or gym

Set-up and Directions: Begin by having the athlete stand with feet shoulder width apart and placing both hands on the hip. Next, have them stand and balance on one leg without the planted foot shifting or without the opposite foot touching the ground (Figure 1.2a). After maintaining this position for at least five seconds, have the athlete squat down to the lowest possible position without raising the heel of the planted foot (Figure 1.2b). The back should be kept straight and the non-standing leg should remain outstretched and pointing forwards. Have the player return to the starting position and repeat for a total of three times. Ensure both legs are tested.

a) **b)**

Figure 1.2 Assessing Balance Using the Single Leg Squat

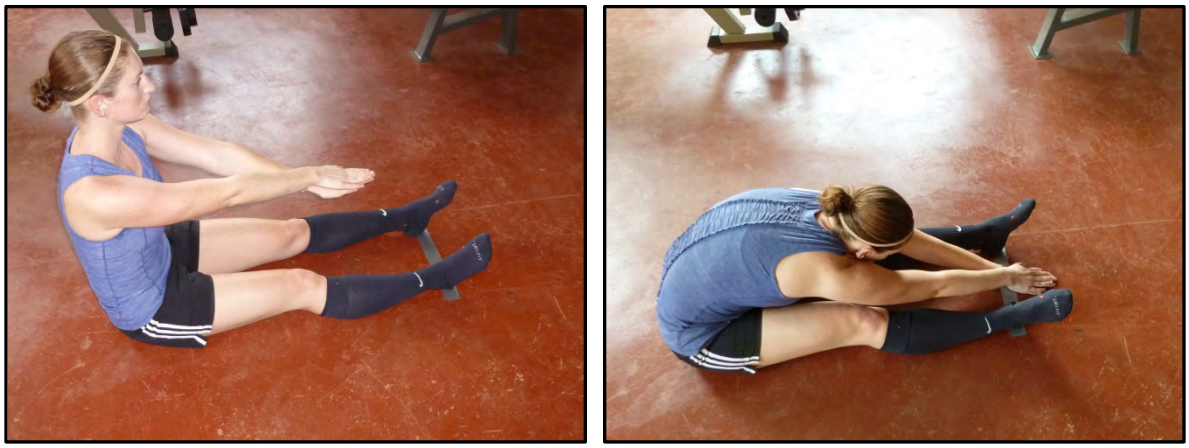
Assessment: Assess how low the athlete is able to go as well the stability of the balancing leg by answering these questions: Does the leg wobble? Does the heel frequently leave the ground throughout the downward motion? Does the foot remain flat during the squat? If the athlete is unable to squat more than a few inches, then flexibility at the ankle and hip joints is limited and they should emphasize hip flexor and calf exercises in their stretching routine (Chapter 2). If the balancing leg frequently shifts during the squatting motion or if the athlete has difficulty keeping the foot flat, then ensure that extra emphasis is placed on the balance component of the athletes conditioning program.

Assessing Flexibility

Sit and Reach Test: The sit and reach test is a simple test that assesses the combined flexibility of the hamstrings and lower back. A lack of flexibility in these areas is a concern as it is frequently associated with injuries to the associated muscles.

Equipment: Measuring tape, adhesive tape, flat space (preferably a gym floor)

Set-up and Directions: Place a piece of adhesive tape 15 inches in length securely on the flat surface. When ready, instruct the athlete to sit (shoeless) with the legs outstretched. The heels should be placed on the adhesive tape 12 inches apart and the toes should be pointing upwards (Figure 1.3a). Have the athlete place the palm of one hand on the back of the other, and then have them slowly reach forward as far as possible. The legs should remain straight and locked at the knees. Ensure the athlete does not lead with one hand and that the fingertips of both hands remain in contact. Have the athlete hold at the furthest possible position for a few seconds and mark the position of the fingertips on the flat surface (Figure 1.3b). Measure the distance from the edge of the adhesive tape to the mark. Repeat the procedure twice and take the best of the three scores.



a) **b)**

Figure 1.3 Assessing Lower Back and Hamstring Flexibility with the Sit and reach Test

Assessment: If the athlete is unable to reach the adhesive tape or the score is less than 3 to 4 inches (8 to 10 cm), then they have very poor flexibility in the hamstrings and lower back, and stretches targeting these areas should be included in the flexibility routine.

NOTE: The athlete should warm up for at least three minutes prior to this assessment by doing dynamic stretches involving the muscles of the hip and lower back. However, these stretches should not be explosive (ballistic) in nature as this can affect the reliability of the results.

Overhead Squat: The overhead squat is one of the most comprehensive tests to assess whole body flexibility and can be used to determine the range of motion at the hips, lower back, shoulders, and ankles.

Equipment: Flat surface (Gym floor or playing field)

Set-up and Directions: Have the athlete stand barefoot on a flat surface (preferably a gym floor) with the feet parallel to each other and hip width apart. The toes should be pointing straight forward. The player should place both arms straight above the head with both palms facing forward (Figure 1.4a). Ensure the elbows are kept locked. When ready, direct the player to squat down by flexing the hips, knees and ankles until the thighs are about parallel to the floor (Figure 1.4b). Remain in this position for 2 to 3 seconds then return to the starting position. The heels should remain on the floor and the toes should be kept pointing forward. Repeat the process at least five times. Ensure the coach assesses the athlete from the anterior, lateral and posterior views.

a) **b)** **c)** **d)**

Figure 1.4 Using the Overhead Squat to Assess Whole Body Flexibility

Assessment: The overhead squat gives a good indication of the range of motion in the major joints of the body. It also identifies overactive and underactive muscles that need to be stretched and strengthened respectively. If the athlete is unable to keep their back straight or if there is excessive forward lean (Figure 1.4c), then the athlete needs to focus on strengthening the gluteus (buttocks) and lower back muscles and emphasize the hip flexor, hamstring and calf muscles in their stretching routine.

The athlete should also be able to keep the arms pointing upwards. If the arms fall forward (Figure 1.4d), then it is likely that the muscles in the chest and mid-back (latissimus dorsi) are overactive whereas the shoulder and trapezius muscles are underactive and therefore need strengthening. Lastly, if the knees of the player turn inwards during the downward phase of the squat, then it is recommended that the adductor or inner thigh muscles be stretched whereas the gluteus muscles be strengthened.

Assessing Speed

40 yard sprint: Speed is a key component of soccer conditioning and the 40 yard sprint is one of the simplest methods to determine linear speed.

Equipment: Two cones, measuring tape, stop-watch, a flat running surface at least 55 yards in length (40 yards for the sprint and 15 yards after the finish line for deceleration)

Set-up and Directions: Place two cones 40 yards apart in a straight line. Designate one of these cones as the starting point. The player should be allowed to warm up for several minutes with some light jogging and dynamic stretching. The athlete should also be given two practice runs at submaximal speed. When ready, have the athlete attain a stance of their preference with his forward most foot directly in line with the starting cone (Figure 1.5). The coach/timer should be placed at the finish line directly in line with the cone at the endpoint. On the timer's signal, the player sprints maximally until passing the end line.

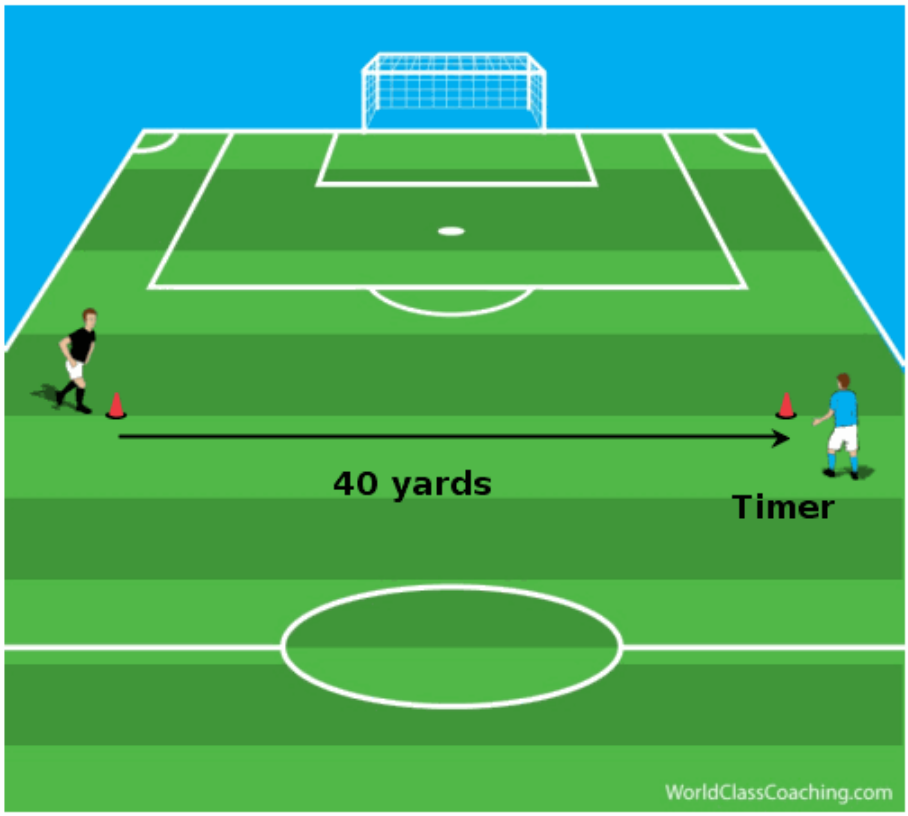


Figure 1.5 Assessing Maximum Speed Using The 40 Yard Sprint

Assessment: For senior players (18 years and older) a time of less than 4.7 seconds for men and 5.5 seconds for women is considered to be an excellent score, whereas times slower (greater) than 5.2 for men and 6.5 for women are considered below average.

10-yard sprint: The time taken to complete the first 10 yards of the 40-yard sprint can used as an indicator of ***linear acceleration*** (the rate at which a player increases in speed), a quality that is very relevant to soccer, especially in terms of one versus one ability and closing down opponents.

Equipment: Same as the 40-yard sprint but with an additional cone

Set-up and Directions: The set up will be the same as the 40-yard sprint with one addition. A third cone is placed 10 yards from the starting point and a second timer takes up a position here (Figure 1.6).

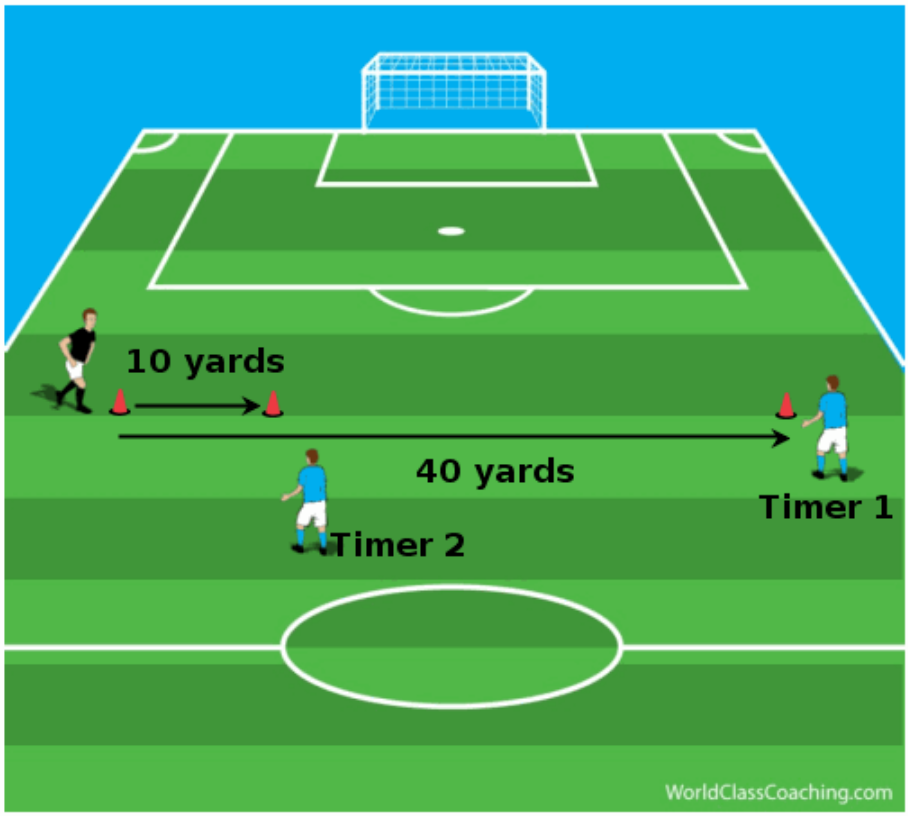


Figure 1.6 Assessing Starting Speed and Acceleration using the 10 Yard Sprint

Assessment: Times observed should be used only for the purpose of comparing teammates and determining the effectiveness of the training program.

Note: An electronic device should ideally be used for both the 10 and to a lesser extent the 40-yard sprint as a stop watch is less accurate. However, such devices may not be readily accessible to many coaches and the results should be reliable (if the same person is consistently used) and thus can be used for the purpose of comparison.

Assessing Agility

T-Test: There are several tests that can be used to assess agility. For coaches with limited resources and time however, the T-test is one of the best options, as it is very reliable yet easy to administer.

Equipment: Tape measure, four cones, stop-watch, flat surface (area > 100 square yards)

Set-up and Directions: Set up four cones as shown in Figure 1.7. The athlete should be allowed to warm up for several minutes with some light jogging and dynamic stretching. They may also be given a practice run at submaximal speed. The athlete begins at the cone marked A. On the timer's signal, the player sprints forward and touches the base of cone B with their right hand. The player then side shuffles left and touches the base of the cone marked C with their left hand. They then side shuffle to the right until they touch the base of the cone marked D (10 yards) with the right hand. The athlete then side shuffles left and touches the base of cone B with the left hand. Finally, they backpedal until they have passed cone A where the timer stops the watch. Repeat the test after a 5-minute rest and average the time of both runs to get a final score.

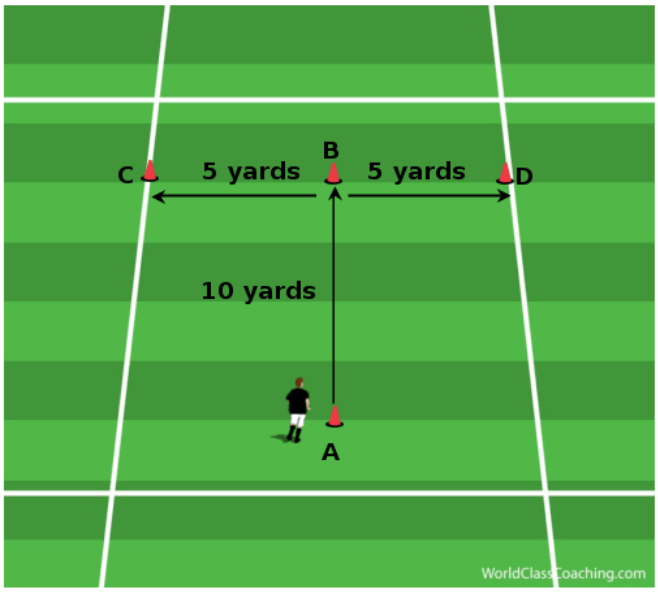


Figure 1.7 Using the T-Test for Assessing Agility

NOTE: When side shuffling (B to C, C to D and D to B), the athlete must remain facing forward and is not allowed to crossover the feet. Ensure the athlete always touches the base of each cone.

Assessment: For senior players (18 years and older) a time of less than 9 seconds for men and 10.8 seconds for women is considered to be an excellent score, whereas times slower (greater) than 11 seconds for men and 13.5 seconds for women are considered below average. Athletes with below average scores should focus on developing the various components of agility discussed in Chapter 5.

Assessing Strength Endurance

The Push-up (Standard and partial methods): The Push-up is an excellent exercise to develop upper-body and core strength, and assessing the maximum number of repetitions that can be performed in a 2-minute time frame provides a valid assessment of upper-body strength endurance. The partial push-up can be used in young or female athletes who may not have well-developed upper-body strength.

Equipment: Flat open space in a gym or on a field, stop-watch

Set-up and Directions: For the standard push-up, have the athlete assume the normal starting position for a push-up with the palms flat on the floor, shoulder width apart, and the arms and body straight (Figure 1.8a). For the partial push-up method, have the athlete start in a position where the knees, and not the feet are in contact with the floor (Figure 1.8c). Have the athlete lower themselves (keeping the body straight) until the chest is approximately three inches from the floor (Figures 1.8b, 1.8d), then return to the starting position by forcefully extending the elbows. If they do not lower themselves to the desired position, then it is considered a failed repetition and not counted. In addition, athletes are not allowed to pause at the bottom position. Count the number of successful repetitions completed in a 2-minute time period.

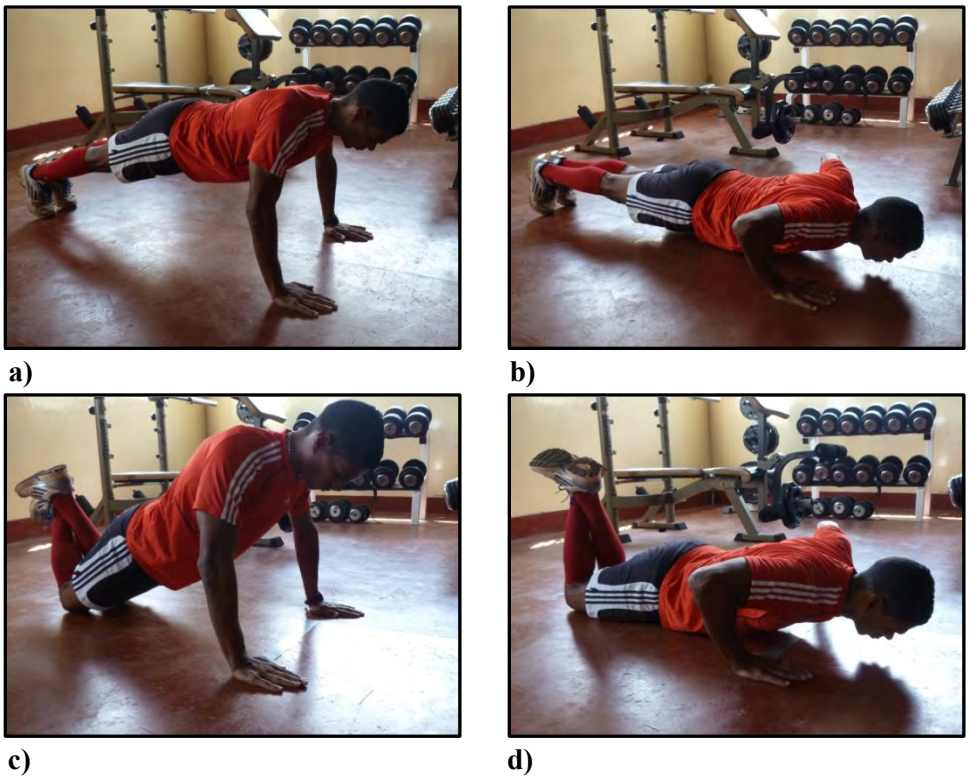


Figure 1.8 Standard and Partial Push-up Tests for Assessing Muscular Endurance

Assessment: Scores less than 15 for men and 10 for women are considered to be poor and it is recommended that these players focus on developing basic upper body strength then progress to developing strength endurance.

Body weight Squat: The squat is a fundamental exercise for developing lower body and core strength, and by assessing the number of successful repetitions performed in a 2-minute period gives a good indication of lower body strength endurance.

Equipment: Flat open space in a gym or on a field, stop watch

Set-up and Directions: Have the athlete stand on a flat surface with the feet parallel to each other and hip width apart. The toes should be pointing straight forward. The arms should be folded across the chest as shown (Figure 1.9a). Have the athlete squat down until the thighs are parallel to the floor (Figure 1.9b), pause for one second and then return to the starting position by extending the knees, hips and ankles. If the athlete is unable to squat to the desired position then it is considered a failed repetition. Count the number of successful repetitions completed in a 2-minute time frame.

a) **b)**

Figure 1.9 Assessing Lower Body Muscular Endurance with the Body Weight Squat

Assessment: Male and female athletes who complete less than 20 and 15 repetitions respectively should make multi-joint lower body exercises such as the squat and lunge a priority in the strength component of their conditioning program.

Assessing Power

Vertical Jump: Explosive power is essential for effectively performing many soccer-related actions such as jumping and sprinting, and the vertical jump test assesses the ability of the leg muscles to exert force at a high velocity. The test can be administered using a Vertec measuring device or in an area with a flat wall and a high ceiling. We have provided the set-up and procedure only for the latter.

Equipment: A flat wall with a very high ceiling, chalk, measuring tape, flat surface with good traction

Set-up and Directions: Have the athlete rub chalk (different color than the wall) on the fingers of their dominant hand. Direct the athlete to stand with the shoulder of the dominant side six inches from the wall. Next, have them reach as high as possible with the dominant hand making a mark on the wall as shown (Figure 1.10a). Both feet should remain flat on the ground. Instruct the player to perform a counter movement jump and reach as far as possible with the dominant hand, making a second mark on the wall (Figures 1.10b and 1.10c). The athlete is not allowed a preparatory step and should take off from a two-footed stance. The distance between the two chalk marks will be used as the athlete's score. The best of three trials should be used for the final score.

a) **b)** **c)**

Figure 1.10 Using the Vertical Jump Test to Assess Power

Assessment: Performance on the vertical jump test is indicative of explosive power and athletes with unsatisfactory scores, less than 12 inches (30 cm) for men and 8 inches (20 cm) for women, should concentrate on improving this aspect of soccer performance by including appropriate plyometric exercises in their program.

Assessing Anaerobic Endurance

300-yard shuttle: A high level of anaerobic endurance is necessary to perform the repeated high-intensity actions required over the course of a game. The 300-yard shuttle assesses a player's ability to perform repeated sprints with minimal recover time and is a good measure of anaerobic endurance or capacity.

Equipment: Stop watch, a space at least 25 yards in length with a suitable (flat, good traction) running surface, two cones, measuring tape

Set-up and Directions: Place the two cones 25 yards apart and designate one of the cones as the starting point. After a sufficient warm-up (light jogging and dynamic stretching) have the athlete position themselves at the starting point with the forward most foot directly beside the cone (Figure 1.11). On the timer's signal, the athlete will sprint and touch the base of the second cone (25 yards away) and then immediately sprint back to the starting cone. Continue this process until six round trips are completed. Ensure the athlete touches the base of the cone each time. Record the time taken to complete six round-trips (300 yards). After a rest period of 5 minutes, have the player repeat the process and average the times from both trials to give a final score.

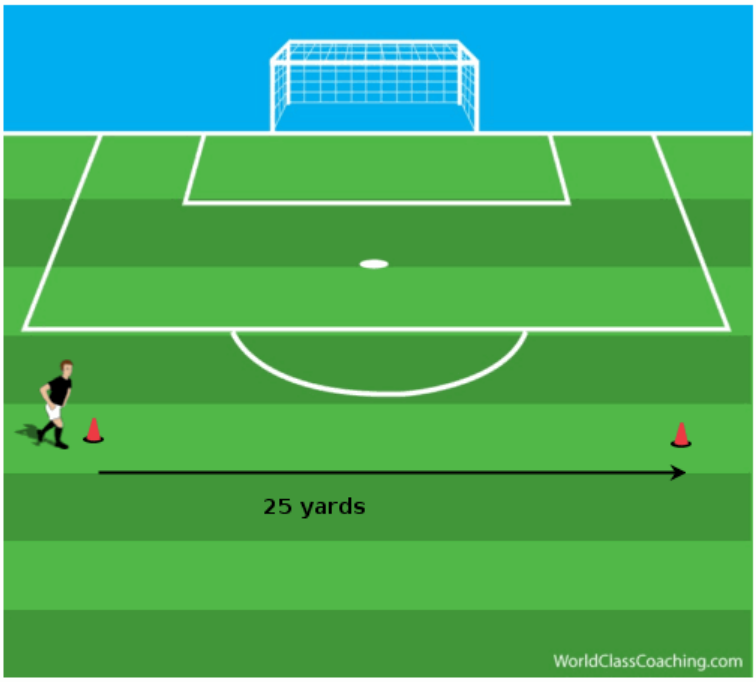


Figure 1.11 Assessing Anaerobic Endurance using the 300 Yard Shuttle Run

Assessment: The results of the 300-yard shuttle should be used more towards establishing the effectiveness of the off- and pre-season training program rather than assigning a score ranging between poor and outstanding. The reason for this is that measures of anaerobic capacity tends to fluctuate and is likely to fall during the period between the end of the competitive phase and the start of the following preparatory period.

Assessing Aerobic Endurance

1.5-Mile Run: Aerobic endurance is a major determinant of soccer performance as the sport involves continuous activity over a 90-minute period. Directly measuring aerobic capacity is possible with the use of metabolic equipment, but it can also be assessed indirectly by using endurance-based fitness tests such as the 1.5-mile run.

Equipment: stop watch, a suitable running track of a known distance or a 1.5 mile course with a good running surface

Set-up and Directions: If you are using a running track with a distance less than 1.5 miles, ensure that you determine the exact amount of laps required to complete the distance and relay this information to the players. Have the athlete(s) warm up with light jogging and dynamic stretching. When ready, direct them to line up behind the starting line. Have the players start on the coach's command and record the time taken for each athlete to complete the run (more than one timer may be required if you have a big group).

Assessment: Scores recorded in the 1.5-mile run are very closely related to VO_2max (maximal oxygen uptake), a measure of an athlete's aerobic capacity. Although soccer involves intermittent, high-intensity exercise, having a high level of aerobic endurance facilitates recovery from these high-intensity actions and lessens the onset of fatigue. Aerobic endurance will improve as the season progresses and the player is involved in more game-related activities. However, if the scores are particularly low (greater than 15 minutes for men and 17 minutes for women), then the coach should strongly consider making aerobic endurance training a priority in the conditioning program.

Table 1.2 gives a summary of the various fitness assessment tests and illustrates how each parameter measured may apply to soccer.

TABLE 1.2 Fitness Assessment Tests for the Various Conditioning Elements Relevant to Soccer

Fitness Assessment Test	Conditioning Parameter	Application to Soccer
Sit and Reach Test	Flexibility (hip and lower back)	Stride distance while sprinting
Overhead Squat	Flexibility (whole body)	Efficient movement while passing, receiving, shooting, etc.
T-test	Agility	Evading tackles and creating space in tight areas
40-Yard Sprint	Speed	Recovering runs after losing possession poor
10-Yard Sprint	Acceleration	1 v 1 Battles
Push-Up	Local Muscular Endurance (upper body, core)	Shielding, throwing (Goalie)
Body-Weight Squat	Local Muscular Endurance (lower body, core)	Continuous movement over course of the game
300-Yard Shuttle	Anaerobic Endurance	Repeated sprint ability
1.5 Mile Run	Aerobic Endurance	Reduce onset of fatigue

TEST ADMINISTRATION

Fitness assessment tests need to be administered properly and in a structured manner in order to achieve accurate and consistent results. In addition, the athlete's health is a top priority and tests therefore need to be safely conducted. The following subsections provide various guidelines that will ensure tests are administered safely and in an organized manner.

Test preparation

Players need to be properly warmed up prior to conducting any test in order to avoid injuries and to improve the reliability of the tests results. On days with multiple tests, a general warm-up of jogging and dynamic stretching prior to the first test should be adequate. However, if there is a long waiting period between tests, the athlete may need to repeat the warm-up procedure.

Test Sequence

Ideally, tests that assess anaerobic and aerobic endurance should be conducted on separate days from the other tests. In many situations however, all assessments are all completed on the same day. In such an event, the tests should be ordered in a way that gives the most reliable results. Indeed, assessments that require skilled movements and coordination should be administered before ones likely to induce fatigue. Administer tests in the following sequence on occasions when they are all done on the same day:

1) Flexibility tests (Sit and reach, overhead squat)

2) Agility tests (T-test)

3) Power tests (vertical jump)

4) Speed tests (40 and 10 yard sprint)

5) Strength endurance tests (Push up and body weight squat)

6) Anaerobic endurance tests (300 yard shuttle)

7) Aerobic endurance tests (1.5 mile run)

You must also ensure that your players are sufficiently rested between different tests, and between trials of the same test. A rest period of 5 to 10 minutes between tests of different components should be adequate, whereas a period of 3 to 5 minutes is sufficient between trials of the same test. However, assessments for aerobic endurance (1.5-mile run) should be completed at least one hour after the anaerobic endurance test (300-yard shuttle run).

Testing Conditions

Practice locations (gyms, playing fields) are likely to change as you progress throughout the different phases of the season, especially in areas that experience extreme weather conditions. However, to get consistent results from the different testing periods, it is recommended that the test conditions (running surface, running track, equipment, etc.) remain the same. Environmental factors such as temperature and humidity are uncontrollable; but if possible, conduct tests on days with similar weather conditions as large variations can significantly affect test results. Additionally, ensure the tests are conducted in the same order, by the same testing personnel, at the same time of day, and when athletes are sufficiently rested.

Safety Considerations

All athletes should get medical clearance before being allowed to partake in physical activity and fitness assessment procedures. In addition, coaches should be able to identify hazardous testing conditions. These include extreme weather (very hot, very humid) and slippery or uneven running surfaces. Coaches must also recognize symptoms associated with adverse health outcomes such as chest pains, dizziness, light-headedness, nausea, and shortness of breath; and seek medical attention if necessary. In both cases, testing should not be carried out or immediately stopped.

When and How Often

A fitness assessment is a powerful tool for the coach, but it is important not to go overboard and conduct fitness assessments every week. On the other hand, assessments need to be conducted a sufficient amount of times in order to monitor the progress of your players and the effectiveness of the conditioning program. Consider administering tests at the following points throughout the training year:

i) At the beginning of the off-season to get baseline measurements and identify areas of weaknesses

ii) At the end of off- and pre-season to determine the effectiveness of the methods implemented during these phases

iii) At the midpoint during the competitive season to identify how the playing season has affected conditioning levels and determine areas that need to be addressed

If you have not already done so, it is recommended that you keep detailed records of the results from previous years, so that you have an idea where your team stands at beginning of the season as well as how individuals compare from season to season.

CHAPTER 2: FLEXIBILITY TRAINING

Flexibility refers to the degree of movement, or range of motion, around a joint such as the knee or hip. Most movements and actions in soccer require good flexibility to be performed successfully. Take for instance, a winger running full speed to connect with a ball played over the top: a limited range of motion in the hamstrings and hip flexor muscles will greatly limit stride distance and therefore sprinting ability.

Indeed, increased flexibility will allow your players to reach those high and awkward air balls, increase their shooting power, and enable them to stretch a few more inches to make that goal-saving sliding tackle. Having a greater range of motion also facilitates more efficient movement. Therefore, players with good flexibility will expend less energy to do the same action than players who have limited ranges of motion. Importantly, efficient movement also translates to better technique.

In addition to producing quality movement, flexibility training is also essential for injury prevention. Soccer requires a player to perform repeated high-intensity actions throughout a game. Continuously performing these actions with tight muscles can lead to strains and more serious injuries such as tears. As such, coaches should ensure players engage in year-round flexibility training not just for performance enhancement but also as a method of injury prevention.

DEVELOPING FLEXIBILITY

Flexibility should be a part of any soccer conditioning program and should start from a young age. Developing flexibility is important for growing children as it helps to develop strong joints and reduces injury that may occur during rapid growth spurts. Flexibility for very young soccer players should not be extensive but of a general nature, and should be included as part of a regular training session. Starting flexibility training at a young age is recommended also because it gets a player into the habit of stretching before and after games and training. Time and time again, I have observed coaches neglect flexibility in their training sessions or match routines largely because they don't make a habit of it.

Flexibility training becomes more important as a child matures. This is because range of motion decreases with age, especially as muscle mass increases. Adolescent and senior athletes need to allocate more time to developing flexibility; and, in weeks with multiple intense games, a session dedicated entirely to stretching may be necessary. Increasing flexibility should be a major goal of ***off-season training***, especially for players with limited range of motion, whereas maintenance should be the goal for ***pre-*** and ***in-season*** phases. However, flexibility training should be a part of all practice sessions, regardless of the training phase.

Good whole-body flexibility is important for developing a sound fitness base, but flexibility training should not be overdone as there is a point where further increases in flexibility will not improve soccer performance.

FORMS OF FLEXIBILITY TRAINING

Increasing range of motion can be done by one or more forms of ***stretching***. Stretching is simply moving a body part past a point of resistance in the range of motion. Stretching can be done using a variety of techniques. These include static stretches, dynamic stretches, ballistic stretches and proprioceptive neuromuscular facilitation (PNF) or active stretches.

Static stretching involves slowly stretching to a point of resistance and holding that position for a given amount of time. This type of stretching allows a muscle or muscle group to relax and lengthen in a controlled manner. Bending over and touching your toes while keeping the legs straight is one of the most common examples of a static stretch.

Dynamic stretching involves more functional movement and uses sport-specific actions to produce the desired stretch. Dynamic stretches such as the lunge-walk or alternating high kicks are a great way to prepare soccer players for the actions required in training and games.

A ***ballistic stretch*** involves using active or bouncing movements to achieve the desired range of motion. Unlike static stretches, the end position is not held. For instance; in the static stretch example given above, instead of bending over slowly to touch the toes and holding this position, the player would reach down quickly and forcefully. As soon as the required position is attained, they would return to the starting position. Ballistic stretches can be used for exercise preparation but can cause serious injury to muscles and connective tissues.

PNF stretching is usually done with the assistance of a partner and includes both passive and active movements. This type of stretch involves reaching to the limits of motion, doing an isometric or static contraction against resistance from a partner, and then moving the involved body-part past the previous limit of motion. At this point, the player will once again engage in an isometric contraction (Figure 2.1). PNF stretching is very effective for increasing flexibility but should only be used after intense training sessions or matches, or as recovery technique.

a) **b)**

Figure 2.1 Proprioceptive Neuromuscular Facilitation (PNF) Stretch for the Hamstrings

WHEN AND WHAT FORM

For optimal benefits on soccer performance, flexibility training should be performed as part of the ***warm-up*** routine preceding training sessions and games, and as a part of the ***cool-down*** phase at the end of these activities. As previously mentioned, a separate session devoted entirely for flexibility may be necessary; especially after intense tournaments or matches, or for athletes with poor ranges of motion. Such sessions are not always practical for teams with limited training times however. Players with poor flexibility are recommended to devote extra time outside of regular training to improve this component of conditioning.

All forms of stretching can be effective for developing and improving flexibility, provided they are used at the appropriate times. However, ***dynamic*** and ***static stretches*** are the most commonly used and also the most practical, especially for youth and amateur players. The reasons for this are discussed in subsections below.

DYNAMIC STRECTHING FOR THE WARM-UP

The warm-up is an essential part of any training session and game preparation. The purpose of the warm-up is to prepare the body for more intense activity. This is achieved by increasing muscle and core temperatures as well as blood flow to the working muscles. Warm-ups should also mentally prepare the player and include sport-specific movements. A complete warm-up consists of a ***general*** component, which involves low-intensity activity such as jogging, and a ***specific*** component that consists of sport-specific movements and flexibility exercises.

The active nature of ***dynamic*** and ***ballistic*** stretches makes them suitable for use in the warm-up. Both forms facilitate increases in body temperature and blood flow (unlike static stretching that can actually reduce body and core temperature) as well as excitation of the nervous system. However, ballistic stretching can lead to serious injury because of the high amount of stress placed on the muscles. Dynamic stretching is a safer alternative as it avoids bouncing and is performed in a more controlled manner. In addition, dynamic stretching involves functional sport movement and better prepares the player (mentally and physically) for the demands of the sport. Ballistic stretching may also trigger the stretch reflex that does not allow the muscle to relax, thus defeating the purpose of stretching. Finally, dynamic stretching can involve multiple joints and is therefore more time efficient than ballistic and other forms of stretching.

A description of the most appropriate dynamic stretches for soccer players are described below. The stretches can be performed as either a series of repetitions in place, or over a specified distance (15 to 20 yards for example). Regardless of the method chosen, each movement should be performed in a controlled manner.

Forward Lunge

Muscle Groups Involved: Gluteus Maximus (Buttocks), Hamstrings, Iliopsoas (Hip flexor), Quadriceps

Directions: Have your players stand erect with feet shoulder width apart and parallel to each other. Direct them to take a step forward (about 2 to 3 feet) with the right leg, gradually flexing the right knee and hip, until the left knee just about touches the floor. The right foot should land flat on the ground with the toes pointing forward and the right thigh should be parallel to the ground. The front knee should not extend past the toes (Figure 2.2). Instruct them to return to the starting position by pushing off with the right foot as soon as the left knee touches the ground. The torso should be kept erect through the entire motion. Repeat with the left leg.

Figure 2.2 Forward Lunge

Side Lunge

Muscle Groups Involved: Gluteus Maximus, Hip Abductors and Adductors, Hamstrings, Iliopsoas

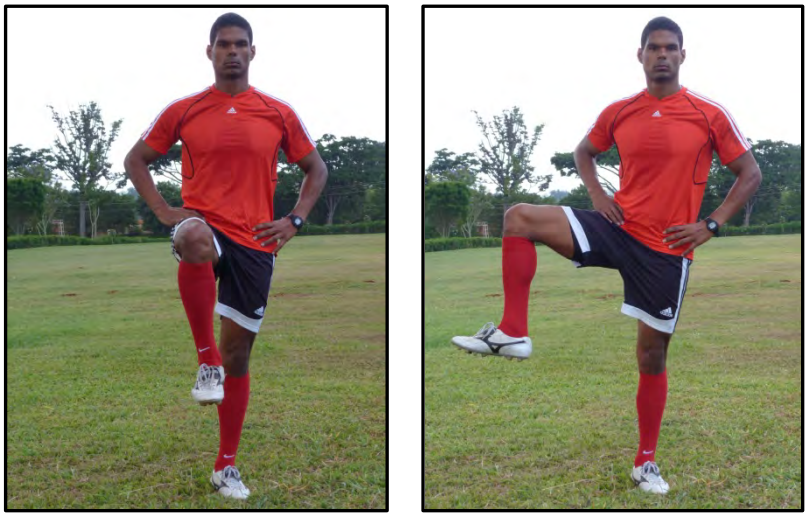
Directions: The starting position is the same as Forward Lunge. This time the player takes a big step laterally with the right leg and flexes the right knee until the right thigh is just about parallel to the ground. The player's body weight should be kept over the heel of the right leg. The left leg should remain straight and the left foot should remain flat on the floor (Figure 2.3). Have them immediately return to the starting position by pushing off with the right foot and then repeat the process with the left leg.

Figure 2.3 Side Lunge

Open and Close the Gate

Muscle Groups Involved: Iliopsoas, Hip Abductors and Adductors, Gluteus Maximus

Directions: Direct the players to stand erect with feet shoulder width apart and parallel to each other. Have them gradually bring the right knee straight up until the right thigh is parallel to the floor (Figure 2.4a) and then abduct the thigh (open the gate) as shown (Figure 2.4b). Instruct them to hold this position for one second and then adduct the thigh (close the gate) until the knee is facing straight ahead. Return to the starting position and then repeat for the left leg.



a) **b)**

Figure 2.4 Open and close the Gate

High Kicks

Muscle Groups Involved: Hamstrings, Iliopsoas, Erector Spinae (Lower Back), Ankle Musculature

Directions: Have your players stand upright with feet shoulder width apart; and with the left hand straight out, parallel to the floor and palm down. Direct them to swing the right leg forward, by flexing at the hip, until the instep of the right foot touches the palm of the left hand (Figure 2.5) and then return to the starting position. The right leg should remain straight and the toes should be pointing straight forward. Keep the movement fluid and controlled. Switch legs after each swing.

Figure 2.5 High Kicks

Lunge and Twist

Muscle Groups Involved: Gluteus Maximus, Hamstrings, Iliopsoas, Obliques (Core), Latissimus Dorsi (Upper Back)

Directions: Have the players lunge forward with the right leg as described in the Lunge exercise earlier. As the left knee just about touches the ground, instruct them to reach up with the left arm and slowly bend the torso laterally towards the right leg (Figure 2.6). Return to the erect torso position and then to the initial starting position.

Figure 2.6 Lunge and Twist

Dynamic Hamstring Stretch

Muscle Groups Involved: Hamstrings, Erector Spinae

Directions: Instruct your players to stand erect with feet shoulder width apart and parallel to each other. Have them simultaneously push the left leg backwards and touch the ground with both hands just in front of the right foot by bending at the waist. The left leg should remain straight and the right leg should be bent very slightly at the knee (Figure 2.7). Direct them to gradually return to the starting position and then switch legs.

Figure 2.7 Dynamic Hamstring Stretch

Dynamic Quadriceps Stretch

Muscle Groups Involved: Quadriceps

Directions: Stand erect with feet shoulder width apart and parallel to each other. In a fluid motion, bring the heel of the right foot towards the buttocks, by flexing the right knee. Hold the right foot in the position shown (Figure 2.8) for one second and then return to the starting pose. Switch legs and then repeat.

Figure 2.8 Dynamic Quadriceps Stretch

DYNAMIC FLEXIBILITY ROUTINES

Dynamic stretching routines can range from 15 to 20 minutes in length and should include stretches for all the major muscle groups (see above) and sport-specific movements (back-pedals, side-to-side shuffles, etc.) required in soccer. They should also include some form of ball work such as dribbling or one-touch passing. Many of the conventional dynamic stretching routines used by coaches rarely incorporate ball-oriented activities. This can be problematic however, especially before matches as players may go onto the field physically prepared, but mentally they may still be asleep.

The following are two examples of a ***general*** ball-oriented dynamic stretching routine that can be used for games or practices:

Sample Routine A

Set-up and Directions: Divide your players into 2 equal groups: a working group and a passing group. Set up a circular grid, 20 yards in diameter, using small cones. You can also use the centre circle of a regular-sized soccer field. Have the players in the working group stand by a large cone in the centre of the grid. Have each player in the passing group stand on the edge of the circle with a ball in their hands, but ensure that they are spaced equally around the circle (Figure 2.9a).

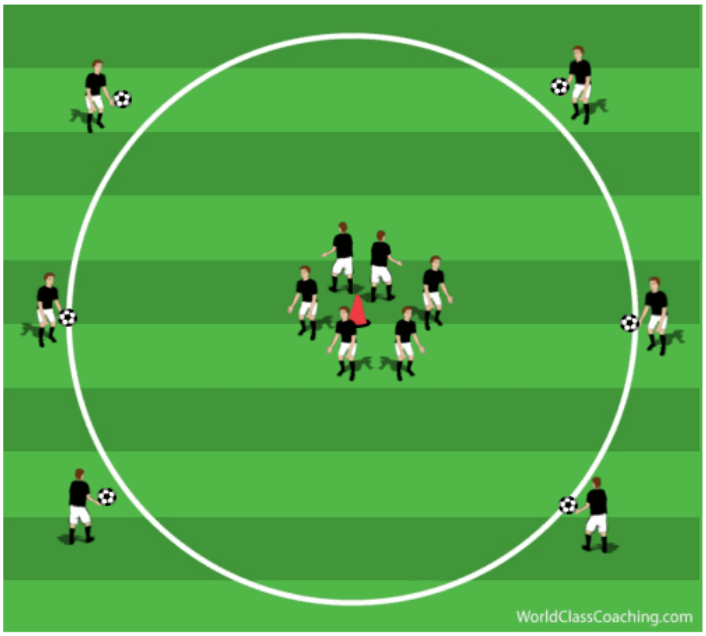


Figure 2.9a

On the coach's call, have each person in the working group run towards a different player on the edge of the circle where they receive a tossed pass that they must return with a side-footed volley (Figure 2.9b). As soon as they return the pass, they immediately run towards the centre of the circle (Figure 2.9c), touch the cone, and then run towards a different player where they repeat the same process.

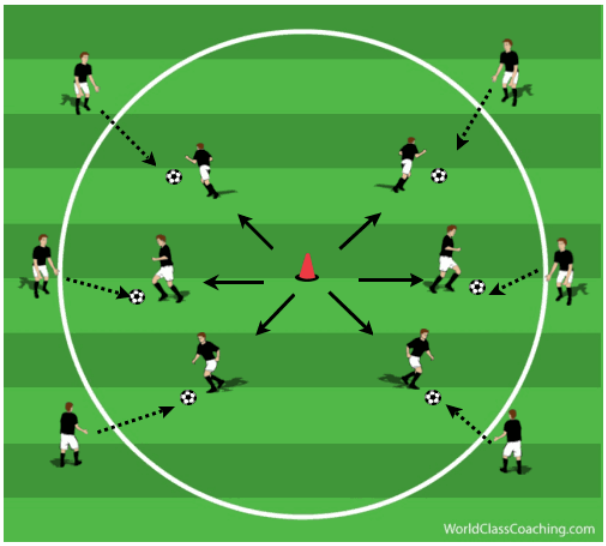


Figure 2.9b

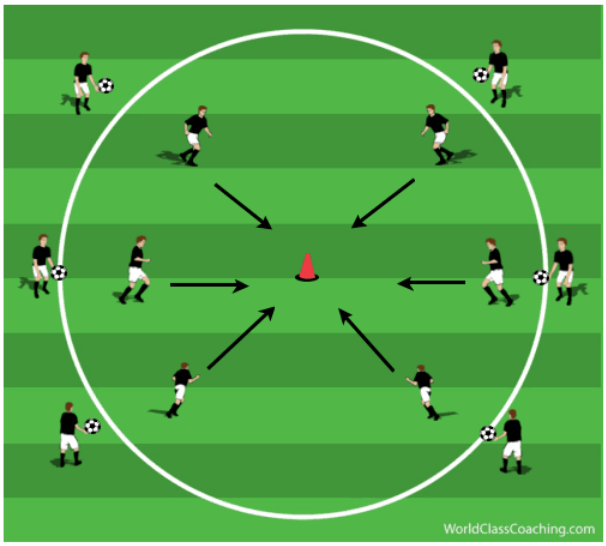


Figure 2.9c

Note: the working player must touch the cone in the centre of the circle before they can run towards a new player to receive and return a pass. Have the players work continuously for 60 seconds, switch roles as quickly as possible, and then proceed for another 60 seconds.

Dynamic Stretches and Sport-Specific movements: Continue this sequence until each group does a total of 6 to 8 working repetitions. However, after both groups have completed one repetition, have them do a different dynamic stretch (in place) before continuing the passing and receiving sequence. Ensure they perform all of the stretching exercises provided above.

You should also incorporate different movement patterns into the exercise. After each group has performed two repetitions, have the players ***backpedal*** towards the cone after receiving and retuning a pass to the player on the outside. You can then switch to ***side-to-side shuffles*** after another two repetitions. For the last 60-second repetition, have the players ***sprint*** each time they move from the cone to receive a pass from the player on the outside. They can jog to the cone after playing a pass, but must sprint from the cone as soon as they touch it.

Variation: You should switch the type of pass or technical action after every one or two repetitions. Consider including passes along the ground, bounced passes, heading, as well as instructing the players to use different parts of the body (chest, thighs) to receive the ball.

Sample Routine B

Set-up and Directions: Divide your squad into groups of 4 to 6 players. For each group, place two cones 15 yards apart and have a line of two or three players stand behind each cone. The two lines should be facing each other and the player at the front of one of the lines should have a ball at their feet (Figure 2.10a).

Initiate the exercise by having the player with the ball pass to the player at the front of the other line and then follow their pass by running, until they join the back of the other line (Figure 2.10b). The player who receives the ball then does the same. The players are limited to a maximum of two touches.

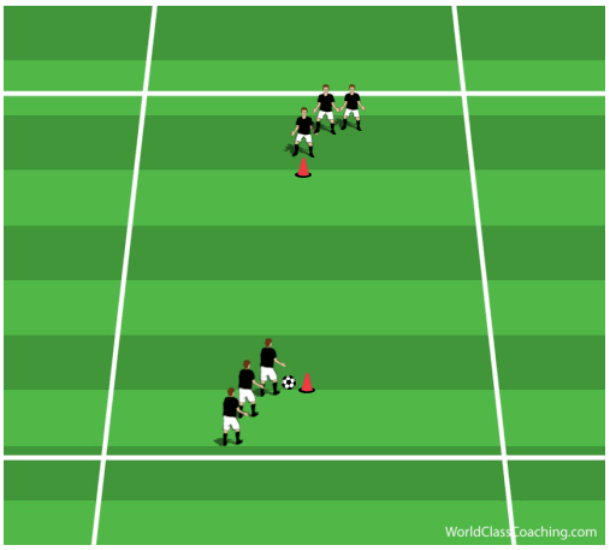


Figure 2.10a

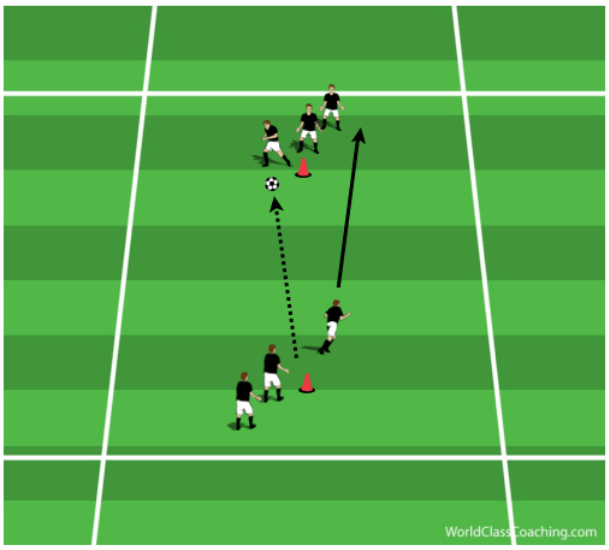


Figure 2.10b

Continue this process for 90 seconds and then have your players perform a dynamic stretching exercise. Complete a total of 7 or 8 cycles of pass and follow your pass, followed by a dynamic stretching exercise. However, ensure the players perform a different stretch after each repetition.

Sport-Specific movements: After every one or two cycles have them perform a different movement pattern after playing their pass. Consider the following: place two cones mid-way between the first two cones so that one is 7 yards to the left and the other is 7 yards to the right. After making a pass, have the player run to the cone to their right, cut left, and then join the line at the other end (Figure 2.10c).

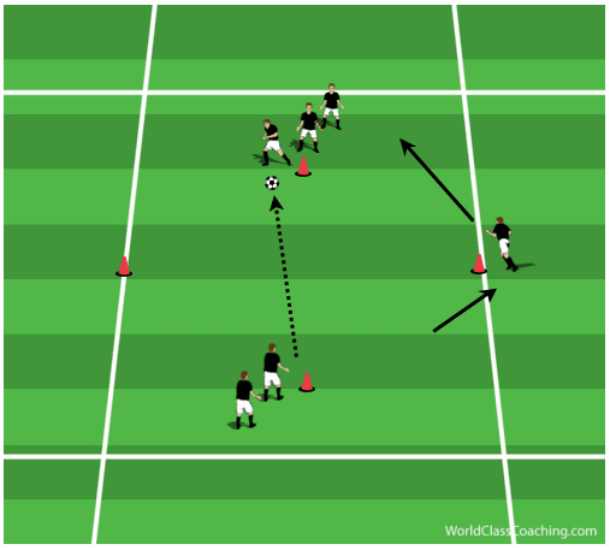


Figure 2.10c

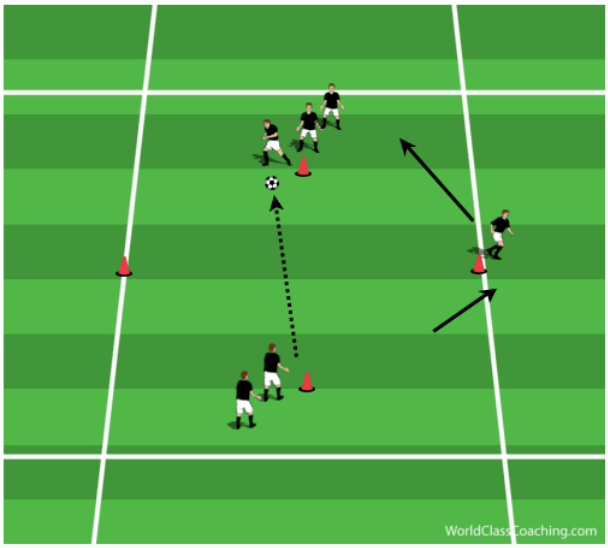


Figure 2.10d

After the next 90-second cycle, have the player run to the cone, turn, and then ***backpedal*** until they join the line at the other end (Figure 2.10d). You can then replace backpedaling with ***side-to-side shuffles, butt kicks*** or any other soccer-specific movement pattern that you see fit. For the final cycle, have them run to the cone and then ***sprint*** to the end of the line on the other side.

Variation: You should vary the passing component of the activity after every one or two 90-second cycles. For example, you can instruct your players to take their first touch with the inside or outside of the foot. You can also have them play passes using the laces or outside of the foot only. Lastly, you can limit them to one touch only. The ***warm-up*** may also include balance and neuromuscular exercises, which are discussed in the following chapter.

STATIC STRETCHING FOR THE COOL-DOWN

The last thing many players want to do after a game or practice is cool-down, but this phase is critical to the recovery process. The purpose of the cool-down is to provide the body with a gradual transition from intense exercise to a resting state by i) slowly decreasing the heart and breathing rates; ii) reducing body temperature; and iii) returning the muscles to an optimal length-tension relationship. Flexibility exercises are essential to the cool-down, and Static and PNF stretches are the best forms to use. Both enhance relaxation and facilitate a steady decrease in body temperature. Static exercises are preferable to the amateur and youth coach however, as performing PNF stretching exercises require expertise and most often requires a partner, making it less practical.

Static Stretching routine: As with dynamic flexibility routines, a **static stretching routine** for soccer players should involve all the major muscle groups engaged during the various movements and actions. Include the following stretches at the end of your training session to help maintain whole-body flexibility, reduce muscle soreness and initiate recovery from intense exercise:

Lying Quadriceps Stretch

Muscle Groups Involved: Quadriceps

Directions: Direct the players to lie on their right sides with both legs straight and place their right forearm flat on the floor, perpendicular to the body. Instruct them to bring the left ankle towards the buttocks, by flexing the knee, until they are able to hold the front of the foot (Figure 2.11). Have them hold for 20 to 30 seconds and then switch sides.

Figure 2.11 Lying Quadriceps Stretch

Butterfly Stretch

Muscle Groups Involved: Hip Adductors, Sartorius (Groin Muscles)

Directions: Have your players sit with a straight torso and then bring the soles of their feet together by flexing both knees. Have them place the elbows on the inside of their legs and the palms on the top of their feet (Figure 2.12). Direct them to engage the stretch by leaning forward gradually while pushing the knees down and out with the elbows.

Figure 2.12 Butterfly Stretch

Kneeling Hamstring Stretch

Muscle Groups Involved: Hamstrings, Erector Spinae (Lower back)

Directions: Have your players assume a kneeling position, with an erect torso and then direct them to extend the right leg straight in front. Instruct them to engage the stretch by slowly leaning forward and placing both hands on the ankle of the outstretched leg (Figure 2.13). (Players with reduced flexibility are recommended to reach with the hand of the extended leg only). Have them hold for 20 to 30 seconds and then switch legs.

Figure 2.13 Keeling Hamstring Stretch

Standing Calf Stretch

Muscle Groups Involved: Gastrocnemius, Soleus (Calf Muscles)

Directions: Stand erect with feet shoulder width apart, approximately 2 to 3 ft. from a wall. Place the palms of both hands against the wall (Figure 2.14a). Take a step backwards with the left foot, keeping the left leg straight (Figure 2.14b). Gradually flex the right knee to engage the stretch in the left calf. Both feet must remain flat on the floor. Hold for 20 to 30 seconds then switch legs.

a) **b)**

Figure 2.14 Standing Calf Stretch

Gluteal Stretch

Muscle Groups Involved: Gluteus Maximus (Buttocks)

Directions: Lie flat on your back with both legs straight. Bring both knees towards the chest until the thighs are perpendicular to the ground. Cross the right leg over the left by placing the right ankle slightly past the left knee (Figure 2.15). Bring the left knee towards the head slightly and hold for 20 to 30 seconds before switching legs.

Figure 2.15 Gluteal Stretch

Lower Back Twist

Muscle Groups Involved: Erector Spinae

Directions: Lie flat on your back with both legs straight. Bring both knees towards the chest until the thighs are perpendicular to the ground (the upper body should remain flat on the ground). Engage the stretch by guiding both knees towards the ground on the right side by twisting at the waist. Keep both shoulders on the ground however (Figure 2.16). Hold for 20 to 30 seconds and then bring the knees to the other side.

Figure 2.16 Lower Back Twist

Cobra Stretch

Muscle Groups Involved: Erector Spinae

Directions: Lie flat on your stomach with your legs together and extended. Place both forearms on the ground, parallel to the body, so that the palms are facing the ground and directly below the shoulders. Engage the stretch by pushing the chest and head off the floor with the hands while arching the lower back (Figure 2.17). The legs should remain on the ground. Hold for 20 to 30 seconds and then return to the initial position.

Figure 2.17 Cobra Stretch

Kneeling Hip-Flexor Stretch

Muscle Groups Involved: Iliopsoas (Hip Flexor)

Directions: Direct the players to kneel down on their left knee and have them place the right leg in front of them so that the right thigh is parallel to the ground and the lower right leg is perpendicular to the ground (Figure 2.18). The torso should be erect and both hands should be placed on the hips. Have them engage the stretch by slowly lowering hips forward, while maintaining an erect torso. Hold and then switch legs.

Figure 2.18 Kneeling Hip Flexor Stretch

Behind the Neck Stretch

Muscle Groups Involved: Triceps, Latissimus Dorsi (Upper back***)***

Directions: Place the palm of the right hand on the upper back, slightly below the neck, by abducting the shoulder and bending the elbow (Figure 2.19). At the same time, hold the right elbow with the palm of the left hand and pull the elbow slightly towards the head.

Figure 2.19 Behind the Neck Stretch

Arm across the Chest Stretch

Muscle Groups Involved: Middle Trapezius, Rhomboids (Upper and Mid Back)

Directions: Stand erect and bring the right arm across the chest by moving the right hand towards the left shoulder. Engage the stretch by slowly pushing the right elbow towards the left shoulder with the palm of the left hand (Figure 2.20). Hold for 20 to 30 seconds and then switch arms.

Figure 2.20 Arm across the Chest Stretch

Each stretch should be performed slowly and under control. Hold the stretch for 20 to 30 seconds, and then return to the starting position slowly. It is also important that you do not stretch the muscle until the point of pain as this can lead to muscle and connective tissue injuries**.**

FLEXIBILITY GUIDELINES FOR YOUNGER PLAYERS

As previously mentioned, flexibility training is recommended for players of all ages, including pre-puberty and adolescent players and should be a high priority no matter what phase of the season. As will be mentioned in Chapter 6, good flexibility is important when youth players begin strength training as it helps prevent injuries and facilitates the use of good technique. Flexibility training is especially important for adolescent players. This is because growth spurts that occur during puberty may lead to muscle imbalances around a joint, which may make a child more susceptible to injury.

All training sessions and games should be preceded by and end with flexibility training. Static and dynamic stretching can be used by players of all ages (not necessary for mini soccer). However, Ballistic stretches are not recommended for pre-puberty and adolescent players, whereas PNF stretching can be introduced in the later years of the adolescent phase.

CHAPTER 3: TRAINING TO DEVELOP STATIC AND DYNAMIC BALANCE

Developing good balance should be a fundamental goal when designing a conditioning program for soccer, as this tenet of conditioning is critical in so many game situations. The ability of a striker to i) receive a lofted ball with the instep or thighs while under pressure from a defender; or ii) stay on their feet after evading a sliding challenge while dribbling at full speed; both depend on the ability to maintain control of the body. Developing the balance component is also important for improving other facets of the game. For example, having good stability allows a player to change direction more efficiently and perform one-touch passes with greater control; highlighting the importance of balance in the ***agility*** and ***technical*** aspects of the sport.

Unfortunately, balance training is a component of conditioning frequently neglected by coaches either due to a lack of time, or the belief that this element of fitness is not important. However, one of the great things about balance training is that you don't t need to do many exercises to get a positive effect. In addition, many balance exercises can easily be modified to include some form of ball work.

Figure 3.1 Good Balance is essential for maintaining control when receiving balls under pressure and trying to turn your man

BALANCE TRAINING PRINCIPLES

By definition, balance is the capacity to maintain the body's center of gravity within the base of support. In simple terms, it is the ability to sustain control of the body while stationary (***static balance***) or moving (***dynamic balance***). Maintaining this state of equilibrium is dependent on accurate information from the visual, vestibular and other sensory systems of the body. Sensory receptors transmit information relating to changes in body position, displacement, velocity and muscle tension to the brain for processing. Efficient and appropriate processing of this sensory data leads to coordinated movement and control.

Challenging the body to sustain a state of equilibrium by varying the inputs from the different sensory systems is the ***main principle*** of balance training. This can be done by performing certain activities with the eyes closed or on unstable surfaces for example. Ultimately, balance training improves soccer performance by enhancing body awareness and movement coordination, which allows for greater control and stability while performing the different actions during the game or training session.

BALANCE TRAINING AND INJURY PREVENTION

In addition to improving coordination and efficient movement, balance training may also help prevent injuries. So many injuries occur after landing awkwardly, either following contact from an opponent or performing a common action such as jumping or back pedaling. Injuries to the anterior cruciate ligament (ACL), one of the four major ligaments in the knee, are of particular concern to the soccer player, especially among women. The incidence of ACL injuries in soccer players is one of the highest of any sport and females have been shown to be approximately five times more likely to suffer this form of injury than their male counterparts. Damage to the ligaments of the ankle and overuse injuries such as patellar tendinitis, shin splints and achilles tendinitis are also quite common.

Importantly, performing balancing exercises that improves processing of sensory information and positional awareness may increase stability in the joints of the lower body. This in turn reduces unwanted movement and lessens the chance of injury. In fact, recent scientific research in young, elite female athletes show that performing balance and core stability exercises as part of a warm-up routine may significantly reduce the chance of sustaining ACL and other knee-related injuries. Soccer-specific balance training programs have also been shown to reduce muscular (hamstring, calf) and overuse (tendinitis) injuries.

BALANCE TRAINING EXERCISES AND PROGRESSION

To improve balance and stability, it is essential that you continuously challenge the ***balance threshold*** or the furthest point you can move outside the base of support without losing control. Start with ***static*** balance exercises such as balancing on one leg while performing side-footed volleys. Once these have been mastered, start incorporating ***dynamic*** balance exercises into your training program. With both

categories, start with ***beginner*** or ***basic*** level exercises then progress to intermediate and when possible, advanced ones.
As will all elements of conditioning, the key is to do to balancing exercises that are specific to the sport. For soccer, this may involve landing on one leg after a vertical or horizontal jump, or performing a technical action while balancing on one leg.

Balance exercises should be incorporated into training at least once per week (either in the warm-up or as a separate section) regardless of what phase of the season you are in. As previously mentioned, the great thing about balance training is that very few exercises (1 or 2) need to be done in order to maintain gains in balance development previously made. The following is a set of static and dynamic balance exercises that incorporate technical training. Each exercise is categorized as basic, intermediate or advanced and includes a description of how to progress or vary the activity.

STATIC BALANCE EXERCISES

Single-Leg Balance with Headers

Level: Basic

Set up: Divide your players into pairs with one ball between the two. Instruct them to stand about 3 yards apart and have the player with the ball hold it in their hands. The player without the ball starts by standing and balancing on one leg. The balancing leg should be slightly bent at the knee (Figure 3.2a). When ready, have the player toss the ball to the player on one leg so that they return the ball with a header (Figure 3.2b). They must try and remain balanced while performing each repetition. Have the player complete 8 to 10 repetitions for each leg and then have your players switch roles. Perform a total of two sets.

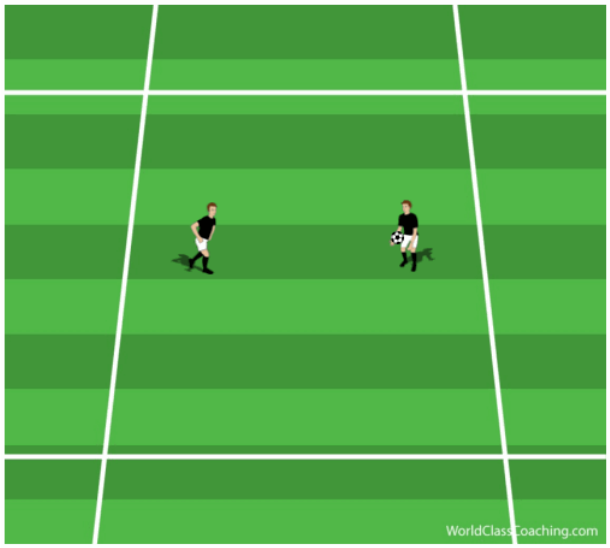


Figure 3.2a

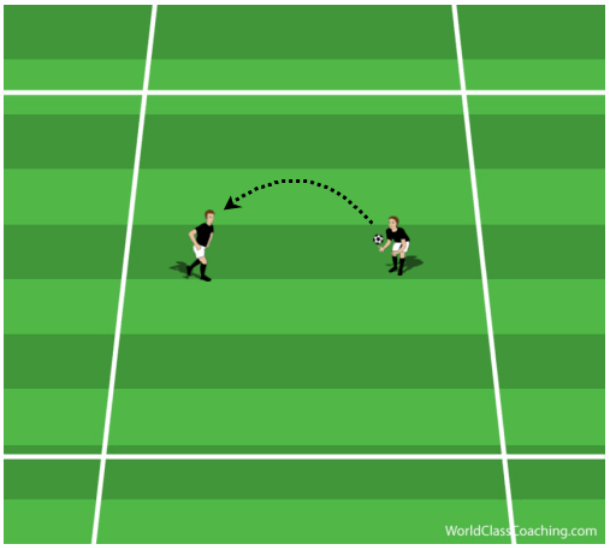


Figure 3.2b

Coaching Points: Ensure the players maintain a low center of gravity by keeping the knee of the balancing leg bent. Also, make certain the upper body remains straight and the players avoid swaying from side to side.
For the technical (heading) element of the drill, ensure to keep the eyes open and mouth closed, the neck muscles firm, and make contact with the forehead. Arch the back and then drive the upper body forward to generate power.

Variation: The exercise can be varied by or by changing the technical action to side-footed volleys or one-touch passing.

Progression: The level of difficulty for this exercise can be increased in several ways: 1) have the player balance on an unstable surface such as a balancing board or thick foam mat; 2) increasing the distance between the players so that a more forceful header is required; or 3) touching a point on the ground after each repetition.

Keep-Ups While Balancing on One Leg

Level: Intermediate

Set up and Instructions: Divide your players into groups of two with one ball per group. Have them stand 1 to 2 yards apart and instruct them to perform keep ups while remaining balanced on one leg (Figure 3.3).

Figure 3.3 Keep –Ups While Balancing on One Leg

They must remain standing on one leg at all times, even when they are not in possession. Additionally, both players must remain in one spot and should avoid shifting the balancing leg as much as possible. Continue for 60 seconds and then switch the balancing leg. Do each leg 2 to 3 times. This exercise is categorized as intermediate, but the technical level required to perform this exercise successfully is high.

Coaching Points: The players are not allowed to move and therefore the quality (weight and accuracy) of passes between the two has to be very high. Also, ensure that each player takes small or soft touches when keeping-up in order to avoid stretching and/or moving out of position. Encourage the players to make passes at different heights so that different parts of the body are used to receive or passes.

Progression: Divide the players into groups of three so each player now has to make and receive passes in and from different angles.

DYNAMIC BALANCE EXERCISES

Single-Leg Hop and Land through Agility Ladder

Level: Basic

Set-up and Instructions: Set up and an agility ladder in between two cones so that the start, and end, of the ladder is approximately 5 yards away from a cone. Have your players line up behind the cone nearer to the start of the ladder. When ready, have the player at the front run to and complete the ladder by hopping from one square to the next on one leg (Figure 3.4a). On every landing, they must hold a balance position for 3 seconds before hopping to the next square.

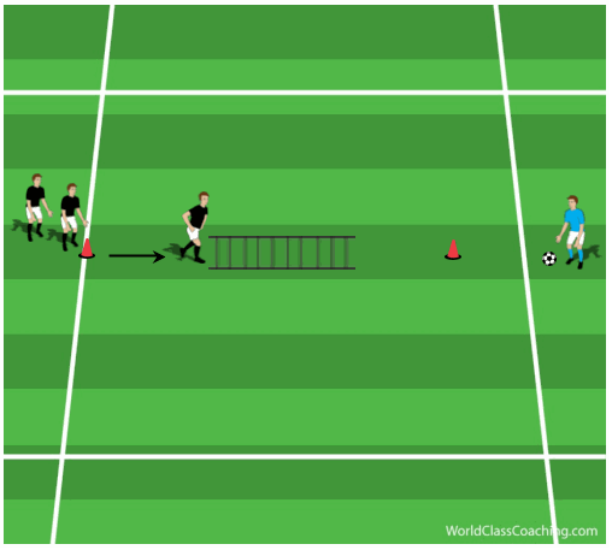


Figure 3.4a

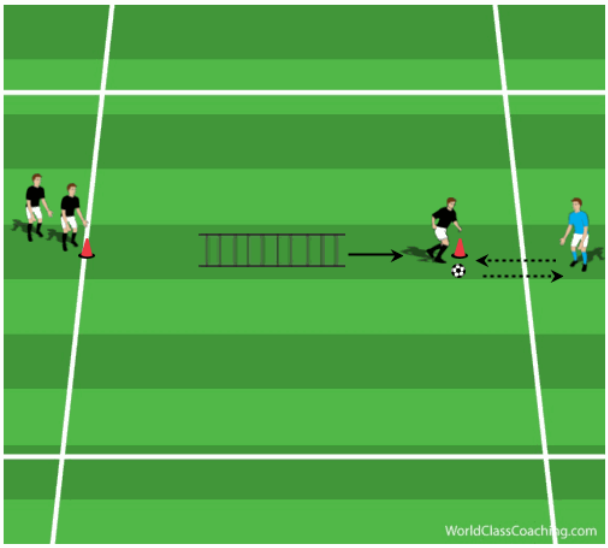


Figure 3.4b

As soon as they complete the ladder, they must accelerate towards the second cone where they will return a pass played to them by the coach with one-touch (Figure 3.4b). The player should land on the same leg for one entire run through and then switch legs on the next repetition/run through. Have them work each leg twice

Coaching Points: Ensure the player bends the knee slightly upon landing to absorb the impact. Additionally, the player should keep the upper-body straight and sway as little as possible while balancing by keeping the core muscles tight.

After completing the ladder, the players should accelerate towards the pass, ensuring they get their bodies behind the ball. Coach the weight and accuracy of the return pass.

Variation: You can vary the exercise by switching the technical component of the exercise.

Progression: You can progress the exercise by switching to a pattern of two squares forward, one square back.

Single Leg Hop with One-touch Passing

Level: Basic

Set up and Instructions: Divide your players into pairs with one ball to use between the two. Instruct them to stand about 3 yards apart. The player with the ball should have it at their feet. The player without the ball starts by standing and balancing on one leg. The balancing leg should be slightly bent at the knee (Figure 3.5a).

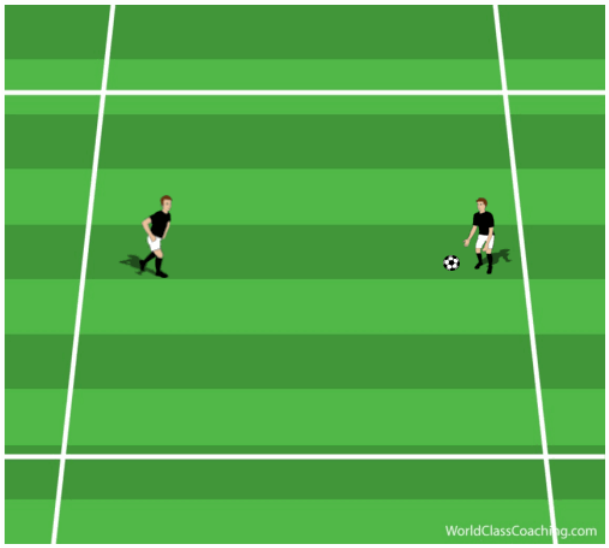


Figure 3.5a

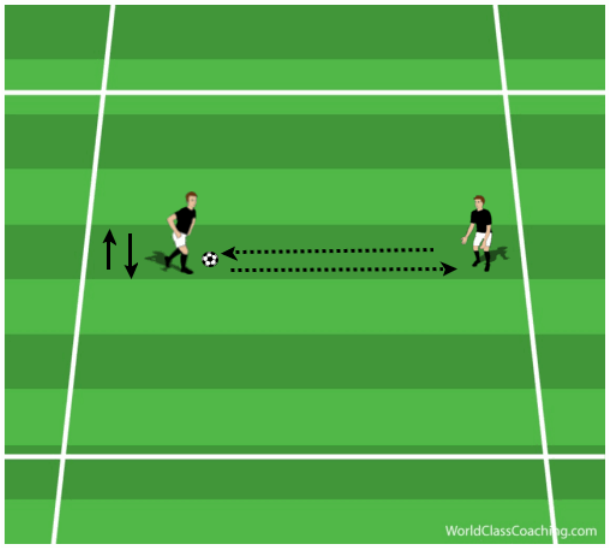


Figure 3.5b

When ready, direct this player to hop off and land on the balancing leg and hold this position for three seconds. At this instant they will have a ball passed to their non-balancing leg, which they will return with one touch (Figure 3.5b). Continue this process until they have completed 8 to 10 hops (followed by one-touch passes) then switch legs. When finished, have the players switch roles. Perform a total of two sets.

Coaching Points: Ensure the player bends the knee slightly upon landing to absorb the impact. Additionally, the player should keep the upper-body straight and sway as little as possible while balancing by keeping the core muscles tight. For the technical element of the drill, ensure that the player keeps the ankle locked with the toes pointed upwards when making contact with the ball, and that the follow-through action of the foot is toward their partner.

Variation: The exercise can be varied by changing the technical action to heading or side-footed volleys.

Progression: The level of difficulty for this exercise can be increased by hoping forwards and backwards over a mini hurdle or by giving the player a bounced pass.

4-Cone Single-Leg Hop with Headers

Level: Intermediate

Set-up and Directions: Set up four cones to make a diamond shape. The length of each side must be 1.5 yards. Have a player stand and balance on one leg in the centre of the diamond facing a second player with a ball, standing 2 yards away from the top cone (Figure 3.6 a).

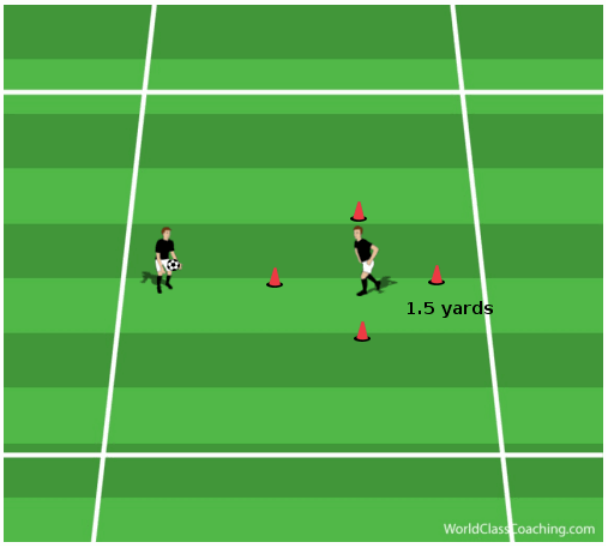


Figure 3.6a

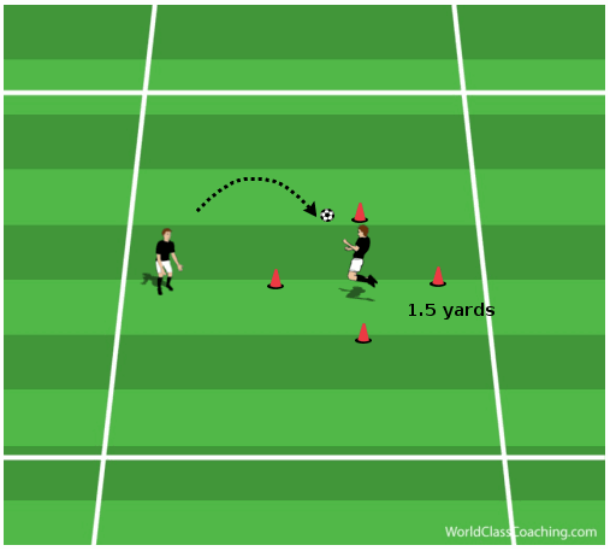


Figure 3.6b

When ready, the player in the diamond must hop to the cone at the top and then back to the centre, hop to the cone on the right and then back to the centre; and should continue this process until they have hopped to all four cones and back. They must land on the same leg each time and maintain a balanced position for at least three seconds. As soon as they have completed the final hop, they must immediately return a ball tossed to them from their partner using a jumping header (Figure 3.6b). Switch roles after each repetition, and complete one set of 6 to 8 repetitions.

Coaching Points: Ensure the player bends the knee slightly upon landing to absorb the impact and uses the arms to help balance. When heading, keep the eyes open and mouth closed, the neck muscles firm, and make contact with the forehead. Arch the back and then drive the upper body forward to generate power.

Variation: Have the player head to a third person standing to the left or right of the person tossing the ball (Figure 3.6c).

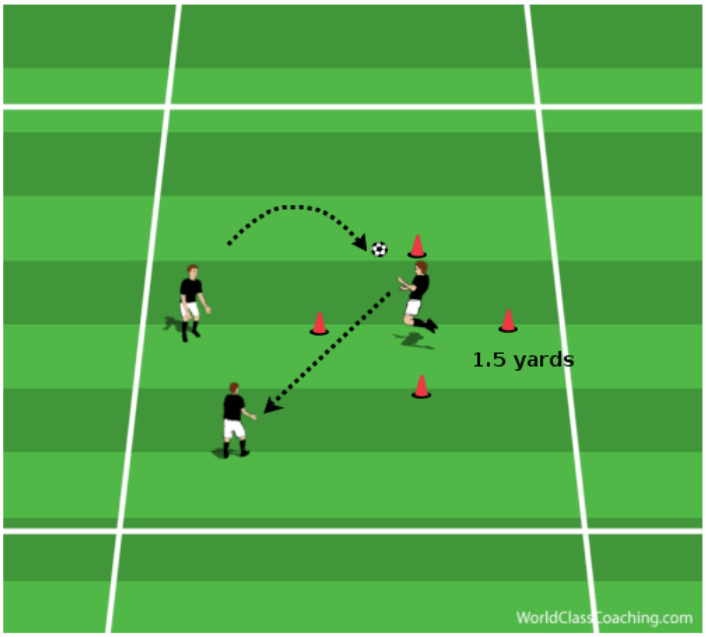


Figure 3.6c

Progression: You may progress this exercise by having the player complete the cycle twice before heading.

Lateral Hops with Side-Footed Volleys

Level: Intermediate

Set up and Instructions: Divide your players into pairs with one ball between the two. Instruct them to stand about 3 yards apart and have the player with the ball hold it in their hands. The player without the ball starts with both feet on the ground, shoulder width apart, approximately 8 to 12 inches to the side of a mini hurdle or cone (Figure 3.7a). When ready, direct that player to hop laterally over the mini hurdle and land and balance on one leg. The landing leg should be the one furthest away from the hurdle after hoping, or the outside leg (Figures 3.7b and 3.7c). After maintaining a balanced position for at least 2 to 3 seconds, their partner will toss a ball to them which they return with a side-footed volley. Note: for every repetition, the player must hop from a two-footed stance, but land on one leg.

a) **b)** **c)** **d)**

Figure 3.7 Lateral Hops with Side-Footed Volleys

Coaching Points: As before, ensure the athlete bends the knee slightly and that shoulders are over the knee when they land. When passing, the player should be compact over the ball. The ankle should remain locked with the toes pointing upwards, and the leg should follow through in the direction of their partner.

Progression: This exercise can be progressed to an advanced level by either landing on inside leg (Figure 3.7d), increasing the height of the hurdle, or by changing the starting position from a two-footed to a one-footed stance.

Variation: The exercise can be varied by doing volleys with the laces or by changing the technical action.

180-Degrees Hop with Side-Footed Volleys

Level: Advanced

Set up and Instructions: Players are again divided into groups of two, with one ball between the pair. The player without the ball starts with both feet shoulder width apart, 2 to 3 yards in front of, **but** with their back turned to their partner (Figure 3.8a). When ready, direct that player to jump and perform a 180-degree turn while in the air and then land and balance on one leg (Figure 3.8b). After balancing for three seconds, they will receive a tossed ball to the non-balancing leg that they should return with a side-footed volley (Figure 3.8c). Have them return to the starting position and repeat for a total of 8 to 10 repetitions per leg.

a)

b)

c)

d)

Figure 3.8 180-Degrees Hop with Volleys

Coaching Points: As before, ensure the athlete bends the knee slightly and the shoulders are over the knee when they land. The athlete also needs to jump high enough to perform a 180-degree turn while in the air. When passing, the player should be compact over the ball. The ankle should remain locked with the toes pointing upwards, and the leg should follow through in the direction of their partner.

Variation: This exercise can be varied by changing the technical element to any one of the actions mentioned in the previous exercises, or by performing volleys with the laces (Figure 3.8d).

Progression: To progress this exercise, you can have the player hop up and over a mini hurdle placed 6 to 12 inches behind them, or by changing the starting position stance to one leg.

Note: The hops in the exercises presented above are not intended to be explosive in nature. They should be controlled (somewhat slow) movements aimed at getting the player a few inches off the ground, or over the barrier. When incorporating a hurdle, it should be not more than 6 to 12 inches (i.e., a mini hurdle).

BALANCE TRAINING FOR YOUNG PLAYERS

Balance and motor-skill training exercises are recommended for soccer players of all ages, as developing good coordination should start at a young age. However, only the exercises in the ***basic*** category should be used for players in the ***pre-puberty*** age group. Games like hop-scotch with one-touch passing can also be used to improve balance and coordination in the younger pre-puberty players (7 to 8 year olds).

Adolescent and ***post-puberty*** players can progress to more advanced exercises once they have mastered the basic exercises. Regardless of age, balance training should be incorporated into training at least once per week; either as part of, or immediately after, the warm-up.

CHAPTER 4: INTEGRATING TECHNICAL WORK WITH SPEED TRAINING

Lightning speed is a necessary quality for all soccer players, regardless of playing position. Even goalkeepers need to develop this component of fitness, especially when coming of their line to intercept well-placed though balls. In fact, speed is regarded by both players and coaches as one of the most important predictors of soccer performance. As such, these individuals spend countless of hours on improving this facet of the sport. For the time-constrained coach, the challenge, as always, lies with when and how to incorporate speed work into twice-a-week practice schedules.

Developing a solid speed base is reliant upon establishing a sound foundation in other conditioning parameters; in particular, strength, power and flexibility. Gaining distance on a player requires powerful, explosive movements from both the arms and legs and emphasizes the importance of strength and power training (Chapters 6 and 7). Moreover, poor flexibility (Chapter 2) in the hip-flexor and hamstrings muscles will greatly impair stride length, a major determinant of maximum speed capabilities.

When thinking of speed, the 100 meter race generally comes to mind. However, although great technique is required for both, training to run a 100 meter race cannot be applied to soccer. Though you may see attackers bursting forward starting from deep inside their own half, the majority of sprints in soccer occur over relatively short distances. Importantly, accelerating and sprinting in soccer occurs from a variety of starting positions (stationary, from a lying position, after a turn) and in multiple directions (linear, diagonal, curved). Situations in soccer that involve rapid acceleration and full on sprinting also involve performing one or more technical and tactical tasks such as tackling, receiving, or regaining position on an opponent. Coaches therefore need to focus on developing ***soccer-specific speed*** that is multi-dimensional in nature**.**

Figure 4.1 Speed and acceleration are necessary qualities for defenders making recovery runs

ELEMENTS OF SPEED

When a player like England and Arsenal's Theo Walcott blazes down the touch line, and we think to ourselves "Wow, he's fast!", we are referring to his ***maximum speed***. There are other elements of speed however, which include ***starting speed***, ***acceleration***, and ***speed maintenance***.

Starting Speed

Starting speed refers to how quickly you can cover the first few steps (yards), usually from a stationary position. Starting speed is important when a central defender closes down a striker as he receives a ball in the penalty area; or for a central midfielder checking quickly to receive a pass in tight spaces. Starting speed involves overcoming inertia by pushing forcefully into the ground with the feet. Force is generated from the ankles, knees and hips, and applying the force effectively is dependent on good body orientation and foot work. The first step must be short and in the intended direction of movement. The foot should land slightly behind the hips and push down and backwards. There also needs to be a positive angle (about 45 degrees) between the ground and your body (Figure 4.2). Having this positive body angle allows for maximum force generation. A major difference between starting speed (and accelerating) in soccer compared to sprinting in track and field, is that the eyes must be looking up and not down into the ground!

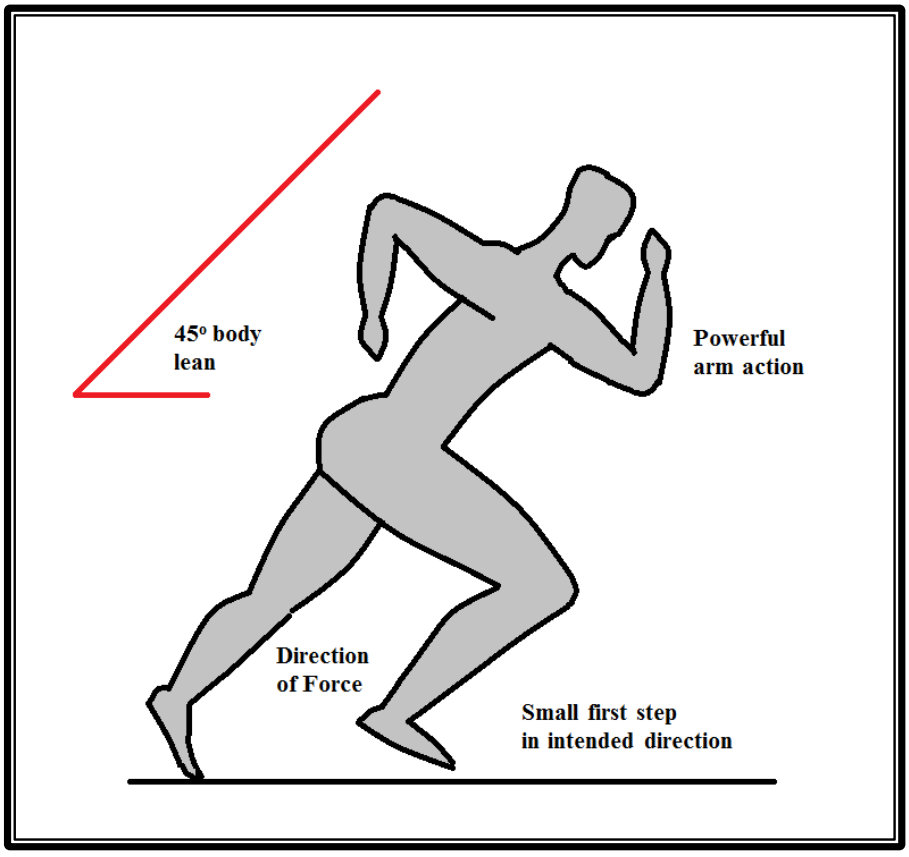


FIGURE 4.2 Body Alignment during Starting Speed and Acceleration

Starting speed also has a ***cognitive*** (mental) aspect to it. Players have to recognize a variety of visual and other sensory cues, process the information, and then respond accordingly. To improve this aspect of starting speed, you should perform drills that involve various stimuli or cues that frequently occur in game situations that evoke a specific response. For a center back, this may be when a pass is played into the feet of the attacker he is marking. The pass would be a ***visual*** cue for the defender to close down his opponent. When strikers are defending, they may have to respond to ***auditory*** signals from their teammates behind them such as "Close him down!" By continuously reacting to set stimuli with a specific response, these actions will become instinctive and the body will respond quicker.

Acceleration

In simple terms, ***acceleration*** it is the time taken to reach maximum or high levels of speed. Acceleration is one of the most important elements of speed and requires a lot of attention in training. Acceleration allows us to get the better of a defender in a 1v1 situation, or recover from a miss-timed tackle to chase down an attacker. Being as "fast as lightning" will be of little use in soccer if it takes forever to attain that speed.

Accelerating quickly is dependent on proper body alignment (a positive angle between the body and the ground facilitates greater forces to be applied); good arm action; and explosive lower body power (the hips, knees and ankles need to push off as quickly and forcefully as possible).

Drills for acceleration should use distances ranging from15 to 20 yards and should emphasize the athlete taking small, explosive steps while maintaining a positive body lean (Figure 4.2). Note: this needs to be a whole-body lean, not just at the waist. As before, the player needs to have their eyes forward.

Maximum Speed

Maximum Speed, as the name suggests, is the fastest possible speed you can attain. Plays that involve maximum speed usually occur when balls are played in behind the defense and often involve a foot race between a defender and attacker. This element of speed is a very desirable quality for wingers and strikers. An assumption many coaches make is that: because most sprints in soccer occur over short distances, they do not occur in the maximum-speed phase. However, many of these sprints are from moving starts (jogging, striding), which greatly reduce the distance needed to achieve top speed. As such, it is important that this component of speed not be neglected in preference for the others.

Reaching maximum speed from a ***stationary*** position usually occurs after about 30 or 40 yards and is dependent on achieving an optimal balance between stride frequency (number of strides per time interval) and stride length (distance covered by each stride). Establishing good form and running mechanics is a must for improving this element of speed. (Box 4.1 describes the correct form and running mechanics during this phase in great detail) The coach needs to address proper arm and leg action as well as posture. Increasing functional strength and power with the appropriate exercises is also critical.

Using ***sprint-assisted*** (downhill sprinting for example) and ***sprint-resistance*** (sled-towing for example) techniques is also a great way to improve stride frequency and stride length. However, incorporating ball work into these types of exercises is generally not recommended. As such, these training methods are not included in this book.

Speed Maintenance

Speed maintenance or ***speed endurance*** (not to be mixed up with anaerobic endurance) refers to the ability to maintain maximum speed over an extended period of time or distance. Wing backs caught out of position high up the pitch, or attackers joining a counter attack initiated deep in their own half, may cover over 70 yards at full speed and thus require good speed endurance.

Exercises that involve maintaining maximum speed over a distance of about 30 yards will help facilitate an improvement in speed endurance. For these activities, distances totaling 70 to 80 yards (6 to 8 seconds) are required. The entire distance does not have to be a linear fashion however. Including small turns or curves in the sprint is a good idea and more applicable to the game.

More than 10% of the total distance covered by soccer players during a game is done while sprinting and it is important that when designing your training program, you address **all** elements of speed. However, situations involving speed maintenance are not as common during the game. As such, more time should be spent on developing and improving starting speed, acceleration and maximum speed.

BOX 4.1 RUNNING MECHANICS DURING THE MAXIMUM SPEED PHASE

Leg Action
Sprinting involves a sequence of strides. During the stride at maximum speed, the leg cycles through three main phases: i) the drive phase; ii) the recovery phase; and iii) the support phase.

In the ***drive*** or ***take-off phase***, the drive or rear leg extends at the hips, knees and ankles and forcefully propels the body forward by pushing downwards and backwards into the ground at the ball of the foot. At the same time, the knee of the other (front) leg is driven upwards and forwards until the thigh is parallel to the ground.

The ***recovery*** or ***flight phase*** starts as soon as the driving foot leaves the ground. The knee of front leg reaches it maximum height after which the lower leg swings forward and then extends at the knee until the foot strikes the ground. The rear leg is cycled through by a closing of the knee joint followed by flexing of the hip.

The ***support phase*** occurs after foot strike of the front leg. During this phase, the weight of the body is supported by the entire foot and the body's centre of gravity passes over this foot until the drive phase is initiated.

Arm Action
The arms and legs work in an opposing manner. For example, as the knee of the front leg comes forward during the drive phase, the arm on the same side is forcefully driven backwards. The arm swing should occur from the shoulder and the upper and lower arm should make a 90 degree angle at the elbow. The hands should not reach across the chest during the arm swing, which ranges from the side of the face to the hip.

Posture
The torso should be erect throughout the entire stride

Common Errors
For coaches that have little experience with sprinting form and technique, the main errors to watch out for are:

- Bouncing (too much vertical height achieved with each stride)
- Insufficient or incorrect arm action
- Short stride lengths (poor leg strength, power or flexibility)

STRENGTH AND POWER REQUIREMENTS FOR SPEED

It is vital that the conditioning coach factors in speed development when designing the power and strength training program (Chapters 6 and 7), as all aspects of speed are heavily influenced by these two components.

Starting speed and acceleration involve forceful extension of the ankles, knees and hips. Improving power capabilities in the lower body can be achieved with appropriate ***plyometric*** exercises such as the squat jump and split squat, which emphasize triple extension of joints mentioned above.

Of course, building a strength foundation or ***basic strength*** should be a precursor to power development. Developing basic strength with functional exercises is also important, as poor ***leg strength*** and ***core strength*** will impair movement efficiency and quality. Core strength is also required for balance and maintaining good posture, which is vital for all aspects of speed.

Lastly, increasing ***strength*** and ***power-endurance*** will help maintain proper sprinting technique and power production over longer distances. When and what exercises should be included will be discussed in more detail in Chapters 6 and 7.

ARM ACTION

Proper arm action is essential for achieving maximum speed and efficient acceleration. The arms act as a lever to generate force from the upper body, which facilitates a powerful leg drive. Additionally, the drive and frequency of the arms actually help coordinate leg movement and thus stride frequency and stride length.

The arm swing or action should be generated from the shoulder joints, which should be low and relaxed. Each swing should be powerful, but controlled. The angle between the forearm and upper arm should be approximately 90 degrees when going at maximum speed and slightly larger when accelerating. During the upswing, the hand should not go above the head, and at the bottom of swing, it should be next to or slightly behind the outer thigh. The hands should not extend across the body. The elbows must be close to the body at all times.

In my time of coaching youth and amateur teams, I have rarely encountered teams doing exercises focusing on arm action. However, proper arm action is fundamental for optimum acceleration and maximum speed, and can easily be incorporated into footwork activities (see section on Speed Training Exercises).

SPEED TRAINING PROGRAM DESIGN

The age and experience of the athlete as well as the phase of the season will determine to a large extent, the type of speed drills performed. The exercises presented here are mainly for adolescent and senior youth athletes, as well as adult players. Speed training for players in the pre-puberty age group will be discussed at the end of this chapter.

The ***off-season*** should focus mainly on improving maximum speed through proper technique as well as building speed endurance capacity. The ***pre-season*** should focus almost entirely on starting speed and acceleration. During this phase, the volume (number of exercises and repetitions) should be lower, but the intensity must be high. Because the main conditioning goal during the ***in-season*** is maintenance, the type of speed training exercise you choose will vary from week to week or cycle to cycle. However, exercises for starting speed and acceleration should predominate, with less emphasis placed on speed endurance and maximum speed.

Due to the high neuromuscular and coordination demands, speed drills (especially for starting speed and acceleration) should be done early in the training session before fatigue sets in. For each session, doing 2 or 3 different exercises (1 to 2 sets each) with 6 to 8 repetitions per set should be adequate. Importantly, the recovery periods between repetitions should be approximately 45 seconds or assign a work-to-rest ratio of 1:5. Table 4.1 summarizes the general guidelines to be used when designing your speed training program and practice.

TABLE 4.1 Main Guidelines for Speed Training Program Design

CATEGORY	RECOMMENDATION
Segment of Practice Session	Early (after warm up but before fatiguing exercises)
Repetitions per Set	6 to 8 (1 to 2 sets total)
Work-to-Rest Ratio	1:5 (between repetitions) (2 to 3 minutes rest between sets)
Off-season Focus	Maximum Speed & Speed Endurance
Pre-Season Focus	Starting Speed & Acceleration
In-Season Focus	Varies (mostly starting speed and acceleration)

SPEED TRAINING EXERCISES

Dribble and Chase

Objective: Develop starting speed and acceleration, as well as speed dribbling technique

Set-up and Instructions: Place two cones three yards apart in a straight line. Set up a small goal (1 to 2 yards wide) with flags or cones, 12 yards away from the closer cone as shown (Figure 4.3a). Divide your players into pairs with one ball between the two. The player with the ball will start on the cone closer to the goal and the other player will start on the cone behind them. (Set up a station for each pair or you can have two pairs per station, with one pair recovering while the other one goes.)

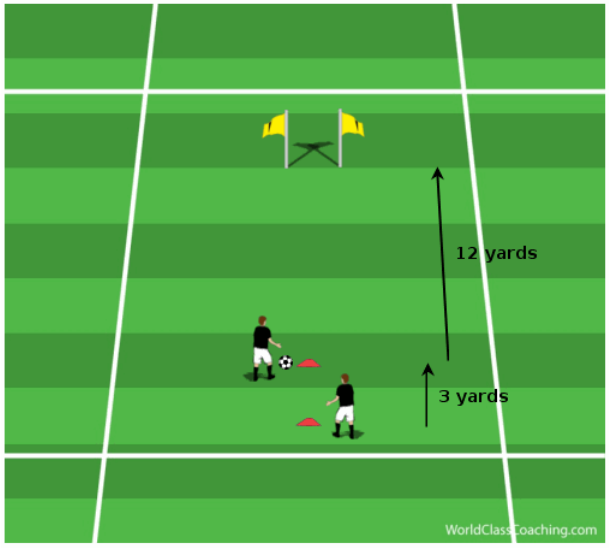


Figure 4.3a

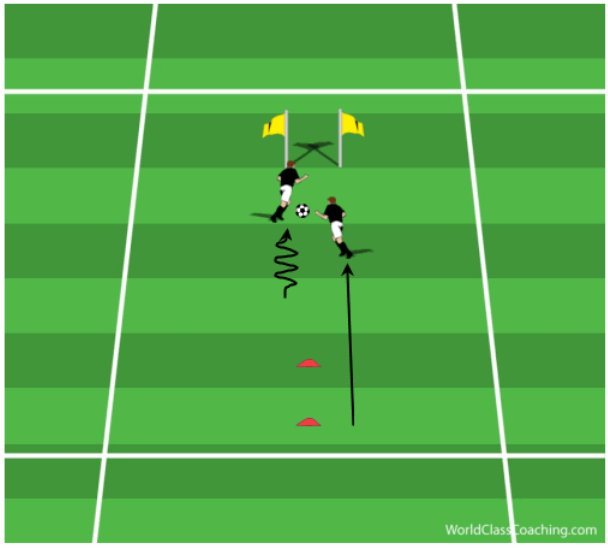


Figure 4.3b

On the coach's signal, both players start and accelerate towards the small goal. The front player must dribble the ball at speed, but under control, through the small goal while their partner attempts to catch them up and pass them (Figure 4.3b). Whoever crosses the goal line first is the winner. Switch roles after each attempt.

Coaching Points: The player without the ball must have a good ready position (low center of gravity, good posture). The first step must be in the intended direction and they must take short, powerful steps with appropriate posture (positive body angles) when accelerating. The player dribbling must use the instep (laces) and upon contact with the ball the toes must be pointing down. The first touch should be slightly bigger than the rest and in the intended direction.

Variation: Vary this exercise by using different starting positions (lying on stomach, lying on back, facing away from goal) for the player without the ball.

Progression: Allow the back player to tackle (NO slide tackles allowed)

Close Him Down!

Objective: To develop reactive starting speed using various stimuli

Set-up and Instructions: Divide your players into groups of three with one ball for the group. Have two players stand 5 to 7 yards apart facing each other, but with their sides to a third player standing 10 yards away. The two players will pass back and forth between each other, but they must take 2 touches (Figure 4.4a). After a few passes, one of these two players will take a touch in the direction of third player. As soon as this happens, the third player sprints towards the player who has turned towards them (Figure 4.4b). There is no tackling or dribbling. Switch the working player after each repetition.

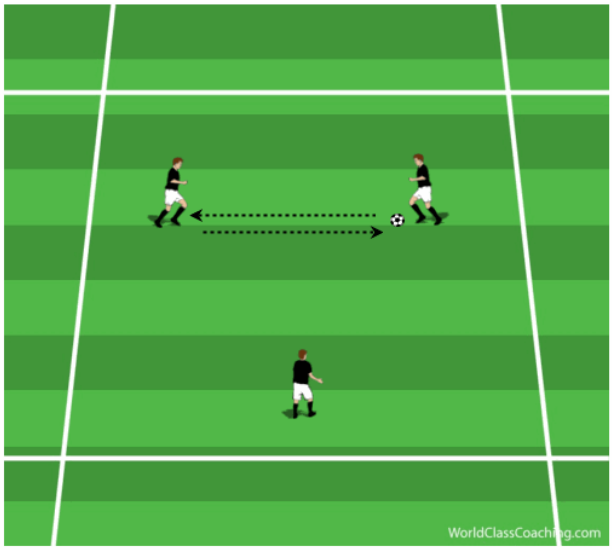


Figure 4.4a

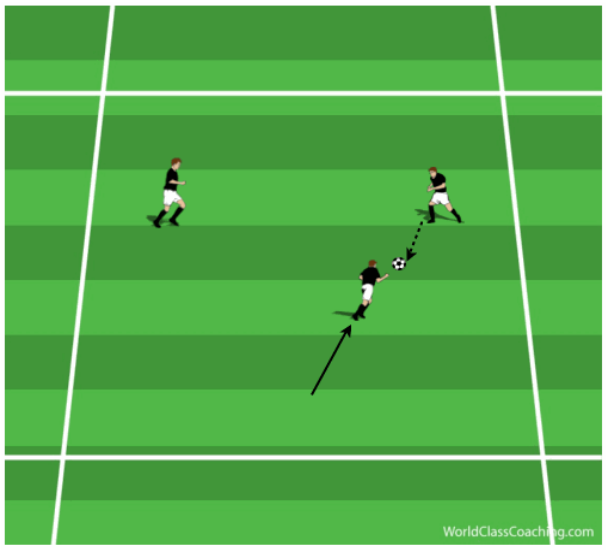


Figure 4.4b

Coaching Points: The player should maintain a good ready position (low center of gravity, good posture). Powerful first step in intended direction and short, powerful steps while accelerating. In addition, encourage quality passes between the other two players and fast turns.

Variation: You can vary this exercise by having the coach call out "Close him down!" as the signal for the sprinting player to start his run.

Progression: You can progress this exercise by having the player make a curved run showing the turning player outside or inside (Figure 4.4c)

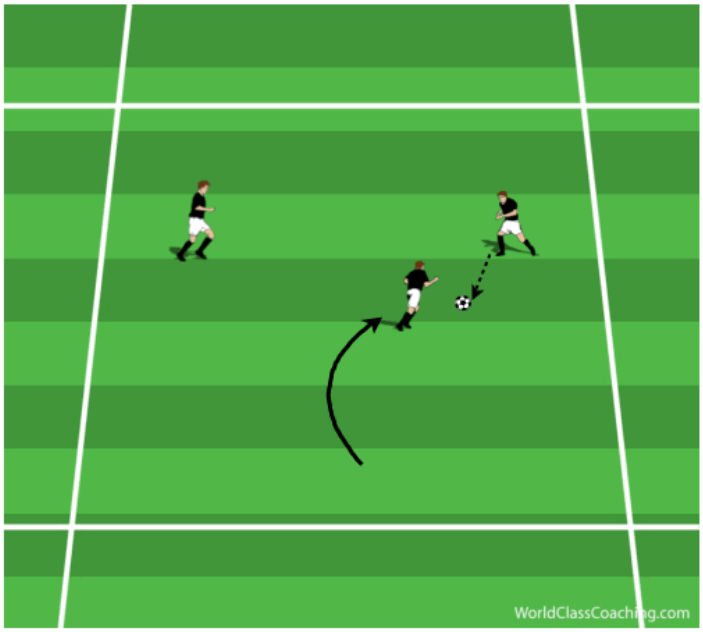


Figure 4.4c

Ball Drops with one-touch Finishing

Objective: Develop reactive starting speed, and finishing ability

Set-up and Instructions: Place a cone 25 yards in front of a regular-sized goal (or at the edge of the D on the 18-yard box) so that it is in line with the centre of the goal. Have a small group of players stand behind this cone facing the goal. Have the coach stand 15 yards away from goal holding a ball in front of them at waist height (Figure 4.5a).
(To avoid line ups, set up another station in front of a second goal)

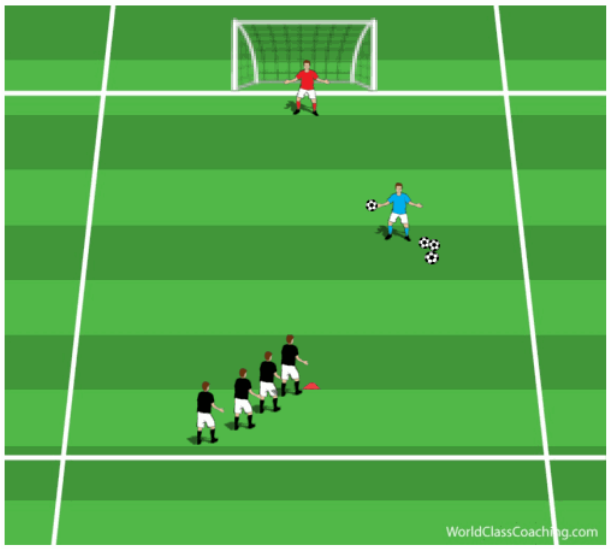


Figure 4.5a

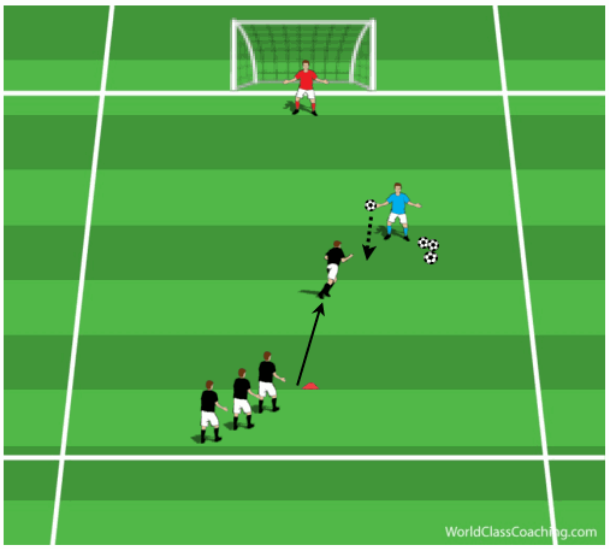


Figure 4.5b

When ready, the coach should let the ball fall from their hands. As soon this happens, the player at the front of the line must accelerate towards the ball and finish on goal with one touch (Figure 4.5b). Have the next person in line go as soon as the player in front of them finishes.

Coaching Points: The player should maintain a good ready position (low center of gravity, good posture) while waiting. They must take a powerful first step in intended direction and short, rapid steps while accelerating.

When finishing, players must attack the ball and adjust their body appropriately to finish with one touch. They should also be compact over the ball and the follow through of the finishing leg should be towards the target.

Variation: You can have both the goal keeper and player start in a lying position.

Progression: This exercise can be progressed by having the coach bounce the ball, or dropping it from a higher level so that the player must use different actions to achieve a first-time finish.

Give and Go with One-Touch passing

Objective: Develop proper technique for accelerating as well as one-touch passing ability

Set-up and Instructions: Place two small disks or cones approximately 30 yards apart. Place two larger cones in between this space so that the two large cones are 15 yards apart from each other but 7 yards away from the closer small cone (Figure 4.6a). Have your players form equal lines behind each small cone, with the player at the front of one line having a ball at their feet.

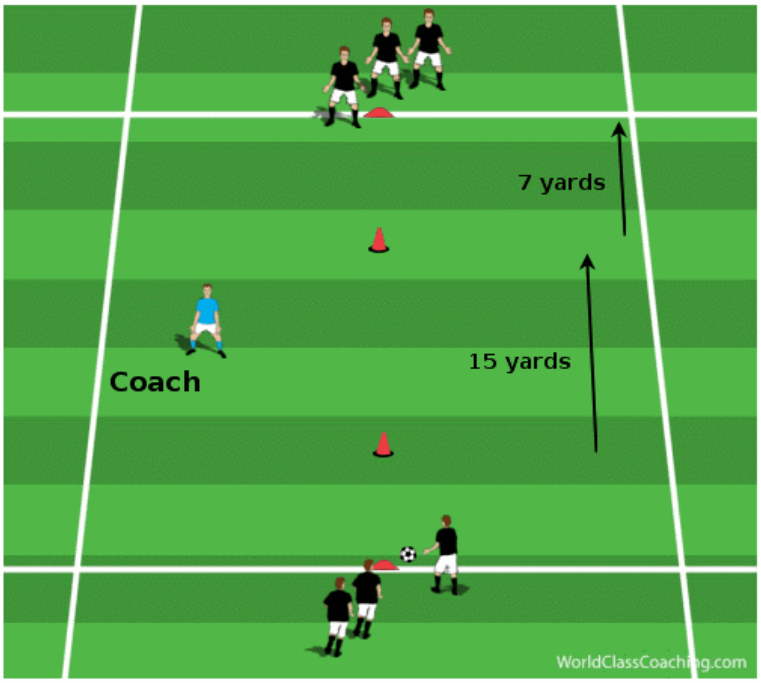


Figure 4.6a

Play is initiated by the player with the ball dribbling towards the large cone closest to him. Upon approaching the cone, they play a pass into the feet of the coach (Figure 4.6b) and immediately accelerate towards the space between the large and small cones at the other end. The coach will play a pass into this space for the accelerating player so that they can make a one touch pass into the feet of the player at the front of the other line (Figure 4.6c).

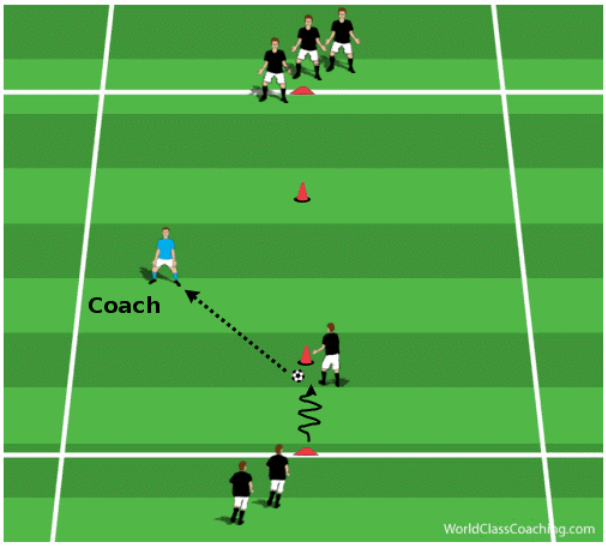


Figure 4.6b

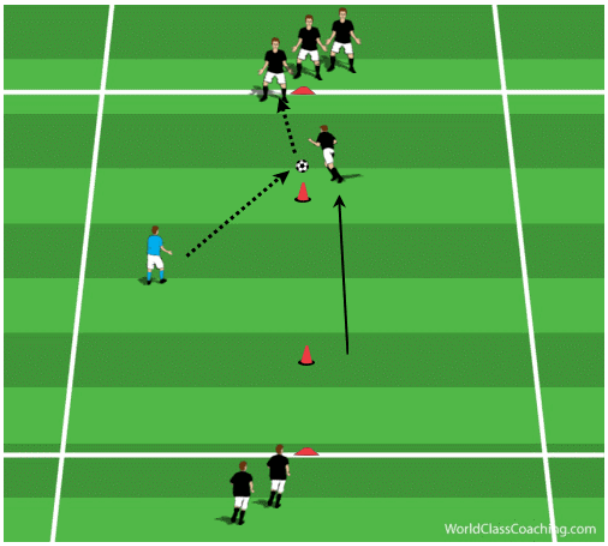


Figure 4.6c

The player who receives the pass must then repeat the process and the sequence continues.

Coaching Points: The player must accelerate immediately after making the pass to the coach and should use short, powerful steps while maintaining good posture.

Coach the weight and accuracy of both passes: For the one-touch pass, the player must adjust their body as they are about to make contact with the ball so that their hips are facing the target. In addition, follow through of the passing leg should be towards the target.

Variation: Have the players vary the way they make the initial pass. They can use the outside of the foot closest to the coach, or they can do a step-over before passing.

Progression: You can progress this activity by increasing the running distance between the two large cones (20 to 25 yards) so that it now incorporates maximum speed.

Long Range Passing With All-Out Sprints

Objective: Develop maximum speed and long range passing technique

Set-up and Instructions: This exercise requires half of a regular-sized playing field for the playing area. Place one cone on the penalty spot and a second cone at the center spot on the half way line. Have your players form equal lines behind each cone, with the player at the front of one line having a ball at their feet (Figure 4.7a). Start by having the player with the ball play a driven pass (with the laces) to the player at the front of the other line. As the pass is made, the player must sprint to the end of other line (Figure 4.7b). The player who receives the ball repeats the process.

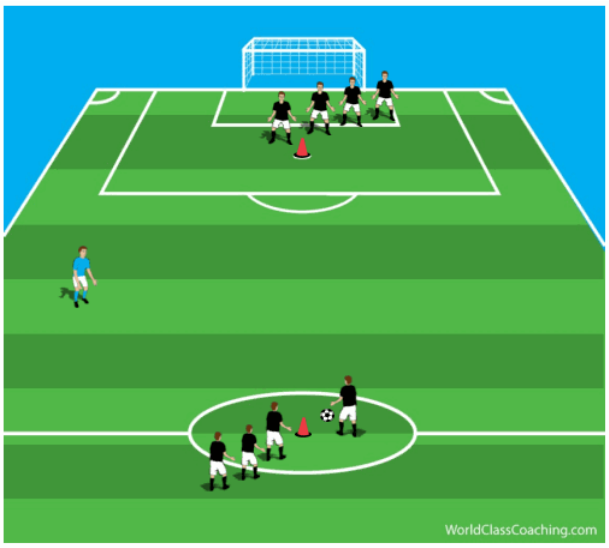


Figure 4.7a

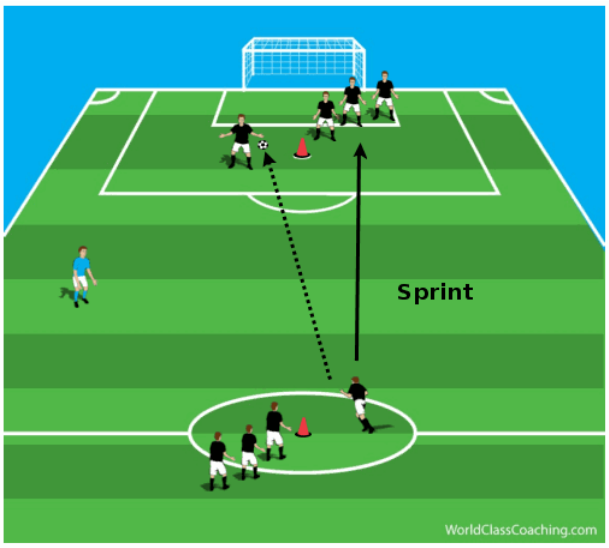


Figure 4.7b

Coaching Points: The athletes should attempt to sprint maximally with proper technique after passing. The coach should focus on arm action, knee drive, posture, and foot strike.

When passing, the player must take a touch out of their feet and approach the ball at a slight angle (not straight on). The player must then hop unto the supporting foot, which should be placed beside the ball and pointing in the direction of the intended pass. The toes of the foot striking the ball should be pointing down, and the leg should follow through towards the target.

Variation: You can vary the exercise by having the players make passes along the ground, or by having them play curved or bent passes.

Progression: The player who passes the ball now sprints towards the receiving player and plays a wall pass with them before the other player makes their driven pass (Figure 4.7c).

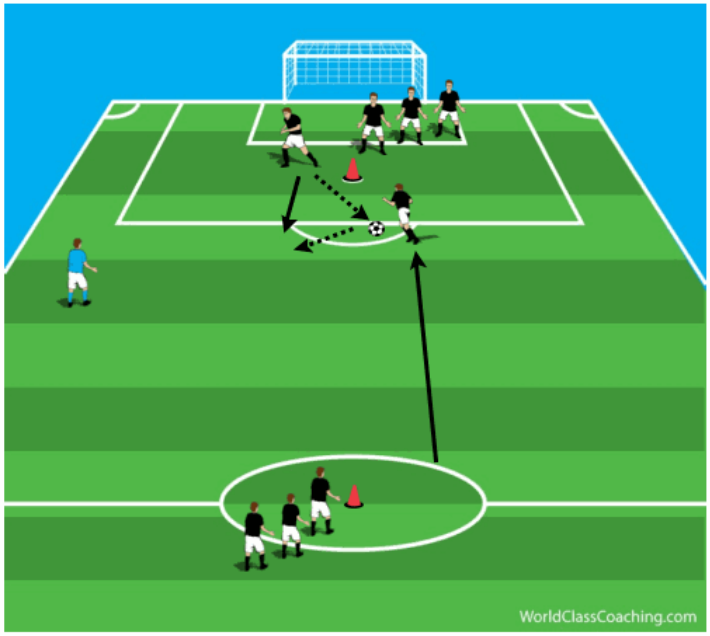


Figure 4.7c

One-Touch Cross and Finish

Objective: Develop speed endurance and finishing ability

Set-up and Instructions: This exercise requires half of a regular-sized playing field for the playing area. Place three cones on the half-way line- the first at the center spot, the second 5 yards in from the left sideline, and the third 5 yards in from the right sideline. Have your players form two equal lines behind the cone at the centre spot and the cone near the right touch line. There should be a surplus of balls at the centre spot. When ready the player at the front of the line at center plays a pass into the feet of the coach. As this pass is made, the players at the front of both lines takeoff and sprint forward (Figure 4.8a).

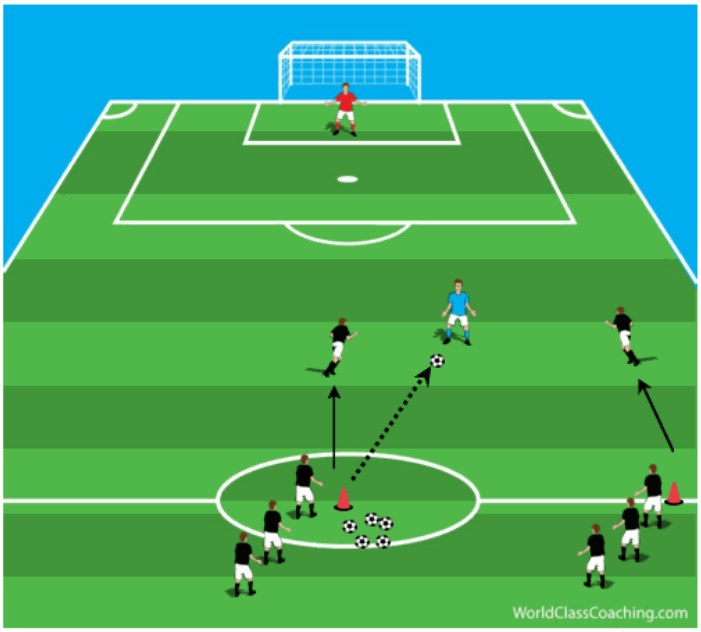


Figure 4.8a

The coach will then play a pass into the direction of the corner flag for the wide player to run unto and cross for the central player to finish with one touch (Figure 4.8b). As soon as the central player strikes the ball, both players must return to the back of their lines with an ***all-out sprint*** (Figure 4.8c).

Note: the winger is limited to a maximum of two touches, but preferably one.

Figure 4.8b

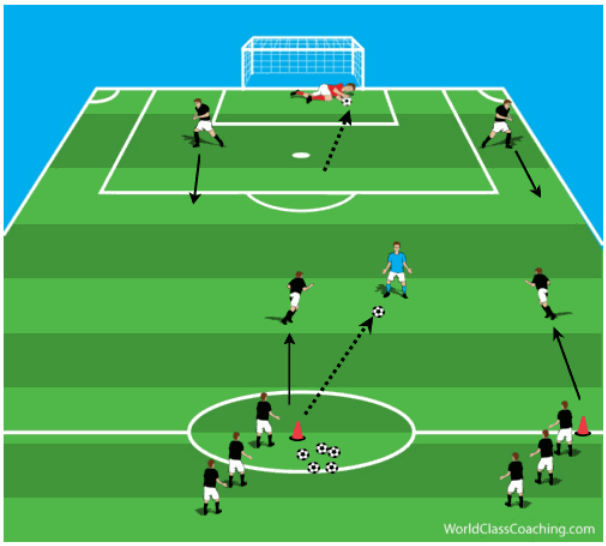


Figure 4.8c

Note: Players should change lines after each attempt and the coach should switch wings after each player has done a few repetitions.

Coaching Points: Coach the weight and accuracy of the cross, which should be played into the path of the oncoming striker. You should also coach the body positioning of the player before crossing.

When finishing, players should adjust their body so that they are leaning over the ball on contact. They must quickly select what surface of the foot they want to use, and follow through of both the leg and hips should be towards the intended direction (after contact with the ball).

Variation: You can vary this exercise by having the wide players shoot one touch and then having the central players follow up the rebound.

Progression: You can progress this exercise by having a defender start on the half way line in between the wide and central player. Their job is to try and cut out the cross into the striker. They must start with their backs facing away from the goal, however. The winger is still limited to a maximum of two touches.

Form Drills

Form dills are exercises that target a key sprinting action (knee drive, etc.) and help develop proper neuromuscular movement patterns. Each movement is performed slowly at first and then progressed to maximal or near-maximal speed. It can be difficult for many teams to dedicate valuable practice time to forms drills. However, by including them in the warm up along with technical work and dynamic stretches, you can essentially "kill two birds with one stone". That is, you have included sport specific movements as well as addressing sprinting technique.

Include the following form drills in place of the standard movements (side shuffles, back pedals) if you intend on addressing maximum speed in your training.

a) Knee Lifts (High Knees)

Objective: Establish proper knee drive during the drive phase

Set-up and Instructions: Cover a distance of 20 yards at a time by powerfully bringing the knees up and forward (one leg at a time) until the thigh is parallel to the ground (Figure 4.9).

Coaching Points: The knee should be lifted up **and** forward. The player should always land on the balls of their feet, and the foot contact should be fast and light. The ankle should be dorsiflexed (toes slightly upwards) until the foot makes contact. The torso must remain erect and proper arm action should be emphasized.

Figure 4.9 Knee Lifts (High Knees)

b) Butt Kicks

Objective: Establish an active recovery during the recovery phase

Set-up and Instructions: Cover a distance of 20 yards at a time by bringing the knee upwards and at the same time swinging the lower leg backwards until the heel of the foot touches the buttocks (Figure 4.10).

Coaching Points: The knee should be lifted powerfully in a forward and upward direction. The heel should be brought upwards at the same time of the knee lift. The angle between the lower leg and the thigh should be very small. Foot contact with the ground should be on the balls of the feet and under the hips. The torso should be kept erect throughout the motion.

Figure 4.10 Butt Kicks

c) Pull-Throughs

Objective: Establish an effective leg cycle and powerful foot striking action.

Set-up and Instructions: After bringing the knee upwards, extend the lower leg in front of you (as if hurdling) and then bring the leg down in a powerful motion (Figure 4.11). Cover a distance of 20 yards at a time using this motion.

Coaching Points: The motion starts with a knee lift and then a fast extension of the leg at the knee. Foot contact with the ground should be powerful and in a back and downwards direction. Contact should on the balls of the feet and under the hips. A pull-through motion occurs after ground contact. The torso should be kept erect throughout the motion.

Figure 4.11 Pull-Throughs

Arm Action Exercises

Toe Taps with an Emphasis on Arm Action

Toe taps is a great exercise for improving foot-speed and getting a general feel of the ball at your feet. It is especially good for young players. Importantly, it can also be used to develop proper arm action for sprinting.

Objective: Develop proper arm action for accelerating and maximum speed

Set-up and Instructions: Place the ball on the ground slightly in front of you. Place the toes of one foot on the ball (Figure 4.12a), and have your body weight on the other foot. Switch positions of the feet by jumping slightly and quickly placing the standing leg on the ball, while transferring the foot that was previously on the ball to the ground (Figures 4.12b and 4.12c). The ball should remain stationary. Repeat until both feet touch the ball at least 10 times. Start slowly and then once you are comfortable, try performing them as quickly as possible. The arms should move opposite to that of the legs.

a) **b)** **c)**

Figure 4.12 Toe Taps with an Emphasis on Arm Action

Coaching Points: Although fast footwork and light touches with the feet are important, the focus of this exercise is arm action. The swing should be created at the shoulders. The elbows should be close to the body. The range of the swing should be from the outer thigh to the head. The hands should not cross the midline of the chest.

Progression: To progress this exercise, you can have the player move the ball forwards or backwards while doing the arm and foot actions.

SPEEDTRAINING IN YOUTH ATHLETES

It is important that young soccer players incorporate speed exercises into their training; as, although development occurs mostly in the adolescent and post-puberty phases, improvements can be made as early as 5 years of age. Indeed, the pre-puberty stage is an important phase for ***neuromuscular adaptation***- the nervous system will become more efficient at controlling the muscles.

For the younger age groups, speed work can be incorporated into skill and technique training, but it should come mostly in the form of games. Relays involving sprinting then dribbling is a good example. The distance of each sprint should be less than 30 yards and should be done primarily in a straight line. The rest time between sprints should be at least 60 seconds. Performing one set of two different exercise (5 to 8 repetitions/set), after warm-up, should suffice. Coaches should also spend some time in the warm up doing form drills and teaching young players proper technique. Having a structured or periodization program is not recommended for these players, but speed exercises should be included in practice at least once a week.

An exercise that I frequently use to develop speed in the younger age groups is 1 v 1 to a big goal after a foot race (Figure 4.13). In this exercise, two players start at the right and left goal posts. The coach will then play a ball 15 to 20 yards in front of goal. As soon as the ball is played, the two players race to the ball (Figure 4.13a). Whoever gets to the ball first is the attacker, and attempts to take the other player on to try and score (Figure 4.13b).

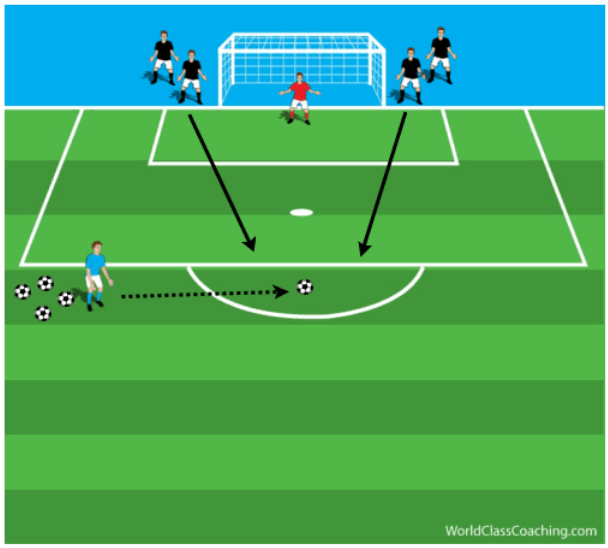


Figure 4.13a

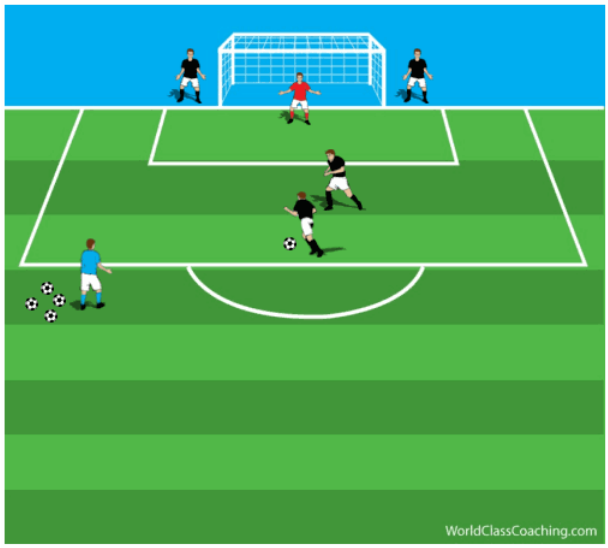


Figure 4.13b

This exercise emphasizes speed, 1 v 1 skills, and finishing ability. You can also vary the exercise by having the players start lying down or facing away from the field.

As players progress to the ***adolescent stage*** (12 to 14 year olds), exercises involving maximum speed can be increased to 40 or 50 yards. These players should have a year or season-long program set out for them, and should follow the basic guidelines described in the section on speed program design. Importantly,

most exercise should now be ***soccer-specific***. At this stage, it is also important to include more exercises aimed at increasing reaction time (*Dribble and chase, Ball-drop*). At the same time, greater emphasis should be placed on teaching proper posture and mechanics when starting and accelerating.

As children enter adolescence, there is a natural increase in body strength. This is important because the coach can start incorporating basic strength and plyometric exercises into the program. When players reach the latter stages of this age range, they can progress to more advanced plyometric exercises to optimize neuromuscular coordination.

CHAPTER 5: INCORPORATING SOCCER TECHNIQUE INTO AGILITY TRAINING

Quick turns with the ball. Being able to effectively track or evade tricky opponents. Faking left, and then explosively cutting to the right. These are some key actions that help describe ***agility***- the ability to quickly change direction or body orientation under control. Agility is one of the most complex conditioning elements in soccer. It is affected by both decision making (cognitive) and physical (motor) abilities. It can be ***planned***- when players know exactly what they want to do, or it can be ***reactive***- which is the case for most situations in soccer. Like speed, developing good agility is dependent upon having a sound base in other conditioning components; particularly core and lower-body strength, balance, flexibility, and power.

Agility development is essential for soccer players because this fitness component transcends to all aspects of the game: attacking, defending and equally as important, goalkeeping. In the modern-day game, teams are very adept at becoming compact when not in possession; so for ***attackers***, being able to maneuver with and without the ball in these tight spaces is a must. How agile a ***defender*** is will greatly determine how effective they are at tracking shifty opponents and closing down strikers in the penalty area. For ***goalkeepers***, having good posture, reaction skills and footwork represent a large percentage of their required skill set, and are especially important for stopping those close-ranged strikes on target.

Figure 5.1 Agility is necessary quality for centre midfielders trying to evade or stick with their opposite number

COMPONENTS OF AGILITY

Agility was earlier defined as the ability to change direction or body position quickly and in a controlled manner. This may be too simple a definition however. Agility is the combination of several qualities including stop-and-go ability, body orientation and posture, balance, coordination, quick reaction, and good foot work. A name that so often comes to mind when referring to agility is Barcelona's and Argentina's Lionel Messi. His ability to stop and go on a dime, change direction explosively, and evade numerous challenges when dribbling, all while under control, is impeccable and exemplifies nearly all aspects of agility.

Acceleration and Deceleration

Improving the ability to attain high speeds rapidly in multiple directions (***acceleration***) and to reduce speed quickly, yet under control (***deceleration***) should be a key focus of agility training. Good posture (positive shin and body angles); small, explosive steps; and fast arm action are essential to accelerating quickly, whereas good balance and high levels of lower body strength, particularly eccentric strength (discussed in Chapter 6), are required for stopping efficiently. Incorporating agility exercises that emphasize deceleration or stopping is also very important for soccer players as so many injuries occur during the deceleration phase of a movement.

Balance

Good ***balance***, especially the dynamic component, is essential for agility development. This is because quick acceleration or deceleration followed by a change of direction involves a rapid shift of the body's centre of gravity. Without good balance capabilities, either the speed or quality of execution of a movement will be compromised. As discussed in Chapter 3, balance exercises should be incorporated into training at least once per week.

Reaction

How quickly a player responds to certain cues or stimuli within the game will play a significant impact on their performance. When defenders are marking in the box, they must respond and close down attackers quickly as soon as they receive the ball. Holding midfielders continuously have to respond to commands like "left shoulder!" from their center backs when they are trying to screen passes into strikers behind them. Reaction time can be improved by doing exercises in which players have to respond to various sensory stimuli (auditory, visual, etc.) as this leads to a well-trained neuromuscular system. It is important that these stimuli (and the resulting reactions) are soccer-specific and are likely to occur multiple times throughout a game.

Coordination

Controlling the ball while running at full speed and then immediately sidestepping a tackle to play a pass, shows the importance of ***coordination***- the ability to do several complex movements in an organized manner. Improved coordination can be achieved by progressively having the player complete more complex activities such as patterns on the agility ladder, or by completing a specific pattern in less time.

Body Orientation and Posture

How quickly a player reacts to a given situation depends on how they orient themselves. Having a low center of gravity and a stance with positive angles will allow players to have a quick first step, which can make a world of difference. Body orientation is largely determined by posture and developing a strong core should therefore be a priority when training agility.

Foot Work

When an outside back is jockeying a winger dribbling towards them at full speed, or when a goalie covers the face of the goal, they must have good foot work. Not only must they move their feet quickly, but they also have to move them correctly; that is, small steps without the feet crossing over. Good foot work (fast and coordinated) is necessary not only for wing backs and goalies, but for all positions.

To train and develop agility effectively, it is essential to factor in all the underlying physical and cognitive skills or qualities that it is composed of (Figure 5.2).

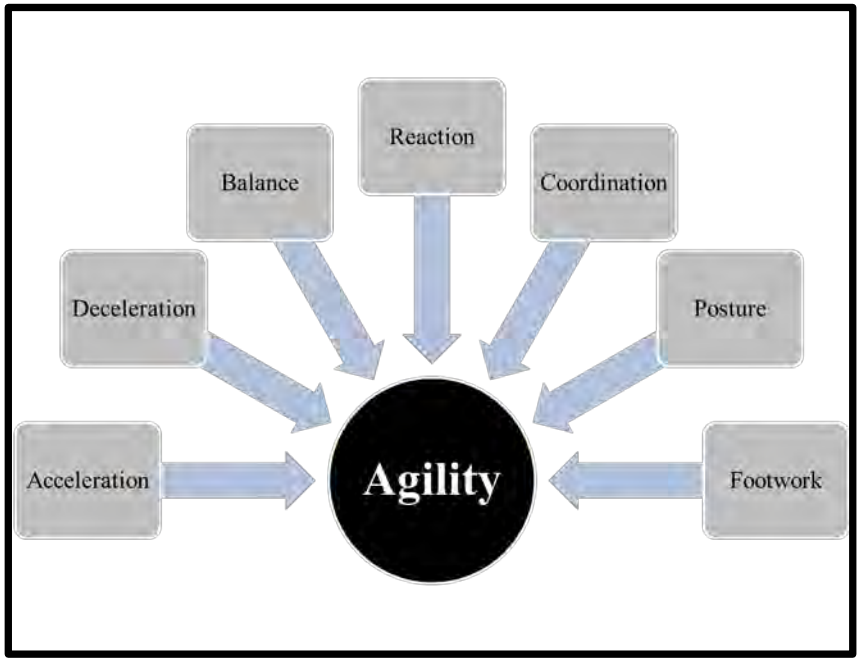


Figure 5.2 Components of Agility

STRENGTH AND POWER REQUIREMENTS FOR AGILITY

As was the case with speed, developing certain aspects of strength and power are crucial for establishing a sound agility base. A high level of ***eccentric strength*** is particularly important for deceleration. To slow the body down, the muscles of the legs must contract eccentrically; that is, the muscles lengthen rather than shorten as would be the case with a concentric muscle contraction. You can build eccentric leg strength by focusing on slowly moving through the lowering phase of the squat or lunge, or slowing the rate of decent as you land from a jump.

Eccentric strength is not the only strength requirement for developing a sound base in agility. Indeed, a high level of ***core strength*** is a necessary prerequisite for good balance and posture. An important note for the coach is: because agility is multi-directional, it is important to choose strength exercises that emphasize all planes of motion.

As will be mentioned in chapter 7, plyometric exercises like the squat jump help develop explosive ***lower body power***, which is crucial for acceleration. Short response (the time the foot is in contact with the ground is very short) plyometric jumps also help to improve foot speed and coordination.

It is clear that the coach must factor in specific strength and power exercises into the overall conditioning program for optimal agility development. When and what exercises should be included will be discussed in more detail in Chapters 6 and 7.

FUNDAMENTAL AGILITY MOVEMENTS AND ACTIONS IN SOCCER

Over the course of a game, a multitude of movement patterns and actions involving stopping and going or change of direction occur. However, there are some basic ***agility-associated movements*** (side-to-side shuffling, jockeying and rapid backpedaling) and ***actions*** (cuts, drop steps and turns) that are fundamental to soccer and occur more frequently than others. As with so many other aspects of the sport, the frequency and type of action or movement performed will vary depending on position.

Backpedaling

Backpedaling is most frequently used when defending or when attackers are trying to create space while staying open to the field. Central defenders in particular need to be very proficient at this movement. They are required to drop back when possession is lost, but at the same time, they must be able to see the entire field so that they can give instructions to the players in front of them.

When backpedaling, the player must take small, quick steps. In addition, the center of gravity must be kept low and the bodyweight must be kept forward at all times (Figure 5.3). With this movement, players normally travel no more than 10 to 15 yards at a time.

a) b)

FIGURE 5.3 Backpedaling Technique

Side Shuffling

This movement is frequently observed as the ball is switched from side to side over a short distance. The athlete should take small, lateral steps without the feet crossing; and they must avoid bobbing (greater vertical than horizontal motion) while moving. Importantly, their center of gravity must be kept low (Figure 5.4).

a) b)

Figure 5.4 Side-to-side Shuffling Technique

Jockeying

Jockeying is a movement observed when wing backs and other defenders are trying to delay an opponent as they attempt to penetrate space by dribbling. Essentially, it is moving backwards while taking a side-on or 45-degree angle stance (Figure 5.5).

Good posture and footwork are crucial for jockeying, as the player must take short, quick steps without the feet crossing over. They should also lean forward slightly, so that the bodyweight is over the balls of the feet. Jockeying frequently requires the player to pivot or switch the lead leg while rapidly retreating, further highlighting the importance of excellent footwork.

Figure 5.5 Jockeying Technique

Cutting

Cutting, especially at high speeds, is a must for attackers trying to evade their mark, or when trying to beat a defender on the dribble. This action involves rapid deceleration, shifting the body's centre of gravity, and then explosively accelerating into a different direction.

If a player is cutting to the left for example; they should use the left leg to help slow themselves and then plant the right foot (opposite from the intended direction) wide and parallel to the body so that it lands outside of the knee (Figure 5.6). This foot (right) then forcefully drives the body in the intended direction. Note: the foot should not be planted too wide!

Figure 5.6 Cutting Technique

Drop Step

This step allows you to transition from backpedaling to running or sprinting linearly. This move is frequently performed by defenders as a ball is played into space deep behind them.

A drop step is initiated by opening the hips and taking a step diagonally backwards with the leg on the side that opens up. The player then explosively pushes off with the other leg, while rotating the hips, propelling the body in the intended direction.

Turning

Soccer players perform a range of turns of varying degrees, both with and without the ball. Central midfielders in particular, frequently perform 180-degree (half) turns to face forward after receiving a pass from their defenders. As another example, you may often hear coaches say to a striker: “try to turn your man”. This is a skill that needs to be performed at speed and requires good body awareness, positioning, footwork, and balance.

DESIGNING BALL-ORIENTED AGILITY DRILLS

Training for agility must target the neuromuscular system (brain/CNS and muscles). That is, you need to train the nervous system and muscles to process and react quickly. This is done by continuously performing specific movement patterns, eventually at high speed. Agility training should also include coordination drills, drills that emphasize change of direction, and exercises to improve foot speed. It is clear that designing an agility training program can be quite difficult.

One of the major roles of the conditioning coach is to design exercises that are specific to the demands of the sport. In terms of agility, the coach needs to consider the various movement patterns (shuffling, backpedals, etc.) that precede a change of direction as well as the different actions used to initiate a change direction (cut, drop step). It is also necessary to consider the relative distance and speed at which these movements occur. For example, a midfielder might side shuffle quickly for 5 to 10 yards, but almost never would he do this for the entire width of the field.

Another aspect to consider, especially for the time-constrained coach, is the various technical actions that precede or follow agility-associated movements. Cutting quickly is usually followed by receiving the ball to feet or finishing first time, as would be the case for a playmaker losing his mark in midfield or a striker losing his mark in the penalty box. As another example, a defender is usually forced to tackle or jockey after rapidly accelerating to close down his mark.

It therefore seems reasonable that technical actions (passing, receiving, etc.) and decision making be incorporated into agility drills. However, it may not always be practical or appropriate to perform exercises incorporating all these factors, especially with young players who are learning the proper

mechanics for the first time. Similarly, you do not want to include a technical action so complex that it takes away from the agility component of the drill.

Overall, when training for agility, the exercises you choose should range from a ***basic*** level that emphasizes elementary agility technique (ready position, footwork and cutting mechanics), to an ***advanced c***ategory, which involves responding quickly to different stimuli while performing more complex technical and tactical tasks. Table 5.1 summarizes the different variables that can be used to progress agility exercises.

TABLE 5.1 Variables for Progressing Agility Exercises

Category	Basic Level	Advanced Level
Speed of Execution	Speed that players are comfortable with and which allows them to perform the pattern with proper technique	As quickly as possible under control, but with proper technique
Level of Complexity	Simple (For example, running forwards through the agility ladder using a one foot in per square pattern)	Complex (For example, running through the agility ladder backwards using a one in, one out diagonal step)
Planned or Reactive	Planned (Players know exactly what movement patterns to perform)	Reactive (Players have to respond to movement of an opponent or different sensory stimuli)

AGILITY TRAINING PROGRAM DESIGN

When it is time to do agility exercises in training, the drills you choose will depend on the ***age*** and experience of players, as well as the ***phase of the season***.

Younger and less experienced players, who may have a low level of agility development, should focus on establishing sound mechanics and technique. The majority of the drills done by these players should be of the basic level (see above), in which the player knows exactly what movement patterns they need to perform. The players should start the exercise at a speed that allows them to do the patterns properly. Once they have mastered the movement, they should then attempt to do it as quickly as possible. The ball-work component of these drills should be relatively simple (receive and pass for example) as the main focus of the exercise is agility.

For more experienced players, the drill you choose will depend largely on the phase of the season you are in. As you progress from the ***off-season*** to the ***pre-competition*** phase, you want to progress from drills with simple to complex patterns, as well as exercises that emphasize reaction. Remember, most game situations involving agility are reactive in nature. During the ***competitive*** phase, you can alternate among drills of various levels of difficulty, but the majority should fall in the advanced category.

Regardless of the session, 2 to 3 exercises, with 8 to 10 repetitions per exercise, should be sufficient. Because agility exercises place a high demand on the neuromuscular system and require coordinated efforts, they should be placed early in the training session. However, as your players master the various agility skills, you may start performing exercises when players are more tired, as they are likely to perform these same movements in the game under a fatigued state. Agility exercises also need shorter work, but longer rest periods. As such, assign a work-to-rest ratio of about 1:5 or 1:6.

Table 5.2 summarizes the general guidelines to be used when designing your agility training program and practice.

Table 5.2 General Guidelines for Agility Exercise Program Design

CATEGORY	RECOMMENDATION
Segment of Practice Session	Early (during off and pre-season)
Repetitions per Exercise	8 to 10
Work-to-Rest Ratio	1:5 or 1:6 (between repetitions) 2 to 3 (minutes between exercises)
Off-season Focus	Basic exercises (see Table 5.1)
Pre-Season Focus	Advanced Exercises (see Table 5.1)
In-Season Focus	Varies (mostly advanced exercises)

AGILITY TRAINING EXERICES

The following is a set of ball-oriented agility exercises that range from a basic to an advanced level.

In the exercises marked with an *, have the player join the end of the line as soon as they are finished, and have the player next in line go as soon as the first player reaches half-way in the sequence. This will allow the activity to flow and prevents players from standing around. You may also need to set-up a second station depending on the amount of players.

When dealing with large numbers, you may also choose to set up two different exercises side by side and have the two groups switch after each player has completed the prescribed number of repetitions.

If there is a situation where there is only one coach (and therefore one server), have each player act as a server once they finish their repetition, and then quickly get back to join the group as soon as the next player replaces them.

Zigzag Shuffle with Receiving*

Objective: Develop basic footwork and coordination, as well as introduce cutting technique

Set-up and Directions: Set up a row of seven small cones 1.5 yards apart and offset by 1.5 yards. Place a larger cone 5 to 7 yards before the first small cone and have a small group of players stand behind this cone. The coach should stand approximately 10 yards from the last cone in the row (Figure 5.7a).

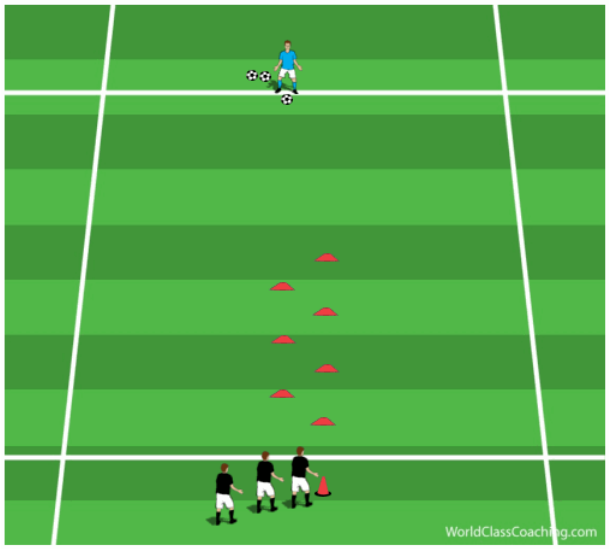


Figure 5.7b

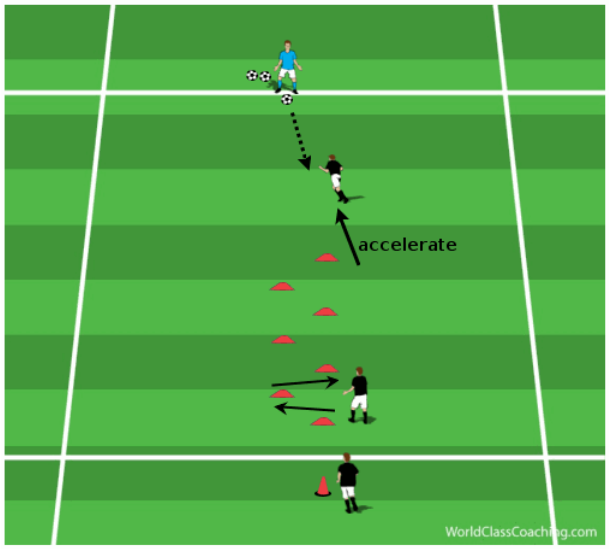


Figure 5.7c

When ready, the player at the front of the line will jog to the right of the first small cone, perform a cut, and then side shuffle (diagonally to the left) to the second cone. At this cone they will perform another cut, and then side shuttle (diagonally to the right) until they have reached the third cone. Have them continue this pattern until they reach the last small cone. At this point, they will accelerate towards the coach where they will receive a pass to feet and return with one or two touches (Figure 5.7b).

Coaching Points: Ensure the player maintains good posture and a relatively low centre of gravity. The feet should not cross in front of each other. Emphasize good cutting technique (see earlier section), and see that the player uses their arms to help balance.

Make certain the player accelerates towards, and gets their body behind the pass. Coach the weight and accuracy of the pass and if passing with one touch, ensure the player leans over the ball on contact.

Variation: You can vary the type of pass (bounce, lobbed) to the player in order to develop receiving with various body parts.

Progression: Have the player start the exercise slowly, and once they have mastered the footwork, have them perform it as quickly as possible.

Backpedal and Sprint with Dribbling

Objective: Develop the ability to transition from a backpedal to a sprint using a drop step

Set-up and Directions: Set up a grid 20 yards by 20 yards. Place two small goals (1.5 yards wide) at the base of the grid, 1 yard in from each side line. Mark out a half-way line by placing four small cones 4 to 5 yards a part. Have a player with a ball start on the center of the half-way line facing a second player who is standing at the top of the grid (Figure 5.8a). (Set up one grid for each pair, or have two pairs per grid, with one pair recovering while the other pair goes)

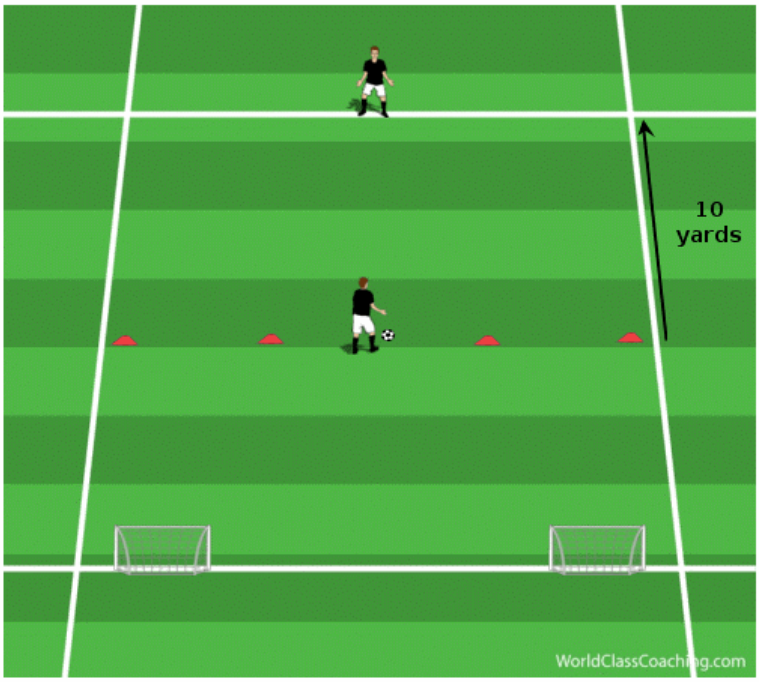


Figure 5.8a

Play is initiated by having the player with the ball play, and follow, a pass into the feet of their partner. As soon as the player receives and controls the ball, they must dribble straight at the other player who must then start backpedaling (Figure 5.8b). Note: The passing player is not allowed to win the ball.

This continues until the backpedaling partner crosses the half-way line at which point the dribbling player will cut and speed dribble diagonally towards one of the two goals. The player backpedaling must transition from backpedaling to a sprint in order to chase their dribbling partner (Figure 5.8c).

Note: once the dribbling player chooses a goal, they must stick with that goal

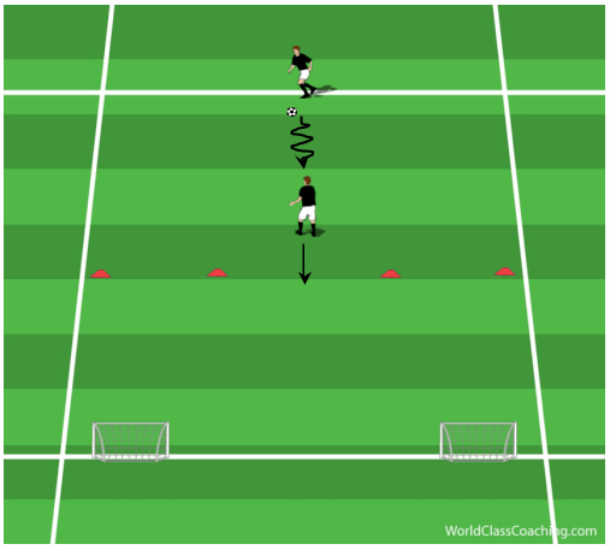


Figure 5.8b

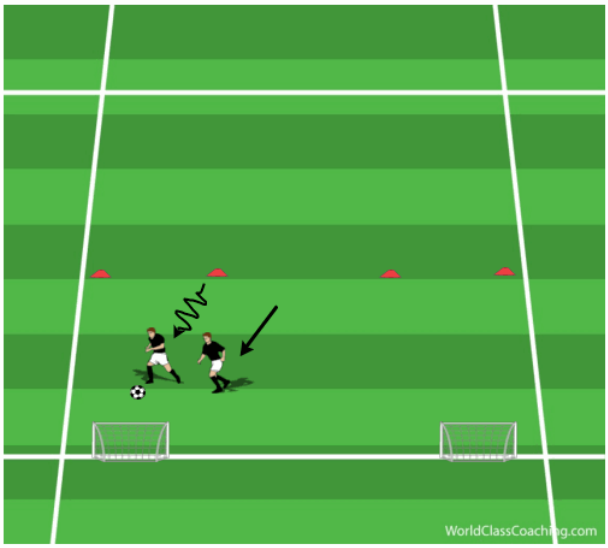


Figure 5.8c

Coaching Points: When backpedaling, the player must use small, quick steps while maintaining a low centre of gravity. The bodyweight should also be kept forward. When transitioning from backpedaling to sprinting, the player must use a drop step (see earlier section).

When dribbling towards their partner, the player should have their head up and must keep the ball close to their feet. When dribbling at speed, the player must use the instep (laces) and upon contact with the ball the toes should be pointing down.

Progression: Have the players perform the exercise slowly at first and once they have mastered the drop step, have them perform it as quickly as possible. The exercise can be further progressed by allowing the player with the ball to fake while dribbling and score in any of the goals while attacking. This allows the activity to be more ***reactive*** in nature.

Forwards-backwards Footwork Exercise with Third-man Pass*

Objective: Develop basic footwork, coordination and stop-and-go ability

Set-up and Directions: Set up a horizontal row of seven small cones 1 yard apart, but offset by 1 yard. Place a larger cone 5 to 7 yards from the first small cone, perpendicular to the direction of the smaller cones. Have a ***small*** group of players line up behind this cone. Have two coaches stand at the opposite end as shown (Figure 5.9 a).

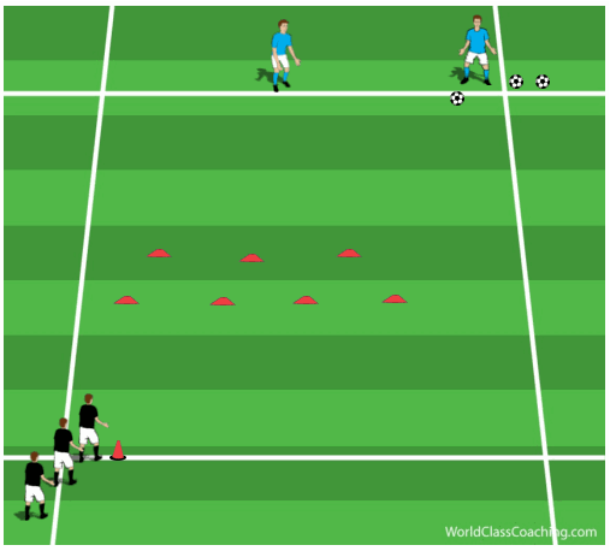


Figure 5.9a

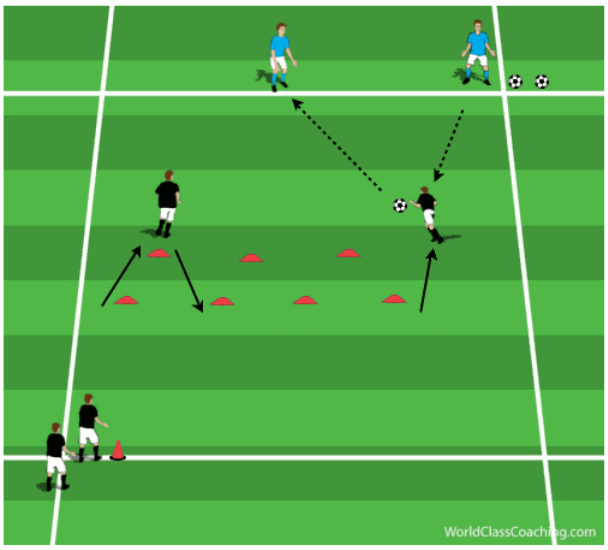


Figure 5.9b

When ready, have the player at the front of the line sprint towards the cone in front of them and complete the pattern as shown (Figure 5.9b). They continue this backwards-forwards pattern and when they round the final cone, they must sprint towards the coach who will play a pass to them that they must play 1-time into the feet of the second coach (third-man) (Figure 5.9b).

Coaching Points: The player must maintain good posture (slight forward lean at the hips) and a low centre of gravity. Ensure they transition between movements quickly, but under control. The steps should be short, but rapid.
As soon as they round the final cone, the player must accelerate towards the coach. As they receive the pass, the player must adjust their body and open their hips in the direction of where they intend to play the ball. They should be compact over the ball and the foot should follow through towards the target.

Variation: Vary the position of the second coach (either to the left or right of the coach passing the ball) as well as how the ball is played into the player (bounced, lobbed, etc.).

Progression: Have the players start the exercise slowly, and once they have mastered the footwork, have them perform it as quickly as possible.

4-Cone Hop Drill with Heading

Objective: Develop foot speed, coordination and dynamic balance; as well as heading technique

Set-up and Directions: Divide your players into groups of two. Set up four cones to make a diamond shape. The length of each side must be 1.5 yards. Have a player stand in the centre of the diamond facing a second player with a ball standing 2 yards away from the top cone (Figure 5.10a).

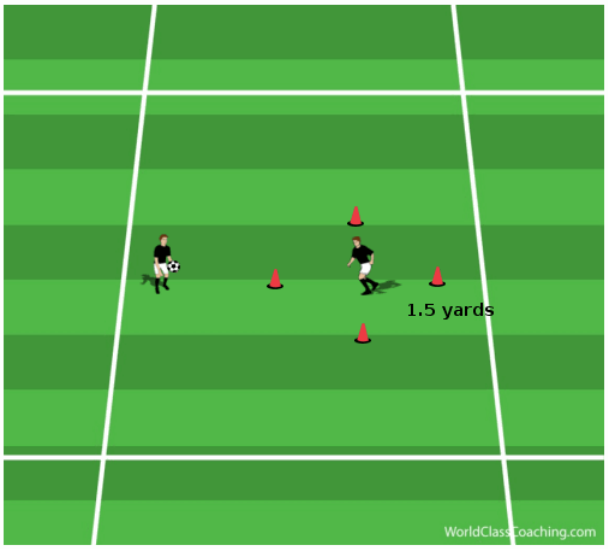


Figure 5.10a

When ready, the player in the diamond must hop to the cone at the top and then back to the centre, hop to the cone on the right and then back to the centre, and should continue this pattern until they have hopped to all four cones and back. As soon as they have completed the final hop, they must immediately return a ball tossed to them from their partner using a jumping header (Figure 5.10b).

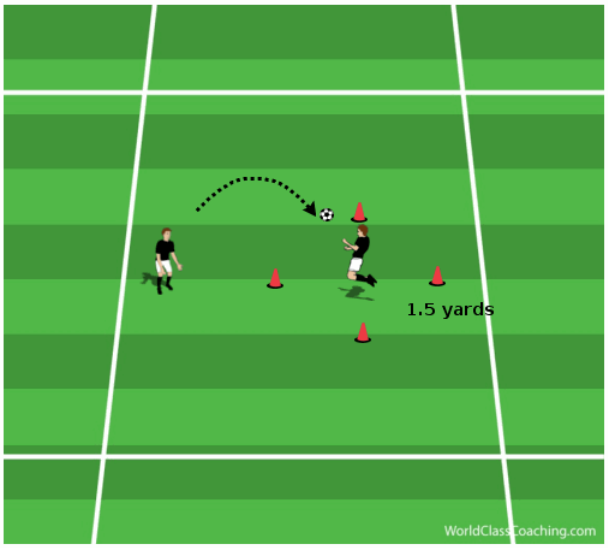


Figure 5.10b

Have your players switch roles after each cycle.

Coaching Points: Instruct the player to perform the sequence as quickly as possible by emphasizing short contacts with the ground. They should maintain good posture while jumping and use the arms for balance.

When heading, they should keep the eyes open and mouth closed, the neck muscles firm, and make contact with the forehead. Instruct them to arch the back and then drive the upper body forward to generate power.

Variation: You can vary this exercise by having the player head to a third person standing to the left or right of the person tossing the ball (Figure 5.10c).

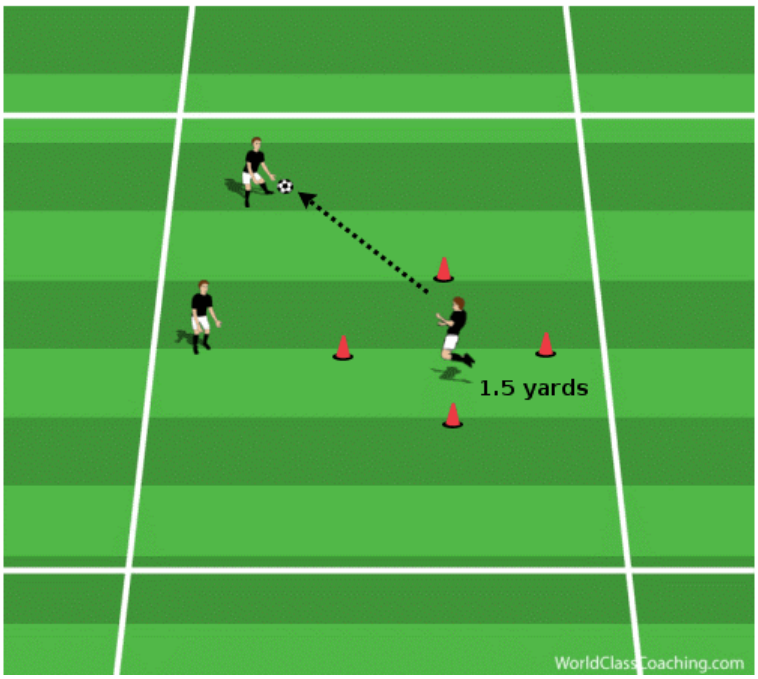


Figure 5.10c

Progression: You may progress this exercise by having the player complete the cycle twice before heading, or by switching to one-legged hops.

Agility Ladder with Turns and Dribbling*

Objective: Develop footwork, coordination and turning ability

Set-up and Directions: Set up an agility ladder in between two small cones so that the start and end of the ladder are each 7 yards away from a cone. The two cones must be in line with each other. Place a third cone 10 yards to the left of the cone that is near the end of the ladder. Instruct a small group of players to stand behind the cone nearest to the start of the ladder. Have the coach stand approximately 5 yards away from the cone near to the end of the ladder as shown (Figure 5.11a).

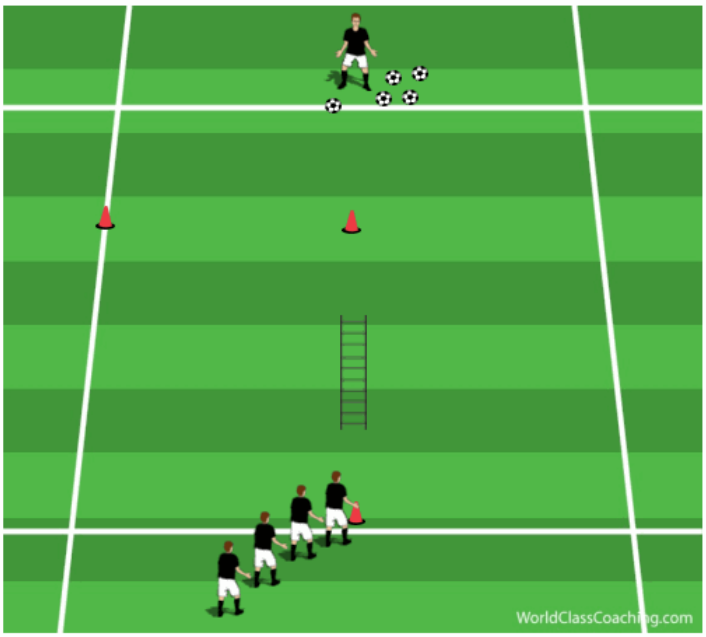


Figure 5.11a

When ready, have each player sprint towards and complete the ladder using a 1 foot per square pattern. As soon as they complete the ladder, they must accelerate towards the coach who will play a pass into their feet. With their first touch, the players must turn (90 degrees) towards the cone to their left (Figure 5.11b).

After taking their first touch, they must dribble as quickly as possible to the cone (a few touches) and then return the ball to the coach (Figure 5.11c).

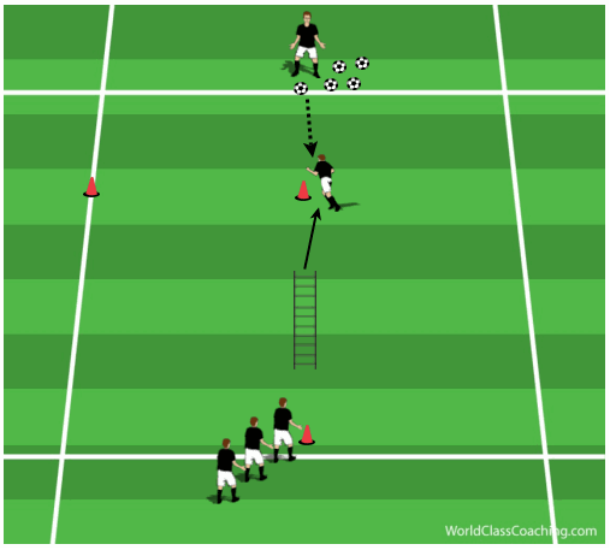


Figure 5.11b

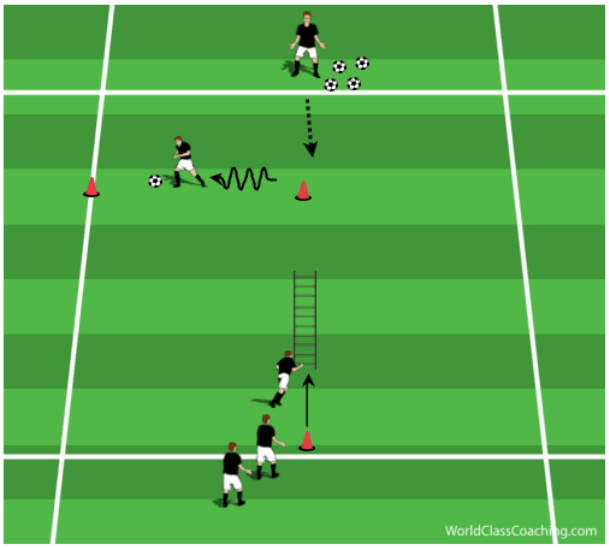


Figure 5.11c

Coaching Points: Instruct the players to complete the pattern as quickly as possible while maintaining good running form (arm and leg action). Foot contact with the ground should be very short and light.

The player must accelerate towards the pass. They should get behind the line of the ball, and as they take their first touch, they should open their hips in the direction of the cone to their left. You should also coach the ***weight*** of the first touch. That is, the player must cushion the ball upon contact so as not to take too big of a touch.

Variation: Start by having the players use the inside of their right foot to take their first touch. After a few repetitions, have them use the outside of their left foot. After several repetitions, switch positions of the third cone so that it is now 10 yards to the ***right*** of the cone near the end of the ladder. The players will now have to take their first touch and dribble towards the ***right***.

Progression: To progress this exercise, you can choose to do more complex patterns on the ladder. Some examples include: i) run through placing two feet per square, ii) move through laterally (one or two feet per square), iii) using a two-legged hop with a pattern of forward two squares, back one square, iv) using a one-legged hop with a pattern of forward two squares, back one square, and v) diagonally shuffling through with a two feet in-one foot out, pattern.

Zigzag Sprint and Cut with Finishing*

Objective: Develop cutting ability at high speeds as well as shooting technique

Set-up and Directions: Set up four cones outside the 18-yard box so that they are 5 yards apart and offset by 5 yards. The cone closest to the box should be on the edge and centre of the D. Instruct a small group of players to line up behind the cone furthest away from the goal. Have the coach stand with a supply of balls on the top corner of the 6-yard box as shown (Figure 5.12a).

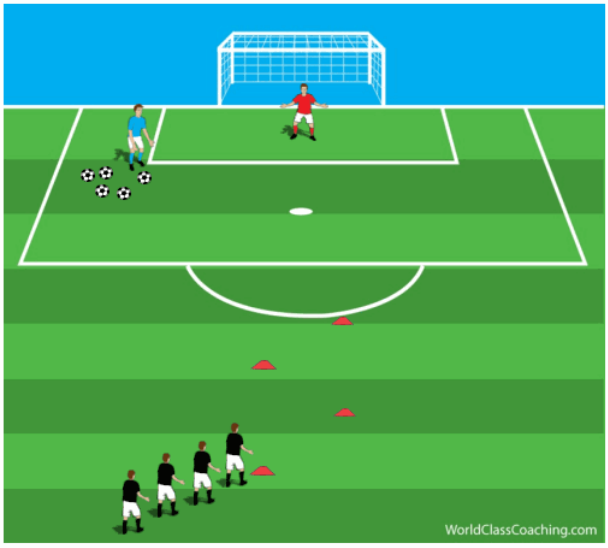


Figure 5.12a

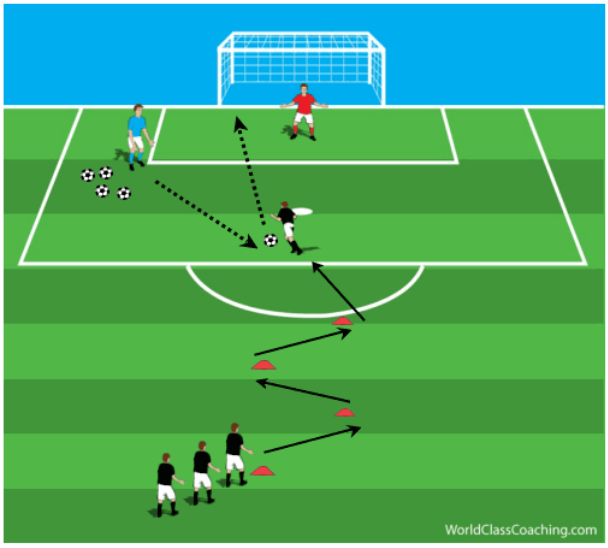


Figure 5.12b

When ready, have the player at the front of the line sprint towards the cone closest to them, cut, and then sprint towards the next cone. They should continue this pattern until they have performed a cut at every cone. After making the cut at the final cone, they must sprint in the direction of the coach who will play a ball for them to finish on goal (Figure 5.12b). Players are only allowed one touch before shooting.

Coaching Points: Emphasize good cutting technique (previously mentioned) and encourage the players to cover the distance between each cone as quickly as possible, but under control.

The first touch of the player must be in front of them. When shooting, the player must approach the ball at slight angle. The foot of the supporting leg should be placed bedside the ball and pointing in the direction of the target. If using the laces, the player must strike through the centre of the ball with the toes pointing down. The striking leg should follow through towards the target.

Variation: You can vary this exercise by changing the type of pass (along the ground, bounced, lobbed, etc.) to the player. Ensure that you also vary the layout of the cones and the position of the coach so that the final cut has been made to both the left and right sides.

Progression: Progress this exercise by restricting the players to one touch or by adding a defender who is allowed to close down the working player as soon as the coach plays the pass.

Close Him Down with Side-to-Side Shuffles

Objective: Develop ability to transition from a lateral shuffle to a forward motion as well as reactive agility

Set-up and Directions: Divide your players into groups of three with one ball per group. Have two players stand 5 to 7 yards apart facing each other, but with their sides to a third player standing 10 yards away. Direct the two players facing each other to pass back and forth. They must take 2 touches. The third player must move laterally using a side-to-side shuffle in the direction the ball is played (Figure 5.13a).

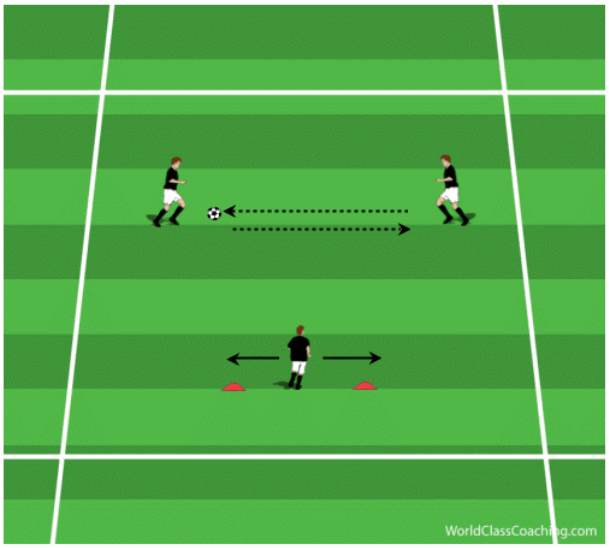


Figure 5.13a

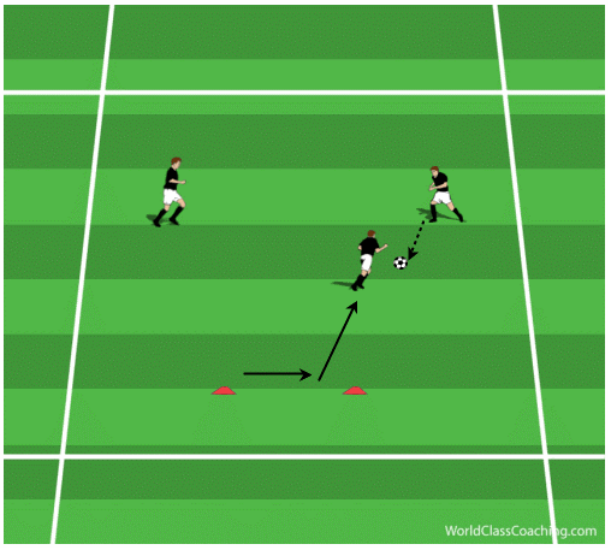


Figure 5.13b

After a few passes, one of these two players will take a touch in the direction of third player. As soon as this happens, the third player sprints towards the player who has turned towards them (Figure 5.13b). There is no tackling or dribbling. Switch the working player after each repetition.

Coaching Points: The player should maintain a low center of gravity and take small quick steps when shuffling. The legs should not cross. They must take a powerful first step in intended direction and short, powerful steps while accelerating. Encourage quality passes between the other two players and fast turns with the ball.

Variation: You can vary this exercise by having the coach call out "Close him down!" as the signal for the shuffling player to accelerate forwards**.**

Progression: You can progress this exercise by having the player make a curved run showing the turning player to the outside or inside.

Short Sprint and Cut, with Half-Turns and Finishing*

Objective: Develop the ability to perform 180-degree turns at high speed as well cutting technique

Set-up and Directions: Set up a 30 by 20 yard playing area. Place a regulation-sized goal (with a goalkeeper) in the middle of the end-line at the bottom of the area. The coach will stand in the middle of the end-line marking the top of the playing area. Place a large cone on one side-line so that it is 10 yards from the top of the playing area. Have your players stand behind this line facing the goal. Place a second large cone 5 yards in field and 5 yards down from the first cone (Figure 5.14a).

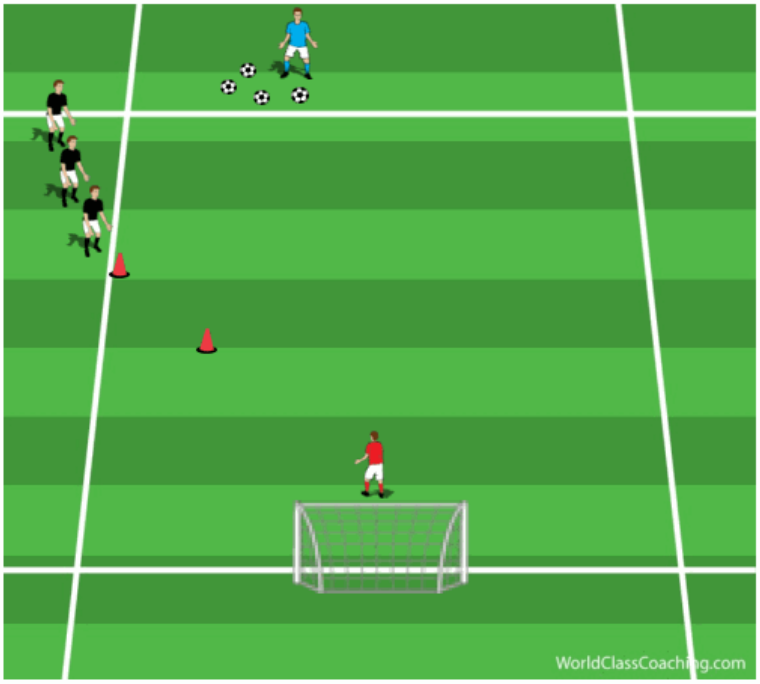


Figure 5.14a

When ready, have the player at the front of the line sprint towards the second cone, cut, and then sprint towards the coach who will then play a pass into their feet. Instruct the player to perform a 180-degree as they receive the ball so that they are facing the goal with their first touch (Figure 5.15c). After making their turn, direct them to then shoot on net with their second on third touches.

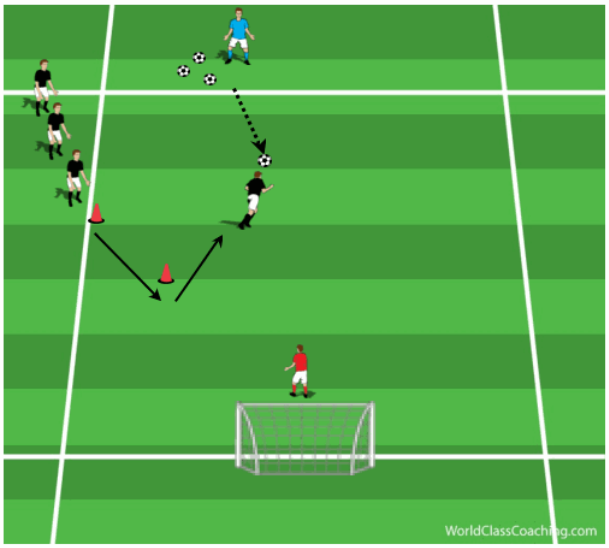


Figure 5.14b

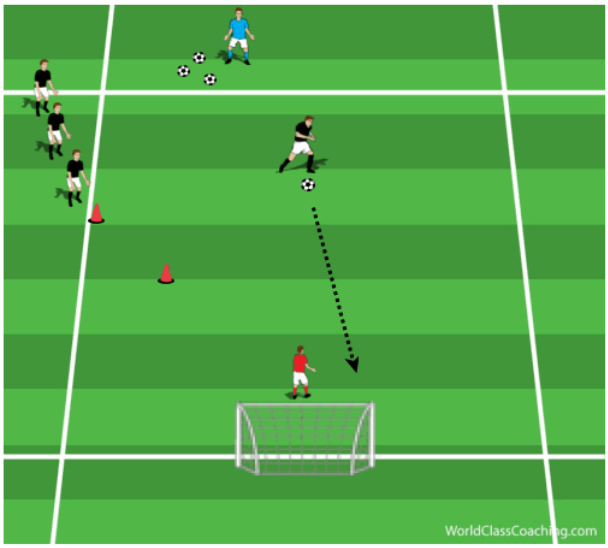


Figure 5.14c

Coaching Points: Emphasize good cutting technique (previously mentioned) and instruct the players to accelerate towards the coach after cutting. As the player is about to receive the ball, they should pivot on the front foot and turn by opening the hips on the other side. This will allow them to receive the ball on the back foot and face forward. Coach proper shooting technique (previously mentioned) as well.

Progression/Variation: You can progress or vary this exercise by adding a defender who has to perform a similar movement pattern. Place a large cone on the other side-line 10 yards from the top of the playing area. Have your defenders stand behind this line facing the goal. Place a second large cone 5 yards in field ***but 7 yards*** down from the first cone. Players at the front of both lines go on the coach's call. The procedure is the same for the attacker except now they attempt to beat a defender before shooting on goal (Figure 5.14d).

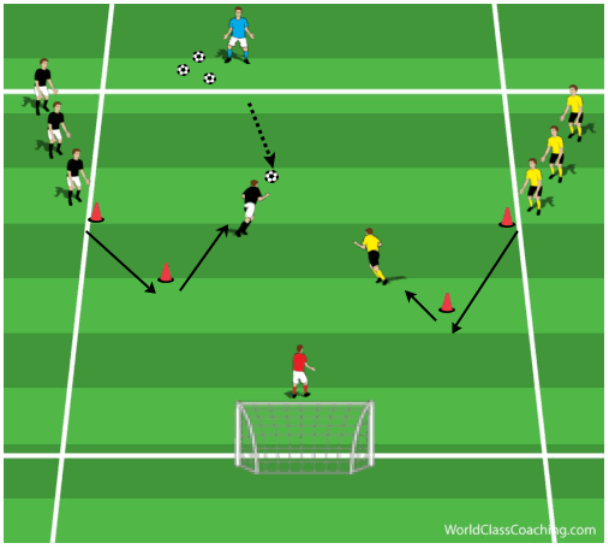


Figure 5.14d

4-Cone Shadow Exercise

Objective: Develop multi-directional stop-and-go ability, speed of reaction and dribbling technique

Set-up and Directions: Set up four cones to make a diamond (cross) shape. The length of each side of the diamond should be four yards. Set up a second diamond approximately 5 yards from the top of the first so that both are directly in line with each other (Figure 5.15a). Have two players stand in the centre of each diamond facing each other. Designate one player as the leader and the other as the follower. Whatever movement the leader does, the follower has to mirror.

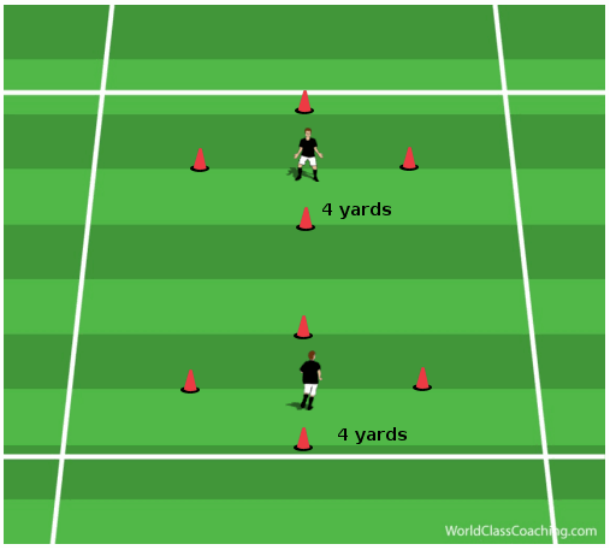


Figure 5.15a

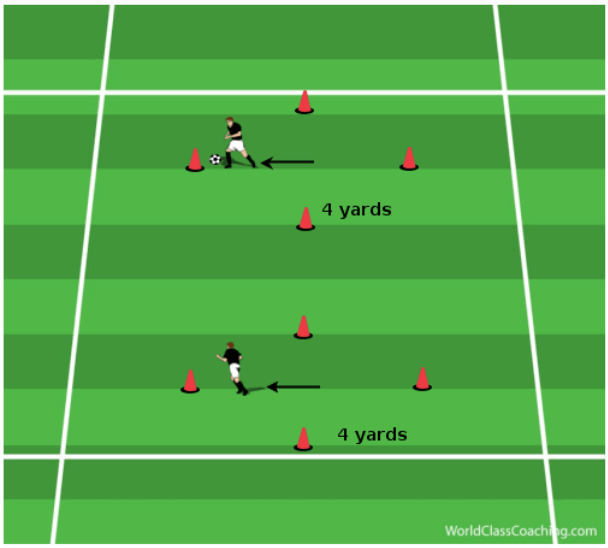


Figure 5.15b

The goal of the exercise is for the leader to reach and touch a cone well in advance of the follower. Players are only allowed to move forwards, backwards or laterally (side-to-side shuffle) to and from the center of the diamond, and must always be facing each other.

Coaching Points: Good posture and a low centre of gravity should be maintained at all times. Ensure players use proper technique when cutting, side-to-side shuffling, backpedaling and accelerating. Emphasize speed and encourage the leader to use fakes and cuts to lose the follower.

Variation: You can vary the exercise by directing the player following to go in the opposite direction to that of the leader.

Progression: Progress this exercise by having the leader dribble a ball (Figure 5.15b). Instead of touching the cone, they must stop the ball beside the cone with their feet.

AGILITY TRAINING FOR YOUNG ATHLETES

Developing ***coordination*** should be a major priority for coaches of players in the ***pre-puberty*** age group, as this age range represents the time where the greatest improvements and learning of motor skills will occur. In addition, coordination underlies all other qualities necessary for establishing a solid agility base. The coach should use a combination of fun activities and basic agility exercises that emphasize coordination and footwork. For players in the pre-puberty age group, when doing these basic agility exercises, it is recommended that the first few times be done without the ball. This will allow them to concentrate fully on the movements and get comfortable with the mechanics and technique.

Structured agility exercises involving rapid deceleration or changing direction after intense actions should be avoided. Young children should develop the ability to change direction and slow down at their own pace and by playing games such as tag or stuck in the mud. Participating in these games will teach the nervous system to coordinate the muscles of the body more effectively; that is, neuromuscular adaptation.

For the pre-puberty age group, the coach should use no more than 2 or 3 agility exercise per practice session. As was the case with older players, these activities should be placed early in the session after a proper warm-up .Each exercise should have about 6 to 8 repetitions and the players should be allowed plenty of rest between repetitions as well as between exercises. Having a structured or periodization program is not recommended for these players. However, agility exercises should be placed in practice at least once a week. As the young players master the simple patterns, more complex patterns can be introduced.

As players progress to the ***adolescent*** age group, they naturally become stronger. As such, the coach can place a greater emphasis on soccer-specific agility drills involving change of direction, decelerating and reactivity. The gains in strength should also prompt the coach to introduce basic strength and power training exercises into the overall conditioning program. These players should have a year or season-long program set out for them and should follow the basic guidelines described in the section on agility program design.

CHAPTER 6: DEVELOPING WHOLE-BODY STRENGTH

As a young player growing up, strength training at practice consisted of a set of push-ups and sit ups at the end of the session. However, most coaches today realize that developing whole-body strength is crucial for optimum performance on the soccer field. Your ability to effectively shield the ball from one or even two defenders; tussle with opponents in 50-50 challenges; and constantly withstand physical contact throughout the game, will all be greatly influenced by your upper-body, lower-body and core strength.

Whole-body strength is also necessary for developing so many of the other components of soccer fitness. Indeed, developing a good strength platform is a prerequisite to training for explosive power, as without it, your body will not make the same gains and is more likely to get injured. As was discussed in Chapters 4 and 5, developing core and lower body strength is a must for establishing a sound foundation in speed and agility, especially for movements that require rapid acceleration and deceleration, or change of direction. A stronger body will also allow players to cope better with the strenuous and physical demands of a 90-minute match or training, and lessens the chances of injury.

Unfortunately, developing strength can sometimes pose a challenge to coaches, as many teams do not have access to weight training facilities or qualified strength and conditioning coaches to supervise a training program. However, integrating an effective strength training program into your overall coaching plan is easier than it seems and does not require intricate gym equipment. Importantly, many strength training exercises can be tailored to include a ball component and can be carried out on the training pitch.

Figure 6.1 Strength is a necessary quality when tussling with opponents and shielding the ball

STRENGTH TRAINING TERMINOLOGY

Before progressing into the strength training goals for soccer, and designing a resistance training plan specific for the sport, there are some fundamental terms and concepts that must be understood.

Muscular strength: Refers to the capacity of the muscles to exert force against a resistance.

Repetitions: In strength training, a repetition refers to moving a weight (or doing an action) from the starting point, through a full range of motion and back to the initial starting point.

Set: A collection of repetitions performed in sequence until the player stops to rest.

Load: The amount of weight assigned for a particular exercise. For example, if a player squats 100kg, then the load is 100kg.

Rest period: Is the recovery time taken between sets of a specific exercise

One repetition maximum (1RM): This is the highest load a person can lift for one repetition only (in a particular exercise)

Volume: Refers to the total amount of weigh lifted in a training session and is dependent on the total amount of sets and repetitions performed as well as the load.

Hypertrophy: Increase in muscle mass. This would be a goal of smaller strikers who tend to get 'out-muscled' by their defensive counterparts.

Concentric, Eccentric and Isometric Muscle actions: The muscles in our body are capable of performing three types of actions (sometimes referred to as contractions): concentric muscle actions, eccentric muscle actions and isometric muscle actions.

Concentric muscle actions refer to when a muscle shortens in length whereas ***eccentric*** muscle actions refer to when a muscle increases in length. For example, when kicking a soccer ball, the quadriceps muscles contract concentrically to extend the knee, whereas the hamstring muscles act in an eccentric manner to slow the lower leg. As a another example, during the push-up, as you lower yourself to the floor, the muscles in the chest lengthen or act eccentrically; whereas when you push yourself back up to the starting position these same chest muscles contract concentrically or shorten in length.

Isometric muscle actions occur when the muscles are working but there is no change in length. For example, when you squat down until your thighs are parallel to the floor, and you hold that position for 5 or 10 seconds without moving; your core and leg muscles are contracting isometrically to keep you in that stable position.

STRENGTH TRAINING PRINCIPLES

To design an effective strength training program, you must first understand the principles of strength training. There are three basic principles: overload, specificity and progression.

In order to develop and improve whole-body strength you must ***overload*** the body. That is, you must subject the body to a stress that it is not accustomed to.

As will be mentioned, it is also important that any gains in strength translate to an increased performance on the field. The exercises you choose must therefore be ***specific*** and must mimic the movement patterns of the sport.

The muscles and body adapts to strenuous exercise by getting stronger. So, to continuously make gains, it is important that you ***progress*** the training program. For example, when developing basic strength, if a player can perform more than 12 repetitions then you must progress that exercise. Progressing an exercise can be done in many ways: i) increasing the load; ii) doing a more difficult variation of the same exercise; iii) incorporating it into a compound or superset; or iv) decreasing the rest periods between sets.

STRENGTH TRAINING GOALS FOR SOCCER PLAYERS

Strength training is a very wide-spread discipline that encompasses a variety of training methods that can be used, depending on your objective. For example, body-builders use strength training with the ultimate goal of muscle hypertrophy (increasing muscle mass). Participating in a strength training program will undoubtedly produce a stronger athlete, but it is important that the exercises we choose translate into an increased performance on the soccer field. That is, we must determine how strength training can affect the development of speed, agility, power and other conditioning components, and implement strength training exercises that will enhance these components.

Developing Basic Strength

Basic strength simply refers to how strong you are. It is a relative concept and it usually expressed in terms of body weight. The first goal in soccer is to develop ***basic strength***, as this will provide a strength foundation to do more complex training methods, as well as increase the body's overall work capacity. Without a solid foundation, the body will not gain the benefits from more demanding training methods such as plyometric exercises, and is more likely to sustain injuries as a result of the high physical demands from games and weekly practice sessions.

A major priority when establishing basic strength is to develop ***core strength.*** The core is involved in almost every movement on the soccer field, and poor core strength will lead to inefficient movement. A strong core is essential for stability as well as developing good posture and balance, which are essential in soccer, especially for speed and agility-related movements.

After core strength has been developed, the focus should then shift to developing ***lower*** and ultimately ***upper-body strength***. It is imperative that the exercises you choose are ***functional*** or ***sport-specific*** exercises that reflect the movement patterns of soccer (lunge or squat for example).

Developing Eccentric Strength

After developing a base level of core and whole body strength, the next major goal for soccer players should be to develop ***eccentric strength***. This component of strength is frequently overlooked, but is crucial for overall strength development. A high level of eccentric strength is especially important for good decelerating and stopping ability, a major component of agility.

Developing eccentric strength is done by using slow and controlled movements during the eccentric phase of an exercise. When an athlete lowers themselves during the squat, lunge or the push up, this is the eccentric phase. Have your athletes perform the eccentric phase of appropriate exercises (squat, one-legged squat, lunge, lateral lunge, push-up) for 5 seconds before forcefully returning to the start position. You can also do jumps in which the players try to slow the lowering phase after landing.

Developing Maximum Strength

Maximum Strength refers to the greatest amount of force a muscle or muscle group can produce during a single muscle contraction. Training for maximum strength requires lifting very heavy loads (close to 1 repetition maximum) and should only be done by well-trained and experienced players. Although maximum strength is beneficial for improving power-associated soccer movements (jumping, accelerating, et.) it is not necessary for all levels of play.

Developing Strength Endurance

The final strength goal for soccer players should be developing ***strength endurance***. ***Strength Endurance*** refers to your muscles' ability to produce force over an extended period of time. Strength endurance is the only strength component that has an element of fatigue. Great strength endurance is essential in a sport like soccer that requires players to perform repeated high intensity actions throughout the game, and thus a ***high work capacity*** is required. Many coaches try to develop strength endurance as the first phase of strength development. However, without a base level of strength you cannot fully develop strength endurance.

STRENGTH TRAINING EXERCISES

The exercises provided are either i) functional exercises that reflect the movement patterns of soccer and therefore target and strengthen the muscles used in the sport, or ii) exercises aimed specifically at improving core strength and balance.

Lunges

Objective: Develop lower body (gluteus maximus, quadriceps, hamstrings, hip flexors) strength

Level: Beginner

Directions and Coaching Points: Have the player stand erect with feet shoulder width apart and parallel to each other. Direct them to take a step forward (about 2 to 3 feet) with the right leg, gradually flexing the right knee and hip, until the left knee just about touches the floor (Figure 6. 2).

Figure 6.2

The right foot should land flat on the ground with the toes pointing forward and the right thigh should be parallel to the ground. Have them return to the starting position by pushing off with the right foot, extending the knee and hip. The torso should be kept erect through the entire motion. Repeat the process with the left leg and continue for the desired number of repetitions.

Lateral Lunges

Objective: Develop lower body (gluteus maximus, quadriceps, hamstrings, hip flexors, hip abductors and adductors) strength

Level: Beginner

Directions and Coaching Points: The starting position is the same as lunge, but this time the player takes a step laterally with the right leg until the right thigh is just about parallel to the ground. The player's body weight should be kept over the heel of the right leg. The left leg should remain straight and the left foot should remain flat on the floor (Figure 6.3). Return to starting position by pushing off with the right foot and then repeat the process for the left leg. Repeat for the desired amount of repetitions.

Figure 6.3

Multi-Directional Lunges

Objective: Develop lower body strength in different planes of motion

Level: Intermediate

Directions and Coaching Points: The multi-directional lunge uses the same technique as the standard and lateral lunge with a few additions. Starting with the right leg, the athlete i) lunges forward then back to the starting position; ii) lunges laterally and then back to the starting position; and iii) lunges diagonally backwards (Figure 6.4) and then back to the starting position. The players should perform one lunge in each direction with the right leg and then switch to the left. Repeat for the desired amount of repetitions.

Figure 6.4

Squats*

Objective: Develop lower body (gluteus maximus, quadriceps, hamstrings) and basic core strength

Level: Beginner

Directions and Coaching Points: Have the athlete stand on a flat surface with the feet parallel to each other and shoulder width apart. The arms should be folded across the chest as shown (Figure 6.5). Have the athlete squat down until the thighs are parallel to the floor, pause for one second and then return to the starting position by extending the ankles, knees and hips. Repeat for the desired amount of repetitions.

Figure 6.5

Single-Leg Squats*

Objective: Develop lower body and core strength as well as static balance

Level: Advanced

Directions and Coaching Points: Begin by having the athlete stand with feet shoulder width apart and placing both hands on their hip. Next, have them stand and balance on one leg without the planted foot shifting or without the opposite foot touching the ground (Figure 6.6a). Instruct the athlete to squat down to the lowest possible position without raising the heel of the planted foot and without the outstretched leg touching the floor (Figure 6.6b). Have them hold this position for one second and then return to the starting position. Repeat for the desired amount of repetitions.

a)

b)

Figure 6.6

**** For players with limited flexibility, you may consider placing a board or firm object that is approximately 1 inch (2.5cm) thick under the heels so that they can maintain proper form.***

Single-Leg Deadlifts

Objective: Develop lower body (hamstrings) and core strength as well as static balance

Level: Intermediate

Directions and Coaching Points: Have the player stand erect with feet shoulder width apart and parallel to each other. Direct them to simultaneously push the left leg backwards and touch the ground with both hands just in front of the right foot by bending at the waist. The left leg should remain straight and the right leg should be bent very slightly at the right knee (Figure 6.7). Gradually return to the starting position. Repeat for the desired amount of repetitions before switching legs.

Figure 6.7

Standing Leg Extension

Objective: Develop lower body (quadriceps, hip flexors) and core strength as well as static balance

Level: Intermediate

Directions and Coaching Points: Begin by having the player stand and balance on the left leg (slightly bent at the knee). Next, instruct them to lift the right knee up and forwards until the right thigh is parallel to the ground, keeping the lower right leg perpendicular to the ground (Figure 6.8a). Direct them to extend the lower leg (at knee) until the entire leg is just about parallel to the ground (Figure 6.8b). Hold the position for one second and then return to the starting position (Figure 6.8a). Repeat for the desired number of repetitions (while remaining balanced one leg) and then switch legs.

a)

b)

Figure 6.8

Eccentric Hamstring Exercise

Objective: Develop eccentric strength in the hamstrings as well as core strength

Level: Advanced

Directions and Coaching Points: Divide your players into pairs. Have one player kneel down on the ground maintaining an erect torso. Instruct the other player to hold the ankles of the player kneeling down in a firm position (Figure 6.9 a). Direct the kneeling player to lean forward slowly from the knees until the torso makes a 45 degree angle with the ground. The body (from the knees to the head should be straight (Figure 6.9b). Slowly return to the starting position. Switch roles after the desired amount of reps.

a)

b)

Figure 6.9

Hip Bridge

Objective: Develop core strength with an emphasis on the hip musculature and gluteus maximus

Level: Beginner

Directions and Coaching Points: Have the player lie flat on their back with the legs together. Instruct them to bend (flex) the knees until the lower legs are almost perpendicular to the ground (Figure 6.10a). Both feet should be flat on the ground and parallel to each other. Initiate the bridge position by lifting the hips off the ground until the knees to the shoulders form a straight line (Figure 6.10b). The player should be contracting the gluteus and core muscles to maintain a stable bridge position. Continue for the desired time and then return to the starting position.

Progression: This exercise can be progressed by having the player lift and extend one leg off the ground while maintaining a stable bridge position (Figure 6.10c).

a)

b)

c)

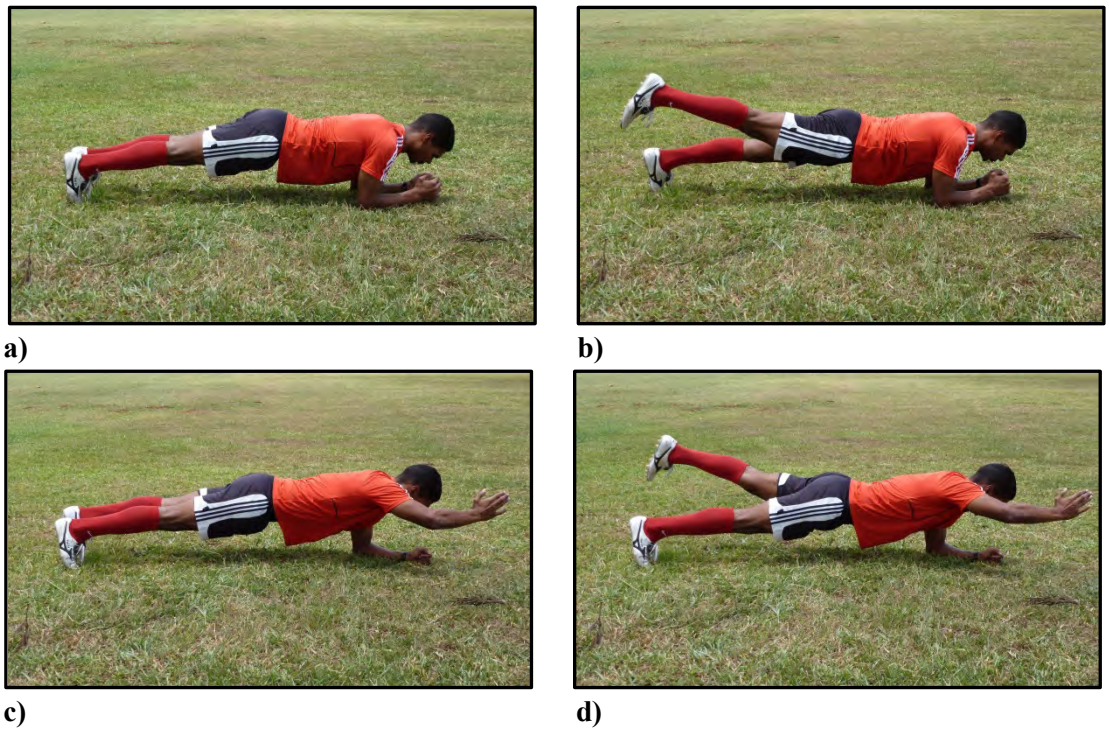
Figure 6.10

Plank

Level: Beginner

Objective: Develop overall core strength

Directions and Coaching Points: Have the player lie down flat on the ground in a prone position. Have them place both forearms on the ground, parallel to the body, so that the elbows are directly below the shoulders. Instruct them to initiate the plank position by raising the hips and trunk off the ground (by contracting the core muscles) so that the body is straight (Figure 6.11a). Only the forearms and toes should be in contact with the ground. Do not allow the hips to sag towards the ground. Hold this position for the required time (approximately 30 to 60 seconds).



a) **b)** **c)** **d)**

Figure 6.11

Progression: This exercise can be progressed by making several body adjustments while maintaining a plank (straight) position: i) raising one foot off the ground (Figure 6.11b); ii) raising one arm off the ground (Figure 6.11c); and iv) raising one arm and the opposite foot off the ground (Figure 6.11 d).

Side Plank

Objective: Develop core strength with an emphasis on the obliques

Level: Intermediate

Directions and Coaching Points: Instruct your players to lie on their sides, with the body straight. Have them place the forearm of the side they are laying on, perpendicular to the body with the elbow directly below the shoulder. Instruct them to initiate the plank position by raising the hips off the ground (by contracting the core muscles) so that the body is in a straight line from head to feet (Figure 6.12a). Hold this position for the required time (approximately 30 to 60 seconds).

Progression: This exercise can be progressed by having the player raise the leg on the side not in contact with the ground while maintaining a stable plank position (Figure 6.12b).

a)

b)

Figure 6.12

Supine plank

Objective: Develop core strength with an emphasis on hip musculature, gluteus maximus and the lower back.

Level: Intermediate

Directions and Coaching Points: Same as plank but the player is in a supine position (Figure 6.13a).

Progression: This exercise can be progressed by having the player raise one leg off the ground while maintaining a stable plank position (Figure 6.13b).

a)

b)

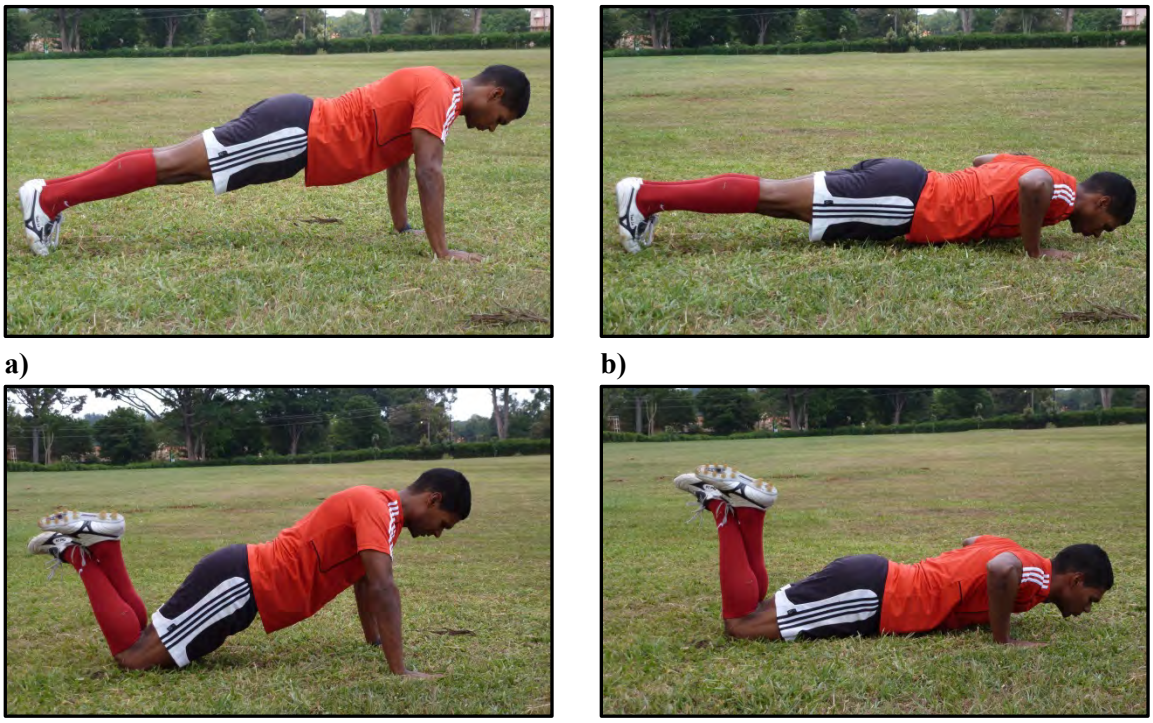
Figure 6.13

Push-Up (Standard and Partial)

Objective: Develop upper body (chest, triceps, and shoulders) and basic core strength

Level: Beginner

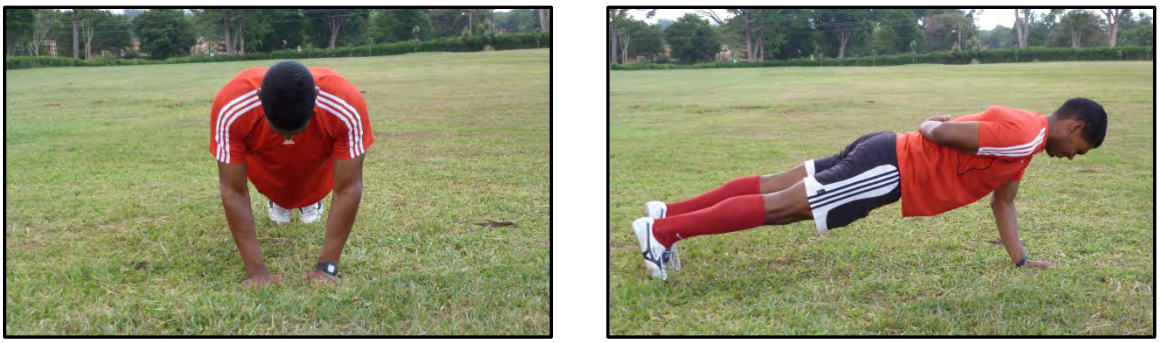
Directions and Coaching Points: For the standard push-up, have the athlete assume the normal starting position for a push-up with the palms placed flat on the floor, shoulder width apart, and the arms and body straight (Figure 6.14a). For the partial push-up method, have the athlete start in a position where the knees, and not the feet are in contact with the floor (Figure 6.14c). Have the athlete lower themselves (keeping the body straight) until the chest just about touches the floor (Figures 6.14b and 6.14d), then return to the starting position by forcefully extending the elbows.



a) **b)** **c)** **d)**

Figure 6.14

Progression: The push exercise can be progressed by doing modifications to the standard push up: i*)* the ***triceps push-up***, in which the starting position has the hands beside each other (Figure 6.15a); and ii) ***the 1-handed push-up*** (advanced), in which the player performs the same movement but with one hand behind their back (Figure 6.15b).



a) **b)**

Figure 6.15

Hand-Shake Push-Up

Objective: Develop upper body Strength as well as core stability

Level: Intermediate

Directions and Coaching Points: This exercise can be done in pairs or in isolation. Have the two athletes lie facing each other so that their bodies are in a straight line and their heads are about 12 inches apart. Have them assume the standard push-up position and lower themselves at the same time (Figure 6.16a and 6.16b). At the top of the movement have both players shake hands (left hand in picture) while maintaining a stable plank position (Figure 6.16c). Have them shake hands for 1 to 2 seconds and return to starting position. Repeat the process for the desired amount of repetitions, but switch hands after each repetition.

a)

b)

c)

Figure 6.16

Plank with 1-Arm Row

Objective: Develop upper body (upper back) strength and core stability

Level: Advanced

Directions and Coaching Points: Have the player get in the starting position for the standard push-up (Figure 6.17a). Have the player perform a one arm row by lifting the right hand off the ground and raising the elbow upwards until the palm touches the chest (Figure 6.17b). Hold this position for one second and then steadily return to the starting position. Repeat the procedure with the left hand and then perform the desired amount of repetitions. Ensure that the players maintain a stable plank position and that they keep the elbow close to the body when rowing.

a)

b) **Figure 6.17**

INTEGRATING A BALL COMPONENT INTO STRENGTH TRAINING EXERCISES

In keeping with a ball-oriented training methodology, it is important that we integrate ball work into our strength training routines. As you can well imagine, such a task can be quite challenging. There are ways however, to include technical training into your strength exercises. These include: i) performing a technical action in between each repetition; ii) performing low-intensity ball work during rest periods between sets; and iii) doing technical or tactical exercises at a station in a circuit training routine.

i) Performing a technical action between repetitions

Exercises that fall into this category are ones that allow the player to easily perform a technical action such as heading, side-footed volleys, and one-touch passes after each repetition. Appropriate strength training exercises include the lunge, lateral lunge, squat, single-leg squat, and push-up. Using this type of combination is most appropriate for the phase of the season focusing on basic strength. The following are two examples:

<u>Lunges with One-Touch Passing</u>

Set-up and Directions: Divide your players into groups of two with one ball between the pair. Have the players stand 5 yards apart and have the player with the ball start with it at their feet. On the coach's call, the player without the ball lunges forward with their left leg until their right knee just about touches the ground (Figure 6.18a) and then returns to the starting position. At this point, they will get the ball passed to them from their partner, which they should return with a one-touch pass (Figure 6.18b). Have the player immediately perform another lunge, this time with the right leg and then receive another pass. Continue this sequence for the desired amount of repetitions and then switch roles.

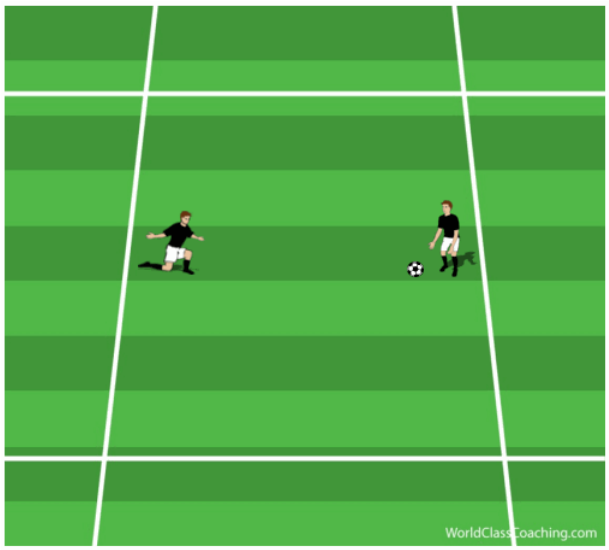


Figure 6.18a

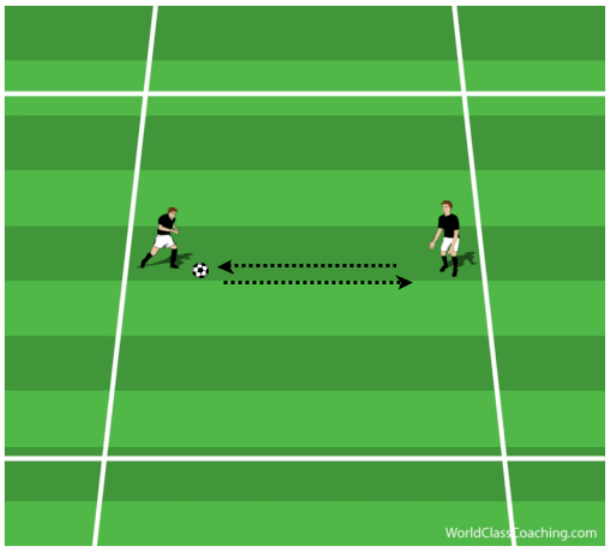


Figure 6.18b

Push-Ups with Side-Footed Volleys

Set-up and Directions: Divide your players into groups of two with one ball between the pair. Have them stand approximately 2 to 3 yards apart. One player starts in a push-up position and the other will start with the ball in their hands. On the coach's call, the player without the ball does a push-up and then immediately rises to a standing position, receives a tossed pass from their partner and returns the pass with a side-footed volley. The player immediately drops down, does another push-up and rises again to receive another toss. Repeat this process for a total of about 8 to 12 repetitions and then have your players switch roles. It is important that the player tossing the ball gives a good throw each time.

Variation/Progression: For the above (and other combinations), you can vary the technical component by choosing headers, volleys using the instep/laces, control with the chest and then volley, or control with the thigh and then volley. Additionally, you can progress the exercise by using a more difficult variation of the strength exercise (For instance, triceps push-up in the above example).

ii) Performing low-intensity ball work during rest periods between sets

This method is most appropriate for exercises such as the plank or hip bridge and other core exercises that require the athlete to hold a set position for a specific amount of time. It is also suitable when focusing on eccentric strength because the sets take longer than normal. The most suitable strength training exercises to use with this method include the plank, side plank, supine plank, hip bridge, plank with one-arm row, single-leg deadlift, multi-directional lunge, hand-shake push-up and eccentric hamstring exercise.

It is important that the ball-component of the drill be low in intensity, which allows the athletes to recover from each set of the strength exercise. The following are a few examples that can be used:

Planks with Individual Dribbling

Set-up and Directions: This exercise uses the penalty box for the playing area. Each player needs a ball. Instruct them to dribble around inside the playing area using small touches while keeping their heads up (Figure 6.19). They are not allowed to go outside the penalty box. After 90 seconds, have all players perform a set of planks for 90 seconds. As soon everyone is finished, have them dribble again for another 90 seconds, after which, they perform a second set of planks. Continue this cycle for the desired amount of sets, or strength exercises (no more than 2 to 3).

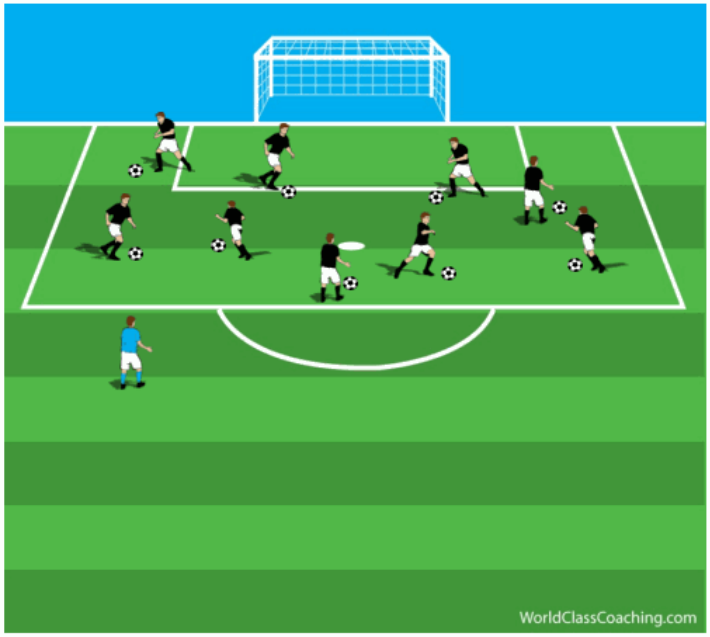


Figure 6.19

Variation/Progression: You can vary the dribbling component by i) having them take alternate touches with the inside then outside of the foot; having them perform a step-over after every three touches; having them dribble with the weaker leg only; performing a cutback after every 3 touches; or any way you feel appropriate.

Handshake Push-ups Interspersed with Sequential passing

Divide your players into groups of four and for every group, give each player a different number between 1 and 4. Set up a 20 yards by 20 yards playing area for each group or have all groups working in one half of the field. Have each group pass and move for 90 seconds (Figure 6.20).

Players should take 2 touches only and they must pass sequentially (1 pass to 2; 2 pass to 3; etc.). After 90 seconds, have your players perform a set of handshake push-ups. When completed, have the groups continue passing for another 90 seconds and perform a seconds set of push-ups. Continue this cycle for desired amount of sets or strength exercises (no more than 2 to 3).

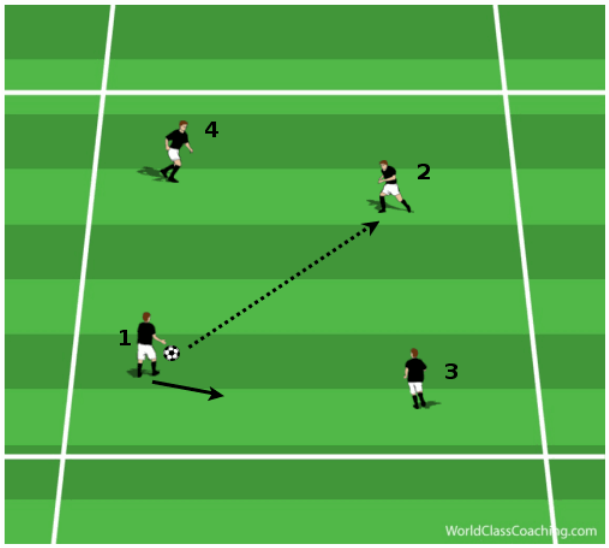


Figure 6.20a

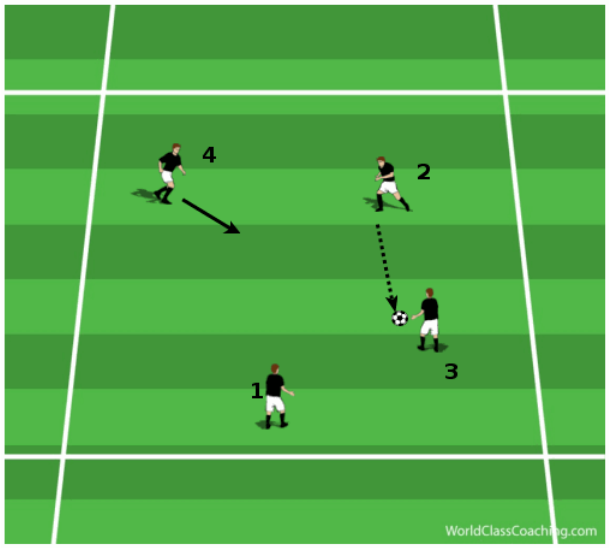


Figure 6.20b

<u>Plank with One-arm Rows and two-touch Passing</u>

Set-up and Directions: Divide your players into groups of two with one ball for each pair. Have them stand approximately 10 yards apart. Instruct them to pass back and forth between each other (they must take 2 touches). After 90 seconds, all players perform a set of planks with one-arm rows for10 repetitions. When completed, have them return to passing for another 90 seconds, after which, they perform a second set of planks with one-arm rows. Continue this cycle for desired amount of sets or strength exercises (no more than 2 to 3).

Variation: You can vary the passing component of the exercise by i) having the players control with the right then pass with the left (and vice versa); ii) control with the outside of the foot and pass with the same foot; or iii) one-touch passing.

Other low-intensity ball work activities that can be interspersed between strength exercises include keep-ups. Remember, the activities during the rest periods must be ***low intensity***; otherwise the players will not be sufficiently recovered. The focus is on improving strength.

iii) Doing technical or tactical exercises at a station in a circuit training routine

Circuit training involves performing several exercises, normally in close succession, one after another. The exercises are set up as stations and each exercise is performed for one set before moving to the next. One cycle of the circuit refers to when all stations have been performed once. Circuit training is most often used for developing strength endurance and therefore the rest periods between stations are short (30 to 45 seconds). However, by incorporating varying recovery times, this method can be tailored for developing other forms of strength. Circuit training is a very suitable strength training method for soccer as the entire team can train at once.

When choosing ball-oriented exercises to include as stations in a circuit, you want to include exercises that are easy to transition into. As such, they should be straight forward exercises that do not require long explanations or demonstrations, and the set-up should be relatively simple. Sample exercises include 3 v 1, individual dribbling, and triangle passing.

The following is a whole-body circuit that can be used once or twice a week, depending on preference and phase of the season:

Whole-body Strength Training Circuit with Technical Drills

Set-up and Directions: This circuit requires half of a regulation-sized field to set up the various stations. Divide your players into groups of four and ensure that all players understand what needs to be done at each station. Have each group work continuously for 1 minute and then walk to the next station (which should take no longer than 30 to 45 seconds). As soon as each group is at the next station, have them work continuously for another minute. Continue this cycle until each group has done each station twice. There are a total of 8 stations, which are:

1) Lunges
2) Triangle passing (Pass and follow your pass around a triangle of 10 yards in length each side)
3) Squats
4) 3 v 1 keep away (3 attackers try to keep possession from 1 defender in a 10 by 10 yard area)
5) Planks
6) Toe taps
7) Push-ups
8) Individual dribbling (each player dribbles at speed inside a 10 by 10 yard playing area)

Set up each station at least 15 yards apart (Figure 6.21)

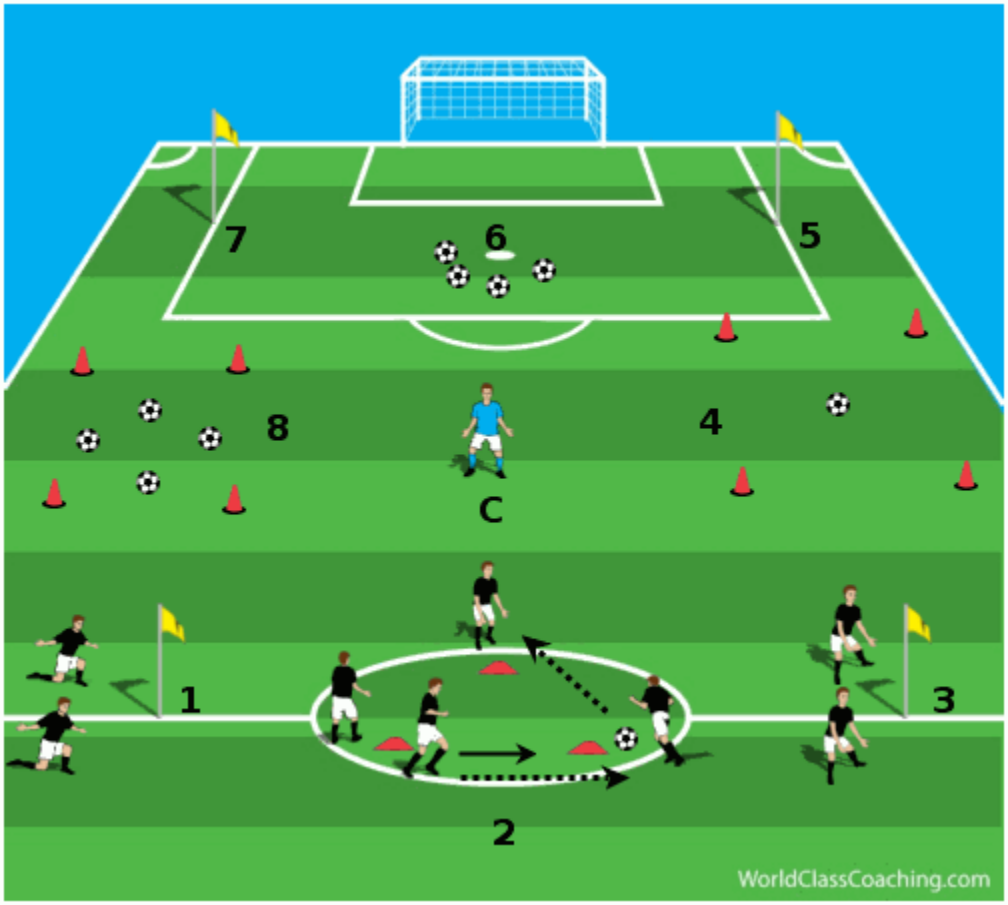


Figure 6.21

Because most teams are likely to have two (at the most three) training sessions per week, all circuit routines should include exercises for the core as well as the upper and lower body (whole-body circuit routines).

STRENGTH TRAINING PROGRAM DESIGN

Strength Training Program Variables

The are several variables to consider when planning your strength training program (load, rest period, level of difficulty, sets, reps, number of exercises, etc.) and how you implement each variable will be determined mainly by the base level of strength of your athletes and the phase of the season.

As mentioned in Chapter 1, it is recommended that you do a thorough fitness assessment of your players at beginning of the off-season. The tests you use to assess local muscular endurance will give a good indication of basic strength and therefore the loads each player is capable of.

In the first part of the ***off-season***, the goal will be to develop basic strength using 4 to 6 exercises (2 core, 1 to 2 upper-body, 1 to 2 lower-body). Perform 2 to 3 sets per exercise and 6 to 12 repetitions per set. For isometric exercises such as the plank or hip bridge, have the players hold the position for 30 to 45 seconds. The rest periods between sets should be about 90 seconds. At this point, have all players start with beginner level exercises. When the athlete can do more than 12 repetitions, they should progress to a more advanced exercise (for example, progressing from standard to triceps push-ups).

As the off-season carries on and players get stronger and their work capacity increases, you may increase the number of exercises to 6 or 7. More emphasis should be placed on developing eccentric strength. It is also important that you vary the exercises in the routine to prevent boredom as well as stagnancy.

The major strength training priority of the ***pre-season*** is to develop strength endurance. The best method to do this is circuit training. The circuit should have at least 5 strength exercises. The rest period between exercises should be no more than 30 to 45 seconds, which should consist of the players moving quickly from one station to the next. Choose exercises that your players will be able to perform for 12 to 15 repetitions or hold for 45 seconds, and do 2 or 3 cycles of the circuit. The entire routine should not take more than 25 minutes. (You may opt not to include ball-oriented stations, depending on the technical or tactical objectives of the session.) You should do a fitness assessment prior to the pre-season so that you have an accurate idea of where your players stand in terms of strength gains.

During the ***in-season***, the strength training goal is to maintain the basic strength and strength endurance levels achieved during the off and pre-seasons. It is not necessary to do strength training more than one a week and the methods and exercises you choose can vary between focusing on basic strength and strength endurance.

Table 6.1 summarizes the main variables to consider, and appropriate recommendations, when designing the strength training program for your players.

Table 6.1 Variables and Guidelines for Strength Training Program Design

Phase of Season	Strength Training Focus	Number of Exercises	Sets (and repetitions) Per Exercise	Rest Period For Exercises
Early Off-Season	Basic Strength	4 to 6	2 to 3 (6 to 12)	90 seconds
Late Off-season	Eccentric Strength	6 to 7	3 to 4 (6 to 12)	90 to 120 seconds
Pre-Season	Strength Endurance	5 to 6	2 to 3 (12 to 15)	30 to 45 seconds
In-Season	Maintenance of Off and Pre-Season Strength Gains	Varies	Varies	Varies

From my experience working with youth and amateur athletes, the challenge for the coach (and it is certainly a big challenge) is that there will be a large variation in strength amongst the players. I have coached youth teams in which some players could easily perform 10 push-ups, whereas others were not capable of doing one. That is why fitness assessments at the start, and at various points throughout the season, is so important. As a coach, you have to carefully monitor your athletes and assign exercises with the appropriate level of difficulty to each individual. If you give the same exercise to every player, then it may be a breeze for some or way too challenging for others.

STRENGTH TRAINING IN THE YOUTH SOCCER PLAYER

In contrast to the popular notion that it stunts growth and is not safe for children, strength training can be quite beneficial to the youth athlete; as long as the training is well supervised and the appropriate exercises are chosen and performed correctly. In fact, children as young as 6 years old have benefitted from a strength training program. In addition to increasing muscular strength and endurance, resistance training exercises strengthen ligaments and tendons, helps prevent injuries, and prepares players for later stages of maturation. Additionally, despite the thinking that weight training will stunt the growth of young players, appropriate strength training exercises will actually positively influence bone growth and formation.

When designing a strength training program for youth soccer players, coaches need to consider the biological (stage of development) and chronological age (age in years). Due to the large variation in the rates of growth and maturation, it is more appropriate to use the biological age. Training age, which refers to the length of time a person has participated in a strength training program, must also be considered.

Strength training guidelines for youth players:

- At no point should pre-puberty and adolescent children engage in heavy lifting or training for maximum strength
- Incorporating flexibility training (Chapter 2) into the training program is paramount. Good flexibility is required for preventing injuries and developing good technique, and appropriate stretching exercises should be performed prior to and after strength training sessions.
- Learning good technique and posture, as well as performing exercises using controlled movements should be a high priority for each player.
- When beginning a program for the first time, or when returning from a long layover, youth players must start with the most basic training exercises. Additionally, in comparison to their adult counterparts, exercise progression for young players should be very gradual.
- Developing basic strength, and in particular core strength, should be the major strength training goal. Only after a suitable stage of maturity and a good foundation in basic strength is established, should youth athletes focus on developing eccentric strength and strength endurance.

Strength Training Program Design for Pre-Pubescent Players:

For this age group, the volume of training should be low (3 to 4 exercises, 1 to 2 sets per exercise) and the intensity should be very low. The exercises should be of the beginner level only, and they should aim to perform 6 to 12 repetitions per set. In comparison to senior players, the rest period between sets for pre-pubescent players should be slightly longer (approximately 2 to 3 minutes). Progression in this age group must be very gradual. Start with one session per week with 3 to 4 exercises and as the year continues you may progress to two sessions per week with 4 or 5 exercises. Exercise variation is also important.

Strength Training Program Design for Adolescent Players:

As children enter puberty there is a natural increase in strength and work capacity. As such, the volume of strength training for players in the adolescent age groups can be moderately higher than that used for pre-pubescent players. The intensity must still remain low however. Start with 4 exercises, 2 sets per exercise, once or twice per week and then slowly increase the number of exercises and sets to 5 or 6 and 2 to 3 respectively. Players in this age group must also start with beginner exercises, but strength gains will occur more rapidly and therefore you may progress the level of difficulty to an intermediate level. One consideration is that, during the growth spurt that accompanies puberty, muscle imbalances around a joint may make a child more susceptible to injury. As such, coaches may need to adjust the strength training program during these periods by reducing the load in training and placing more emphasis on flexibility.

As long as a child is ready to participate in a soccer program then they are ready to partake in a strength training program. However, it is essential that they are properly supervised, and the exercises chosen must be appropriate for their age.

CHAPTER 7: TRAINING FOR EXPLOSIVE POWER

So many movements in soccer depend on the ability of the body to produce force rapidly, or explosive power. Think of central defenders jumping high in the air to meet a goal kick or cross; or strikers sprinting past defenders after playing the ball behind them. Jumping and sprinting-related actions occur frequently throughout the game, and how successful your players are at performing these actions will be greatly influenced by their power capabilities. Even goalkeepers need explosive power; especially when throwing long balls, diving to make a save, or when leaping high in the air to meet a cross.

There are three main training methods that can be used to develop power in soccer players. These are: power or ***Olympic-style weightlifting***; ***medicine ball training***; and ***plyometric training***. As mentioned in Chapter 6, many youth and amateur teams don't have access to weight training facilities or strength training coaches who can teach and supervise an Olympic lifting program. For these teams, this form of training is not likely to be an option. Moreover, doing medicine ball training in a team setting requires a large volume of equipment and is therefore not very practical.

For most youth and amateur teams, plyometric training presents the most suitable option for developing explosive power. Importantly, it has been shown to be a very effective method. In fact, sports science research has shown that incorporating short-term plyometric training into the yearly training program is effective at increasing power-associated movements such as jumping, sprinting and changing direction in both adult and youth players.

In this chapter we describe the basic principles of plyometric training and give a variety of ball-oriented plyometric exercises that can be used to develop explosive power in your players.

Figure 7.1 Explosive power is a necessary quality for centre backs jumping high in the air to make defensive headers

PRINCIPLES OF PLYOMETRIC TRAINING

Plyometric exercises are mostly jump-related exercises that focus on training the muscles to produce the maximum amount of force in the shortest amount of time. Plyometric training involves performing a ***countermovement***, which emphasizes the ***stretch-shortening cycle*** (SSC). In the SSC, a muscle is loaded with ***elastic energy*** during the eccentric phase (during the lowering phase of a squat for example) when it lengthens, which allows it to contract more forcefully during the concentric (shortening) phase.

As a simple example, consider the vertical jump test described in Chapter 1. Before jumping the athlete is allowed to perform a countermovement (Figure 1.10b and Figure 7.2 below) from a standing position.

Figure 7.2

During the countermovement, the player squats down- which lengthens the quadriceps and gluteal muscles in the legs, and loads them with elastic energy. This elastic energy then contributes to a more forceful contraction when these muscles extend the knees and hips prior to taking off.

There is a slight pause at the bottom of the countermovement when the player transitions from a downward movement into jumping upwards. This pause is known as the ***amortization phase*** and is very important to the success of the jump. If the amortization phase is too long, then the elastic energy stored

during the lengthening or eccentric phase will be lost. Coaches must therefore stress a quick transition between the countermovement and taking off.

PLYOMETRIC EXERCISE TECHNIQUE AND MECHANICS

Good technique when performing plyometric exercises is extremely important, as this type of training places a high amount of stress on the joints and ligaments of the body. As such, poor form can produce inappropriate stress and increase the chances of injury. Good technique is also required to make the most gains from the training. That is, teaching the muscles to produce the most forceful contraction as quickly as possible.

During the countermovement or loading phase, the athlete lowers themselves by flexing the hips, knees and ankles (Figure 7.2). The feet should be parallel to each other and shoulder width apart. Both arms are simultaneously brought back (at the time of lowering) and should be straight, not bent. (Proper arm action is essential to the success of the jump).

As previously mentioned the amortization is critical towards the success of the jump and should not be too long.

When landing, ground contact should be on the balls of the feet. Upon contact, the ankles, knees and hips need to sequentially flex in order to properly absorb the impact. The centre of gravity must be over the feet, and the shoulders should be over the knees (Figure7.3).

Figure 7.3

STRENGTH REQUIREMENTS FOR PLOMETRICTRAINING

It is important that a base level of strength be established before progressing into a plyometric training program. Without this strength foundation, the body will not respond to the training effectively and the chance of developing an injury greatly increases.

Power is essentially strength with an element of speed. It involves moving a force as quickly as possible. In plyometric training the force produced is used to propel the body off the ground and this force is generated mainly by the triple extension of the ankles, knees and hips. As such, a certain degree of ***leg strength*** is essential. Moreover, the stronger the legs, the greater the force they will be capable of producing.

Leg strength and in particular ***eccentric leg strength*** is also crucial for the landing phase, as this requires controlled deceleration. This is especially important during multiple jumps of great height because the player needs to immediately prepare themselves to repeat the jump upon contact with the ground.

Training for explosive power is also dependent on having great body control and posture during each jump, and therefore requires good dynamic balance and ***core strength***. Core strength is also important to efficiently transfer power generated in the lower body to the limbs of the upper body.

CATEGORIES OF PLYOMETRIC EXERCISES

Plyometric exercise can be categorized in several ways depending on what factor you are investigating. For the purpose of this book, we will categorize plyometric exercises based on the ***type of jump***, or the ***ground contact time***.

TYPES OF JUMPS

Single versus Double-Leg Takeoff and Landing: Jumps can initiate from, and end in, either a double or single-footed stance. (Single-leg jump are frequently referred to as hops) However, jumps involving single-footed takeoffs and landings are much more strenuous (and therefore of a higher intensity) than double-footed ones, as all the force is produced from or absorbed by one leg rather than equally distributed over two.

Direction: Jumps or hops can occur in many directions (vertical, lateral, and horizontal), or emphasize one direction more than others. Jumps can also involve turns of various degrees (90, 180) and therefore the direction the player faces after landing is different from that of the starting position, unless it is a 360 degree turn.

Bounding: Bounding refers to jumps categorized by alternate leg landing and subsequent takeoffs. Compared to other jumps, bounding emphasizes greater horizontal speed and distance. As a visual description, think of the first two jumps in a triple jump.

Multiple versus Standing Jumps/Hops: Multiple jumps refer to repeated movements or jumps/hops in which there is no recovery between repetitions. As soon as contact is made, the individual immediately repeats the jump (Figure 7.4). Standing jumps are maximum effort jumps in which there is a recovery period between each attempt.

a) **b)** **c)**

Figure 7.4

Depth Jumps: Depth jumps involve the athlete stepping off and then landing from an elevated position, such as from the top of a box, and then immediately jumping into a new direction (Figure 7.5). Depth jumps are extremely high in intensity and should only be performed by experienced athletes who have a suitable level of basic strength.

a) **b)** **c)**

Figure 7.5

GROUND CONTACT TIME

Short Response: Short response jumps are characterized by quick movements. The foot contact with the ground is fast and lite, and the loading or eccentric phase is therefore very short. This type of jump usually has a smaller displacement in comparison to jumps with longer ground contact times. Multiple jumps usually have short response times.

Long Response: In long response jumps, the contact with the ground and therefore the eccentric phase is a little longer. This increases the load or elastic energy in the muscles and therefore allows for a more forceful contraction. Bounding or standing jumps are examples of long response jumps.

Very Long Response: These are jumps characterized by much slower movements and a very long ground contact time. They are usually very high in intensity. Depth jumps are a good example of very long response jumps.

(The exercises in this book will not include bounding or depth jumps)

PLYOMETRIC PROGRAM DESIGN AND PROGRESSION

As was the case with strength training, there are many variables to consider when designing your plyometric program. These variables include: sets, repetitions, rest period, volume, and intensity level. Of these, intensity level is considered the most important as it affects how you prescribe the other variables. Plyometric training exercises can be categorized into 3 main intensity levels: i) ***low intensity***, such as standing vertical jumps; ii) ***intermediate intensity***, such as multiple lateral jumps; and iii) ***high intensity***, such as depth jumps or single-legged lateral hops. A major point to note is: as you increase the intensity level of the exercise, you must decrease the volume.

As previously mentioned, plyometric training should only be incorporated into your training sessions after a base level of strength has been established. In terms of phase of the training year, a good starting point tends to be the 2nd half of the ***off-season***. At this point, all exercises should be low-intensity. Start with 2 or 3 exercises (2 to 3 sets with 8 repetitions per set), for the first few weeks. You can then progress to more intense exercises after the players have developed proper jumping and landing technique, and their bodies have adjusted to this new form of training. At the end of the off-season, the players should be performing exercises predominantly of an intermediate intensity level. You can still have them perform 2 to 3 exercises with 2 to 3 sets each, but the number of repetitions should not exceed 6 or 7.

A major priority of the ***pre-season*** is developing explosive power and transferring that to improvements in speed and agility. Plyometric training should therefore be a fundamental part of the pre-season training program. Players should reach their peak power capabilities by the end of this training phase. At this point, the majority of exercises should fall under the intermediate or high-intensity categories. Remember, as you increase intensity, you must decrease the volume.

During the ***in-season***, it is a good idea to incorporate plyometric exercise into training once per week. However, this will be based on the number of practice sessions per week. Chapter 11 describes how to effectively prepare a training plan for the in-season in greater detail. Regardless of the frequency however, each plyometric session should be high in intensity and low in volume. You may consider doing lower intensity exercises if you have a heavy week of games or training. Two exercises with 2 to 3 sets each should be sufficient. The number of jumps per set should be no more than 4 or 5.

An important point to consider is that plyometric exercises are meant to be explosive in nature and therefore have a high neural demand. As such, the amount of repetitions (jumps) per set should never exceed 8, and should range from 4 to 8 depending on intensity level (the higher the intensity, the lower the amount of jumps). In addition, the rest periods between sets should be at least 90 seconds. Ideally, this form of training should take place early in the session before players become fatigued.

Table 7.1 summarizes the main variables to consider when designing your plyometric training programs and shows how these variables differ depending on the phase of the season.

Table 7.1 Variables and Guidelines for Plyometric Training Program Design

Phase of Season	Number of Exercises	Sets (and reps) Per Exercise	Intensity Level of Plyometric Exercise	Sample Exercise
Early Off-Season	--	--	--	--
Late Off-season	2 to 3	2 to 3 (6 to 8)	Low to moderate	Vertical Jumps with Headers
Pre-Season	2 to 3	2 to 3 (5 to 6)	Intermediate to High	Split Squats with Juggling
In-Season	2 to 3	2 (4 to 5)	Mostly High	Single-leg Lateral Jumps with Passing

PLYOMETRIC TRAINING EXERCISES

Note: In comparison to the jumps or hops described in Chapter 3 for developing dynamic balance, the exercises listed here are meant to be explosive in nature. The athlete needs to produce a great amount of force to clear a substantially higher hurdle or to elevate themselves as high as possible. These jumps must also emphasize the countermovement and proper arm action.

Jumps in Place with One-Touch Passing

Category: Vertical, Multiple Jump with Short Response

Intensity Level: Low

Set-up and Directions: Divide your players into groups of two. Each group needs one ball. Have both players stand 3 to 4 yards apart, facing each other. One of the players should have a ball at their feet (Figure 7.6a). When ready have both players stand upright, with feet shoulder width apart and then perform 6 to 8 repetitions of (multiple) vertical jumps. As soon as both players are finished, have them pass back and forth to each other for 90 seconds using one touch (Figure 7.6b). After 90 seconds, have them perform another set of vertical jumps for a total of 2 or 3 sets.

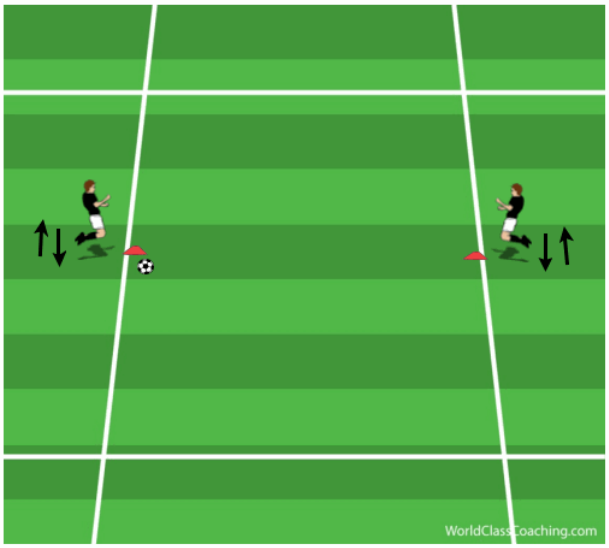


Figure 7.6a

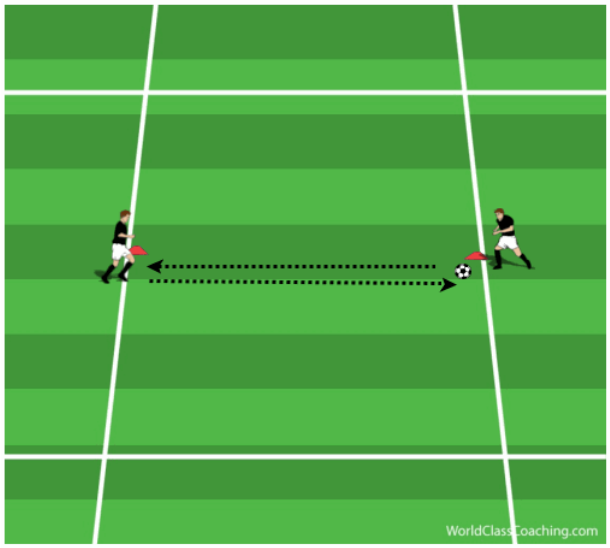


Figure7.6b

Coaching Points: Have the players begin with a countermovement and then jump upwards by explosively extending the ankles, knees and hips. They should land in the same position and then immediately repeat the jump. This exercise is intended to be a short response activity and therefore the time between landing and subsequent takeoff should be very short. Emphasize quick and fluid movements between each jump.

When landing, ground contact should be on the balls of the feet, and the ankles, knees and hips need to sequentially flex in order to properly absorb the impact. The centre of gravity must be over the feet, and the shoulders should be over the knees

Variation: You can vary this exercise by having the players jump side to side over a line, such as the touch line (Figure 7.6c), or by having them dribble or do keep-ups during the recovery period instead of one-touch passing. All other coaching points remain the same.

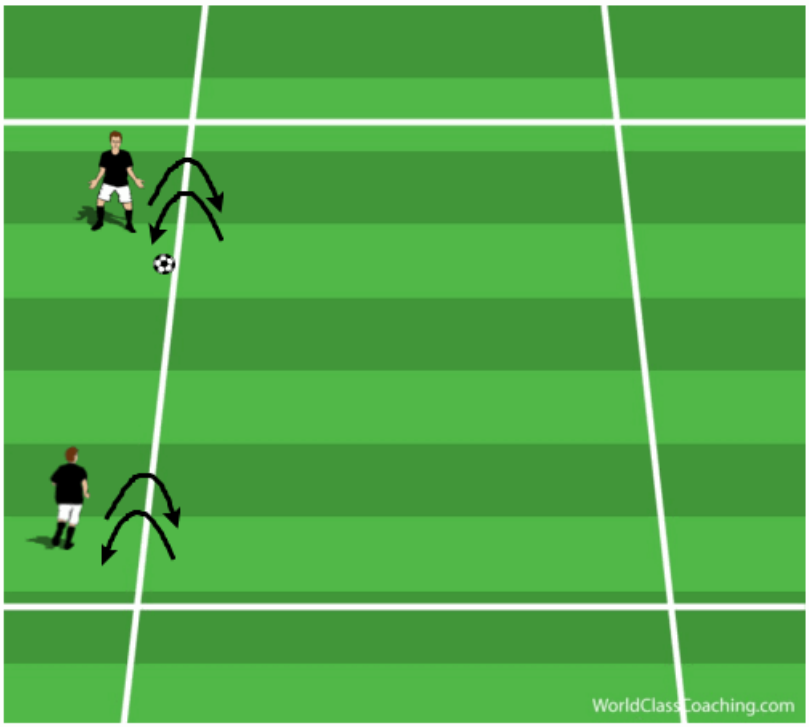


Figure 7.6c

Progression: You can progress this exercise to a ***high*** intensity level by having the players jump off and land on one leg.

Vertical Jumps with Headers

Category: Vertical, Standing Jump with Long Response

Intensity Level: Low

Set-up and Directions: Divide your players into groups of two. Each group needs a ball. Have both players stand 3 to 4 yards apart, facing each other. One of the players should have a ball in their hands (Figure 7.7a). When ready have the player with the ball toss it high enough in the air for their partner to return it with a jumping header (Figure 7.7b).

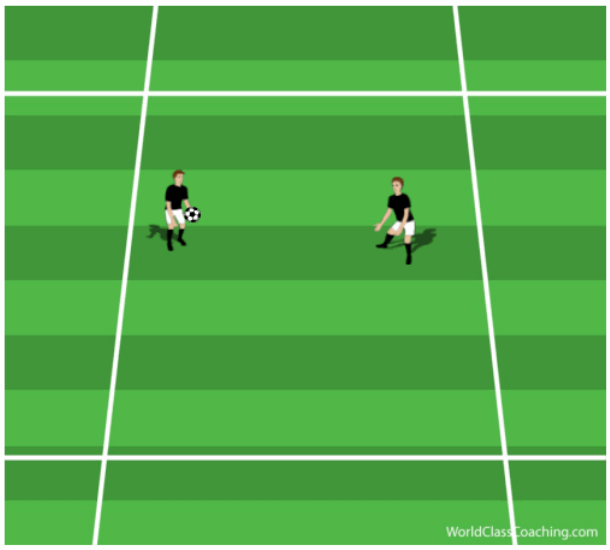


Figure 7.7a

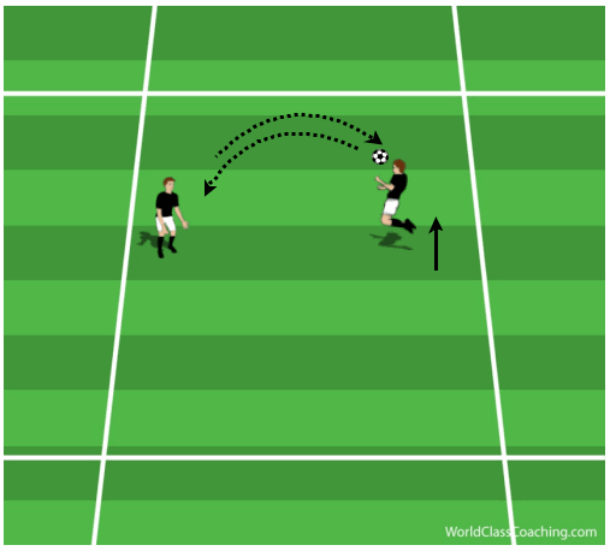


Figure 7.7b

Coaching Points: When jumping, the player should begin with a counter movement and jump explosively upwards by extending the ankles, knees and hips, and using the arms to assist. When heading, they should keep the eyes open and mouth closed, the neck muscles firm, and make contact with the forehead. Ensure the players use proper landing technique (discussed earlier). Upon landing, have the player recover for 1 or 2 seconds before performing the next and subsequent repetitions. Perform a total of 6 to8 repetitions and then switch roles.

Progression: You can progress this exercise to a ***high*** level of intensity by having the player jump off and land on one leg.

Lateral Jumps over Hurdle with Two-Touch passing

Category: Lateral, Standing Jump with Long Response

Level: Intermediate

Set-up and Directions: Divide your players into groups of two. Each group needs one ball. Have both players stand 7 to 8 yards apart, facing each other. One of the players should be standing 6 to 12 inches to the right or left of a hurdle (or large cone) with their feet shoulder width apart. The other player should have a ball at their feet (Figure 7.8a).

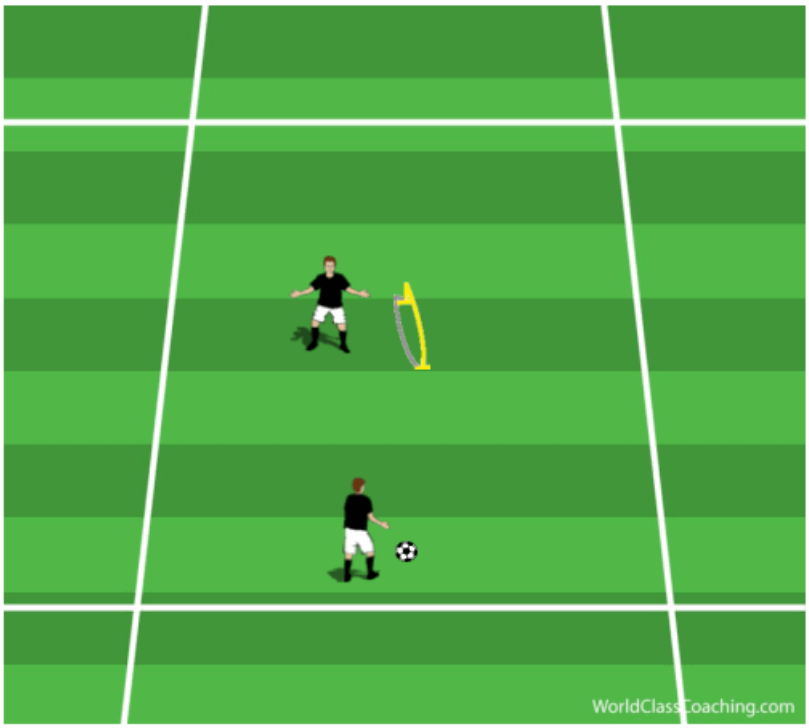


Figure 7.8a

When ready, have the player without the ball begin the exercise by jumping laterally over the hurdle by explosively extending the ankles, knees and hips. As soon as the player lands, they should have a ball passed to them by their partner, which they should control and then return with the next touch (Figure 7.8b).

As soon as they return the pass, have the player get into a ready position and jump laterally over the barrier again so that they return to the initial starting position. As before, as soon as they land, they should have a ball played to them by their partner that they should control and return with the next touch. Repeat this process for a total of 6 to 8 repetitions and then have the players switch roles.

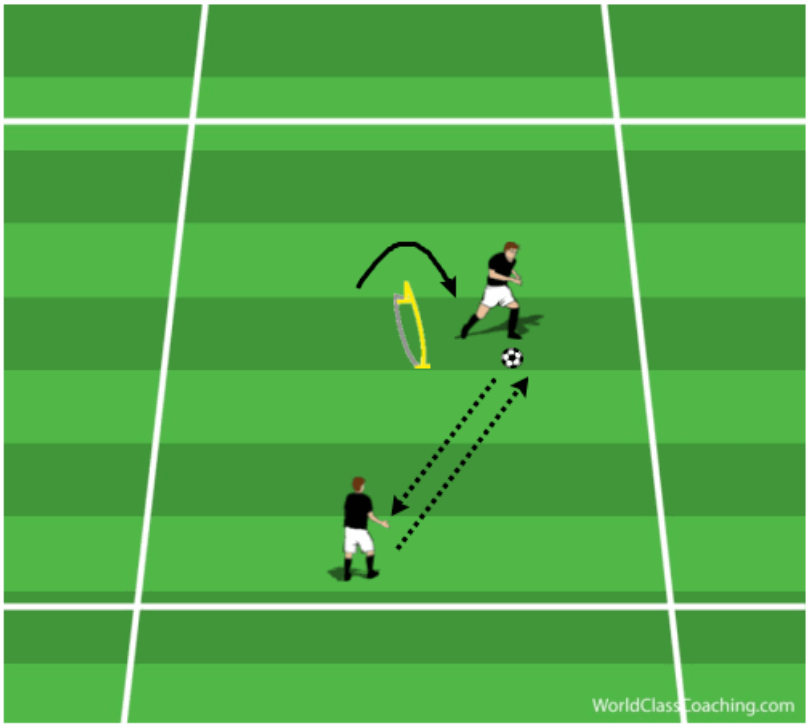


Figure 7.8b

Coaching Points: When jumping, the player should begin with a counter movement and jump explosively upwards and to the side by powerfully extending the ankles, knees and hips, while using the arms to assist. You should also emphasize proper landing technique (discussed earlier).

When passing, ensure that the player keeps the ankle locked and the toes pointed upwards when making contact with the ball, and that the follow-through action of the foot is toward their partner.

Variation: You can vary the exercise by changing the delivery of the pass (bounced or air ball), by changing the part of the foot (inside, outside) that the player must use to make their first touch, or by restricting the players to return the pass with one-touch. You can also have the player jump forwards rather than laterally.

Progression: You can progress this exercise to i) an ***intermediate*** level by increasing the height of the hurdle; or ii) a **high** level by having the player jump off and land on one leg.

Multiple Front Hurdle Jumps with Third-man Volleys

Category: Multiple Jumps with Short Response

Intensity Level: Low to Intermediate

Set-up and Directions: Place five hurdles (or large cones) 1 yard apart in a straight line. Have a small group of players line up behind a cone that is 5 yards from the first hurdle in the row (Figure 7.9a).

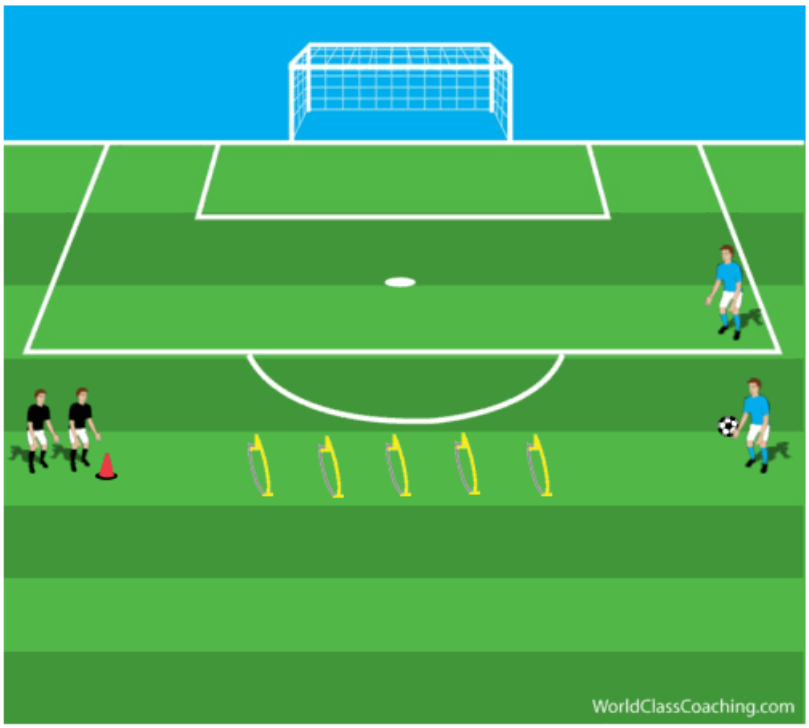


Figure 7.9a

When ready, have the player at the front of the line move towards the first hurdle and, from a standing position, jump as far up as possible over the first hurdle so that they land in the space between the first and second hurdle. As soon as they land, they must immediately jump over the second hurdle and continue the process until they have cleared the 5th and final hurdle (Figure 7.9b).

Upon clearing the final hurdle, they will run to the coach who will toss them a ball that they must play with a one-touch volley into the hands of a second coach standing 5 yards to the right of the one who tosses the ball. As soon as the player is finished, have them quickly join the back of the line. Repeat for a total of 5 or 6 repetitions.

Figure 7.9b

Coaching Points: The player should begin with a countermovement and jump up and over the hurdles by explosively extending the ankles, knees and hips, while using the arms to assist. This exercise is intended to be a short response activity and therefore the time between landing and subsequent takeoff should be very short. Emphasize quick and fluid movements between each jump.

When volleying, the player should be compact over the ball. The ankle should remain locked with the toes pointing upwards, and the leg should follow through in the direction of the second coach (where they are playing the ball).

Progression: You can progress this exercise to i) an ***intermediate*** level by increasing the height of the hurdle; or ii) a ***high*** level by having the player jump off and land on 1 leg.

Multiple Lateral Hurdle Jumps with Drop Ball Finish

Category: Multiple Lateral Jumps with Short Response

Intensity Level: Intermediate

Set-up and Directions: Place five hurdles (or large cones) 1 yard apart in a straight line so that the row of hurdles is approximately 5 yards from the edge of the 18-yard box. The last hurdle in the row should be in line with the penalty spot. Have a small group of players line up behind a cone 3 yards from, and in line with, the first hurdle in the row. The players should be facing the goal (Figure 7.10a). The coach should be standing on the edge of the 18-yard box with a ball in their hands.

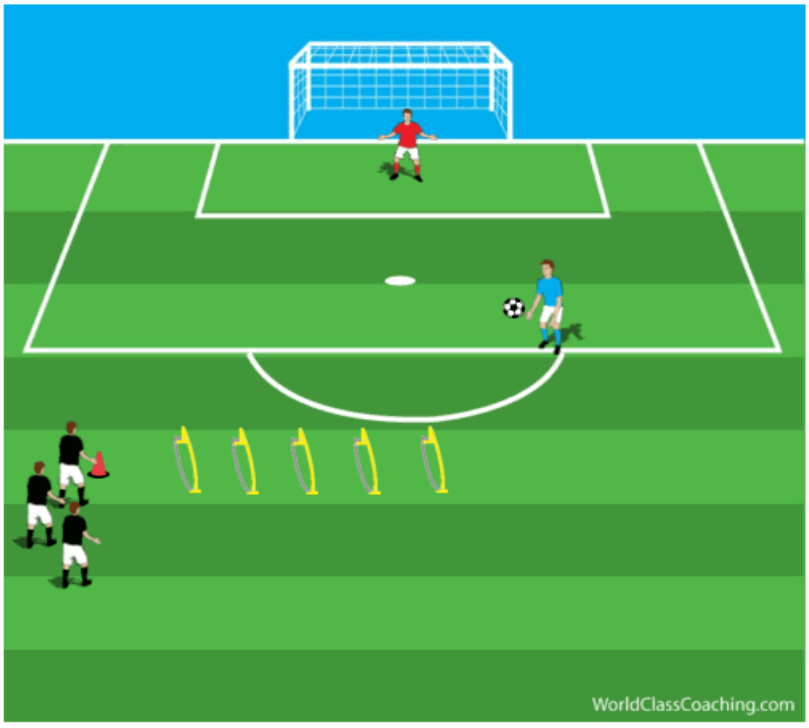


Figure 7.10a

When ready, have the player at the front of the line move towards the first hurdle and from a standing position, jump as far up as possible, but ***laterally***, over the first hurdle so that they land in the space between the first and second hurdle. As soon as they land, they must immediately jump over the second hurdle and continue the process until they have cleared the 5th and final hurdle (Figure 7.10b).

Upon clearing the final hurdle, they will run towards the coach who will then drop the ball for the player to finish first time on goal. As soon as the player is finished, have them quickly join the back of the line. Repeat for a total of 5 or 6 repetitions.

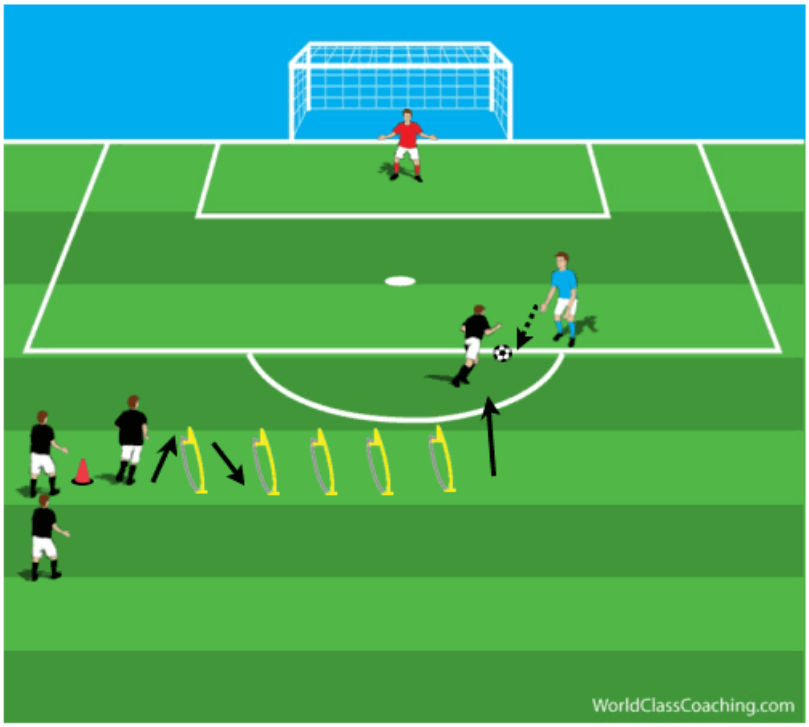


Figure 7.10b

Coaching Points: The player should begin with a countermovement and jump up and laterally over the hurdles by explosively extending the ankles, knees and hips, while using the arms to assist. This exercise is intended to be a short response activity and therefore the time between landing and subsequent takeoff should be very short. Emphasize quick and fluid movements between each jump.

When finishing, they must attack the ball and adjust their body appropriately to finish with one touch. The follow through of the finishing leg should be towards the target.

Progression: You can progress this exercise to i) an ***intermediate to high*** level by increasing the height of the hurdle; or ii) a ***high*** level by having the player jump off and land on one leg.

180-Degree Jumps with Side-Footed Volleys

Category: Standing 180-degree Jump with Long Response

Intensity Level: Intermediate to high

Set-up and Directions: Divide your players into groups of three. Place a hurdle or large cone in the middle of two players that are standing 10 yards apart, but facing each other. Have the third player stand 6 to 12 inches in front of the hurdle facing one of the two outside players. The players on the outside should both have a ball in their hands (Figure 7.11a).

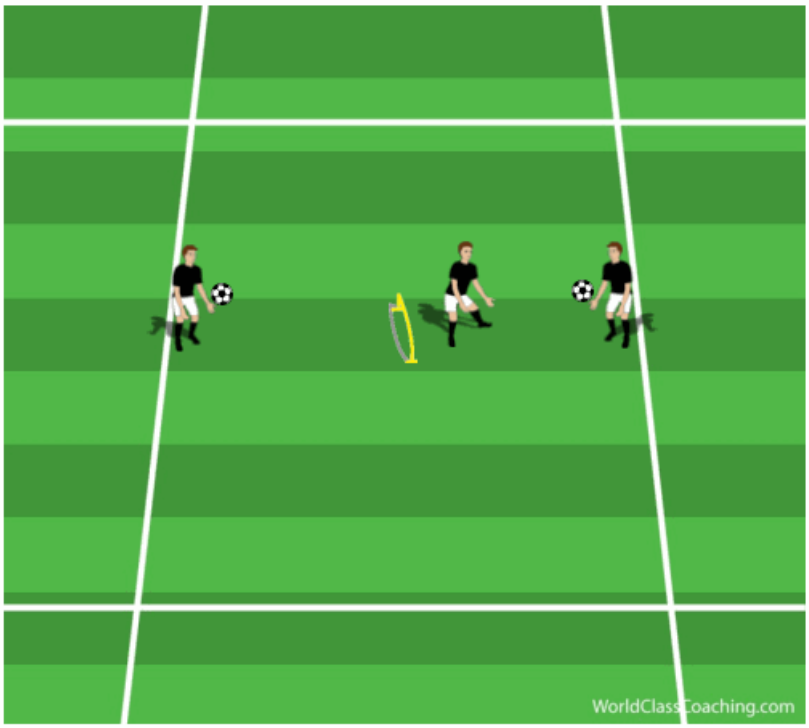


Figure 7.11a

When ready, have the middle player jump up and over the barrier behind them, by performing a 180 degree turn while in the air, so that they face the other player upon landing. As soon as they land, they will receive a tossed ball from the outside player, which they must return with a side-footed volley (Figures 7.11b and 7.11c).

Immediately after returning the pass, they should ready themselves and perform another 180-degree jump so that they return to the initial starting position. Upon landing, they again receive a ball from the outside player which they again return with a side-footed volley. Continue this process until the player has performed 5 to 6 repetitions and then switch roles.

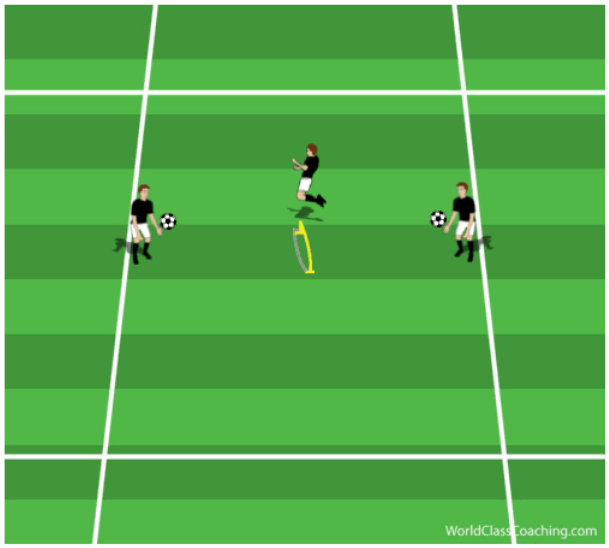


Figure 7.11b

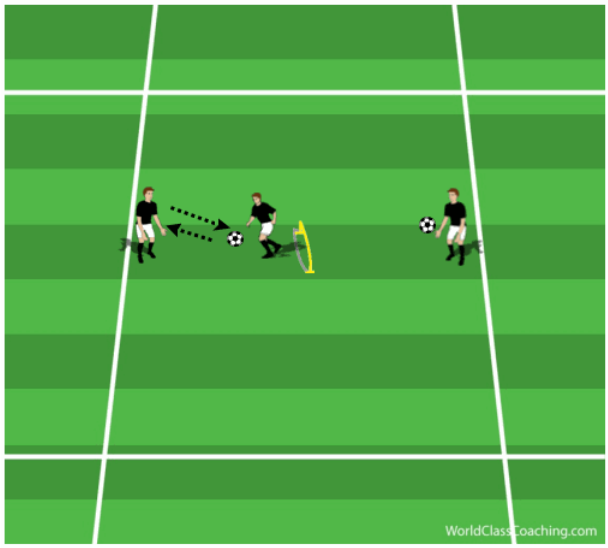


Figure 7.11c

Coaching Points: When jumping, the player should begin with a counter movement and jump explosively upwards and backwards, while rotating 180-degrees in the air. They must jump high enough to perform the turn and clear the hurdle; so emphasize powerful extension of the ankles, knees and hips as well as proper arm action. You should emphasize proper landing technique (discussed earlier) as well.

Variation: You can vary the exercise by having the players perform a different technical action such as volleys with the laces, or control with the chest and then volley.

Progression: You can progress this exercise to a ***high*** intensity level by having the players jump off and land on one leg or by increasing the height of the hurdle.

Split Squat Jumps with Juggling

Category: Multiple Jumps (in place) with Short Response

Intensity Level: Intermediate to High

Set-up and Directions: Give each player a ball and ensure that they are at least 4 to 5 yards away from any other player. When ready, have your players get into the down phase of the lunge (right thigh parallel to the ground and let knee almost touching the ground (Figure 7.12a) and then perform 5 to 6 repetitions of a split squat jump (Figure 7.12). As soon as your players are finished, have them perform keep-ups for 90 seconds and then have them perform another set of jumps for a total of 2 or 3 sets.

a) **b)** **c)**

Figure 7.12

Coaching Points: The players should begin in the down phase of the lunge exercise (Figure 7.12a). Initiate the jump with a slight countermovement and then jump upwards by explosively extending the ankles, knees and hips. While in the air, they should switch positions of the legs so that they also land in a lunge position but with the position of the legs reversed (Figures 7.12b and 7.12c).

This exercise is intended to be a short response activity and therefore the time between landing and subsequent takeoff should be very short. Emphasize quick and fluid movements between each jump.

Variation: You can vary this exercise by asking your players to use the thigh or the outside and inside of the foot only when juggling; or by having them use specific body parts in sequence. For example: foot, then thigh, then head.

Multiple Zigzag Hurdle Jumps with Touch into Space and Dribble

Category: Multiple Diagonal Jumps with Short Response

Intensity Level: High

Set-up and Directions: Place seven hurdles 2 feet apart in a zigzag pattern. Have a small group of players line up behind a cone 3 yards from, and in line with, the first hurdle in the row. The coach should stand approximately 5 yards from and in line with the last hurdle in the row with a supply of balls (Figure 7.13a). Place another cone 5 to 7 yards to the left or right (right in picture) of the coach.

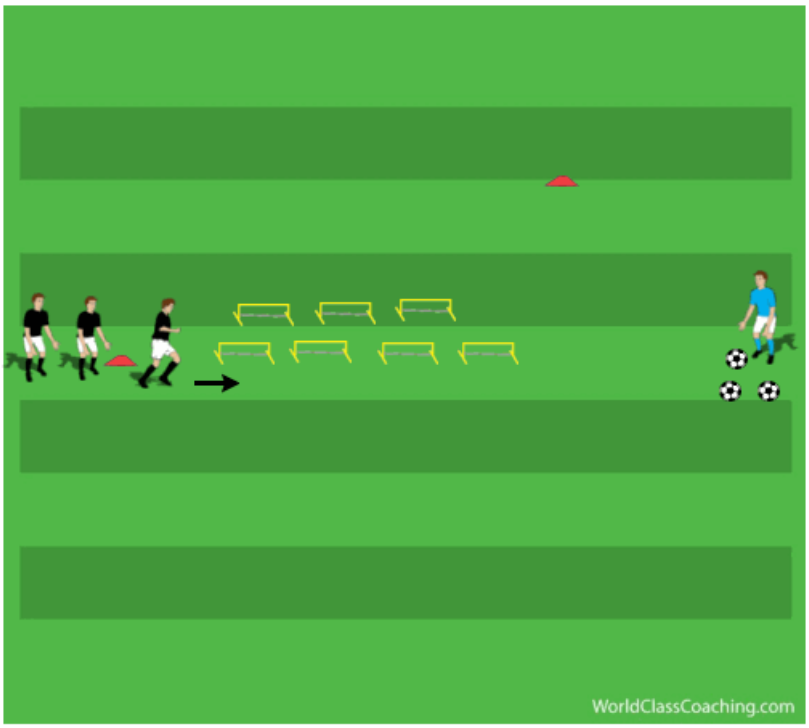


Figure 7.13a

When ready, have the first player approach the outside of the first hurdle and, from a standing position, jump diagonally to the outside of the second hurdle. As soon as they land, they must immediately jump diagonally over the second hurdle to the outside of the third hurdle and continue the process until they have cleared the 7th and final hurdle (Figure 7.13b).

After clearing the final hurdle, they must run towards the coach, who will play a ball into their feet that they must play into the direction of the cone to their left with their ***first touch*** (Figure 7.13c). They must then dribble to the cone with their subsequent touches and then return the ball to the coach. As soon as the player is finished, have them quickly join the back of the line. Repeat for a total of 5 or 6 repetitions.

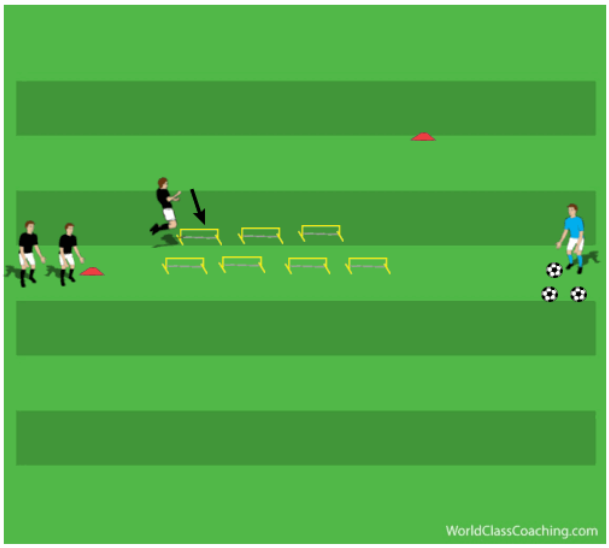


Figure 7.13b

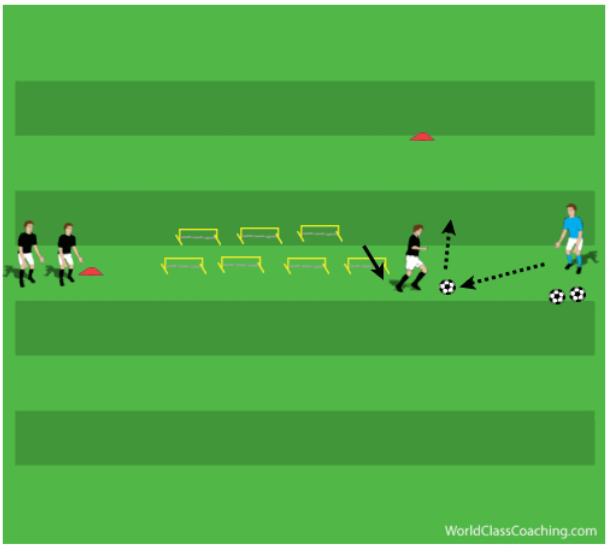


Figure 7.13c

Coaching Points: The player should begin with a countermovement and jump up and diagonally over the hurdles by explosively extending the ankles, knees and hips, while using the arms to assist. This exercise is intended to be a short response activity and therefore the time between landing and subsequent takeoff should be very short. Emphasize quick and fluid movements between each jump.

Variation: You can vary the exercise by changing the type of pass or the part of the body they use to take their first touch. For example, begin by having them take their first touch with the inside of the foot. You can then switch to the outside of the foot; bounce passes and finally tosses to the chest.

Progression: You can progress this exercise by increasing the height of the hurdle or by switching to a one-legged takeoff and landing (very advanced level!).

EXERCISES FOR DEVELOPING POWER IN THE UPPER-BODY

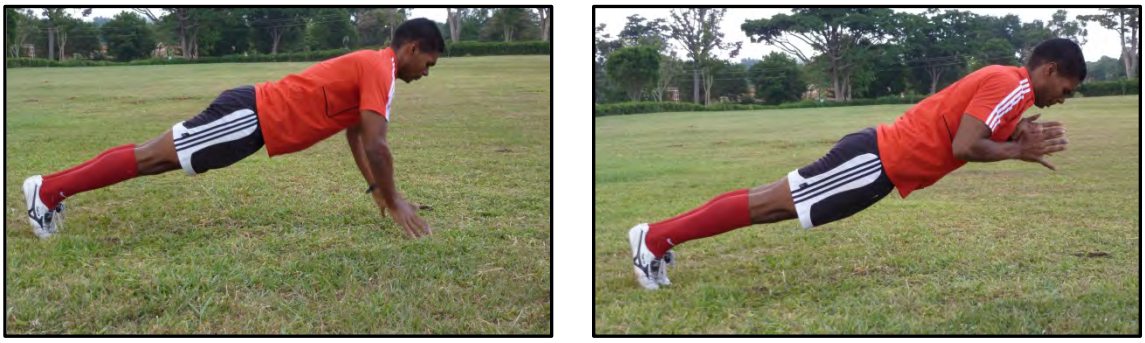
For an outfield soccer player, improving performance in jump and sprint-related actions are a top priority. For many coaches therefore, developing explosive power in the lower, rather than the upper-body may be the main objective. However, the goal is to establish whole-body explosive power, and coaches should therefore incorporate exercises targeting the upper-body in the power training program as well.

In the section below, we present a few exercises for developing upper-body power, and describe ways in which you can integrate technical work into each activity. Performing 2 to 3 sets of one of the following exercise in every power training routine should suffice.

The Clap Push-up

Level: Low

Description: The clap push-up is similar to the standard push-up exercise described in detail in Chapter 6. However, at the bottom of the movement, the player must push off with enough force enabling them to clap their hands and put them back in place before returning to the starting position (Figure 7.14a and 7.14b)



a) **b)**

Figure 7.14

Sample Exercise: Clap Push-up with Two- Touch Passing

Directions and Coaching Points: Divide your players into groups of two with one ball for each pair. Have them stand approximately 10 yards apart. Instruct them to pass back and forth between each other (they must take 2 touches). After 90 seconds, all players perform a set of 6 to 8 clap push-ups. When completed, have them return to passing for another 90 seconds, after which, they perform a second set of clap push-ups. Continue this cycle for the desired amount of sets.

Variation: You can vary the passing component of the exercise by i) having the players control with the right then pass with the left (and vice versa); ii) control with the outside of the foot and pass with the same foot; or iii) one-touch passing.

Depth Push-up

Level: Medium

Description: Have your players assume the starting position of a standard push-up but with a soccer ball placed directly below their chests. Instruct them to lower themselves until their chest touches the ball (Figure 7.15a). At this point, have them forcefully push up so that they can place both hands on the soccer ball (Figure 7.15b) and then fully extend the elbows (Figure 7.15c). At the top of the movement, quickly remove the hands and repeat the procedure for a total of 5 to 6 repetitions.

a) **b)** **c)**

Figure 7.15

Sample Exercise: Depth Push-up with Individual Dribbling

Directions and Coaching Points: This exercise uses the penalty box for the playing area. Each player needs a ball. Instruct them to dribble around inside the playing area using small touches while keeping their heads up. They are not allowed to go outside the penalty box. After 90 seconds, have all players perform 5 repetitions of depth push-ups. As soon everyone is finished, have them dribble again for another 90 seconds, after which, they perform a second set of depth push-ups. Continue this cycle for the desired amount of sets.

Variation: You can vary the dribbling component by i) having them take alternate touches with the inside then outside of the foot; ii) having them perform a step-over after every three touches; iii) having them dribble with the weaker leg only; iv) performing a cutback after every 3 touches; or v) any way you feel appropriate.

PLYOMETRIC TRAINING FOR YOUNG SOCCER PLAYERS

As with strength training, plyometric training for youth players is considered by many to be unsafe and unsuitable. However, if the appropriate exercises are chosen and properly supervised, this form of training can be very beneficial to the young soccer player, as it may increase muscular power as well as bone and ligament strength. In fact, scientific research has shown that plyometric training in pre-adolescent soccer players can improve performance in power-related tests such as speed and jump assessments.

At no time however, should pre-puberty or adolescent players participate in high intensity exercises such as depth jumps or single-leg hops over hurdles, as these exercises require a substantial amount of lower body strength, and may lead to serious injury. For players in these age groups, learning proper jumping and landing technique should be the main priority. These players should start with low intensity exercises such as double-legged vertical jumps, rope jumping, skipping, or jumping unto a box of low height. Players can progress to exercises of an intermediate level only after learning proper plyometric technique and a suitable strength base has been developed.

Similar to their adult counterparts, young players can perform plyometric exercises once or twice a week, but you must allow at least three days rest between each workout. Two exercises (2 or 3 sets per exercise) should be sufficient. In comparison to older players however, progression for young players should be a lot more gradual.

CHAPTER 8: USING BALL-ORIENTED EXERCISES TO DEVEELOP AEROBIC AND ANAEROBIC ENDURANCE

Soccer is regarded as an intermittent-type sport that requires players to perform a number of high-intensity actions over the course of a game. One the biggest concerns for the conditioning coach is ***fatigue.*** During this state, both the work-rate and the amount of high-intensity actions significantly decrease. Fatigue is also associated with impaired technical proficiency and decision-making ability.

To minize the occuurence of fatigue in players, the coach must develop their ***recovery ability***. Indeed, how well a player performs will also influenced by their capacity to recover from the many energy-consuming bouts. On this note, soccer is considered to be a random sport, because the recovery periods between these actions can range from a few seconds to a couple of minutes. In addition, unlike some sports or fitness activities, the recovery between maximum-effort bursts are ***active*** in nature, as players perform some form of low or moderate-intensity activity such as jogging or walking.

If we recall from Chapter 1, energy for short duration, high-intensity actions is supplied by the ***Phosphagen*** (PCr) and ***fast glycolytic*** systems and is generated anaerobically; whereas lower intensity activities that are longer in duration are fueled by the ***slow glycolytic*** and ***oxidative*** systems, which produce energy aerobically.

In order to cope with the energy requirements of the game and delay the onset of fatigue, it is imperative that you enhance both the ***capacity*** and ***efficiency*** of all energy systems to generate energy. To properly do this, you must choose exercises that target the appropriate intensity levels, work durations and recovery periods. Table 8.1 summarizes how each of these variables can be appropriately manipulated to emphasize the different energy systems during training.

Table 8.1: The relationship between Exercise Intensity, Exercise Duration and Work-to-Rest Ratio on the various energy systems

Energy System	Intensity Level	Duration of Work Period	Work-to-Rest Ratio
Phosphagen System	Very High	Less than 10 seconds	1:5 to 1:15
Fast Glycolytic	High	10 to 90 Seconds	1:3 to 1:5
Slow Glycolytic	Moderate	90 seconds to 2 minutes	1:2 to 1:3
Oxidative System	Low to Moderate	Greater than 2 minutes	1:1 or Continuous

Great levels of aerobic and anaerobic endurance are critical for peak performance in soccer, but exercises that develop these components are frequently quite mundane. One of the most challenging tasks for coaches is motivating players to practice at a high intensity during these types of drills. In this Chapter, we address this difficulty by introducing a set of ball-oriented and therefore more engaging exercises that can be used as an alternative to traditional endurance drills.

DEVELOPING ANAEROBIC CAPACITY

As mentioned throughout the book, the ability to perform high-intensity actions over the course a game is a key predictor of performance in soccer. In fact, one of the major differences between players of higher- and lower-ranked teams is their ability to perform high-intensity activities, especially towards the end of a game. Developing the ***anaerobic capacity*** of your players will increase their potential to perform short sprints and other high-intensity actions.

In the past, coaches generally use shuttle runs and similar activities involving all-out sprints that do not involve ball work to condition their players anaerobically. However, in the section below, we provide a variety of ball-oriented exercises that integrate anaerobic conditioning with technical and tactical training.

EXERCISES TO DEVELOP THE PHOSPHAGEN SYSTEM

1 v 1 Breakaway Game

Set-up and Directions: Place a cone on the centre point of the half-way line and have a small group of players stand behind this cone. These players will be the retreating defenders. Place another cone approximately 15 yards in front of the first cone in the direction of the 18-yard box. Have a second group of players, with a ball each, stand behind this cone. These will be your breakaway attackers. Have a goalkeeper stand a yard off their line facing the two groups of players (Figure 8.1a).

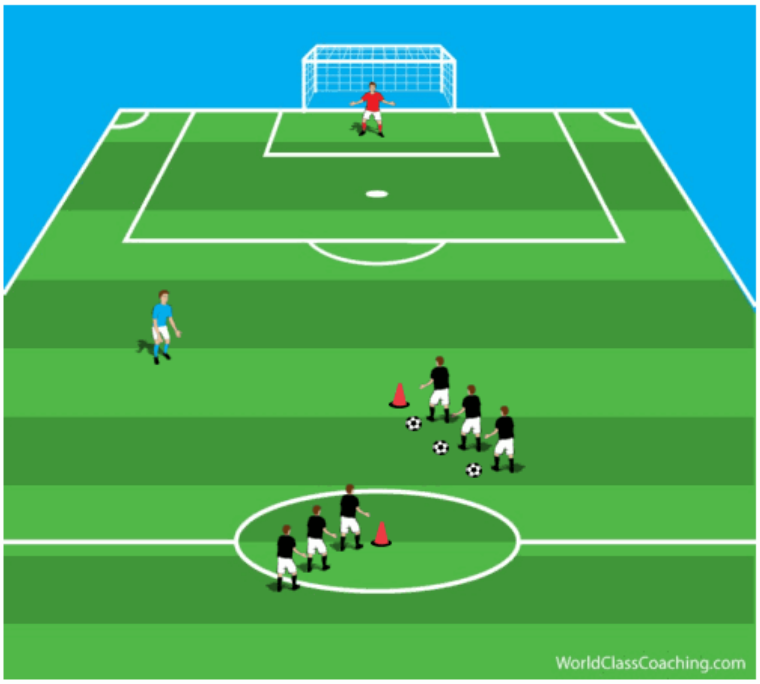


Figure 8.1a

On the coach's call, the player at the front of the line closer to goal dribbles as fast as possible, but under control, towards the net. They must attempt to take a shot on net but are only allowed to shoot once they have entered the 18-yard box (Figures 8.1b and 8.1c).

As soon as the dribbling player takes off, the player at the front of the line on the half-way line is allowed to go. Their role is to sprint and catch up with the dribbling player and attempt to make a tackle before that player can get a shot on net. The goalkeeper is allowed to tackle or make a save, but must stay on their line until the dribbling player takes their first touch towards goal.

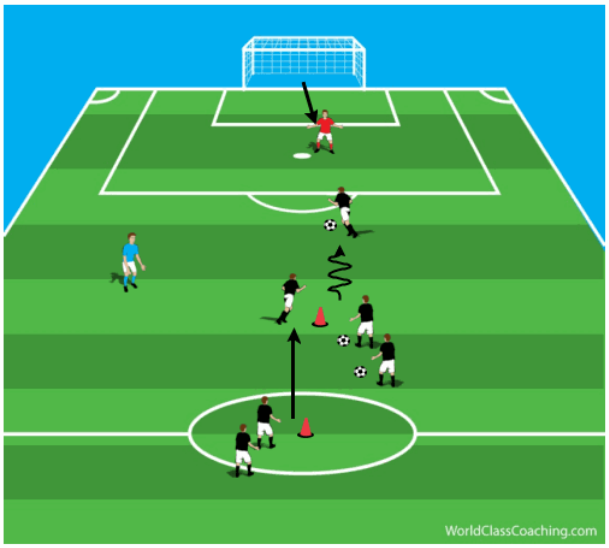


Figure 8.1b

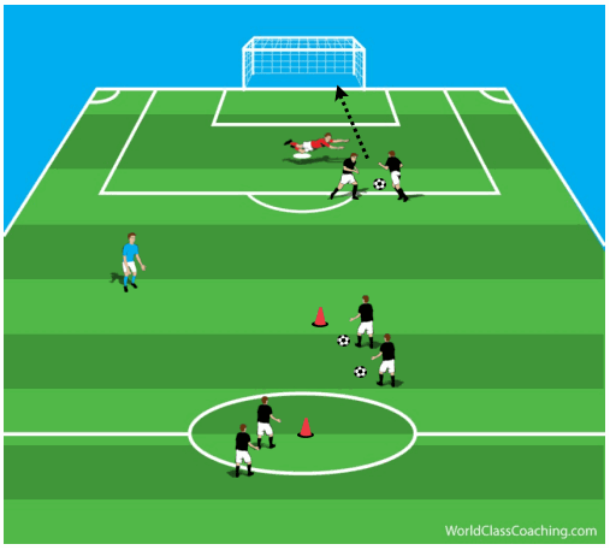


Figure 8.1c

Work-to-rest Ratio: This play should last no longer than 7 to 10 seconds. The time taken to jog back into place and rest before performing another repetition should range between 45 to 90 seconds. This gives a work-to-rest ratio ranging from 1:5 to 1:10. Have your players switch lines after each repetition and perform a total of 8 to 10 repetitions.

Coaching Points: The dribbling player must use proper speed dribbling technique. The first touch must be slightly bigger than the rest and should be towards the direction of the goal. They should use the laces or the outside of the foot to dribble and upon contact with the ball the toes should be pointing down. In addition, they should attempt to get their body between the ball and recovering defender.

The recovering defender must take off as quickly as possible and use rapid, powerful strides while accelerating. Their runs should be towards the mid-point of the goal and they should attempt to get between the ball and the player to make a tackle.

Variation: You can vary this exercise by having the coach play a ball for the player in the line closer to goal to run unto, or by having the dribbling player make a wall pass with the coach before dribbling into the 18-yard box. All other rules remain the same.

1 v 1 Dribble to line

Set-up and Directions: Divide your players into groups of two (or three). For each group, set up a playing area 12 yards in length and 7 yards wide. Have one player stand at the top line of the playing area facing a second player with a ball, who will be standing on the line at the base of the playing area (Figure 8.2a).

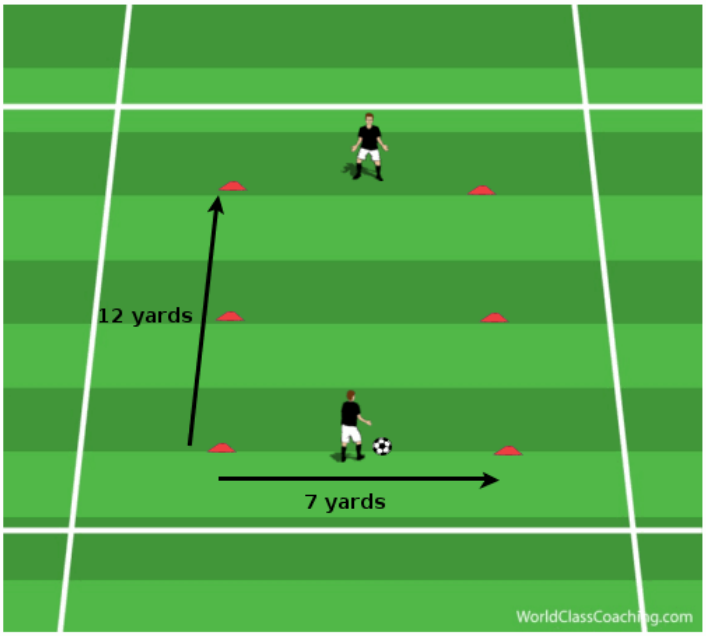


Figure 8.2a

Play is initiated by the player with the ball playing a firm pass into the feet of the second player at the top of area. As soon as the receiving player takes their first touch, they should attempt to take on the other player by dribbling and stop the ball on the end-line at the bottom of the grid (Figures 8.2b and 8.2c).

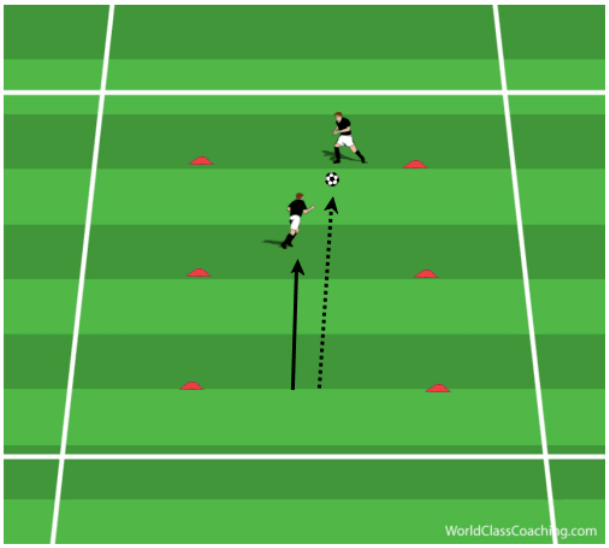


Figure 8.2b

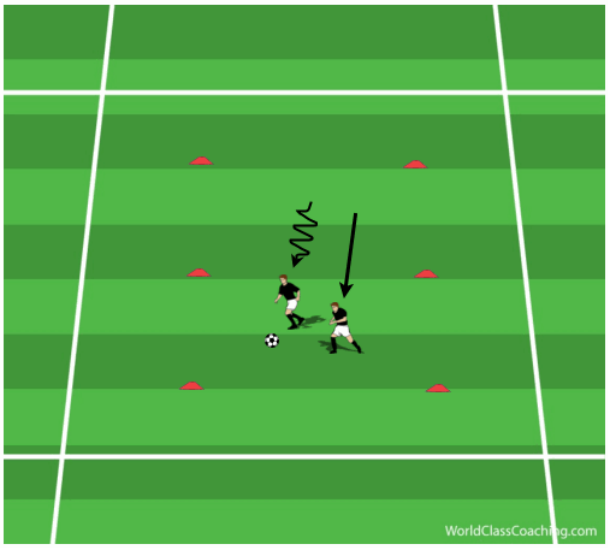


Figure 8.2c

As soon as the player makes the initial pass, they should follow their pass and try to prevent the dribbling player from beating them. If they win the ball, they should try and dribble and stop the ball on the end-line at the top of the grid. The play is over when either player stops the ball on their intended end-line, if the ball goes out of the grid, or after 10 seconds of continuous play.

Work-to-rest Ratio: Each play should last no longer than 5 to 10 seconds and the players should rest for no longer than 45 seconds between goes. This will give a work-to-rest ratio between 1:5 and 1:10. Have the players switch roles after each repetition and perform a total of 2 sets, 10 repetitions per set.

Coaching Points: The player who makes the initial pass must close down the attacking player as quickly as possible using rapid, powerful steps. However, as they approach the dribbling player, they must slow themselves by taking shorter steps so as not to over-commit. The defending player should attempt to be no more than an arm's length away from the dribbling player and should also assume a side-on position with a low centre of gravity.

A good first touch, into space, is essential from the attacking player. They must also take small touches while dribbling and attempt to take the defending player on at speed. You should also encourage them to use a variety of moves such as step-overs and fakes in an attempt to beat the defender.

Variation: You can vary this exercise by placing a third player on either side of the grid, which the attacking player can make a wall-pass with in an attempt to beat the defender player (Figure 8.2d). This player should be limited to one-touch however.

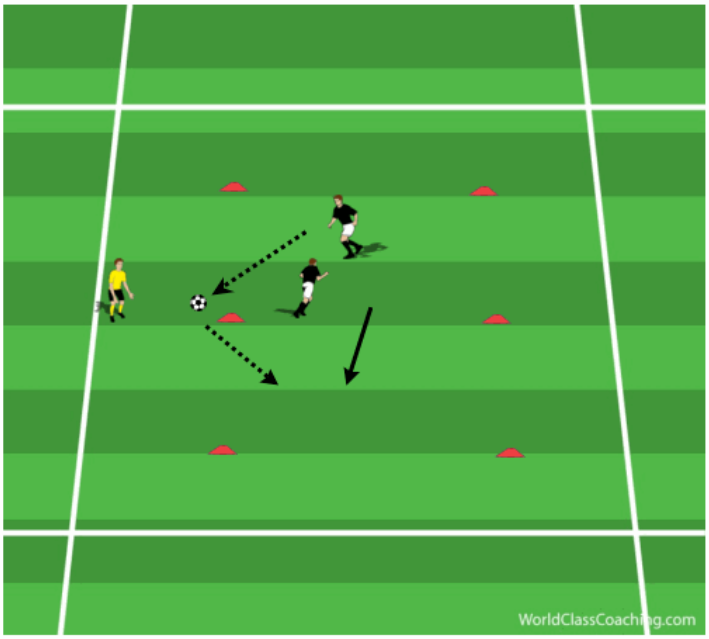


Figure 8.2d

Shuttle runs with Speed Dribbling

Set-up and Directions: Divide your players into groups of three or four. For each group, set up four cones, 5 yards apart in a straight line. Have the group of players stand behind the first cone in the row. The player at the front of each line should have a ball at their feet (Figure 8.3a).

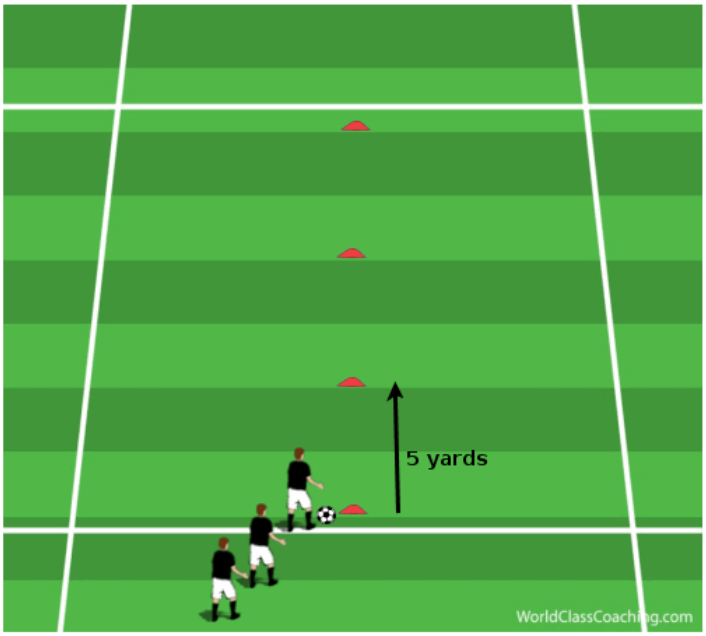


Figure 8.3a

On the coach's signal, the player at the front of each line dribbles as quickly as possible towards the cone 5 yards away. Upon reaching the cone, they should stop the ball, turn and dribble back towards the starting cone (Figure 8.3b and 8.3c).

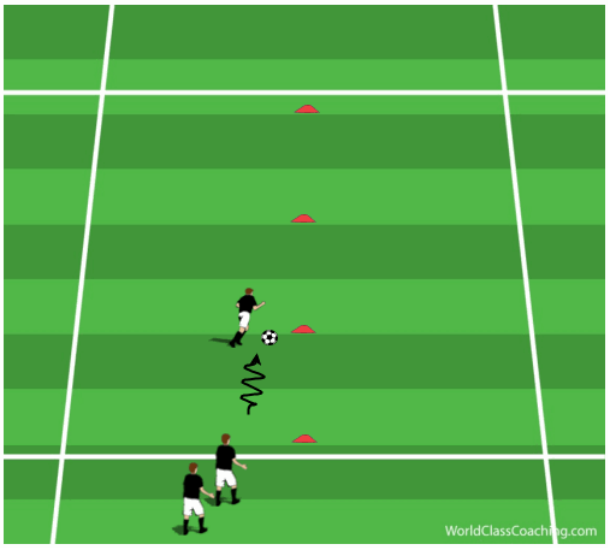


Figure 8.3b

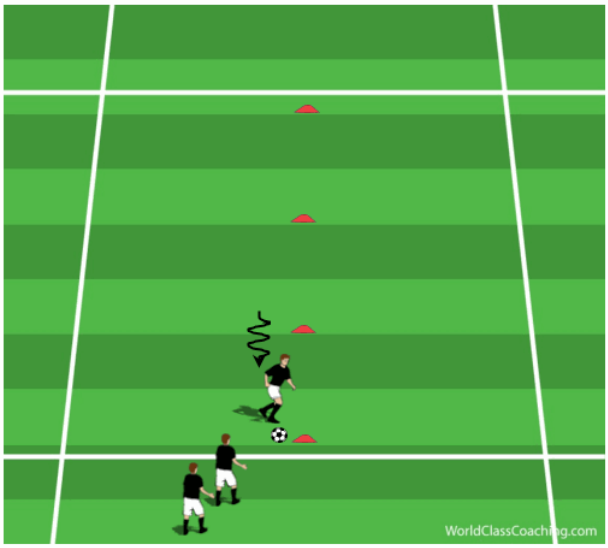


Figure 8.3c

Once they reach the starting cone, they again stop the ball, turn, and then dribble towards the third cone in the row (10 yards from the starting cone). They must continue this sequence until they have dribbled to all three cones and back. After returning from the third and final cone, they must stop the ball at the feet of the player next in line, so that they can perform the same sequence.

Work-to-rest Ratio: The time each player takes to perform one round of shuttle dribbles should last no more than 10 to 15 seconds. The recovery between repetitions should be the time taken for all the players in front of them to perform their runs and should be no longer than 1 minute (60 seconds). This gives a work-to-rest ratio of approximately 1:5. Perform a total of 2 to 3 sets with 3 repetitions per set.

Coaching Points: Players must dribble as fast as possible under control. Encourage them to take small touches and dribble with their heads up. By forcing them to stop the ball at each cone, you will ensure that they dribble under control.

Variation: You can vary this exercise by instructing the players to perform a particular turn at each cone. For example, they must turn using either the outside, inside or sole of the foot. You can also instruct them to dribble with their weaker foot only or to use a particular surface of the foot (inside, outside or a combination) when dribbling.

EXERCISES TO DEVELOP THE FAST GLYCOLYTIC SYSTEM

Pass and Sprint to Open Cone

Set-up and Directions: Divide your players into groups of four. Each group needs a ball. For each group, set up a 20 yard by 20 yard playing grid. Place five cones inside the grid at random points. However, ensure that each cone is at least 10 yards away from the nearest cone. Have each player stand at a different cone, so that one cone is without a player .One of the four players should have a ball at their feet (Figure 8.4a).

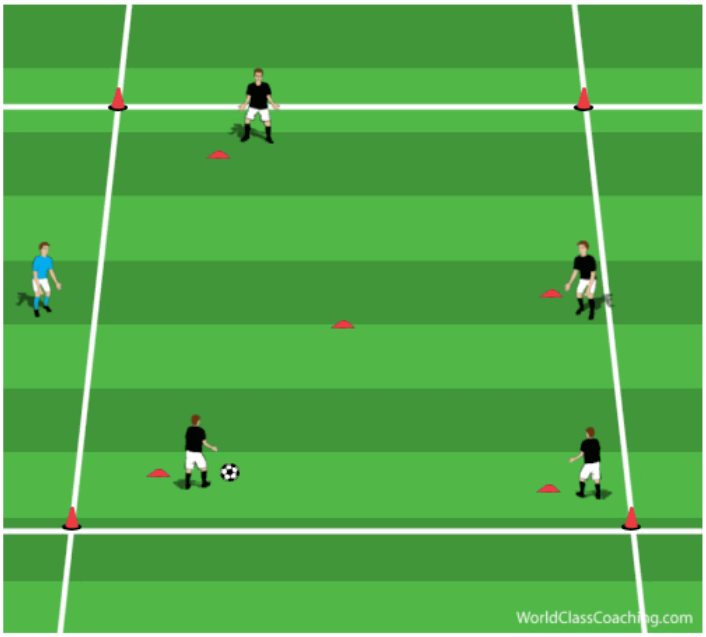


Figure 8.4a

When ready, the player with the ball plays a firm pass into the feet of any of the other three players. As soon as they make this pass, they must sprint to the open cone (Figure 8.4b). The player who receives the pass must take a touch and then pass it to another player, followed by a sprint to the open cone (Figure 8.4c). However, they are not allowed to pass it to the player from whom they received the pass.

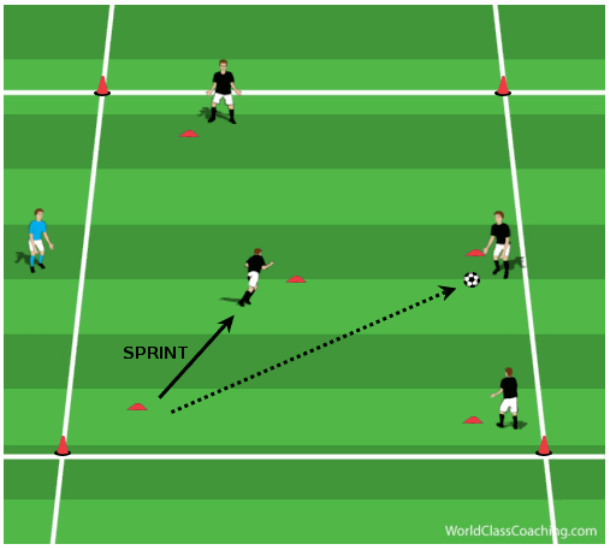


Figure 8.4b

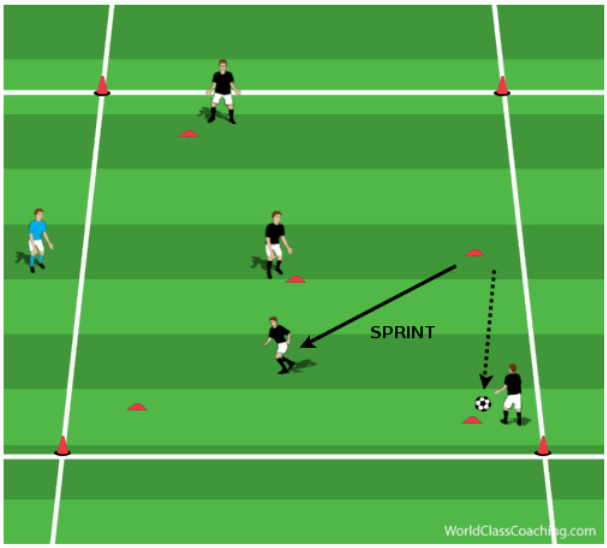


Figure 8.4c

Work-to-rest Ratio: Have the players continue this passing sequence for 90 seconds and then rest for three minutes. Because they rest intermittently throughout the exercise this works out to be a work-to-rest ratio of about 1:3. Perform a total of 4 to 6 repetitions.

Coaching Points: After making a pass, the player should take a powerful first step in intended direction and short, powerful steps while accelerating. Ensure the players maintain good posture (positive body lean) while accelerating. Upon approaching the cone, the players should take small strides to decelerate.

Encourage the players to move the ball as quickly as possible while making quality (good weight and accurate) passes. Players should decide who they are passing to before they receive the pass and should therefore take their first touch in that direction.

Variation: You can vary this exercise by having the players speed dribble to the open cone and then making a pass to another player or you can instruct the players to take their first touch with a specific part of the foot (inside or outside) into space.

Progression: You can progress this exercise by limiting the players to one-touch only or by having them perform ***rapid*** backpedals or side-to-side shuffles instead of sprinting. You can also divide the players into groups of three and therefore the time between sprints will be reduced.

Control, Pass and Sprint

Set-up and Directions: Divide your players into groups of two. For each group, set up the following station: Place two small cones 2 yards apart horizontally. Have a player stand at any of these two cones with a ball at their feet. Place a second pair of small cones horizontally so that they are 15 yards apart but 10 yards away from the first set of cones. These cones will be for the second (working) player. Have the working player stand at the cone on the side that their partner is on. The two players should be facing each other (Figure 8.5a). Play is initiated by the player with the ball making a pass to the feet of their partner who takes a touch and then immediately plays the ball back (Figure 8.5b).

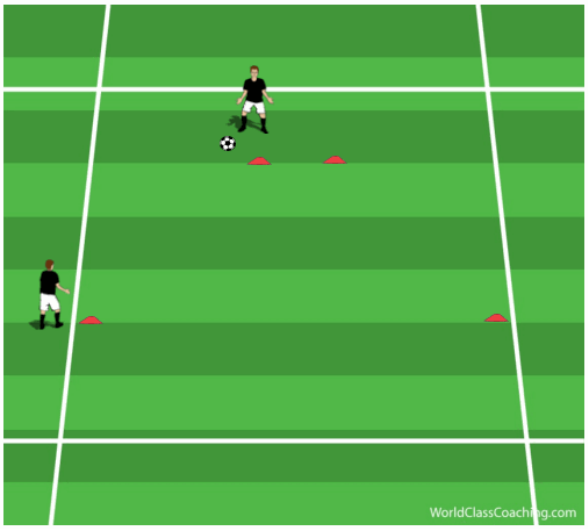


Figure 8.5a

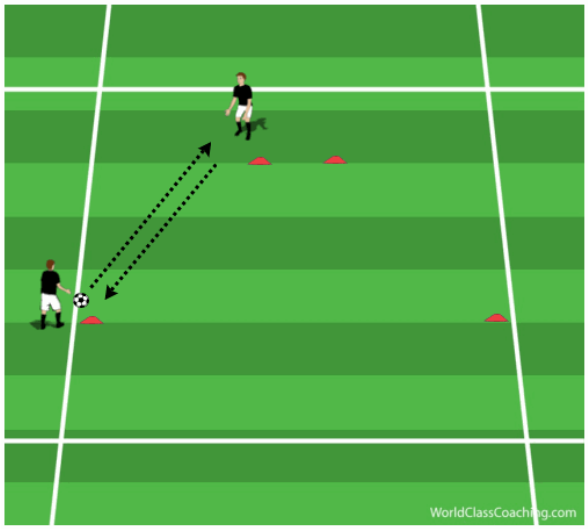
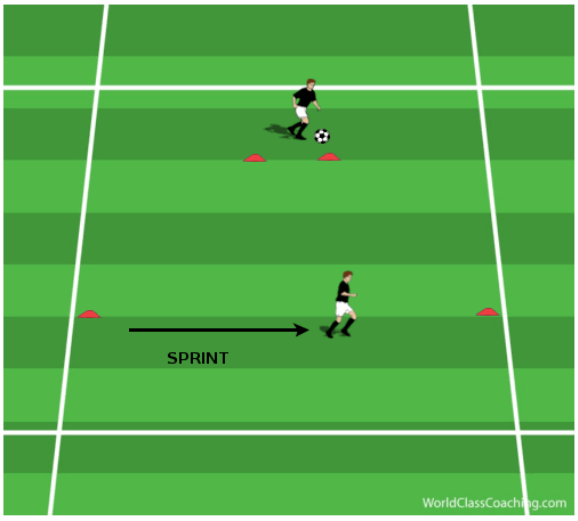


Figure 8.5b

As soon the working player returns the pass, they must turn and ***sprint*** towards the cone 15 yards away (Figure 8.5c). At this point they will receive another pass from their partner (who has also moved to the second cone) which they must again control and quickly return (Figure 8.5d).



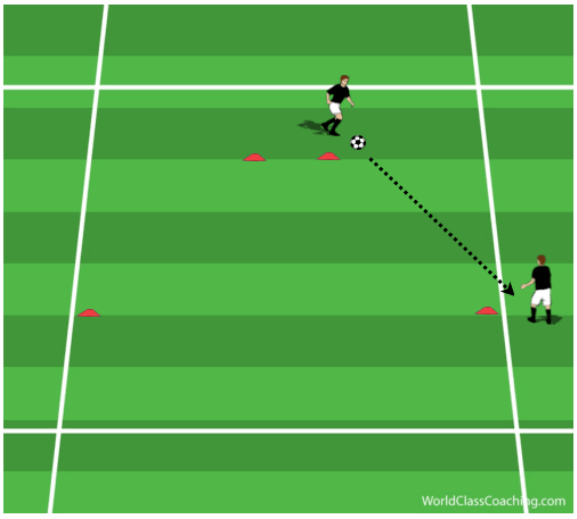


Figure 8.5c **Figure 8.5d**

Work-to-rest Ratio: Continue this sequence of control-pass-sprint for 60 seconds and then have both players rest for 60 seconds. Have the players switch roles after every 60-second repetition. This works out to be a work-to-rest ratio of 1:3, because the period during which the player is acting mainly as the passer is considered to be a part of the recovery period. Have each player perform a total of 4 to 6 ***working*** repetitions.

Coaching Points: Encourage the players to move the ball as quickly as possible but with quality (good weight and accuracy) passes. After making a pass, the working player should take a powerful first step in intended direction and short, powerful steps while accelerating. Ensure the players maintain good posture (positive body lean) while accelerating. Upon approaching the cone, the player should take small strides to decelerate.

Variation: You can vary the exercise by having the working player speed dribble to the cone 15 yards away before returning the ball to their partner. They then sprint back to the initial cone and repeat the sequence of control-speed dribble-pass-sprint.

Progression: You can progress this exercise by changing the delivery of the passes (bounced passes or air balls) into the working player, or by having the working player jump over hurdles while sprinting between the cones (Figure 8.5e).

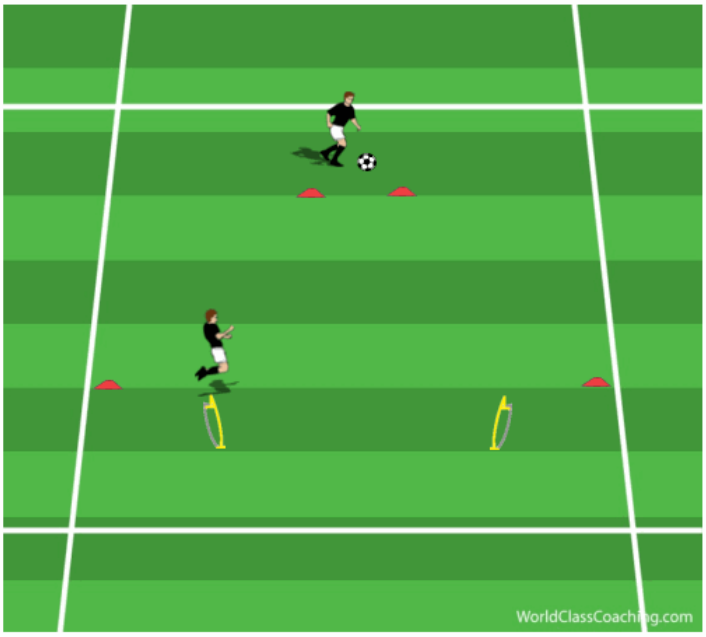


Figure 8.5e

DEVELOPING AEROBIC CAPACITY

During a soccer match, a large percentage of time is spent doing low to moderate- intensity activities such as jogging back into position, or moving into space to stretch the field. To meet these demands, it is important that players have high levels of aerobic endurance. Indeed, soccer players have very high measures of VO_2max -- the maximal amount of oxygen consumed by the body per minute, which is used as a measure of aerobic endurance or capacity. More importantly, increasing your aerobic capacity also improves your ability to recover during bursts of high-intensity activities, and prevents a decrease in technical performance that occurs with fatigue.

Several methods exist that can be used to develop aerobic endurance. These include: i) the continuous work method; ii) interval training; and iii) Fartlek or variation training.

Soccer coaches have traditionally used the continuous work method (slow long distance running for example) to develop the aerobic capacity of their players. However, as with all exercises, it is important that the coach choose a method that meets the demand of the sport. For example, long slow distance running will improve the endurance capabilities of your players, but can actually decrease force production capabilities in sprint and other explosive- related actions. Moreover, although soccer players do a lot of jogging over the course of the game, it is never in a continuous manner. As such, methods such as interval and Fartlek training that involves performing short periods of high intensity work interspersed with work periods of lower intensities are more soccer appropriate.

The exercises presented in the sections below target aerobic conditioning but involve soccer-specific actions and mimic situations likely to occur throughout the course of a game.

EXERCISES TO DEVELOP THE SLOW GLYCOLYTIC SYSTEM

Teaching the Back and Midfield Four Defensive Shape

Set-up and Directions: Divide your players into groups of four and pair two groups together. This exercise uses a playing area that is 20 yards long and 40 yards wide. Place 4 cones approximately 14 yards apart in a horizontal line. Have the players of one group stand at each of these cones (these players are not allowed to move or enter the playing grid). Place another 4 cones 14 yards apart so that each of these cones is in line with a cone from the first set but 20 yards away. Instruct the players of the second group to stand at each of these cones opposite to the players of the first group (these are your defenders). One of these four defenders should have a ball (Figure 8.6a).

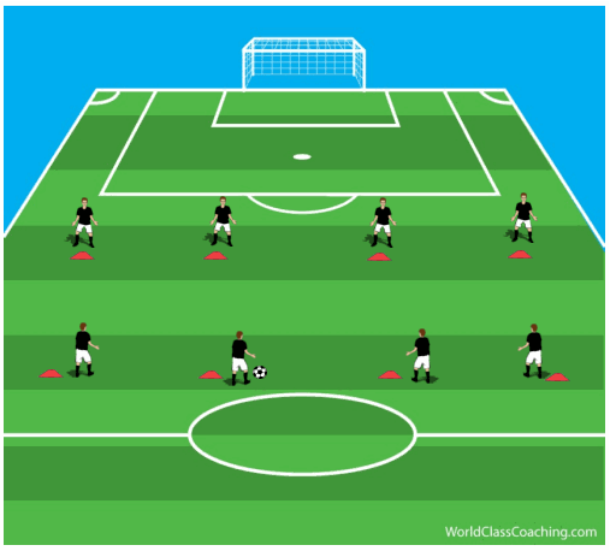


Figure 8.6a

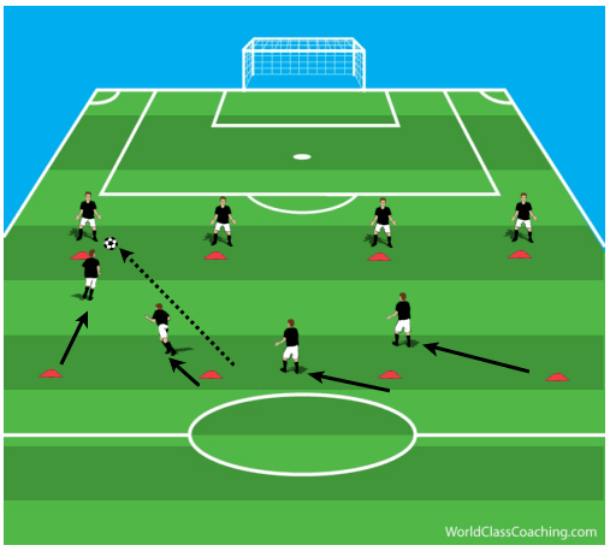


Figure 8.6b

Play is initiated by the defender with ball playing a pass into the feet of any of the four players standing at the top of the grid. In this example, he has passed to the player furthest to his left. At this point, the leftmost defender applies immediate pressure, while the remaining defenders provide cover and balance (Figure 8.6b).

The player who receives the ball must take a touch and then pass it to any of the players to their left. In this example, he has passed it to the player directly to his left (Figure8.6c). When this happens, the covering defender (second from left) becomes the first defender and immediately applies pressure on the ball. The remaining defenders then assume positions to provide cover and balance (Figure 8.6c).

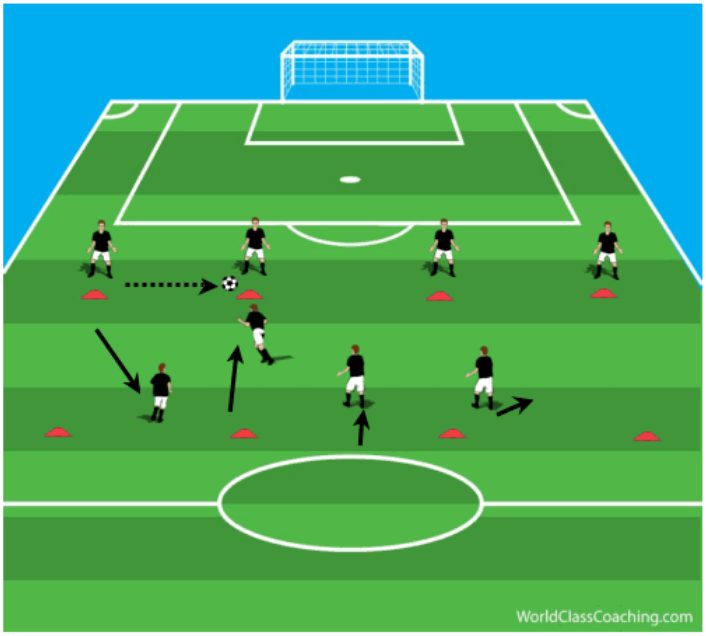


Figure 8.6c

The player (second from top left corner) who receives the ball must take a touch and can then pass it back to the player who he received the pass from, or switch it to any of the two players on his left. In this example, they have switched it to the player at the far right corner (Figure 8.6d). The defender on the right now becomes the first defender and applies pressure, while the central and left defenders move into positions to provide cover and balance (Figure 8.6d).

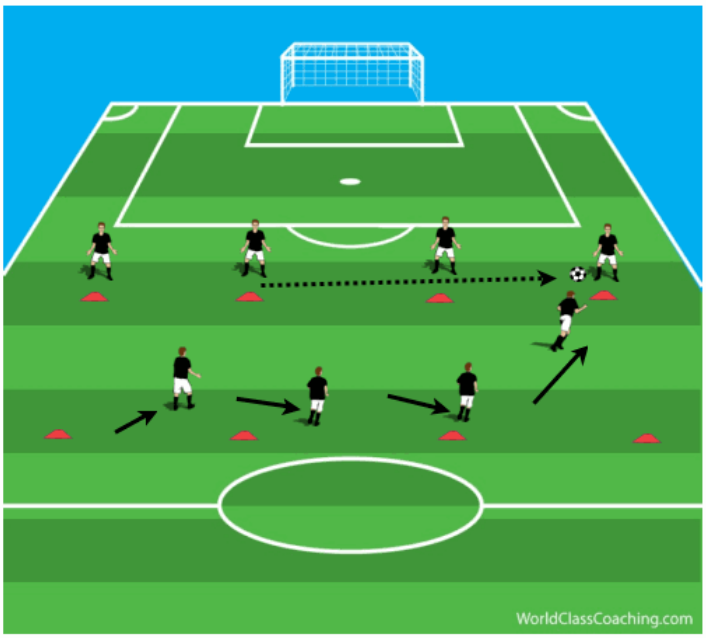


Figure 8.6d

Work-to-rest Ratio: Continue this activity for 90 seconds, rest for one minute, and then have the two groups switch roles. This gives a work-to-rest ratio of 1:3. Have each group perform 4 to 6 repetitions of defending.

Coaching Points: When applying pressure, the defender must get there as quickly as possible using fast and powerful steps, but slow themselves as they approach the player with the ball. Defenders must also move as quickly as possible, using appropriate foot work (backpedals or side-to side shuffles), when recovering from a pressuring position.

All defenders should maintain good body orientation (for example, side-on position and low centre of gravity for pressuring defenders) and must adjust their positions ***as*** the ball is played and not after the player receives the ball.

Encourage the players passing the ball to take their first touch and move the ball as quickly as possible but with quality passes.

Progression: You can progress this exercise by placing a third group of four players at the bottom of the grid. The group passing the ball at the top should now attempt to play a penetrating pass through the defending group to one of the players in the group at the bottom of the grid (Figure 8.6e).

Figure 8.6e

EXERCISES TO DEVELOP THE OXIDATIVE SYSTEM

Individual Dribbling using an Interval Training Format

Set-up and Directions: This exercise uses the 18-yard box of a regular-sized playing area as the playing grid. Give each player a ball and instruct them to dribble around inside the playing grid using small touches while keeping their heads up. They are not allowed to go outside the penalty box and they must always be moving (Figure 8.7).

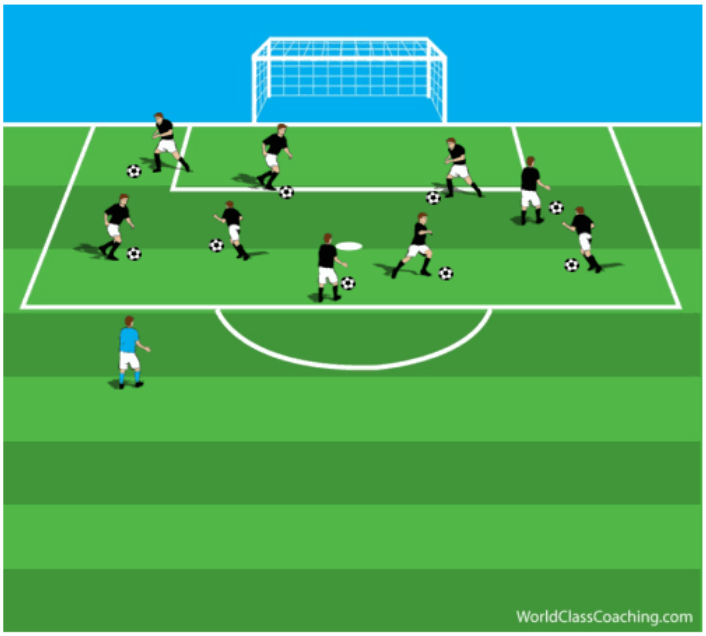


Figure 8.7

Work-to-rest Ratio: After 60 seconds, have all players dribble as fast as possible, but under control, for 10 to 15 seconds. After this period of speed dribbling, have them walk around for 30 seconds and then dribble for another 60 seconds followed by speed dribbling again. Continue this cycle (dribble--speed dribble--walk) for 15 to 20 minutes.

Coaching Points: When dribbling in the box, the players must use small touches while keeping their heads up. When speed dribbling, they must use the outside of the foot or laces, and upon contact with the ball, the toes must be pointed down with the heel up. Encourage them to use both feet when dribbling and performing skills.

Variation: Vary the dribbling component after every 1 to 2 repetitions. This is important to continuously challenge the players and ensure they do not get bored during the activity. Start by having them dribble with either foot and then progress to: i) having them dribble with the weaker (normally left) leg only; ii) having them take alternate touches with the inside then outside of the foot (inside-outside); iii) having them perform a step-over or double step-over after every three touches; iv) having them perform a

cutback after every 3 touches; and v) having them do any move they want, as long as it is as quickly it is done at pace.

Centre Circle Game for Dribbling, Passing and Sprinting

Set-up and Directions: This exercise uses a playing area 40 yards long and 30 yards wide. Set up a circle with a diameter of 5 yards in the centre of the playing the area, using flags or large cones. Place one or two gates (2 small cones 1 yard apart) randomly on the edges of all four sides of the playing area. However, each gate must be at least 10 yards from the nearest one. Have a player stand in each of these gates. Direct the rest of your players to stand inside the circle with a ball each (Figure 8.8a).

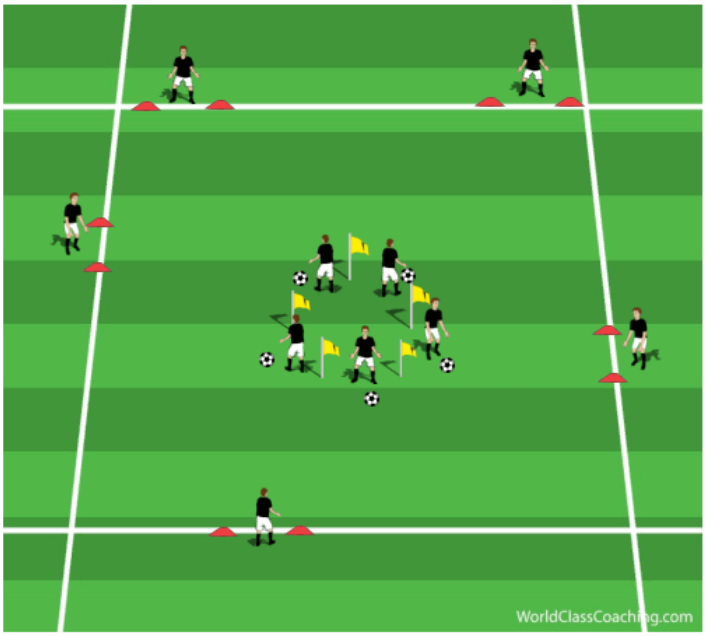


Figure 8.8a

(Note: to determine how many gates you will need, divide your players into two equal groups and use the number of players per group)

When ready, direct the players in the centre circle to dribble towards a different player standing in a gate. When they are approximately 5 yards away from the player they are dribbling towards, have them play a pass to that player's feet and then take the player's spot between the gate (Figure 8.8b).

As soon as the player standing between the gate receives the pass, they must dribble through the centre circle and then towards a player standing at any of the gates around the playing area (Figure 8.8c). As before, they should make a pass to the player standing in the gate when they are approximately 5 yards away and then take that player's spot.

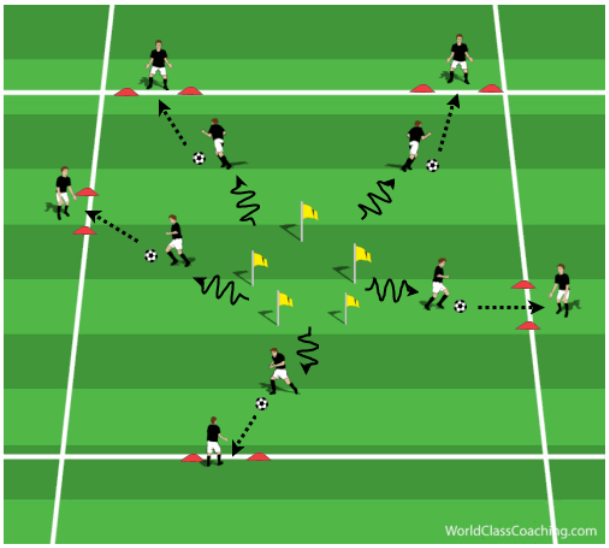


Figure 8.8b

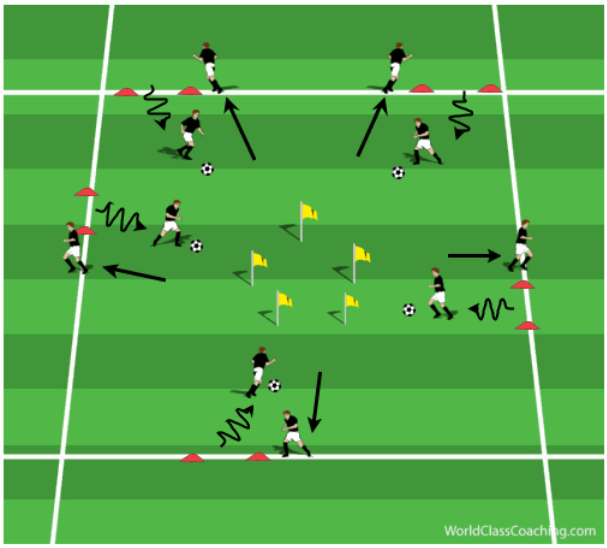


Figure 8.8c

Work-to-rest Ratio: Continue this sequence for 2 to 3 minutes and then have the players rest for one minute. Continue for a total of 15 to 20 minutes. During each rest period vary the technical element of the activity slightly (see paragraph on variation below). This will ensure that the players do not get bored during the activity.

Coaching Points: When dribbling, the players should take soft touches while keeping their heads up. Encourage them to dribble as quickly as possible but under control. It is also important that they try to use both feet and different surfaces of the foot to play the ball.

Encourage firm and accurate passes on the ground. In addition, the player receiving the pass must take their first touch into space.

Variation: You should vary the technical actions of the drill after every 3-minute sequence and there are several ways that this can be done. You can start by having the players perform a different skill while dribbling. For example, have them do a step-over every three or four touches. You can also vary the exercise by restricting how the player standing between the gate receives the pass. For example, they must take their first touch with the outside or inside of the foot.

Progression: For the last few sequences of the exercise, have the players sprint after making their pass to take up the position between the gate**.**

USING SMALL-SIDED GAMES (SSG) FOR DEVELOPING BOTH AEROBIC AND ANAEROBIC ENDURANCE

Small-sided games (SSG) involve smaller teams (3 vs. 3, for example) that incorporate all components of soccer and present an excellent alternative to traditional fitness sessions. Because SSG involve both technical and tactical components in addition to the high physical demands, they are one of the most efficient forms of training.

Benefits of Small-Sided Games

There are many benefits to using small-sided games in your training program. Most importantly, SSG facilitates youth development as having fewer players on the field simplifies the tactical environment, making the game visually clearer for players. Players also get many touches on the ball, which greatly facilitates technical development. The competitive nature of SSG means players are likely to be playing at a high intensity and therefore circumvents the motivational problems coaches may experience with more routine drills. Lastly SSG incorporates all aspects of the game including combination play, individual and group defending, and the various elements of technique (passing, receiving, dribbling, etc.).

Scientific Basis for Using SSG

Several scientific studies have quantified the physiological responses as well as the physical and technical activities during SSG and have shown that SSG elicit similar hear rate values observed during normal 11 v 11 soccer. In fact, when compared to standard match play, SSG training using a 4 v 4 format led to: i) higher values of total distance covered per minute of play; ii) high-intensity running; and iii) 1 v 1 battles.

Studies have also shown that SSG-oriented training can be just as effective as traditional fitness training for improving certain parameters of conditioning. For example, SSG and high-intensity interval training methods were shown to be equally effective in increasing aerobic capacity and the ability to perform intermittent exercises in amateur soccer players. Importantly, SSG-oriented training has been shown to be an effective means of conditioning for ***young*** soccer players. These studies provide evidence supporting the idea of using SSG as a major method of endurance fitness preparation, in addition to their use in technical and tactical training.

Tailoring SSG for Aerobic or Anaerobic Conditioning

By tailoring or adding a specific restriction to your small-sided activity, you can emphasize either aerobic or anaerobic conditioning. The easiest way to do this is by manipulating the number of players per team or the size of the pitch. This in turn alters the playing intensity. If your aim is to develop ***anaerobic*** endurance, then it is best to play 1 v 1, 2 v 2 or 3 v 3 SSG. It is also important that the coach or a player on the side has an ample supply of balls and that a new ball is played in as soon as one goes out of play.

Play games that are 90 to 120 seconds in length and then have your players rest for approximately four minutes.

If your goal is to develop ***aerobic*** capacity, then it is best to have at least four players per team. Play games that are 3 to 5 minutes in length but have your players rest for at least two minutes between games. You may also choose to play continuously for 20 to 30 minutes.

The following are two other examples of how tailoring SSG can be used to target either aerobic or anaerobic conditioning:

4 V 4 With Targets

Objectives: This exercise focuses on aerobic endurance

Set-up and Directions: Divide your players into teams of four. Set up a 40 by 30 yard playing area with 2 regulation-sized goals at each end. This is a 4 v 4 (plus goalies) small-sided game, with two neutral or target players on each sideline (Figure 8.9).

Figure 8.9

Play regular soccer except that a player in possession of the ball can pass to any target player on the side. Once a target player receives a pass, they must pass back to any member of the team from who they received the pass. Target players are not allowed to pass to other target players and are restricted to 1 or 2 touches.

Work-to-rest Ratio: Play games 3 to 5 minutes in length and then change teams. If there are only three teams, meaning one team has to play two games in a row, ensure the players of that team rest for at least two minutes before playing the next game.

3 V 3 Transition Game with Zones

Objective: This exercise focuses on ***anaerobic*** conditioning and repeated sprint ability

Set-up and directions: Divide your players into groups of three. Set up a 45 by 25 yard playing area with 2 regulation-sized goals at each end of the pitch. Divide the playing area into three horizontal zones, all 15 yards in length (Figure 8.10). There should be a goalkeeper in each net.

This is a 3 v 3 (plus goalkeepers) game with a few conditions. The defending team is only allowed to tackle in their defensive third/zone. The attacking team cannot score until all their players are in the attacking third of the field. When travelling through the middle third, the player in possession of the ball must speed dribble.

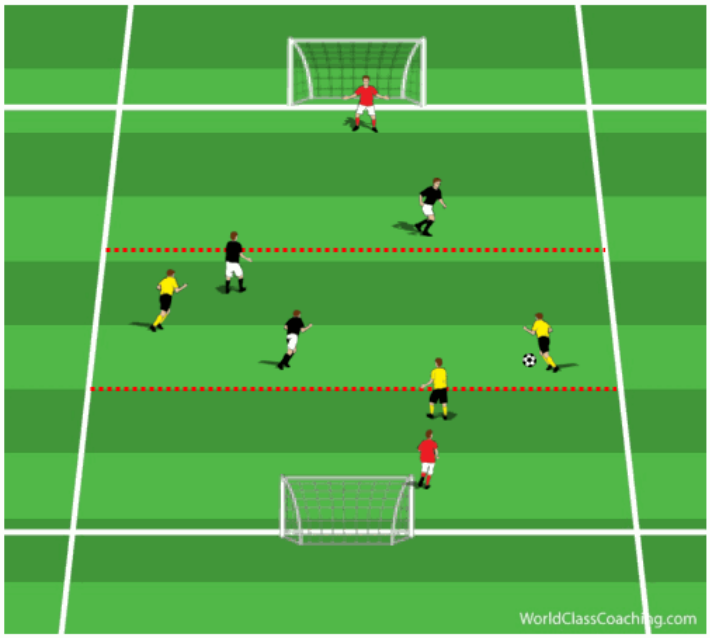


Figure 8.10

Work-to-rest Ratio: Play games that are 90 seconds to 2 minutes in length then have those teams rest for about 4 to 5 minutes. Ensure that both goalkeepers as well as the coach have a multitude of balls. Play should resume as quickly as possible after a ball goes out for a goal kick or throw-in.

DETERMIING EXERCISE INTENSITY WITH HEART RATE MONITORING

For endurance conditioning to be effective, it is essential that your players train at the desired intensity for the required period of time. Too low of a training intensity will not challenge the energy systems to adapt; whereas too high of an intensity will lead to fatigue earlier than intended.

The best way to determine what intensity level your players are achieving during a training activity is by monitoring their heart rates, as there is a very close relationship between percentage of maximum heart rate and exercise intensity. By monitoring the heart rate values of your players you can i) ensure they are practicing at the appropriate intensity level for the exercise; and ii) track changes in endurance levels (improvements or declines) as the season progresses.

For ***aerobic*** training exercises, players should be achieving values between 60 and 75% of their maximum heart rate values; whereas for ***anaerobic*** conditioning, values between 80 and 95% of the maximum heart rate levels are appropriate. To determine the approximate maximum heart values for your players, simply subtract their age from 220. For example, a player who is 25 years old will have an approximate maximum heart rate value of 195 (220 – 25) beats per minute. You can use heart rate monitors (available at most sports stores) that will give instant readouts or you can deduce the values by asking your players to check their pulse over a 10-second time frame and multiplying this value by 6.

PROGRAM DESIGN FOR ANAEROBIC AND AEROBIC CONDITIONING

There are certain key factors to consider when designing the anaerobic and aerobic endurance component of your training program. These include: intensity (assessed by HR values), duration of the work periods (will depend on intensity level), training frequency, and training volume. These variables will be dictated mainly by the phase of the season you are in.

The ***off-season*** should be used to develop a high work capacity, but in particular, aerobic fitness. Essentially, we are aiming to gradually increase the time taken for the onset of fatigue. During the ***early phase*** of the off-season, you should incorporate aerobic endurance exercises into training at least twice per week. However, it is important to start at a manageable level and then gradually build work capacity. This can be achieved by increasing the duration of the workout or reducing the work-to-rest ratios. For example, in the *Centre Circle Game for Dribbling, Passing and Sprinting* exercise, you can start by doing four or five 120-second repetitions with a rest period of 60 seconds between reps. You can then increase the work period by 30 seconds every one or two weeks until the work periods are 180 seconds long. At this point, you can start reducing the rest periods by 10 or 15 seconds each week until the rest period is only 30 seconds long.

As you progress into the ***late off-season***, you should gradually begin to incorporate anaerobic activities into training. By the end of this phase, you should be doing anaerobic exercises at least once per week.

During the ***pre-season***, the focus of endurance training should shift to developing anaerobic capacity. Activities such as *Control, Pass and Sprint* should be integrated into training twice per week. Training for aerobic endurance should be in the form of SSG only.

As with the other elements of conditioning, the major goal for endurance training during the ***competitive phase*** or ***in-season*** should be to maintain fitness levels established during the off and pre-seasons. Doing exercises specifically geared towards anaerobic conditioning once per week should be sufficient. However, this will be based on the number of practice sessions per week. Chapter 11 describes how to effectively prepare a training plan for the in-season in greater detail. As is the case with pre-season training, aerobic conditioning should be entirely in the form of SSG. Methods such as interval training should only be used if there is a significant decline in fitness levels or if a player is returning from injury.

ANAEROBIC AND AEROBIC CONDITIONING FOR YOUTH PLAYERS

Although soccer games at the youth level are generally played for a shorter duration (60 minutes instead of 90 for example), anaerobic and aerobic conditioning will still have a profound effect on the performance levels of these players (much less important for children in the pre-pubescent age group). As mentioned in Chapter 1, youth players also perform and have to recover from intermittent, high-intensity actions, and can cover up to 6km during a 60-minute match. They also maintain heart rate values ranging between 80 and 90% of their maximum values.

Youth soccer players in the ***pre-pubescent*** age group will have lower VO_2max values and a lower tolerance for high-intensity exercises in comparison to their adult counter parts. However, they are able to increase their work capacities, and as such, endurance-based training may certainly have a beneficial effect. Children in this age group are not able to properly cope with exercises targeting the glycolytic systems, especially the fast glycolytic systems. As such, endurance training for this age group should be mainly concerned with the phosphagen and oxidative systems. Exercises for these players should come mainly in the form of fun games including small-sided games and other activities such as ***Stuck in the Mud***, ***Tag***, ***Knockout*** and relay-type games.

The exercises presented for developing the oxidative systems (*Individual Dribbling* and the *Centre Circle Game*) can also be used. However, the total duration should not be more than 15 minutes. In addition, the recovery time between work periods should be longer and the exercise should not be high in intensity (less speed dribbling or sprinting).

A structured endurance training program for these players should not be a concern, but endurance activities should be included in training at least once a week and preferably at every training session. As the year progresses, you can gradually increase the duration of the chosen (endurance) activity.

As children enter the ***adolescent*** age range, their VO_2max increases naturally and their tolerance for high-intensity exercise improves. Coaches of children in this age group can start incorporating more soccer-specific and ball-oriented exercises into training sessions for both anaerobic and aerobic conditioning.

The duration of interval training can be increased from 15 to 20 or 25 minutes. However, exercises such as *Control, Pass and Sprint* and *Pass and Sprint to Open Cone* should be gradually introduced into training. In addition, the work-to-rest ratios of exercises targeting the ***Glycolytic Systems*** should be less, and the number of repetitions for each exercise should not be more than 3 to 4.

CHAPTER 9: DESIGNING A PROGRESSIVE AND EFFECTIVE TRAINING PROGRAM

The ultimate goal of the conditioning coach is to prepare their athletes to achieve a peak level of fitness at the start of the competition period, and maintain this conditioning level (as best as possible) throughout the in-season. To achieve this peak level of match-ready fitness, the coach must construct a yearly training plan that is ***structured***, ***progressive*** and has attainable ***conditioning objectives***. Incorporating fitness activities into training sessions cannot be done at random. We cannot simply do agility or plyometric exercises on a certain day because we 'feel like it' or because the 'the boys have not done it in a while'.

Indeed, designing a training plan is one of the most important assignments for any soccer coach and this responsibility presents unique challenges for both the amateur and youth coach. For the youth coach, a common problem is that many younger athletes often play for more than one soccer team or participate in more than one competitive sport. Proper planning is therefore necessary to prevent overtraining or burnout. In comparison, coaches of amateur teams may not be able to conduct year-round team training and therefore have a truncated training season. For these coaches, achieving peak conditioning levels prior to the competitive season becomes difficult due to the shortened preparation time.

In the program design section presented in Chapters 2 to 8, we have given you the general recommendations (sets, repetitions, frequency, etc.) for each conditioning element and how each variable changes with the phase of the season. In this chapter we assist you in putting all this information together to design a progressive training program for the entire training year. These plans take into consideration that most amateur and youth teams are limited to 2 to 3 training days per week and only have a few months for their off and pre-season preparations.

PERIODIZATION

As much as we would like, our players are not capable of maintaining a peak level of ***match-ready fitness*** all year long. As such, the ultimate goal of the soccer conditioning coach is to ensure that the players peak at the start of (or soon after) the competition period. To do this, we need to have a system in place that allows our players to gradually build their work capacity and enables them to incorporate a specific fitness component at a time that facilitates optimum gains and prevents injury or fatigue. ***Periodization*** is the structuring of the yearly training program into various phases or blocks. Each phase will have specific conditioning objectives and allows you to build from the gains made in the previous one.

In terms of soccer conditioning, periodization allows you to transition from a general phase of high volume and low-intensity (intended to build work capacity and a base level of fitness) to a phase of high-intensity and soccer-specific training. Periodization not only enables your players to peak for the start of the in-season, but it provides variety in training and helps prevents both physical and psychological fatigue. For the majority of soccer teams, the training year is divided into four main blocks or phases: the ***off-season*** (early and late); the ***pre-season***, the ***in-season*** (competition period); and the ***transition period***.

The Off-Season

The off-season is a very important period for conditioning: because there are no scheduled games, more time can be devoted to this aspect of training without jeopardizing technical and tactical preparations. The length of off-season can vary, depending on the team, but is usually divided in multiple phases. For the purpose of this book, we have chosen to further divide the off-season into an early and late period, each ranging from 4 to 6 weeks in length.

The major conditioning objective for this phase of the season is to establish a base level of conditioning that will increase a player's tolerance for more intense training. As such, fitness training during this phase should be higher in volume, but lower in intensity. During the initial stages, or early off-season, coaches should focus on improving aerobic endurance; build basic strength; and reacquire basic speed and agility techniques. The latter stages of the off-season should build on the initial objectives and also prepare the players for the pre-season phase, which involves more intense training.

The Pre-Season

Session planning during the pre-season can be challenging as players need to be conditioned for the high-intensity nature of games, but priority also has to be given to technical and tactical preparation. This training phase usually lasts three weeks, regardless of the league, and must be well planned. The main conditioning objective during this phase is to prepare the body for match play, which is accomplished by developing explosive power, anaerobic and strength endurance, as well as starting speed and acceleration.

The In-Season

Achieving and maintaining a peak level of match fitness for the competitive season is what soccer conditioning all comes down to. This is no easy feat, especially for teams with an extended playing season that can last up to six months. During this phase, fitness activities have to be carefully planned and executed in order to allow for optimal recovery for games. As such, conditioning drills should be low in volume but high in intensity.

Regardless of its length, the main conditioning objectives for the in-season are to maintain the fitness levels acquired during the off and pre-season phases. However, it will be extremely difficult to target all conditioning components within a twice-a-week training schedule. We therefore recommend a rotational system that covers all the components within a three-week cycle (discussed below).

Injury prevention should also be a major focus during this phase, further highlighting the need for a low volume/high intensity training format. Additionally, the coach should ensure that balance and flexibility training are not neglected.

The Transition Period

The transition period is the phase between the end of the competitive period and the start of the off-season. However, for teams that have multiple competition periods, the transition period also refers to the phase between the end of one competitive period and the start of the next preparation phase. The length of this phase can range from a week to a few months, depending on the league or standard of play.

The main goal during the transition period is physical and mental recovery of your players. However, athletes should perform some time of physical activity during this period in order to maintain a base level of fitness. This ensures that they are not physically overwhelmed at the start of the next preparation phase or off-season. As such, coaches generally incorporate cross-training techniques during this phase. By performing physical activity that is not soccer-related, players are allowed to mentally recover from participating in a long and intense training program while maintaining a base level of fitness.

Table 11.1 summarizes the major conditioning objectives for all phases of the training

Table 11.1 Conditioning Objectives for the Multiple Phases of the Training Year

Phase of Season	Duration of Phase	Main Conditioning Objectives
Early Off Season	4 to 6 weeks	Develop basic strength, aerobic endurance and basic speed and agility techniques
Late Of season	4 to 6 weeks	Develop eccentric strength and prep the body for high-intensity training
Pre-Season	2 to 3 weeks	Develop anaerobic capacity, strength endurance and explosive power
Competition Phase (In-Season)	Varies	Maintenance of fitness acquired during off and pre-seasons
Transition Period	1 week to a few months	Mental and physical recovery, while maintaining a base level of fitness

GUIDELINES FOR CONSTRUCTING A YEARLY TRAINING PROGRAM

The following is a set of general guidelines that coaches should consider when constructing their training program:

1. Determine the ***dates*** and the ***length*** of the competitive period. This may vary considerably among leagues. For example, the in-season for Canadian University Varsity teams lasts for approximately 3 months whereas the competition period for the English Premier League extends for 8 months.

2. Identify the ***dates*** and ***length of time*** that will be used for the off and pre-seasons based on when the competitive period(s) are scheduled. For each phase, list the ***general*** conditioning objectives that you aim to accomplish (see sections above).

3. Determine how many training sessions per week you will be able to schedule during each phase of the season.

4. Set specific goals based on fitness assessments conducted at the start of the off-season. All components of conditioning have to be incorporated into your plan. However, one or more components may be particularly week and the training programs needs to be modified to improve these areas. As mentioned in Chapter 1, it is also a good idea to do fitness assessments prior to the pre-season phase and during the competition period to determine the effectiveness of your program and what component, if any, needs adjusting.

5. Recovery should be a main priority, especially during the competitive season. As such, schedule activities that need more recovery time (strength and plyometric workouts) early in the week (assuming games are on the weekend). Training sessions closer to game days should be lower in volume.

6. Ensure you monitor how your players progress through each phase, as well as for the signs of overtraining. For players who play for more than one team, the coach should request the training regimen from the other team and adjust the volume and frequency for that athlete accordingly.

7. Make exercises age-appropriate and add variety to your training sessions. This is especially important for preventing mental fatigue and boredom. This book provides a number of exercises (with variations) for all components of fitness that will help facilitate this objective.

Note: These are just general guidelines and the coach must develop a plan based on the needs of the players, the time commitments of both players and coaches, as well as the scheduling of games throughout the competitive season.

SAMPLE TRAINING PROGRAMS

In the following section we present sample weekly training plans (2 training sessions/ week) for the various phases of the season. Remember, these plans are for coaches of youth and amateur teams with limited training time. Each plan is constructed based on the guidelines outlined above and is based on the conditioning objectives for that training cycle.

If you manage to schedule a third training day into the weekly schedule, then you can follow the guidelines given in the ***Program Design Sections*** of Chapters 2 to 8 to plan your training session. You may also choose to focus strictly on technical or tactical-based exercises in that session if you feel it necessary. These are just sample plans and should be tailored based on the needs of the team and the improvement of the players as you progress from week to week throughout each training phase.

As previously mentioned, the main conditioning objective during the competition phase is the maintenance of fitness levels acquired during the off and pre-seasons. However, because less time will be devoted to conditioning during practice sessions, it is impractical to target all conditioning components within a twice-a-week training schedule. Instead, we recommend a rotational system that covers all the components within a three-week cycle:

In the first week (cycle A), the focus will be on training for agility and explosive power.

In the second week (cycle B), the focus will be on training for explosive power, anaerobic endurance and starting speed and acceleration.

In week three (cycle C) the emphasis will be to maintain strength and anaerobic endurance as well as training for starting speed and acceleration.

In each week, you will concentrate on specific conditioning components and set attainable fitness targets. The sequence should be repeated at the end of the 3-week cycle.

SAMPLE TRAINING PLANS FOR THE EARLY OFF-SEASON

Training Day 1of 2

Phase of Season: Early Off-Season

Conditioning Objectives: Develop aerobic endurance, basic strength, and basic agility techniques

Session Duration: 90 Minutes

COMPONENT	SETS AND REPETITIONS	TOTAL DURATION	NOTES
Warm-up	--	15 minutes	Balance exercises should be included at the end of the routine
Speed/Agility Exercises *i) Zigzag Shuffle with Receiving* *ii) Agility Ladder with Turns and Dribbling*	1 to 2 sets (6 to 8 repetition/set) 1 to 2 sets (6 to 8 repetitions/set)	20 minutes	In this session, the focus will be on agility. At this stage, all agility exercises should be of a ***basic*** level
Strength/Power Exercises *i) Push-ups with Side-footed Volleys* *ii) Squats with Headers* *iii) Planks with Dribbling*	2 to 3 sets (8 to 12 repetitions/set) 2 to 3 sets (8 to 12 repetitions/set) 3 sets (hold plank for 30 seconds)	25 minutes	Strength exercises should focus on developing ***basic Strength***
Endurance Exercises *i) Teaching Defensive Shape*	3 sequences (120 seconds each)	15 minutes	--
Small-Sided or Regular Game	5-minute games or continuous	10 minutes	You can modify or add restrictions to emphasize a certain tactical theme
Cool Down	--	5 minutes	--

Training Day 2 of 2

Phase of Season: Early Off-Season

Conditioning Objectives: Develop aerobic endurance and proper sprinting technique

Session Duration: 90 Minutes

COMPONENT	SETS AND REPETITIONS	TOTAL DURATION	NOTES
Warm-up	--	15 minutes	Include ***Form Drills*** as your soccer specific movements
Speed/Agility Exercises *i) Long Range Passing with All-Out Sprints* *ii) Give and Go with One-touch Passing*	1 to 2 sets (6 to 8 repetitions/set) 1 to 2 sets (6 to 8 repetitions/set)	25 minutes	This session will emphasize speed. At this stage, all speed exercises should focus on establishing proper technique
Strength/Power Exercises	--	--	--
Endurance Exercises *i) Individual Dribbling with Interval Training Format*	8 to 10 work-rest cycles (2 minutes per cycle)	20 minutes	Increase the work period or decrease the work-to-rest ratio every 1 to 2 weeks
Small-Sided or Regular Game	5-minute games or continuous	25 minutes	You can modify or add restrictions to emphasize a certain tactical theme
Cool Down	--	5 minutes	--

SAMPLE TRAINING PLANS FOR THE LATE OFF-SEASON

Training Day 1of 2

Phase of Season: Late Off-Season

Conditioning Objectives: Develop eccentric strength, anaerobic endurance and reactive agility

Session Duration: 90 Minutes

COMPONENT	SETS AND REPETITIONS	TOTAL DURATION	NOTES
Warm-up	--	15 minutes	Balance exercises should be included at the end of the routine
Speed/Agility Exercises *i) 4-Cone Shadow Exercise* *ii) Zigzag Cut and Sprinting with Finishing*	1 set (6 to 8 repetitions set) 2 sets (6 to 8 repetitions/set)	20 minutes	At this point you should be progressing the complexity of the agility exercises by including a ***reactive*** component
Strength/Power Exercises *i) Whole-Body Strength Training Circuit*	2 cycles of the circuit	25 minutes	At this stage, some of the strength exercises should focus on developing ***Eccentric Strength***
Endurance Exercises *i)Shuttle runs with Speed Dribbling*	2 to 3 sets (3 repetitions/set)	15 minutes	As the off-season progresses, exercises for ***anaerobic endurance*** can be introduced into the routine
Small-Sided or Regular Game	5-minute games or continuous	15 minutes	You can modify or add restrictions to emphasize a certain tactical theme
Cool Down	--	5 minutes	--

Training Day 2 of 2

Phase of Season: Late Off-Season

Conditioning Objectives: Develop speed endurance, aerobic endurance and a base level of explosive power

Session Duration: 90 Minutes

COMPONENT	SETS AND REPETITIONS	TOTAL DURATION	NOTES
Warm-up	--	15 minutes	Include ***Form*** or ***Arm Action*** Drills
Speed/Agility Exercises *i) Close Him Down* *ii) One-Touch Cross and Finish*	1 to 2 sets (6 to 8 repetitions/set) 1 to 2 sets (6 to 8 repetitions/set)	20 minutes	Exercises targeting ***speed endurance*** can now be included as proper sprinting technique should have been established
Strength/Power Exercises *i) Jumps in Place with one-touch Passing* *ii)Vertical Jumps with Headers*	2 sets (8 repetitions/set) 2 sets (8 repetitions/set)	10 minutes	At this stage, you can now start to introduce ***beginner*** plyometric exercises into your routine
Endurance Exercises *i) Centre Circle Game*	5 to 6 work sequences (2 to 3 minutes/sequence)	20 minutes	As before, you should aim to increase the work periods or decrease the work-to-rest ratio every 1 to 2 weeks
Small-Sided or Regular Game	5-minute games or continuous	20 minutes	You can modify or add restrictions to emphasize a certain tactical theme
Cool Down	--	5 minutes	--

SAMPLE TRAINING PLANS FOR THE PRE-SEASON

Training Day 1of 2

Phase of Season: Pre-Season

Conditioning Objectives: Develop explosive power, anaerobic endurance and strength endurance

Session Duration: 90 Minutes

COMPONENT	SETS AND REPETITIONS	TOTAL DURATION	NOTES
Warm-up	--	15 minutes	Balance exercises should be included at the end of the routine
Speed/Agility Exercises *i) Short Sprint and Cut, with Half-Turns and Finishing* *ii) Backpedal and Sprint with Dribbling*	1set (6 to 8 repetitions) 1set of 6 to 8 repetitions	20 minutes	At this stage, you should have progressed to agility exercises that fall under the ***complex*** category
Strength/Power Exercises *i) Multiple Front Hurdle Jumps* *ii) Multiple Lateral Hurdle Jumps* *iii) Whole-body Strength Training Circuit*	1 to 2 sets (5 to 6 repetitions/set) 1 to 2 sets (5 to 6 repetitions/set) 2 cycles of the circuit	30 minutes	During the pre-season, all strength workouts should focus on ***strength endurance***, which is best accomplished by using a circuit training format
Endurance Exercises *i) 1 v 1 Breakaway Game*	1 set (8 reps)	10 minutes	Focus is ***anaerobic endurance*** (Phosphagen system)
Small-Sided or Regular Game	5-minute games or continuous	20 minutes	You can modify or add restrictions to emphasize a certain tactical theme
Cool Down	--	5 minutes	--

Training Day 2 of 2

Phase of Season: Pre-Season

Conditioning Objectives: Develop explosive power, anaerobic endurance as well as starting speed and acceleration

Session Duration: 90 Minutes

COMPONENT	SETS AND REPETITIONS	TOTAL DURATION	NOTES
Warm-up	--	15 minutes	--
Speed/Agility Exercises *i) Ball-Drops with One-touch Finishing* *ii) Dribble and Chase*	 1 to 2 sets (6 to 8 repetitions/set) 1 to 2 sets (6 to 8 repetitions/set)	20 minutes	The focus of speed training should now shift to ***starting speed*** and ***acceleration***
Strength/Power Exercises *i) Lateral Jumps over Hurdle* *ii) Single-leg Vertical jumps* *iii) Clap Push-ups*	 2 sets (5 to 6 reps per set) 2 sets (5 to 6 reps per set) 2 sets (5 to 6 reps per set)	25 minutes	Power Training only, and plyometric exercises should be of an ***intermediate*** to ***high*** level
Endurance Exercises *i) Control, Pass, Sprint*	 4 to 6 repetitions	15 minutes	Focus is on anaerobic endurance (fast glycolytic system)
Small-Sided or Regular Game	--	20 minutes	You can modify or add restrictions to the SSG to emphasize a certain tactical theme
Cool Down	--	5 minutes	--

SAMPLE TRAINING PLANS FOR THE IN-SEASON

Cycle A

Training Day 1of 2

Phase of Season: In-Season

Conditioning Objectives: Training for agility and explosive power

Session Duration: 90 Minutes

COMPONENT	SETS AND REPETITIONS	TOTAL DURATION	NOTES
Warm-up	--	15 minutes	Incorporate the agility ladder into the movement pattern component
Conditioning Exercises *i) Split Squats with Juggling* *ii) Single-leg Vertical jumps with Head* *iii) Zigzag Shuffle with Receiving*	2 sets of 5 to 6 repetitions per set 2 sets of 5 to 6 repetitions per set 1 to 2 sets (6 to 8 repetition/set)	20 to 25 minutes	Plyometric exercises should be scheduled at least 48 hours before games to ensure maximum recovery.
Soccer-Specific Training *For example: Functional Training, Phase of Play Training or Conditioned SSG*	--	20 to 30 minutes	--
Small sided or Regular Game	--	20 to 30 minutes	This can be 4 v 4 up to 11 v 11 (depending on numbers) with little to no restrictions
Cool Down	--	5 minutes	--

Cycle A

Training Day 2 of 2

Phase of Season: In-Season

Conditioning Objectives: Agility training

Session Duration: 90 Minutes

COMPONENT	SETS AND REPETITIONS	TOTAL DURATION	NOTES
Warm-up	--	15 minutes	Balance exercises should be included at the end of the routine
Conditioning Exercises *i) Forwards-Backwards Footwork Exercise with Third Man Pass* *ii) 4-cone Hop Drill with Heading* *iii) 4-cone Shadow activity*	1 set of 6 to 8 repetitions 1 set of 6 to 8 repetitions 1 set of 5 to 6 30-second repetitions	20 to 25 minutes	Agility exercises can be a combination of basic and advanced activities.
Soccer-Specific Training *For example: Functional Training, Phase of Play Training or Conditioned SSG*	--	20 to 30 minutes	--
Small sided or Regular Game	--	20 to 30 minutes	This can be 4 v 4 up to 11 v 11 (depending on numbers) with little to no restrictions
Cool Down	--	5 minutes	--

Cycle B

Training Day 1of 2

Phase of Season: In-Season

Conditioning Objectives: Training for lower-body explosive power as well as starting speed and acceleration.

Session Duration: 90 Minutes

COMPONENT	SETS AND REPETITIONS	TOTAL DURATION	NOTES
Warm-up	--	15 minutes	You may choose to include ***Form*** and ***Arm Action*** drills
Conditioning Exercises *i) Single-Leg Lateral Jumps Over Hurdle* *ii) 180-degree jump over Hurdle* *iii) Give and go with One-touch passing*	2 sets of 5 to 6 repetitions per set 2 sets of 5 to 6 repetitions per set 1 set of 8 repetitions	20 to 25 minutes	--
Soccer-Specific Training *For example: Functional Training, Phase of Play Training or Conditioned SSG*	--	20 to 30 minutes	--
Small sided or Regular Game	--	20 to 30 minutes	This can be 4 v 4 up to 11 v 11 (depending on numbers) with little to no restrictions
Cool Down	--	5 minutes	--

Cycle B

Training Day 2 of 2

Phase of Season: In-Season

Conditioning Objectives: Training for upper-body power, anaerobic endurance as well as starting speed and acceleration

Session Duration: 90 Minutes

COMPONENT	SETS AND REPETITIONS	TOTAL DURATION	NOTES
Warm-up	--	15 minutes	Balance exercises should be included at the end of the routine
Conditioning Exercises *i) Close Him Down* *ii) Clap Push-ups with Two-touch Passing* *iii) Control, Pass Sprint*	1 set of 6 to 8 repetitions 3 sets of 5 to 6 repetitions 3 90-second repetitions per player	20 to 25 minutes	--
Soccer-Specific Training *For example: Functional Training, Phase of Play Training or Conditioned SSG*	--	20 to 30 minutes	--
Small sided or Regular Game	--	20 to 30 minutes	This can be 4 v 4 up to 11 v 11 (depending on numbers) with little to no restrictions
Cool Down	--	5 minutes	--

Cycle C

Training Day 1of 2

Phase of Season: In-Season

Conditioning Objectives: Strength endurance and anaerobic endurance

Session Duration: 90 Minutes

COMPONENT	SETS AND REPETITIONS	TOTAL DURATION	NOTES
Warm-up	--	15 minutes	--
Conditioning Exercises *i) 1 v 1 Dribble to line* *ii) Whole-body Strength Training Circuit*	1 set of 10 repetitions 2 cycles of the circuit	20 to 25 minutes	During the competition period, it is best to schedule strength training workouts earlier in the week in order to achieve maximum recovery before games.
Soccer-Specific Training *For example: Functional Training, Phase of Play Training or Conditioned SSG*	--	20 to 30 minutes	--
Small sided or Regular Game	--	20 to 30 minutes	This can be 4 v 4 up to 11 v 11 (depending on numbers) with little to no restrictions
Cool Down	--	5 minutes	--

Cycle C

Training Day 2 of 2

Phase of Season: In-Season

Conditioning Objectives: Anaerobic endurance with a minor emphasis on starting speed and acceleration

Session Duration: 90 Minutes

COMPONENT	SETS AND REPETITIONS	TOTAL DURATION	NOTES
Warm-up	--	15 minutes	Balance exercises should be included at the end of the routine
Conditioning Exercises *i)Dribble and Chase* *ii) 2 v 2 small-sided games*	1 set of 6 to 8 repetitions 4 to 5 games (90 seconds per game) for each team	20 to 25 minutes	For the 2 v 2 SSG, it may be best to play to 2 small goals at each goal line. This may encourage the players to attack more.
Soccer-Specific Training *For example: Functional Training, Phase of Play Training or Conditioned SSG*	--	20 to 30 minutes	--
Small sided or Regular Game	--	20 to 30 minutes	This can be 4 v 4 up to 11 v 11 (depending on numbers) with little to no restrictions
Cool Down	--	5 minutes	--

The programs provided are intended for teams that have one major competitive period (in-season) within the training year. However, they can be modified so that teams with multiple competition periods can also use them. These teams should include a pre-season or pre-competition phase before any competitive period and can follow the 3-week pre-season plan outlined above. However, teams with more than one competition period must include a transition phase at the end of every competition period before preparation for the next one begins.