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Part One of Ball Touch Speed Development examined the development of an effective Biomechanical Sprinting Model. Remember in the development of speed we are concerned with the development and refinement of a skill. Part One looked at the creation of sprinting technique that would lend itself to faster and more efficient running. This meant programming or enhancing the central nervous system's signal transmission or 'firing pattern'.

After establishing this technique with the exercises used in Part One, we can now look at the factor to which most opponents of sprinting technique enhancement hold. It is often heard that soccer is an activity which often requires the athlete to change stride length and stride frequency. This is true.

The relationship of these factors, independent of technique quality, do determine an athlete's potential speed. Both of these factors can be influenced within skill development sessions. Within a 100 metre race, the sprinter typically begins with high stride frequency and a short stride length. As speed is generated, the runner lengthens stride length and subsequently decreases stride frequency. After 100 meters, the race ends. A sprinter must manipulate the factors of speed until top speed is reached. This is followed by the sprinter attempting to maintain this relationship until the race is over. However, the critics will tell you that soccer is not that simple.

Soccer players must manipulate the factors of stride length and stride frequency to match specific conditions within the game. These conditions change instantaneously within the game where the player is not able to plan their steps to guarantee optimal efficiency. Fortunately, by practicing these changes within training, specifically the changes in stride length and stride frequency, they may become automatic within the flow of a game. Where do stride length and stride frequency change in the run of a game?

For example: A player may wish to generate and maintain speed in open field when attempting to catch a ball pushed behind the defenders. This requires the player to increase stride frequency to start movement forward as their stride length is short. As they have increased their speed through high stride frequency, top speed is achieved by increasing stride length. As a player receives the ball, they want to maintain this speed while being able to manipulate the ball as a defender approaches. This requires the athlete to decrease stride length but increase stride frequency.

Because stride length x stride frequency = speed, if a player wishes to maintain speed but is forced to decrease one of the factors (shorten stride length as they near a defender), they must increase the other factor (increase stride frequency). A number of exercises will be discussed that may help the athlete's development toward optimal recruitment of the speed muscles through teaching the central nervous system to recruit efficiently.

With the proper technique from Part One being continually refined, we can now look to expand our technical learning. It will be done in Part Two by using sticks and competitions. The sticks will assist with stride length and stride frequency manipulation. The competitions provide the coach and athlete motivating activities in which they can go head to head with teammates or training partners.

At what age? When and where to begin? As was stated in Part One, the skills of sprinting, speed development and stride manipulation can be initiated at any age. In fact, research states that the development of new skills is greatest during the ages of six to twelve. However, stride manipulation exercises should be introduced only after efficient sprinting technique has been learned. Once sprinting technique has been established, stride manipulation can be trained throughout the year. This helps confirm to the athletes that speed is an integral soccer skill.

Traditional soccer periodization placed speed development directly before and during the season. Within these periods, training intensity increases in preparation for the season's competitions. It is now proposed that speed should become a focus through-
out the year, although the nature of the exercises and activities that develop speed may vary within the year.

**Sticks (No Stones!)**

By asking players to sprint through a series of sticks placed on the ground and spaced at varying distances, players will be forced to manipulate their stride length while maintaining technique. The players can begin with sticks placed close together (approximately 30 percent of their inseam length to a minimum of 30 centimeters - this allows an adjustment for all ages). They can take one step or two steps between the sticks but must be encouraged to maintain technique. Many players rush through with shuffle steps in the beginning of the program.

After a period of learning the athletes will combine the variability of stride length and proper sprinting technique. Encourage players to keep their body leaning forward and their arms and legs driving. The distance between the sticks and the number of steps between the sticks can be changed by the coach for variety and to meet the needs of the players. The examples in Figure 1 show the basic layout of the sticks and the ways in which they can be manipulated. These variations may force the players to begin with short strides, then gradually accelerate with longer strides. The sticks can also begin further apart and then become close, forcing the players to shorten stride length. Regardless of the distances used between the sticks, always attempt to finish the stick repetition with a full sprint with an emphasis on technique.

Remember that the development of running technique is often a refinement of a skill which has been partially learned. Many of our players require more time than others during this refinement phase. Initially, we can use stick exercises to manipulate stride length and frequency. As competence is established, the players can complete their sprint with a soccer specific skill. Allow a work to rest ratio of 1:8-10 and perform 15-20 total repetitions of these sprints with the sticks placed in various positions. Remember that it is quality of sprinting technique within a soccer environment that is the concern and not the quantity.

The sticks are made of wood or plastic. They must be heavy enough not to blow in the wind and cannot be so high that there is a threat of injury when athletes step on them (2 - 3 feet in length). Competitions that encourage speed as discussed in Part One, and ball touch exercises were introduced because it is important not to completely remove the soccer player from the game completely.

Likewise, competition is part of the sport which attracts top players and as coaches we can use this motivation to help the athletes sprinting performance. These exercises are designed to be soccer specific and they demand that the player to perform soccer-like accelerations (varied starting positions and direction changes). As in all speed exercises, it is crucial for the coach to emphasize correct technique. Players should understand that these exercises are for the development and application of their refined technique.

The following exercises are examples of competitions. With your imagination, they can be varied to add directional changes, player jostling (pushing and pulling) or ball contacts at the end of the sprint. Always emphasize technique. It is the coach that must sell the program and the purpose to the players.

**COMPETITIONS (Technique, Starting Speed)**

**Exercise #1**

Player X1 takes the role of the attacker while X2 is the defender. The two players face one another within a three metre area (area designated by two pylons or lines). The attacking player initiates the exercise and is permitted to make one or two body feints before leaving the area. Once the attacking player leaves the area, either to the left or to the right, they are committed to sprinting to the furthest pylon in that determined direction (20 meters from three metre area). The defending player must attempt to stay with the attacker and reach the closer pylon (17 yards
from the three metre area) to the left or right before the attacker reaches the furthest pylon. Players can take turns as attacker and defender. The exercise is completed when each player has taken 10-15 repetitions.

**Exercise #2**

Player X1 takes the role of the attacker while X2 is the defender. The two players stand back to back. The attacking player initiates the exercise by sprinting to the furthest pylon either to the left or the right. Once the attacking player moves, they are then committed to sprinting directly towards the pylon (20 meters away). The defending player must turn and attempt to catch the attacker or reach the closer pylon (17 meters away) before the attacker reaches the furthest pylon. Players can take turns as attacker and defender. The exercise is completed when each player has taken 10-15 repetitions.

**Exercise #3**

Player X1’ takes the role of the attacker while X2 is the defender. Facing the finishing pylons, X1 stands on a line 20 meters from the finish. Three to five meters in front of X1 is X2 who is holding the squat position facing X1 (the attacker). The attacking player initiates the exercise by sprinting to the furthest pylon. The defending player must stand and turn in an attempt to reach the finishing pylon before the attacker. Players can take turns as attacker and defender. The exercise is completed when each player has taken 10-15 repetitions.

**VARIATIONS:**

The coach can instruct the players to take one repetition with each member of the team. Instead of the defender sprinting in the same direction as the attacker (Exercises #1 and #2), they must sprint in the opposite direction. Both players can perform all of the exercise with a ball.

**Conclusions**

It is the coach’s responsibility to design training that develops technique development occurs. This includes all of the traditional soccer techniques, as well as the techniques stressed in the last two articles. We must develop not just soccer players, but athletes. These articles should help you create athletes that can run, and run efficiently.