180^{o} Change-of-Direction

Changes of direction occur at many different angles and at many different speeds. One of the most common is the 180^{o} Change of Direction where the athlete is running in one direction (up the field towards the goal), and then in 1 quick movement, plants, turns to the left (or right) and runs out of the cut at full speed towards the other goal. Below is an example:

This is a movement that leads to many injuries. Everything from ankle sprains, groin pulls, hip and back strains to knee injuries like the every popular ACL tear can be traced back to problems in the technical efficiency of this movement. Maybe the athlete was not strong enough to decelerate efficiently. Maybe the athlete tried to plant too hard on her outside leg (right leg for the girl in the picture above) and lost the ability to control her momentum, thus putting too much force on 1 leg. Maybe the athlete couldn't control her posture and stumbled out of the cut. Many factors play into this type of movement and this article will try to assess the technical component in hope that it will shed some light on how to get the athletes to cut more efficiently, therefore reducing the risk of injury, increasing confidence in high speed change of direction, and improving their agility on the field.

Fast, healthy athletes ***change direction*** differently than slow or injured athletes. Here are three things that faster athletes do better than slower athletes:

- **Dorsiflexed position of the foot/ankle** when it first contacts the ground - this does not necessarily mean "heel hits first" this just means that the athlete is not "pointing the toe" (plantar flexion) as they go into the cut, rather they are trying to land on the ball of the foot / full foot, then transition the load through the hamstrings, gluts and hips similar to a lunge, as opposed to letting the knee come forward and using the quad and knee to try and control the movement.
- **Use of the inside leg** when cutting (changing direction at high speed) or stopping suddenly – as seen in the picture above, the girl shown uses the right leg to start the deceleration, but then uses the left leg or "inside leg"(in the second picture) to be the primary decelerator. This allows her to effectively lean towards the direction she wishes to move and let gravity (essentially) pull her out of the cut.
- **Make ½ the Turn** with the inside leg – it is not enough to just use the inside leg, the athlete has to make ½ the turn with the inside leg. This means if your turn takes you through 180^{o} of movement you need to have turned 90^{o} by the time the inside leg hits the ground (as seen in the picture above). This eliminates much of the rotation that the knee has to control and sets the athlete up to be square (facing) there opponent, which is a much better position to be in for reaction purposes.

These are three simple techniques that will help keep the body in line, and reduce impact forces or rotational forces on the joints. The hips and upper leg takes the majority of the load. Below is an example (girl in orange) of what it looks like if they don't follow the three techniques above:

In this picture the athlete (girl in orange) did come in with a dorsiflexed ankle, but did not effectively control her momentum on the inside (left) leg, and did not make ½ the turn (notice that she is off balance, too deep – knee bend, has to control momentum with outside leg (right), looses upper body posture, and comes out of the cut slowly and out of position).

Here is a game photo that we can use to analyze this movement with a ball and come up with a training protocol that strengthens the inside leg movement, quickens reaction and improves their confidence in 180^{o} Change of Direction.

Notice the girl in white (with ball) and how she gets in front of the ball, dorsiflexed ankle, makes ½ the turn (not shown), loads the inside leg, controls posture and the ball and is in a position to accelerate out of the cut. Now notice the girl in red (defending) running side by side, then is unable to quickly reposition by controlling momentum with the inside leg and making ½ the turn. Also notice how she is forced to plant hard on the outside leg (her right in this case), and how she is unable to control her posture as she tries to react, leaving her out of position and at risk of injury.

So if we all agree that the girl on in white (with ball) is in a good, athletic position in the second picture (coming out of the cut) then this is where we must start our training emphasis.

1. Can your players get into this position? It is a simple lunge position with a slight forward body lean over the front leg (her left in this case).
2. Are your players strong and confident in this position? When doing lunges, do the knees cave in (rotate towards the body's midline)? Do their hips kick out (push out away from the body's midline)? Can they feel this in the glutes or hamstrings as they get in an out of this position, or do they feel it in the quads (using too much push from the toe and knee extensors vs. hip extensors)?
3. Can they perform exercises quickly with powerful bursts with little or no instruction to what they need to be controlling?

If you answered **NO** to any of the above questions then here are some strengthening exercises to prescribe to your players:

***Balance:** have the players perform balancing drills where they focused on feeling the “burn” or “fatigue” in the glutes and not in the knee, quad, calf, or foot. Have them move in and out of balancing positions to learn how to use the glutes to control their position. Posture should always be a concern – the athlete in the picture is trying to maintain a neutral spine or flat back throughout the drill.

***Lunges:** have the player get in a good athletic stance and focus on dropping down into a lunge position keeping most of the weight on the front leg (left for the girl in the picture) and then squeezing the glutes and driving through the heel as they come up out of the lunge (returning to the starting position). You can progress these to reaching back lunges where the player reaches back (like in the balance photo) then lets the rear leg hit the ground, control balance and then come back up off the front leg, and then of course progress to walking (forward) lunges.

***Split Squats or Jumping Lunges:** this is the 3rd progression of the lunge and this starts to develop the speed and reaction type response so the athlete can learn how to load, and fire out of this position quickly, with maximum power production, and efficiently using the right muscles to control the firing pattern and posture.

·**Rotational Med Ball Throws:** this is a drill that adds the speed and coordination of the movement with an external load to mimic momentum that takes the athlete through the transverse (rotational) plane. This teaches the athlete how to take on momentum (the ball) using the hips and core to decelerate and then react quickly and efficiently to throw the ball back to their partner (or against a wall). This could also be done on a single leg to add difficulty, proprioception and balance emphasis (as shown in the third picture below).

That takes us through the preparation part of the 180^{o} Change of Direction training. When the athletes are strong and stable enough to move through these positions, we will be able to see greater improvements in the control and coordination of the movement itself (which should be being worked simultaneously). We have several other articles on change of direction drills, progressions, protocols, etc. that we will cover in the future.

Here is a quick breakdown of rhythmic movement drills you can add to your warm up to develop confident changes of direction.

- **Forward Skipping** (light and rhythmic)
- **Forward Skipping for Height and Distance** (still light and rhythmic)
- **Lateral Skipping** (focus on rhythmic push off)
- **Carioca** (focusing on rhythm)
- **Carioca for Distance** (work on driving out and rhythmically covering more distance)
- **Shuffle** (focusing on push off for distance)
- **Shuffle 5 yds to Carioca 5 yds to Run** (seamless transition from 1 to another)
- **Shuffle 5 yds then Carioca back** to Start, Shuffle 10 then Carioca back to start (focus on not wasting steps in directional change)
- **Run 5 yds then Carioca back** to Start, Run 10 yds then Carioca back to start (most complex, requires efficient, quick transitions)
- **Run 5 yds then Run back** to Start, Run 10 yds then Run back to start **(180^{o} Change of Direction)**

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If you have any questions on the progressions, research, drills or theories that this article is suggesting, please contact Scott Moody or go to the CAP website and view the video library at www.capprogram.com.