

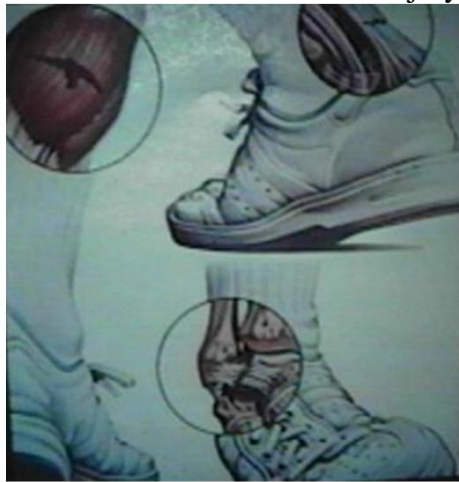
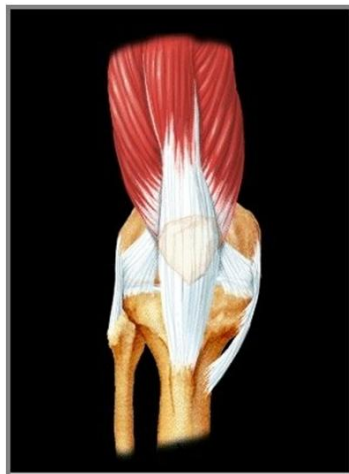
Background:

Soccer Injuries

- First thing to realize and appreciate is that players can get hurt in soccer!!!
- The statistics indicate that for children age 6-18 years there is an injury rate of 5-10 injuries for every 1000 hours of participation.

Injury Incidence

- Basically we can expect that for a 15 player team, practicing and playing 5 hours per week we would predict that 5-10 injuries will occur every ~3.5 months
- Players will be more often injured in games
- Knees and ankles are most susceptible
 - Knee injuries resulted in the most time lost from competition and produced the greatest number of cases requiring surgery.
 - At the ankle, lateral sprains were more common than medial ones.
- Some Sports Medicine Centers are reporting that “soccer is the number one activity that brings people into our clinic”.
- Extrapolating ACL injury data from a Northern California study of girls U14-U19 teams, we may expect 8 girls to experience ACL injuries this season (Data for Davis Club Teams).
- 70% of these injuries are non-contact and believed to be preventable. That is 5-6 ACL injuries we might be able to prevent if we are proactive.
- Specific training programs have demonstrated a reduction in ACL injury incidence.



Proposed training warm up to reduce injury risk and improve physical performance:

- A program developed by the Santa Monica Orthopaedic and Sports Medicine Group called - **Prevent injury and Enhance Performance (PEP)**
- The Sutter Orthopaedic Institute – “Preventing ACL Injury Program”
- A program developed in Cincinnati called “SportsMetrics”
- Various basic science studies.

Standard Warm-up Plan

Lower extremity speed, agility, strength

These drills should be introduced and the intensity kept low until basic body mechanics and strength are good. Once the athlete demonstrates good body mechanics and strength, then the intensity (speed) should be increased, but only if proper mechanics are maintained (see notes at end about body posture and movement mechanics).

20 minutes

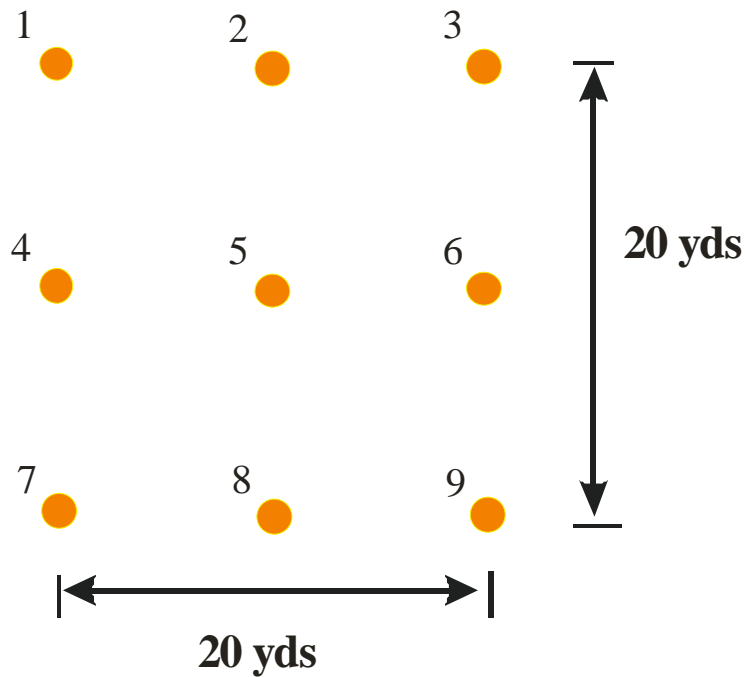
- Warm-up should always precede strenuous activity. At least 250 low intensity loading cycles are required for leg muscle-tendon units to achieve a steady state. For the legs this is equivalent to about a 5 minute light jog. Dynamic stretches are considered the most appropriate for warm ups and static stretches for cool down.
 - o Slow jog (5 minutes)
 - o Dynamic stretching (5 minutes) – striders, high knee long steps, side shuffle, side shuffle touch hands to ground, back pedal, strider shift to back pedal, high knee walk, high knee skip, heel to butt walk, butt kickers, toy soldier walk, inch worm (push up position, move toes to hands, fall forward, arch back, start again), crab walk (on all fours, bring leg up under shoulder and stretch, move forward and do other leg), side step to squat, kung fu straight kick, kung fu side kick, samari (squat, stand and rotate backward with flexed knee), hip ab/adductor steps.
 - o Strength/Plyometrics (5 minutes) – lunges, side to side bilateral jumps, front to back jumps, one legged side to side and front to back jumps (once strong enough to do this), same as previous but moving down a line, no hands vertical squat jumps, box/bench jumps, scissor jump/squats.
 - o Speed/Agility/Power (5 minutes) –10 to 20 yard box using cones (sprint, side shuffle, back pedal, side shuffle). See diagram at end.
 - o Core strength - Planks, both straight forward on elbows and toes and side-planks on one hand and one foot (30 seconds at a time, working up to longer times)



These can also be done on hands rather than elbows.

Notes: Athletes should run with good movement mechanics (ankles, knees and hips aligned; hands relaxed and in-line with forearm, hands pumping from hip to about nose height). If movement mechanics break down, then the athlete should take a break. When jumping and cutting athletes should land on the balls of their feet and flex ankles and knees to provide soft, springy impacts and rebounds.

General Field Layout:



From this cone configuration, you can have athletes perform a variety of speed/agility maneuvers. Some examples are:.

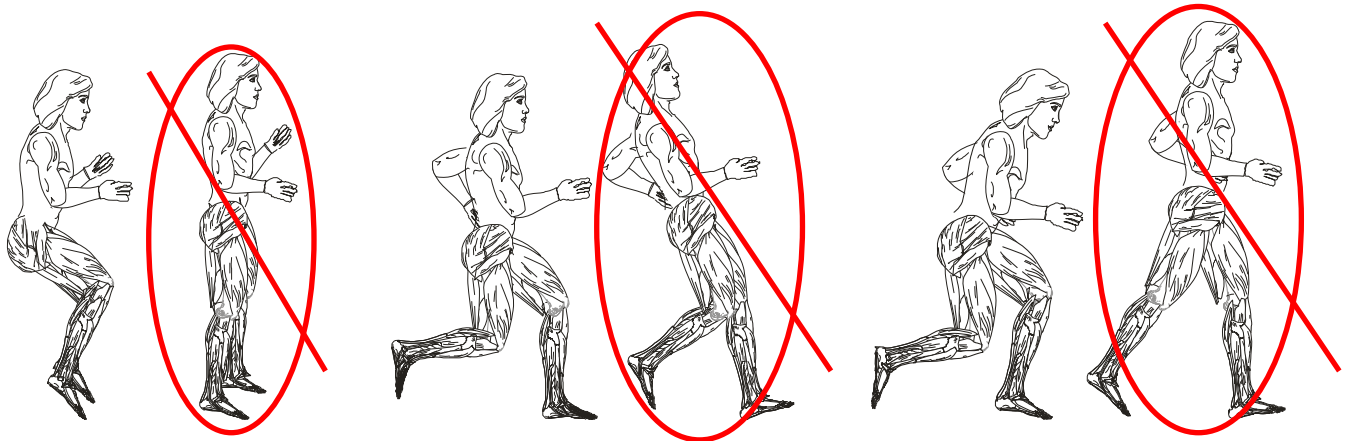
1. Start at 1, sprint to 7, side shuffle to 9, back pedal to 3, side shuffle to 1
2. Start at 1, sprint to 5, spin around hand and sprint to 2 then back to 5, spin around hand and sprint to 3 then back to 5, repeat until back to 1.
3. Start at 1, sprint to 4, side shuffle to 2, sprint to 5, side shuffle to 3, sprint to 9, side shuffle to 5, sprint to 8, side shuffle to 4, jog to 1.
4. Start at 1, sprint to 4 then cut and sprint to 8, back pedal to 5 then cut and sprint to 3, hand spin around 3, sprint to 6 then cut and sprint to 8, back pedal to 5 then cut and sprint to 1.

Note - These are full out, high intensity drills. Different combinations of forward, backward, side and diagonal directions can be used. The key is high intensity with good mechanics. Keep knees bent during all change in directions!

Body Posture and Movement Mechanics:

Good movement mechanics and body awareness are essential to performance and the longevity of an athlete's career. Good movement mechanics will minimize the forces placed on an athlete's muscles, tendons, ligaments, and bones during training and competition. They will allow the athlete to react quicker and respond to the actions taking place around them. They will allow the athlete to achieve their speed, agility and jumping potential. Here are a few things to consider regarding movement mechanics and body awareness.

1. The athlete should always be aware of what is going on around him, where are opponents, where are team-mates. Athletes can work on this while training with a partner.
2. Athletes should always assume a good athletic posture, ready to react to actions around them. A good athletic posture (i.e. pressure on the balls of your feet, ankles, knee, and hips slightly flexed and in good alignment) ensures that the joints are in good anatomical positions, muscles are slightly activated, and the athletes are focused on what is taking place around them.
3. Whenever cutting, landing from a jump, decelerating, etc. athletes should get in the habit of crouching slightly to flex their knees, and putting the pressure on the balls of their feet. This posture will reduce the forces transmitted to ligaments in the ankle and knees and increase the athletes' responsiveness.
4. Athletes should keep their ankles, knees and hips aligned during their movements. Again, this will reduce the forces transmitted to ligaments in their ankles and knees.
5. If training with a partner, then have partners watch leg alignment during the drills to let each other know if their ankle or knees are bending in or out. If you have a video camera, then video the front and side while the athletes are doing certain drills. Review the video to determine if the athletes have good leg and body alignment. If not, then the athlete may need to spend some extra time on muscle strengthening and/or neuromuscular coordination training.



Jump landing:

Soft landings on balls of feet, flexing ankles and knees during impact. Avoid straight legs and heel contact.

Cutting/Decelerating:

Shorten your stride, your center of mass, increase your step frequency, stay on balls of feet and keep knees bent as you slow down or prepare to cut. Avoid straight legs and long strides in a final step.

Backpedaling:

Keep your butt low so knees are flexed. Stay on the balls of your feet. Avoid straight legs and upright posture.

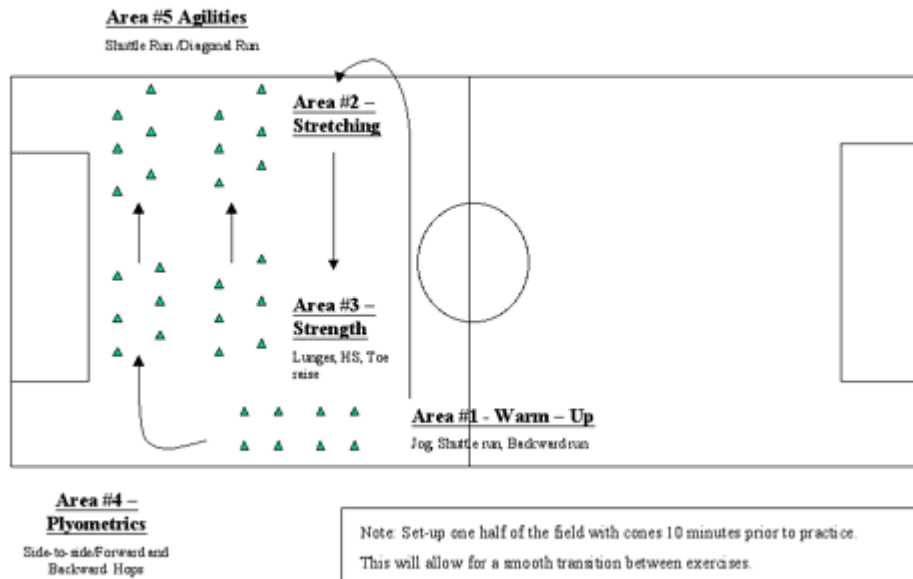
Resources:

www.sparqtraining.com

<http://www.aclprevent.com/pepprogram.htm#map>



PEP Program: Prevent injury and Enhance Performance Field Set-Up



<http://www.sportsmetrics.net/>

<http://www.youthsportsny.org/injuries/2007/11/>

<http://sportsmedicine.about.com/od/children/a/overusekids.htm>

<http://sportsmedicine.about.com/od/children/a/acsmkids.htm>

<http://sportsmedicine.about.com/od/children/a/01062005.htm>

<http://www.nyssf.org/welcome.html>