Why Warm Up??

Prepare the body for exercise:
• Increase core body temperature
• Increase oxygen uptake so can more readily get to a steady state if need
• Enhance nervous system activation therefore enhance reaction time
• Rehearsal of the movements to be performed

Prevent Injury?!!

No direct evidence to support decreased injury risk

However, there has been studies showing decreased risk of injury with dynamic warm up (Olsen et al 2011+).
Goal is to prepare the body for:
• intense bursts of running
• lower extremity stretching/reaching
• change in direction
• pivoting
• jumping to head balls
• contact with other players

Incorporates whole body movements. Athletes actively and rhythmically contract muscle groups through part of their range of motion.

Examples of Active Warm Up that incorporate Dynamic Stretches
• Easy skip with arm swings
• Skip for distance using arms to drive forward
• Skip for height using arms to drive upward
• Backward run (extend heel sideways during stride)
• Step into single leg Romanian dead lift
• Lateral low shuffle
• Walking diagonal lunges/lunge twist to same side

• High knee pulls (knee to chest, on toe)
• Heels to bum
• A’S B’S for track
• Hip rotations out and in to side with 2 steps in between
• Extend leg out front and sweep hands towards it
• Carioca
• Straight leg strides
• Gradual accelerations ( 50%,  75%,  90%)
How Long? How Hard?

15-20 minutes of activity at 60-70% of max heart rate prepares the body for ballistic exercise Beedle 2007

Stretching—Dynamic or Static?

RESEARCH - Static stretching:
- Increases max force production
- Increases peak height with jumps
- Increases sprint times
- Increases reaction time

Static stretching creates elongated muscles therefore when asked to contract must contract over longer distance therefore slower time to peak contraction
These deficits were still present in studies 30 minutes after the static stretch despite dynamic activity after
Amiri 2010 found static stretching decreased the agility performance on an agility test

Dynamic Stretching

Dynamic stretching incorporates whole body movements. Address activity and rhythmically contract muscle groups through part of their range of motion

HOW — Can involve skipping, swinging of limbs, rotational movements of limbs designed to elevate core body temperature, enhance motor unit excitability, improve balance and provide an opportunity for movement rehearsal
Both Dynamic and Static stretches showed improvement in the sit and reach flexibility test.

SDDO before activities use dynamic stretches and get the benefit of the increased flexibility without the effect on decreasing performance static stretching has been found to do.

Dynamic stretching performed at a jogging pace yielded better sprint times than those done on the spot.

Dynamic stretching resulted in faster sprint times in professional soccer players.

Side leg swing - with body facing the wall, swing leg out to the side (abduct) and then swing leg back across midline (adduct) as far as possible with forward facing, neutral pelvis.

Forward leg swing - with body perpendicular to the wall, swing leg closest to the wall forward, keeping knee extended. On the backward return swing, allow thigh to extend as far back as possible at the hip joint.

Standing Dynamic Stretches

When Should I Static Stretch?

Following sport in the cool down period is a great time to incorporate static stretching.

Especially if there is an area of tightness, injured area, or muscle imbalance from side to side. Differences in sides of the body in flexibility can become a source of injury. If one side is tighter spend more time stretching that side.

Following the game/practice have the athletes jog back and forth across the soccer pitch and then do their static stretching. Stretch just until the muscle tightness is felt and then hold it there for 30 seconds do relaxed breathing. Relax the muscle and repeat trying to take the stretch further.
**Injury Prevention WHY??**

Soccer, most popular sport in the world!!

Increase in numbers annually especially in females

In soccer, 58% of injuries are non-contact

- Most ACL injuries are non-contact, occurring during deceleration, landing or changing direction such as pivoting
- Rate of ACL injuries 3-5x higher for girls than boys age 12-18; 16%

Chinese striker Ma Xiaoxu will miss the Olympic women’s soccer competition for injury.

---

**Implications of Injury**

- Long recovery time: many competitive athletes 2/3 do not return to their pre-injury sport one year after their surgery (2011 AJSM)
- Athletes may give up sports, become inactive, lead to many preventative health conditions as an adult
- Increased risk of osteoarthritis later in life and perhaps joint replacement
- Can cost associated with the injury: bracing, surgery, and therapy
  - May lose out on a scholarship opportunity

---

**Girls at risk**

Girls have laxer ligaments than boys (hormones may play a role in this.)

Girls tend to land from jumps with their knees in valgus.
Athletes who run and change direction in a more upright position are at more risk of ACL injury.

Girls tend to play with a straighter knee.

Girls change direction with their knee in valgus.

---

"11+ Program"

Developed by: FIFA’s Medical Assessment and Research Centre and the Oslo SportsTrauma Research Centre and the Santa Monica Orthopaedic and Sports Medicine Research Centre.

11+ Program is a structured warm-up programme designed to prepare the body for activity and improve awareness and knee and ankle control during landing and pivoting movements in order to prevent knee and ankle injuries among youth athletes.

BJM Structured warm up (11+) can prevent severe knee injuries and severe ankle injuries 1/3 Study in Sweden 15 min exercise program incorporated into warm up decreased ACL injuries by 44% even 1x a week helped decrease incidence of acute injuries

Preventive training should be routine in training programmes for adolescents in pivoting sports.

---

Look at hip and knee position in all positions and learn proper biomechanical technique and improved awareness/control during running, cutting, landing from a jump, and planting.
**Slide 19**

**11+ Program • 3 Parts**

1. Dynamic warm up - 8 min
2. Strength, plyometrics, balance exercises • 10 min
3. Running exercises • 2 min

To see the entire 11+ Program manual with complete instructions go to:
http://issuu.com/vongrebelmotion/docs/11plus_workbook_english

3 levels in part 2 to be progressed as the season progresses

Take 2-3 training sessions to teach the correct technique especially in Part 2

All three parts performed 2x a week before practices
Parts 1 and 3 before games

**Slide 20**

**Field Set Up**

The course is made up of six pairs of parallel cones, approximately 5-6m apart.
Two players start at “A” doing running exercises to end of cones and then run back along the outside “B” speed can be increased progressively as players warm up

**Slide 21**

**Part 1**

Running Exercises, 8 minutes
(opening warm up, in pairs; course consists of 6 pairs of parallel cones; do each one 2 times

- Jog straight ahead to final cone faster back (running technique!!)
- Jog to first cone lift knee up and rotate hip out, alt legs at cones
- Jog to first cone lift knee and rotate hip in as above
- Jog to first cone shuffle sideways circle partner while facing forward, shuffle back to cone jog to next and repeat
- Jog to first cone shuffle sideways to partner in middle jump to make shoulder to shoulder contact with your partner, land on both feet
- Run quick to second cone back quickly to first cone run 2 fwd 1 back

*Instead of doing each one 2x can incorporate other dynamic stretches described above.*

*Joanne Carswell MClS, BMR-PT, BPE*
**Part 2.**
Strength, plyometrics, balance, 10 minutes
(one of three exercise progression levels each training session)

**The plank:**
Level 1: both legs 3×20-30 seconds
Level 2: alternate legs 3×20-30 seconds
Level 3: one leg lift 3×20-30 seconds

**Side plank:**
Level 1: static 3×20-30 seconds (each side)
Level 2: dynamic 3×20-30 seconds (each side)
Level 3: with leg lift 3×20-30 seconds (each side)

**Nordic hamstring lower:**
Level 1: 3-5
Level 2: 7-10
Level 3: 12-15

---

Joanne Carswell MClS, BMR-PT, BPE
**Single leg balance:** Balance training reduces risk of injury

<table>
<thead>
<tr>
<th>Level</th>
<th>Activity</th>
<th>Reps</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Holding ball 2×30 seconds (each leg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Throwing ball with partner 2×30 seconds (each leg)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Testing partner 2×30 seconds (each leg)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Squats:**

<table>
<thead>
<tr>
<th>Level</th>
<th>Activity</th>
<th>Reps</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>With heels raised 2×30 seconds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Walking lunges 2×30 seconds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>One leg squats 2×10 (each leg)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Jumping:**

<table>
<thead>
<tr>
<th>Level</th>
<th>Activity</th>
<th>Reps</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vertical jumps 2×30 seconds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Lateral jumps 2×30 seconds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Box jumps 2×30 seconds</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When the athletes can do all the repetitions with good technique typically within 3-4 weeks if done regularly (at least 2 × a week)
**Slide 28**

Game Warm ups

Part I and 3 (10 minutes)

OR...

Part I and Small Sided Soccer Games

Zois 2011 found that small sided games warm ups performed better in speed and agility tests felt the traditional warm up fatigued the athletes prior to a game.

---

**Slide 29**

Points of Interest

Top class soccer players cover 11 km in a 90 min match, females run a shorter distance (probably we pass more!)

Midfielders run more at low speeds than defenders and forwars.

Midfielders and attack players sprint 1.6x more than central defenders.

Per game do:
10-20 sprints which last 2-4 seconds every 70-90 seconds, 15 tackles, 10 heads, 50 touches, 30 passes.

---

**Slide 30**

The average work intensity of soccer is 80-90% max heart rate - an aerobic sport! But close to anaerobic threshold!

Training INTERVAL TRAINING for soccer for fitness (not to be done by unconditioned athletes or under age of 14yrs at this intensity)90-95% max HR for 3-8 minutes followed by an active recovery at 70% max HR to remove lactate.

Helgerud “4x4 program” 4 x 4 min 90-95% max HR (takes 1-2 minutes to get to max speed and heart rate) followed by 3 min at 70% max HR repeated 4x.

Elite soccer player (male 75kg) can squat >200 kg, bench press 100kg, vertical jump 60cm

Goal bench press: 0.8 x BW, ½ squat 1.5 x BW.
References


