The 11+
The FIFA Injury Prevention Initiative

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Intuitively, you know the answers . . .

- What?
- Who?
- When?
- Age?
- Match or training?
- Boys or girls?
- Rec or elite?
The preventive research model

1. Establish the extent of the injury problem:
   - Incidence
   - Severity

2. Establish the etiology and mechanism of sports injuries

3. Introduce preventive measures

4. Assess effectiveness by repeating step 1
## Overall injury rates

<table>
<thead>
<tr>
<th>Category</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>youth</td>
<td>10/1000 ph</td>
<td></td>
</tr>
<tr>
<td>adolescents</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>college</td>
<td>25</td>
<td>22</td>
</tr>
<tr>
<td>professionals</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td><strong>Overall match</strong></td>
<td><strong>25-30</strong></td>
<td><strong>13-24</strong></td>
</tr>
<tr>
<td><strong>Overall training</strong></td>
<td><strong>3-7</strong></td>
<td><strong>3-4</strong></td>
</tr>
</tbody>
</table>

* International competition rates >2-3x
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Risk Factors of Soccer Injury
Risk factors of injury

- **Player related**
  - Sex, age
  - Physical characteristics
  - Joint laxity
  - Fitness, skill level
  - Position, psychological factors
  - Sports behavior
  - Flexibility (leg, groin)
  - Previous injury

- **Environment related**
  - Equipment
  - Fields and surfaces
  - Weather
  - Quality of training
  - Training load
  - Training/match ratio
  - Rules and refereeing
  - Foul play
  - Opponent’s behavior

Pre-season screening effectively identifies injury risks.
what do we have control over?

• Player related
  Sex, age
  Physical characteristics
  Joint laxity
  Fitness, skill level
  Position, psychological factors
  Sports behavior
  Flexibility (leg, groin)
  Previous injury

• Environment related
  Equipment
  Fields and surfaces
  Weather
  Quality of training
  Training load
  Training/match ratio
  Rules and refereeing
  Foul play
  Opponent’s behavior
what does the evidence say?

- **Player related**
  - Sex (ACL, head), age
  - Physical characteristics
  - Joint laxity
  - Fitness, skill level
  - Position, psychological factors
  - Sports behavior
  - Flexibility (leg, groin)
  - Previous injury (#1!)
  +6-8x for ankle/hams

- **Environment related**
  - Equipment
  - Fields and surfaces
  - Weather
  - Quality of training
  - Training load
  - Training/match ratio
  - Rules and refereeing
  - Foul play
  - Opponent’s behavior
Tackling: The most dangerous part of the game

<table>
<thead>
<tr>
<th>Risk</th>
<th>Tackled</th>
<th>Tackler</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high</td>
<td>Clash of heads</td>
<td>Clash of heads</td>
</tr>
<tr>
<td>High</td>
<td>2-footed</td>
<td>Side</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jumping vertically</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2-footed</td>
</tr>
</tbody>
</table>
Contact ankle sprain
Hamstring strain
Non-contact ACL tear
1. a high school injury

2. the younger the first ACL, the greater the chance of having a 2\textsuperscript{nd} or more

3. Prevent the 1\textsuperscript{st} tear
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Prevention programs from the medical literature

- Ekstrand 1984
  - Medical/therapist supervised program
  - numerous interventions
Prevention programs from the medical literature

- Heidt, 2000
  - High school girls in Cincinnati
  - 2 groups: 1 normal summer, other speed/strength/agility training for 7 weeks prior to camp

Avoidance of Soccer Injuries with Preseason Conditioning

Robert S. Heidt, Jr., MD*, Lisa M. Sweeterman, ATC, MS, Richelle L. Carlonas, MS*, Jeff A. Traub, MD* and Francis X. Tekulve, ATC

* Wellington Orthopaedic and Sports Medicine, Cincinnati, Ohio; Tekulve Acceleration Training, Cincinnati, Ohio
Prevention programs from the medical literature

- Junge, 2002
  - ~200 males 13-19y
  - Variety of core, plyometrics, balance, motor control activities at all training sessions
F-MARC 11

1. Appui sur les avant-bras
2. Appui sur l'avant-bras en position latérale
3. Hamstrings
4. Ski de fond
5. Lancer le ballon sur un pied
6. Appui sur une jambe en pliant le haut du corps
7. Appui sur une jambe en faisant faire des huit au ballon
8. Sauter sur les deux jambes
9. Shuffle en zigzag
10. Sauter en hauteur et en longueur
11. Fair-play

Lorsque la pratique de football, une grande partie des blessures est causée par des fautes. C'est pourquoi le respect des règles du jeu et un comportement Fair-play sont essentiels. Les œuvres antérieures ou postérieures, ainsi que les fautes de force doivent être évitées. Il est important de respecter ses adversaires, de jouer avec du respect et de faire preuve de Fair-play.
Prevention programs from the medical literature

- Mandelbaum, 2005
  - 2 yr project in CA
  - Guided warmup intervention
  - Details at www.aclprevent.com

Effectiveness of a Neuromuscular and Proprioceptive Training Program in Preventing Anterior Cruciate Ligament Injuries in Female Athletes

2-Year Follow-up

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From the *Santa Monica Orthopaedic and Sports Medicine Research Foundation, Santa Monica, California, the §Peachtree Orthopaedic Clinic, Atlanta, Georgia, the ¶VA National Center for Health Promotion and Disease Prevention, Durham, North Carolina, and the ‡Duke University Medical Center, Durham, North Carolina
The preventive research model

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Prevention programs from the medical literature

- Ekstrand 1984
  - Medical/therapist supervised program
  - numerous interventions
  - ↓ flex = ↑ strains (*)
  - ↓ Q/H strength in knee injured players

Injury prevention for adult male rec?
No diff in overall rate
But significantly fewer knee injuries

- time with injuries
- ↑ training/match = ↓ injury rate
Prevention programs from the medical literature

- Heidt, 2000
  - High school girls in Cincinnati
  - 2 groups: 1 normal summer, other speed/strength/agility training for 7 weeks prior to camp

- Their results
  - 35% reduction overall in injuries
  - 11 season ending injuries in UT group
  - 1 in trained group

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Prevention programs from the medical literature

- Junge, 2002
  - ~200 males 13-19y
  - Variety of core, plyometrics, balance, motor control activities at all training sessions
- 1.2 injuries per control player
- .75 injuries per intervention player
  - 37% fewer injuries
- Other injury reductions
  - -41% overuse injuries
  - -55% training injuries
  - -24% match injuries
Other findings from Junge 2002

<table>
<thead>
<tr>
<th>Body Part</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spine</td>
<td>-50%</td>
</tr>
<tr>
<td>Trunk</td>
<td>-80%</td>
</tr>
<tr>
<td>Groin</td>
<td>-80%</td>
</tr>
<tr>
<td>Thigh</td>
<td>-42%</td>
</tr>
<tr>
<td>Knee</td>
<td>-41%</td>
</tr>
<tr>
<td>Ankle</td>
<td>-5%</td>
</tr>
<tr>
<td>Foot</td>
<td>-43%</td>
</tr>
</tbody>
</table>
Injury rate reduced regardless of skill level – Junge 2002
Prevention programs from the medical literature

- Mandelbaum, 2005
  - 2 yr project in CA
  - Guided warmup intervention
  - Details at www.aclprevent.com

- 30% fewer injuries overall
- 65% fewer ACL injuries
The 11+
Prevention programs from the medical literature

- Soligard, 2008
  - Nearly 1900 females, age 13-17
  - Guided complete warm-up programme with increasing intensities
  - The 11+
  - In 3 parts

**Comprehensive warm-up programme to prevent injuries in young female footballers: cluster randomised controlled trial**

Torbjorn Soligard, PhD student; Grethe Myklebust, associate professor; Kathrin Steffen, research fellow; Ingvar Holme, professor; Holly Silvers, physical therapist; Mario Bizzini, physical therapist; Astrid Junge, associate professor; Jiri Dvorak, professor; Roald Bahr, professor; Thor Einar Andersen, associate professor.
Optional exercises for variety and increasing difficulty

What % of coaches have incorporated an injury prevention program into training?
Running and dynamic flexibility

Run in pairs, each done 2x
Strength, plyometrics, balance
Running exercises

Urban HS basketball
Team handball
Netball
Where to find The 11+
Prevention programs from the medical literature

- Soligard, 2008
  - Nearly 1900 females, age 13-17
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  - The 11+
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What about time lost to injury?
Prevention programs from the medical literature

- Soligard, 2008
  - Nearly 1900 females, age 13-17
  - Guided complete warm-up programme with increasing intensities
  - The 11+
  - In 3 parts
  - All injuries ↓32%
  - Overuse injuries ↓53%
  - Severe injuries ↓45%
  - Match injuries ↓28%

Knee injury prevention: >4500 girls
64% reduction in ACL tears
Quality of officiating?

Injuries per match @ U20 WC

<table>
<thead>
<tr>
<th>Year</th>
<th>Injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td></td>
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</tbody>
</table>

w/ senior level FIFA refs
Key Points

- Prevention programs WORK
- Injury are predictable
  - legal contact or
  - Just a single player or
  - foul play.
    - ¼ (female) to ½ (male) injuries
- Contusions, sprains, and strains, generally minor.
- Since 1998, 2.7 injuries per FIFA match
  - < 10% of injuries are serious (>28d)
- Modify rules to sanction players for foul play
Recommendations for coaches

- Improve fitness and soccer skills
- **Emphasize fair play.**
  - Coaching education makes a difference.
- Low training/match:
  - Poor fitness, skill, tactical development
  - underperformance and injuries.
- Maintain quality playing fields
- Support improved officiating
  - enforce sanctions against foul play.