



The 11+

The FIFA Injury Prevention Initiative

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Intuitively, you know the answers . . .



Match or training?

What?

When?

Age?

Who?

Boys or girls?

Rec or elite?



US YOUTH SOCCER WORKSHOP  
AT THE NSCAA CONVENTION



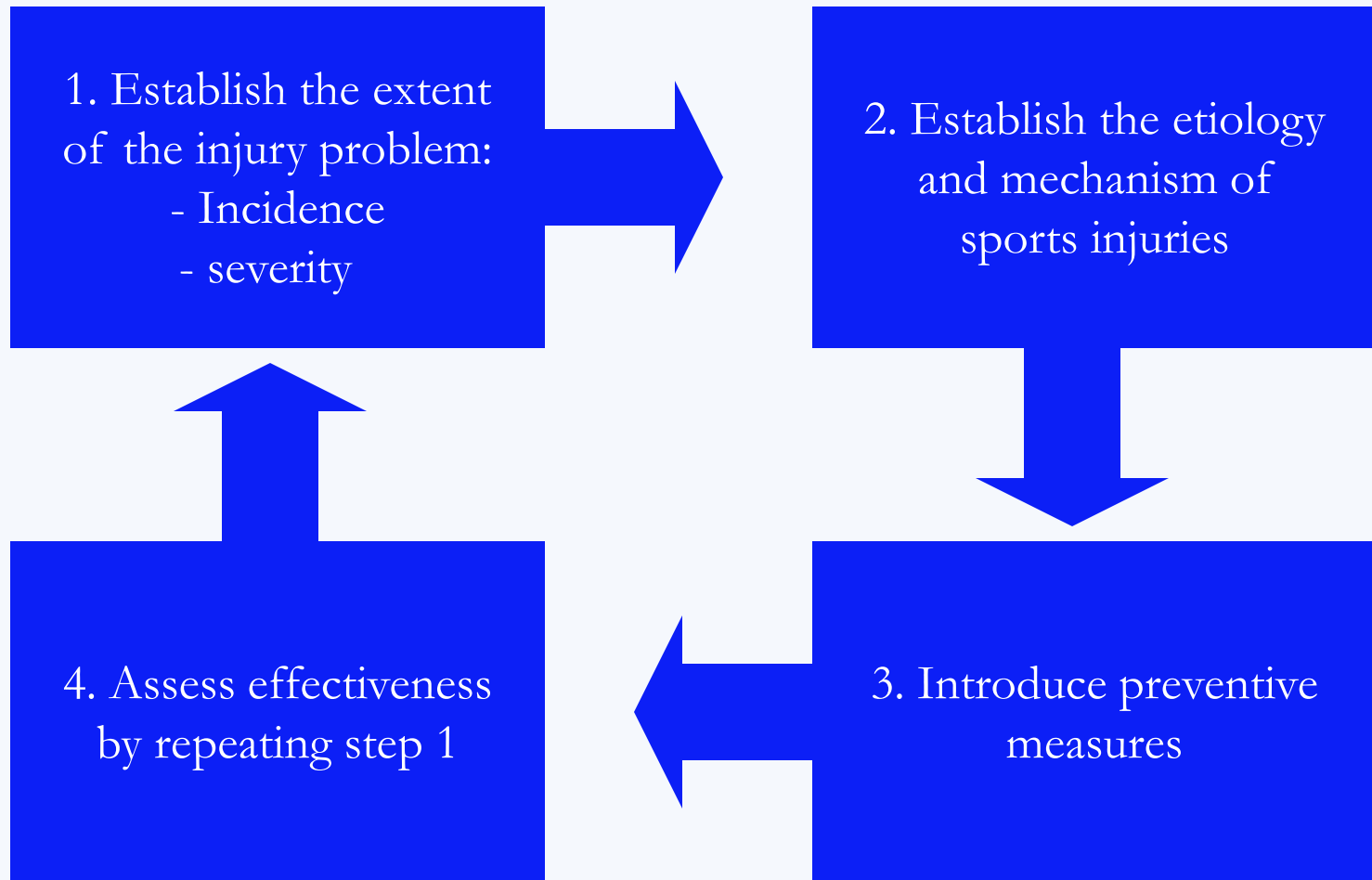
# The 11+

A complete warm-up program



US YOUTH  
AT 11

# The preventive research model



# Overall injury rates



	Males	Females
youth	10/1000 ph	
adolescents	16	8
college	25	22
professionals	23	23
<b>Overall match*</b>	<b>25-30</b>	<b>13-24</b>
<b>Overall training</b>	<b>3-7</b>	<b>3-4</b>

\* International competition rates >2-3x



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# The preventive research model



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

2. Establish the etiology and mechanism of sports injuries

4. Assess effectiveness by repeating step 1

3. Introduce preventive measures





# Risk Factors of Soccer Injury

# Risk factors of injury



- Player related

Sex, age

Physical characteristics

Pre-season screening  
effectively identifies  
injury risks

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 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

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Quality of training

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# 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

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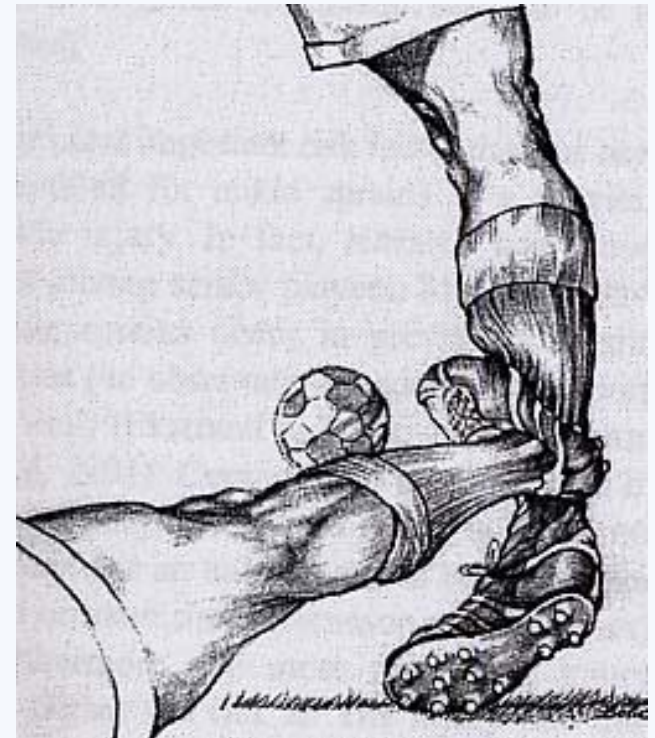
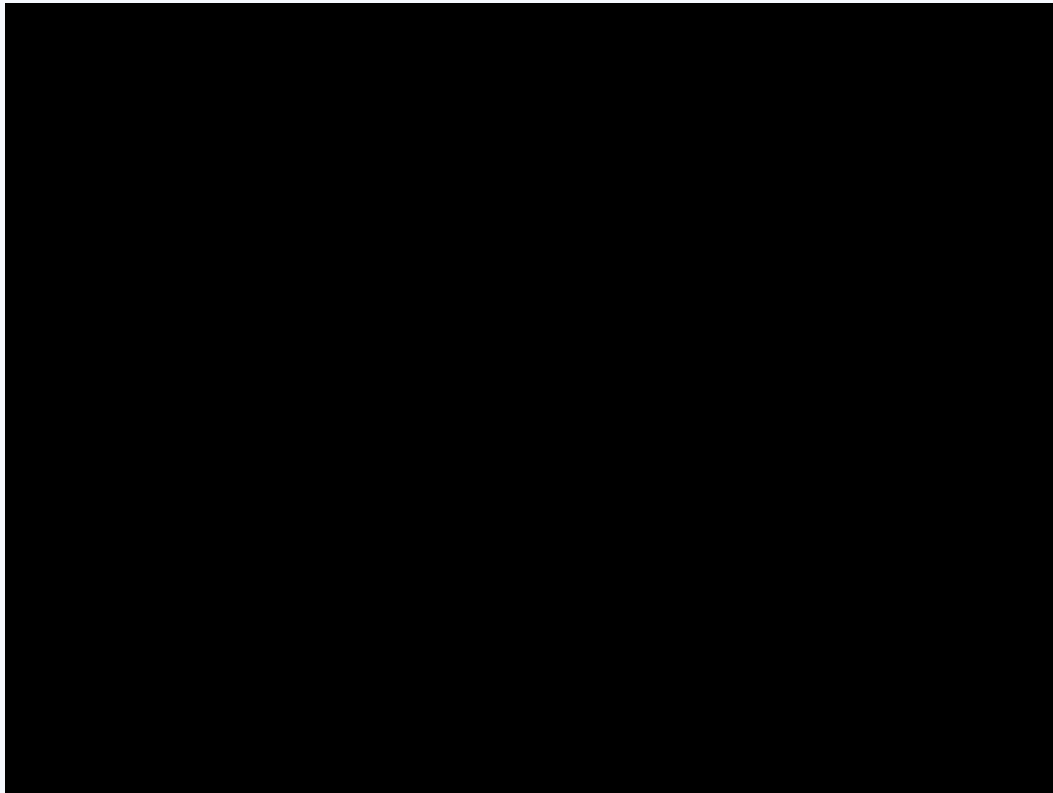
# Tackling: The most dangerous part of the game



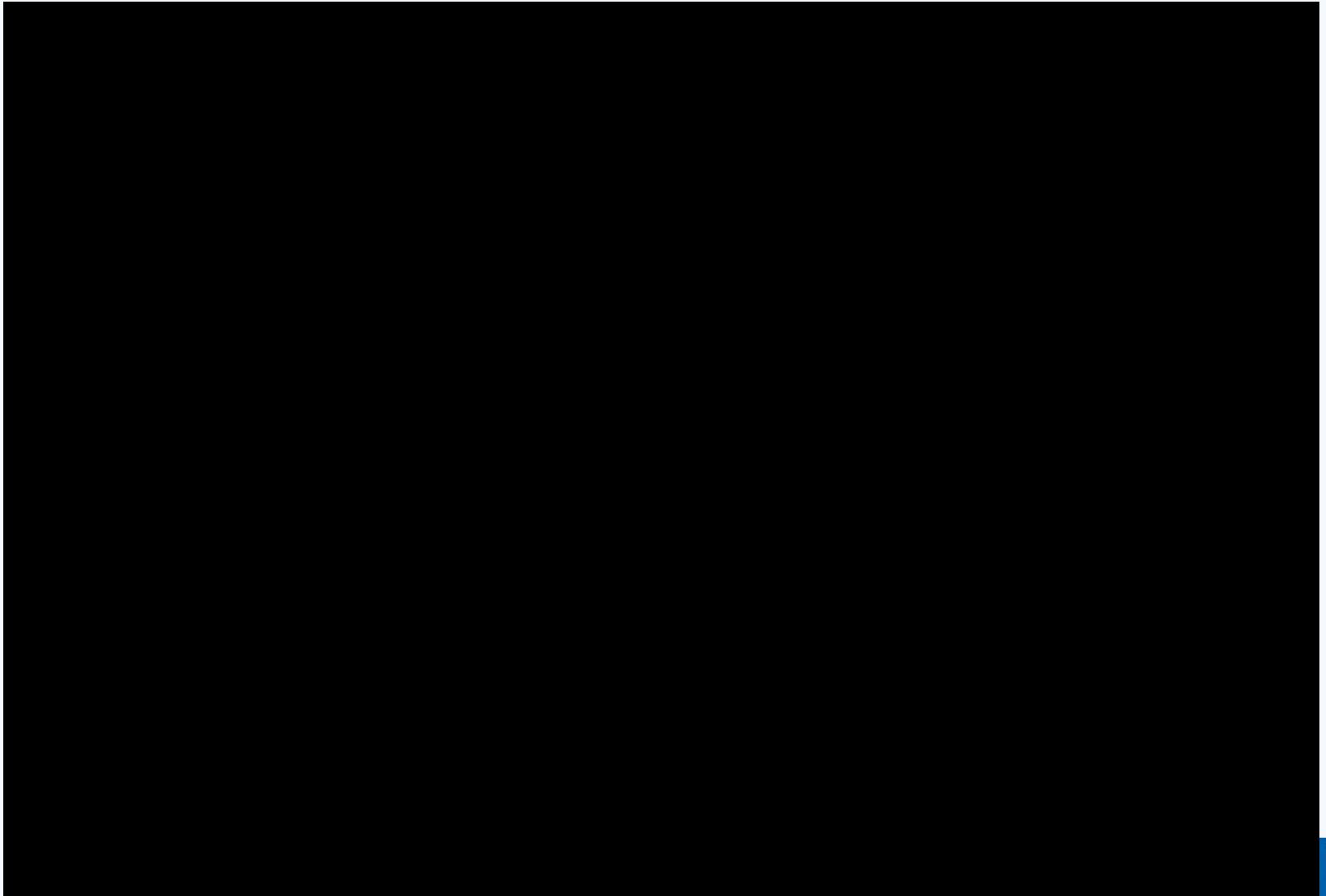
Risk	Tackled	Tackler
Very high	Clash of heads	Clash of heads
High	2-footed	Side Jumping vertically 2-footed



# Contact ankle sprain



# Hamstring strain



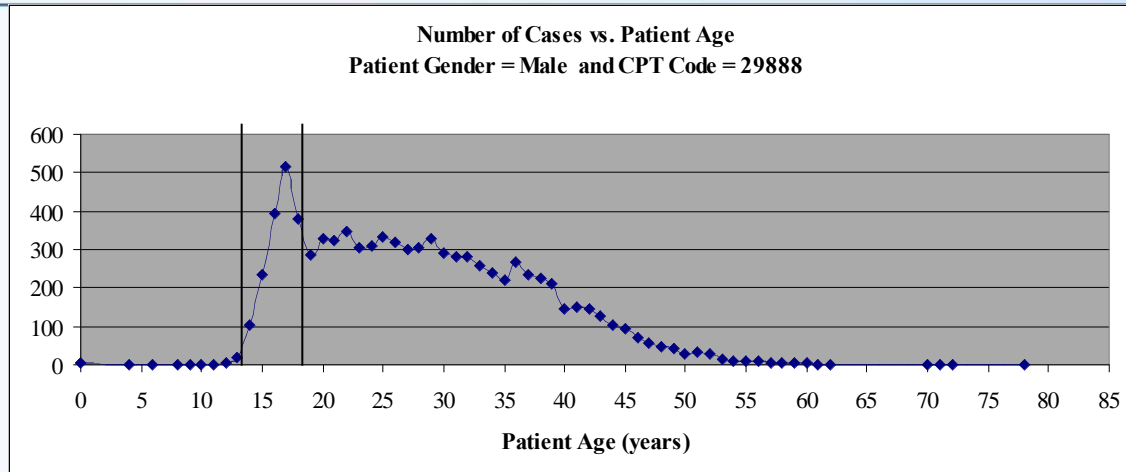
# Non-contact ACL tear



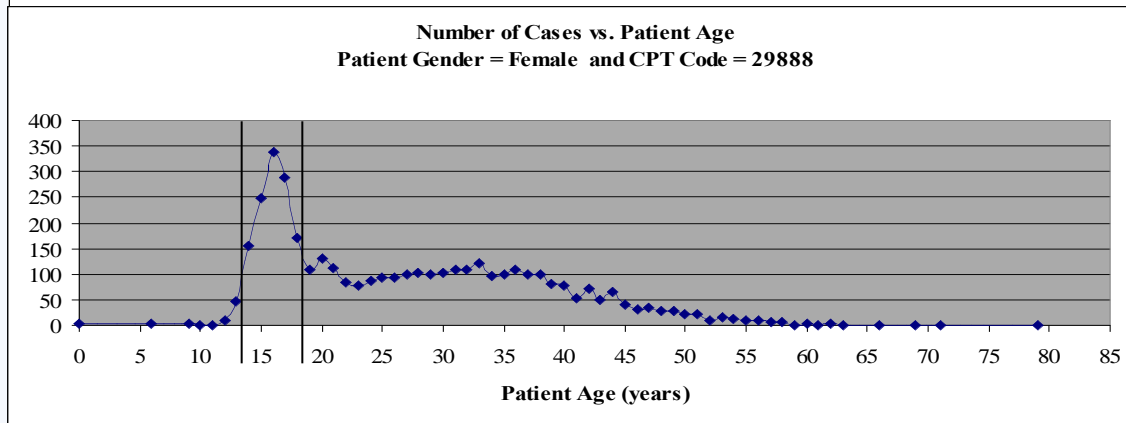
# ACL surgeries by age and sex



1. a high school injury



3. Prevent the 1<sup>st</sup> tear



2. the younger the first ACL, the greater the chance of having a 2<sup>nd</sup> or more



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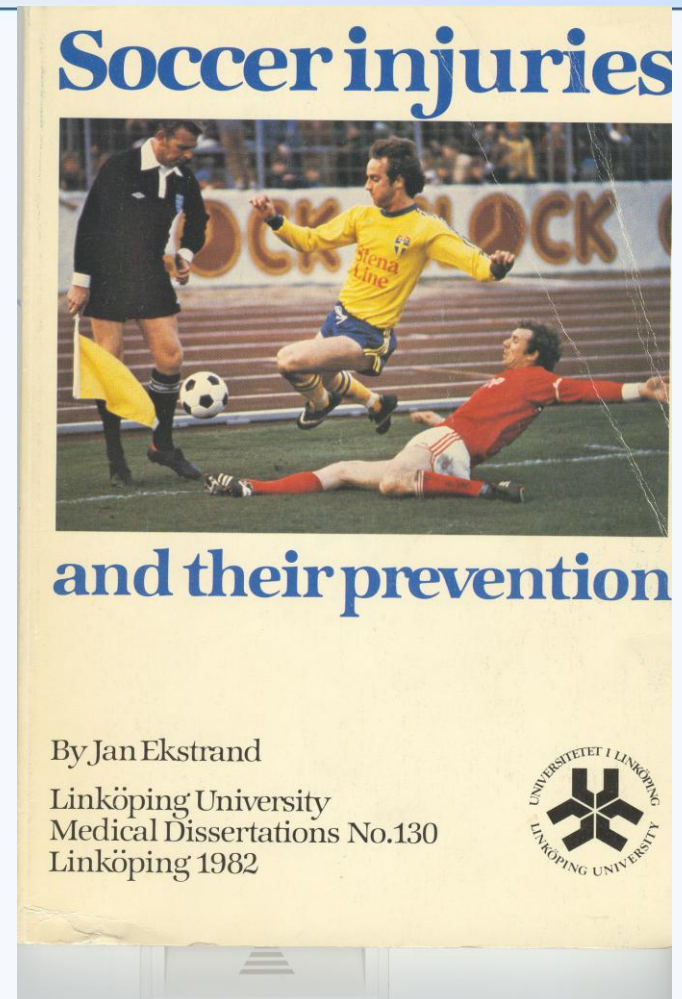




# Prevention programs from the medical literature



- Ekstrand 1984
  - Medical/therapist supervised program
  - numerous interventions



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# 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

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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

## Prevention of Soccer Injuries: A Prospective Intervention Study in Youth Amateur Players

Astrid Junge,\*†‡ PhD, Dieter Rösch,\*§ MA, Lars Peterson,\*|| MD, Toni Graf-Baumann,\*ª MD, and Jiri Dvorak,\*† MD

*From the \*Fédération Internationale de Football Association Medical Assessment and Research Center (F-MARC) and the †Schulthess Clinic, Zurich, Switzerland, the §Department of Sport and Sport-pedagogic, Pedagogic-University, Freiburg, Germany, ||Gothenburg Medical Center, Vastra Frölunda, Sweden, and the ªOffice for Management in Medical Research, Teningen, Germany*



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# F-MARC 11

**1 Appui sur les avant-bras**

La tête, le dos et le bassin sont alignés, avec les épaules, sur un même plan parallèle au sol. Les coudes sont placés perpendiculairement sous les épaules. Soulever la jambe droite à quelques centimètres du sol et maintenir cette position pendant 15 secondes. Répéter une à deux fois pour chaque membre.

**2 Appui sur l'avant-bras en position latérale**

L'épaule supérieure, la hanche et la jambe supérieure se situent sur une seule et même ligne parallèle au sol. Le coude est placé perpendiculairement sous l'épaule. Vous êtes en haut, les épaules, les coudes et les genoux forment une ligne droite. Maintenez cette position pendant 15 secondes en évitant d'abaisser le bassin. Répéter deux fois de chaque côté.

**3 Hamstrings**

Un partenaire prend appui avec les deux mains sur les jambes du joueur et les maintient fermement vers l'avant en maintenant le haut du corps droit et les hanches tendues. Cuisse, hanche et haut du corps forment une ligne droite. Contenir le haut du corps aussi longtemps que possible à l'aide de la musculature des cuisses. Se laisser ensuite tomber en avant et se rattraper à l'aide des deux mains. Répéter l'exercice cinq fois.

**4 Ski de fond**

Fléchir et étendre le genou de la jambe d'appui en balançant les bras asymétriquement d'avant en arrière de façon rythmée. Toujours maintenir le genou un peu fléchi en évitant qu'il devie vers l'intérieur. Le bassin et le haut du corps restent stables et dirigés vers l'avant. Maintenir le bassin toujours à l'horizontale. Répéter l'exercice 15 fois sur chaque membre.

**5 Lancer le ballon sur un pied**

Le genou et la hanche de la jambe d'appui sont légèrement fléchis. Ne prendre appui que sur l'avant-pied ou relever le talon. Vue de face, hanche, genou et pied de la jambe d'appui forment une ligne droite. Répéter l'exercice dix fois pour chaque membre.

**6 Appui sur une jambe en pliant le haut du corps**

Comme pour l'exercice 5, sauf qu'avant de renvoyer le ballon, lui faire toucher le sol sans y mettre de charge. Toujours maintenir une légère flexion du genou en contact de la double vers l'intérieur. Répéter l'exercice dix fois sur chaque membre.

**7 Appui sur une jambe en faisant faire des huit au ballon**

Avant de relancer le ballon, le joueur lui fait faire un huit à l'aide de ses deux mains. Il lui fait d'abord faire un tour autour de la jambe d'appui puis autour de l'autre jambe en fléchissant le haut du corps vers l'avant et en restant le plus droit possible. Le genou demeure toujours légèrement fléchi et ne doit pas décaler vers l'intérieur. Répéter l'exercice dix fois sur chaque membre.

**8 Sauter sur les deux jambes**

Sauter sur les deux pieds aussi rapidement que possible et en « espasant » par-dessus la ligne et revenir en arrière de la même façon. Réception en douceur sur les avant-pieds avec les genoux légèrement fléchis. Ne pas laisser décaler les genoux vers l'intérieur. Répéter l'exercice dix fois face à la ligne (aller et retour) puis dix fois latéralement par rapport à la ligne.

**9 Shuffle en zigzag**

Genoux et hanches fléchis, de manière que le haut du corps soit bien penché en avant. Une épaule montre dans la direction du mouvement. Effectuer le parcours aussi rapidement que possible en exécutant des sauts latéraux. Sautez et réception toujours sur l'avant-pied. Ne pas décaler les genoux vers l'intérieur. Effectuer deux fois le parcours (6 marques sur 10x20 m).

**10 Sauts en hauteur et en longueur**

Lors du saut, il faut lever le genou de la jambe d'appui aussi haut que possible et ramener le bras contralatéral devant le corps en pliant. Réception en douceur sur l'avant-pied en fléchissant légèrement le genou. Éviter de décaler le genou vers l'intérieur lors du saut et lors de la réception. Parcourir deux fois un parcours d'environ 20 mètres.

**11 Fair-play** Lors de la pratique du football, une grande partie des lésions est occasionnée par des fautes. C'est pourquoi le respect des règles du jeu et un comportement fair-play envers ses adversaires constituent des mesures importantes pour éviter les blessures. Faites toujours 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](http://www.aclprevent.com)

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

### 2-Year Follow-up

Bert R. Mandelbaum,<sup>\*</sup> MD, Holly J. Silvers,<sup>\*†</sup> MPT, Diane S. Watanabe,<sup>\*</sup> MA, ATC, John F. Knarr,<sup>\*</sup> PT, ATC, Stephen D. Thomas,<sup>\*</sup> MPT, Letha Y. Griffin,<sup>‡</sup> MD, Donald T. Kirkendall,<sup>§</sup> PhD, and William Garrett, Jr.,<sup>||</sup> MD, PhD

*From the <sup>\*</sup>Santa Monica Orthopaedic and Sports Medicine Research Foundation, Santa Monica, California, the <sup>†</sup>Peachtree Orthopaedic Clinic, Atlanta, Georgia, the <sup>§</sup>VA National Center for Health Promotion and Disease Prevention, Durham, North Carolina, and the <sup>||</sup>Duke University Medical Center, Durham, North Carolina*



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## •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

68%

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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

## Prevention of Soccer Injuries: A Prospective Intervention Study in Youth Amateur Players

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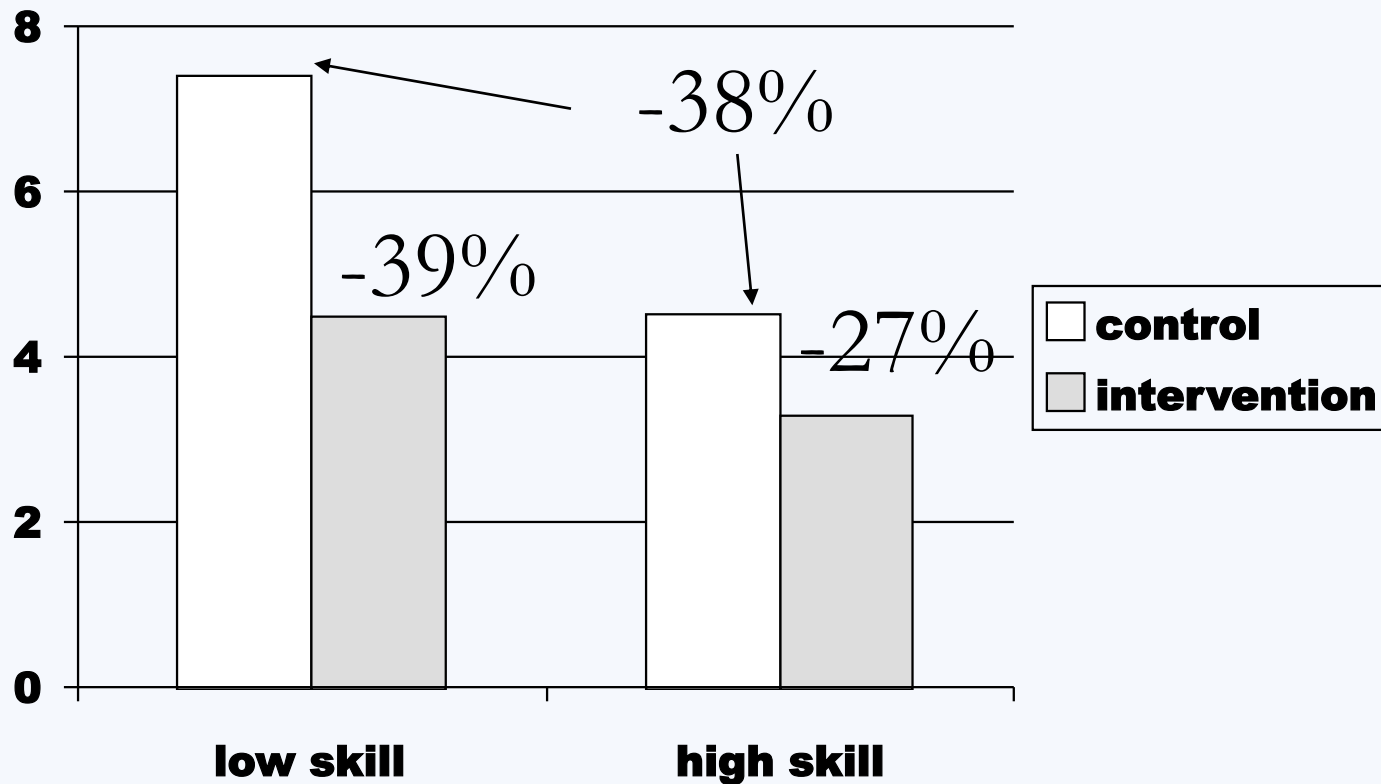
# Other findings from Junge 2002



Spine	-50%
Trunk	-80%
Groin	-80%
Thigh	-42%
Knee	-41%
Ankle	-5%
Foot	-43%



# Injury rate reduced regardless of skill level – Junge 2002



# Prevention programs from the medical literature



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- 30% fewer injuries overall
- 65% fewer ACL injuries

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# The 11+

# Prevention programs from the medical literature



BMJ

RESEARCH

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  - 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

Torbjørn Soligard, PhD student,<sup>1</sup> Grethe Myklebust, associate professor,<sup>1</sup> Kathrin Steffen, research fellow,<sup>1</sup> Ingar Holme, professor,<sup>1</sup> Holly Silvers, physical therapist,<sup>2</sup> Mario Bizzini, physical therapist,<sup>3</sup> Astrid Junge, associate professor,<sup>3</sup> Jiri Dvorak, professor,<sup>3</sup> Roald Bahr, professor,<sup>1</sup> Thor Einar Andersen, associate professor<sup>1</sup>



US YOUTH SOCCER WORKSHOP  
AT THE NSCAA CONVENTION



Optional exercises for variety and increasing difficulty

# The 11+

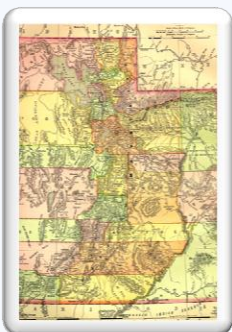
## PART 1 RUNNING EXERCISES • 8 MINUTES

<p><b>1 RUNNING STRAIGHT AHEAD</b></p> <p>The course is made up of 4 to 10 pairs of cones. The distance between the cones is approx. 2-6 meters. At running exercise you start at the first pair of cones. You change your direction at the second pair of cones. You do this until you reach the last pair of cones - zigzag through the cones.</p>	<p><b>2 RUNNING HIP OUT</b></p> <p>Walk or jog slowly, side at each pair of cones. Hit your knee and rotate your hip outward. Alternate between left and right leg.</p>	<p><b>3 RUNNING HIP IN</b></p> <p>Walk or jog slowly, side at each pair of cones. Hit your knee and rotate your hip inward. Alternate between left and right leg.</p>
<p><b>4 RUNNING CIRCLING</b></p> <p>Run forward as a pair to the first pair of cones - shuffle sideways 90 degrees clockwise and start in the middle - shuffle as you move away from the cones. Repeat 4 times. Then run back to the first pair of cones. Repeat for 20-30 sec. Short break, change sides and repeat.</p>	<p><b>5 RUNNING RUNNING &amp; JUMPING</b></p> <p>Run forward as a pair to the first pair of cones - shuffle sideways 90 degrees and start in the middle - jump forward with either side, landing on the other side. Repeat 4 times. Then run back to the first pair of cones. Repeat for 20-30 sec. Short break, change sides and repeat.</p>	<p><b>6 RUNNING QUICK RUN</b></p> <p>As a pair, run quickly to the second set of cones. Run backwards quickly for a distance of one meter. Repeat 4 times. Then run forward as a pair to the second set of cones. Repeat for 20-30 sec. Short break, change sides and repeat.</p>

## PART 2 STRENGTH • PLYOMETRICS • BALANCE • 10 MINUTES

LEVEL 1	LEVEL 2	LEVEL 3
<p><b>7 THE PLANK BOTH LEGS - 3 sets</b></p> <p><b>Starting position:</b> Lie on your stomach and support yourself on your forearms and toes. Your elbows should be directly under your shoulder joint. <b>Exercise:</b> Lift your body up, supported on your forearms and your heels. Hold the position for 20-30 sec. Your body should be a straight line. Do not sway or arch your back.</p>	<p><b>7 THE PLANK ALTERNATE LEGS - 3 sets</b></p> <p><b>Starting position:</b> Lie on your stomach and support yourself on your forearms. Your elbows should be directly under your shoulder joint. <b>Exercise:</b> Lift yourself up onto your forearms and put your weight on the forearms of the ground, and hold the position for 20-30 sec. Continue for 45-60 sec. Your body should be straight. Do not sway or arch your back.</p>	<p><b>7 THE PLANK ONE LEG LIFT - 3 sets</b></p> <p><b>Starting position:</b> Lie on your stomach and support yourself on your forearms. Your elbows should be directly under your shoulder joint. <b>Exercise:</b> Lift yourself up onto your forearms, pull your right leg up, the centerline of the ground, and hold the position for 20-30 sec. Your body should be straight. Do not let your opposite hip dip and do not sway or arch your back. Short break, change leg and repeat.</p>
<p><b>8 SIDE PLANK STATIC - 3 sets on each side</b></p> <p><b>Starting position:</b> Lie on your side with the side of your lower leg bent. <b>Exercise:</b> Lift up your upper body so that you rest on your forearm and knee. The elbow of your supporting arm should be directly under the shoulder joint and the supporting leg should be bent 90 degrees. Your shoulder, hip and knee should be in a straight line. Hold the position for 20-30 sec. Short break, switch side and repeat.</p>	<p><b>8 SIDE PLANK DYNAMIC - 3 sets on each side</b></p> <p><b>Starting position:</b> Lie on your side with both legs straight. <b>Exercise:</b> Place your weight on your forearm and the side of your foot so that you are in a straight line from shoulder to foot. The elbow of your supporting arm should be directly beneath your shoulder. Raise and lower your hip over the ground and lift it up again. Repeat for 20-30 sec. Short break, change sides and repeat.</p>	<p><b>8 SIDE PLANK WITH LEG LIFT - 3 sets on each side</b></p> <p><b>Starting position:</b> Lie on your side with both legs straight. <b>Exercise:</b> Lean on your forearm and the side of your foot so that your body makes a straight line from shoulder to foot. The elbow of your supporting arm should be directly beneath your shoulder joint. Lift your upper leg to the side and slowly lower it down. Repeat the exercise for 20-30 sec. Short break, change sides and repeat.</p>
<p><b>9 HAMSTRINGS NORDIC HAMSTRINGS - 1 set</b></p> <p><b>Starting position:</b> Kneel on a soft surface. Ask your partner to firmly hold your ankles. <b>Exercise:</b> Lean forward by converting weight from the shoulder to the knee. Lean forward as far as you can using the resistance of the back of your thighs and your ankles. When you feel no longer feel the position, gently support your weight through your hands, falling into a squat position. Complete a minimum of 20 repetitions and/or 60 sec.</p>	<p><b>9 HAMSTRINGS NORDIC HAMSTRINGS - 1 set</b></p> <p>Minimum 1-1.5 repetitions.</p>	<p><b>9 HAMSTRINGS NORDIC HAMSTRINGS - 1 set</b></p> <p>Minimum 1-1.5 repetitions.</p>
<p><b>10 SINGLE-LEG BALANCE HOLD THE BALL - 2 sets</b></p> <p><b>Starting position:</b> Stand on one leg. <b>Exercise:</b> Balance on one leg while you hold the ball between your hands. Keep it on the right side of your foot. Rebalance 10 times on the same leg. Repeat for 30 sec. Switch legs and repeat. Do not let your knees sway or wobble by placing the ball around your middle and ankle.</p>	<p><b>10 SINGLE-LEG BALANCE THROWING BALL WITH PARTNER - 2 sets</b></p> <p><b>Starting position:</b> Stand 2-3 meters apart, both standing on one leg. <b>Exercise:</b> While holding your balance and your raised leg, throw the ball to one another. Keep your weight on the ball of the foot. Rebalance. Do not let your knee extend over your foot or sway inward. Keep going for 30 sec. Change sides and repeat.</p>	<p><b>10 SINGLE-LEG BALANCE TEST YOUR PARTNER - 2 sets</b></p> <p><b>Starting position:</b> Stand on one leg, separate your partner at an arm's length. <b>Exercise:</b> While you both try to keep your balance, one of you tries to push your partner off balance in different directions. Keep your weight on the ball of the foot. Rebalance to prevent your knee from being wobbled. Continue for 30 sec. Change leg and change role.</p>
<p><b>11 SQUATS WITH TOE RAISE</b></p> <p>If you feel large forward, bend less. Do not let your knees move past your toes.</p>	<p><b>11 SQUAT WALKING LUNGES</b></p> <p>Go very slowly. Do not let your knees move past your toes.</p>	<p><b>11 SQUATS ONE-LEG SQUATS - 2 sets on each leg</b></p> <p><b>Starting position:</b> Stand on one leg. <b>Exercise:</b> Standing on one leg, slowly bend your knee as much as you can manage. Concentrate on preventing the knee from coming inward. Bend your knee slowly and straighten it a little more quickly, keeping your hip and upper body level. Repeat the exercise 10 times on each leg.</p>

What % of coaches have incorporated an injury prevention program into training?



# Running and dynamic flexibility



Run in pairs, each done 2x



# Strength, plyometrics, balance



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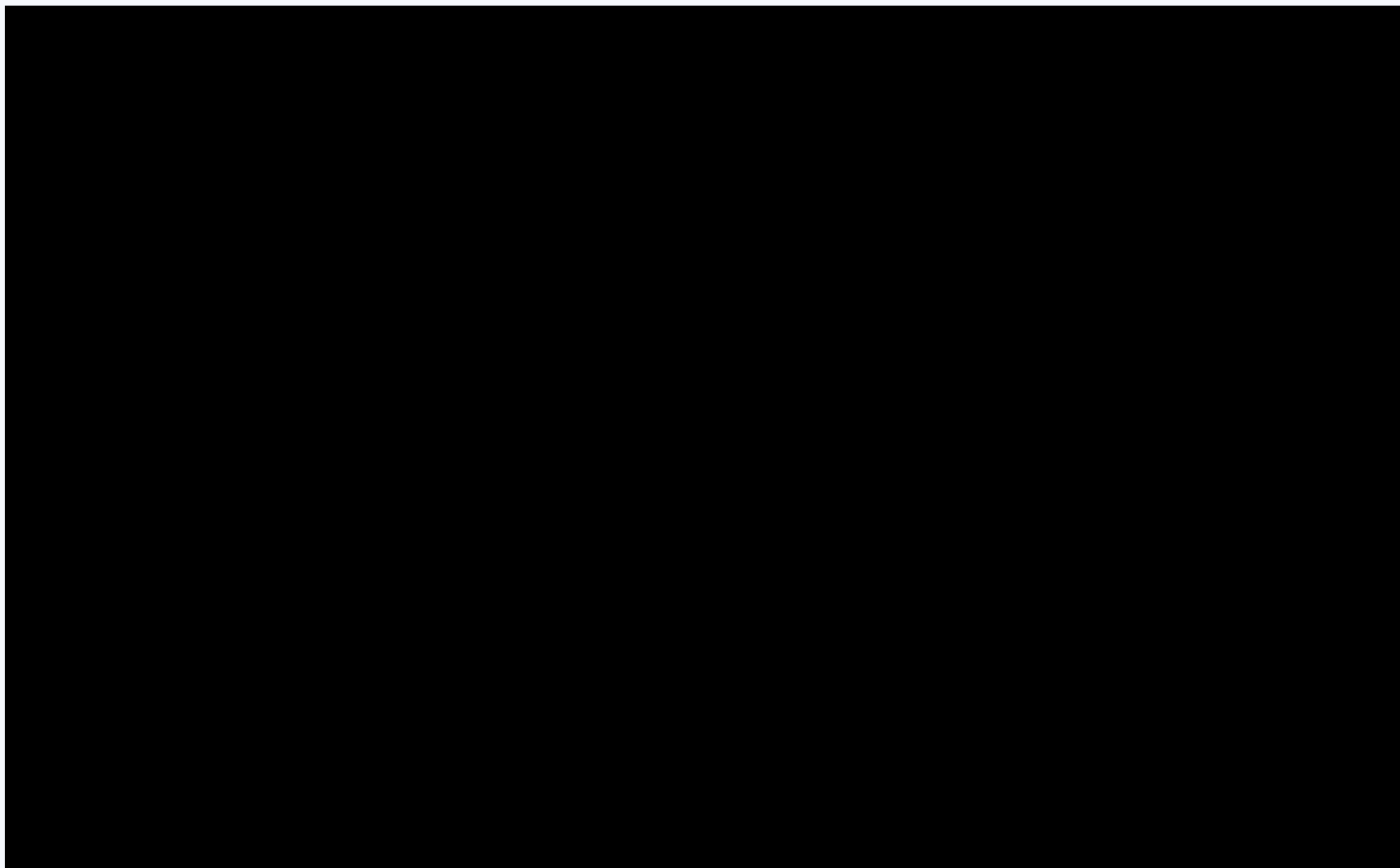
# Running exercises



Urban HS basketball  
Team handball  
Netball



# Where to find The 11+



# Prevention programs from the medical literature



## BMJ

## RESEARCH

- 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

Torbjørn Soligard, PhD student,<sup>1</sup> Grethe Myklebust, associate professor,<sup>1</sup> Kathrin Steffen, research fellow,<sup>1</sup> Ingar Holme, professor,<sup>1</sup> Holly Silvers, physical therapist,<sup>2</sup> Mario Bizzini, physical therapist,<sup>3</sup> Astrid Junge, associate professor,<sup>3</sup> Jiri Dvorak, professor,<sup>3</sup> Roald Bahr, professor,<sup>1</sup> Thor Einar Andersen, associate professor<sup>1</sup>

What about time lost to injury?



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# Prevention programs from the medical literature



## BMJ

## RESEARCH

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  - In 3 parts
  - All injuries ↓32%
  - Overuse injuries ↓53%
  - Severe injuries ↓45%
  - Match injuries ↓28%

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

Orbjørn Soligard, PhD student,<sup>1</sup> Grethe Myklebust, associate professor,<sup>1</sup> Kathrin Steffen, research fellow,<sup>1</sup> Ingar Holme, professor,<sup>1</sup> Holly Silvers, physical therapist,<sup>2</sup> Mario Bizzini, physical therapist,<sup>3</sup> Astrid Junge, associate professor,<sup>3</sup> Jiri Dvorak, professor,<sup>3</sup> Roald Bahr, professor,<sup>1</sup> Thor Einar Andersen, associate professor<sup>1</sup>

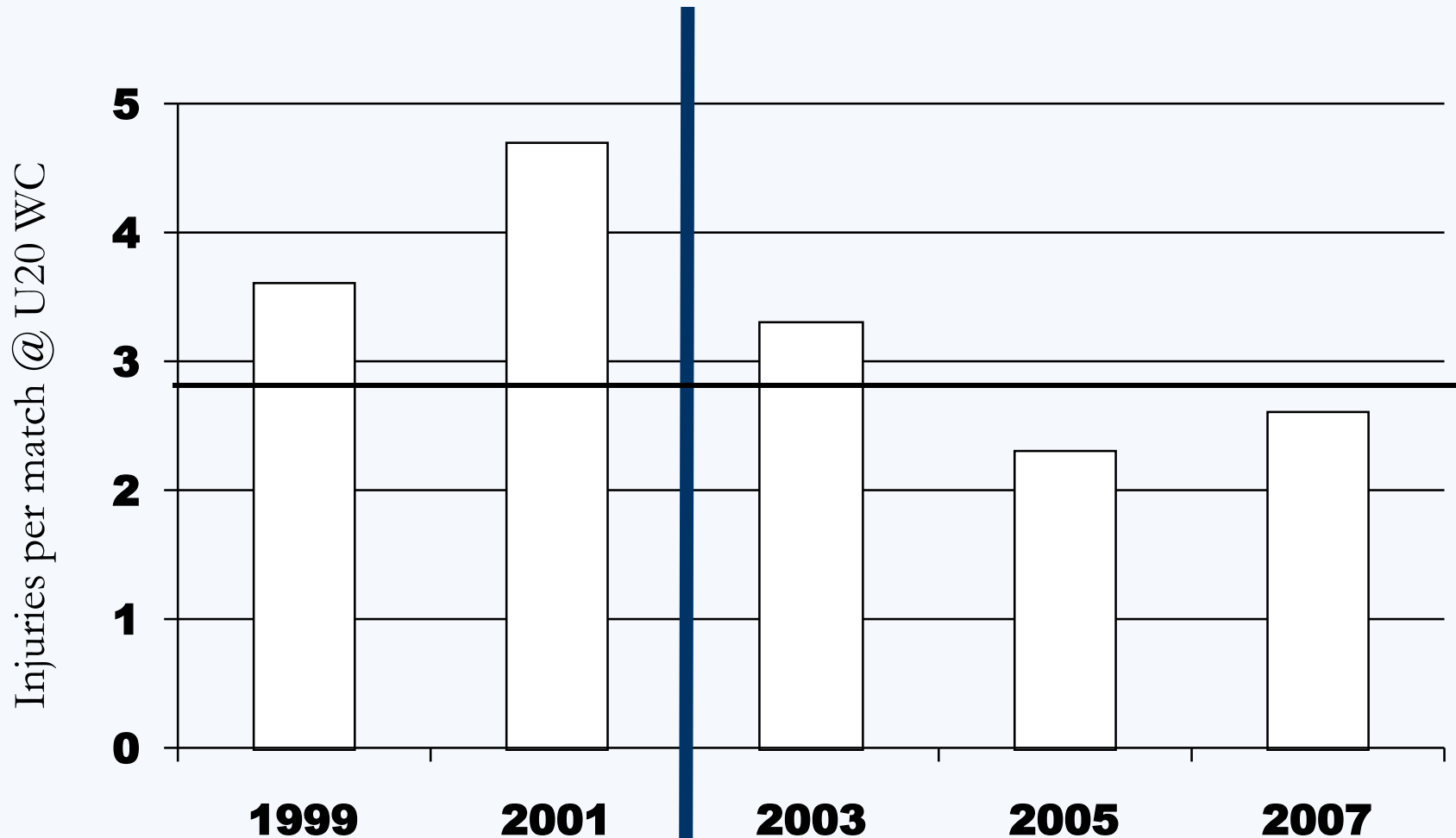
**Knee injury prevention:  
>4500 girls  
64% reduction in ACL  
tears**



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# Quality of officiating?



# Key Points



- Prevention programs WORK
- Injury are predictable
  - legal contact or
  - Just a single player or
  - foul play.
    - $\frac{1}{4}$  (female) to  $\frac{1}{2}$  (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.







**FIFA**

*For the Game. For the World.*