

Injuries and Sports Surfaces

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SPORTSURF
Sport Surfaces Research Forum

Centre for Sports Medicine
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Janda, 1997

“It is the responsibility of every healthcare provider within the field of sports medicine to enhance injury surveillance techniques and make the practice of prevention of injury the rule and not the exception”

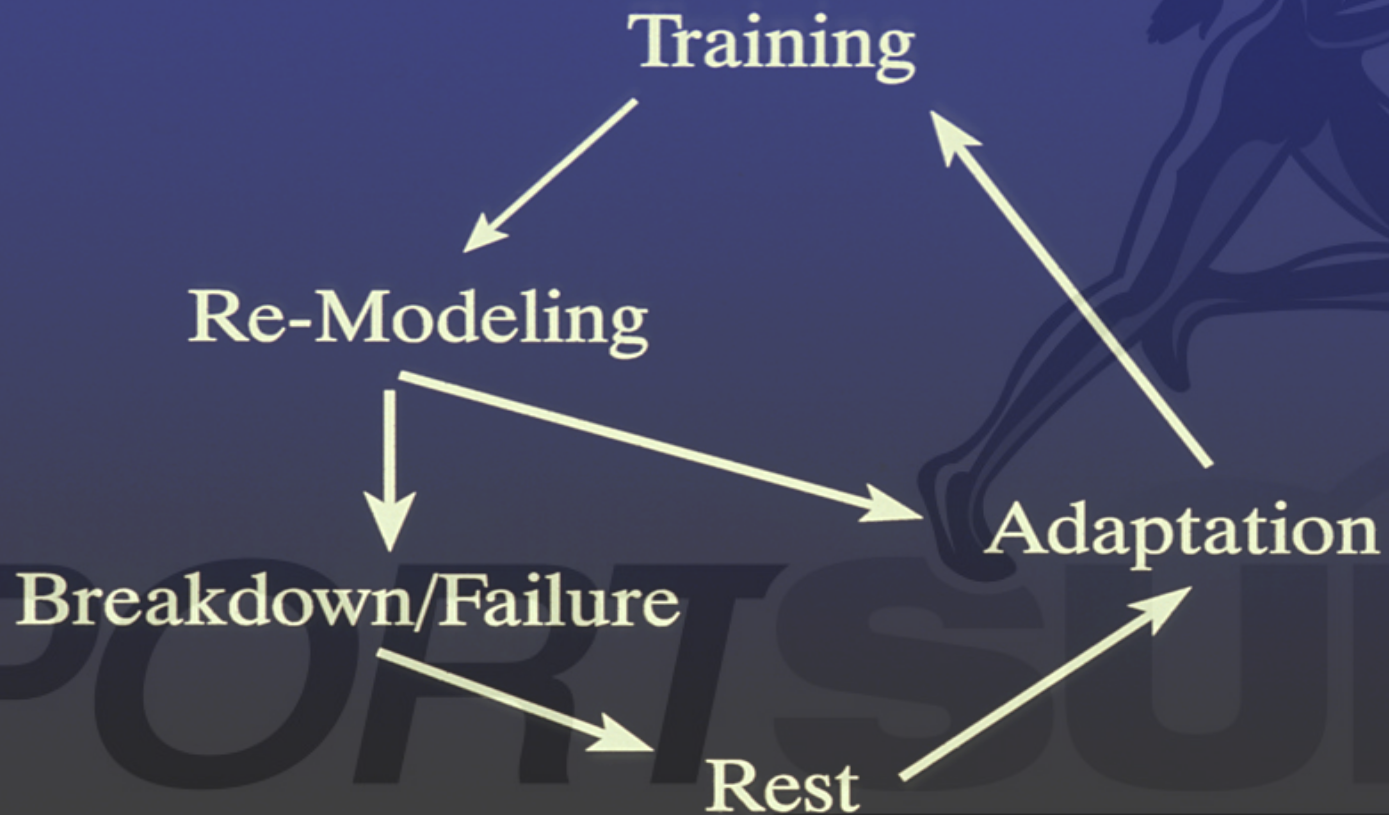
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Injury patterns

- Overuse: microtrauma
- Acute: macrotrauma



Overuse injuries



Overuse injuries

Intrinsic factors

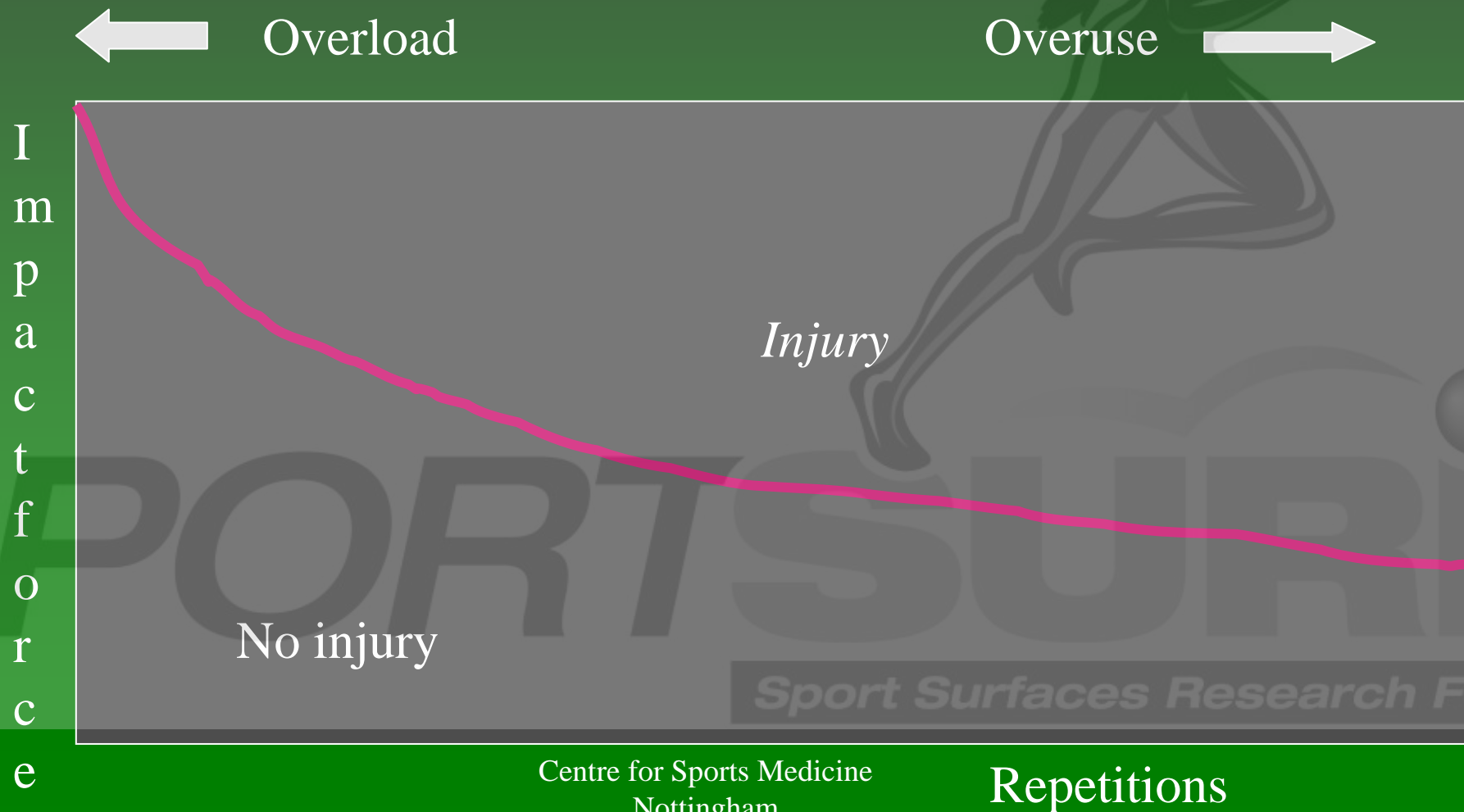
- Sex
- Age
- Growth/maturity
- Anatomy – Biomechanics
- Flexibility/muscle imbalance

Extrinsic factors

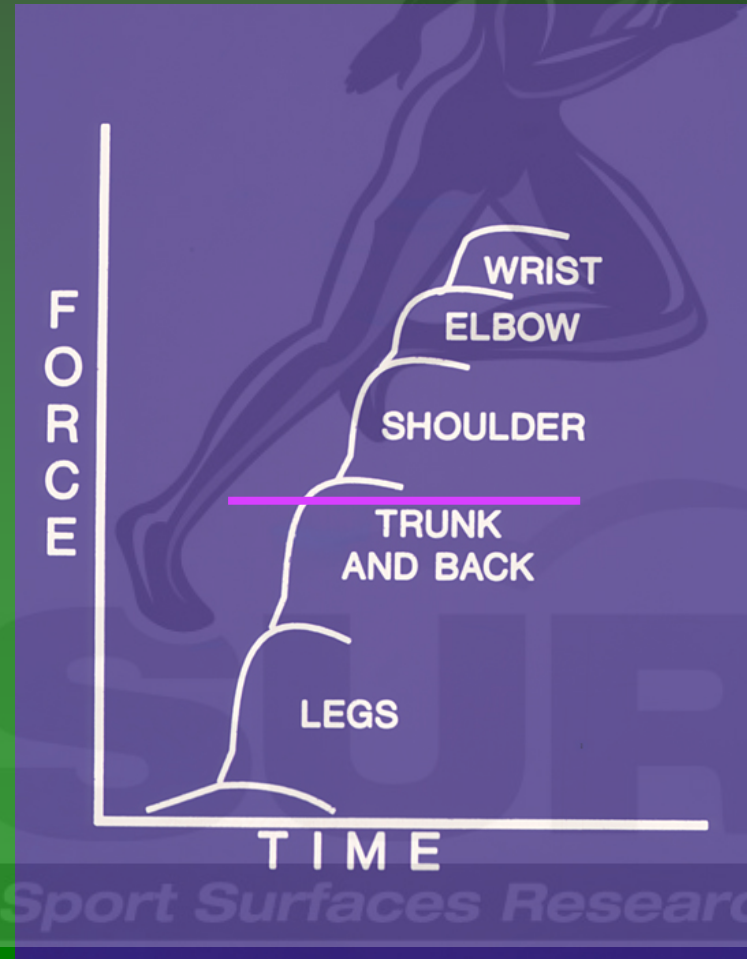
- Training errors: 60-80%
- Equipment
- *Surface*
- Environment/Climate



Overuse injuries: aetiology



Kinetic chain



Overuse injuries: Research

- Biomechanical adaptation to surfaces: individual variability
- Stress fx in race horses: effect of surface
- Tennis: indoor: clay: grass: hard
- Problem: variables ++

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Acute: Macrotrauma: Research

- NCAA American football: grass vs astroturf
- Rugby League – season change: winter to summer
- FIFA (Dr Colin Fuller)



Acute: Macrotrauma: American football Research: Grass vs FieldTurf

Grass:

- Increase:
 - Longer-term injury
 - Head injury
 - Ligament

FieldTurf:

- Increase:
 - Overall incidence
 - Non-contact injuries
 - Skin
 - Muscle

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Acute: Macrotrauma: RL Research

- There is a higher risk associated with playing summer rugby league but the cause may not be related to the summer ground conditions.
- The cause may be related to a combination of factors which include training conditions, the indirect effects of the weather, player characteristics and changes within the game itself.
- Future studies should be concentrated in these areas.

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Injuries during FIFA U-17 Tournaments

Dr Colin Fuller and Dr Astrid Junge

(FIFA Medical Assessment and Research Centre)

- **From: ‘FIFA Quality Concept for Artificial Turf Guide’**
‘FIFA has recognised the enormous benefits artificial pitches would bring to the global development of football’.
- FIFA also recognises the role that playing surfaces have on the incidence and nature of injuries to players.
- FIFA’s Medical Assessment and Research Centre is therefore assessing the impact of artificial turf on the incidence and nature of football injuries in a number of settings around the world.
- One of these settings is the FIFA Under-17 World Cup.

Injuries during FIFA U-17 Tournaments



- **Tournaments using grass:**
 - 1999 New Zealand
 - 2001 Trinidad and Tobago
 - 2003 Finland*
- **Tournaments using Football Turf:**
 - 2003 Finland*
 - 2005 Peru

*Both types of surface used during this tournament

Injuries during FIFA U-17 Tournaments

- **Grass**

Match exposure –

Games: 86

Hours: 2,822 player-hours

Injuries -

All injuries: 218

Time-loss injuries: 79

- **Football Turf**

Match exposure –

Games: 42

Hours: 1,386 player-hours

Injuries -

All injuries: 109

Time-loss injuries: 36

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Injuries during FIFA U-17 Tournaments

- Incidence of Match Injuries

Injuries / 1,000 playing-hours

	<i>Grass</i>	<i>Football Turf</i>
All injuries	77	79
Time-loss injuries	28	26

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Injuries during FIFA U-17 Tournaments

- Mechanism of injury

	<i>Grass</i>		<i>Football Turf</i>	
	Contact	Non-contact	Contact	Non-contact
All injuries	86%	14%	78%	22%
Time-loss injuries	85%	15%	74%	26%

Injuries during FIFA U-17 Tournaments Injury Location

Grass (*All injuries*)

Head/neck: 15%

Upper extremity: 6%

Trunk: 8%

Lower extremity: 71%

Hip/groin - 2%

Thigh - 13%

Knee - 11%

Lower leg - 18%

Ankle/foot - 27%

Football Turf (*All injuries*)

Head/neck: 10%

Upper extremity: 9%

Trunk: 9%

Lower extremity: 72%

Hip/groin - 2%

Thigh - 13%

Knee - 13%

Lower leg - 18%

Ankle/foot - 26%

Injuries during FIFA U-17 Tournaments

Injury Type

Grass (*All injuries*)

Concussion:	3%
Fracture/dislocation:	0%
Sprain:	13%
Strain:	10%
Contusion:	67%
Laceration/abrasion:	4%
Other:	4%

Football Turf (*All injuries*)

Concussion:	2%
Fracture/dislocation:	1%
Sprain:	14%
Strain:	9%
Contusion:	60%
Laceration/abrasion:	6%
Other:	8%

Future directions

A faint, stylized silhouette of a runner in mid-stride is positioned in the upper right quadrant of the slide, behind the main text.

- Sport driven epidemiology studies e.g. RFL:
Surface effect
- FIFA: Surface comparison
- Targeted sports injury research e.g. Astro turf and
Power league football: Surface specific
- Biomechanics: individual response to surface
- Rationale for new surfaces

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Thank you and Questions



www.sportsurf.org

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