



SPORT SCIENCE IN BADMINTON

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BWF WORLD COACHING CONFERENCE

No disclosures

Who am I?

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1993-1994 Elite Coach Academy in DK

1994-1995 Ass. national coach in Germany

1996-2006 Danish national player

1995-2011 Coach in Danish Elite- and 1.Division clubs

2007 Medical Doctor

2014 Orthopedic Surgeon

2010- Member of Danish Society of Sports Medicine

2017 Member of BWF Sport Science and Medical Research Commission

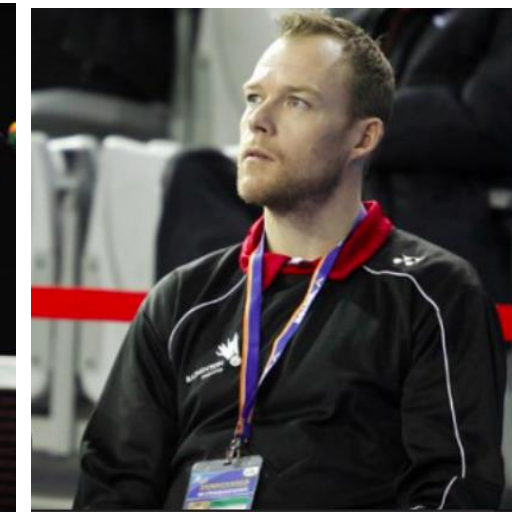


- 1 BWF Sport Science and Medical Research Commission**
- 2 Brief literature review on badminton injuries**
- 3 The most severe injuries in badminton**
- 4 Global badminton health study**
- 5 Load and injuries**

Only stupid players get injured

or

Injured players belong to stupid coaches



The **BWF Sport Science & Medical Research Commission** has three key goals:

- Encourage and widen interest and investment in applied research in Badminton.
- Improve the level and quantity of scientific material available to players, coaches and badminton practitioners.
- Contribute towards the increased knowledge of performance and safety at the international level – of coaches and players.





YEAR	TOTAL APPLICATIONS	RESEARCH PROJECT	TOTAL FUNDING USD
2013 - 2014	29	06	60.000
2014 - 2015	30	07	70.000
2015 - 2016	27	07	70.000
2016 - 2017	30	06	70.000
2017 - 2018	36	10	75.000
2018 - 2019	45	14	100.000

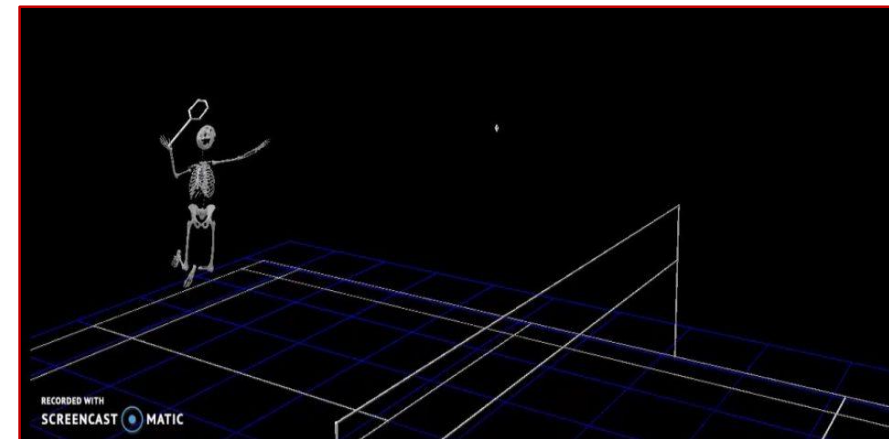
Area: Player Development / Institution: Leeds Beckett University

- 1. Player Development and Coaching Systems in four Leading Badminton Nations**
- 2. Indonesia, Denmark, Korea and Spain.**



Area: Biomechanics / Institution: Loughborough University

Optimum performance in the Badminton Smash



Area: Para-Badminton / Institution: University of Applied Sciences Germany

The Trunk: Strength ratios / Strength in German Elite Para-Badminton Players (Standing Classes and Wheelchair Classes)



Scientific papers connected to Badminton

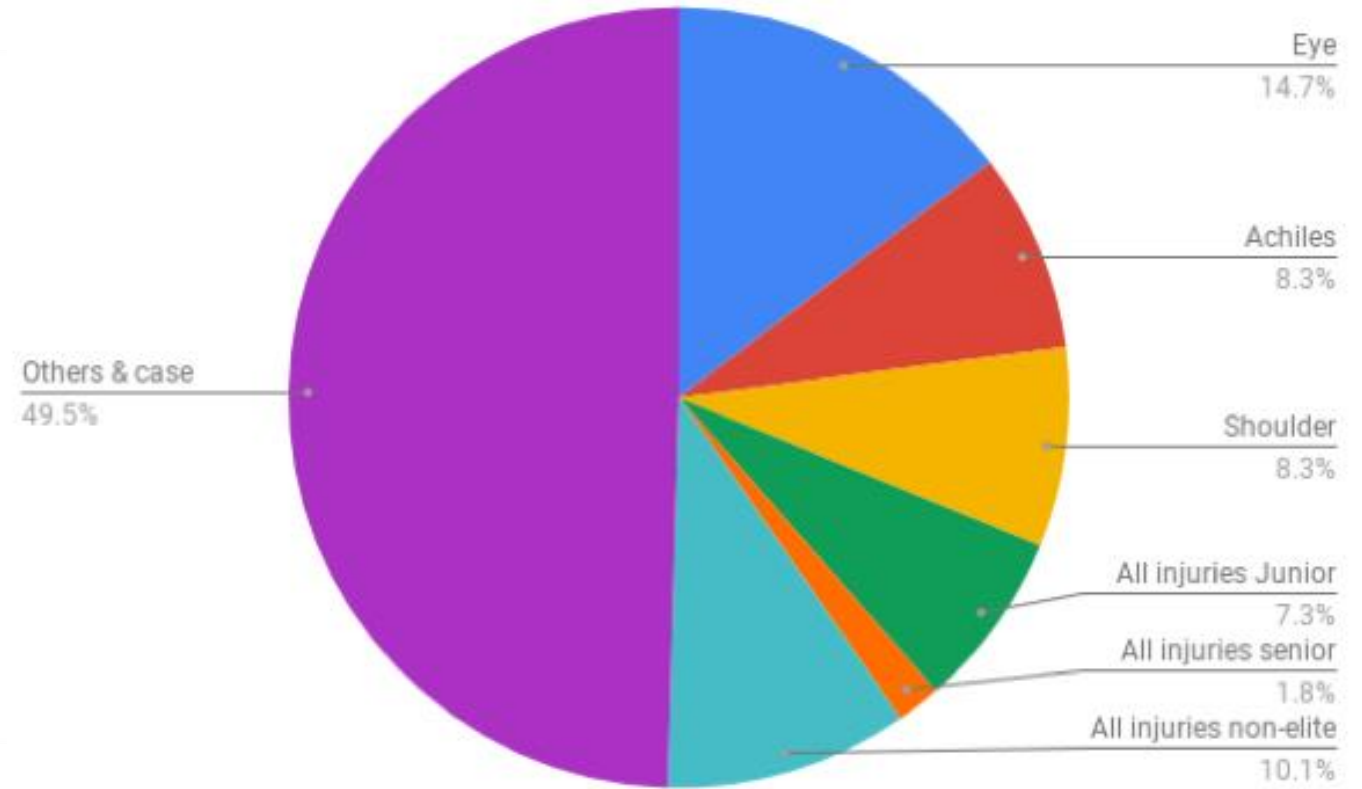
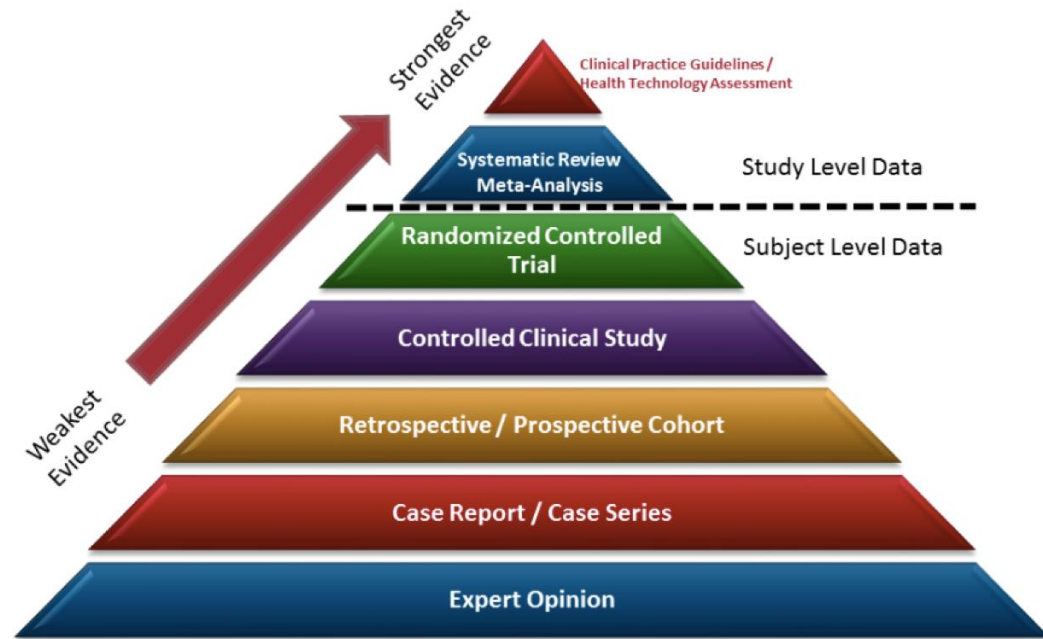


A review of the available worldwide literature relating to badminton has been conducted:

- Research has used the Sportdiscus, Embase, Cochrane Library, Rehabilitation and Sports Medicine, Web of Science, PsycINFO, Science Direct, Mendeley, Scientific.net, Google Scholar.
- A total of **850+ publications** that contained the word “Badminton” in the title and/or in the abstract.

FIELD	PUBLICATIONS	FIELD	PUBLICATIONS
Biomechanics	112	Nutrition	17
Engineering and Technology	91	Notational and Analysis	95
Exercise Physiology	164	Psychology	130
Medical and Sports Injuries	101	Ergonomics	2
Skills and Training	108	Youth Development	01
Sociology of Sport	41		

Injuries in badminton- What is the evidence?



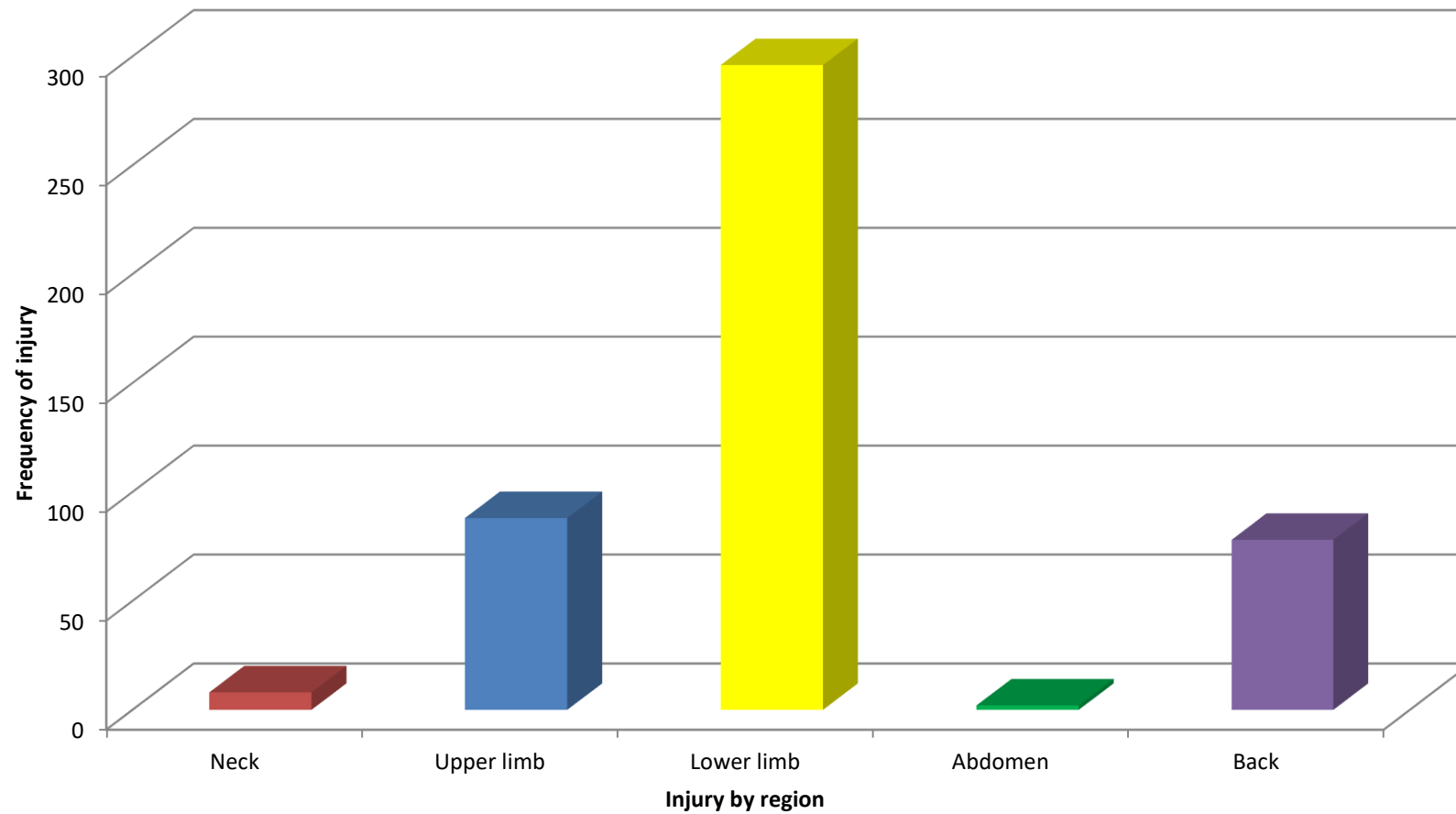
MUSKULOSKELETAL INJURIES AMONG MALYSIAN PLAYERS 2005-2007



- Jan. 2005- June 2007
- 190 players
- 469 injuries
- Mild: 91,5 % (1-7 days of absence)
- Moderate: 1,5 % (8-21 days of absence)
- Severe: 7,0 % (> 21 days of absence)



Injury region (Shariff et al 2008)



INJURY TYPE (SHARIFF ET AL 2008)



- Overuse 169 (36.0 %)
- Strain 145 (30.9 %)
- Sprain 122 (26.0 %)
- Fracture 23 (4.9 %)
- Others 10 (2.1 %)



Protecting athletes' health and preventing injuries in badminton are top priorities for the BWF.

DIFFERENT PLAYER – DIFFERENT INJURY

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BWF WORLD JUNIOR CHAMPIONSHIPS

The aim of this study is to report injuries among elite junior badminton players and to investigate if certain risk factors are associated with previous and present injuries.

QUESTIONNAIRE

- Background
- Significant injuries
- Musculoskeletal Health
- Sleep Quality

PHYSICAL ASSESSMENTS

- Ankle Dorsiflexion Measurement
- Hip ROM and impingement tests
- Shoulder ROM
- Shoulder Impingement

NEXT STEPS:

Prospective follow up with injury surveillance in general

Follow up on specific injuries in the shoulder and hip

Prevention of specific injuries

Is badminton dangerous?

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ACL is the most severe injury



ACL injury

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Kimura et al 2010, 2012

Women

Location

High valgus ankle



ACL injury - Learning from other sports

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Prevention of anterior cruciate ligament injuries in female team handball players: a prospective intervention study over three seasons.

Myklebust et al. Clin J Sport Med. 2003

A randomized controlled trial to prevent noncontact anterior cruciate ligament injury in female collegiate soccer players.

Gilchrist J, Am J Sports Med. 2008



Compliance with preventive training

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A meta-analysis

Higher rates of compliance with neuromuscular training programs were **associated** with **lower rates of anterior cruciate ligament (ACL) injury** incidence among physically active young females.

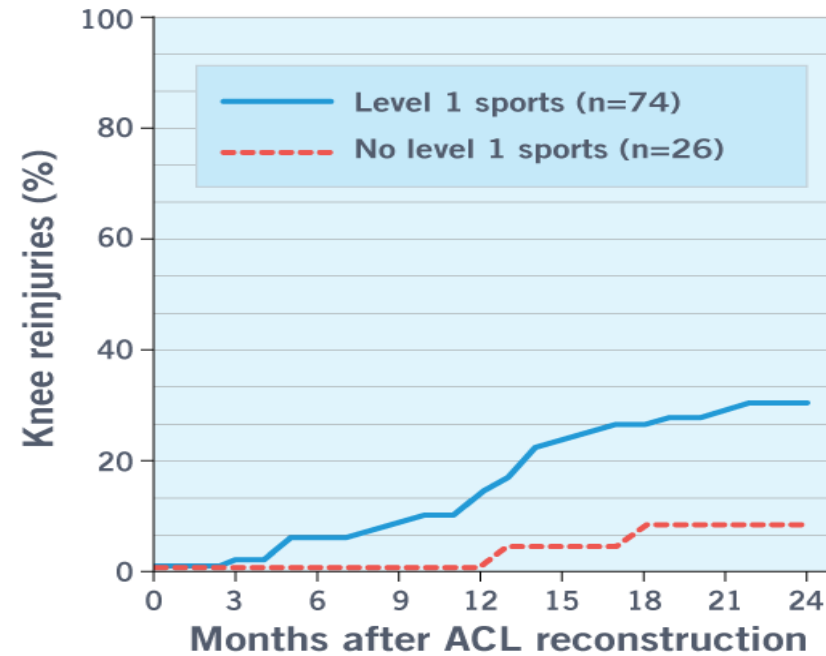
A potential inverse dose-response relationship exists between compliance with neuromuscular training and the incidence of ACL injury in young female athletes.

Attending and completing prescribed neuromuscular training sessions **seem to be** integral components of preventing ACL injuries in young female athletes.



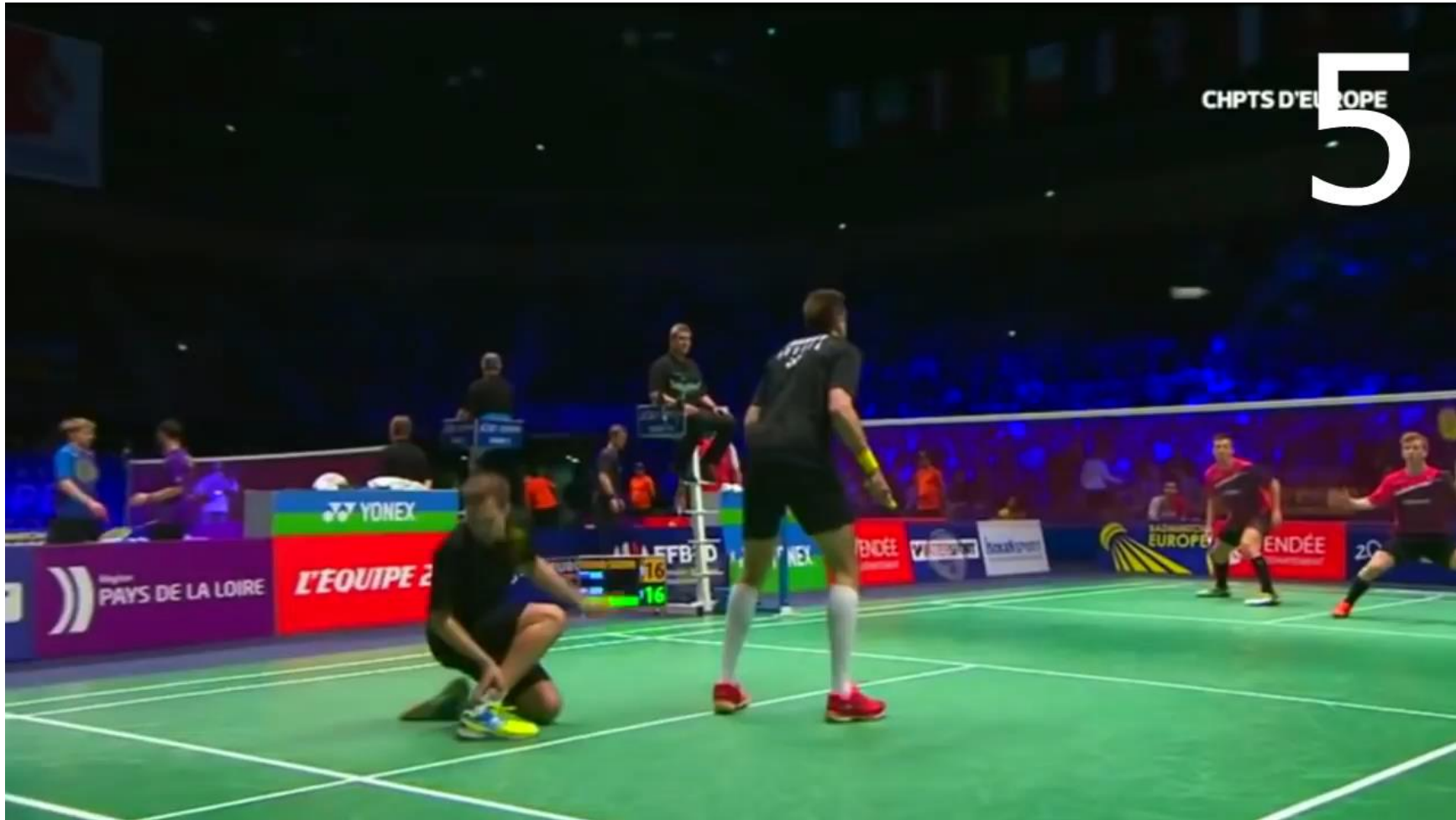
Dai Sugimoto.
Journal of
Athletic
Training 2012;

Return to sport after ACL reconstruction



- 100% athletes who return to sport less than 5 months after an ACL reconstruction suffered a knee reinjury

Achilles tendon rupture



Achilles tendon rupture – just a sick tendon?



Achilles tendon rupture

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Lateral ankle sprain

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- **Indoor sports** responsible for the highest incidences of lateral ankle sprains^{1,4,5}
 - Typically Non-contact injury!^{1,4,5}
 - Especially predominant in:
 - Handball^{1,4}
 - Basketball^{1,4}
 - Badminton^{1,4,5}
- **24.3% of ALL lower extremity injuries**⁶



¹Gribble et al., 2016; ²Fahlström et al., 1998

³Doherty et al., 2013; ⁴Fong et al., 2007; ⁵Kaldau, 2018; ⁶Shariff et al., 2009

Lateral ankle sprain

May result in long term problems
Up to 40-50% may suffer from
chronic ankle instability

Verhagen & Bay, 2010; Gribble et al., 2016; Vuurberg et al., 2018

Viktor Axelsen having problems >1
year after initial ankle sprain.....



“Based on current evidence, a combination of an external prophylactic measure (tape or brace) with neuromuscular training will achieve the best preventive outcomes with minimal burden for the athlete”

(Verhagen & Bay, 2010)



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Thank you

