

INTRODUCTION: Where Are We At The Moment With Injury Prevention?

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Sports Injury Prevention and Research Center



	MINOR	MODERATE	SEVERE
Cervical disc prolapse (Slipped disc)			6 weeks +
Whiplash	1-2 days	5-7 days	2 weeks
Rotator cuff (muscle problems)	2 weeks	4-6 weeks	8-12 weeks
Anterior Cruciate Ligament (ACL)			4-6 months
Calf muscle strain	1-2 weeks	3-4 weeks	6-8 weeks
Cartilage Tear (meniscal tear)	2-4 weeks	4-6 weeks	2 months +
Hamstring strain	1-2 weeks	3-4 weeks	6-8 weeks
Lateral Collateral Ligament Sprain	2-3 weeks	4-6 weeks	3 months
Medial Collateral Ligament Sprain	2-4 weeks	4-8 weeks	3 months
Achilles tendonitis	6 weeks	3 months	6 months +
Ankle sprain	2-3 weeks	4-6 weeks	6-8 weeks
Calf muscle strain	1-2 weeks	3-4 weeks	6-8 weeks



Jonathan Leeder



Junior to senior athlete in England?

- Only 7% of the top 20 U15 athletes (N=560) were ranked in the top 20 ten years later (Shibli & Barrett, 2011).
- Cause? → competing interests such as work, study, family and other sports (Bennie & O'Connor, 2006),
- More recent studies have reported that <u>inappropriate training and competition loads at</u> <u>a young age has led to higher injury rates</u> (Brenner, 2007; Difori, 2010) which contributed, in some cases, to premature retirement (Dixon & Fricker, 1993)



Forced retirement

- Injury severity led to significant time loss from training and competition and in 17.3% of cases to forced retirement.
- Training intensely at 13–16 years resulted in a high percentage of overuse injuries but total training time was not a factor in injury implying the type, not training duration is the contributing factor to injury.





STEP 1. \rightarrow ESTABLISH THE EXTENT OF THE PROBLEM





U16 boys basketball team (n=16), weekly questionnaire for 12 weeks









Prevalence of overuse problems in basketball players (n=16) during 12 week period.





Prevalence of overuse problems in basketball players (n=16) during 12 week period.





Prevalence of overuse problems in basketball players (n=16) during 12 week period.





Ankle, knee, hamstring, groin and LBP problems in track and field athletes (n=21; 12 weeks)





Prevalence of overuse problems in the knee area during 12 week period in track and field athletes (n=21).





Prevalence of overuse problems in the low back area during 12 week period in track and field athletes (n=21).





Prevalence of overuse problems in the knee area during 12 week period in track and field athletes (n=21).





Prevalence of overuse problems in the knee area during 12 week period in track and field athletes (n=21).





Young "future" sprinter?





Top Estonian Cyclists (n=13; 9 weeks)





Prevalence of overuse problems in the knee area during 9 week period in cyclists





Prevalence of overuse problems in the low back during 9 week period in cyclists





Prevalence of overuse problems in the knee area during 9 week period in cyclists







Rowers (n=78)









Rowing and LBP





Female rowers had higher Low Back Pain intensity





Higher training load = more LBP

Training load and LBP pain intensity





What aggrevated LBP in rowers?





Step 2. risk factors





Project

On-going project with the University of Tartu and Estonian Olympic Committee to screen youth athletes 14-19 yo:

- 35 football players
- 43 basketball players
- 4 volleyball players



EESTI OLÜMPIAKOMITEE

Screening for risk factors

- 1. Weight bearing lunge test for ankle DF (knee-to-wall test; cm from big toe to the wall)
- 2. Anterior reach from Y-Balance test (cm)
- 3. Knee valgus from jump landing (0-2p)
- 4. Single leg hop for distance (cm)











WB Ankle DF (knee to wall test; lunge test)

<8cm is considered restriction of ankle DF movement.

>15cm is considered hypermobility of ankle.

(Clanton et al., 2012)









Lunge test in Basketball players n=43

- 23% players had >2cm difference between left and right leg;
- ✓ 16% players with restricted ankle mobility;
 ✓ 9% of players with increased ankle mobility.





Lunge test in Football players (n=35)

- ✓ 14% players had ≥2cm difference between left and right leg mobility
- 9% players with restricted (<8cm) ankle mobility</p>
- 17% players with increased (≥15cm) ankle mobility





Anterior reach of Star Excursion Balance test



...screens for dynamic balance and mobility of the stance leg while the contralateral leg reaches in anterior (ANT)



Anterior reach of Star Excursion Balance test

- ... has been proposed as a screen for LE injury risk: reach <94% of limb length was associated with a 6.5-x higher injury risk in LE.
- Asymmetry >4 cm (sensitivity, 59%; specificity, 72%) as the cut point for predicting injury.
- Only ANT asymmetry was significantly associated with noncontact injury.

Smith, Chimera & Warren, 2015; Plisky et al., 2006



Anterior reach of Star Excursion Balance test Norm difference <4cm between legs

27,5% of players had >4cm
difference between the right
and left leg results





Anterior reach of Star Excursion Balance test Norm value >94% leg length

0% of the basketball players were
able to reach ≥94% leg length!
17% of the football players were
able to reach ≥94% leg length!



RESEARCH REPORT

AGNETHE NILSTAD, PT, MSc¹ • THOR EINAR ANDERSEN, MD, PhD¹ • EIRIK KRISTIANSLUND, MD, PhD¹ ROALD BAHR, MD, PhD¹ • GRETHE MYKLEBUST, PT, PhD¹ • KATHRIN STEFFEN, PhD¹ • TRON KROSSHAUG, PhD¹

Physiotherapists Can Identify Female Football Players With High Knee Valgus Angles During Vertical Drop Jumps Using Real-Time Observational Screening

The results of the study suggest that participants with high knee valgus angles during a vertical drop-jump landing task can be identified using real-time observational screening.

• Scale of 0-2p





Knee valgus angle



- ✓ 53% of players scored 2 points;
 ✓ 81% of players
 - scored ≥1p



Knee valgus angle – football

 ✓ 42% of players scored 2 points;
 ✓ 80% of players scored ≥1p





Breathing pattern

37% of Basketball players had apical breathing 48% of Football players had apical breathing



Kolar et al., 2012





Hamstring isometric testing



↓ decrease in
isometric strength
indicative of hamstring
injury.



Hip adducor isometric strength testing



Groin injury = isom.strength ↓ 185 mmHg



Hamstring conc/ecc endurance (Tempo: 1 sec/ 1sec)



Norm = > 30x <20x = **4x higher LE** overuse injury risk



Gastroc muscle conc/ecc endurance (Tempo: 1 sek/ 1sek)



Norm >30x results <20x = **4x higher LE overuse injury risk**



Bigbank Tartu volleyball team





Volleyball

- highly skilled attacker with 16 to 20 hours of weekly practice time spikes, for example, about 40 000 times a year.
- 8% and 20% of all volleyball-related injuries are to the shoulder and the majority of the shoulder injuries are overuse injuries.

Forthomme et al., 2005 Reeser et al., 2010



	Games played	Attacks per season	AVG attacks per game	Serves per season	AVGserves per game
Opposite 1	51	633	12,4	416	8,1
Opposite 2	51	477	9,4	355	6,9
Outside hitter 1	51	1071	21	620	12,1
Outside hitter 2	51	712	13,9	497	9,7
Outside hitter 3	51	424	8,3	272	5,3
Middle blocker 1	51	319	6,2	638	12,5
Middle blocker 2	51	335	6,5	528	10,3
Setter 1	51	0	0	290	5,6
Setter 2	51	0	0	267	5,2

Soo & Arend, 2015



British Journal of Sports Medicine

An international peer-reviewed journal of sport and exercise medicine

Br J Sports Med doi:10.1136/bjsports-2015-095543

Time to bin the term <u>'overuse</u>' injury: is <u>'training</u> load error' a more accurate term?

M K Drew^{1,2,3}, C Purdam^{1,2,3}





INJURY PREVENTION

Ξ

performance enhancement





Sports Injury Prevention Conference

9.30 - 10.	00 Registration & morning coffee
10.00 - 10	0.10 WELCOMING WORDS Prof. Priit Kaasik, Head of the Institute of Sport Science and Physiotherapy, University of Tartu
10.10 - 10	0.30 INTRODUCTION "Were are we at the moment with injury prevention?" Mati Arend (Estonia)
10.30 - 11	 .30 "PREVENTING SHOULDER INJURIES" Kestutis Laurinskas (Lithuania) • Comments & questions with Janno Jürgenson (Estonia)
11.30 - 1	2.30 "PREVENTING LOW BACK PAIN" Peter Halen (Finland) • Comments & questions with Mati Arend (Estonia)
12.30 - 13	3.30 Lunch break
13.30 - 14	 PREVENTING KNEE & ANKLE INJURIES" Rolandas Kesminas (Lithuania) Comments & questions with Mati Arend (Estonia)
14.30 - 1	4.45 "THE EFFECT OF PREVENTIVE PHYSIOTHERAPY PROGRAM ON THE PERFORMANCE OF TALENTED 15 YEARS OLD LITHUANIAN BASKETBALL PLAYERS" Laimonas Šiupsinskas (Lithuania)
14.45 - 15	5.15 Coffee break
15.15 - 16	5.00 "MONITORING ATHLETE'S TRAINING LOADS" Jarek Mäestu (Estonia) • Comments & questions with Ott Meerits (Estonia)
16.00 - 16	6.30 CONCLUSIONS "Putting it all together" Mati Arend (Estonia)
16.30 - 1	7.00 Final comments & guestions