

Muskelverletzungen im Profifußball

Dr. Christian Klein
VBG Wissenschaftscoordinator Sport

Präventionssymposium Fußball | Volksparkstadion
Hamburg, 5. April 2025



Verletzungsmonitoring – Der VBG-Sportreport

1. und 2. Bundesliga Männer Basketball



Injury analysis

Injuries in the 2 seasons (period) were examined

All insured events (treatment and/or reparation) paid by the incapacity for work

We counted the analysis. Some accidents were injuries.

Fakten zum VBG-Sportreport 2025

Zusammenfassung des Verletzungsgeschehens in den zwei höchsten Ligen der Männer: Basketball, Eishockey, Fußball, Handball

exklusiv & vorab:
Kurzübersicht
zur 8. Ausgabe
(erscheint im August)

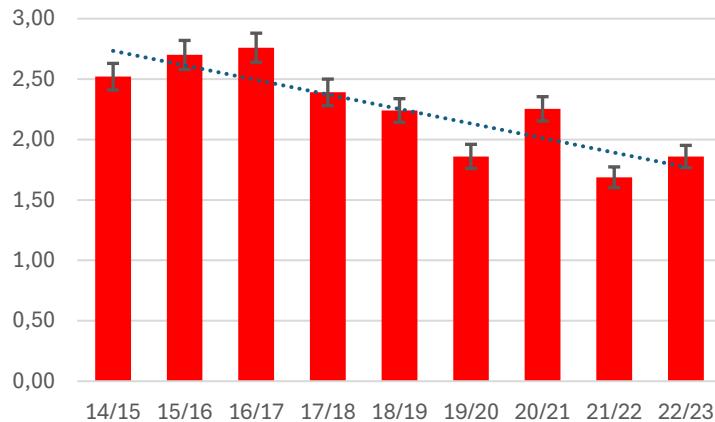
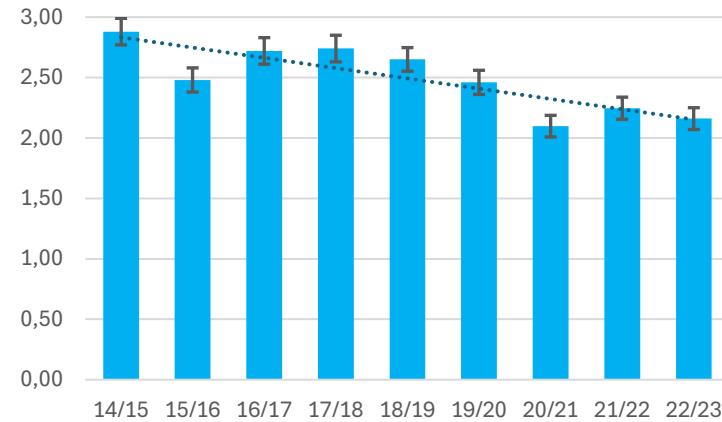
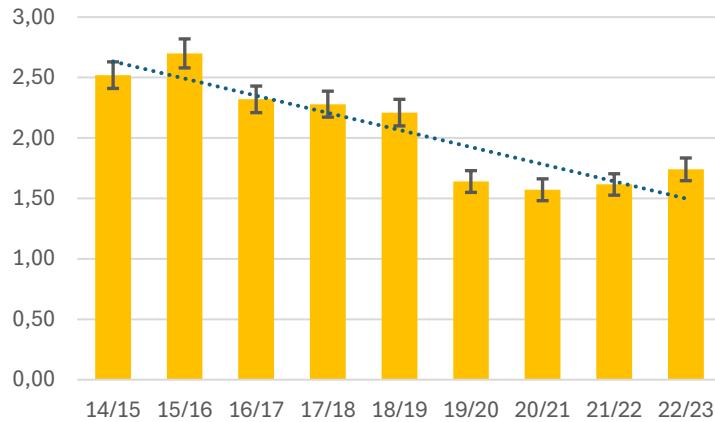
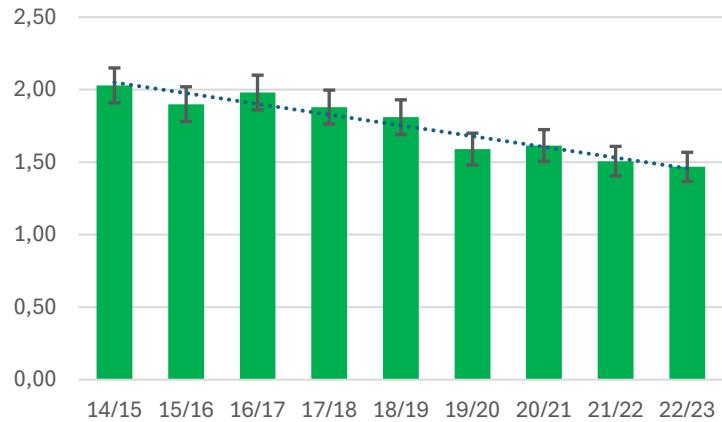
Analysis of the causes of injury

Rate and severe competitive injuries leading in an incapacity for work of seven or more and/or benefits of EUR 1,000 or more paid by the VBG were taken into account. The systematic video analysis of the causes of injury, insofar as they could be identified in video material.

Video population

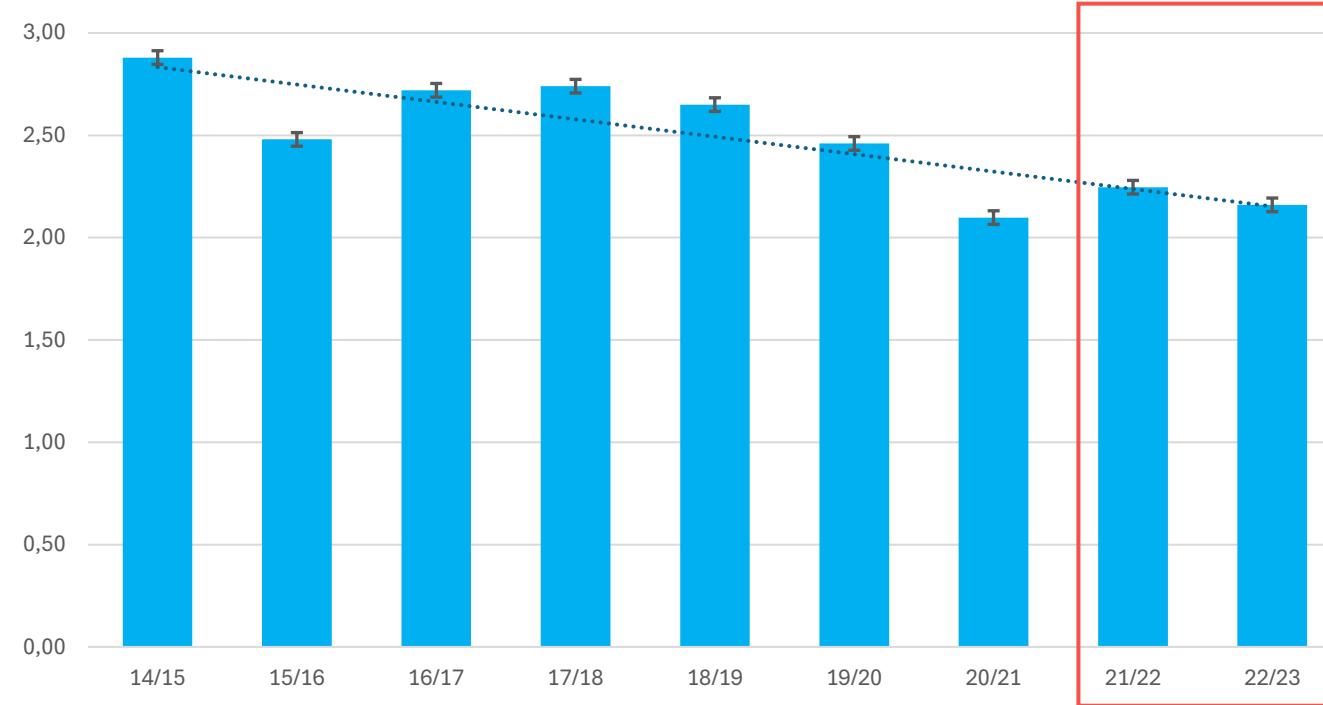
data as of 08/2018) Recorded variables: including place and time of the injury, match situation, movement patterns, match duration, injury mechanism, cause of injury

59.939



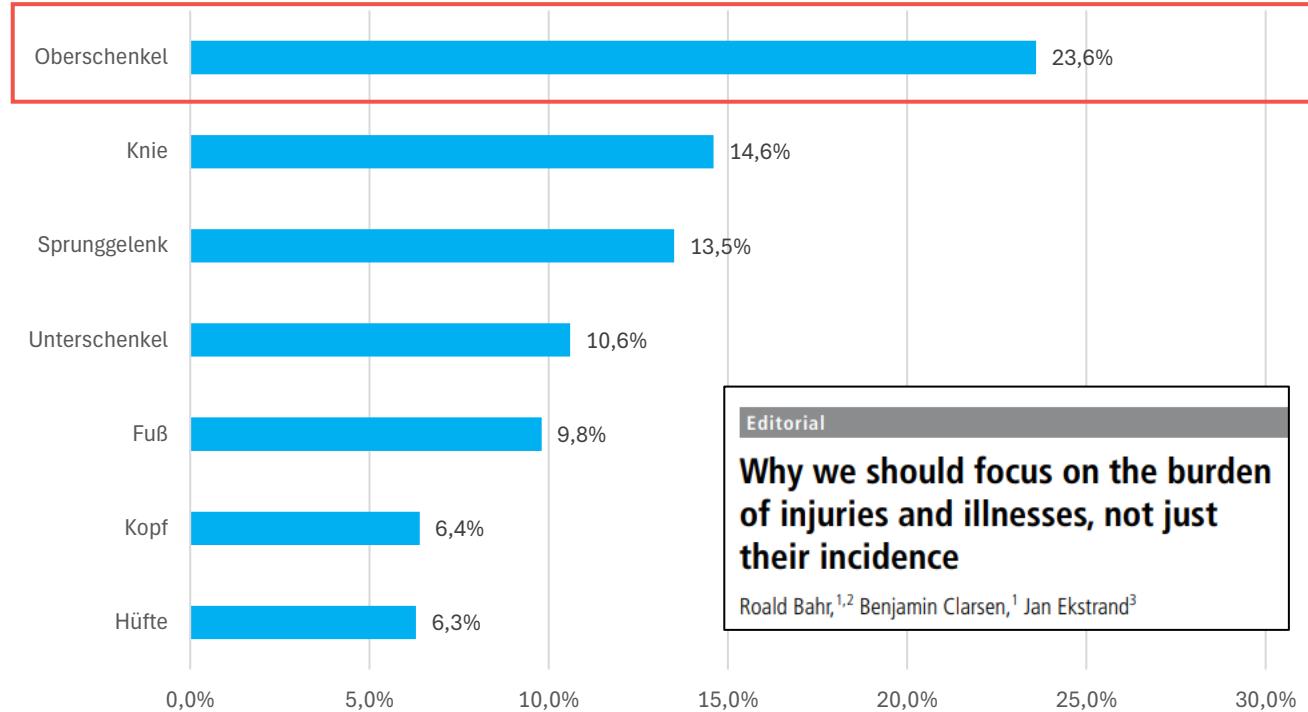
Kumulative Saisoninzidenzen im Fußball

Längsschnittbetrachtung über neun aufeinanderfolgende Saisons (n = 21.469 Verletzungen; $\pm 95\% \text{ KI}$)



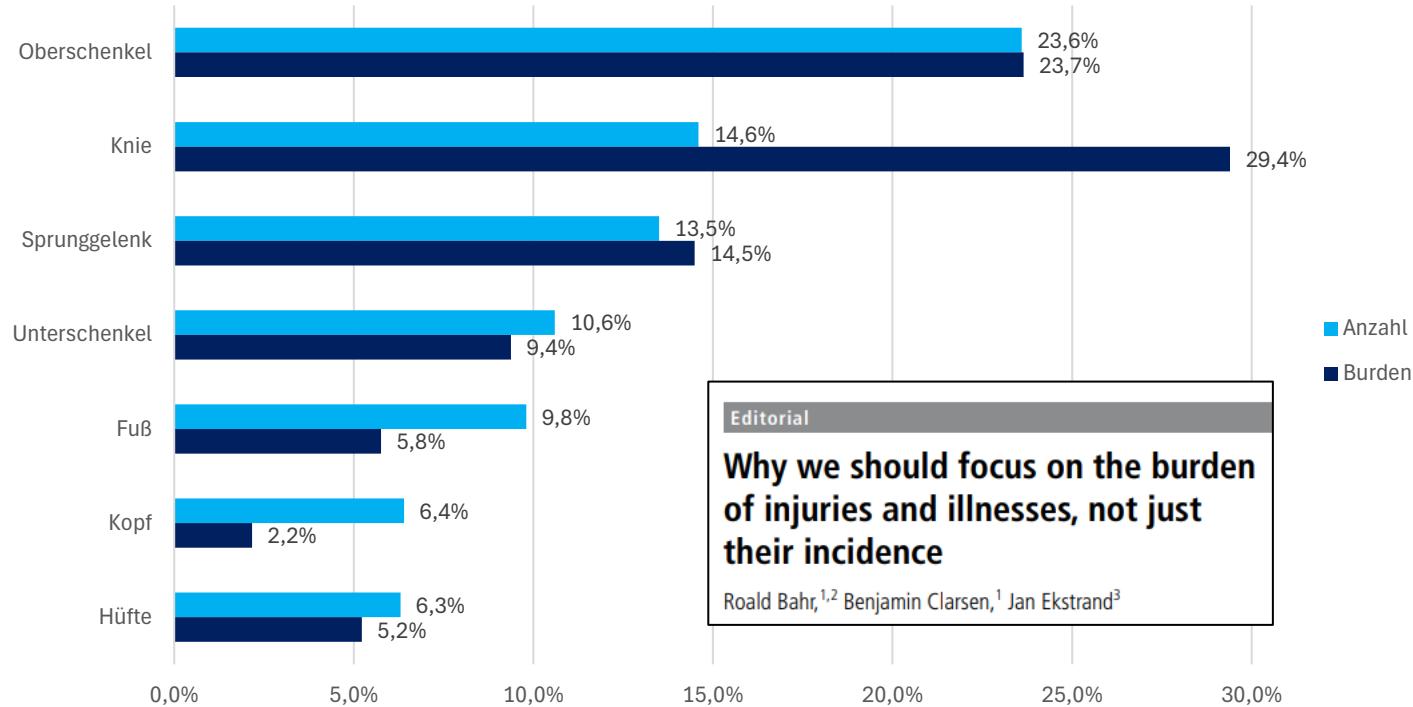
Betroffene Körperregionen

Bundesliga und 2. Bundesliga 2014 - 2023, n = 21.469 Verletzungen



Betroffene Körperregionen und Ausfallzeiten

Bundesliga und 2. Bundesliga 2014 - 2023, n = 21.469 Verletzungen



International Olympic Committee consensus statement: methods for recording and reporting of epidemiological data on injury and illness in sport 2020 (including STROBE Extension for Sport Injury and Illness Surveillance (STROBE-SIIS))

Roald Bahr ^{1,2}, Ben Clarsen ^{1,3}, Wayne Derman, ⁴ Jiri Dvorak, ⁵ Carolyn A Emery ^{6,7}, Caroline F Finch ⁸, Martin Hägglund ⁹, Astrid Junge, ^{10,11} Simon Kemp, ^{12,13} Karim M Khan ^{14,15}, Stephen W Marshall, ¹⁶ Willem Meeuwisse, ^{17,18} Margo Mountjoy ^{19,20}, John W Orchard ²¹, Babette Pluim, ^{22,23,24} Kenneth L Quarré ^{25,26}, Bruce Reider, ²⁷ Martin Schwellnus, ²⁸ Torbjörn Soligard ^{29,30}, Keith A Stokes ^{31,32}, Toomas Timpka ^{33,34}, Evert Verhagen ³⁵, Abhinav Bindra, ³⁶ Richard Budgett, ²⁹ Lars Engebretsen, ^{1,29} Uğur Erdener, ²⁹ Karim Chamari³⁷

Do not neglect injury severity and burden when assessing the effect of sports injury prevention interventions: time to paint the whole picture

Evert Verhagen ³⁵, ¹ Ben Clarsen, ^{2,3} Larisa van der Graaff, ¹ Roald Bahr ^{1,2,4}

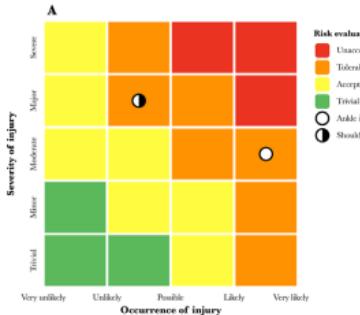
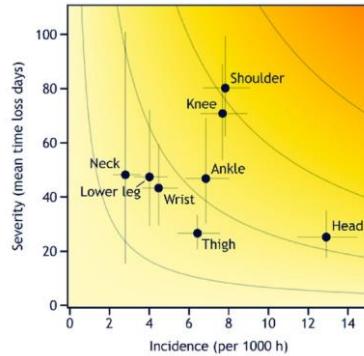
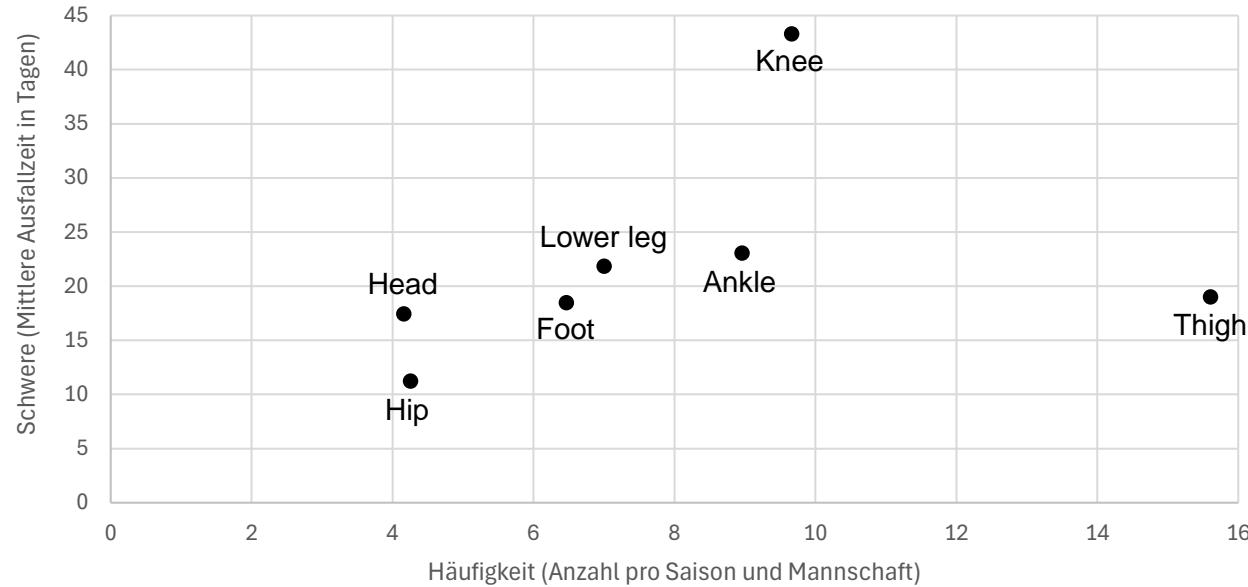


Figure 1 Risk matrices for injuries in recreational volleyball players, recalculated from the original data of Verhagen *et al.*⁷ (A, B) The injury frequency is considered on the x-axis, and on the y-axis, the injury's severity. On the left (A) presents a simplified risk matrix based on a qualitative categorisation,² whereas (B) presents the risk matrix based on quantitative data.¹ In (B) the product of both axes is the injury burden, that is, the number of days lost per 1000 hours of exposure. The dotted lines present the 'Risk Contour' along which the injury incidence and severity combinations have an injury burden equal to the corresponding number, for example, RC20 is the line along which the injury burden is 20 days of time-loss per 1000 hours of exposure.

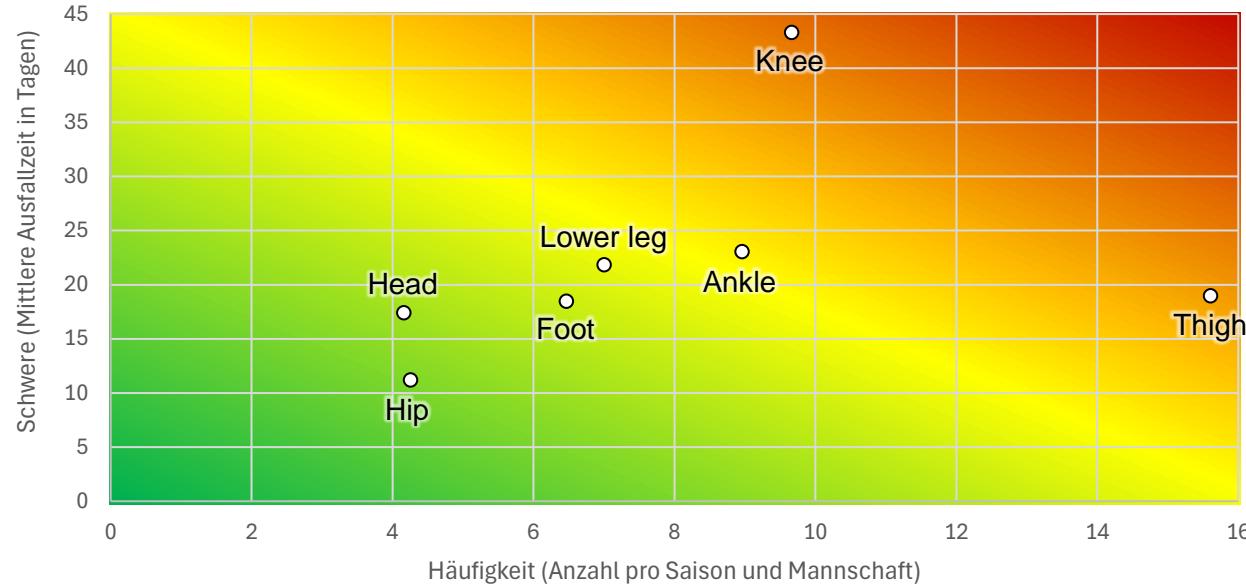
Risiko Matrix – Körperregionen

Bundesliga und 2. Bundesliga 2014 - 2023, n = 21.469 Verletzungen



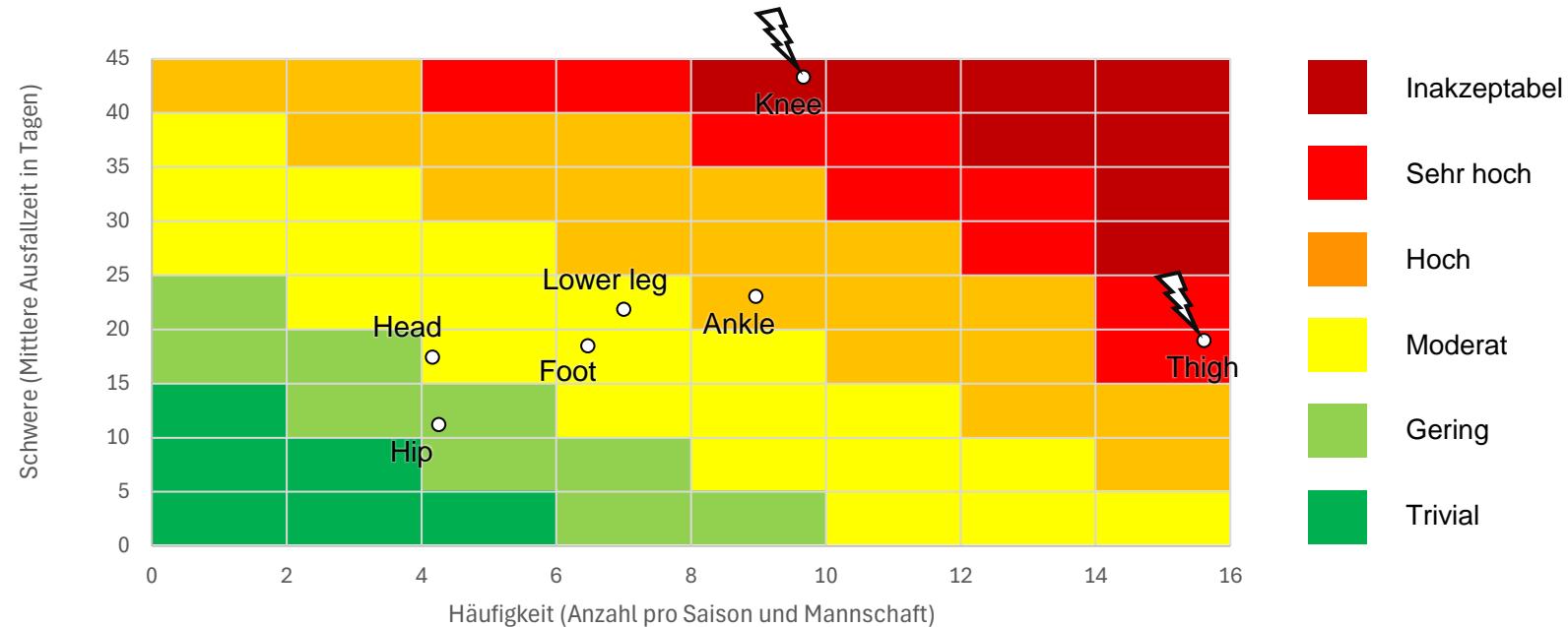
Risiko Matrix – Körperregionen

Bundesliga und 2. Bundesliga 2014 - 2023, n = 21.469 Verletzungen



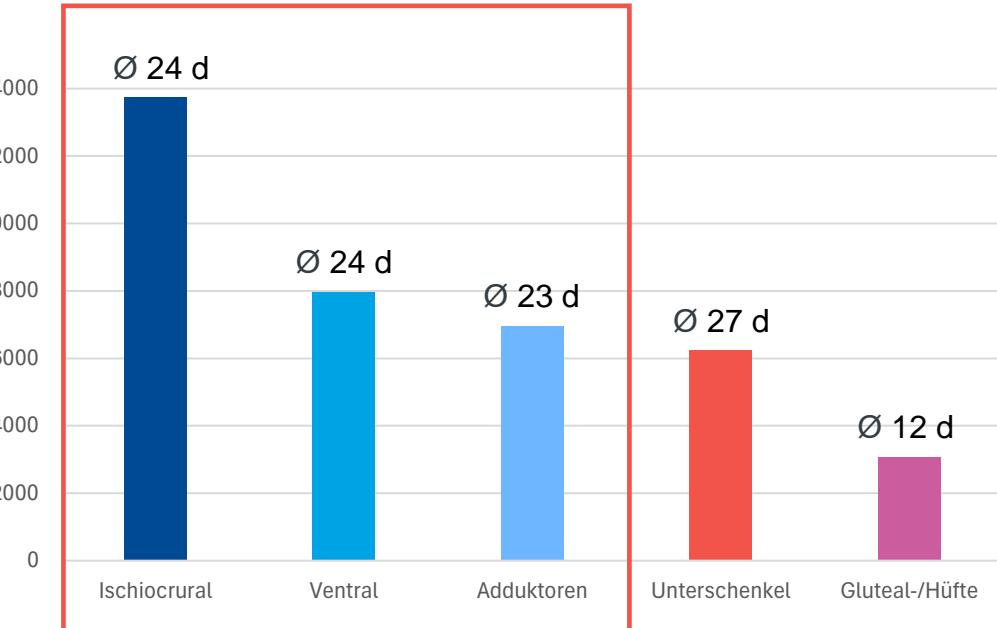
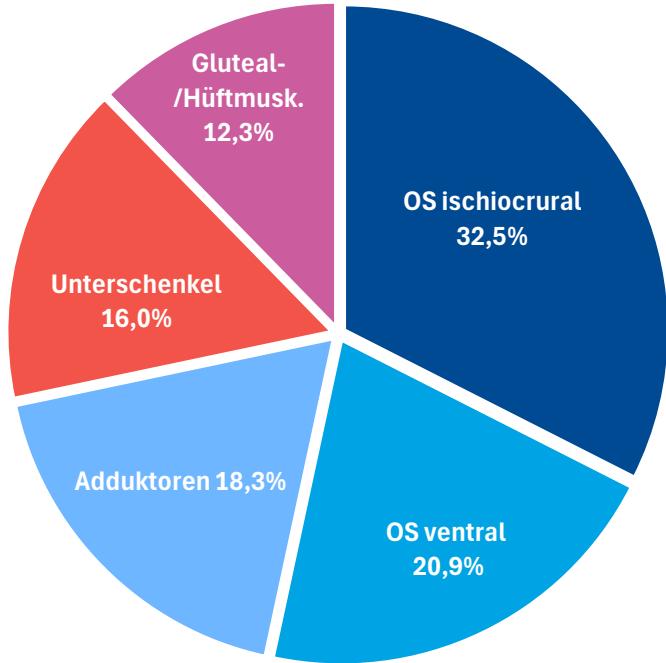
Risiko Matrix – Körperregionen

Bundesliga und 2. Bundesliga 2014 - 2023, n = 21.469 Verletzungen



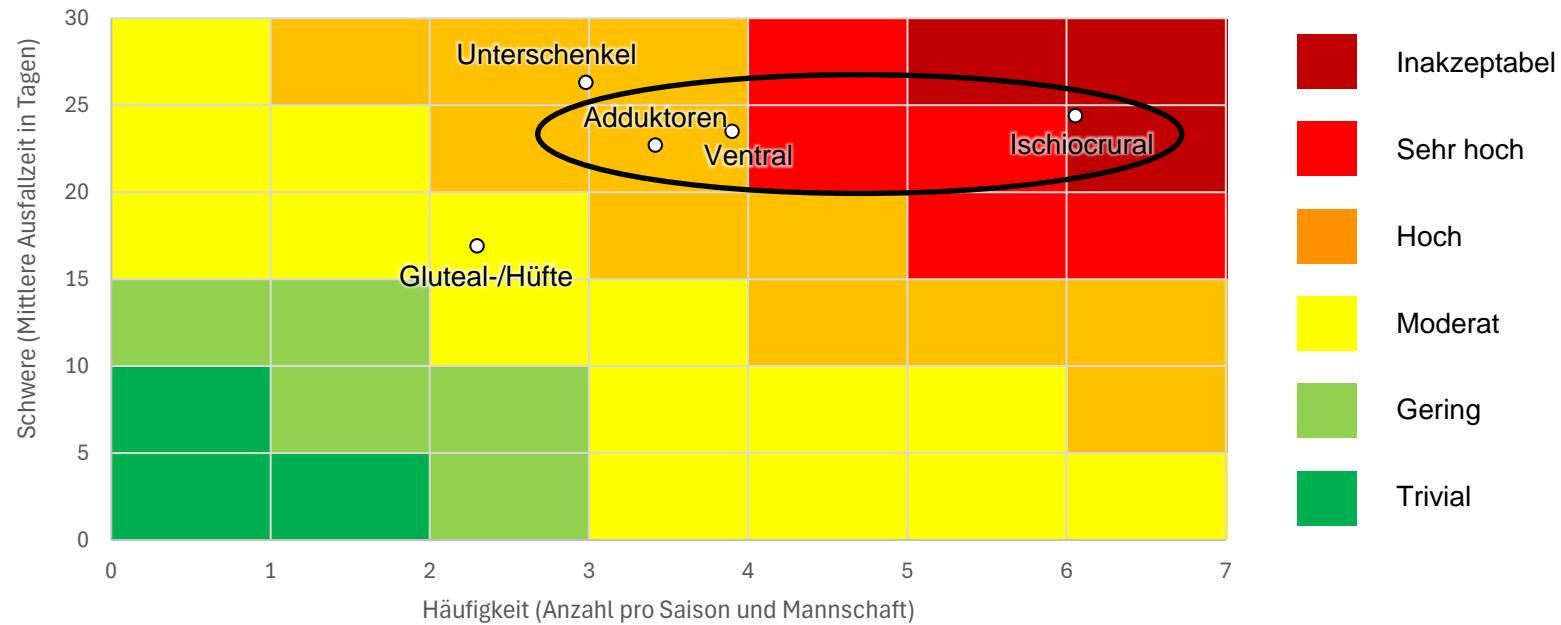
Muskelverletzungen im Vergleich – Häufigkeit und Schwere

Bundesliga und 2. Bundesliga 2020 - 2023, n = 2.014 Verletzungen



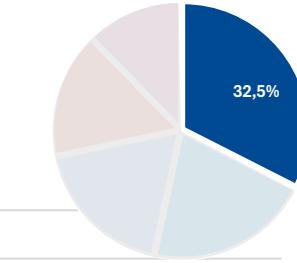
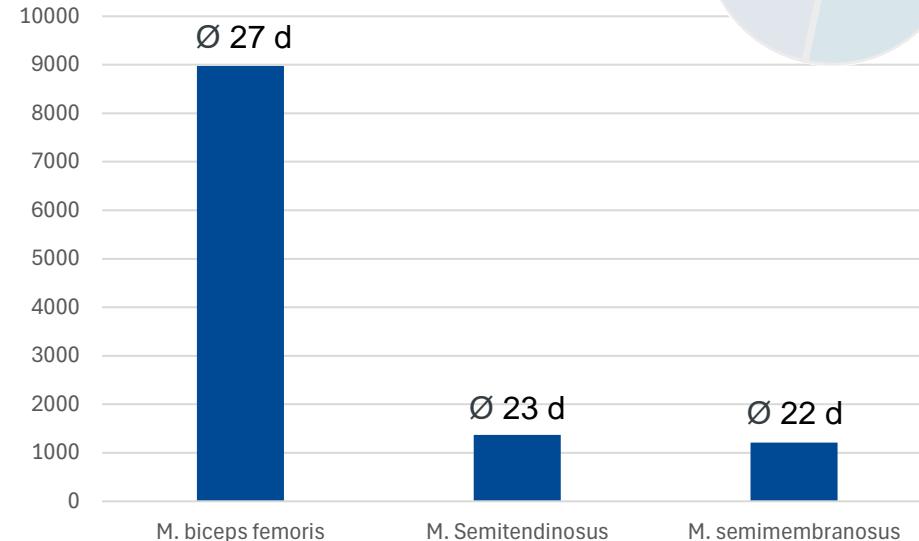
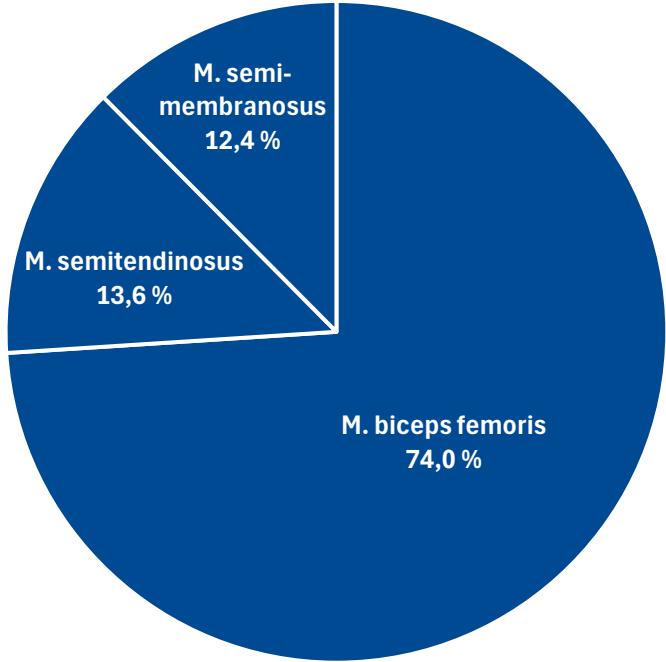
Risiko Matrix – Muskelverletzungen

Bundesliga und 2. Bundesliga 2020 - 2023, n = 2.014 Verletzungen



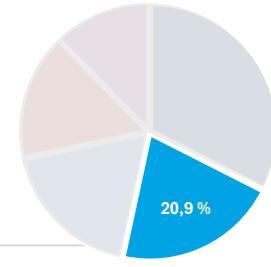
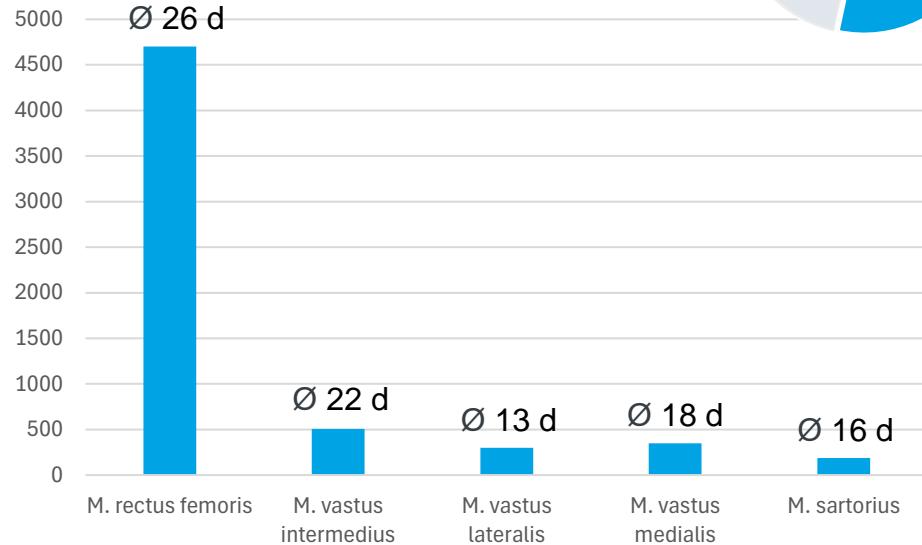
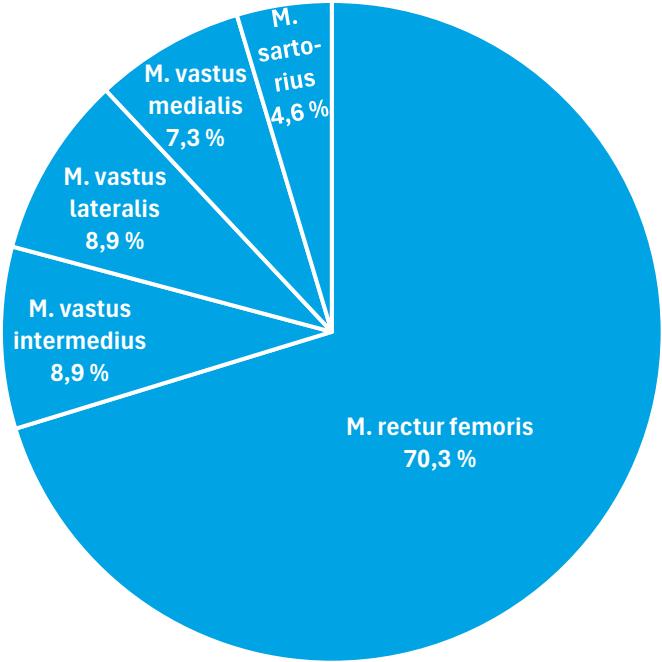
Ischiocrurale Muskelverletzungen – Häufigkeit und Schwere

Bundesliga und 2. Bundesliga 2020 - 2023, n = 654 Verletzungen



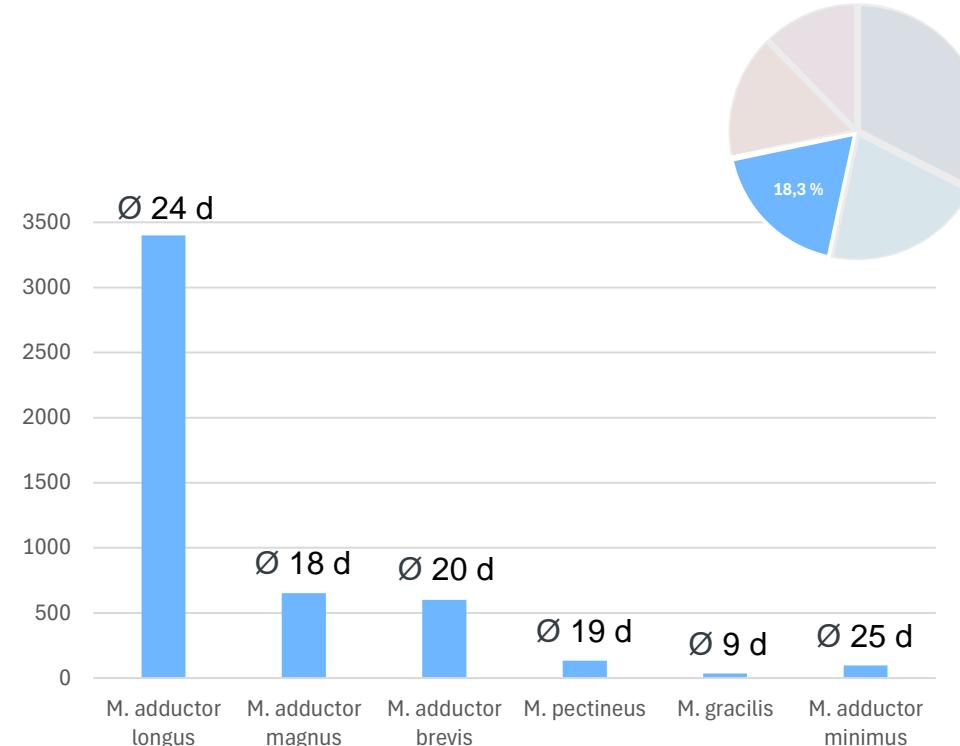
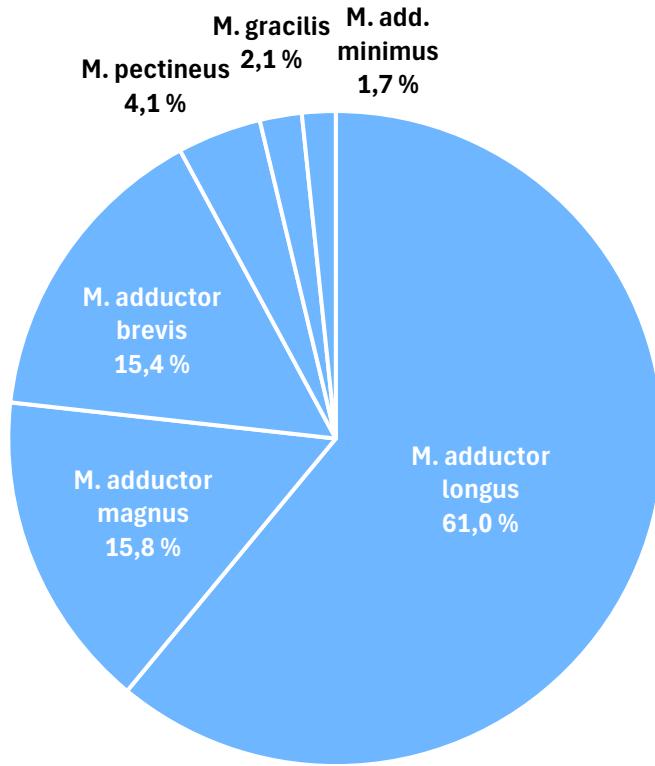
Ventrale Muskelverletzungen – Häufigkeit und Schwere

Bundesliga und 2. Bundesliga 2020 - 2023, n = 421 Verletzungen



Adduktorenverletzungen – Häufigkeit und Schwere

Bundesliga und 2. Bundesliga 2020 - 2023, n = 369 Verletzungen



*Wie entstehen
Muskelverletzungen?*

Ätiologie: Hamstringverletzungen

Original research

HAMSTRING INJURY PATTERNS IN FOOTBALL

Reference: Gronwald et al. BJSM 2022

Designed by @YLM SportScience and @G_Ron_Woods



52 cases of acute non-contact and indirect contact match hamstring injuries of the two highest divisions in German male football were analyzed (ie, time loss of >7 days).

RESULTS

Stretch-related hamstring injuries
Braking or stopping

Lunging
(59%)



Kicking
(30%)



Landing
(7%)



52%
48%



Sprint-related hamstring injuries
Acceleration phase (56%) and
high-speed running phase (40%)



Images provided by PresentMedia

The kinematic analysis of stretch-related injuries revealed a change of movement involving knee flexion to knee extension and a knee angle of <45° when the injury occurred in all closed and open chain movements. Biceps femoris was the most affected muscle (79%) of all included cases.

IMPLICATIONS

The present study supports the need for demand-specific multi-component training practices including acceleration and sprinting, and exercises with rapid braking or stopping (deceleration) movements and high eccentric force potential for hamstring injury risk reduction programmes.

Hamstring injury patterns in professional male football (soccer): a systematic video analysis of 52 cases

Thomas Gronwald ,¹ Christian Klein ,² Tim Hoenig ,³ Micha Pietzonka ,² Hendrik Bloch ,² Pascal Edouard ,^{4,5} Karsten Hollander ,¹

What are the findings?

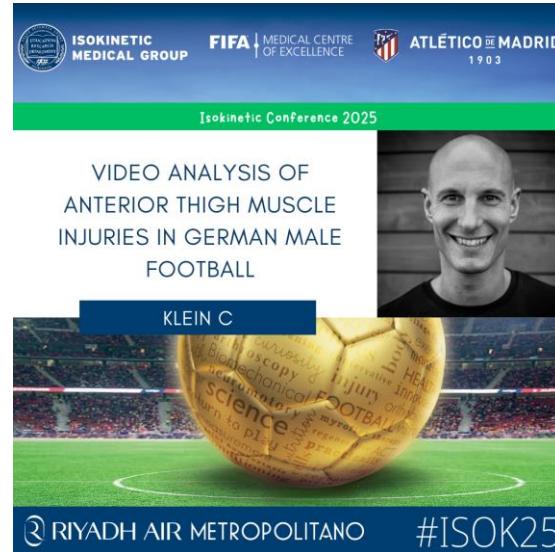
- The three typical reported injury patterns for hamstring injuries were (1) sprint-related injuries, (2) stretch-related closed-chain injuries while lunging and (3) stretch-related open-chain injuries while kicking.
- All sprint-related hamstring injuries occurred during linear acceleration and high-speed running phases.
- All stretch-related hamstring injuries were characterised by a change of movement from knee flexion to knee extension with a knee angle of <45° at the assumed injury frame.

How might it impact on clinical practice in the future?

- The results provide evidence on how hamstring injuries occur in professional male football and show typical situational patterns and biomechanical characteristics that need to be considered for injury risk reduction strategies.
- Strategies for treatment and reduction of hamstring injuries in professional male football should target the three main injury patterns, namely, sprinting, lunging (closed-chain) and kicking (open-chain), including a variety of exercises and in-field situations to prepare the hamstring muscles to the diversity of potential hamstring injury patterns.

Ätiologie: Anterior thigh muscles

Table 1: Illustration of three typical injury patterns for moderate and severe anterior thigh muscle injuries in professional male football



Ätiologie: Adductor longus injuries



Figure 2 Examples of the four categories of player actions at the time of injury: (A) change of direction, (B) kicking, (C) reaching, (D) jumping. These four players injured their right adductor longus.

Original article

Mechanisms of acute adductor longus injuries in male football players: a systematic visual video analysis

Andreas Serner,^{1,2} Andrea Britt Mosler,^{1,3} Johannes L Tol,^{1,4} Roald Bahr,^{1,5} Adam Weir^{1,6}

What are the findings?

- ▶ Acute adductor longus injury situations vary greatly. Player actions can be categorised into change of direction, kicking, reaching and jumping.
- ▶ Kicking and jumping injury actions follow an open chain movement, typically involving a rapid change of movement from hip extension to hip flexion, and hip abduction to adduction, with the hip externally rotated.
- ▶ Change of direction and reaching injury actions follow a closed chain movement, typically involving a combination of hip extension and hip abduction of the injured leg with the hip externally rotated.

Möglichkeiten der Prävention

Exercise-based Programmes

Review

Do exercise-based prevention programmes reduce non-contact musculoskeletal injuries in football (soccer)? A systematic review and meta-analysis with 13 355 athletes and more than 1 million exposure hours

Italo Ribeiro Lemes ,¹ Rafael Zambelli Pinto ,^{1,2} Vitor N Lage,² Bárbara A B Roch,² Evert Verhagen ,³ Caroline Bolling,³ Cecilia Ferreira Aquino,^{4,5} Sérgio T Fonseca ,^{1,2} Thales R Souza ,^{1,2}

What are the new findings?

- ▶ Exercise-based prevention programmes reduce, on average, the risk of non-contact musculoskeletal injuries by 23%.
- ▶ Focused exercise-programmes reduce the risk of non-contact hamstring injuries by 35%.
- ▶ The injury incidence rate of overall non-contact injuries (for control group only) was 0.96 per 1000 hours of exposure.

Review

Table 1 Characteristics of the included studies

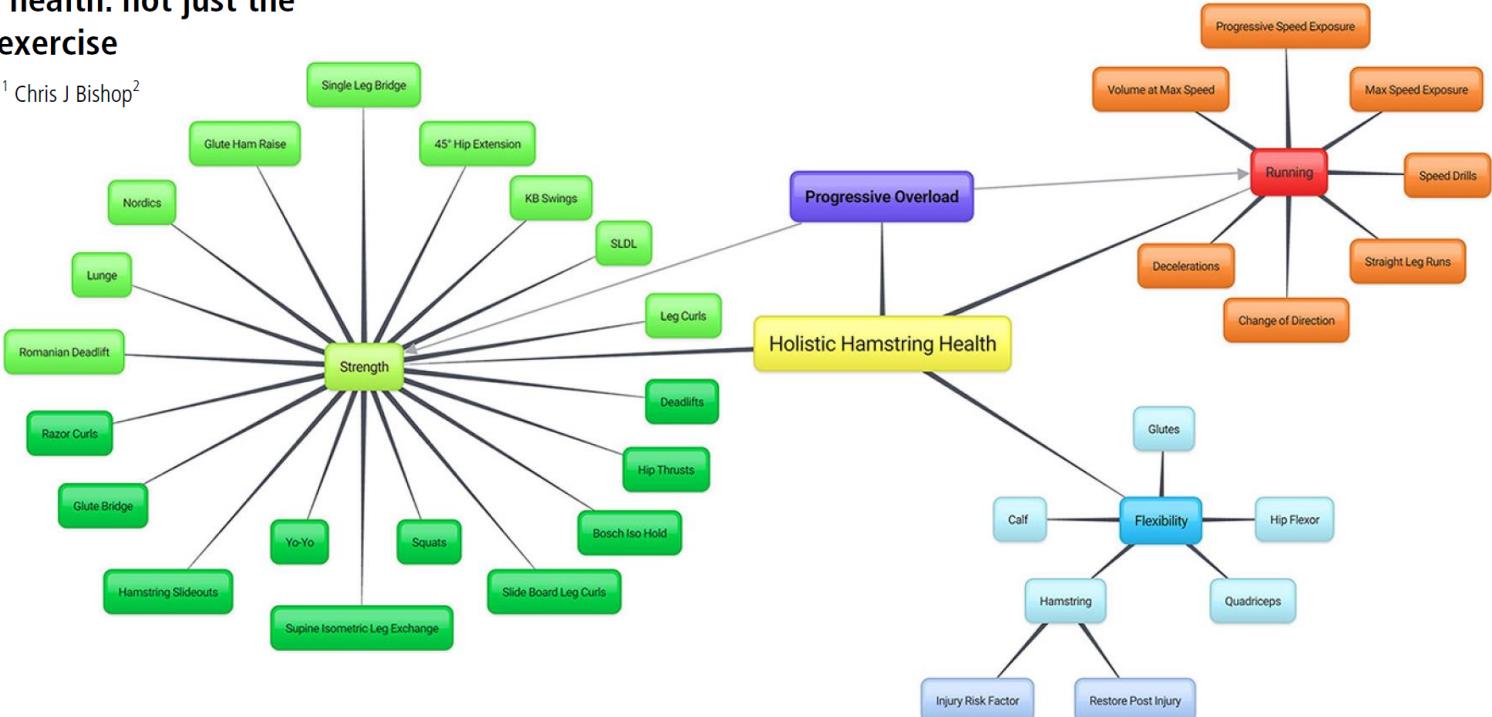
Study, year	Country	Participants (all football players)	Sample size	Intervention	Study length	Outcome
Gilchrist, 2008 ³³	USA	Female collegiate	IG: 583 CG: 852	General Prevent Injury and Enhance Performance (PEP) Programme 3 times/week	12 weeks	Non-contact ACL injuries
Hammes <i>et al</i> , 2015 ⁴³	Germany	Male veteran (≥ 32 years)	IG: 146 CG: 119	General FIFA 11+ Every training session	9 months	Overall injuries
Hasebe <i>et al</i> , 2020 ⁴⁴	Japan	Male high school	IG: 156 CG: 103	Focused Nordic Hamstring Exercise After training session 2 times/week	27 weeks	Overall hamstring injuries
Owoeye <i>et al</i> , 2014 ⁴⁵	Nigeria	Male youth	IG: 212 CG: 204	General FIFA 11+ 2 times/week	6 months	Overall injuries
Silvers-Granelli <i>et al</i> , 2017 ⁴⁶	USA	Male collegiate	IG: 675 CG: 850	General FIFA 11+ 2-3 times/week	5 months	Overall ACL injuries
Soligard <i>et al</i> , 2008 ²³	Norway	Female youth	IG: 1055 CG: 837	General FIFA 11+ 2 times/week	8 months	Overall lower limb injuries
Steffen <i>et al</i> , 2008 ⁴¹	Norway	Female youth	IG: 1073 CG: 947	General FIFA 11 Every training session for 15 consecutive sessions, then 1 time/week for the rest of the season	8 months (including pre-season and summer break)	Overall injuries
van de Hoef <i>et al</i> , 2018 ⁴²	The Netherlands	Male amateur	IG: 229 CG: 171	Focused Bounding Exercise Programme (BEP) Every training session	39 weeks	Overall hamstring injuries
van der Horst <i>et al</i> , 2015 ⁴⁰	The Netherlands	Male amateur	IG: 292 CG: 287	Focused Nordic Hamstring Exercise After training session 2 times/week	13 weeks	Overall hamstring injuries
Waldén <i>et al</i> , 2012 ⁴⁶	Sweden	Female adolescents	IG: 2479 CG: 2085	General Neuromuscular training (Käntroll)	7 months	Overall knee injuries

CG, control group; IG, intervention group.

Holistische Trainingsprogramme

Holistic hamstring health: not just the Nordic hamstring exercise

Aiden J Oakley,¹ Jacob Jennings,¹ Chris J Bishop²



You can run, but you cannot hide...



Review

If You Want to Prevent Hamstring Injuries in Soccer, Run Fast: A Narrative Review about Practical Considerations of Sprint Training

Pedro Gómez-Piqueras ^{1,*} and Pedro E. Alcaraz ²

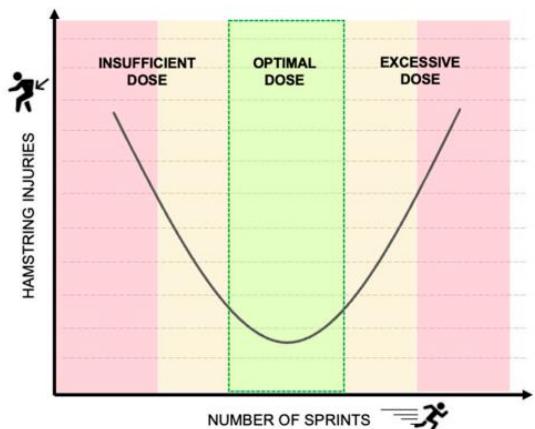


Figure 1. Relationship between the number of hamstring injuries and



14:30-15:00

Speed steigern – Verletzungen minimieren – Reha beschleunigen!

Raphael Schuler, Speed Coach & Consultant, Gründer KEYtoSPEED.com

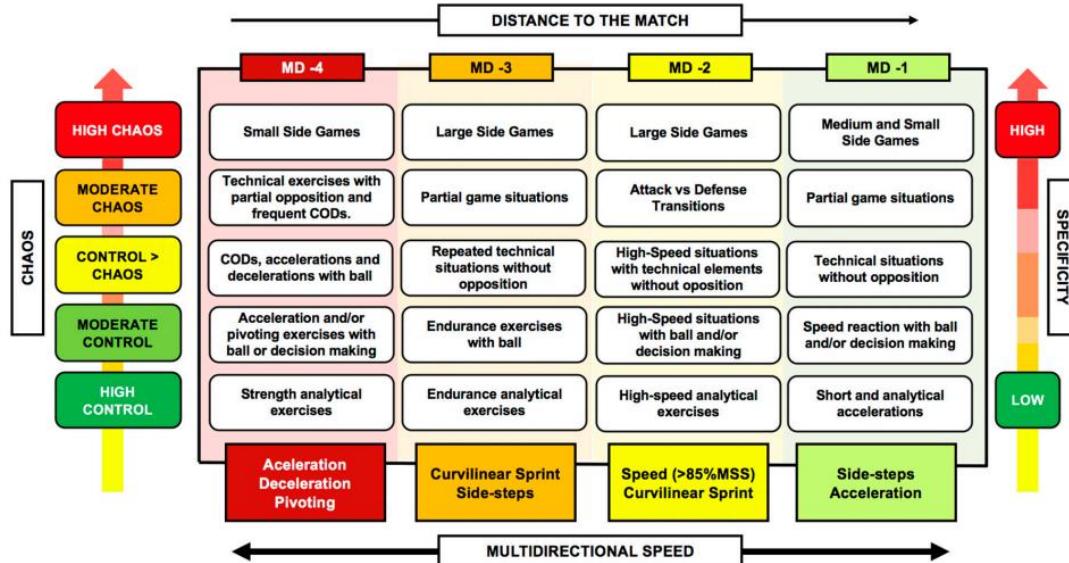
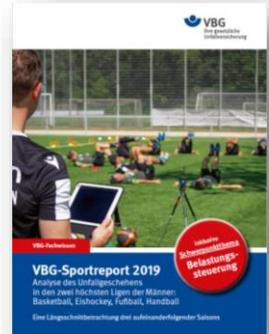
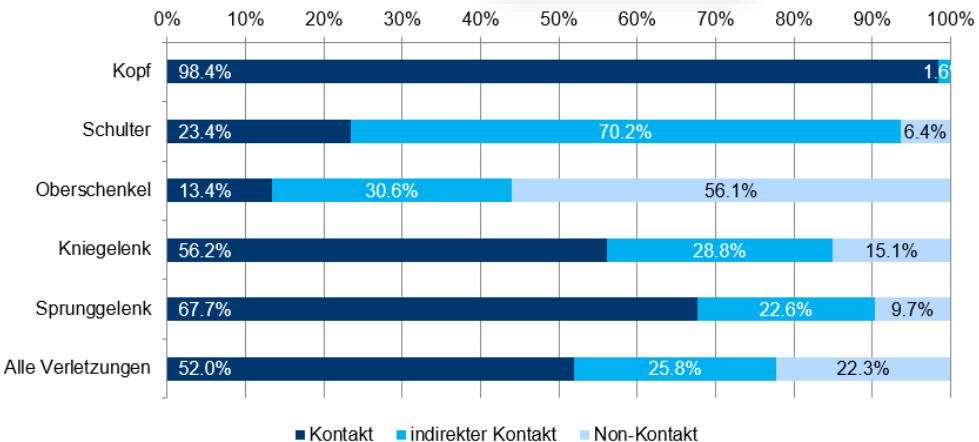
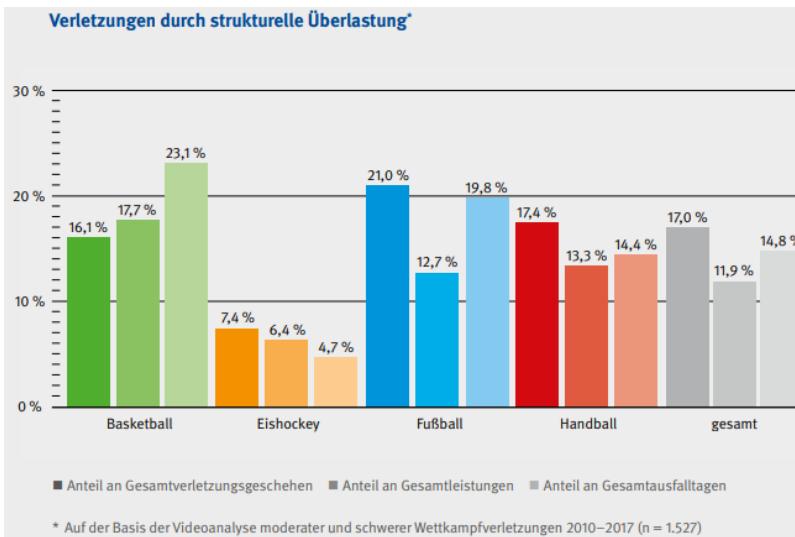


Figure 2. Proposal for the inclusion of the multidirectional speed model during the microcycle based on the complexity of the tasks (MD: matchday; CODs: changes of direction; MSS: maximal sprinting speed).

Belastungssteuerung

13:00-13:30	Schlaf als Erfolgsfaktor im Fußball: Prävention und Leistungssteigerung	Theresa Schnorbach , Psychologin & Schlafwissenschaftlerin, Senior Team Lead bei Emma – The Sleep Company
14:00-14:30	Periodisierung im Athletiktraining	Björn Muser , Athletiktrainer, 1. FSV Mainz 05 U-23



Return-to-Play

Knee Surgery, Sports Traumatology, Arthroscopy
<https://doi.org/10.1007/s00167-019-05623-y>

SPORTS MEDICINE



Injury burden differs considerably between single teams from German professional male football (soccer): surveillance of three consecutive seasons

Christian Klein^{1,2} · Patrick Luig³ · Thomas Henke¹ · Petra Platen¹

Received: 7 January 2019 / Accepted: 10 July 2019
© European Society of Sports Traumatology, Knee Surgery, Arthroscopy (ESSKA) 2019

Recurrent injuries

The overall rate of recurrent injuries was 7.1% ($n=532$). Most recurrent injuries (47.7%; $n=254$) occurred between 2 and 12 months after a player's return to full participation (late recurrence), as shown in Table 3. Almost half of all recurrent injuries (48.1%; $n=256$) were thigh injuries, particularly muscle injuries of the hamstrings and the adductors, followed by injuries of the ankle (24.6%; $n=131$) and the knee (14.8%; $n=79$). The resulting burden of these 466 recurrent injuries that affected the thigh, knee and ankle represented 6.2% of the total injuries, and led to 7355 absence days (9.5% of the total burden). BL1 and BL2 did not differ notably considering the distribution of recurrent injuries.

IJSPT

ORIGINAL RESEARCH

INJURY RISK IS ALTERED BY PREVIOUS INJURY: A SYSTEMATIC REVIEW OF THE LITERATURE AND PRESENTATION OF CAUSATIVE NEUROMUSCULAR FACTORS

Jessica Fulton, PT, DPT, HFS¹
Kathryn Wright, PT, DPT¹
Margaret Kelly, PT, DPT, CSCS²
Britanee Zebrosky, PT, DPT, CSCS³
Matthew Zanis, PT, DPT, ATC, CSCS⁴
Corey Drvol, PT, DPT¹
Robert Butler, PT, PhD¹

ORIGINAL ARTICLE

Previous injury as a risk factor for injury in elite football: a prospective study over two consecutive seasons

M Hägglund, M Waldén, J Ekstrand



Br J Sports Med 2006;40:767-772. doi: 10.1136/bjsm.2006.026609

What this study adds

- Players who are injured during one season have an increased risk of injury in the following season
- Having a previous hamstring injury, groin injury, and knee joint trauma increased the risk of an identical injury in the same leg the following season, whereas no such relation was observed for ankle sprain. Age was not identified as a risk factor for injury

What is already known on this topic

- Previous injury is the most important risk factor for football injury
- Multivariate analyses are recommended for risk factor studies of sports injuries but few studies have applied analytical methods that account for exposure time

Return-to-Play

PRE

RTA

RTS

RTP

RTC

- **Pre-Injury-Screening** = Referenzdatenerhebung für die Rehabilitation z.B. im Rahmen der Leistungsdiagnostik

- **Return-to-Activity** = Übergang von der klinischen Versorgung in das allgemeine Rehabilitationstraining

- **Return-to-Sport** = Übergang vom allgemeinen in das sportspezifische Rehabilitationstraining

- **Return-to-Play** = Übergang ins uneingeschränkte Mannschaftstraining – Ende der Arbeitsunfähigkeit

- **Return-to-Competition** = Gesamtprozess bis zum ersten Wettkampfeinsatz

Trauma Berufskrankh
DOI 10.1007/s10039-017-0236-z
© Springer Medizin Verlag Berlin 2017



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⁴BG Klinikum Hamburg, Hamburg, Deutschland

Return-to-Competition

Sicher zurück in den Sport

Volker Musahl · Jón Karlsson
Werner Krutsch · Bert R. Mandelbaum
João Espregueira-Mendes · Pieter d'Hooghe
Editors



Development and Implementation
of a Modular Return-to-Play Test
Battery After ACL Reconstruction

Hendrik Bloch, Christian Klein, Patrick Luig,
and Helge Riepenhoff

Return to Play in Football

An Evidence-based Approach



Springer

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Background

With a cumulative incidence rate of 2.5 injuries per player and season, German men's professional football is one of the two highest leg-injury rates in the world. In fact, 70.7% of all injuries were lower extremity injuries, with thigh and knee injuries (5.9% and 5.5% respectively) being the most frequent. However, knee injuries alone caused 37.0% of all long-term disability.

A high economic burden of approximately 50% of direct medical costs including compensation payments (Fig. 18.2).

As a result, the highest rate of knee injuries in the two highest German football leagues (59.3%) were reported during noncontact or low contact situations. Additionally, 90.3% of knee injuries were complete, independent of opponent's foul play, a high proportion of which may be preventable (Fig. 18.3).

Special attention should be given to the appearance of anterior cruciate ligament (ACL), which, although only causing 1.7% of all injuries, is update to almost one-third of all direct medical costs including remunerative payments (Fig. 18.2).

In addition to the high medical costs, there is a high secondary rate after returning from an ACL.

Retuned players are at higher risk sustaining a re-injury or an ACL tear on the contralateral leg. Recent studies demonstrate that the

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Return-to-Play

Review

Is subsequent lower limb injury associated with previous injury? A systematic review and meta-analysis

Liam A Toohey,^{1,2,3} Michael K Drew,^{2,3} Jill L Cook,^{1,3} Caroline F Finch,^{1,3} Jamie E Gaida^{4,5}

Original article



Editor's choice
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Sports-related concussion increases the risk of subsequent injury by about 50% in elite male football players

Anna Nordström,¹ Peter Nordström,² Jan Ekstrand³

Workshop I

11:00–12:00	Blood-Flow-Restriction-Training <i>oder</i> Handheld-Ultraschallgeräte – Bestandteil der Physiotherapie von morgen <i>oder</i> Innovative Technologie im Sport: EMG neu gedacht – schnell, einfach, effektiv	Dr. Christian Raeder, Janina-Sophie Tennler , Sportwissenschaftler, Athletikum Rhein Ruhr, BG Klinikum Duisburg Jan-Niklas Drost , Director Health & Human Performance, Red Bull – BORA – hansgrohe Simon Roth , Physiotherapeut, Privatpraxis Roth & Geschäftsführer MYOact GmbH
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VBG Ihre gesetzliche Unfallversicherung

VBG-Fachwissen

Return-to-Competition
Testmanual zur Beurteilung der Spielfähigkeit nach akuter lateraler Bandverletzung am Sprunggelenk

VBG-Fachwissen

Return-to-Competition
Testmanual zur Beurteilung der Spielfähigkeit nach Ruptur des vorderen Kreuzbands

VBG Ihre gesetzliche Unfallversicherung

Algorithmus zur praxisgerechten Diagnostik und Therapie bei Schädel-Hirn-Traumen Im Sport

VBG-Fachwissen

Return-to-Competition
Testmanual zur Beurteilung der Spielfähigkeit nach akuter Verletzung der Schulter



Verletzungsprävention im Fußball

Herausforderung für Teamärzte und Trainerteam

Hendrik Bloch¹ · Christian Klein²

¹ Bezirksverwaltung Bielefeld, Verwaltungs-Berufsgenossenschaft (VBG), Bielefeld, Deutschland

² Bezirksverwaltung Bergisch Gladbach, Verwaltungs-Berufsgenossenschaft (VBG), Bergisch Gladbach, Deutschland

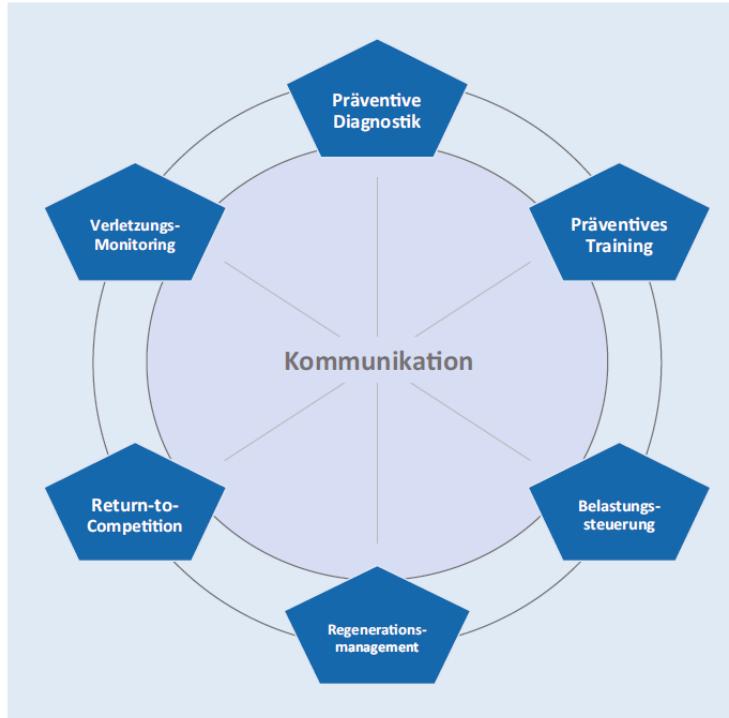


Abb. 1 ◀ Die „Big-6“
der Verletzungsprävention“ (adaptiert
nach [21])

Kommunikation

13:30-14:00

Ein Team, eine Sprache – Kommunikationsstrategien zwischen medizinischem Team und Trainerteam im Fußball

Chiara Behrens de Luna, M.Sc. Sportpsychologin, Hamburger SV & DFB U-17-Juniorinnen

Communication quality between the medical team and the head coach/manager is associated with injury burden and player availability in elite football clubs

Jan Ekstrand,^{1,2} Daniel Lundqvist,³ Michael Davison,^{2,4} Michel D'Hooghe,^{2,5} Anne Marte Pensgaard⁶

What are the new findings?

- ▶ Elite football clubs with good quality internal communication had fewer injuries and greater player availability compared with clubs with poor communication.
- ▶ The communication between the head coach/manager and the medical team was associated with team injury rates.
- ▶ The quality of communication within the medical team, between doctors and physiotherapists, was generally very good in these elite football teams; however, in rare cases of poor communication, player availability at training was affected negatively.
- ▶ Teams with low communication quality between the medical team and the fitness coaches had low player attendance at training.

Open access

Original research

BMJ Open
Sport &
Exercise
Medicine

Higher level of communication between the medical staff and the performance staff is associated with a lower hamstring injury burden: a substudy on 14 teams from the UEFA Elite Club Injury Study

Jan Ekstrand ,¹ Martin Hägglund ,² Markus Waldén ,³ Håkan Gauffin,⁴ Christophe Baudot,⁵ Paco Blosca,⁶ Markus Braun,⁷ Karl Heinrich Dittmar,⁸ Dimitrios Kalogiannidis,⁹ Steve McNally,¹⁰ Ricard Pruna,¹¹ Nelson Puga,¹² Max Sala,¹³ Luca Stefanini,¹⁴ Peter Uebelacker,¹⁵ Bruno Vanhecke,^{16,17} Maikel van Wijk,¹⁸ Wart Van Zoest,^{19,20} José María Villalón Alonso,²¹ Armin Spreco^{22,23}

CONCLUSIONS

A lower hamstring muscle injury burden was associated with a higher level of communication between the medical staff and the performance staff. Successful teams with low injury rates emphasised club-related factors, including good communication between the coach, medical and performance staff and ongoing medical involvement in load management. These factors warrant further investigation in prospective studies.

A photograph of a gladiatorial combat scene. Two fighters are in the foreground, one in blue and gold armor and one in dark blue armor. The fighter in blue and gold is labeled 'CEO', the one in dark blue is labeled 'Coaching Staff'. In the background, a crowd of spectators in ancient-style clothing is watching from the stands. The text labels are placed directly on the image.

CEO

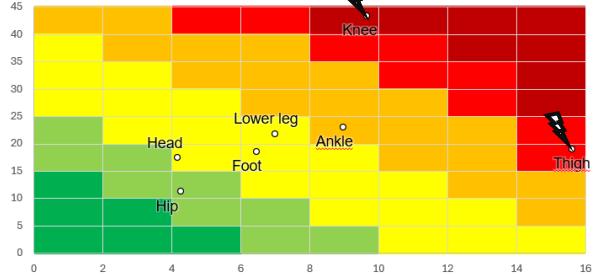
Medical
Staff

Coaching
Staff

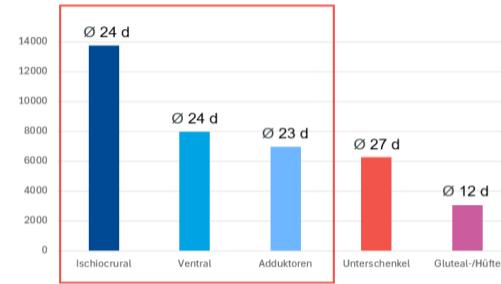




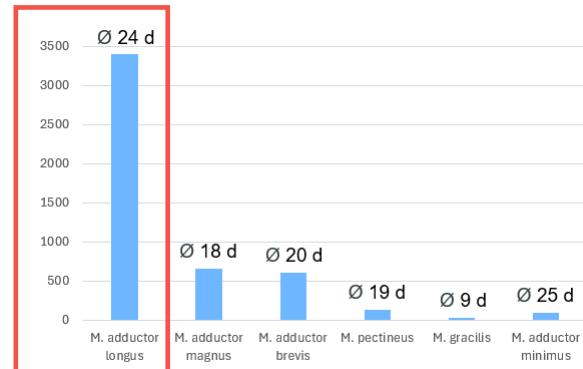
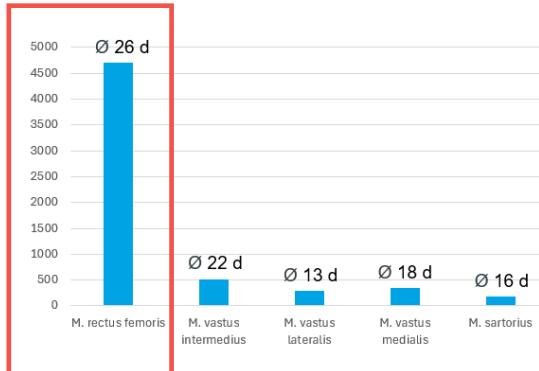
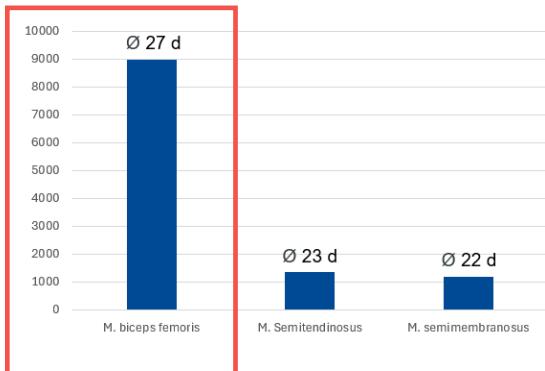
Das 1 x 1 der Muskelverletzungen



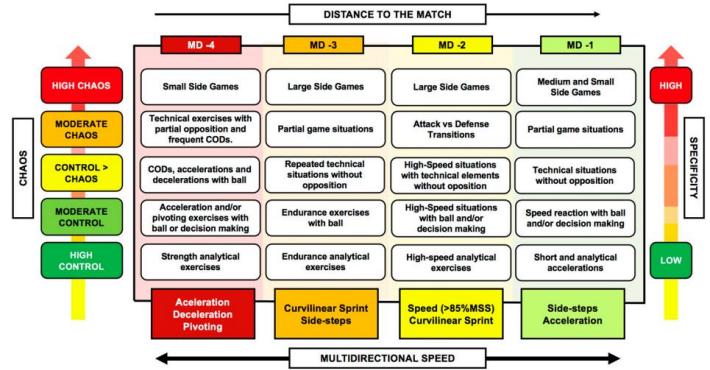
→ Jedes Profi-Team erleidet ca. 16 OS-Verletzungen pro Saison; daraus resultiert > 1 Woche AU / Spieler



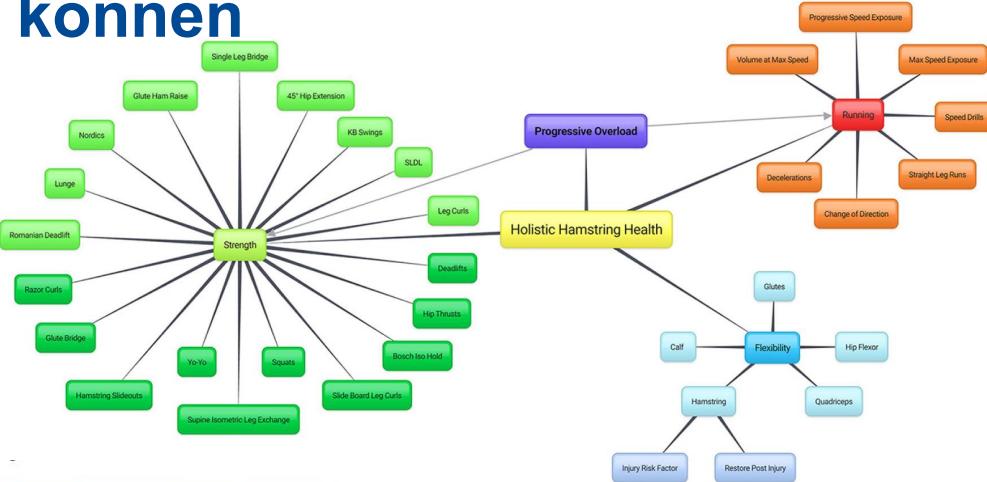
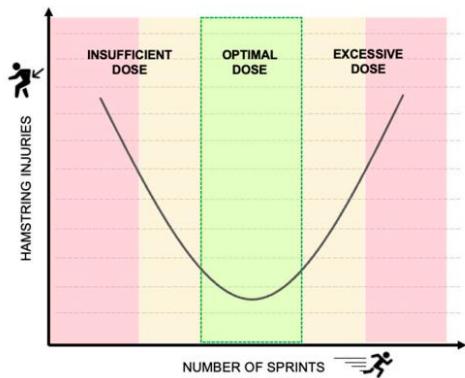
→ Aufgrund des Burdens gilt:
Hams > Quad > Add!



...und was wir dagegen tun können



- PRE** • Pre-Injury-Screening = Referenzdatenerhebung für die Rehabilitation z.B. im Rahmen der Leistungsdagnostik
- RTA** • Return-to-Activity = Übergang von der klinischen Versorgung in das allgemeine Rehabilitationstraining
- RTS** • Return-to-Sport = Übergang vom allgemeinen in das sportspezifische Rehabilitationstraining
- RTP** • Return-to-Play = Übergang ins uneingeschränkte Mannschaftstraining – Ende der Arbeitsunfähigkeit
- RTC** • Return-to-Competition = Gesamtprozess bis zum ersten Wettkampfeinsatz





Dr. Christian Klein
Wissenschaftskoordinator Sport

Vielen Dank für

Ihre Aufmerksamkeit.



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Dr Christian Klein



Christian Klein



www.vbg.de/sport