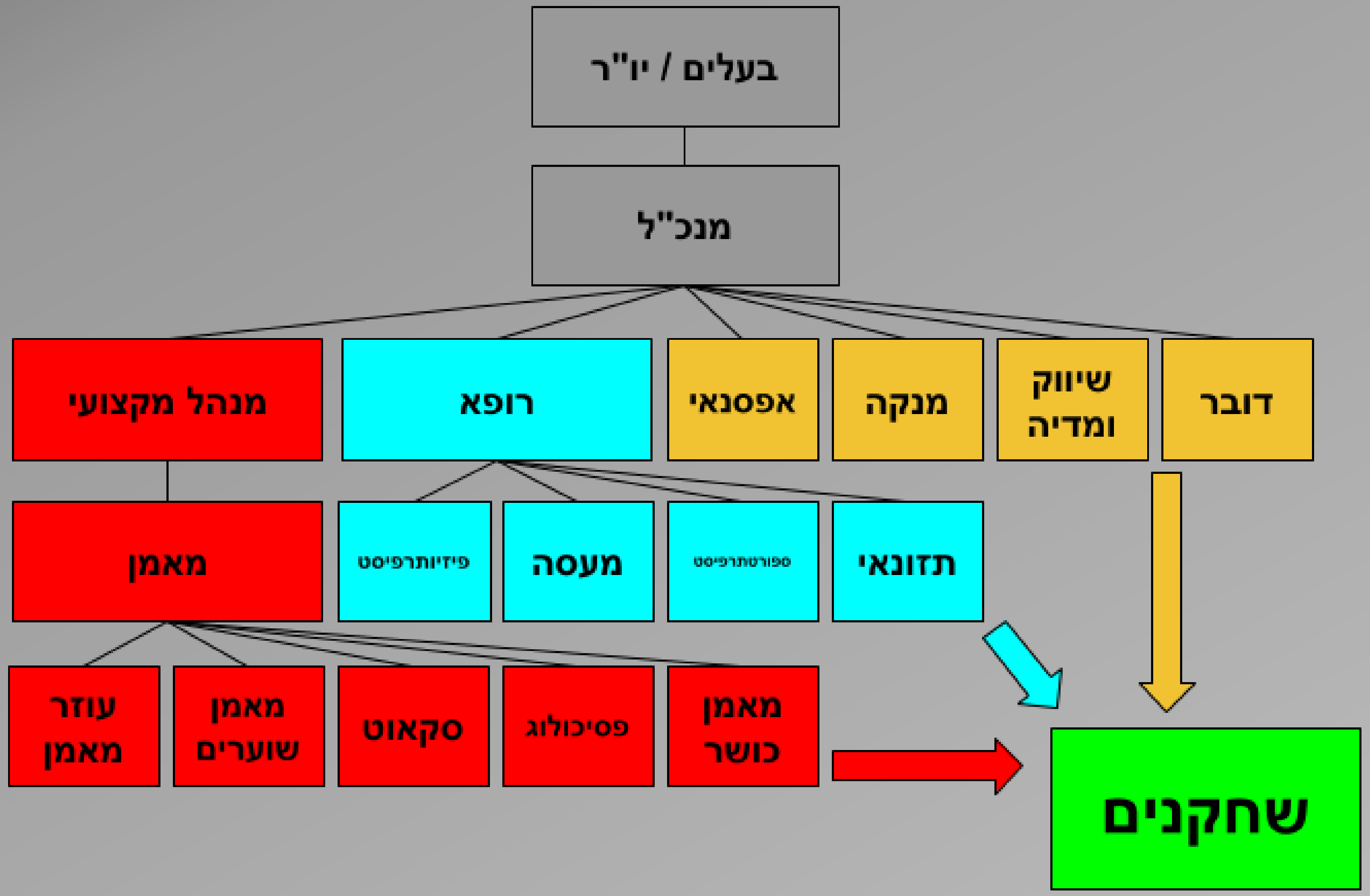
מבוא לפיזיותרפיסט בקבוצת ספורט

מבנה ארגוני של קבוצה



תפקידי הפיזיותרפיסט

- אבחון
- תכנון תכנית שיקום
- טיפול שוטף
- חבישות
- תרגול לפני אימון
- תכניות למניעת פציעות
- עזרה במהלך אימון (חימום, עבודה עם שחקנים בנפרד)
- דיווח ורישום
- ליווי לבדיקות עזר

Managing the health of the elite athlete: a new integrated performance health management and coaching model

H Paul Dijkstra, N Pollock, R Chakraverty and J M Alonso

Br J Sports Med 2014

- A critical element in successful decision-making is integration and communication between disciplines.
- increasing number are employing team doctors on a full or part time basis. However, this employment has the potential to influence clinical decision making in favor of organization performance goals rather than longer term individual health objectives
- Facilitate optimal training and competition while also managing the athlete’s long-term health—often two contradictory elements in the elite athlete
- Is the ‘duty’ of the team physician to protect the health and welfare of the athlete? Or is the primary role is to inform and involve the athlete, providing a safe framework to make the best performance decisions, sometimes even compromising athlete ‘health and welfare’?

Managing the health of the elite athlete: a new integrated performance health management and coaching model

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Table 1 Current challenges for sports physicians and suggested solutions

Challenge	Solution
Doctors lacking specialist training employed to manage the health of elite athletes Doctors practising in isolation; decisions made without broader team consultation Physiotherapists managing the total health of elite athletes	Employ only well-qualified specialist sports medicine physicians to manage the total health of athletes Doctor should practise and make decisions as part of a comprehensive coaching and medical support team Physiotherapists are qualified to manage musculoskeletal health but not the total health of athletes
Doctors are employed by clubs; this fact might influence their objective clinical decision-making	Clear role definition with internal and external clinical governance (eg, appraisal and revalidation process by the appropriate external bodies such as the Faculty of Sport and Exercise Medicine and General Medical Council in the UK)
Doctors are clinically line managed by non-medical team members or non-clinicians. This fact potentially challenges athlete medical confidentiality, access to medical records and ultimate clinical responsibility	Employ appropriately qualified sports medicine physicians with contractual arrangements detailing their ultimate clinical responsibility Culture and contracts within sporting organisations should consider the issue of medical confidentiality
Managers or coaches refer athletes to specialist medical services without involving the medical team/responsible doctor	The medical department is responsible for all the clinical medical aspects including referring athletes for specialist investigations or treatments. Athletes have the right to more than one medical opinion; it is important to develop and agree on a clear referral protocol/policy
The Head Coach influences/over rules clinical decisions by the medical team or doctor	Within a performance environment, the clinical advice may not always be heeded. The Performance Director to whom the medical team is accountable may, in conjunction with the athlete and in receipt of the medical opinion, choose an alternative path. The procedure and documentation around this process should be clear. It is, however, unacceptable for a non-clinician (coach) to make/over rule medical decisions where the athlete lacks the capacity to make a clear decision (eg, RTP in concussion)

RTP, return-to-play.

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- The traditional medical model where that the physician (usually a general practitioner interested in sport) was the ‘primary contact’.
- The improved model recognizes the multidisciplinary nature of the athlete’s ‘primary professional contact’ who may be a physiotherapist, sports physician, team doctor, general practitioner, orthopedic surgeon, nutritionist, physiologist or psychologist.
- Most of the time there is no ‘case-manager’, and it is then left to the often ill-equipped athlete and coach to manage health and performance contributions from a number of clinical and scientific specialists. This has the potential to negatively influence health and performance when the athlete is injured or ill.

Managing the health of the elite athlete: a new integrated performance health management and coaching model

H Paul Dijkstra, N Pollock, R Chakraverty and J M Alonso

Br J Sports Med 2014

- The secret is to take a broad view of the athlete's health.
- Not only pathology driven but also at a functional level. This holistic approach includes strategies to reduce the risk of injury and illness as well as the management of existing health issues.
- Medical teams should also be prepared to prioritize the utilization of sports medicine and science to optimize and improve performance especially for elite athletes with established health problems or disabilities
- Preference-based medicine relies on views from athletes and coaches about their specific goals of care as well as treatment preferences in light of a realistic assessment of risks and benefits.
- That assessment requires sports medicine clinicians to systematically find and appraise the available medical evidence and synthesize and communicate it effectively to athletes and coaches.
- Finally, clinicians, athletes and coaches must integrate both types of information to reach the optimal decision.
- There will obviously be a different preference and attitude towards risk-taking for a local club event as opposed to the Olympic Games, for instance.

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- The players are sorted into one of four classifications based on the assessment of risk:
  - Class 1: Healthy—low risk;
  - Class 2: Some health concerns—moderate risk;
  - Class 3: Significant concerns—great degree of risk;
  - Class 4: Risk too great from a **MEDICAL** point of view.
- It is then the management's ultimate task (owner/president/team manager/head coach) to decide on the level of tolerance of each player's assessed risk.
- Clinicians are focused on the medical 'evidence' and the physical health of the athlete and often want to have the 'final say' on these matters and They then tend to overlook the potential performance and psychological when athlete preferences are excluded from the consultation.
- The reality check of a specific goal or 'preference' is demanded by the athlete–coach team and it might be argued that clinicians choosing to ignore this element only practice 'safe medicine'. They might find it difficult to survive in the elite sport setting.
- Coaches and athletes are sometimes so performance focused that the health consequences of decisions in the heat of the moment are not taken into account.

המלצות

- כדאי להיות בעל תקשורת טובה.
- יכולת לבנות מערכת יחסים מהר
- הבנה בצרכים הספציפיים לענף (אפילו לו"ז וחוקים),
- כדאי לאהוב אות הספורט
- ללמוד ולהתפתח כל הזמן
- לפעמים כדאי להתחיל מענפים קטנים ולהתקדם עם הזמן

זה לא כזה זוהר...

- בטיסות ומחנות העבודה היא 24/7
- לרוב רק הפיזיותרפיסט טס, ואז מבצע גם עבודה של רופא, מעסה ואפילו תזונאי
- עובדים בחדרי מלון על ספות ומיטות רגילות
- חדרי הלבשה ישנים, חנוקים ואין מקום לעבוד
- לא באמת רואים את המשחקים כי תמיד עסוקים במשהו
- לוז שמשתנה בלי הרף (אפילו מספר שעות לפני השינוי)

ניהול זמן והסתגלות לתנאי שטח משתנים (משחקי חוץ, מחנות אימונים, משחקים באירופה, ענפים קטנים)

התפתחות מקצועית ועסקית – לטוב ולרע

יחסי אנוש והתנהלות מול שחקנים ואוהדים

ניהול ציוד והתנהלות מול ספקים ונותני שירות

פריט	כמות	מחיר יחידה	מחיר כולל
שמן עיסוי	10	85	850
טראומיל	20	70	1400
וולטרן	15	50	750
משחה לחימום דרגון	20	42.42	848.4
זוסטריקס	15	27	405
סה"כ בוגרים			4253.4
ציוד לנוער			
שמן עיסוי	5	85	425
טראומיל	20	109.65	2193
וולטרן	25	79.22	1980.5
משחה לחימום דרגון	30	42.42	1272.6
סה"כ נוער			5871.1
סה"כ כללי			10124.5

מבדקים וגורמי סיכון לפציעות

Use of clinical movement screening tests to predict injury in sport

Nicole J Chimera, Meghan Warren

World J Orthop 2016 April 18

- the Functional Movement Screen™ (FMS)
- Y Balance/Star Excursion Balance Test (YBT/SEBT)
- Tuck Jump Assessment (TJA)
- Drop Jump Screening Test (DJST)
- Landing Error Scoring System (LESS)

- Those test are being used fairly regularly in the clinical setting

Use of clinical movement screening tests to predict injury in sport

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FMS

A tool to measure fundamental movements necessary for athletic performance and comprises 7 individual movement patterns and 3 clearing tests, which are tests associated with some movement patterns to determine the presence of pain.

The benefits of the FMS are that it is quick, inexpensive, and easy to administer. takes between 12-15 min. and gives single score (ranging from 0-21)

Young to mid-life physically active males and females, normative FMS falls between 15.4 and 16.2 points. No differences in overall score between males and females were reported, but sex differences were seen with specific movement patterns.

Despite the popularity, the evidence for the FMS is conflicting, limiting the ability to make definitive recommendations for use.

It is a reliable instrument and clinicians should feel comfortable with the consistency of the scoring criteria. But Caution should be exercised in using a single summed FMS score or a specific cut-point for injury.

As an injury prediction screen, the validity was most accurate with firefighters, but firefighters' scores were not responsive to an exercise intervention designed to prevent injury.

The validity of the FMS has been questioned and conflicting findings on injury prediction make recommendations for use difficult at this time

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Table 2 Results of studies using Functional Movement Screen™ score of 14 as a cut point to predict musculoskeletal injuries

Ref.	Sample	Injury definition	Sensitivity	Specificity	+ LR	-LR
Kiesel *et al*[22]	46 male professional American football players	Athletic performance injury requiring injury reserve and time loss of 3 wk	54%	91%	NR	NR
Chorba *et al*[23]	38 female Division II athletes	Athletic performance injury requiring intervention	58%	74%	2.20	NR
O'Connor *et al*[24]	874 male Officer candidates	Any injury: Physical training injury requiring intervention	45%	78%	NR	NR
		Overuse injury: Long term repetitive energy exchange with cumulative microtrauma	12%	90%	NR	NR
		Serious injury: Physical training injury requiring removal from training	12%	94%	NR	NR
Butler *et al*[25]	108 firefight trainees	Physical training injury with time loss of 3 consecutive days	84%	62%	2.20	0.26
Warren *et al*[26]	195 male and females Division I athletes	Athletic performance injury requiring intervention	54%	46%	NR	NR
Garrison *et al*[27]	160 male and females Division I athletes	Athletic performance injury requiring intervention, and 24 h missed time or splinting, to continue participation	67%	73%	2.51	0.45
Hotta *et al*[28]	84 competitive male runners	Physical training injury with time loss of 4 wk	73%	54%	NR	NR
Knapik *et al*[29]	1045 male and female military cadets	Physical training injury	55%	49%	NR	NR
McGill *et al*[30]	53 elite police officer	Back injury not due to specific acute incidents	28%	76%	NR	NR
		All injury	42%	47%	NR	NR

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Star Excursion Balance Test (SEBT) and Y Balance Test (YBT)

SEBT assesses dynamic single leg balance while reaching in 8 reach directions based on the orientation of the stance limb: Anterior, posterior, medial, lateral, anterior lateral, anterior medial, posterior lateral, and posterior medial.

YBT is a modified three reach SEBT (anterior, posteromedial, and posterolateral)

Scoring for both the modified SEBT and YBT involve determining the farthest reach in each of the reach directions and creating a normalized (by participant’s leg length) that gives us a composite reach score (CS).

The validity of the SEBT/YBT has yet to be established

There have been two studies to date that have found differences in performance and kinematics during a direct comparison of the YBT and SEBT performance. Participants reached further in SEBT anterior reach compared to YBT anterior reach; while utilizing less hip flexion.

The development of the YBT was based on the SEBT; however, differences in performance may suggest that these two tests are not as similar as previously thought.

Interestingly, dynamic balance differences have been noted between sexes, ages, countries of origin, sport participation and sport level.

differences between groups and studies may suggest that performing YBT/SEBT may not fully capture the risk of injury attributable to dynamic balance performance.

Additional research is needed in regards to the CS as there are differences in the maximized cut-point to use for injury prediction; however anterior reach asymmetry of 4 or more cm appears to consistently predict non-contact injury risk

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Tuck Jump Assessment

The TJA is a clinical test developed to identify lower extremity landing technique flaws during a plyometric activity.

None of these jumping assessments have been investigated as an injury prediction tool.

All of these assessments were designed to better understand ACL injury, and it is well known that ACL injury are multifactorial, and the mechanism of non-contact ACL injury is multiplane and the inclusion of these clinically jumping assessments as a sole predictor for ACL injury is not recommended

the TJA appeared to be reliable from early studies; however, a newer study suggests that it may not be very reliable and this tool has yet to be validated or proven as an injury risk predictor.

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Drop Jump Test

Evaluate landing patterns from a clinical

The DJST is used to assess dynamic knee valgus on landing from a 30.48 cm height and immediately exploding into a vertical jump *with* a simple frontal plane video analysis

It is important to note that although the results of the studies suggest that landing alignment may be altered following a specific training program

There remains a lack of literature on the validity of the DJST and to date this screening tool has not be used to predict injury risk.

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LESS

The LESS is similar to the DJST in the test procedures with the exception that participant’s jump landing is video recorded from both the frontal and sagittal planes.

In addition, when performing the drop jump landing for the LESS, participants jump from a 30-cm height jump to land on the floor at a distance that is 50% of their height away from the box and then immediately perform a maximal vertical jump.

The LESS is a reliable tool that appears to have validity although caution should be taken as there may be some items/errors that are not completely validated.

Clinicians should account for sex, fatigue, and previous ACLR as these all have demonstrated effects on LESS performance. Further, various types of training programs may improve LESS performance, which may influence ACL injury rate although more studies are warranted at this point.

The Functional Movement Screen as a predictor of Injury in National Collegiate Athletic Association Division II Athletes

Bryan Dorrel, Terry Long, Scott Shaffer, Gregory D. Myer

Journal of Athletic Training. 2018

- Objective: To evaluate the accuracy of the FMS for predicting injury in National Collegiate Athletic Association Division II athletes and to evaluate how an injury definition may affect the prognostic values.
- A total of 257 collegiate athletes (men 176, women 81) between the ages of 18 and 24 years.
- The overall prognostic accuracy of the FMS offered a slightly better than 50/50 chance of correctly classifying those most at risk for injury. As such, the FMS did not provide discriminatory prediction of musculoskeletal injury, overall injury, or severe injury in National Collegiate Athletic
- We recommend using the FMS to assess movement quality rather than as a standalone injury-prediction tool until additional research suggests otherwise

Evaluation of the Functional Movement Screen as an Injury Prediction Tool Among Active Adult Populations: A Systematic Review and Meta-analysis

Bryan S. Dorrel, Terry Long, Scott Shaffer and Gregory D. Myer

SPORTS HEALTH. 2015

- meta-analysis indicated the FMS was more specific (85.7%) than sensitive (24.7%), with a positive predictive value of 42.8% and a negative predictive value of 72.5%. The area under the curve was 0.587 (LR+, 1.7; LR–, 0.87; 95% CI, 0.6-6.1) and the effect size was 0.68.
- Based on analysis of the current literature, findings do not support the predictive validity of the FMS.
- Methodological and statistical limitations identified threaten the ability of the research to determine the predictive validity of FMS

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FUNCTIONAL MOVEMENT SCREEN ORMATIVE VALUES AND VALIDITY IN HIGH SCHOOL ATHLETES: CAN THE FMSTM BE USED AS A PREDICTOR OF INJURY?

Sean M. Bardenett, Joseph J. Micca, John T. DeNoyelles et. All

The International Journal of Sports Physical Therapy. June 2015

- 167 high school were scored using the FMS and were monitored for injury during a single season.
- Likelihood ratios were calculated to determine how much a subject's total FMS score influenced the post-test probability of becoming injured
- Of the 167 participants, 39 sustained a musculoskeletal injury.
- No statistically significant associations were found between total FMS scores and injury status
- The FMS may be useful for recognizing deficiency in certain movements, however this data suggests that the FMS should not be used for overall prediction of injury in high school athletes throughout the course of a season.

Study of the measurement and predictive validity of the Functional Movement Screen

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Fraser Philp, Dimitra Blana, Edward K, Chadwick et. All

BMJ Open Sport Exerc Med 2018

- Objective: to evaluate the reported measurement capabilities and predictive validity of the Functional Movement Screen (FMS) for injury.
- Methods: prospective observational longitudinal study of 24 male footballers from a single team in England. A preseason FMS was carried out with scores recorded. The assessor scores were compared with the photogrammetric system to determine measurement validity, and predictive validity was quantified by assessing sensitivity and specificity.
- Results. The real-time assessor score matched the photogrammetric score awarded for 1 of the participants. It was higher than the photogrammetric system for 22 participants and was lower than the photogrammetric system in 1 participant.
- A higher number of total injuries were associated with higher FMS scores, whether determined through real-time assessment or codification of kinematic variables. Additionally, neither method of score determination was able to prospectively identify players at risk of serious injury.
- Conclusion: The FMS does not demonstrate the properties essential to be considered as a measurement scale and has neither measurement nor predictive validity. Further work on eliminating redundancies and improving the measurement properties is recommended.

Reliability and number of trials of Y Balance Test in adolescent athletes

Pawel Linek, Damian Sikora, Tomasz Wolny, Edward Saulicz

Musculoskeletal Science and Practice. March 2017

- Researches offered 4-6trail attempts
- Researches were on the SEBT and can't be concluded for Y-BT
- Objectives: to assess the protocol (the necessary number of trials to stabilize the results) and reliability of the Y-BT in adolescent athletes.
- Conclusions: It is recommended to perform nine attempts (including six trial attempts and three measurements).
- In order to increase reliability it is recommended that the average of the three measured attempts is analyzed

Injury History, Sex, and Performance on the Functional Movement Screen and Y Balance Test

Nicole J. Chimera, Craig A. Smith, Meghan Warren

Journal of Athletic Training 2015

- Objective : To determine if injury or surgery history or sex affected results on the FMS and YBT
- A total of 200 National Collegiate athletes were screened; 170 completed the FMS, and 190 completed the YBT
- Injury history and sex affected FMS and YBT performance. Researchers should consider adjusting for confounders

VALIDITY OF FUNCTIONAL SCREENING TESTS TO PREDICT LOST-TIME LOWER QUARTER INJURY IN A COHORT OF FEMALE COLLEGIATE ATHLETES

P. David Walbright, Nicole Walbright, Todd Davenport

The International Journal of Sports Physical Therapy. November 2017

- The purpose of this study was to examine the accuracy of three common neuromuscular screening tests to predict the occurrence of a lower quarter injury in female collegiate volleyball and basketball players.
- 35 subjects underwent a pre-season of Y-balance test, the FMS and Single Leg Hop test. Data were collected on lower quarter injury incidence, lost practice time, and lost competition time throughout one season
- Lost-time injuries occurred in 11 athletes (31.4%). There were no significant relationships between occurrence of a lost-time lower extremity injury and scores on any of the three tests.
- ***Conclusions:*** Although reliable, the screening tests under study did not appear to retain adequate validity to predict lower quarter injury risk within these female collegiate athletes.

Why screening tests to predict injury do not work— and probably never will…: a critical review

Roald Bahr

Br J Sports 19 April 2016

- To ensure that screening programs gets the benefits intended, the WHO published the Wilson-Jungner criteria for appraising a screening programme.

(1) that the condition being screened for is an important health problem (depending not just on how serious the condition is, but also how common it is)

(2) that there is a detectable early stage

(3) that treatment at an early stage is of more benefit than at a later stage

(4) that a suitable test is available to detect disease in the early stage

- Clearly, injuries represent an important health problem in sports (criterion 1). However, criteria 2–4 need adaptation when being applied to the case of sports injury prevention.

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- While screening for breast cancer involves detecting established disease as early as possible, screening for injury risk usually involves using a performance test to detect impairments which to injury (e.g., hamstring muscle weakness, poor knee alignment).
- When screening for disease, the objective is to initiate treatment as early as possible. In sports injury prevention, the objective is early intervention to minimize the risk factor before injury occurs. (e.g., strength training program, balance training to improve knee control)
- Risk factors can be modifiable and non-modifiable, and screening tests typically measure modifiable factors. However, it should be noted that non-modifiable factors (such as gender or previous injury history) can be used as well, to target intervention measures to the subgroup thought to be at increased risk.
- One common misconception is that all it takes to develop a screening test is to identify a statistically (highly) significant association between the result from a screening test and increased injury risk. If a significant association is identified between one or more factors and injury risk, it may be tempting to conclude that these can be used to predict who is at risk of injury.

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- However, this is only the first step towards a validated screening program.
- The next step required is to repeat the same study, but this time the question is not how strong the association between the test result and injury risk is (OR, p value), but how well the test predicts who becomes injured and who does not in a new athlete population, different from the one used to develop the test criteria.
- The final step should be randomized controlled trial, where the treatment group receives the combined screening and intervention program.
- The treatment group outcome (injury rate) can be compared with a control group, which trains as usual, but should also be compared with a control group where all athletes are given the prevention program (3 groups)

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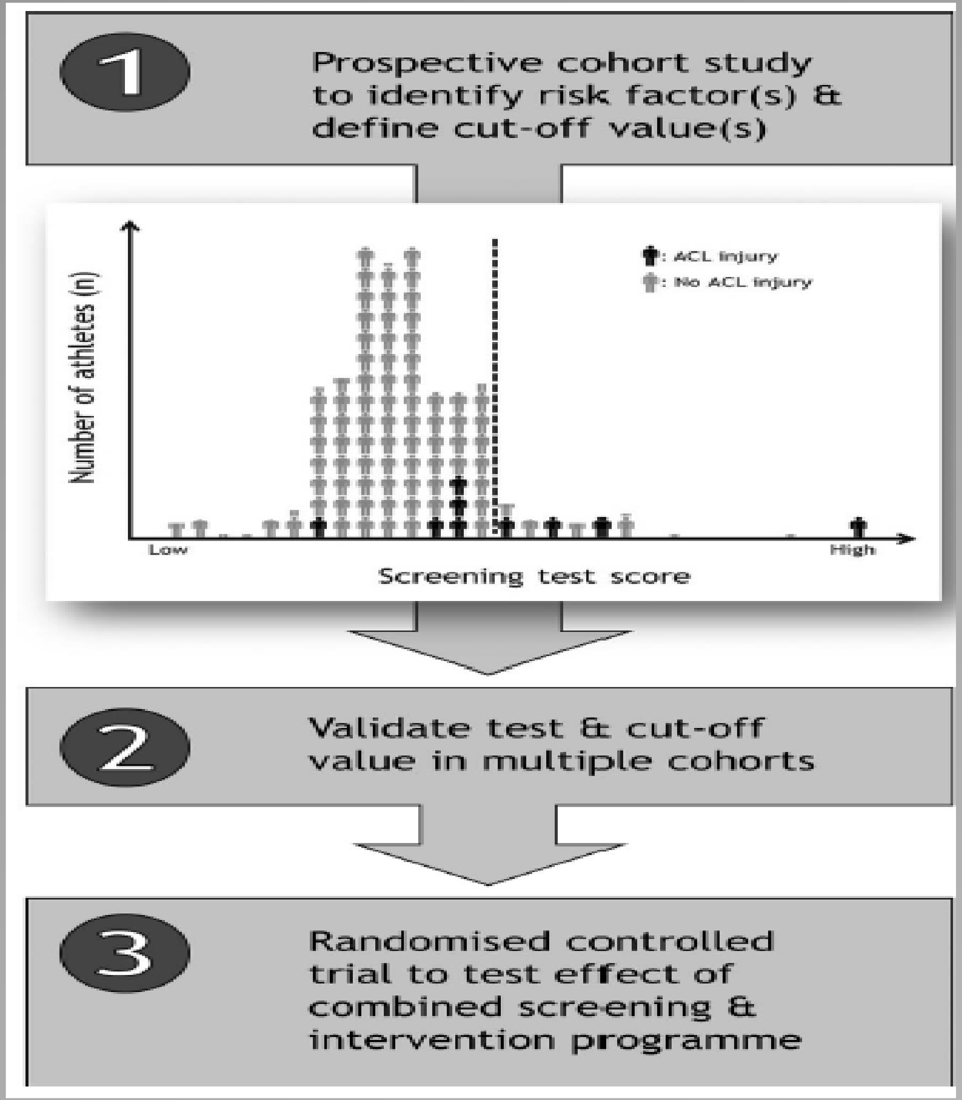

Why screening tests to predict injury do not work— and probably never will…: a critical review

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- The ability of a test to predict injury is often the same as those used for diagnostic tests, that is, sensitivity (does the test capture all those with injury), specificity (does it capture only those with injury), positive predictive value (how many with a positive test are injured) and negative predictive value (how many with a negative test are not injured).
- Hewett et al introduced the vertical drop jump test as a screening test for ACL injury in female athletes in 2005 based on a prospective cohort study. 205 female athletes tested in the preseason, 9 suffer an ACL. Of a range of different movement compared between injured and uninjured players, they observed the strongest association for peak external knee abduction moment during landing, concluding that this factor predicted ACL injury status with 78% sensitivity and 73% specificity
- But the critical question is where the cut-off value separating high-risk and low-risk groups should be set.
- Sensitivity and specificity are inversely related. This means that if you want to capture all injured players (100% sensitivity), specificity suffers (more uninjured athletes will be classified as having high risk).
- In figure 2, scenario A results in a sensitivity of only 44%, that is, only four of nine injured athletes are classified as high risk. Scenario B results in a sensitivity of 78% (the best fit with the data), while the cut-off depicted for scenario C is needed to capture 8 of the 9 injured players. However, specificity will then have dropped, from 93% in scenario A to 70% in scenario C. The positive predictive value is low in all scenarios, ranging from 14% to 7%.

Why screening tests to predict injury do not work— and probably never will…: a critical review

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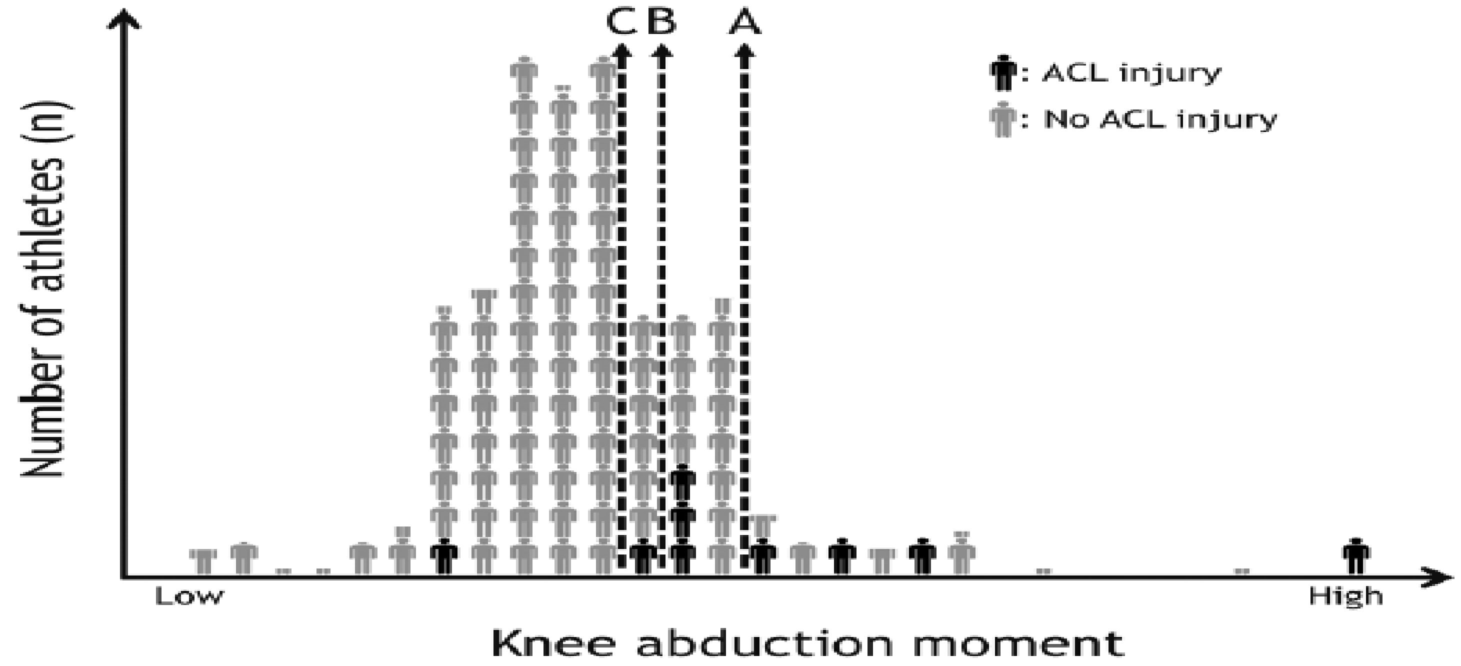

Figure 2 Schematic representation of data from Hewett *et al*,[10] illustrating the relationship between external knee abduction moment (reported as Nm adjusted for body height and weight) and risk of ACL injury. Uninjured players are shown in grey, while athletes who went on to suffer an ACL injury during the season are shown in black. The dotted lines denoted in A, B and C illustrate three alternative cut-off values. Note that the relative proportion of injured (N=9) to uninjured athletes (N=196) is not to scale, as each injured athlete is depicted by a full-size figure.

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- From this we can see that the optimal cut-off value for screening purposes is not necessarily the value representing the best fit.
- If the intervention is costly (for athletes this usually means time consuming), a conservative cut-off (high specificity) may be more appropriate. But if the intervention is easy, has no side effects and is highly effective (like prevention program), a cut-off with high sensitivity is more reasonable
- This is why the second step in validated screening program involves using the same test, applying a predetermined cut-off value on a new population of athletes to: (1) confirm the association between risk factor and injury risk, and (2) test the performance of the cut-off value selected.
- E.g., a recent meta-analysis demonstrated that increased quadriceps peak were associated with increased risk of hamstring injuries. So therefore in a recent study they examined the relationship between injury risk and various strength measures in 614 football players during 4 seasons.
  They saw that eccentric hamstring strength at 60° was associated with injury risk. However, there were substantial overlap between groups, which illustrates that a screening test based on eccentric hamstring strength cannot be used to predict injury and that while a statistically significant association indicates that there may be a causal relationship between a specific test and injury risk, this is not sufficient to use the test to predict who is at risk of injury.
- These data once again illustrate the main challenges with athletic screening tests: the risk factor is continuous and there is substantial overlap between groups and that factors proposed for classifying or predicting risk in individual participants must be held to a much higher standard than merely being associated with outcome.

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- It should be noted that there are more appropriate statistical measures than sensitivity, specificity, positive and negative predictive values and ORs, which should be used to describe the predictive ability of a screening test, such as likelihood ratio or receiver operating characteristic curve analyses.
- In the examples used here, receiver operating characteristic curve analyses revealed an area under the curve of only 0.60 (vertical drop jump test) and 0.56 (eccentric hamstring strength), where a value of 1.0 indicates perfect prediction and 0.5 indicates a truly useless test (no better at identifying true positives than flipping a coin). This emphasizes that more appropriate statistical methods may confirm that these factors cannot be used as screening tests to predict ACL or hamstring injury
- Also in sport, there are examples of binary categorical risk factors like history of previous injury (yes/no) and sex (male/female), and the question is how these behave as factors for injury.
- Most are non-modifiable, although history of previous injury represents a modifiable factor as The risk of re injury is highest immediately after return to sport, and decreese with time (e.g., after an ankle sprain, the re injury is about 50% at the first 6 months after return to play, but only 4% after 2 years and that graft ruptures after ACL tend to occur in the first 6 months).
- The explanation is probably that, with time, injured ligaments and muscles heal, and their functional properties (strength, balance, neuromuscular control) improve.

Why screening tests to predict injury do not work— and probably never will…: a critical review

Roald Bahr

Br J Sports 19 April 2016

- A consistent finding across most injury types and sports researches is that a history of previous injury is the by far strongest risk factor for injury, with very impressive ORs.
- A prospective study in Icelandic football, where players were asked about previous injuries before the start of the season and new injuries were recorded throughout the season. This study observed the highest OR ever reported for history of previous injury as a risk factor for hamstring strains with OR of 7.4.
- However, the question is how well this predicts a new hamstring injury.
- The sensitivity was 53%, specificity 87%, positive predictive value 14% and negative predictive value 98%.
- In other words, if this had been used to predict injury (for deciding who needed an intervention program for example), almost half of the players who went on to suffer an injury would have been denied the intervention.
- The Nordic hamstring exercise program is as a highly effective intervention, which is easy to do and has no side effects when performed correctly. Therefore, in this case, it seems inappropriate to use factors with low sensitivity, As nearly 50% of hamstring injuries happen to players with no previous injury. A coach therefore may want to offer the program to the entire team.
- This illustrates that when data from screening and intervention studies (based on screening) are available, informed decisions can be made to decide if a prevention program should be introduced and who should be using the program.

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- Another example. The issue of preventive interventions is the sex difference in ACL injury risk.
- Studies have shown that ACL injuries are between 2 and 5 time more common among women than men, depending on age group and sport.
- This lead that ACL injury prevention programs are almost exclusively taken by female athletes.
- Given the nature of existing screening tests (where test performance is measured on a continuous scale from low to high), substantial overlap is typically seen between players with high and low risk of injury. Therefore, although the factor tested may demonstrate a highly significant relationship with injury risk, and by that improving the understanding of the factors, such tests are unlikely to be able to predict injury with sufficient accuracy

Complex systems approach for sports injuries: moving from risk factor identification to injury pattern recognition—narrative review and new concept

N F N Bittencourt, W H Meeuwisse, L D Mendonça, A Nettel-Aguirre, J M Ocarino, S T Fonseca

Br J Sports Med. September 22, 2017

- Injury prediction is one of the most challenging issues in sports and a key component for injury
- The sports injury literature has revealed important injury predictors by means of typical statistics tools, such as logistic regression. However, for some injuries (eg, hamstring strain and patellar tendinopathy), these techniques have not yet yielded consistent identification of risk factors.
- Unfortunately, these inconsistencies show that the majority of the human health conditions are complex
- The multifactorial and complex nature of sports injuries arises not from the linear combination of isolated and predictive factors, but from the interaction between the factors. These factors may be linked to each other in a non-linear manner, in the sense that small changes in a few of them can lead to large and, sometimes, unexpected consequences

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For instance, restriction in ankle dorsiflexion range of motion (ROM) and training load are found to be risk factors (although inconsistent) for patellar tendinopathy.

However, in some cases, restricted ankle dorsiflexion ROM only will be relevant in the presence of high training load.

This last risk factor will influence the former because high frequency of vertical jump increases the total mechanical energy reaching the tissues, which should be dissipated by the hip, knee and ankle.

In the presence of restricted ankle dorsiflexion ROM, this energy may not be properly dissipated at the ankle and could overload the patellar tendon

It means that when units A and B interact, the behavior of A in interaction with B is different from the behavior of A alone

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- Injry prediction in sports is less straightforward and frequently dependent on dose–response relationships.
- For example: DKV (high frontal plane knee angle) has been associated with hip abductor weakness.
- In a linear view, one could assume that the weaker the hip abductors, the larger the DKV.
- However, evidence has shown a non-linear relationship between hip muscle strength and DKV when participants have high hip internal rotation stiffness (as in the case of hip retroversion), even a high strength level of the hip abductor is not capable of preventing DKV.
- After an injury occurrence, the system might change in an unpredictable way. In this case, the previous states of the so-called injury predictors are changed as to no longer exhibit the same relationship to the outcome or even be present at all.
- The non-linear interactions among individual factors may result the emerge of new properties that could not be predicted on the basis of the behavior of the individual factor alone

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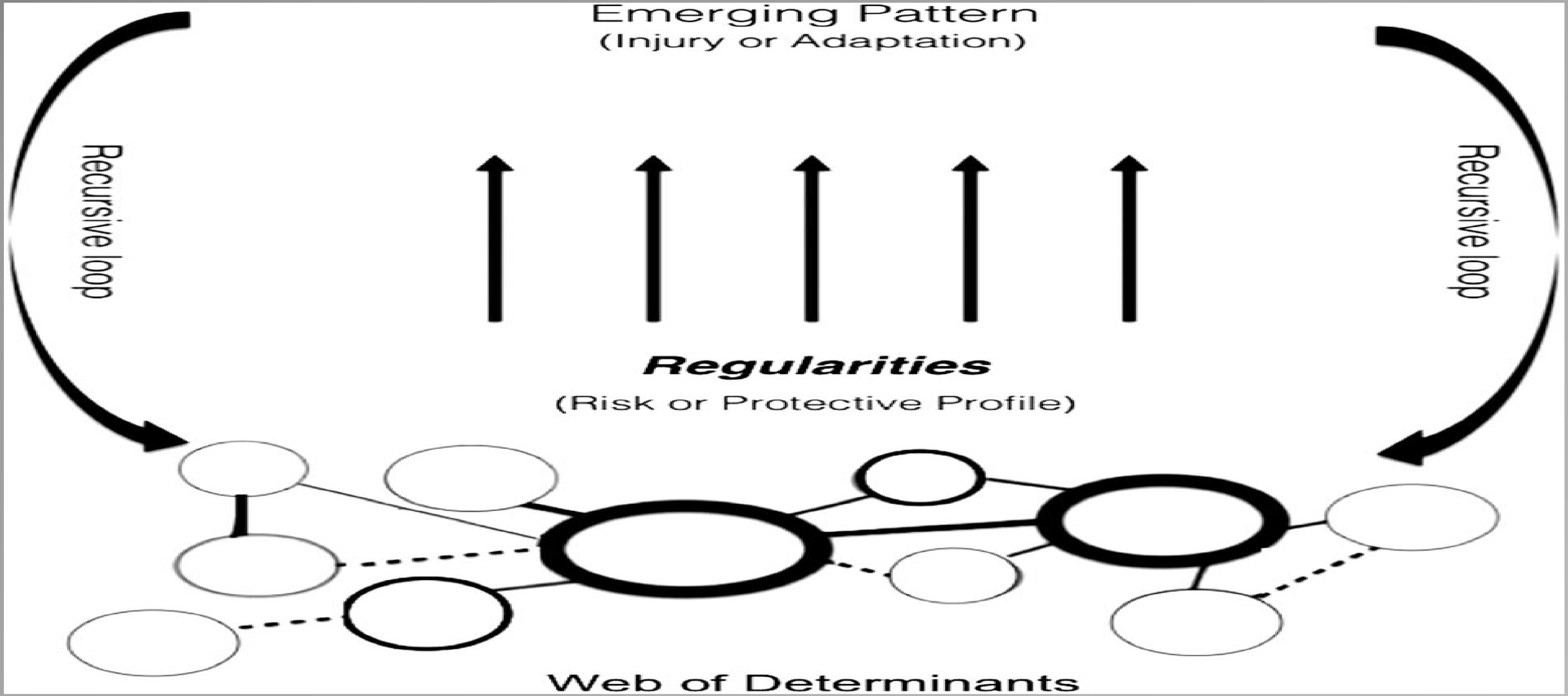

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Complex model for sports injury

- The group of variables at the bottom makes up the web of determinants, which is composed of contributing units with different weights.
- Variables circled by darker lines have more interactions than variables circled by lighter lines and exert a greater influence on the outcome.
- Dotted lines represent a weak interaction and thick lines represent a strong interaction between variables.

Complex systems approach for sports injuries: moving from risk factor identification to injury pattern recognition—narrative review and new concept

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- we need to ask ourselves, without taking away the epidemiological importance of identifying risk factors and their potential modifiability, whether we are aiming at prediction or solely at finding relationships. In order to catch patterns and be able to prevent, we need to predict
- Meeuwisse et al highlighted the dynamic nature of risk factors, as the pattern of change in one variable (ie, change of strength during a season) could influence injury risk more than its absolute value in one point in time.
- Such a concept requires examining risk factor change longitudinally over a period of time, in order to incorporate the history of the event. For this reason, study designs and statistical analyses must consider the existence of complex interactions and changing risks.
- In practice, assessing risk profile should occur along the season, not only in the preseason, and the analyses should focus on the changing web of determinants that lead to injury
- A single risk factor does not warrant the occurrence of the injury. On the other hand, the identification of the risk profile may inform about the probability of the injury occurrence.

Complex systems approach for sports injuries: moving from risk factor identification to injury pattern recognition—narrative review and new concept

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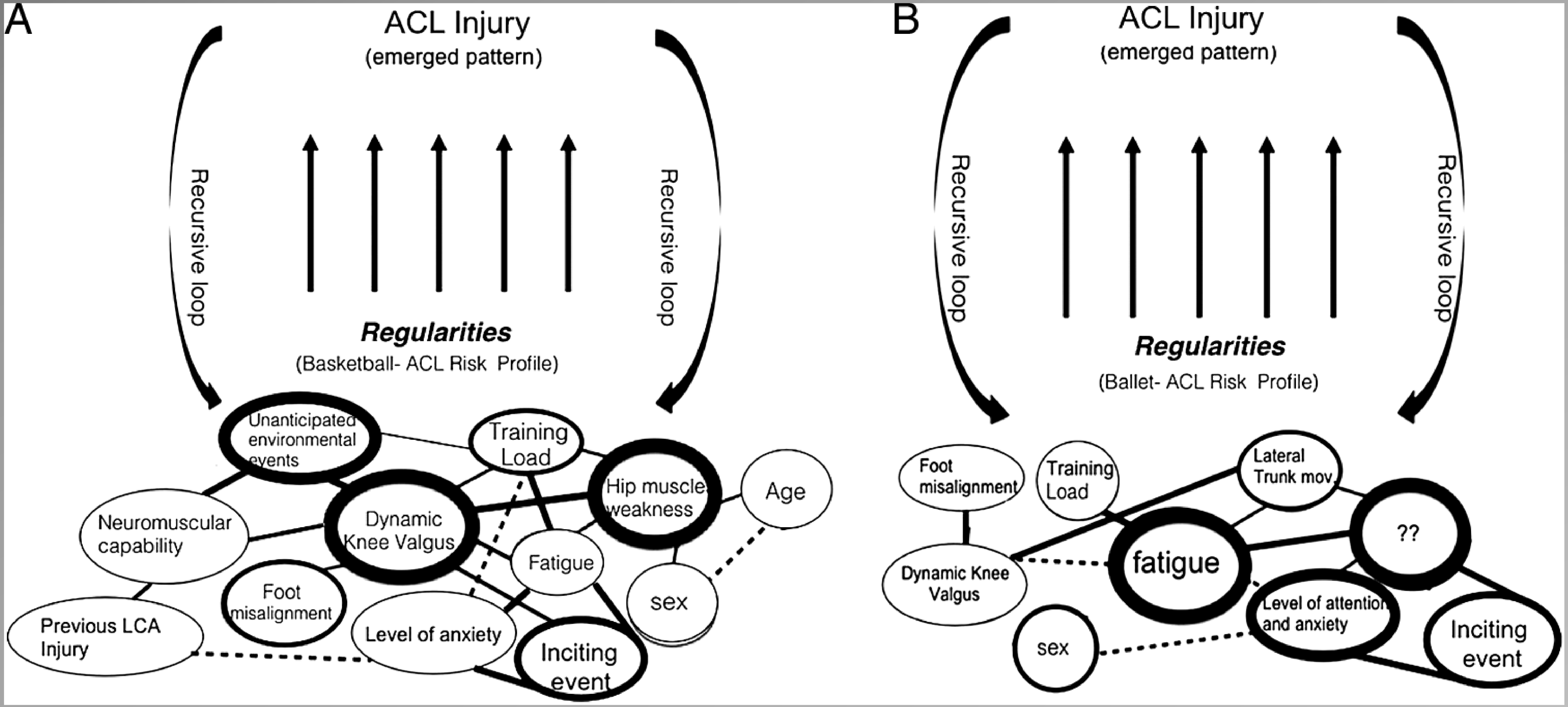

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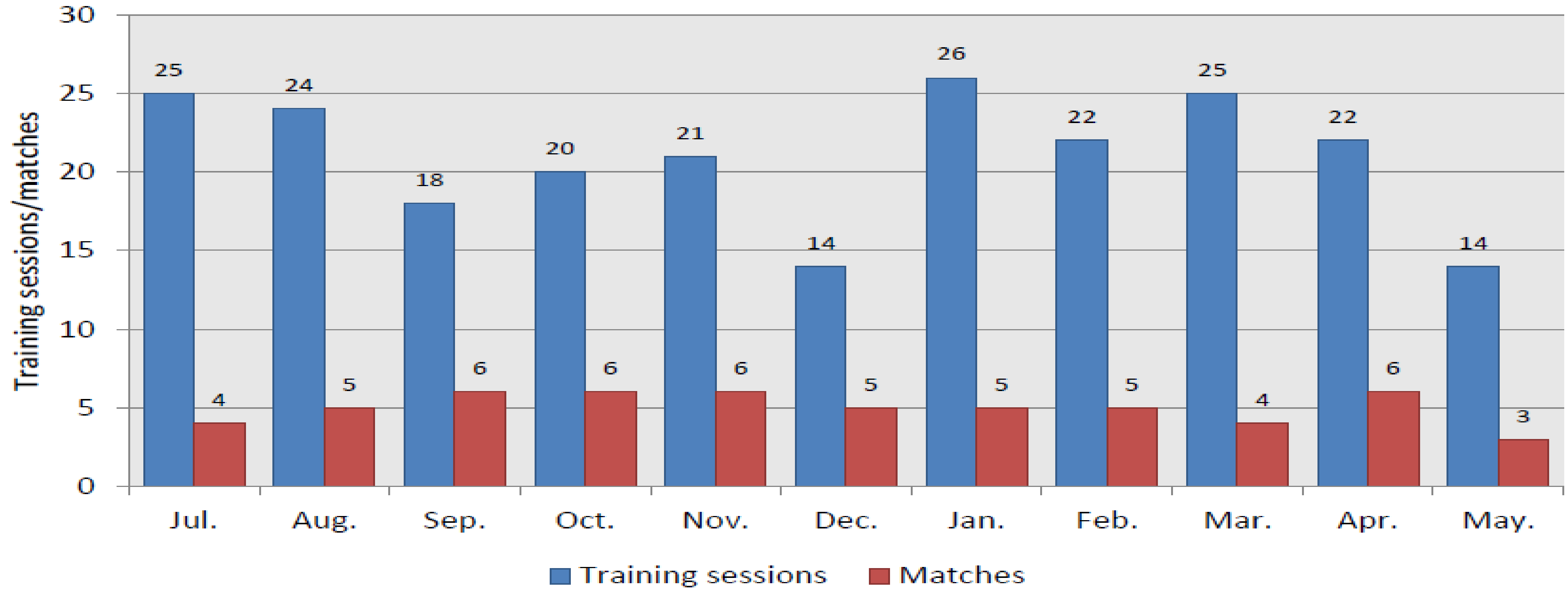
Figure 4. Number of **Team X**'s training sessions (blue bars) and matches (red bars) throughout the season



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- 2016/17 season reported 795 injuries
- 339 training injuries (43%)
- 456 match injuries (57%)
- 142 severe injuries (18%)
- 359 muscle injuries (45%)
- 132 ligament injuries (17%).

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Table 1. Injury locations

	Training				Match play				Total			
	Team X		Other teams		Team X		Other teams		Team X		Other teams	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Head/face	0	0.0	1	0.3	0	0.0	16	3.7	0	0.0	17	2.3
Neck/cervical spine	0	0.0	2	0.6	0	0.0	0	0.0	0	0.0	2	0.3
Shoulder/clavicle	1	4.8	0	0.0	0	0.0	8	1.9	1	2.2	8	1.1
Wrist	0	0.0	0	0.0	0	0.0	2	0.5	0	0.0	2	0.3
Hand/finger/thumb	0	0.0	1	0.3	0	0.0	4	0.9	0	0.0	5	0.7
Sternum/ribs/upper back	0	0.0	3	0.9	0	0.0	6	1.4	0	0.0	9	1.2
Abdomen	0	0.0	5	1.6	0	0.0	3	0.7	0	0.0	8	1.1
Lower back/pelvis/sacrum	0	0.0	19	6.0	2	8.3	11	2.6	2	4.4	30	4.0
Hip/groin	6	28.6	64	20.1	3	12.5	56	13.1	9	20.0	120	16.1
Thigh	4	19.0	88	27.7	8	33.3	124	28.9	12	26.7	212	28.4
Knee	2	9.5	45	14.2	3	12.5	74	17.2	5	11.1	119	15.9
Lower leg/Achilles tendon	4	19.0	44	13.8	2	8.3	36	8.4	6	13.3	80	10.7
Ankle	4	19.0	33	10.4	6	25.0	66	15.4	10	22.2	99	13.3
Foot/toe	0	0.0	13	4.1	0	0.0	23	5.4	0	0.0	36	4.8
Total	**21**	**100.0**	**318**	**100.0**	**24**	**100.0**	**429**	**100.0**	**45**	**100.0**	**747**	**100.0**

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Table 2. Injury types

	Training				Match play				Total			
	Team X		Other teams		Team X		Other teams		Team X		Other teams	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Fracture	1	7.7	7	2.1	0	0.0	22	5.1	1	2.9	29	3.8
Other bone injury	0	0.0	3	0.9	0	0.0	0	0.0	0	0.0	3	0.4
Dislocation/subluxation	0	0.0	0	0.0	1	4.5	6	1.4	1	2.9	6	0.8
Sprain/ligament injury	3	23.1	35	10.7	5	22.7	89	20.6	8	22.9	124	16.4
Meniscus/cartilage	0	0.0	10	3.1	1	4.5	12	2.8	1	2.9	22	2.9
Muscle rupture/strain/cramps	5	38.5	169	51.8	12	54.5	173	40.1	17	48.6	342	45.2
Tendon injury/rupture/tendinosis	3	23.1	32	9.8	1	4.5	20	4.6	4	11.4	52	6.9
Haematoma/contusion/bruise	0	0.0	29	8.9	2	9.1	63	14.6	2	5.7	92	12.2
Laceration	0	0.0	1	0.3	0	0.0	6	1.4	0	0.0	7	0.9
Concussion	0	0.0	1	0.3	0	0.0	11	2.6	0	0.0	12	1.6
Nerve injury	0	0.0	1	0.3	0	0.0	1	0.2	0	0.0	2	0.3
Synovitis/effusion	0	0.0	7	2.1	0	0.0	9	2.1	0	0.0	16	2.1
Overuse not specified	0	0.0	26	8.0	0	0.0	14	3.2	0	0.0	40	5.3
Other injury	1	7.7	5	1.5	0	0.0	5	1.2	1	2.9	10	1.3
Total	**13**	**100.0**	**326**	**100.0**	**22**	**100.0**	**431**	**100.0**	**35**	**100.0**	**757**	**100.0**

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Table 3. Injury mechanism

	Training				Match play				Total			
	Team X		Other teams		Team X		Other teams		Team X		Other teams	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Running/sprinting	7	25.9	55	19.4	3	20.0	80	19.7	10	23.8	135	19.5
Twisting/turning	3	11.1	21	7.4	0	0.0	32	7.9	3	7.1	53	7.7
Shooting	1	3.7	36	12.7	0	0.0	14	3.4	1	2.4	50	7.2
Passing/crossing	3	11.1	13	4.6	0	0.0	15	3.7	3	7.1	28	4.1
Dribbling	1	3.7	3	1.1	0	0.0	8	2.0	1	2.4	11	1.6
Jumping/landing	0	0.0	8	2.8	0	0.0	14	3.4	0	0.0	22	3.2
Falling/diving	1	3.7	6	2.1	0	0.0	8	2.0	1	2.4	14	2.0
Stretching	2	7.4	11	3.9	1	6.7	13	3.2	3	7.1	24	3.5
Sliding	0	0.0	5	1.8	0	0.0	13	3.2	0	0.0	18	2.6
Overuse	8	29.6	67	23.6	2	13.3	38	9.3	10	23.8	105	15.2
Hit by ball	1	3.7	4	1.4	0	0.0	5	1.2	1	2.4	9	1.3
Collision	0	0.0	8	2.8	0	0.0	26	6.4	0	0.0	34	4.9
Heading	0	0.0	0	0.0	0	0.0	1	0.2	0	0.0	1	0.1
Tackled	0	0.0	18	6.3	5	33.3	66	16.2	5	11.9	84	12.2
Tackling	0	0.0	4	1.4	0	0.0	15	3.7	0	0.0	19	2.7
Kicked	0	0.0	14	4.9	3	20.0	39	9.6	3	7.1	53	7.7
Blocked	0	0.0	1	0.4	1	6.7	5	1.2	1	2.4	6	0.9
Use of arm/elbow	0	0.0	0	0.0	0	0.0	4	1.0	0	0.0	4	0.6
Other acute	0	0.0	10	3.5	0	0.0	11	2.7	0	0.0	21	3.0
Total	**27**	**100.0**	**284**	**100.0**	**15**	**100.0**	**407**	**100.0**	**42**	**100.**	**691**	**100.0**

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Table 4. Overuse/trauma distribution

	Training				Match play				Total			
	Team X		**Other teams**		**Team X**		**Other teams**		**Team X**		**Other teams**	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Overuse	7	26.9	146	46.8	4	13.8	121	28.5	11	20.0	267	36.3
Trauma	19	73.1	166	53.2	25	86.2	303	71.5	44	80.0	469	63.7
Total	**26**	**100.0**	**312**	**100.0**	**29**	**100.0**	**424**	**100.0**	**55**	**100.0**	**736**	**100.0**

Table 5. Contact/non-contact distribution

	Training				Match play				Total			
	Team X		**Other teams**		**Team X**		**Other teams**		**Team X**		**Other teams**	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Non-contact	14	82.4	271	84.4	20	60.6	247	58.8	34	68.0	518	69.9
Contact player	2	11.8	44	13.7	12	36.4	164	39.0	14	28.0	208	28.1
Contact object	1	5.9	6	1.9	1	3.0	9	2.1	2	4.0	15	2.0
Total	**17**	**100.0**	**321**	**100.0**	**33**	**100.0**	**420**	**100.0**	**50**	**100.0**	**741**	**100.0**

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Table 6. Injury severity

	Training				Match play				Total			
	Team X		Other teams		Team X		Other teams		Team X		Other teams	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Slight [0 days]	0	0.0	4	1.2	0	0.0	1	0.2	0	0.0	5	0.7
Minimal [1–3 days]	3	30.0	54	16.4	1	4.8	41	9.4	4	12.9	95	12.4
Mild [4–7 days]	0	0.0	90	27.4	4	19.0	93	21.4	4	12.9	183	24.0
Moderate [8–28	6	60.0	135	41.0	8	38.1	213	49.0	14	45.2	348	45.5
Severe [>28 days]	1	10.0	46	14.0	8	38.1	87	20.0	9	29.0	133	17.4
Total	**10**	**100.0**	**329**	**100.0**	**21**	**100.0**	**435**	**100.0**	**31**	**100.0**	**764**	**100.0**

Table 7. Re-injury rate

	Training				Match play				Total			
	Team X		Other teams		Team X		Other teams		Team X		Other teams	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
No re-injury	25	83.3	282	91.3	17	94.4	407	92.9	42	87.5	689	92.2
Re-injury	5	16.7	26	8.4	1	5.6	28	6.4	6	12.5	54	7.2
Unknown	0	0.0	1	0.3	0	0.0	3	0.7	0	0.0	4	0.5
Total	**30**	**100.0**	**309**	**100.0**	**18**	**100.0**	**438**	**100.0**	**48**	**100.0**	**747**	**100.0**

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Table 8. Monthly distribution of injuries

	Training				Match play				Total			
	Team X		Other teams		Team X		Other teams		Team X		Other teams	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
July	0	0.0	39	11.8	0	0.0	27	6.2	0	0.0	66	8.6
August	0	0.0	27	8.2	0	0.0	31	7.1	0	0.0	58	7.6
September	1	11.1	34	10.3	3	13.6	48	11.1	4	12.9	82	10.7
October	2	22.2	36	10.9	3	13.6	53	12.2	5	16.1	89	11.6
November	0	0.0	30	9.1	5	22.7	49	11.3	5	16.1	79	10.3
December	0	0.0	23	7.0	1	4.5	36	8.3	1	3.2	59	7.7
January	2	22.2	37	11.2	0	0.0	44	10.1	2	6.5	81	10.6
February	1	11.1	24	7.3	3	13.6	29	6.7	4	12.9	53	6.9
March	1	11.1	28	8.5	4	18.2	45	10.4	5	16.1	73	9.6
April	2	22.2	28	8.5	1	4.5	48	11.1	3	9.7	76	9.9
May	0	0.0	24	7.3	2	9.1	24	5.5	2	6.5	48	6.3
June	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total	**9**	**100.0**	**330**	**100.0**	**22**	**100.0**	**434**	**100.0**	**31**	**100.0**	**764**	**100.0**

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Table 11. Muscle injury diagnoses

Diagnosis description	Team X		Other teams	
	No.	%	No.	%
[TMXX] Thigh muscle strain/spasm/trigger points	1	16.7	5	1.5
[TMHX] Hamstring strain	1	16.7	17	5.0
[TMQS] Rectus femoris strain	1	16.7	23	6.8
[TMQV] Other quadricep strain	1	16.7	4	1.2
[TMYA] Adductor trigger points	1	16.7	18	5.3
[QMXX] Lower leg muscle Injury	1	16.7	1	0.3
Total	**6**	**100.0**	**338**	**100.0**

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Table 12. Mechanism of muscle injuries

	Total			
	Team X		Other teams	
	No.	%	No.	%
Running/sprinting	4	18.2	123	38.8
Twisting/turning	2	9.1	20	6.3
Shooting	1	4.5	40	12.6
Passing/crossing	3	13.6	18	5.7
Dribbling	0	0.0	6	1.9
Jumping/landing	1	4.5	3	0.9
Falling/diving	0	0.0	2	0.6
Stretching	2	9.1	22	6.9
Sliding	0	0.0	10	3.2
Overuse	8	36.4	50	15.8
Collision	0	0.0	5	1.6
Tackled	0	0.0	2	0.6
Tackling	0	0.0	4	1.3
Kicked	1	4.5	0	0.0
Blocked	0	0.0	1	0.3
Other acute mechanism	0	0.0	11	3.5
Total	**22**	**100.0**	**317**	**100.0**

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Table 13. Contact/non-contact muscle injuries

	Total			
	Team X		**Other teams**	
	No.	**%**	**No.**	**%**
Non-contact	1	33.3	46	35.7
Contact player	2	66.7	76	58.9
Contact object	0	0.0	7	5.4
N/A	0	0.0	0	0.0
Total	**3**	**100.0**	**129**	**100.0**

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Table 14. Severity of muscle injuries

	Total			
	Team X		Other teams	
	No.	%	No.	%
Slight [0 days]	0	0.0	2	0.6
Minimal [1–3 days]	2	18.2	32	9.2
Mild [4–7 days]	1	9.1	82	23.6
Moderate [8–28 days]	8	72.7	200	57.5
Severe [>28 days]	0	0.0	32	9.2
Total	**11**	**100.0**	**348**	**100.0**

Table 15. Re-injury rate for muscle injuries

	Total			
	Team X		Other teams	
	No.	%	No.	%
No re-injury	10	100.0	332	92.5
Re-injury	0	0.0	27	7.5
Total	**10**	**100.0**	**359**	**100.0**

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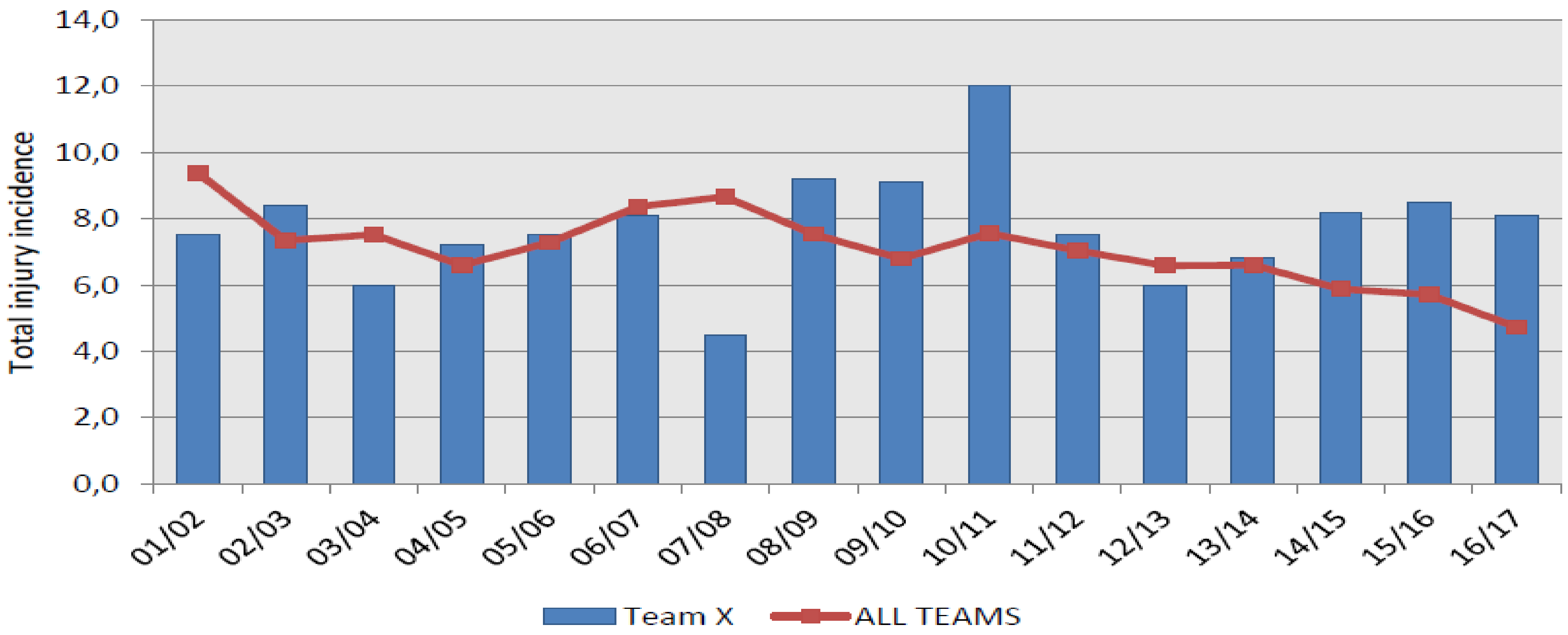
Table 16. Monthly distribution of muscle injuries

	Total			
	Team X		Other teams	
	No.	%	No.	%
July	7	31.8	16	4.7
August	1	4.5	29	8.6
September	4	18.2	34	10.1
October	0	0.0	40	11.9
November	3	13.6	30	8.9
December	1	4.5	29	8.6
January	0	0.0	35	10.4
February	1	4.5	30	8.9
March	2	9.1	37	11.0
April	3	13.6	32	9.5
May	0	0.0	25	7.4
June	0	0.0	0	0.0
Total	**22**	**100.0**	**337**	**100.0**

UEFA Elite Club Injury Study Report 2016/17

Figure 30. Total injury rate



UEFA Elite Club Injury Study Report 2016/17

UEFA Elite Club Injury Study Report 2015/16

העסקה ושכר של צוות רפואי בספורט

Methods of appointment and qualifications of club doctors and physiotherapists in English professional football: some problems and issues

I Waddington, M Roderick and R Naik

Br J Sports Med 2001; (From 1997-1999)

- Semi structured interviews of between 30 minutes and one hour with 12 club doctors and 10 club physiotherapists.
- A total of 19 current and eight former players were also interviewed about their experiences of injury and rehabilitation.
- Interviewees were given a guarantee that neither they nor their clubs would be identified.
- Of the 12 doctors interviewed, 7 were at Premier League, 2 in the First Division, 2 in Second Division, and 1 at Third Division.
- In addition to the interviews, a postal questionnaire was sent to 90 club doctors who were not interviewed. 58 questionnaires were returned.
- Replies were received from 13 Premier League doctors, 13 First Division, 15 Second Division, and 16 at Third Division.
- Of the physiotherapists who were interviewed, 3 work in Premier League, 2 in the First Division, 2 in Second Division, and 2 in Third Division clubs.

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פיZיו

- The primary employment of most club doctors is in general practice; of the 56 doctors 42 indicated that general practice is their primary employment.
- There are substantial variations in the income that doctors receive for their services. Doctors in the higher divisions are normally paid, although the pay is modest.
- Doctors at lower division clubs may not receive any payment; the doctor of a Third Division club explained that he actually subsidized the club by providing some medicines and items of equipment from his own general practice surgery.
- It might also be noted that an important part of the job satisfaction for many club doctors is associated with the fact that they are not just football fans but, in many cases, fans of the particular club for which they work; indeed, this is one of the reasons why most are prepared to work for such modest rates of pay.

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- Most doctors (35 out of 55) obtained their positions through personal contact with the previous club doctor; most often, the previous club doctor had been the senior partner in the general practice in which they worked and, when he retired, the post was passed on to a junior partner.
- Several club doctors inherited the post from a family member, or obtained the post as a result of personal friendship with the club chairman or a club director or someone else connected with the club.
- Of the 58 club doctors who returned the questionnaire, only half (29) had been formally interviewed. Only 3 were interviewed by a panel that included a doctor, in each case this being the previous club doctor.
- Those who were interviewed were typically interviewed by the manager, chairman, director, or club secretary. Not surprisingly, the interview did not and could not examine the applicant's clinical knowledge
- Of the 58 doctors who completed the questionnaire, only 8 had ever worked in a sport other than football and only 2 had ever worked at another football club.

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- Physiotherapist jobs is rarely published and many appointments are secured on the basis of personal contacts.
- It is disturbing to realized that the person who looked after the pitch was interviewed, while the person who treated the players' injuries was not
- 27 were licensed physiotherapists, while 26 were not. the most common qualification held by non-licensed physiotherapists being the FA diploma (held by 23 of the 26 non-chartered physiotherapists)
- Overall, in half of the professional football clubs in England, the day to day management of injuries is in the hands of people who are not qualified to work as physiotherapists within the NHS. This raises serious questions about the quality of care.
- When the club doctor may not come in regularly during the week, also the club physiotherapist as, in effect, primary care practitioners to whom the players bring problems relating not only to injury but also to illness. In such situations, the very limited knowledge that FA trained physiotherapists have about more general health matters is a cause for concern.

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- Most of the physiotherapists who hold the FA diploma are ex-players, and many have spent the whole of their working lives within the world of professional football.
- One non-licensed physiotherapist argued that licensed physiotherapists “have never played the game . . . they don’t know what it’s like, they don’t know what the players are going through . . . I feel that I have a little advantage over the licensed people in as much as I have played the game”. However, whatever advantages the ex-player with an FA diploma may have over his counterpart, these are more than offset by several important disadvantages in terms of the quality of care that he is likely to be able to offer.
- But there is a related problem with those FA trained physiotherapists; playing with pain, or when injured, is a central part of the culture of professional football, and managers look for players who have a “good attitude”, and one way to show that is by being prepared to play when injured.
- If the risks of playing while injured, or with pain killing injections, are fully explained to players and if, after being given this information, they choose to play, then this does not of itself raise any ethical problems. However, different problems arise when coaches and managers insist on becoming involved in the treatment process

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In the light of our findings we recommend the following.

- All vacancies for club doctors and physiotherapists should be publicly advertised in appropriate professional journals.
- Applicants provided a clear written job description and a personnel specification listing essential and desirable candidate attributes.
- All candidates should be formally interviewed.
- Possession of a specialist qualification in sports medicine should be specified as a desirable attribute of candidates for the post of club doctor
- At least one independent medical practitioner—that is, one having no connection with the club—with expertise in sports medicine should be involved in the selection and interviewing of candidates for the post of club doctor.
- Qualification as a physiotherapist should be specified as an essential requirement for all newly appointed club physiotherapists.
- Club doctors should be fully involved in the short listing and interviewing of candidates for the post of physiotherapist.
- Physiotherapists with a lower qualification—for example, the FA diploma—could be appointed as assistant physiotherapists but should only be allowed to work under the direction of a licensed physiotherapist.

How football's richest clubs fail to pay staff a real living wage

Article, The Conversation , March 31, 2017

Tony Dobbins.

פיZין

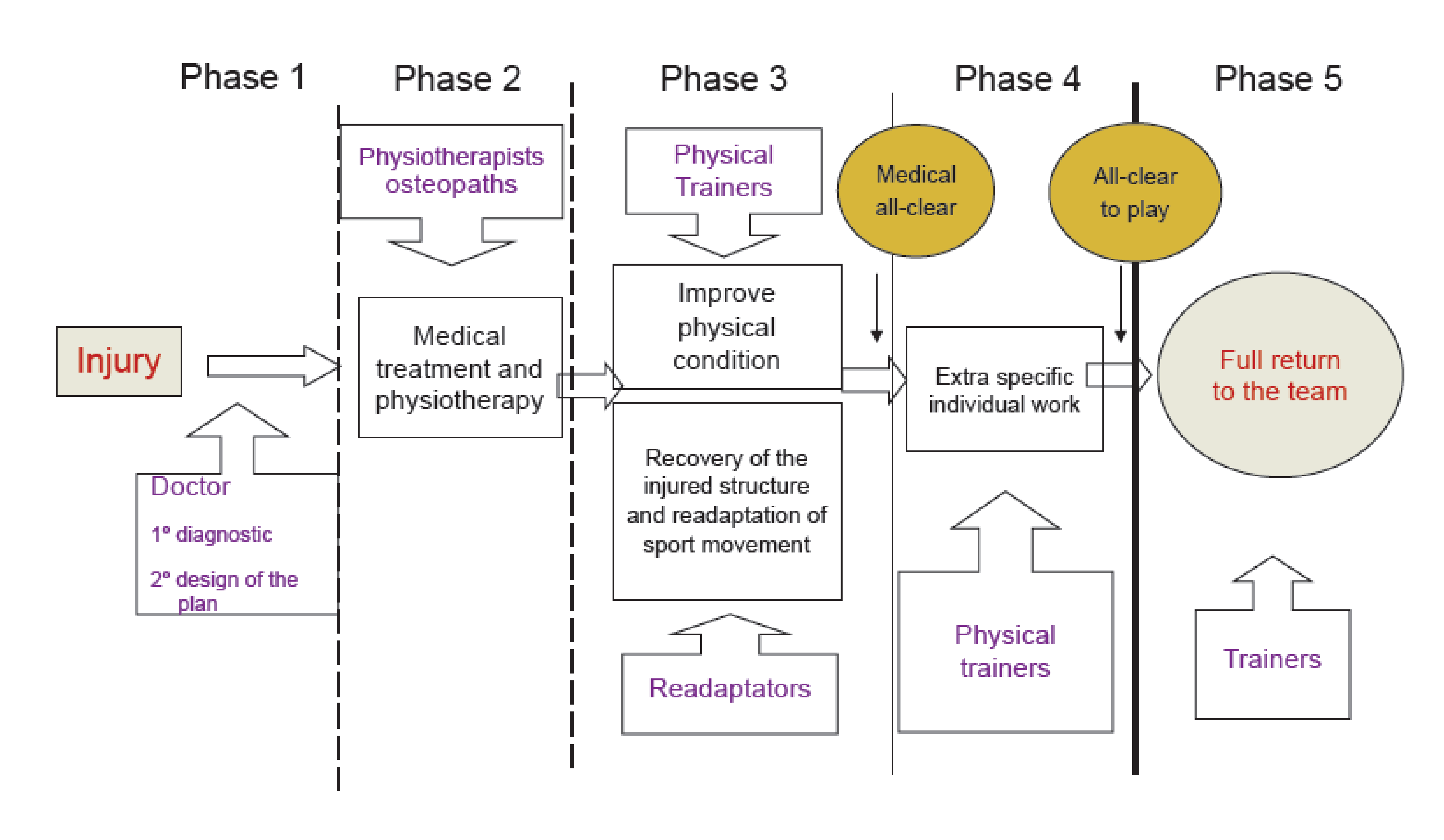
באנגליה רק אברטון וצלסי עובדים לפי שיטה שמשלמת שכר הוגן ומשלמים ישירות ולא דרך חברות כוח אדם (Living Wage Foundation).

השיטה היא לא חובה ומשלמת יותר מהמשכורת מינימום. היא מחושבת לפי מה העובד ומשפחתו צריכים להרוויח ע"פ צרכיהם האמתיים (לדוגמא בלונדון זה £ 9.75 לשעה ובאזורים אחרים 8.45).

מתוך 92 הקבוצות באנגליה (ובסקוטלנד רק 3)משתמשים בשיטה זאת.

כששאלו את 20 הקבוצות בפרימרליג האם הם משלמים ככה; 7 מועדונים לא ענו או הגיבו באין תשובה...

שיקום ספורטאי : מאבחון ועד חזרה למשחק



Phase 1
Phase 2
Phase 3
Phase 4
Phase 5
Injury
Doctor
1° diagnostic
2° design of the plan
Physiotherapists osteopaths
Medical treatment and physiotherapy
Physical Trainers
Improve physical condition
Recovery of the injured structure and readaptation of sport movement
Readaptators
Medical all-clear
Extra specific individual work
Physical trainers
All-clear to play
Full return to the team
Trainers

שיקום ספורטאים

- אבחון וטיפול ראשוני
- אבחון שני (+הדמיות לפי הצורך)
- מנוחה
- שיקום התחלתי
- מעבר לשיקום תנועתי ופונקציונאלי
- שיקום ספציפי במגרש
- חזרה לאימונים ומשחקים

אבחון וטיפול ראשוני

- פציעה באימון לעומת משחק
- קרח ?
- הדרכה ל 24-48 שעות ראשונות

אבחון שני (+הדמיות לפי הצורך)

- 24-48 שעות לאחר הפציעה
- הדמיות
- המשך ו/או שינוי הטיפול הראשוני
- הערכת זמן חזרה
- תכנון פרוטוקול שיקומי

מנוחה

- מנוחה מוחלטת ?
- כמה זמן
- צרכי הקבוצה מול בריאות השחקן

שיקום התחלתי

- תנועתיות וטווחים
- חיזוקים
- הפחתת כאב
- הדרכה

מעבר לשיקום תנועתי ופונקציונאלי

פיZיו

- במקביל לחיזוקים
- תנועה כללית (סולם זריזות, משוכות, טרמפולינה וכו)
- תנועה ספציפית לספורט עם/בלי כדור (בעיטה/זריקה כנגד גומייה או על בוסו, כדרור/הובל כדור וכו)

שיקום ספציפי במגרש

- במקביל לחיזוקים
- תנועה כללית (סולם זריזות, משוכות, מעטפה ועוד)
- תנועה ספציפית לספורט
- הוספת כדור
- עבודה ספציפית לעמדה/סגנון של השחקן
- עבודה במקביל על כושר גופני

פיZיו

דוגמא לתרגיל בשיקום Hamstring אצל כדורגלן

דוגמא לתרגיל בשיקום Hamstring אצל כדורגלן

דוגמא לתרגיל בשיקום מפשעה אצל כדורגלן

דוגמא לתרגיל בשיקום קרסול אצל כדורגלן

חזרה לאימונים ומשחקים

- המשך חיזוקים (לפני או אחרי אימון?)
- השתלבות הדרגתית באימונים
- חבישות
- חזרה למשחק (מתי? לכמה זמן? תלוי ענף)
- המשך חיזוקים גם לאחר החזרה לפעילות מלאה