MEDICINE Matters

APRIL 2009 – No.17

IN THIS ISSUE

PUBLISHED BY UEFA'S FOOTBALL DEVELOPMENT DIVISION

PROMOTING

IMPRESSUM

EDITORIAL GROUP
Andy Roxburgh
Graham Turner

PRODUCTION
André Vieli
Dominique Maurer
Atema Communication SA, Gland, Switzerland
Printed by Artgraphic Cavin SA, Grandson, Switzerland

ADMINISTRATION
Frank Ludolph
Evelyn Ternes
UEFA Language Services

This issue of Medicine Matters features articles based on the injury studies which were carried out under the auspices of UEFA's Medical Committee during EURO 2008 and last season's UEFA Champions League. One of the nice things about the injury research project, which has now been active for seven years, is that it uses data from the immediate past as foundations on which future improvements can be built. This is a philosophy which I wholeheartedly endorse and which, I feel, can productively be applied to may other areas within our sport – and within our lives.

The past year undoubtedly gave us reasons to feel satisfied – but no reason to rest on laurels or become complacent. The testing of blood samples was successfully introduced to supplement doping control procedures at the finals of the European Football Championship, out-of-competition testing was stepped up, the medical facilities provided in Austria and Switzerland set new benchmarks and, of course, we could legitimately refer to the paradox that, in our sport, is applicable exclusively to dope-testing: negative results were positive.

Apart from the professional satisfactions, there were personal ones as well. Maybe not too personal though, because I think they are shared by many people in the UEFA family. For example, my dear friend and colleague Professor Jan Ekstrand, when he sent the articles for publication in this issue, asked whether his interpretations of the injury research data could occasionally be provocative. I had no doubts about replying that I didn't mind that at all. Whether I agree with his opinions or not, I fully agree with the principles of promoting debate and dialogue.

In our profession, they are all too often conspicuous by their absence. Being a team physician is, very frequently, a solitary vocation. Even when a club or national side can assemble a medical team, they usually operate in relative isola-

COVER
Chelsea's Ricardo Carvalho and Manchester United's Wayne Rooney challenge for the ball during the final of the 2007/08 UEFA Champions League. The matches of this competition were the subject of a medical study which features in this edition.
Photo: PA Archive/PA Photos

EDITORIAL

By Dr Michel D'Hooghe
Chairman, UEFA Medical Committee

DEBATE AND DIALOGUE

tion. That's why, when I was reading Professor Ekstrand's text, I underlined the importance of the feedback which forms part of the injury study project. A medical team may, at the end of the campaign, produce impeccable medical records related to their squad of players yet, at the same time, be prevented from drawing meaningful conclusions because they have no data from elsewhere to compare with.

This is why one of my satisfactions in 2008 was to have staged, at UEFA's headquarters last November, the first-ever UEFA Elite Club Medical Forum.

No matter how much people identify us with the fight against doping, UEFA's Medical Committee has never wanted to be seen as an administrative or theoretical instrument. On the contrary, the aim has always been to be as close as possible to what happens on the field of play. That is why we invited a group of team doctors from clubs who are or have been in the UEFA Champions League, and who have collaborated with our injury studies, to Nyon for practical discussions.

I hope they learned some things from us. But I can say with certainty that we learned a lot from them. These are the people who are in the front line of football medicine, the doctors who are, throughout the year and season after season, facing the problems of injuries, the prevention of doping and issues such the eternal tug-of-war between their medical ethical principles and the economic objectives of their team. It was an opportunity for those of us who work on the medical side at UEFA to express our admiration for their complex and polyvalent work.

It was also, quite simply, a priceless opportunity to get together. As I mentioned earlier, team physicians relish the chance to exchange information and experience. I used to experience this phenomenon on an annual basis during the 25-year period when we organised, in my home city of Bruges, the Brucosport congress which was very close to UEFA's heart, as well as mine. Apart from the 'high-profile performances' on stage, we also enjoyed the all-too-rare chance to meet and mix with our colleagues and, as we did in Nyon last November, to learn from each other.

That's why I have great expectations for the near future. Apart from the annual final tournaments in UEFA's age-limit competitions, this year offers us, in terms of our on-going injury studies, a 12-team final tournament of the European Women's Championship in Finland, which will give us a chance to correlate with the data gathered in England four years ago. And, in terms of bringing team doctors together for debate and dialogue, we can begin to warm-up for the fifth UEFA Medical Symposium, which will be staged in Sweden at the beginning of next year and which will provide another valuable meeting point for club and national team physicians. I am already looking forward to it.

THE EMERGENCY CARE OF PLAYERS


UEFA

Sadly, recent years have demonstrated that football, like many other sports, must be prepared to cope with worst case scenarios. Statistically, emergencies are rare. But strategy needs to be pegged to a 'one case is one case too many' philosophy. Alan Hodson, a member of UEFA's Medical Committee and, for many years, a prime mover on the medicine and exercise science front at The FA, explains how top-level English football has reacted to the need for adequate medical infrastructure.

In recent times across Europe there have been several significant injuries on the field of play that have required emergency care and the evacuation of the player to hospital. The main types of injuries requiring on-field emergency care are:

- Head injuries;
- Fractures;
- Injuries or suspected injuries to the spinal column.

Following a number of head injuries sustained during matches played in England's Premier League at the start of the 2007/08 season, The Football Association and the Premier League combined to conduct a review of emergency care procedures, practices, equipment and facilities at stadiums.

A specialised Emergency Care for Players steering group was formed, with the team including a neurologist, a neurological surgeon, a trauma surgeon, an orthopaedic surgeon, club doctors, consultants in accident and emergency, paramedics and an educationalist.


Empics Sport/PA Photos

In England, a study has been carried out into the procedure for emergency treatment.

The terms of reference of the Premier League Emergency Care steering group were to:

- Work with the Faculty of Pre-Hospital Care at the Royal College of Surgeons of Edinburgh to devise a new FA Advanced Resuscitation and Emergency Care (AREA) training course for professional club medical staff;
- Recommend actions and initiatives that should be taken to enhance the emergency care of players;
- Review The FA's AREA course content, programme and assessment on an annual basis;
- Receive, screen and make decisions on accreditation for prior learning applications for the new FA AREA course on the basis of other courses/qualifications offered at home or abroad;
- Act as a reference point for professional club medical staff;
- Conduct club advisory/inspection visits on behalf of the Premier League;
- Offer advice to the Premier League when emergency incidents occur (if required);
- Update Premier League club medical staff on the latest equipment, techniques and research via email links;
- Review Premier League regulations on the emergency care of players;
- Review, on an annual basis, the mandatory equipment and facilities that clubs are obliged to have on site;
- Offer advice and guidance on annual emergency care exercises to be organised by club medical staff;
- Offer advice and education to referees about the emergency care of players.

The steering group met on four occasions and recommendations were forwarded to the Premier League. This led to a number of Premier League initiatives and regulations being implemented during the 2007/08 season:

1. The club doctor and physiotherapist now have a seat on the team bench at matches (first and reserve team).
2. A fully equipped ambulance to be present at matches, exclusively for the use of players and officials.
3. Two fully-equipped paramedics to be present at matches.
4. Stretchers and trained stretcher-bearers to be on the touchline.
5. Clubs must purchase certain mandatory emergency care equipment.
6. Clubs must complete a standard emergency care information questionnaire.

In addition, doctors and physiotherapists who represent clubs at first and reserve team games were obliged to attend an FA AREA course before the start of the 2008/09 season, with course participants assessed theoretically and practically. The course, which has been accred-

Starke/Bongarts/Getty Images

It is recommended that a fully-equipped ambulance be on standby at the stadium.

ited by the Royal College of Surgeons' Faculty of Pre-Hospital Care, lasts two days and the club representatives are obliged to take part once every three years, with a one-day annual refresher course in between.

Day one of the AREA course deals with the following:

- Injury statistics and management principles
- On-field clinical examinations
- Practical demonstrations
- Airway and head injuries
- Basic life support
- Advanced life support
- Use of automatic external defibrillator
- Spinal and orthopaedics
- Practical skills teaching station
  - Spinal immobilisation
  - Basic life support
  - Advanced life support
  - Use of automatic external defibrillator
  - Airways
  - Orthopaedics

Day two is dedicated to the following:

- Casualty management teaching and practice – scenarios
- Examination
  - Multiple-choice theory exam
  - Practical exams

As regards general activities throughout the season, before each game the home club is responsible for providing the visiting team with information on the medical arrangements in place at the venue. A specific club questionnaire on emergency care for players was devised for this purpose and all the clubs' details can be consulted on the Premier League's emergency care website. The core information focuses on the following:

- Details for key club contact persons
- Facilities available
- First-aid equipment available
- Number and position of stretchers and stretcher-bearers in the stadium
- Number of fully equipped paramedics
- Location of the fully-equipped ambulance dedicated to players and officials
- A site plan of the stadium
- Details of the emergency stadium evacuation plan
- Emergency contact name and telephone number(s)
- Contact details and information regarding the nearest hospital with accident and emergency facilities

The mandatory items of medical equipment that must be provided by the home club at all Premier League and Premier Reserve League fixtures are:

- Lifeline Pro oxygen equipment (includes bag-valve-mask and non-rebreather masks)
- Entonox – frac pack/splints
- Insulation blankets
- Automated external defibrillator
- Suture equipment
- Cervical collars (various sizes)
- Spinal board
- Scoop stretcher
- Pocket mask
- IV giving sets, fluids and cannulae (various sizes)
- Nebuliser
- Portable suction
- Oropharyngeal airways – nasopharyngeal airways
- Adrenaline (epinephrine) 10mls, 1:10, 000
- Minijet – atropine 3mg minijet
- EpiPen (300mcg)
- Gloves
- Sharps bin
- Variety of syringes

The regulations and initiatives have been well received by club doctors, club personnel and the Professional Footballers' Association in England.

Special credit is given for the assistance offered by Dr Bryan English of Chelsea FC, Dr Mark Gillett (now of Chelsea FC), the Faculty of Pre-Hospital Care, the Royal College of Surgeons of Edinburgh (Drs Porter and Fairhurst), the foresight of Mike Foster, General Secretary of the Premier League, and, of course, the members of the steering group.

PA Wire/PA Photos

EURO 2008 INJURY STUDY

By Professor Jan Ekstrand


Sportsfile

As UEFA's injury research project was initiated in 2001, the finals of the 2008 European Football Championship in Austria and Switzerland represented a second opportunity to gather data at the event and to correlate them with the findings obtained at the 2004 finals in Portugal. Elsewhere in this edition of *Medicine Matters,* issues related to the 2007/08 UEFA Champions League campaign are discussed and, although the parameters of club and national team football differ substantially, it is interesting to juxtapose tendencies related to a season where a significant number of elite players are required to sustain optimal levels at a EURO which kicks off soon after the end of an intensive and demanding club season. Professor Jan Ekstrand, second vice-chairman of UEFA's Medical Committee and leader of the injury research project, offers an overview and interprets some of the data collected at EURO 2008.

All 16 teams that qualified for EURO 2008 participated in the study. Each squad comprised 23 players. Two players incurred serious injuries during the preparation period and were replaced. The 368 footballers who took part in the final tournament were followed from 7 to 29 June.

Data collection
Data collection followed the methodology previously validated and implemented at professional European club level and during previous European championships (at various age levels), enabling continuous monitoring of injury risks and injury trends over time. Data collection was performed using standardised forms. There was highly-appreciated cooperation by the team doctors who collected the data for the study:
Dr Ernst Schopp (Austria), Dr Zoran Bahtijarević (Croatia), Dr Petr Krejčí (Czech Republic), Dr Jean-Pierre Paclet (France), Dr Josef Schmitt (Germany), Dr Charalambos Christopoulos (Greece), Dr Andrea Ferretti (Italy), Dr Gert-Jan Goudswaard (Netherlands), Dr Jerzy Grzywocz (Poland), Dr Henrique Jones (Portugal), Dr Marin Pompiliu Popescu (Romania), Dr Andrey Grishanov and Arno Philips (Russia), Dr Jorge Candel (Spain), Dr Anders Valentin (Sweden), Dr Rudolf Roder (Switzerland) and Dr Cengiz Dinç (Turkey).

Study definitions
Injury was defined as any physical damage that occurred during football activities (scheduled matches or training sessions) and resulted in the player being unable to participate fully in future training sessions or matches.

Correlating the results from the tournament in Austria and Switzerland with the 2004 finals in Portugal, the following salient features emerged:

Injury risk slightly higher than in 2004
Forty-nine players (13%) suffered 56 injuries during the tournament. A total of 46 of the injuries occurred during matches (82%) and 10 during training (18%). During EURO 2004 in Portugal, 45 injuries occurred (39 in matches and 6 during training – 87% v 13%).


Getty Images

EURO 2008 was the subject of a thorough medical study.

The intensity of top-class footballers can sometimes put footballers at risk of injury.

The total risk of injury was 10.5/1,000 hours of exposure, which is slightly higher than the injury risk at EURO 2004 in Portugal (9.1) and also higher than the total injury risk in top-level club football in Europe (8.0).

Low risk of injuries in training
The mean risk was 2.6 injuries/1,000 hours of training. Previous studies on amateurs as well as professionals have shown that the risk of injury during training is approximately the same, regardless of the level of play (2-6 injuries/1,000 hours of training). The risk is lower at EURO finals, most probably reflecting the fact that training sessions at post-season tournaments often prioritise recovery and rehabilitation, with a consequently lower injury risk.

The injury risk at matches 16 times higher
The incidence of injury was approximately 16 times higher during match play (41.8 injuries/1,000 match hours) than during training (2.6 injuries/1,000 training hours).

It has previously been shown that the risk of injury during match play increases with the level of play (about 10-15 injuries/1,000 hours at amateur level, about 20 injuries/1,000 hours at low professional level and significantly above 25 injuries/1,000 hours at top professional level). The injury risk during EURO tournaments, where the competitive nature of almost all matches is especially intense, is higher than the risk during longer-term competitions where especially high levels of intensity are not usually sustained.

However, the risk of sustaining an injury during EURO matches has increased, reaching 42/1,000 hours in 2008 compared with 36/1,000 hours in 2004.

France's Frank Ribéry receives first aid on the field during the group match against Italy.

Similar injury risks in group and knockout phases
A repeat finding at previous European championships has been that the injury risk is higher during the group stage of the tournament than in the final knockout rounds. However, a mixed relationship was found at the 2008 tournament, where match injury incidences were lower in the final stages (37/1,000 hours) than in the group stage (44/1,000 hours), while the injury risk in training as well as the total injury risk was higher during the final phase. The reason for this inconsistency is unclear but may be due to players being tired during training sessions in the latter stages of the tournament. No difference was observed in injury rates between the eight teams that were eliminated after the group phase and the teams that progressed further.

Higher injury risk for younger players
Older players (30-38 years, n=104) had similar average match exposure (3.2 match hours) to young players (19-23 years, n=43). However, the match injury risk was very significantly higher for players under the age of 24 than for players aged 30 or over (65 v 24 injuries/1,000 match hours). The total injury risk was more than twice as high for younger players than older (13.6 v 5.9 injuries/1,000 hours of exposure).

Higher risk of severe injuries
For the majority of injuries (n=30; 54%), the injured player returned to full training and match play within one week. However, 13 injuries (23%) were moderate with absences of 1-4 weeks and another 13 injuries (23%) caused absences of more than 4 weeks (severe). The incidence of severe match injuries during EURO 2008 (9.5/1,000 match hours) was higher than during EURO 2004 (6.7/1,000 match hours).

The EURO injury study showed that the risk of injury was higher at the end of each half.

Injury patterns
The majority of injuries (86%) were to the lower extremities, the most frequent locations being the ankle (n=11, 20%), lower leg (n=10, 18%), thigh (n=8, 14%), knee (n=8, 14%), hip/groin (n=8, 14%) and head/face (n=5, 9%). During EURO 2004, the thigh was the most common injury location (22%), followed by the ankle (17%), lower leg (14%) and hip/groin (14%).

Sprains (ligament injury) were the most dominant injury type at EURO 2008 (n=16, 29%) and nine of these injuries were to the ankle and seven to the knee. The 15 muscle strain injuries mainly occurred in the thigh (n=6), calf (n=4) and groin (n=2).

Most injuries occurred at the end of each half
The injury risk increased with time elapsed in each half of the matches played. The majority of ligament injuries (59%) occurred during the first half of the match, becoming most frequent in the 30th to 45th minutes. The majority of muscle injuries occurred towards the end of the second half.

More head and knee injuries than in EURO 2004
In contrast to EURO 2004, where no head injuries were reported, five head injuries were seen at EURO 2008. Two of these injuries were fractures (one in combination with a concussion) and three were wounds derived from head-to-head contact with opponents. None of them were considered as foul-play injuries by the referees.

One player sustained a fracture when hit by an opponent's elbow and another player sustained concussion and a fracture in a head-to-face collision with a player from his own team.

During EURO 2004, few knee injuries were seen (only two severe injuries). During EURO 2008, however, six severe knee injuries occurred, three of which required surgery.

Post-tournament follow-up
Contact was maintained with the team doctors after the tournament to evaluate the total absences provoked by in-tournament injuries and other consequences for the players.

For the record, only 13 players suffered injuries entailing absences of over 4 weeks, compared with 15 at EURO 2004.

Fortunately, most of the players who left EURO 2008 with injuries were back at their club teams, fully rehabilitated, by the start of the new season.

Few re-injuries = high-quality medical support
Similarly to previous European Football Championships, there were few recurrent injuries. At European club level, recurrence rates of 13% have been documented, while only four re-injuries (7%) were observed at EURO 2008. This points to a high standard of medical support in the teams during the tournament and suggests that return-to-play decisions were successfully determined.

Few foul-play injuries = good refereeing
Of the 46 match injuries, 26 (57%) were due to player-to-player contact and 9 (35%) of these contact injuries were due to foul play (according to the referee). The rates of match injuries attributable to player-to-player contact and foul play were similar to the rates at EURO 2004 (59% contact injuries; 39% foul-play injuries). The low rates of contact injuries and foul-play injuries probably reflect a high level of respect for the rules, avoiding bad tackles and late challenges.

During EURO 2008, strikers were more at risk of injury, while goalkeepers were the least at risk.

Koepsel/Bongarts/Getty Images

Contact was maintained with the doctors after EURO 2008 to see if the injuries had any consequences.

According to the referees, nine of the match injuries that occurred in contact situations were due to foul play (seven fouls by opponents and two 'self-inflicted'). The consequences of the foul play were nine free kicks. This is a remarkably low figure and indicates that fair-play levels at the tournament were high. The only serious injury that occurred in a foul-play situation was to a player who committed the foul himself. This player was still absent from football three months after his own foul.

Higher injury risk to forwards
When match injuries were analysed with respect to playing position, forwards showed a higher and goalkeepers a lower risk of injury than defenders and midfielders (Table 1).

Playing position	Match hours	Match injuries	Incidence
Goalkeepers	98	1	10.2
Defenders	371	17	45.8
Midfielders	380	16	42.1
Forwards	206	12	58.2

Table 1. Match injury rates according to playing position

Abuse of non-steroid anti-inflammatory drugs (NSAIDs) by elite-level football players?
Local injection of glucocorticosteroids
During the five months or so preceding EURO 2008 (1 January-6 June), 16 of the 368 players participating in the EURO were granted a TUE for local injection of cortisone. One country had five applications for five different players, two countries had four applications, ten countries had one or two applications and three countries had no applications. During the in-competition phase (7-29 June), eight more applications for a local injection of cortisone were submitted for eight different players. Four of these applications came from one country.

Non-steroid anti-inflammatory drugs (NSAID)
During the tournament, 126 doping tests (urine and blood) were performed on 104 different players.

During the doping tests each player was asked if he had taken or been administered any medication during the three months preceding the doping control. A total of 42% of the tested players declared that they had taken (or were taking) NSAIDs.

These findings suggest that treatment of musculoskeletal problems with local corticosteroids is unusual and treatment with NSAIDs very common among top-level football players in Europe.

Possible common use of NSAIDs by top-level football players ought to be discussed in light of the recently described heart and kidney problems as side effects related to frequent use of NSAIDs.

Summary points
- Risk of injury was low in training and 16 times higher in matches.
- Injury risk during match play was higher and risk during training lower at EURO than in top-level club football in Europe.
- Injury incidences at EURO 2008 were higher than in 2004.
- More head and knee injuries were seen than at EURO 2004 but only one injury was caused by a high elbow.
- There was no difference in injury risk between group phase and final phase.
- Most injuries occurred towards the end of each half.
- The injury risk for younger players was twice as high as for older players.
- Forwards displayed higher and goalkeepers lower match injury rates than defenders and midfielders.
- There were only four recurrent injuries observed, reflecting high standards of medical support.
- The same low rate of injuries caused by player-to-player contact and foul play was observed in EURO 2008 as in EURO 2004.
- Many players use non-steroid anti-inflammatory drugs and possible side-effect risks need to be discussed.

Empics Sport/PA Photos

There were five cases of head injuries during EURO 2008.

TIGHTENING THE NET

The year of 2008 provided reassuring data on the doping control front – especially reassuring, in fact, bearing in mind that testing was conducted in greater depth without revealing higher levels of malpractice. In other words, there was cause for satisfaction – but not complacency – based on data which were made public in *uefadirect* at the end of the year.

The 2,027 doping controls conducted in UEFA's competitions for men and women produced only two positives: one for cannabis in the Under-19 category and the other for anabolic steroids at a game in the UEFA Cup. Of the samples, 1,380 were tested for EPO and 637 of the controls were conducted in out-of-competition situations. The 286 blood and urine samples collected at EURO 2008 (160 in pre-tournament out-of-competition tests) were not only tested for EPO but also for blood transfusion and human growth hormone irregularities. This type of screening was made possible with support from WADA, while IRMS analysis upgraded the detection of testosterone derivatives. During the 2007/08 UEFA Champions League, doping controls took place at 79 of the 125 matches played, with 232 of the 316 samples screened for EPO. A total of 477 samples were examined (466 for EPO) as a result of 48 out-of-competition tests and, during the current season, 235 players from 24 of the participating teams have participated in out-of-competition testing, which carried on through the winter break.

The figures are encouraging in that they transmit a clear image of a sport that is clean from the peak of the pyramid down to the broader base of UEFA's youth development competitions.

Since the beginning of 2009, significant operational changes have been implemented. The volume of urine samples has been increased from 75 to 90ml (60ml for the A sample and the remainder for the B sample) and a minimum specific gravity ratio has been introduced (1.005 with refractometer measurement or 1.010 for stick measurements). Failure to reach the s/g threshold will oblige the player to produce further samples.

The doping control officers get ready to carry out their duties at the end of the match.

UEFA may also exercise the right to have samples re-tested at any time during the eight years subsequent to its collection. This measure is a continuation of the IOC policy of retaining all samples from the 2008 Olympic Games for possible re-examination at any time up to 2016. Should UEFA decide to exercise this right, clubs and national associations will be notified in advance.

At the same time, sanctions have become more flexible and, when individual cases are being examined, it is clearly established in which areas the onus is on the player to provide proof that there was no fault or negligence. By the way, sanctions related to anti-doping rule violations are so specific and detailed that they have been removed from UEFA's Disciplinary Regulations and can now be found in the Anti-Doping Regulations.

Team doctors will need to bear in mind some relevant changes in therapeutic use exemption procedures, with the abbreviated TUE extinct since the beginning of the year and existing examples of the species to be phased out by the end of 2009. Local and topical uses of glucocorticosteroids are not subject to a TUE (though local administration of the former within the previous three months must be stated on the declaration of medication form if the player is tested) whereas systemic use of GCS is still subject to a standard TUE procedure. So is the treatment of asthma and its clinical variants via the inhalation of beta-2 agonists salbutamol, salmeterol, formoterol and terbutaline. The use of the standard TUE, in line with FIFA and WADA requirements, means stricter procedures.

The changes set out to narrow the mesh of the anti-doping net – and the aim of UEFA's Medical Committee and anti-doping team is to continue to tighten the net and to continue to transmit the image of a clean sport.

For further information or documents regarding UEFA's anti-doping programme, please click on the dedicated anti-doping section of uefa.com: http://www.uefa.com/uefa/keytopics/kind=1/index.html

The UEFA Medical Forum promotes the exchange of information at European level.

UEFA-pjwoods.ch

FORUM GETS OFF ON THE RIGHT FOOT

UEFA's ongoing injury study permits a certain level of contact with the team doctors who provide the core information. Every four years, a EURO offers opportunities for dialogue with national team doctors. And the UEFA Medical Symposium affords a highly welcome opportunity for a larger family to assemble and to exchange views, concerns and experience. But the people who have crucial day-to-day contact with top footballers are the club doctors who are in the front line of medical care for all but a few weeks of the year. To allow them to express views with a collective voice, UEFA staged the first-ever Elite Club Medical Forum in Nyon.

The participants were medical representatives from 17 top clubs based in Belgium, England, France, Germany, Italy, Portugal, Scotland, Spain and Ukraine. The agenda for the inaugural meeting was arguably less important than the mere fact of getting such a distinguished squad together and allowing them to discuss the issues which arise from a job which is becoming increasingly demanding and, as soon as there is a run of injuries, one which can acquire an unwelcomingly high media profile. As Dr Michel D'Hooghe (who, as chairman of UEFA's Medical Committee, led the forum) commented, "football medicine has become a team sport and club doctors have to be equipped to supervise all aspects of sports medicine."

A review of the injury study provided a platform for discussion on topics such as the prevention of hamstring injuries – one of the major sources of concern – and a scheme providing centralised analysis of MRIs. There was evidently debate on the incidence of injuries to players who travel and are subject to changes of regime while on national team duty. The agenda also featured a review of the educational sessions currently being implemented at UEFA's age-limit national team tournaments and an examination of how this sort of anti-doping education can best be conveyed at club level.

At an operational level, there was concern about the difficulty of making proper medical checks compatible with the urgencies of transfer deadlines. The view was also expressed that there is still room for improvement in terms of communicating relevant information to visiting teams who travel for matches in international competitions. There was even a suggestion that a local medical expert should be available in the tunnel/dressing-room area during games, with a view to helping the away team's doctor to deal with any medical problems. There were questions about how far this sort of upgrading could feasibly be incorporated into tournament regulations.

At the same time, broader issues were addressed, not least the status of the medical staff with regard to the coaching staff and board members. How close is the team doctor to the club's decision-making processes? How close does he or she need to be? In other words, there was a feeling that, ideally, there should be a degree of pan-European uniformity in terms of the club doctor's status – and this would only be possible against a background of intensified communication among the team doctors themselves. The forum obviously represented an important move along this road and one of the suggestions to emerge was that this could be further promoted by creating an exclusive medical section in UEFA's Coaches Circle extranet. The fact that these and other proposals are currently being evaluated is a clear indication that the UEFA Elite Club Medical Forum had got off on the right foot.

Getty Images

Training is not risk-free but the injury rate is low.

HOW IMPORTANT ARE COACHES AND MANAGERS IN INJURY PREVENTION?

A report based on a study of the 2007/08 UEFA Champions League season

By Professor Jan Ekstrand

In 2001, UEFA initiated a research project with the aim of compiling data which could be a useful weapon in the fight to reduce the number and severity of injuries and increase safety in football. Initially, the research focused on a number of top clubs in different areas of Europe and has since been expanded to embrace final tournaments of the European Football Championship and the various age-limit competitions organised under UEFA's auspices. The research project, led by Professor Jan Ekstrand, vice-chairman of the UEFA Medical Committee, along with his research group at Linköping University in Sweden, is the result of several years of work by the UEFA Medical Committee. The purposes of the ongoing injury study related to club football are as follows:

- To analyse injury risk and injury patterns in top-level football and to monitor variations in injury rates over time.
- To carry out specific studies on topics suggested by the medical teams of the participating clubs.
- To provide feedback to the clubs and to stimulate discussions on how to prevent injuries.

The cornerstone of the research project has been cooperation with the clubs. The participating teams provide information about injuries and exposure during match play and training sessions on a monthly basis. At the same time, the teams are also provided with feedback statistics every month. After each season, the clubs receive additional feedback in the form of overall season results from their own club and mean figures based on the results for the other clubs.

This report reflects the results from the full 2007/08 season (July 2007 to May 2008) with data from 14 participating clubs whose cooperation fully warrants acknowledgement and gratitude:

- **Belgium:** RSC Anderlecht, Club Brugge KV
- **England:** Arsenal FC, Chelsea FC, Manchester United FC
- **Germany:** Hamburger SV
- **Italy:** FC Internazionale Milano
- **Netherlands:** AFC Ajax, PSV Eindhoven
- **Portugal:** SL Benfica, FC Porto
- **Spain:** FC Barcelona, Real Madrid CF
- **Ukraine:** FC Shakhtar Donetsk

Workload: 1.4 matches per week

On average, teams had 213 training sessions (range 185-254) and 60 matches (range 51-69) over the season. Teams were therefore working

Barcelona and Manchester United took part in the 2007/08 UEFA Champions League injury study.

Getty Images

Chelsea's players stretch before their match against Fenerbahçe.

on a mean of 5 training sessions and 1.4 matches per week (range 1.2-1.6). This gives an average training to match ratio of 3.6 training sessions per match (range 3.0-4.3).

Expectation: 50 injuries per season, 10 severe
In total, 831 injuries occurred during the 2007/08 campaign, with 457 match injuries (55%) and 374 training injuries (45%).

As a mean, a club with a 25-player squad can expect approximately 50 injuries per season, causing absence from training and matches. Half of them would be minor, causing absences of less than a week. But about ten would be severe, causing absences in excess of one month.

Risks: no increase in seven years
The risk of sustaining an injury in training is low, at about 5/1,000 hours of exposure, compared to the risk at matches, which is six times higher (29-30). The injury risk has not increased during the seven-year study period.

Higher risk in northern Europe
Injury incidences were compared between teams from northern (England, Netherlands, Belgium, Germany, Ukraine) and southern Europe (Italy, Spain, Portugal) and this showed that teams from the north had a 40% higher total injury incidence compared with teams from the south. The finding was the same for the incidence of training injuries and match injury incidence.

Similarly, the incidence of severe injuries and joint/ligament sprains was greater in teams from northern Europe. The incidence of muscle/tendon strains, however, was similar across the two groups.

One reason for the differences observed could be that poor climate and surface conditions increase the risk of injury for teams in northern countries. However, variety in terms of training methods between northern and southern Europe could be another arguable explanation.

Most common injury: hamstring strains
Injuries to the hamstring muscles (sprinter's injury) are the most common injury at elite level, in all probability a reflection of the speed and velocity of modern top football. A team can expect about ten muscle injuries to the thigh each season, seven of them affecting the hamstring muscles (back of the thigh) and three affecting the quadriceps muscles (front of the thigh).

Why is it important to avoid injuries?
Injuries are correlated to performance. They weaken the team, disrupt playing tactics and create uncertainties related to team selection. Since performance is the bottom line for a team, avoidance of injuries should be of central interest to club managers and coaches.

Impact of major injuries
A study of the Swedish Super League during the 2001 and 2002 seasons found a negative correlation between the number of severe injuries (causing more than four weeks of absence) and the overall performance of the team. Another study, in Norway, also showed a negative correlation between performance and the number of absence days due to injuries.

As mentioned, the mean number of severe injuries in the UEFA Champions League (UCL) study is ten per season, each injury causing a mean absence of 75 days. The total absence due to these severe injuries in a team averages 750 days each season, representing about 10% of all exposure (meaning two players out of a squad of 25 constantly absent from training and matches due to these injuries).


Getty Images

The risk of injury was revealed to be lower for clubs in southern Europe, such as Benfica.


PA Archive/PA Photos

All injuries have been recorded and classified.

How can injuries be avoided?
The two fundamental questions to be answered are:
What factors influence the risk of injuries?
Who controls these factors?

With regard to the first question, there are many possible factors behind injuries. The most important are:

- Player factors (previous injuries, strength, coordination, flexibility, etc.)
- Load (season planning, amount of training, number of matches, recovery/rest, etc.)
- Club factors (club philosophy, playing tactics, consistency, medical service, etc.)

The commonly used method of preventing injuries is to approach player factors by providing the players with specific preventive training programmes such as development and maintenance of strength, coordination, flexibility, aerobic capacity, etc. This should be done, but it is not enough to reduce the total injury risk.

At elite level, the load on players and changes of load especially are very important factors as well. The amount of training, the number of matches, the overall planning for the whole season and the balance between load and recovery are key factors to consider.

Furthermore, this study shows that factors linked to club management should be taken into account. Such club factors are essential components of the injury equation. The selection of coach, players and medical teams are important, but also the consistency of staff. For example, a study conducted by Professor Mehmet Binnet (also a member of the UEFA Medical Committee) showed that, in Turkey, certain teams recorded a high number of injuries sustained during training which appeared to be linked to the incidence of coaching changes. A general tendency over the seven years for which UCL teams have been monitored is that teams with a high consistency of staff have fewer injuries than teams where the coaching and/or medical staff have undergone relatively frequent changes. This trend has become detectable because some teams in our study have had the same coach for all seven years, while others have had several different coaches.

The existence of specific club philosophies and playing tactics can also influence the injury risk.

To avoid the risk of excessively quick changes of load (excessive being those which the human body cannot tolerate), some clubs decide to run a prevention programme, irrespective of the identity of the coach. A club's or team's playing style can also influence the injury situation. Technical football based on one-touch passing decreases the risk of match injuries which normally occur in contact situations.

Who controls the injury factors?
The person or persons responsible for injury prevention need to control or influence all these different injury factors. The medical team normally has adequate control and influence over the player factors, being able

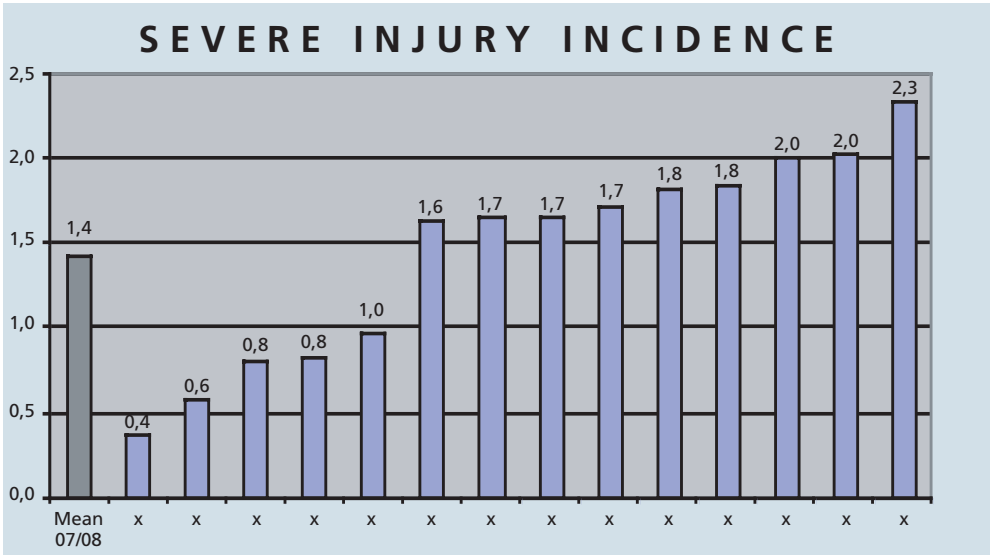


Fig.1. Incidence of severe injuries (causing absence more than a month) expressed as nr/1000 hours of exposure. Each bar represents one team.

Good physical preparation makes players more resistant to injury.

to provide the footballers with individual preventive training programmes, for example.

However, the loads applied to the players are normally determined by the coaching staff, while the club factors are governed by the manager and the board. The bottom line is that, at elite level, the coach and the club manager are key people in relation to injury prevention.

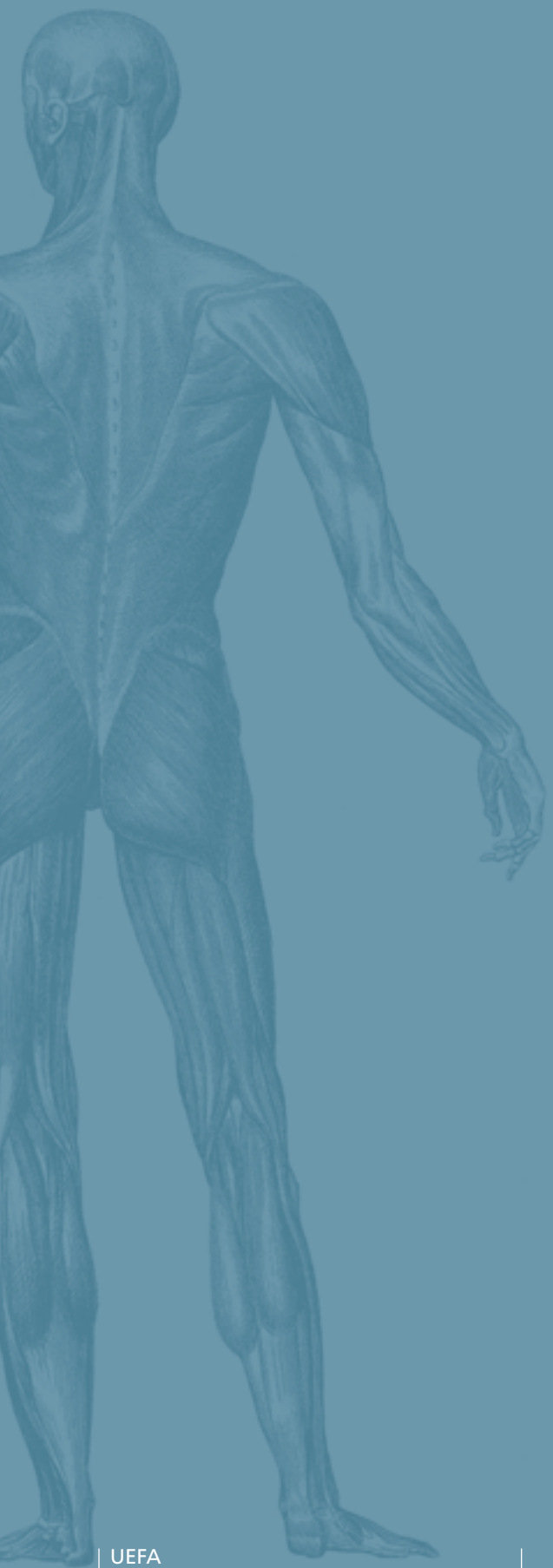
Feedback: how significant to the manager?
The participating clubs receive feedback every third month, as well as an extensive post-season report, which normally runs to 40 pages with overall statistics for the club as well as a mean for other clubs. An example of this is provided by Figure 1, showing the incidence of severe injuries (causing absence of more than a month) expressed as No./1,000 hours of exposure. Each bar represents one team.

At our regular visits to clubs, medical teams have asked for statistics which could have practical impact and which also provide information significant to coaches and managers. One such example is squad availability, which is fundamental because it builds the disposable potential of a team. In the report, clubs are provided with statistics for the percentage of players absent from training and matches due to injury as well as the number of training sessions/matches missed due to injury.

In search of excellence
At elite level, clubs normally maintain their own internal statistics. But a key feature of the UEFA study is that each club can assess and interpret their own statistics in the light of the mean figures based on the other clubs. The statistics clearly show the injury risk and the injury pattern in a club in relation to others. In general, the medical teams have high ambitions and therefore constantly seek information that could improve the injury situation at their club. During the 2007/08 season, the concept of "the search for excellence" was introduced in the study. At the end of the season, when the study group performs preliminary analyses, the two or three clubs that have the most favourable results for each variable (for example, severe injuries, muscle injuries, re-injuries, squad availability, etc.) are contacted and asked for their opinion about the reasons behind their favourable results. These opinions are then expressed (anonymously) in the post-season report, providing the reader with a checklist of items for possible improvement.

The bottom line
Coordination and communication between the club manager, coaching staff and medical staff is the key to injury prevention. Experience acquired during seven years of monitoring strongly suggests that clubs with high levels of close communication and cooperation between the management, coaching and medical teams are more successful in attaining lower levels of injury.

In the heat of the action, the risks that a player might expose an opponent to cannot necessarily be controlled.



UEFA
Route de Genève 46
CH-1260 Nyon
Switzerland
Phone +41 848 00 27 27
Fax +41 22 707 27 34
uefa.com

Union des associations
européennes de football