



MEDICINE

Matters

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IN THIS ISSUE

SWEDISH
SMÖRGÅSBORD

SCIENCE –
MAKING
A DIFFERENCE
IN MODERN
FOOTBALL?

MEDICAL
STAFF
AND REFEREES

THE FEMININE
FACTOR



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A FANTASTIC

IMPRESSUM

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This issue of Medicine Matters is being compiled in the aftermath of the fifth UEFA Medical Symposium, staged in Stockholm in February. After so many years in football medicine, it is unusual for me to be so enthusiastic about an event. But this one was very, very satisfying for two reasons.

Firstly, I was enthusiastic about the quality of the presentations and the fact that they addressed genuine problems in modern-day football medicine (as opposed to sports medicine), such as the prevention of sudden deaths, the study of injury patterns, the epidemiology of lesions and, I would say, a remarkable session led by the former top referee Markus Merk who, despite the difficulties endemic to the job, made it clear that he felt the referee's prime duty is – like ours – to protect the health and safety of the players. There was not a single presentation that failed to teach me something.

Secondly – and equally importantly – I was impressed by the fantastic collegiate atmosphere in Stockholm. There was an ambience of friend-

ship among colleagues who face the same challenges. Credit for this must go to the UEFA staff and the Swedish national association who created, around the symposium, an ambience which was perfect for listening, discussing and learning. I went home with an exceptionally good feeling and with a clear view of the issues which currently concern team doctors and, for that matter, the UEFA Medical Committee which, with five new signings in the line-up, made its first appearance of the 2009–11 campaign in Stockholm. It is always good to combine the input and fresh ideas from new colleagues with the accumulated wisdom of those who have been members of the committee for many years.

COVER

Philipp Lahm (Bayern Munich) up against Juan Vargas (Fiorentina) in the UEFA Champions League round of 16. The physical intensity of top-flight football necessitates first-rate medical care.

Photo: Pollex/Bongarts/Getty Images



EDITORIAL

BY DR MICHEL D'HOOGHE
Chairman, UEFA Medical Committee

COLLEGIATE ATMOSPHERE

It was also a good idea to mix doctors from 52 of UEFA's member associations with colleagues from the top clubs who are participating in our ongoing injury study and who, day in, day out, are working at the stadium or the training centre. It was an excellent blend and one which reinforced my view that, at elite level, the 'team doctor' doesn't really exist any more. The medical care of a squad of players has become so complex that a single person cannot be a 'master of all trades'. These days, we are talking about a 'medical team' which needs to communicate efficiently with the coaching and management staff and which, to be efficient in terms of enhancing performance, must be fully integrated into the daily life of the group.

Of the many issues raised during the symposium, several will be mentioned in the following pages. So I will not try to touch on all of them now. However, some of them are fundamental. I was informed, for example, that there are still five

European national associations that do not have a medical committee. I believe that it is a prime obligation to create one and to give it administrative, financial and political support. The creation of an anti-doping unit is also an absolute must.

In Sweden, we also looked at critical subjects which are of special interest to me – and, I believe, to my colleagues in football medicine. For instance, we could do worse than to look very carefully at our own roles and establish criteria which will help us to define exactly what qualifications are required by a doctor who sits on the bench during matches and who may, in addition to more routine occurrences, have to deal with challenging emergencies. Two of my colleagues on the Medical Committee, Mehmet Binnet and Mogens Kreutzfeldt, are to be credited for some excellent groundwork in this area. The evidence provided by their pilot study will, I am sure, be invaluable when it comes to deciding whether establishing stan-

dardised football-specific qualifications is a viable project or not.

I underline the term 'football-specific'. Stockholm was not 'just another medical congress'. It was, from start to finish, a football-specific event. Medical matters were always related directly to the game of football. It led to an invigorating variety. In a single day, topics ranged from an in-depth look at doping controls and their accuracy to various perspectives on how medicine can best serve the player and, bearing in mind that, in the women's game, Germany cannot seem to stop winning titles, it was appropriate that Dr Ulrich Schneider should address the specificities of women's football. UEFA's technical director, Andy Roxburgh, also contributed two motivational presentations on the 'team behind the team' and the future of football. Amidst all that, the discussion sessions emphasised that, even if we have come a long way in football medicine, there is still a lot of work to be done.

SWEDISH SMÖRGÅSBORD

For the average visitor to Sweden, the *smörgåsbord* is the typical buffet-style meal of various hot and cold dishes. It might not be stretching the imagination too far to claim that the participants at the recent medical symposium in Stockholm were offered football medicine's equivalent. The menu for the three-day event was certainly varied – so much so that maybe the best thing to do is pick up a fork or a handful of cocktail sticks, walk around the *smörgåsbord* table and take a few tasters.

only 45 of 1,728 tests last season falling short of the mark (2.6%), with 78% of those occurring during out-of-competition testing.

No fewer than 81% of therapeutic use exemptions were due to asthmatic conditions, with Nordic countries providing the lion's share of TUE (therapeutic use exemption) applications.

Anti-doping programme

This may not be the tastiest of dishes but it has become, over the years, the team doctors' staple diet. Dr Jacques Liénard, a long-standing member of UEFA's Medical Committee, reported that, over the last decade, the number of tests conducted under UEFA auspices has risen from 208 to 1,748 per season and that 15 years of in-competition controls have uncovered 29 positive cases in 10,419 tests – a figure of 0.28%. As Dr Michel D'Hooghe commented, "the costs of the testing programme are considerable, but the results demonstrate that there is no doping culture in football".



Dr Jacques Liénard, member of the Anti-Doping Panel, at the symposium in Stockholm

One codicil to the figures is that 9 of the 29 tested positive for cannabinoids and 2 for cocaine. Only 11 were attributable to anabolic agents, glucocorticosteroids, Beta-2 agonists or, in one case, diuretics susceptible to be used as masking agents.

In Stockholm, the focus was therefore on procedural details rather than 'doping culture'. The new requirements in terms of the specific gravity of samples have revealed that the digital refractometer is the best provider of reliable readings. The increase in the volume of samples from 75 to 90ml resulted in

Among the match-related issues was the draw conducted in the doping control room 15 minutes before the end of the game – the general opinion being that this should be attended by a team administrator, in preference to leaving the bench medically unguarded while the team doctor is inside.

Out-of-competition testing also produces some logistical hiccups, largely related to the implementation of the 'whereabouts' ruling. Let's imagine the two doping control officers ringing the bell at the gates of a training ground, only to be told that, on the



The equipment for a doping control



Former referee Markus Merk was on hand to present the referees' point of view.



previous evening, the coach had decided – bearing in mind the team's workload and the climatic conditions – to give the players a day off. On the one hand, there are understandable demands for the sanctions in such a case to be severe (in order to pre-empt abuse) while, on the other hand, how easily is the coach going to be persuaded not to change his plans on the remote chance of a doping control? In the current environment, it is therefore essential for clubs to fine-tune their communication procedures so that information can be passed as rapidly as possible to the doping control unit.

Referees and injured players

Markus Merk, the former elite referee who handled the 2003 UEFA Champions League and EURO 2004 finals, was in Stockholm to discuss injuries. "The players' most important capital is their health," he said, "and our priority is to protect and safeguard it."

He also made the interesting point that, in a way, the referee is the first to assess an injury. "Our duty involves assessing the injury risk attached to certain types of situation. The 1990 World Cup was the first event to highlight this by looking at the dangers of the tackle from behind. Awareness has risen steadily since then and there is increasing pressure on today's referee in terms of assessing fouls and injuries. We sometimes don't get as much help as we would like. For example, how many winning teams get 'injuries' near the end of the match? We want to allow play to flow, so we have to make instant assessments before we react to a fallen player."

The theme was picked up in a couple of the discussion groups. Apart from debate on how far the punishment should be influenced by the referee's assessment of the severity of the injury, there was a look at situations where

the referee frustrates the team doctor by putting the brakes on his desire to get onto the pitch. And there was debate about the best procedures for dealing with the treatment of blood injuries – another area of potential antagonism between referee and doctor. Markus had the last word: "If the doctor is called onto the pitch, it is to treat the player – not to argue with the referee about his decisions!"

The team behind the team

The importance of the team doctor and his relationship with the coach was one of the core themes in Stockholm. By extension, it generated exchanges of views on the increasing tendency for coaches to take members of the medical staff with them when they move to a different team. It is an understandable move for coaches and doctors who have

developed a relationship of mutual trust and respect. Looking at the other side of the coin, however, it can be bad news for a doctor who has been performing efficient work at a club, only to be ousted by the newcomer.

It raises questions about career pathways for the football doctor. Is it best to be attached to a club? Or is it more viable to become attached to a coach? Similarly, is the fitness coach to be considered a member of the coaching staff? Or part of the medical team?

Stress fractures

These are such a rare occurrence that clubs asked UEFA to collate data which could be used to draw comparisons and offer pointers towards best practice. The incidence in elite male football is 0.04 stress fractures per 1,000 hours



It is up to the referee to judge how serious an injury is and to act accordingly.



Prof. Mats Börjesson, member of the Swedish FA's medical committee

of exposure and, in a squad of 25, the medical team can be expected to encounter one every three seasons. Within the context of rarity, it's interesting to note that the risk of this type of injury is double during pre-season.

Stress fractures generally affect younger players, with 80% of injuries involving the under-26 age group. Fifth metatarsal fractures became topical when they affected elite players, and the team doctor can expect to deal with 44 muscle injuries for every metatarsal injury. A study based on 30 MT5 fractures revealed that, of the 18 operated players, the average absence was 87 days against 63 days for non-operated players. However, there were four cases of non-union in each group – which meant that the incidence is one in three if the non-surgical option is preferred.

Medical action plans

Cardiac arrests and sudden death are, unfortunately, topical issues. But, in Stockholm, the subject was put into a broader context. Prof. Mats Börjesson, cardiologist and member of the Swedish association's medical committee, started by reviewing the importance of reaction times to cases of cardiac arrest and then used a wider lens to focus on the stands as well as the pitch. He commented on a survey of 190 European clubs which, even though the study was completed in a single season, revealed widely differing degrees of arena safety.

He also invoked a series of observations made by one of the members of his audience: Luís Serratos, head of medical services at Real Madrid CF. Between them, they pinpointed potential difficulties in dealing with medical emergencies in the stadium: the need to navigate large crowds, often with no clear landmarks; the frequent existence of barriers

to access or even accreditation problems; the extremely limited possibility of exploiting motorised transport; the chance that the casualties might be multiple; potentially dangerous environmental conditions; and, even if all that is surmounted, there might be a patient who is reluctant to leave the stand and miss the action. Hence the need to draw up a coherent medical action plan and brief the appropriately trained personnel on how to implement it.

The flying doctor

How can you guarantee the team doctor a comfortable away trip? You eliminate the nagging worries that he or she carries on to the plane. Insurance, for example. How many policies include in the small print a clause about covering only the work performed on home territory? Is enough attention paid to this aspect when age-limit teams are on the road?

These were among the questions to emerge from the discussion groups, where a chorus of voices called for

greater interchanges of information aimed at allowing the visiting medical team to know, in advance, what facilities, equipment and hospital access they can expect when they arrive on-site, along with some key contact numbers and addresses.

What's more, there's more to a team than its players. Any doctor who has travelled to a medium- or long-duration tournament may be able to endorse the thesis that the other members of the delegation give as much work to the medical staff as the squad of players. Let's imagine that one of the administrators or security staff is taken ill. How much does the team doctor know about him or her? Hence the suggestion that, taking into full account all the confidentiality issues, some sort of medical passport accompanies every member of the travelling party so that the team doctor has foundations on which to build a response to illness or accident.

The UEFA team

Last but not least, Stockholm provided the scenario for the first meeting of the UEFA Medical Committee, which has been re-structured for the 2009-11 period. The committee's chairman, Dr Michel D'Hooghe, welcomed five new members: Dr Ian Beasley from England, Dr José Henrique da Costa Jones of Portugal, Dr Ioannis Economides of Greece, Dr Andrea Ferretti of Italy and Dr Juan Carlos Miralles of Andorra. For the record, there were 16 items on the agenda for their first get-together, covering many of the issues which made the symposium such an enriching event.

Some of the other dishes on the Stockholm *smörgåsbord* will undoubtedly appear in future issues...



The UEFA Medical Committee

SCIENCE – MAKING A DIFFERENCE IN MODERN FOOTBALL?

BY DR PAUL BALSOM, PERFORMANCE MANAGER AT THE SWEDISH FOOTBALL ASSOCIATION
AND HEAD OF SPORTS SCIENCE AT LEICESTER CITY FC, IN COLLABORATION WITH GARY PHILLIPS,
HEAD OF EXERCISE SCIENCE AT THE FOOTBALL ASSOCIATION

During the symposium in Stockholm, Paul Balsom twice appeared on stage alongside his former 'boss', Lars Lagerbäck, head coach of the Swedish national team for over a decade. The first time was to discuss the importance and the mechanisms of the 'team behind the team'. During the second, dedicated to 'the future of football', Paul, to his credit, had only a momentary expression of panic, when asked to summarise, in two minutes, the role of science in the future of top-level football. Afterwards, we offered Paul the possibility to be more expansive on the pages of *Medicine Matters*. This is the result...



Dr Paul Balsom

Today, professional football is a result-driven industry where winning is the science of being totally prepared. JW Orchard is among those to have suggested that "the importance of medical/sports science staff in overall team success may be currently undervalued."

Sports and medical science can create an understanding of training impact through the quantification of training loads and advise in the design of individualised multidisciplinary preparation programmes (physical, nutritional, psychological and technical), taking into consideration inter-individual variability and adaptation capacities. Planned and structured interventions can minimise the incidence of injury and illness,

increasing the availability of players for training and selection, and assist in establishing a player's "readiness to perform". Adopting a systematic "scientific" approach to performance issues has the capacity to inform and enhance decision-making, improve game understanding and positively affect risk management. Such insights have the potential to positively influence both the coaching process and resultant coaching behaviours.

The high-tempo of the modern game, in addition to an increase in the number of matches per season, is placing increasing physical and mental demands on the player. The speed of play and power exhibited by the player is greater than ever before. An English Premier League game was recently described as "an intense athletic experience". In the last ten years, statistics have shown that, at the highest level, players in all positions now record more overall and high-speed distance totals than ever before.

On average, 16 of the 2008/09 UEFA Champions League teams had 230 training sessions and 59 matches over the season. This equated to 23 training sessions and 5.8 matches per month with an average 4:1 training/match ratio. In 2007/08, Glasgow Rangers had a 68-game campaign lasting from 31 July to 24 May, with an average of



Glasgow Rangers (Kyle Lafferty, in blue, pictured here in the Scottish Cup Final against Jackie McNamara of Falkirk) have a packed programme.



Empics Sport

Sir Alex Ferguson and his assistant, Mike Phelan, have the support of an extensive medical team at Manchester United.

4.4 days between matches. If five international breaks totalling 59 days are excluded, the average was 3.8 days between matches. In the final month of the season, they played 9 games in 24 days. Add to this the confounding variation in kick-off times (from 12.00 to 20.45) and it was hypothesised that the amount of travel and number of international players in their squad impacted negatively on the club's ability to achieve domestic and European performance goals.

In response to these trends, the physical development of the modern footballer has needed to adapt. Higher levels of strength and power are required to be more 'explosive' and increased resilience to physical impact, increased aerobic and anaerobic power/capacities are necessary to produce intensive physical efforts more frequently, and a greater ability to produce, reduce and stabilise force in a coordinated manner is imperative to execute complex technical and locomotory actions at even higher speeds. Mike Forde, performance director at Chelsea FC, noted that the primary aim of the support staff is to make sure that the players are technically, tactically, mentally and physically prepared to cope with the demands of the modern game.

In the "team behind the team", medical and sports science practitioners are now well established at most professional football clubs. In a recent interview with UEFA's technical director, Andy Roxburgh, Sir Alex Ferguson was asked how, in the last 25 years, the ingredients for success had changed. "They have changed in terms of the backup

required, particularly in the area of sports science. Medical information, nutrition and preparation of players for top-level games have reached another level." Sir Alex's current backroom staff at Manchester United includes five physios, a doctor, an optometrist, a podiatrist, a strength coach, three fitness coaches, two video analysts and two assistant coaches.

In the UEFA injury study conducted by Prof. Jan Ekstrand and his team during the 2008/09 season, the clubs with the most favourable injury statistics were asked to give subjective opinions about why they had such good results. Several highlighted the importance of good collaboration between the medical/sports science team and the technical staff.

Other reasons highlighted: the role of assistant coaches in implementing a sound mentality of training, rigour in adhering to prevention/treatment protocols, players who have minor complaints or imperfect condition being allowed to rest, players monitored before games to identify fatigue, the role of the fitness coach in helping to prevent muscle strains, individualised programmes with focus on

nutrition, preparation and prevention, and important work by the psychologist to achieve mental balance.

To be effective, sports science and medical practitioners must be able to influence key decisions with respect to injury-reducing or performance-enhancing aspects such as training loads (duration and intensity), training content (e.g. gym-based versus on-field activities), recovery strategies, training/team selection based on needs (considering the requirement to rest players, etc). This is where the core values, beliefs and leadership qualities of the modern-day coach become critical.

It can be argued that the job description of the head coach of a modern professional football team can be compared to the CEO of a business, who commands overall responsibility for a company's operations. Sir Alex Ferguson puts his longevity down to developing management skills as much in common with running large companies as with work on the football pitch. He is no longer the one-man band who did everything. With a hundred players and staff under his control, he has become a master of overseeing a giant operation at a club valued at £1 billion.

The medical symposium in Stockholm





At Chelsea, Carlo Ancelotti has a scientific coordinator to help him to prepare his team.



"It would be impossible to work in the same way as I did in 1986," said Sir Alex. "It's too big a beast now to be hands-on with everything. Delegating is essential. I've learned at this level you need good people around you. I trust them and rely on them. There must be about 40 people who report to me now, quite apart from the players."

Ric Charlesworth, in his book *The Coach: Managing for Success*, writes "a manager must optimise athletes' capacities with a training, learning and counselling regime. His task is not simply a scientific one for the subtleties. Nuances of coaching are best learned by experience and wide consultation. The coach must absorb scientific data and apply them to the best effect using judgement and finesse."

Modern management demands the creation and integration of an athlete-focused/coach-centred holistic, multidisciplinary support team to implement a support infrastructure which allows for the systematic development of talent. The task is to develop and coordinate a programme of sports science and medical services for players – its objective to provide the right opportunities (facilities, training and competition) and support (sports medicine/science) for the right people (coaches/athletes) at the right time. When operating optimally, these support systems have the potential to underpin high performance, maximise the talent of the athlete and provide the coach with detailed information on individuals and the group in order to help them make more informed coaching decisions.

The growth in the number of medical and sports science practitioners in football has led to the emergence of a 'scientific coordinator' or 'performance manager'. A good relationship with the

head coach is essential for this role to be successful. All information gathered by the medical and sports science practitioners is filtered in order to provide the coach with an executive report. Bruno Demichelis, the scientific coordinator at Chelsea FC, describes his role as "assisting the coach in order to coordinate all the activities that support the team and individual players to help them reach their highest performance levels." He is one of three assistant managers, alongside Ray Wilkins and Paul Clement, a trend envisaged to become more prevalent in the forthcoming decade and crucial to ensure that programmes are devel-

oped on objective decision-making rather than subjective opinion. The performance decisions made by the support team need professional acceptance. Key decisions such as when the player can return, should NOT be tainted by the opinion of the coach.

Is sports and medical science having an impact on the game today? Undoubtedly yes. Greater resourcing, integration and application of the multidisciplinary approach will see the support team provide greater performance insights as technology develops and both the interpretation and communication of knowledge improves.



The presentation in Stockholm by Markus Merk highlighted the need for collaboration between referees and medical staff in terms of assessing and treating injuries. It offered the perfect cue for Medicine Matters to feature an abridged version of an article by Mike Healy, head of medical education at The Football Association, entitled:

MEDICAL STAFF AND REFEREES

Teaming up to care for the players

Referees have a duty of care to the players and pre-game confirmation that the playing conditions, the playing area, the ball and the player's equipment comply with the laws, and are not a potential source of injury, are testimony to this fact.

Pre-match briefing

Pre-match dialogue between referee and medical staff can be useful to review the protocol related to entering the field of play and to ensure that any injury is managed efficiently and does not unduly delay the restart of the game.

Stopping the game

Law 5 states that a referee should stop the match if, in his/her opinion, a player is seriously injured and ensure that the player is removed from the field of play. This is down to a referee's individual interpretation and ability to discriminate between serious and non-serious injury. This is not always easy.

The abiding principle in medical practice is 'first: do no harm'. Delaying treatment may cause harm. Referees have a duty to permit medical staff on the field as soon as a player's need

for medical assistance is recognised. Beware the player who is not moving following a challenge.

The cautioning of a player should not be the priority: the medical staff need to be called on first.

There must also be an understanding that observed life-threatening or limb-threatening injury warrants immediate access. There are cases where the medical profession would respectfully ask the referee not to be too pedantic about 'entering the field of play without permission'.

Serious injury

What should be considered a 'serious injury'? Evidently, players who are unconscious, have impaired breathing or are bleeding severely. These are 'time-critical' injuries which require immediate medical attention. Fractures, dislocations and head or spinal injuries similarly need prompt attention.

Severe bleeding, if not controlled quickly, will cause a player to go into shock and possibly lose consciousness. The bleeding may also conceal a potentially serious open fracture of the lower leg. Those managing an open wound must wear disposable protective gloves. Bloodstained clothing must be changed before a player is allowed to return to play and any blood on the field of play should be dispersed.

No head injury is trivial. Delayed injury response is potentially catastrophic. It is important that referees do not measure severity only by unconsciousness. A player may sustain a fractured skull or a spinal injury as a result of a blow to the head and yet remain conscious. But players who are rendered unconscious, no matter how short the timeframe, should not be allowed to return to the match. The use of smelling salts on unconscious players, which prompts a violent neck movement, may result in spinal trauma. Referees should also be aware that the use of chewing gum entails a risk of choking or airway compromise.

Manhandling players

There is widespread misunderstanding that an unconscious or concussed player may have 'swallowed his tongue' and must be immediately moved into the 'recovery position'



The referee checks to see how badly the player is injured.



Arsenal's goalkeeper Vito Mannone receives treatment on the field during a Premier League match against West Ham.



(on their side with their head back). Both misconceptions need to be dispelled. Players do not swallow their tongues; the relaxed tongue simply falls back and obstructs the airway. An obstructed airway can be managed by appropriate head positioning. Putting a player in the 'recovery position' does not mean a player will recover! What's more, moving an injured player may unwittingly cause them further harm.

Referees should avoid touching or moving an injured player and should discourage manhandling by teammates before being medically assessed, 'normal' breathing is confirmed, and potential spinal injury excluded (the risk could be permanent paralysis of the player). The referee has a duty to hasten the arrival of the medical staff responsible for the 'duty of care'.

On-field management of injured players

A referee should allow an injured player to be medically assessed before being removed from the field of play. To do this, referees need to be able to differentiate between the 'assessment' and 'treatment' of an injury.

The standard 'on-field' musculo-skeletal injury assessment process has the following stages: i) questioning the player, confirming responsiveness and the site of injury; ii) a look at the site of the injury; iii) gentle palpation around the area of the injury; iv) active movement of the injured/involved joint by the player; v) passive movement of the injured/involved joint by the physiotherapist; and vi) resistance tests of the muscles working over the injured/involved joint. The process is designed to assess the integrity of the bony structures, ligaments, muscles and tendons and to confirm the suit-

ability of a player to return to play. Treatment is only applied once this process is complete. Serious injuries clearly take longer to assess.

Referees sometimes fail to appreciate that a physiotherapist's use of hands does not necessarily constitute treatment. And – a point which also applies to some of the other issues raised – referee observers should not pre-judge a delay as poor referee control.

On-field treatment

Injury treatment is considered to be any intervention, e.g. ice application or strapping of a joint, which takes place after an injured player has been assessed. In most instances it is safe to have the player leave the field of play. However, in cases of serious injury, a player should not be moved until pre-hospital treatment has been administered and the injury/condition is stabilised.

The emergency management of a player who is unconscious, not breathing normally or has a suspected or obvious spinal injury or fracture, may take several minutes. Airway management, oxygen administration, immobilisation of the spine and fracture stabilisation all take time. This is where the medical staff are grateful for the referee's patience.

Removal of injured players

The referee is responsible for ensuring that an injured player is safely removed from the field of play, but the ultimate decision on removal and the method of removal is for medical staff alone. The referee should be ready to accept expert opinion rather than harass medical staff or insist that a player gets onto a stretcher. Players who are able to walk off the pitch

should be allowed to do so, as it is a part of a functional assessment process. Stretcher-bearers, typically called on at the same time as the medical staff, need to understand their supporting role. They must not intervene, man-handle players or attempt to put them on a stretcher until asked to do so by the medical staff.

Conclusion

There are many ways in which a referee can safeguard the health of the players and contribute to the quality of medical care for an injured player. The default position should be that Law 18, 'the law of common sense', should prevail and that referees, in partnership with the medical staff, should always act in the best interests of the players and ensure that prompt medical attention is permitted and administered.



If the injury looks serious, the referee allows the doctor onto the field.

THE FEMININE

Dr Magnus Forssblad, chairman of the Swedish FA's medical committee, addresses the symposium.

One of the presentations made during the symposium in Stockholm was by Dr Ulrich Schneider, medical consultant to the German national team which, as their rivals will not wish to be reminded, is THE dominant force in European women's football – a fact highlighted by their fifth successive victory at the Women's EURO 2009 finals staged in Finland. In medical terms, the fact that Germany has set benchmarks on the field of play is possibly less relevant than the figure of over 1 million registered female players, which provides a broad base for data gathering and analysis.



Even though Germany is one of the continent's frontrunners, organised women's football is still a relatively young discipline. The first women's league match in Germany, for instance, was not played until 1990 and, in a majority of other member associations, league football is an even

more recent phenomenon – a fact which may have a bearing on certain medical parameters. This means that growth rates are more spectacular than in the men's game. In Germany, the audience in Stockholm was told, women's football experienced a growth of 21.27% between 2000 and

2008, whereas the growth rate in the masculine game was 2.45%. This sort of statistic, even though the figures vary considerably from country to country, is a clear indicator of the rapidly increasing need to provide proper medical care for female players. Dr Schneider's presentation on the specificities of women's football was therefore thought-provoking.

He started by examining workloads. A survey among German national team players revealed that they played between 22 and 45 club matches a season (at an average of 32.5) plus between 1 and 20 for national teams (at an average of 10.6). The average match-play workload was therefore 43 games and could, in an extreme case, stretch as far as 65. Training units ranged from 4 to 12 per week at an average of 6.4 – all of which adds up to figures easily comparable with physical loadings in the men's game.

In terms of workload during matches, Dr Schneider commented that analysis based on the German national team against top-class opposition revealed an average distance covered of 10,507 metres, with midfielders averaging 11,784 – again, figures comparable with the men's game. However, run-



FACTOR

Prof. Jan Ekstrand is in charge of UEFA's injury study.



ning patterns differ substantially, with only 260 metres covered at sprint speed (179 metres at speeds between 21 and 24km/h and 81 at speeds of 24+), and a further 765 metres covered in the 17–21km/h speed range. High-speed running therefore represents 0.77 of the total distance covered.

Interestingly, comparisons were made between the two members of an attacking partnership. One covered 11,115 metres during the game, 372 of them (3.3%) at 21km/h or more. The other ran a lower distance (10,466 metres) but covered 494 (4.7%) at high speed. Comparing top-level performances, the distances covered at sprint speed in men's football are approximately 50% higher than at the elite end of the women's game.

Having said that, the figures presented by Dr Schneider in Stockholm indicated that performance levels in the women's game are increasing. Between 2006 and 2009, the mean time for explosive sprinting over 5 metres decreased from 1.11 to 1.05 seconds (compared with 0.95 in the men's game). Over 30 metres, the time has been lowered from 4.45 to 4.35.

Recent studies of heart rates during elite women's games have demonstrated a high degree of consistency over the 90 minutes, with readings reaching 87% of maximum values.

Studies have also revealed that anaemia is an issue to be addressed in the medical care of female players, with Hb and Ferritin readings – even among national team players – quite often dropping to levels which are considerably below normal and which can place considerable restrictions on performance.

On the other hand, Dr Schneider revealed that the sort of eating disorders or menstrual dysfunctions prevalent in other sporting disciplines are not endemic to the footballing population. Indeed, the percentages are three or four times lower – and substantially less frequent than in society at large. The anthropometric data he presented indicated that the under-20s are now taller and heavier than their 'senior' team-mates – which made for some interesting comparisons with data related to the squads at the 2009 European Women's Champi-

onship final round in Finland, where the average height was 169cm and the weight 62kg.

A few minutes before Ulrich Schneider stepped on to the stage in Stockholm, Magnus Forssblad, chairman of the Swedish FA's medical committee, national team doctor and orthopaedic surgeon, had asked a rhetorical question with regard to medical skills and ethics. "We might be skilled, interested and capable surgeons when performing ACL reconstructions," he said, "using high-tech methods, latest graft



Studies have demonstrated the high level of consistent effort of Germany's women's team.



Women's youth teams are also monitored closely from a medical point of view.

UEFA-Woods

choice and increasing percentages of double-bundle technique, *but can we honestly recommend a 15-year-old girl to return to football?*"

The italics don't reflect a change of Magnus Forssblad's tone, but rather an unspoken question: why had he chosen a 15-year-old girl as an example? Dr Schneider was to throw light on it by referring to the high incidence of anterior cruciate ligament injuries in women's football. A season-long study in the German league had produced a figure of 2.2 ACL ruptures per 1,000 hours of match play and a survey among national team players revealed that 23% had suffered an ACL rupture in the past – most of them at tender ages.

This dovetailed with a survey conducted by UEFA during the Women's EURO 2009 as part of the ongoing injury research project. A study based on 10 of the 12 squads revealed that 4.9 players per team had suffered an ACL rupture – representing 22% of all the players at the finals. For the record, there was one ACL rupture during the tournament – and it occurred during training.

By contrast, a similar study among the eight finalists at the Women's Under-19 Championship final round played in Belarus a month before the tournament in Finland had revealed an average of 0.5 per squad (3% of the total).

Magnus Forssblad, however, referred to data collected between 2005 and 2010, which revealed a contrast between patterns of men's and women's ACL ruptures. Whereas the 'peak period' for the men was between the ages of 20-25, the age group most

at risk in women's football is between 15 and 20, with an absolute peak between 17 and 19. Dr Schneider offered plausible explanations for the high incidence of ACL ruptures: anatomical factors (such as increased Q-angle, smaller intercondylar notch in the femur), hormonal influences on knee joint stability, or muscle strength and neuromuscular activation patterns (e.g. hamstring to quadriceps ratio).

However, statistics related to other types of injury hint at an evolution within women's football. Dr Schneider had referred to studies which revealed a peak of injuries at under-15 level, which then dropped steadily until the age of 19. The same studies showed an approximate equilibrium between contact and non-contact injuries (52 to 48%), with 52.6% of the non-contact variety occurring during running (30.5%) or abrupt changes of direction (22.1%) – followed by shooting (15.8%), jumping (11.6%) or impact from the ball (10.5%), with the remaining 9.5% down to various other types of incident. Of the contact injuries, 70.6% were the result of a tackle deemed to be legitimate, 22.5% were derived from foul play and 6.9% were due to collisions.

One of the salient features was that contusions provided 27.3% of thigh injuries, 13% of those related to the knee and 9.3% of the ankle injuries. "The traditional notion," commented Professor Jan Ekstrand, "is based on mass and velocity. So the parameters of the men's game are more likely

to produce fractures, whereas the doctor working with a women's team is more likely to deal with contusions. But that might be changing."

His suspicion can be backed by figures from the Women's EURO 2009. At the 2005 finals in England, there had been no fractures. In Finland, the number of contusions was lower (six), but there were four fractures – hinting that the mass and velocity equation at the top end of the women's game might be evolving. Contusions and fractures jointly accounted for 36% of the injuries.

UEFA's injury study conducted in Finland provided positive information in that the tournament registered a clear trend towards lower incidences

Sweden v England in the Women's EURO 2009, which was the subject of a medical study



Sportsfile



Dr Ulrich Schneider,
medical consultant to the German
women's national team



of injury. During the 19-day, 25-match event, 27 injuries were recorded – 19 of them during match play. The highest injury rate was recorded during the 18-match group stage, though the three severe injuries (entailing an absence of four weeks or more) were all sustained during the knockout phase of the tournament – and all three were knee-joint lesions in non-contact situations. Of the other 24, 15 (55% of the total) entailed absences of up to three days and only six resulted in absence of over one week. A total of 85% of the injuries were traumatic. Another salient feature was that, whereas 20–25% of injuries in the men's game affect the thigh, the women's tournament registered only 11% and of minimal severity.

In injury studies, 'down' is a good word. At the Women's EURO 2009, down went the incidence of severe injuries (2.5 per 1,000 hours compared with 5.6 at EURO 2005 and 9.5 at the men's EURO 2008) and down went the overall incidence of injury (22 per 1,000 hours of match play compared with 36 at EURO 2005).

The incidence of injury in training was also very low, at 3.3 per 1,000 hours, yet provided 30% of all the tournament's injuries and 38% of those which entailed an absence of over a week. In this sector, comparisons with 2005 are dangerous, given that the finals in England were played in June, whereas the event in Finland was staged in late August / early September. The 2009 training schedules had high rest-and-recovery components and the number of sessions during the group phase ranged from three to eight – something logical bearing in mind that some contestants were in mid-season, others in pre-season.

At the same time, UEFA's injury studies at the finals of its Women's Under-19 Championships have also revealed an interesting pattern. After a slight upturn at the 2007 finals in Iceland, the incidence of injury has headed steadily downwards.

It is dangerous to jump to conclusions. But it could be legitimate to debate whether one of the statistics presented by Dr Schneider might be part of the explanation. He pointed out that, in the year 2000 in Germany, 25.3% of the registered female players were under-16s. By 2008, this had risen to 32.5%.

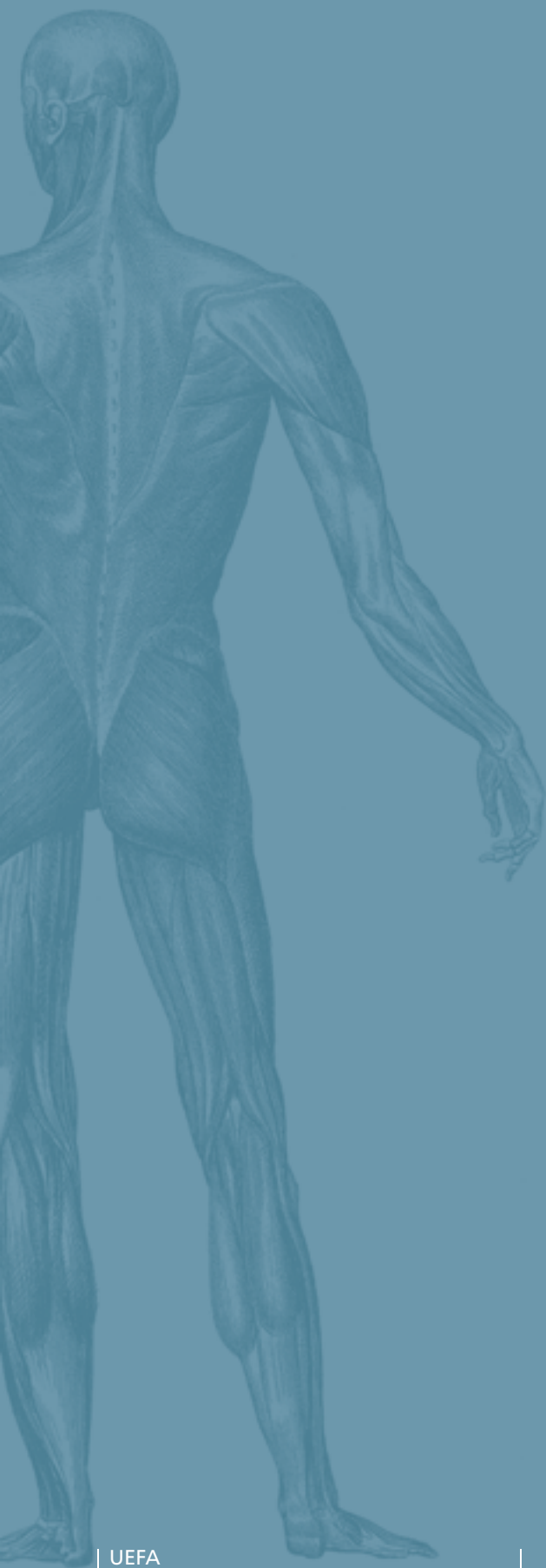
It could be argued that if girls are playing football from earlier ages, their limbs receive a more complete footballing education than those who come into the game at – literally and figuratively – secondary education stages, with the extra years of training

and playing helping to generate hardened tissues. Projecting into the future, Dr Schneider suggested in Stockholm that female players will need to be equipped for more high-intensity running and that preventive strategies aimed at reducing the incidence of knee and ankle injuries in the higher-risk age groups will need to include specific training on aspects such as proprioceptive coordinative exercising, lower-extremity landing skills, plyometrics and the improvement of muscle balance.

Bearing in mind that Germany is at the top of the women's ladder, the advice is of special interest to national associations on the rungs below them, where girls may be starting to play their football at later ages, and where doctors have a role to play in helping them to avoid the physical pitfalls which, in recent years, have become apparent in the women's game.



The Danish women's team in training during the Women's EURO 2009



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