INJURIES IN PROFESSIONAL FOOTBALL
- SHOULDERING THE BURDEN

FEATURE / DR IAN HORSLEY PHD, MCSP, MMACP, CSCS

Football is the most popular team sport worldwide. In the last global census undertaken by FIFA, it was estimated that there are over 300,000 clubs and 265 million people who participate in the sport along with more than 5 million referees. This equates to 4% of the world's population. In this country, The Football Association represents about 37,000 clubs and millions of players . A recent FIFA study reported that in the last decade more than 13 million women have been recorded playing football at both amateur and elite levels across the globe (FIFA, Women's Football MA's Survey Report, 2019).

There is a saying in sport that "injury is just part of the game". In other words, injury is seen as an inevitable consequence of participation in sport (Chalmers, 2002). Within a professional football team with a squad of 25 players, the team will endure about 50-time loss injuries each season. This equates to two injuries per player per season (Ekstrand et al., 2011).

A recent systematic review and meta- analysis of 44 studies that reported the epidemiology of injuries in male professional football concluded that the overall incidence of injuries in professional male football players was 8.1 injuries/1000 hours of exposure, with match injury incidence being approximately 10 times higher than training injury incidence rate (Lopez-Valenciano et al., 2020). This tallies to 50-55 time loss injuries per team/season (2 injuries per player/season) which equates to approximately 14% of squad unavailable at any time.

A similar systematic review and meta-analysis carried out in Women's football reported that the overall incidence of injuries in female football players was 6.1 injuries/1000 hr of exposure, and that match injury incidence is almost six times higher than the training injury incidence rate (Lopez-Valenciano et al., 2021).

Both papers reported that lower limb injuries were most prevalent with muscle/tendon injuries being the most common injury type. This was also confirmed in a study carried out by Kirkendall and Dvorakould (2010) who reported that the most common injured site was the lower limb (67.7%). Furthermore, they also reported that the next most injured area was upper limb (13.4%) .

Recent FIFA data shows the prevalence of upper limb injuries by playing position (Table 1) and anatomical location of upper limb injuries (Table 2).

Player Position	Upper Limb Recorded Injury
Defender	3%
Midfield	2%
Forward	2%
Goalkeeper	19%

Table 1: *Percentage of upper limb recorded injuries by field position*

Upper Limb Injury Area	Goalkeeper	Outfield Player
Shoulder	9%	1.5%
Arm	3%	0.2%
Wrist/Hand	7%	0.4%

Table 2: *Location of upper all injuries*

Injuries have considerable negative physical, psychological and financial short and long-term outcomes for an individual player and their respective clubs (Lopez-Valenciano et al., 2021). So, it is necessary to construct efficient preventive risk mitigation strategies (Roe et al., 2017) and improve our understanding of causality, effective management and rehabilitation of injuries.

In recent years, shoulder injuries have represented an increasing health problem in football players (Lungo et al., 2012). There have been a few studies which have analysed the incidence of shoulder injuries within professional (male) football. Walden et al.,(2007) reported an 8.8% prevalence during Euro 2004, Junge et al., (2006) reported a 6.4% prevalence during the Athens Olympic Games, and Junge et al., (2004) reported a prevalence ranging from 2-13% over a four-year review of FIFA tournaments and Olympic Games.

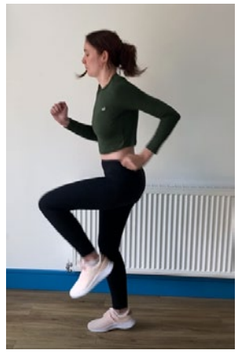
Within the Women's game similar figures have been returned for shoulder injuries; 5.3% (Faude et al., 2005), 2% (Jacobsen et al., 2007), 4.7% (Tegnander et al., 2008) and 5.5% (Walden et al., 2007).

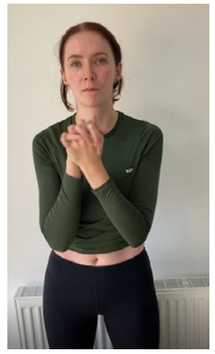
Just over a quarter of shoulder injuries (28%) sustained by professional football players are classed as severe as this results in the said players to be unavailable to train or play matches for around 28 days (Ekstrand et al., 2011). In a study carried out during the 2006-2008 UEFA European Championships, a total of 34 severe injuries were documented, of which two were dislocations of the shoulder (Hagglund et al., 2009). One review assessed the serious shoulder injuries sustained in professional football over a period of four competitive seasons for all English Premiership Football teams. Based on health insurance claims, this review noted that 3.3% of all claims were shoulder injuries (1335). This equates to an average of 445 serious shoulder injuries per year. The vast majority of surgical procedures were arthroscopic stabilisations (26%) and labral repairs (23%) (Pritchard et al., 2011).

With the gradual increase in shoulder injuries within football, there has been a drive to prevent shoulder injuries. Following the successful implementation of the FIFA 11+ programme which was developed to prevent lower limb injuries (Bizzini & Dvorak, 2015), FIFA developed the FIFA 11+ shoulder (FIFA 11+S) (Ejnisman et al., 2016) which targets the prevention of shoulder injuries in goalkeepers but can be applicable to outfield players also.

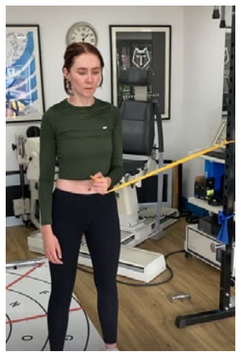
The program consists of three parts which takes 20-25 minutes to complete and should be carried out as part of the goalkeeper warm up as explamfied.

• General warming-up exercises (part I)





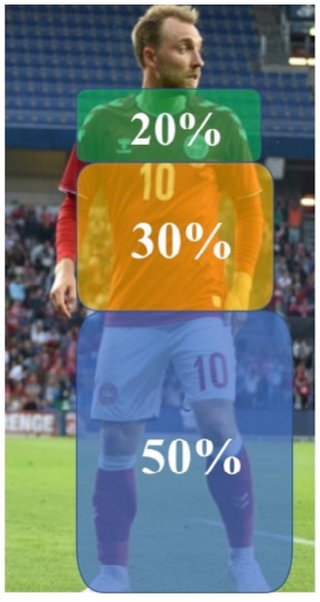
• Exercises to develop strength and balance of the shoulder, elbow, wrist, and finger muscles (part II)



A randomised controlled trial of the programme to assess the effectiveness of the FIFA 11+S program in reducing the incidence of upper extremity injuries among amateur soccer goalkeepers (Attar et al., 2021), reported 50% fewer upper extremity injuries among soccer goalkeepers, compared with a regular warm-up.

Return to play after shoulder injury should be founded on objective measurements (Gumina et al., 2008) and includes evaluation of the player's health status, participation risk and extrinsic factors (Lephart, 1994).

Since the whole kinetic chain has a role in optimal function of the shoulder girdle, the distal elements and their influence on local function should be taken into consideration. It is vital, therefore, that an attempt is made to identify sub-optimal movement strategies along the length of the whole kinetic chain and focus on these in the rehabilitation process. In summarising the primary functional requirements of the kinetic chain, Boyle (2016) enquired whether the primary requirement for the shoulder girdle to function optimally is mobility or stability. It was concluded that the shoulder girdle requires alternating both stability and mobility.



Kinetic chain shoulder rehabilitation incorporates the dynamic link of biomechanics to produce proximal-to-distal motor-activation pattern with proprioceptive neuromuscular facilitation and closed kinetic chain exercise techniques. This method centres on movement patterns rather than isolated muscle exercises. Patterns consecutively uses the leg, trunk, and scapular muscle system to facilitate less active shoulder musculature, to gain an increase in active range of motion, and increase in force output.

Examining the kinetic chain from the ground up, we can consider the optimal requirements of the joint; namely whether the primary requirement of the joint is that of stability or mobility (See Table 3). The results are an alternating prerequisite of stability and mobility along the whole kinetic chain.

In addition to this, it is necessary to consider the "strength" requirements of the shoulder girdle such as muscle force production characteristics and whether there is a requirement for a high rate of force production, high endurance capacity or high-speed movement. Moreover, the type of muscle action (concentric, eccentric, isometric) in what part of the available joint range (inner range, middle range, outer range) is required.

Furthermore, it is necessary to understand the functional requirements of the shoulder of the player. It goes without saying that the functional requirements of the shoulders of a goalkeeper is much more complex than that of an outfield player, but one needs to consider the role of the arms (and thus shoulders) in outfield players in activities such as jumping, fending off an opponent or taking throw ins. This can be broadly broken down into what percentage of time is the arm used below the level of the shoulder, in line with the shoulder or above the shoulder. The consensus for this distribution is shown in Figure X.

Below The Shoulder	In Line with The Shoulder	Above the shoulder
1% * (25% Goalkeepers)	50% (Goalkeepers)	99%* (25% Goalkeepers)

Figure 1: *Estimation of Functional Shoulder Position in Football*

Although not part of the functional requirements of players during match play, ever increasing elaborate goal celebrations may place shoulders in vulnerable positions- such as when completing a cartwheel!

Joint	Primary Requirement
1st MTP	Mobility
Mid Tarsal	Stability
Ankle	Mobility
Knee	Stability
Hip	Mobility
Lumbo-Pelvic Spine	Stability
Thoracic Spine	Mobility
Scapula	Stability
Glenohumeral	Mobility

Table 3: *Primary Requirements of the Kinetic Chain (Boyle, 2016)*

Once all these characteristics have been considered, an assessment process can be carried out to identify whether these attributes are available to the player.

Further information regarding management of shoulder injuries in football can be found at **TheGoalieshoulder.co.uk** along with specific prevention and rehabilitation interventions.

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