

An Introduction to Fitness Training for Soccer

Soccer or football as we know it in the UK is the worlds most popular game and is played by men, women and children of all ages and levels of ability. Success as a player requires an appropriate mixture of mental, physical, technical and tactical ability. The game is currently at its most healthy and successful, with more spectators, participants, revenues and media interest than at any time in its history. Consider the following statistics and the potential opportunities for a proactive fitness trainer:

- * 7 million participants, plus 5 million in schools
- * 500,000 volunteers
- * 37,500 clubs, including 9,000 youth clubs
- * 2,000 competitions
- * 32,000 schools (17,000 primary)
- * 30,000 FA-qualified coaches
- * 27,000 FA-qualified referees
- * 45,000 pitches (21,000 facilities)

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This article will provide an overview of the physiology and demands of the game; outline some field-based methods of testing and evaluation, and briefly overview approaches for both endurance and strength training interventions. Readers are directed to the reference and key reading list for a comprehensive analysis.

Physiology and Demands of the game

At elite level you can expect an outfield player to cover in the region of 10-12km over a 90 minute period at an intensity of around 80-90% MHR (Stolen et al 2005). This effort is interspersed with sprints, jumping, changes of direction, backwards running, sideways movements, tackling and retaining balance and ball control under defensive pressure.

Although many decisive moments are defined by anaerobic activities such as sprinting, jumps and contests for the ball, most activity involves aerobic metabolism (Reilly 2005).

The demands and rules of the game have moved considerably in recent years this may explain the increased distances covered across all positions. For example Strudwick and Reilly (2001) showed that players covered around 1.5km more in 2000 than before 1992. This was shown across all positions.

The contemporary game now requires a more scientific approach to conditioning of the players than at any time previously.

Strength, Power & Speed Tests

Jumping ability and sprint speed are the most likely abilities to be assessed here.

A range of vertical jump tests are available to the practitioner both double leg and more specifically single leg take off. The practitioner needs to select the test best suited to their needs and circumstances at the time.

Ability to cover short distances quickly is likely to be an asset to any player. The 30m sprint test between timing gates is seen as highly relevant to soccer performance, with time taken to cover the first 10m of that distance likely to be a highly significant marker (Stolen et al 2005).

It might be possible that a range of barbell related RM tests are useful (e.g. 1RM half squats) however little data currently exists with footballers.

(For a comprehensive review of available tests see Stolen et al 2005)

Fitness Training

Traditionally there has been a focus on game based or “match fitness” and many of the methodologies around conditioning being passed down over time. Despite popular belief, it is difficult to improve the individual fitness abilities over time with game playing alone and specifically designed training drills are a more appropriate method for player development.

Endurance Training for Soccer

Research has demonstrated a relationship between players VO₂ max and both distance covered and sprints attempted during a game. Mean values for elite players have ranged between 55 and 67mL/kg/min (Tumilty 1993; Davis et al 1992; Nawacki et al 1988; Rhodes et al 1986; Thomas & Reilly 1979; Williams et al 1973; op cit Hoff and Helgerud 2004)

Although players can perform conditioning work based around running drills, for example hill work or variations of shuttle runs, the best way to develop the required endurance appears to be to include a ball and relate the drill to game performance. Reilly (2005) discusses the benefits of 3 v 3 small sided games for young players, though key variables such as time, pitch size and motivational climate are important to success. Hoff and Helgerud (2001) achieved success with a specifically designed interval training programme of 4x4 mins at 90-95% HRmax with 3 min jog between. Players performed twice a week for 8 weeks with significant improvements in match distance covered, number of sprints and number of contacts with the ball. Hoff et al (2002) also developed a specific dribbling track for fitness development. Bangsbo (1994) amongst others offers a range of field based training sessions as a useful starting point for a conditioning practitioner.

Strength Training for Soccer

Historically, little emphasis has been given to strength training with soccer players. Today, both in injury prevention and performance development, strength training is seen to have an increasing role to play. For example, speed, agility and jumping are important to football performance; strength training can positively impact all of these abilities. Training for strength can be categorised into two types, training for hypertrophy, and for neural adaptations.

Long-term hypertrophy training is aimed at increasing muscle mass / bodyweight, this can have several positive benefits but might not necessarily be a desired effect for a soccer player. A relevant cost/benefit analysis of additional body-mass must be considered for each individual. Training methods for achieving muscular hypertrophy are well documented in the literature; texts from the National Strength and Conditioning Association (NSCA) provide a sound basis.

For developing neural processes explosive/power type training would be the method of choice. Recent work reported in Hoff and Helgerud (2005) has demonstrated improved 10m and 40m sprint times with elite soccer players and further work in pre-season at champions league level showed improvement in sprint speed and jumping ability. These studies both followed well established low reps/mod-high load power training protocols focusing on speed of movement. These studies begin to suggest much potential for strength and power training interventions with soccer players. Advanced training approaches such as plyometrics and complex training would be considered in this area.

Summary and Conclusion

This article offers a brief insight into the physical elements of soccer performance and conditioning for soccer players. Based on current interest and levels of participation fitness trainers should develop a greater understanding of both the demands and physiology of soccer and approaches to testing and physical conditioning.

References and Key Reading

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