

Exclusive Coach Interview...

with Dr Adam Owen, we ask him about:

Pre-Season Training, Periodization, Should Conditioning be All Football Specific? + more...

Hi Coach,

As many of you already know, **Dr Adam Owen** is a World Leading **UEFA Pro Licence**, Sport Science and Fitness Coach for **Wales National Team** & newly appointed as **Assistant 1st team Coach** at **Lechia Gdansk**.

He is also the Author of bestselling books:

[Football Conditioning: A Modern Scientific Approach - Speed & Agility](#) | [Injury Prevention](#) | [Periodization Training](#) | [Small Sided Games](#)

I hope you find the Interview Interesting and beneficial!



Dr Adam Owen
Sport Science / Fitness Coach -
Wales National Team



1. For what age group should coaches start to implement conditioning training into their sessions?



Having held many positions over the years from academy level through to 1st team senior levels, there was a large emphasis placed on developing speed, agility and strength at youth level of children around the Under 9-10 age groups.

Obviously, children are not mini-adults and should not be placed under the same demands as senior players, however, there are key things that can and should be done alongside the maturation stages in order to maximise physical development.



2. Should conditioning be all football specific?



This is a question that always comes up and I suppose it depends on the coaching philosophy you have as a coach. I prefer to perform conditioning aspects with the ball as much as possible, within a tactical strategy based on how we will look to play in the next match. However, that's not to say I don't include specific exercises to stress certain energy systems without the ball!



3. How does a knowledge and understanding of science affect the performance aspect?

From my perspective, it's vital to have a generic knowledge and understanding of performance aspects. The game has become and continues to be more professional, with the finances available for success becoming greater each year.



I firmly believe the days when the manager had no involvement or understanding of the physical development aspects of the players has gone - they no longer leave it all to the fitness staff. Managers and coaches must have an understanding of training load management, injury prevention and how various sessions impact the readiness and preparation of the players, due to the fact they are responsible for the match day performance.



4. How important is Periodization for performing at an optimum level consistently?

Periodization is a term that is often used and in a lot of cases misunderstood from my perspective. It is basically a term that was developed many, many years ago in the old Soviet Union with the aim of balancing a tapering or decreased training load strategy with a progressive overload (increased training load) on athletes to ensure they peaked at a given time in the future. The Football Conditioning books outline how to implement periodization into your training to achieve optimum results for your team.



Within football, players need to peak once or twice per week as all games are important and they are all worth 3 points! From my perspective, the key is to ensure performance dips are kept to a minimum and fitness elements are developed over time, with the long-term vision of the players upheld - especially in the earlier ages groups.



5. You put a lot of emphasis on small sided games - can you explain why implementing small sided games is so pivotal for fitness training?

I have spent a lot of time researching the impact of various sided games on amateur, youth and professional players to see how they adapt, recover and potentially improve performance through the use of them in training.



The exposure of players to various sided games throughout the course of the training week can have an extremely positive response on the players from both a physical and technical point of view. Different player numbers, area sizes and possession rules significantly affect the demand placed on the players in these sessions and as a result, influence the training response of the players in various ways. All this is highlighted in the book.



6. What are the main aspects of injury prevention?



You cannot prevent all injuries, but you can reduce the risk of soft tissue or non-contact injuries. As a coach, understanding the recent science behind this topic is key, as you will start to see how training load management and the total output on the pitch are

directly linked to certain types of injuries. Coaches have to take responsibility for these types of injuries as 90% of the time it's the coach who manages the on-pitch training content.

Performing strength and conditioning, core development and functional strength exercises (all included in the book) will assist in maintaining a healthy conditioning state - however, if the pitch training content is wrong or too much/not enough then generally we are adding more load to the body at the wrong stage.



7. How important is it as a coach, to adapt practices and create your own ideas?



I think it's very important to establish your strength and weaknesses as a coach and develop your own ideas, changing exercises to suit your needs and coaching style. However, as I said before there are not many sessions being performed that other coaches have not done and as a result, it's about how you as a coach deliver the session, engage and create that buy-in from the players. They need to understand the key principles of the session and how that fits with the strategy of the upcoming match.



8. Do any of your football conditioning principles change when training players at a lower level? If so, what are the main differences?



Each level of players you work with have what we call a specific 'training age' and this is different based on athletic competency or their previous exposure to exercise or sport. The principles within this book can be developed across various stages of play from youth, semi-professional, professional and elite.

I wouldn't necessarily say that principles needed to be changed, however the expectation of technical and physical performance across levels would obviously differ.



9. Do you have to have a scientific understanding to benefit from reading your work?



The key to the development of my work is to ensure that we appeal to managers, coaches, players, physiotherapists, sport scientists and fitness staff across all levels and abilities.

The scientific language in the Football Conditioning books is certainly toned down to ensure a smoother read and the key integration of infographics to summarise the text lends itself well to the simplicity.



10. With pre-season training approaching, how will these books help coaches and players prepare for the new season?



These books will allow coaches and players to understand the key physical elements needed to be stimulated, in order to improve different fitness aspects. We provide examples of practical drills and sessions that can be used, but also underpin everything with scientific evidence and a history of success.

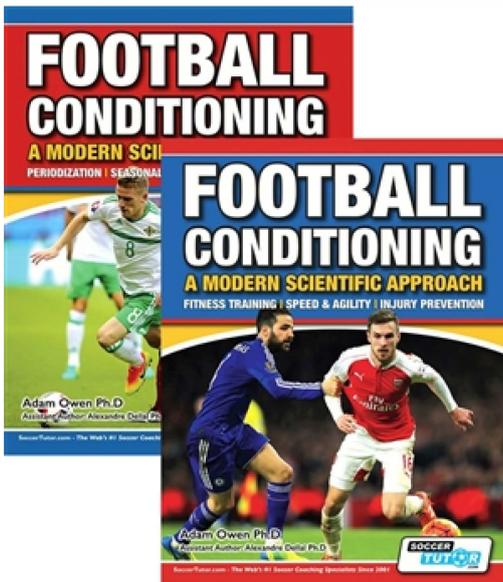


11. Can this be applied to coaches/players at different ages and levels?



Yes, the fact that the human body responds to training in a similar way ensures that the content of the books is applicable across various levels, ages and abilities of play.

[Football Conditioning: A Modern Scientific Approach 2 Book Set - Speed & Agility | Injury Prevention | Periodization Training | Small Sided Games](#)



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CHAPTER 1

DISTANCE AND INTENSITY OF RUNNING IN FOOTBALL

CHANGES OF DIRECTION (COD)

Analysis of competitive matches has shown the intermittent (stop and start) nature of the sport, and subsequently the need for players to repeat high-intensity exercises (Bangsbo, 2007; Dellal et al., 2012). Recent studies have estimated that **between 1000 and 1500 distinct movement changes occur within each match at a rate of 5-6 seconds whilst having a static pause of 3 seconds every 2 minutes** (Reilly, 2003; Strudwick et al., 2002).

Previous research has shown how players make various accelerations, straight-line, backward and sideways movements throughout the course of a game (Bloomfield et al., 2007), however, early research conducted by Reilly and Bowen, (1984) indicated how these unorthodox movements led to significant increases in exertion when compared to running forwards.

These findings have been further confirmed through recent research comparing the physiologic responses of traditional high-intensity straight-line running intermittent exercise with shuttle-running requiring 180° directional changes (Dellal et al., 2010). It was concluded that the physiological impact of directional changes required a significant increase in the **anaerobic metabolism** (see definition on key terms page) when compared to straight line running.

The results from both of these studies may aid coaches in the design of intermittent (stop-start) training programmes using classical straight-line and changes of direction to get different physiologic responses. This is where you can use small sided games as a way of having more **CODs** and subsequent increases in the **anaerobic metabolism** of players through specific training as opposed to traditional interval training.

When discussing **CODs** further within elite level matches, Bloomfield et al., (2007) concluded the following:

- Midfielders were found to perform more forward movements than defenders who had the highest amount of backwards and sideways movements.
- The majority of diagonal and curved movements were performed by midfielders and strikers (in order to create space, evade a marker or be in a position to receive a pass from a teammate). From a striker's perspective these arching runs also give them the opportunity to stay 'onside' when running in behind the opposition's defence.
- High numbers of turns were made with the majority between 0° to 90°.
- Defenders made approximately 700 turns per match.
- Midfielders made approximately 500 turns per match.
- Strikers made approximately 600 turns per match and made the most turns between 270° and 360°. These turns may be in order to evade a marker or through general play, making movements towards the ball when it was played overhead (e.g. from a goal kick).
- The amount of 90° to 180° turns is relatively even with all positions performing approximately 90-100 in a match.



KEY POINT:

These specific turning exertions and accelerations/decelerations should be included as part of conditioning sessions to maximise the performance for these specific movements. The inclusion of these movements at game intensity within small sided games or general conditioning can significantly enhance 'football specific strength' capacity of players.

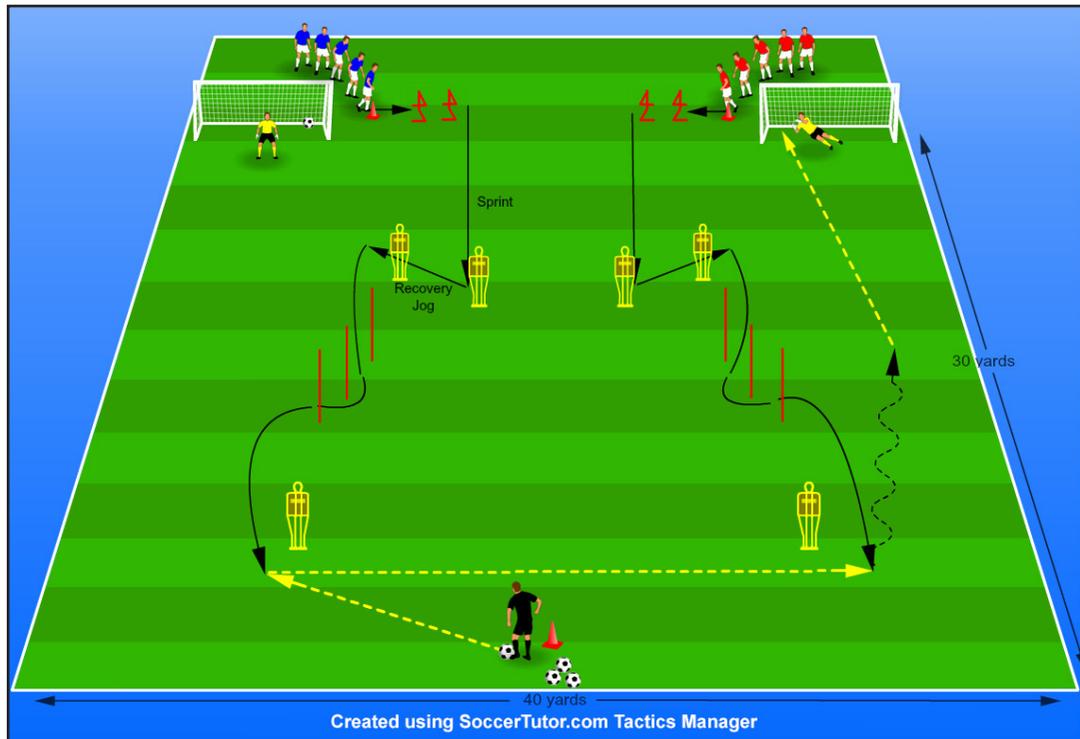
In addition to the previous research highlighting directional changes within the varying work-rate profiles of elite level players, Orendurff et al., (2010) concluded that within competitive matches:

- 43% of movements lasted less than 6 seconds
- 23% of movements lasted 6-9 seconds
- 13% of movements lasted 9-12 seconds
- 9% of movements lasted 12-15 seconds
- 53% of recovery periods are less than 6 seconds
- 22% of recovery periods last 6-9 seconds
- 9% of recovery periods last 9-12 seconds
- 5% of recovery periods last 12-15 seconds

Further analysis into movement changes within elite professional football also suggested that players perform between 1000 to 1400 short duration actions in a game, lasting 2-4 seconds (Stolen et al, 2005), with approximately 220 of them being at a high intensity (Mohr, 2003). Bangsbo (1994), suggested that players perform a different action every 4-6 seconds throughout a competitive match.



PRACTICE EXAMPLE: Changing Direction at Speed and Finishing



Objective

To develop explosive power, reaction speed, acceleration and football specific conditioning.

Description

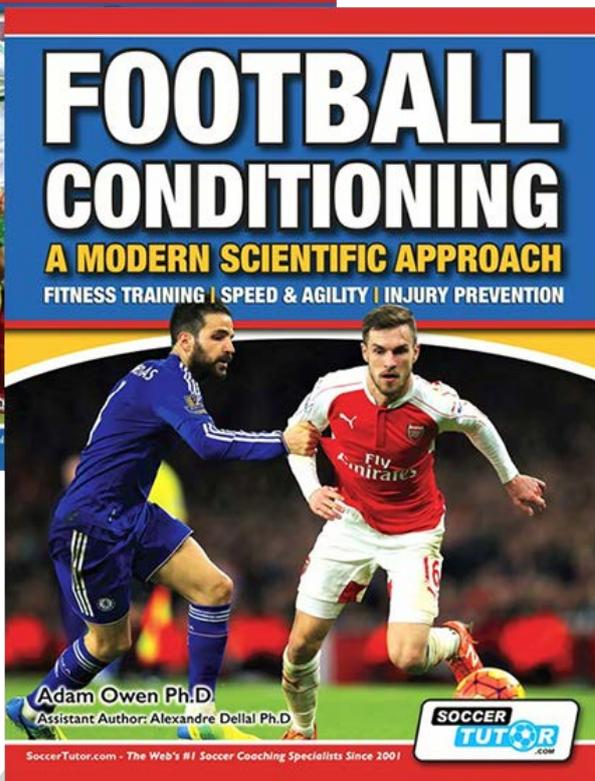
In a 40 x 30 yard area, we mark out the hurdles, mannequins and cones in the positions shown. Players perform various explosive movements before shooting at goal.

The players are in 2 groups facing each other and start by jumping over the 2 hurdles. They then accelerate to touch the first mannequin, jog (recovery) around the second mannequin and perform diagonal explosive movements through the poles. The coach plays a pass to one of the players who must react quickly to meet the ball, receive and pass the ball across to the player on the other side. The second player receives with an open body shape, dribbles at maximum speed and shoots. Players then walk to the back of the opposite group.

Progression: The player who makes the pass across moves to apply pressure on the attacker from behind.

Coaching Points

1. Players must accelerate at maximum speed.
2. Players must react to the coach's pass accordingly to maintain the technical quality throughout the drill.
3. Dribbling at maximum speed towards goal is required to make it more game realistic.



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CHAPTER 2

SMALL SIDED GAMES

PHYSIOLOGICAL RESPONSES AND ACTIVITY PROFILES OF SMALL SIDED GAMES (SSG)



1 *Physiological and Perceptual Responses*

Higher in the smaller SSG formats (2 v 2 and 3 v 3).

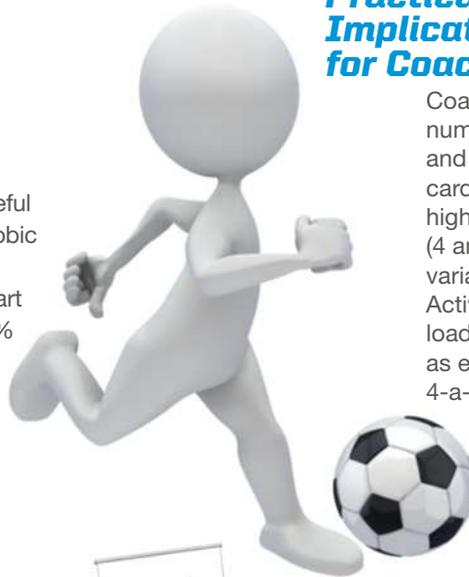


Practical Implications for Coaches

Coaches can use lower numbers of players (2 and 3-a-side) to increase cardiovascular demands but higher number of players (4 and 5-a-side) to increase variability and specificity. Activity profile and body load were not as different as expected, however, 4-a-side SSGs presented higher values and higher variability, while the 3 v 3 SSG was the most stable format.

Aerobic Fitness Development

2 v 2 and 2 v 3 may be useful for training to improve aerobic fitness in football players because they can elicit heart rate responses around 90% of maximal heart rate.



3 *What About 4 and 5-a-side?*

This could indicate that smaller formats (2 v 2 and 2 v 3) are more appropriate to increase physiological stress, whereas larger formats (4 v 4 and 5 v 5) can be used to improve match specific demands.



REFERENCE

M. Aguiar, G. Botelho, B. Goncalves and J. Sampaio
J Strength Cond Research, December 2014



Designed by @YLMsPortScience

PHYSICAL DEVELOPMENTS WITHIN SMALL SIDED GAMES

Developing a better understanding of physiological and technical demands imposed on players within *SSGs* allows the opportunity to further analyse the movement profiles of players. At most levels, performing repetitive sprint efforts, changes of direction, shooting, tackling and dribbling are fundamental components and efforts needed to compete. However, these specific movements and actions within *SSGs* result in severely strain through additional loading placed on football specific muscle groups. This additional load imposed upon players may offer an additional physical stimulus because the ability to perform technical and tactical requirements under fatigued conditions is considered important for football (Iaia et al, 2009).

Dellal et al (2011) examined the relationship between playing levels in football (amateur vs. professional) using various *SSGs* (2 v 2; 3 v 3; 4 v 4). The main findings revealed significant differences between elite and amateur players concerning their ability or capacity to perform high-intensity actions, in combination with their competency to execute various technical abilities. Further analysis from the investigation showed how amateurs completed less successful passes, produced higher *RPE* and *BLA* values and less sprint distance and high intensity running. The comparison of the professional and amateur football players' activities during *SSGs* showed that the playing level influences the physiological responses, physical output and technical activities.

Table 11. Physical and Technical Demands of *SSGs* (3 v 3) Among Professional Football Players (Dellal et al., 2011).

	PHYSICAL AND TECHNICAL DEMANDS IN A PROFESSIONAL 3v3 SSG (N=20)			
	1 Touch	2 Touches	Free Play	Average
Total Distance (m)	22476.6	2124.7	2014.0	2128.8
Total Distance Sprinting (m)	397.0	351.2	315.6	354.6
% of Total Distance Sprinting	17.7	16.6	15.7	16.7
Total Distance in HIR (m)	523.2	473.9	422.5	473.2
% of Total Distance in HIR (m)	23.4	22.4	21.1	22.3
Number of Duels	30.9	28.2	26.8	28.6
Number of Duels per minute	2.6	2.3	2.2	2.4
% of Successful Passes	52.1	69.9	71.7	64.5
Total Number of Ball Losses	17.1	15.2	14.4	15.5
Number of Ball Losses per minute	1.4	1.3	1.2	1.3
Total Distance in Possession	51.8	43.8	41.7	45.8

The Effect of Pitch Size

It is well reported that physical demands during *SSGs* can be significantly influenced through the manipulation of key variables such as player numbers, pitch area size, possession rule changes and bout durations (Casimichana and Castellano, 2010; Dellal et al, 2011; Owen et al, 2004; Owen et al, 2011). Recent

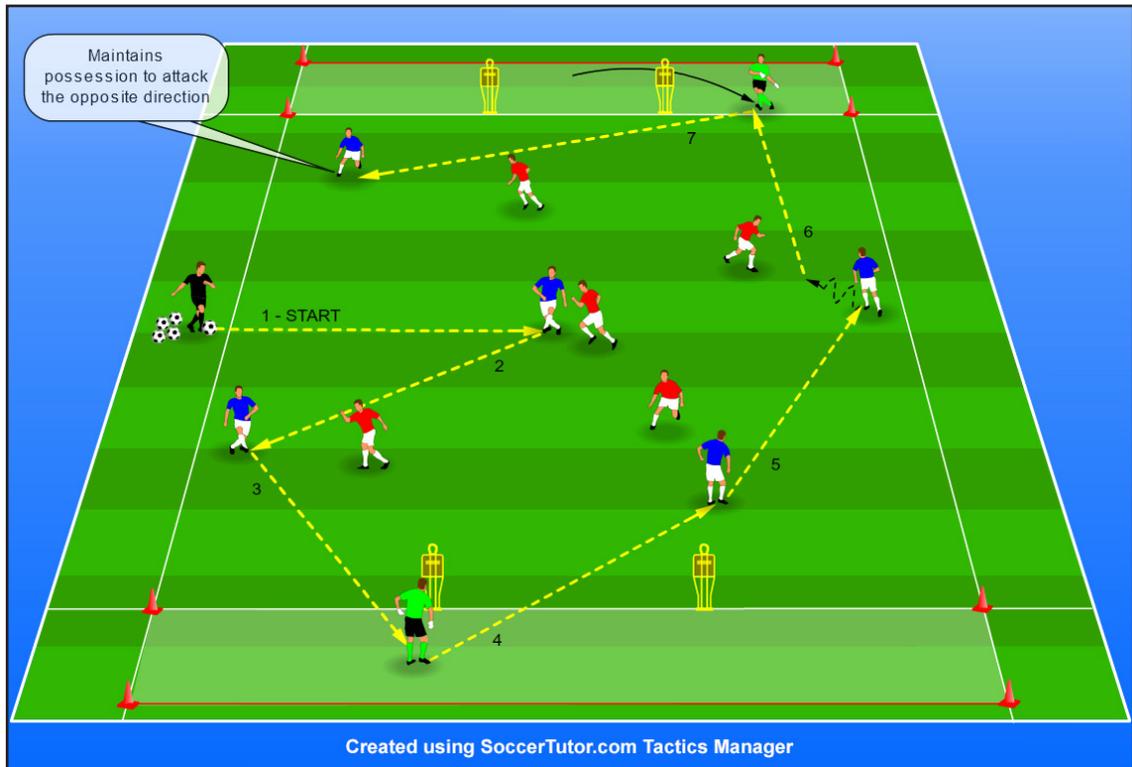
research within varying levels of football has revealed that changing the dimensions of the training pitch can create significantly different physiological and movement profiles. It should be noted however, that the various studies investigating the effects of the pitch dimensions on the players suggested contrasting opinions. One such study researching the effects of changing pitch sizes suggested that no significant

CHAPTER 3

SMALL SIDED GAMES (TRAINING DRILLS)



Playing Through the Lines in a Possession Game with Goalkeepers



Description

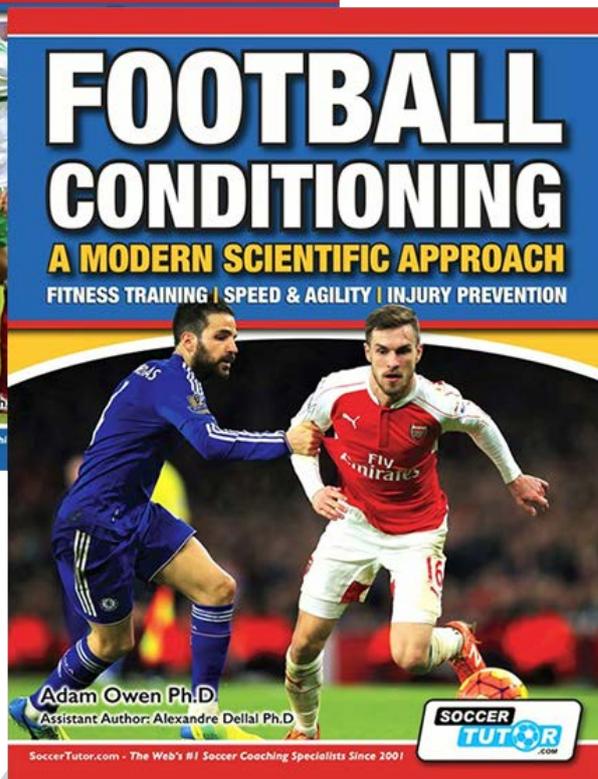
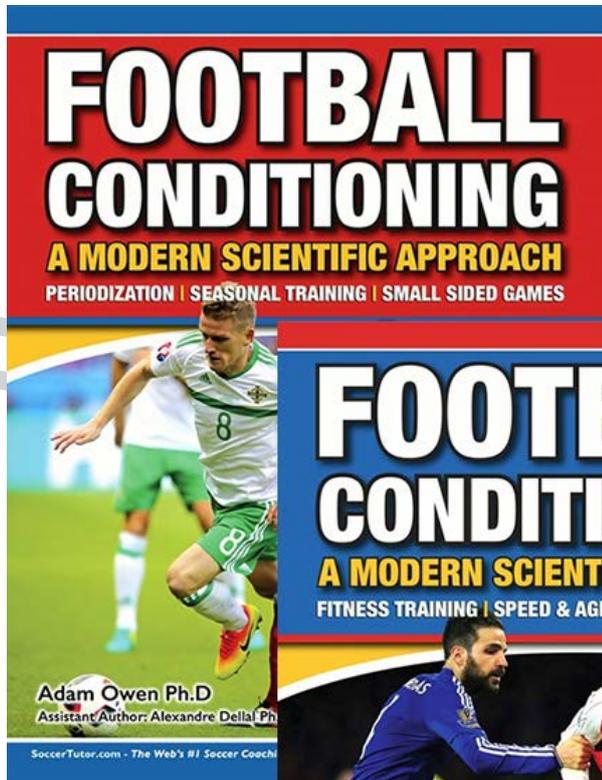
In this practice we play 5 v 5 in the central area (30 x 35 yards) and we also have 2 x 8 yard zones with neutral goalkeepers positioned behind 2 mannequins as shown in the diagram. The aim for both teams is to maintain possession and to continually play from one end to the other. Each time they pass from one goalkeeper to the other without the opposition intercepting the ball they score 1 point. Play in 3 minute periods.

Variations: 1) Challenge the players to complete a set number of passes to score a point. 2) You can use multiple player numbers to change the demand on players, but the key theme is on the tactical demand.

Progression: Players are not allowed to close goalkeepers in possession - progress to allow pressure.

Coaching Points

1. Players need to demonstrate quality of movement in order to play into and receive from the goalkeeper.
2. Ensure a high intensity of play is maintained within the game through pressure.
3. The players should look to switch play and play through the pitch.
4. Ensure the defending team do not stay in deep areas to try and block the goalkeeper.



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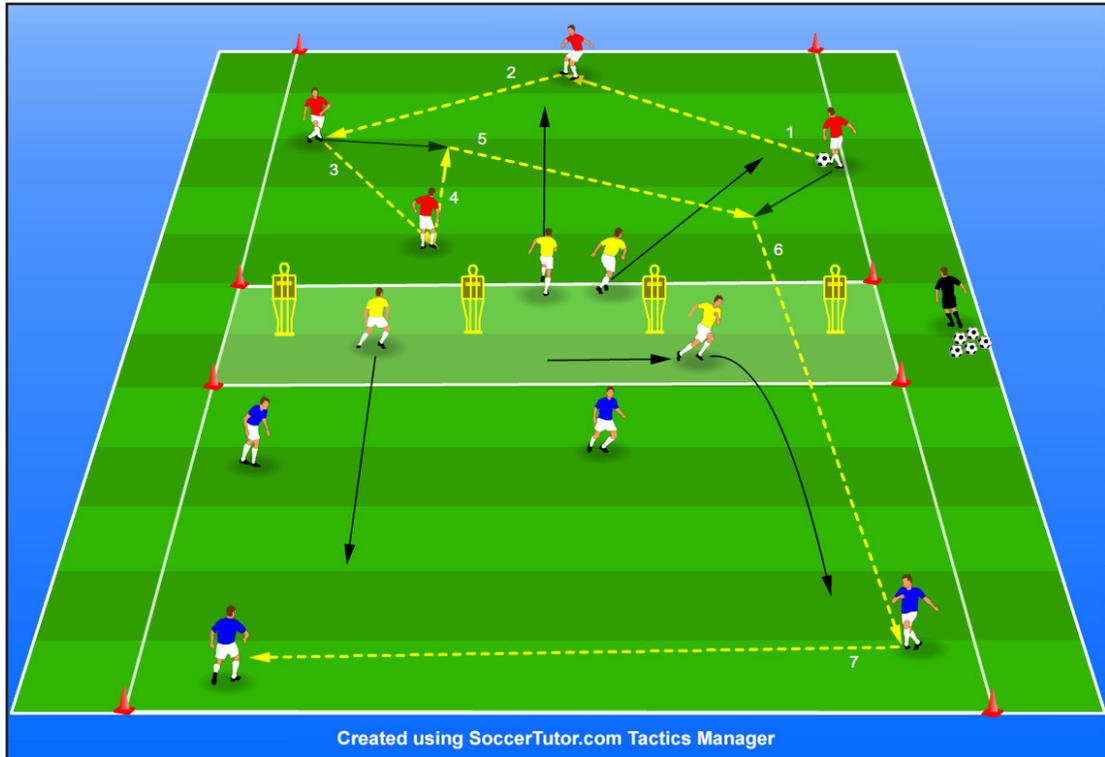
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Intense Pressing (2 v 4) in a 3 Team Transition Game



Description

In a 20 x 35 yard area we have 2 end zones (20 x 15 yards each) and 1 middle zone (20 x 5 yards) with 4 mannequins in the positions shown. We have 3 teams of 4 players and each team starts in one of the zones.

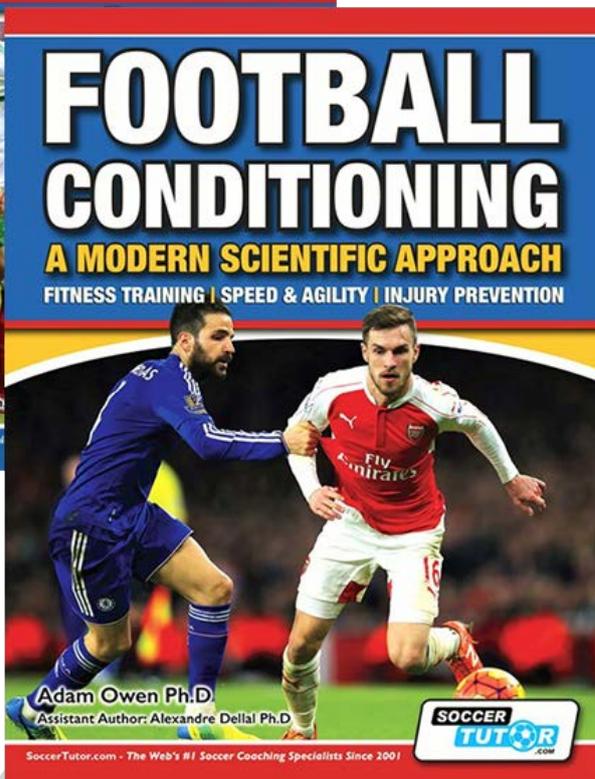
The practice starts with one team keeping possession in an end zone (reds in diagram) and 2 defending players (yellows) move from the middle zone to press and try to win the ball or kick the ball out of play (1 point). If the 2 yellow players are successful then the red and yellow teams switch roles. Play 5 minute periods.

If the reds manage to complete a set number of passes they must then attempt to play a pass to the other side past the mannequins and the 2 yellow middle zone players (who can attempt to stop the ball) or chip a pass over them. If they successfully pass to the team on the other side (blues) they score 1 point and the 2 yellow middle zone players move across to press and try to win the ball (the other 2 yellow players move into the middle zone).

The players are limited to 2 touches throughout.

Coaching Points

1. There should be a constant change over of possession and defending players working into and out of the middle zone - this tests the players' speed endurance and stamina.
2. If the same team are defending for too long, change the roles to allow the players to recover.



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STRATEGIES TO IMPROVE RUNNING ECONOMY

Results from high intensity training studies are unclear, but the best results to improve RE appear to occur when training at near maximal or supramaximal intensities on flat or uphill terrain



The most common strategies used to improve running economy are resistance & plyometric training and explosive resistance training

NUTRITIONAL STRATEGIES
Ingestion of dietary nitrate, especially in the form of beetroot juice, also appears to hold promise as a natural means to improve RE

ALTITUDE
Acclimatisation results in better oxygen delivery & utilisation, mechanisms that potentially could improve RE

STRETCHING
It can improve RE; however, it appears that there is an optimal degree of flexibility and stiffness required to maximise this gain



Reference: Barnes & Kilding
Sports Medicine, August 2014

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REPEATED SPRINT ABILITY (RSA)

Within professional football, *RSA* is associated with the player's ability to reproduce maximal effort sprints over short distances, typically less than 10 seconds in duration and followed by set recovery periods in between repetitions.

Elite professional football players have been observed performing between 8 and 18 sprints during a game (Di Salvo et al., 2009; Bradley et al., 2009; Dellal et al., 2010). The sprints a football player performs during competitive match-play are generally between 10 and 25 metres in length, or 3-5 seconds in duration (Barros et al., 2007). The recent importance placed on reducing both the number, and durations of recovery bouts required within the competitive environment, coupled with the increased emphasis on training specificity, has opened up more discussions and research surrounding the area of *repeated sprint training (RST)* for cyclical repeated sprint sports, such as football (Bompa, 1999; Dupont et al., 2005).

Performance in most multiple-sprint team sports is dominated by technical and tactical qualities of the players involved. Therefore, according to some research, the importance of *RSA* as a fundamental physical variable of team-sport performance has been questioned (Buchheit et al., 2010). However, fatigue development in team sports such as football has been linked with the ability to reproduce sprints. This increase in fatigue is associated with significant reductions in sprint and high-speed running actions observed towards the end of elite football matches (Mohr et al., 2003). The randomised flow of a competitive game leads to numerous periods of intense activities, inclusive of sprinting, which may determine the final outcome of a game through winning or maintaining possession of the ball, or conceding/scoring goals (Trappattoni, 1999). Earlier research has suggested that a ~0.8% reduction in sprint speed can significantly increase a player's probability of losing possession to the opposition when two players on opposite sides sprint to compete for the ball (Paton et al., 2001).

Power Actions in Goal Scoring Situations

Recent literature has attempted to progress this physical-success notion even further through analysing the influence of speed and power abilities in goal situations in professional football. Research by Faude et al., (2012) examined videos of 360 goals in the German 1st division and highlighted the situations immediately preceding the goals. The actions observed pre-goal scoring were categorised as:

- No Powerful Action
- Rotation (Around the Body's Centre-Line)
- Straight Sprint
- Change of Direction Sprint
- Jump
- Any Combination of the Above

The results revealed that 298 (or 83%) of the goals were preceded by a minimum of one powerful action performed by the scoring or assisting player. The most common actions for the scoring player were:

- A straight sprint (161 or 45% of all analysed goals)
- Jumping (57 or 16%)
- Rotations (22 or 6%)
- Change of Direction Sprints (22 or 6%)

Faude et al., (2012) also revealed that most sprints from the 360 goals analysed were conducted without pressure from an opponent (109) and without the ball (121). Additionally, when discussing the role of the assisting player, the most frequent action was:

- A straight sprint (137 or 38%)
- Rotations (28 or 8%)
- Jumping (22 or 6%)
- Change of Direction Sprints (18 or 5%)



It should be noted that straight sprints leading to goals scored for the assisting players were mostly conducted with the ball (93 out of 360 goals). To conclude the work of Faude et al., (2012), straight sprinting is the most frequent action performed by either the assisting or scoring players within competitive match-play situations that lead to goals. Subsequently, it should

be noted that power, speed and most importantly the ability to reproduce sprints to a high level are of paramount importance within decisive situations in professional football and therefore, should be included in both fitness testing and training situations.



KEY POINT:

Power, speed and most importantly the ability to reproduce sprints to a high level are of paramount importance within decisive situations in professional football and therefore, should be included in both fitness testing and training situations.



CHAPTER 3

SPEED TRAINING DRILLS

Sprint, Cross and Finish in a Speed Endurance Circuit



Description

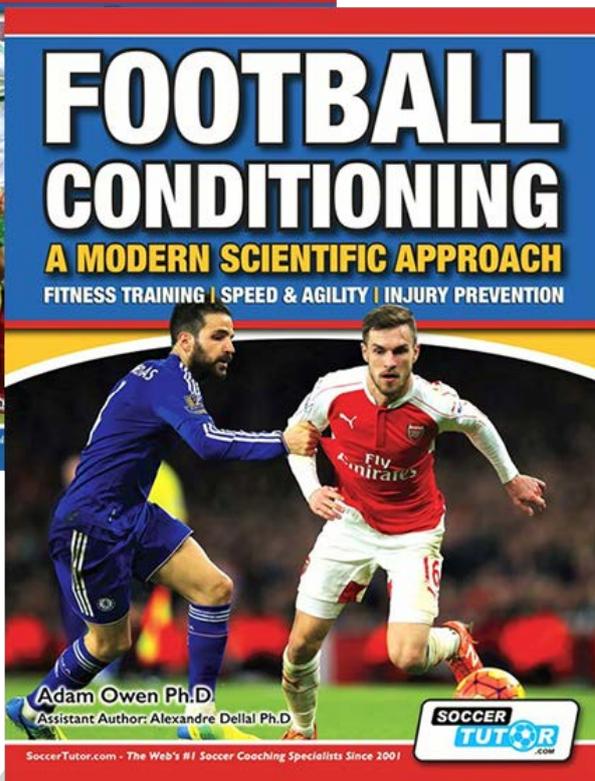
In this practice we have 2 groups (red and blue) who alternate working on the coach's whistle to ensure adequate recovery for the players. This is to maximise the acceleration and sprint work in the session. The players perform 2/3 sets of 4-6 repetitions each.

There are a minimum of 2 players on each station as shown (A, B, C, and D). There is also 1 extra player (feeder) who starts the practice by passing to Player A who moves forward (timing his run) to cross the ball first time. Players B, C and D sprint at maximum speed to try and score past the goalkeeper. At the same time, the 3 players outside the area perform a 30 yard sprint before walking (recovery) to positions B, C and D respectively.

Players B, C and D then walk (recovery) outside the area to perform a 30 yard sprint. Player A moves to the feeder position and the feeder moves to the back of group A.

Coaching Points

1. Players must work at maximum speed throughout all the different movements.
2. Players need to demonstrate good timing, a high intensity/speed of run and technical quality when passing to ensure maximum acceleration.
3. High quality is needed for the technical aspects so the practice maintains rhythm.



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