

## POINT OF VIEW

### USE OF SKILL-BASED GAMES IN FITNESS DEVELOPMENT FOR TEAM SPORTS

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#### Introduction

Team sports such as the soccer, field hockey, handball, netball and basketball are characterised by repeated bouts of high intensity exercise of short duration, with incomplete rest. These bouts are also randomly interspersed with longer periods of low intensity activity or recovery. In addition to repeated sprint ability (RSA), team sports also require highly developed aerobic endurance, speed, agility, flexibility, muscular strength and power for optimal performance (1).

The concurrent development of several physical capacities may result in disproportionate amounts of limited training time being devoted to the physical preparation of the players (2). Unfortunately, for many amateur coaches and athletes, training time is limited due to study, work and family commitments. Consequently, the time available for training is valuable. Therefore, serious consideration should be given to adopting physical training methods that make more efficient use of limited training time. In this article we will discuss some of the advantages of using skill-based conditioning games to improve fitness characteristics for team sport athletes.

#### Traditional approach

The traditional approach of developing team-sport fitness capacities typically involves the use of running drills, using continuous and interval formats of varying duration, as well as the use of cross-training modalities including swimming and cycling. These methods typically require athletes to complete repeated high-intensity efforts or long slow continuous runs in a non-specific and non-competitive environment (3). When using these traditional methods of conditioning, coaches often find it difficult to empower amateur athletes with the extrinsic motivation to train. However, by using skill-based training such as small-sided games, athletes tend to enjoy training more, placing the coach

in the unfamiliar role of having his/her athletes looking forward to 'fitness work'.

#### An alternative approach

Skill-based conditioning games are now commonly used in many amateur and professional level team sports (4-8). We believe that this type of conditioning offers many benefits to team-sport coaches and athletes. In general, skill-based conditioning is highly suitable for team sport athletes due to the optimization of training time, the increased skill requirements during conditioning games, the increased specificity of sport-specific movements (for example, sprints, changes of direction and tackling) and as a method of potentially reducing injuries during training.

#### Combining skills and fitness development

One of the benefits of using skill-based conditioning games is the combination of sport specific skills and fitness. By developing small-sided, sport specific games, athletes are required to think under pressure and execute skills under fatigue whilst competing in a game that simulates the specific movement patterns and intermittent nature of team sports (9). Gabbett (9) suggests that by simulating game-specific pressure situations, such as player on player tagging roles, skill-based conditioning games may become highly specific to competition. Consequently, your athletes may be able perform their skills and communicate more confidently when placed in similar situations during competitive matches.

#### Risk of injury

Coaches that understand the benefit of skill-based games as effective conditioning drills are often hesitant to incorporate them into their conditioning training due to the perceived risk of contact injuries. However, research by Gabbett (10) on rugby league players reported that skill-based conditioning games had lower

injury rates during training (10.7%) than did traditional type of conditioning activities (37.5%). These results suggest that this type of training may reduce the injury rate at training.

Whilst you can never eliminate the possibility of contact injuries in team-sports like football, the potential for injury during small-sided games may be reduced by rule

or equipment modifications. In particular, minimising unnecessary body contacts / collisions and increasing the amount of protective clothing may assist with this. Furthermore, implementing skill-based games that involve physical contact at the start of a training session when your athletes are fresh, may further reduce the risk of injury.

**Advantages of skill-based, small-sided games as conditioning alternatives:**

- Enjoyed by most athletes, especially when given the choice of 'fitness work' or 'games'.
- Challenges the athlete's ability to make decisions under fatigue and opposition pressure.
- Athletes are motivated to participate.
- Train skill components under match specific conditions.
- Development of teamwork.
- Assist in developing game 'intelligence'.
- May allow the head coach to carefully observe an athlete in a game situation and identify a technical deficiency - something that the coach would not be able to detect in generic type training (this happened day before yesterday, in our own training environment!)
- Increased likelihood of transfer of skills to the competitive environment.

**Increased training time at appropriate intensities**

Increases in aerobic power ( $VO_2max$ ) and anaerobic threshold have been shown to improve intermittent sport performance (3,11). It was demonstrated that by increasing both  $VO_2max$  and anaerobic threshold in a group of nine elite junior soccer players over an 8-week period, soccer match performance was increased through increasing the distance covered, work intensity, the number of sprints and involvements with the ball during the game when compared to a control group that did not increase their  $VO_2max$  or anaerobic threshold (3). Similarly, Castagna et al. (11) have recently observed that elite soccer referees with a higher anaerobic threshold cover more distance during a game than those with poorer fitness capacities.

Taken together, these results suggest that intermittent sport athletes may perform better with increased  $VO_2max$  and anaerobic threshold. Therefore, a fairly high percentage of conditioning training time for intermittent sports should be completed at exercise intensities greater than 80% HRmax, to develop these important fitness capacities. Fortunately, when planned effectively, small-sided games can be a valuable method of training at appropriate intensities to improve sports

performance (i.e. 80-95% HRmax), whilst incorporating sport specific skills.

**Implementing the Games Approach for Fitness Training**

Balsom, a sport scientist who previously worked with the Swedish National Football Team, completed a series of acute studies on soccer players where he compared the heart rate response of both generic interval training and small sided games (12). The following logistical and organisational considerations for designing small-sided games for your sport arise from the findings of these studies:

**1. Motivation**

For small-sided games to be completed at sufficiently high intensity, athletes MUST demonstrate a high degree of motivation. To facilitate this, it is important that your athletes clearly understand the objectives of each game. I have found it valuable to give both skill based and fitness objectives for particular drills. Furthermore, educating players about the fitness benefits that can be gained through this type of training also appears to motivate athletes, especially if they are made aware that considerably less generic running sessions may be implemented if the conditioning games

are completed effectively. Finally, ensuring opposing teams are well balanced in terms of athlete ability and that you as a coach are well organised, also assists in increasing training intensity when using skill-based conditioning drills.

## 2. The number of players

By changing player numbers in these skill-based conditioning games, the exercise intensity, level of player involvement and tactical demands will be altered. By including fewer players the exercise intensity for each athlete will be increased, as is the player involvement. Conversely, including more players will decrease the exercise intensity of the game and potentially reduce player involvement.

## 3. Work periods or duration of conditioning games

To get training heart rates to levels that will create an appropriate training effect of  $VO_2\max$  (i.e. approximately 90% of  $HR\max$ ), Balsom (12) recommends that work (playing) periods of between 2 to 4 minutes and passive rest periods of between 30 seconds to 2 minutes should be used. Recently, Fanchini et al. (13) compared the effect of SSG duration using 2-min, 4-min bout and 6-min playing duration in a 3 vs. 3 format. It was found that heart rates responses of bout 1 (2 min) were significantly lower than bout 2 (4 min) and bout 3 (6min). The effect of duration was close to significance for HR ( $p = 0.057$ ) with 6-minute SSG significantly lower than 4-minute SSG ( $p = 0.004$ ). Interestingly, no effect of duration was observed for number of technical actions per minute. Fanchini et al. (13) concluded that the magnitude of changes in HR (89.5 vs. 87.8 of  $HR\max$ ) is probably not enough to induce different training adaptations. Therefore, coaches can use different bout durations with minimal impact on exercise intensity and without compromising technical proficiency. However, when extending the work (playing) period to 10-30 minutes, the training intensity should be reduced to be between 80-85%  $HR\max$ . Coaches can use heart rate monitors or get athletes to take their pulse manually during the breaks to monitor exercise intensity.

## 4. The size of the pitch area

Your choice of playing field size is dependent on the type of sport, aim of the session and the number of participating athletes in your game. Generally speaking, a larger playing field area per player competing will increase the training intensity. However, it is recommended to have your athletes wear heart rate

monitors during these modified games to get an indication of training intensities. You can use cones or existing lines/markings on playing field or court to determine the size of the playing area.

## 5. Rule modifications

The coach can also control training intensity by modifying game rules. For example, applying restrictions like players must run to predetermined markers at the side of the field following touching the ball, or that all players must be in a certain zone for a goal to be scored can increase training intensity. Other rule modifications can be used to increase the specificity of training. For example you may insist that 'X' amount players must be involved in a play before a goal / point can be scored, or requiring that team tactics such as set plays be used during games will increase the game specificity of your drills. The development of sport specific, skill-based conditioning games is limited only by the imagination of the coach. Games can be designed to suit your team goals, playing field availability, weather conditions, expected opposition tactics and the like.

## Limitations

SSGs promotes the development of aerobic power as well as sport specific speed and agility, but not RSA. Recently, Gabbett & Mulvey (2) stated that SSGs do not simulate the repeat-sprint characteristics evident in international matches, so the reader should be cautioned. We believe that SSGs almost certainly contribute to improving aerobic power. However, we doubt that SSGs develop RSA effectively in elite athletes! We certainly would not depend on this training stimulus in its entirety.

## Conclusion

Successful implementation of skill-based conditioning games requires athletes to perform multiple high intensity sprint activities using sport-specific movement patterns. By incorporating skills during SSGs, the athletes may develop greater game sense through increased team work, communication skills and player awareness. Furthermore, the athletes may perform better under pressure situations during matches and develop into tactically smarter players whilst increasing their fitness. Finally, and probably most importantly, most athletes tend to enjoy skill-based conditioning more than traditional fitness conditioning methods.

## Practical applications

The effectiveness of SSGs training for conditioning purposes also depends on the skill level of the players. For amateur players, the fitness requirement for their level of football is lower, and therefore SSGs can be used almost exclusively for conditioning training. However, at both the semi-professional and professional levels, SSGs training should not be relied on solely for effective conditioning. In fact, a recent study demonstrated that the physiological and technical responses of amateur and professional soccer players to SSGs, can differ (14).

Small-sided games should not be viewed as simply another “fitness fad” or “fitness flavour of the month”. Nor should it be viewed as the answer to the problems of conditioning team-sport athletes! The perfect conditioning modality for team-sport athletes simply does not exist. Nevertheless, continual efforts should be made towards developing SSGs as a more “precise” conditioning training stimulus. Ultimately, we should aim to establish SSGs as one of several conditioning tools available for strength and conditioning coaches, particularly for those working with semi-professional and professional team-sport athletes. As a first step towards achieving this, we need to be cautionary about our current levels of knowledge and understanding of these games.

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Recebido em 20/01/2011

Aceito em 20/02/2011