

## SKILL AND GAME-BASED TRAINING AS AN INTEGRAL PART OF VOLLEYBALL CONDITIONING

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### Abstract

Volleyball is an intermittent sport that requires players to compete in frequent short bouts of high-intensity exercise, followed by periods of low-intensity activity. It is an important consideration to optimize skill development in volleyball while still obtaining appropriate level of conditioning. Therefore, a great number of coaches use this type of exercise with great number of digs, attacks, transitions from defense to attack and blocking. The aim of this paper was to show the advantages of specific movements and technical-tactical elements as a part of specific conditioning training in volleyball. The examples of specific exercises were also shown that can contribute to the improvement in conditioning. The advantages of small sided games are reduced number of players which equals a higher number of ball contacts and more quality decisions during the game. Moreover, players become more physically efficient in the smaller area, with more opportunities to learn tactical skills. However, the most important is that children may benefit from this fun and dynamic approach to learning the game of volleyball.

**Key words:** volleyball, training, conditioning, significance

### Introduction

Volleyball is an intermittent sport that requires players to compete in frequent short bouts of high-intensity exercise, followed by periods of low-intensity activity (Viitasalo, et al., 1987). Drawn near, volleyball involves frequent bouts of intense activities such as jumping, diving, and lateral movement, and these activities are coupled with short rest periods throughout a match duration that is typically 60-120 minutes (Sheppard, Gabbett, Taylor, Dorman, & Lebedew, 2007). Volleyball players require well-developed speed, agility, upper-body and lower-body muscular power, and maximal aerobic power (VO<sub>2</sub>max). Considerable demands are also placed on the neuromuscular system during the various sprints, jumps (i.e., blocking and spiking), and high-intensity court movement that occur repeatedly during competition (Hakkinen, 1993). These qualities are the primary focus of the physical training program in most clubs and national teams. However, research evidence has shown that when examining successful selection to a volleyball squad, skill assessments, but not endurance-type fitness tests, help predict selection to the higher or lower group (Gabbett, & Georgieff, 2007; Gabbett, Georgieff, & Domrow, 2007). With this in mind, it is an important consideration to optimize skill development in volleyball while still obtaining appropriate conditioning levels. A common method to accomplish skill development as well as improve conditioning level is skills-based conditioning (also known as games-based conditioning). The use of skill-based conditioning games as training drills allows the simulation of movement patterns of team sports, while maintaining a competitive environment in which athletes must perform under

pressure and fatigue (Gabbett, 2002). Perhaps more importantly, skill-based conditioning games offer an additional challenge to team-sport athletes that would not normally be present in non-skill-related conditioning activities. It is well documented that skills learned under fixed and blocked conditions (i.e., repetitive performance of the same skill under the same conditions before progressing to the next skill) result in greater short-term improvements in performance. (Magill, 2001; Porter, Landin, Hebert, & Baum, 2007; Brady, 1998). However, when tested following a period of non-training, subjects who learned under random and variable conditions (i.e., frequently performing different skills under variable conditions) demonstrated greater retention of skill, indicating greater long-term learning. Furthermore, these improvements transferred to the performance of other similar skills (Magill, 2001).

Studies have assessed the specificity of skill-based conditioning games in a limited number of team sports (e.g., soccer, rugby league, and rugby union). Gabbett (2008) showed that skill-based conditioning games that simulate the physiological demands of competition in junior elite volleyball players offer a specific training stimulus. Gabbett et al. (2006) have concluded that skill-based volleyball training improves speed and agility performance, spiking, setting, passing accuracy, spiking and passing technique, but has little effect on the physiological and anthropometric characteristics of players. They also stated that skill-based training programs should be supplemented with an appropriate amount of energy system training to enhance the physiological

and anthropometric characteristics of talented junior volleyball players (Gabbett, et al., 2006). Having this in mind, the aim of this paper was to show the advantages of specific movements and technical-tactical elements as a part of specific conditioning training in volleyball.

#### *Traditional vs. Skills-Based Conditioning*

Traditional conditioning (i.e., running activities with no skill component) involves the completion of specific repetitions, intensities, distances or durations. An example of traditional conditioning could be:

- Depth jumps (4 sets x 5 reps, 2 minutes rest / set);
- Lateral shuffle (3 sets x 20 reps x 5 m, 1 minute rest / set);
- Linear speed-acceleration (4 sets x 5 reps x 18 m, reps on 10 sec. turnaround, 2 minutes rest / set).

In this example, intensity is easily quantified by using a stop-watch or timing lights to monitor each repetition. The total distance can be used to plan progressions in the training program in regards to volume of work. Although quantifying total work to ensure effective planning and progression is important, this form of traditional conditioning is limiting in that no skill development takes place, only physical preparation.

Skills-based conditioning differs in that it involves outcomes that are focused on skill or game-play, rather than physical based quantification of distances and intensities. Put simply, skills-based conditioning is oriented toward a skill (or set of skills) as the objective, and then the nature of the drill or game is manipulated to achieve a desirable conditioning effect.

Simple example of skills-based conditioning would be:

- lateral movement and block or
- lateral movement and dig drill.

Player is positioned at middle of net, takes rapid lateral step(s) and executes block to stationary ball. Upon landing, player backs off of net and retrieves ball (e.g. pass/dig) that is hit over net by coach/player. In this example, conditioning (through stress) can be achieved by manipulating rest periods, sets, reps, and the nature of the drill (athlete may need to block more than once per rep, cover longer distances laterally to make the block, or make the ball that must be passed harder to retrieve). This basic example of skills-based conditioning involves the pre-planned skill (i.e. 'closed skill') of lateral movement and blocking, and the 'open skill' of moving off of the net and retrieving a ball. The drill can be progressed further so that the lateral movement and block task is an open skill, having the player read and react to a set from the opposing side, and having an attacker (2 or more options) actually hit the ball. The 2nd ball would then be added in so that the blocker had to retreat from the net and dig or pass the 2nd ball (Sheppard & Borgeaud, 2009). The skill-based conditioning sessions included modified volleyball games that also involved a specific conditioning

purpose. For example, small-sided (e.g., 5 vs. 5) games were developed such that players were required to run and touch a marker, placed approximately 3 m from the baseline, each time they touched the ball. In this respect, athletes rarely performed the same skill on 2 consecutive trials, with skills learned using random practice. By using this approach, the skill-based conditioning game became a constantly evolving contest of 2 unequal teams (e.g., 5 vs. 4 or 5 vs. 3), thereby forcing players to quickly touch the hat and re-enter the game to alleviate pressure on teammates (Gabbett, 2008). In team training, a more complex, multi-skill (and open skill) example of skills-based conditioning for volleyball could be:

#### *Competitive drills, 6 vs. 6*

First team to 25, (but scoring starts at 10-10);  
First ball served in and rally played out;  
2nd ball immediately passed in from side of court that lost point and 2nd rally played out;  
3rd ball immediately passed in to side that lost 2nd point and 3rd rally played out;  
The team that wins 2 out of the 3 rallies scores one point. Other scoring variations can be used. 5 seconds rest.

In the above example, the coaches create an emotionally intense environment by implementing a scoring system (playing to 25), with the teams tied at 10-10. It could be viewed that the addition of the second and third ball allows for a conditioning demand that literally exceeds that of a match, in that during a match, rests between rallies are typically 12 seconds or less, but range from 4 to 38. The immediate addition of 2 extra rallies per service allows for both emotional and physiological stress, which was found to be similar in physiological response (heart rate, blood lactate) to that of the most extreme demands of competition.

Although the duration of each individual rally in this drill is not controlled by the coach, total duration of the drill can be recorded to assist in inter and intra-session planning. The total repetitions can be easily quantified by summing the total points played in the rally, then multiplying by the number of rallies per point. For example, in the scenario presented here, 25 – 20 indicates that 25 points were played, and multiplying by 3 rallies per point gives 75 repetitions (Sheppard & Borgeaud, 2009).

#### *Game-based training*

In recent years, an approach called game-based training has been developed in order to combine the skill and conditioning elements in a coordinated approach (Gabbett, 2002; Gabbett, 2003; Gamble, 2004; Nurmekivi et al., 2002; Sassi, Reilly, & Impellizzeri, 2004). Young players often find it hard to support the traditional fitness training, because of a lack of enjoyment and experience with this type of exercise (Wall & Côté, 2007). The key problem of training in sports games is to find the right relation between match performance and training load (Reilly & Bangsbo, 1998).

The use of games in training is based on the premise that the greatest improvements in performance occur when the physiological demands and movements patterns replicate the demands of the sport (Rushall & Pyke, 1990). At the moment, in training process, complex game like drills and preparatory games require participation and the close cooperation of more players or the whole team respectively are preferred. Drills conducted in this way have complex character stimuli, which lead to an increase in effectiveness and game like situations' solution stability and which can also contribute to fitness development and maintenance (Lehnert, Stejskal, Háp, & Vavák, 2008). Aforementioned authors conducted a study with aim to find out the level of load represented by two different preparatory games' versions. They found out that the training preparatory game represented a stronger training stimulus in terms of inner load compared to preparatory competitive game. However, they concluded that the average HR values of the whole group do not give a proper view of the load of particular players with possible source of error in training control. Some studies showed significant improvements in physical fitness with game-based training of short duration (Impellizzeri et al, 2006), while others have found improvements in physical qualities when using longer duration games (Gabbett, 2006). It is obvious that further research investigating the training-performance relationships of gamebased training and traditional conditioning activities are needed. At present, although relatively few studies have investigated the effectiveness of game-based training, most have reported that it offers coaches an effective method of conditioning for team-sport competition.

#### *Small-sided games*

Sport games represent a high-strategy sports in which sport-specific declarative and procedural knowledge are of crucial importance for sport performance (Abernethy, Thomas, & Thomas, 1993). Some studies have compared the effectiveness of the traditional technique approach and the game-based instructional model on game performance in school settings (Kirk & MacPhail, 2002). Although the traditional instructional model might be effective in improving technical skills, it has been criticized for the loss of the contextual nature of the skills in sport games (Turner & Martinek, 1995). One study in volleyball (Griffin,

Oslin, & Mitchell, 1995) showed that declarative knowledge was significantly higher in a group of students taught with a game-based instructional approach compared with a technical teaching approach and a control group. The concept and motive behind the use of small sided games is a reduced number of players equals a higher number of ball contacts, and consequently a greater number of learning opportunities. Several studies showed the physiological impact of small-sided games on diverse team sports. However, studies that have assessed the specificity of small-sided games in volleyball are limited. Gabbett (2008) showed that skill-based conditioning games that simulate the physiological demands of competition in junior elite volleyball players offer a specific training stimulus. The goal of small sided game is to be of particular use for junior, youth and young adult players. However, the long term plan should be to develop a full pathway of modified games so that new or younger players can move through the various formats ending up at the 6 v 6 game with a fully developed range of the required tactical and technical skills.

#### **Conclusion**

To conclude, game-based training appears to be an effective way of improving explosive strength in adolescent volleyball players. The advantages of small sided games are reduced number of players which equals a higher number of ball contacts and more quality decisions during the game. Moreover, players become more physically efficient in the smaller area, with more opportunities to learn tactical skills. However, the most important is that children may benefit from this fun and dynamic approach to learning the game of volleyball.

Skill and game-based conditioning are increasingly being used as a means of improving performance of athletes from skill-based sports. Without proper planning of the conditioning training in pre-season, volleyball players will most likely be confronted with decrease in power performance during in-season period. It could be concluded that much knowledge is needed for a skill-based conditioning program to be implemented in volleyball conditioning. One of the conditions is that coaches understand the specific demands of volleyball, especially metabolic and biomechanical.

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