



# Hockey

## Conditioning For Field Hockey

### *Small Side Games to Improve*

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**I**mproving endurance has been shown to improve performance in soccer (5), whose movement requirements are similar to field hockey (10). This is achieved by increasing the distance covered during a game, enhancing work intensity, and increasing the number of sprints and ball involvements in a game (5).

Small sided games are essentially condensed versions of the full game, and can be utilized in many sports in addition to field hockey. They characteristically involve fewer players than are used in a traditional game, and are played on a reduced sized playing area. A field hockey small sided game may involve two teams of four players on a half pitch area. Additionally, skill development drills can be developed into a small sided games format. In these smaller sized games, the number of player movements and skill actions per time period increases substantially.

Specificity is a key training principle, and the use of small sided games allows for endurance to be developed in the key movement patterns of field hockey. Specificity of movement patterns will include speeds of movement, directions of movement, types of movements (e.g. backpedals, side-shuffles, etc), and duration of movements. Traditional running patterns often do not reflect the constant changes of motion involved in the game, and Spencer et al (10) recommend that it may be more appropriate to perform more frequent changes of motion in future simulations of team sport activity, which the small sided games approach provides.

Additionally, in small sided games, the movements are all carried out with a stick and in hockey specific body positions, which can all increase energy expenditure (9). Additionally the use of small sided games can negate the need for long steady state runs, which can be counterproductive to speed development. The small sided games approach

provides the most efficacious method of replicating the movement patterns of field hockey.

Heart rate has been shown to be a good indicator of estimating energy expenditure in hockey (2). Heart rate data collected with small sided games reveals that a variety of work intensities can be elicited via this approach (7) and that these heart rates are maintained throughout the games. They provide a training stimulus similar to that elicited by interval training (6), which is generally regarded as the optimal method of developing the key endurance parameters. The approach has been shown to be effective in rugby and soccer, and currently is used by a number of top soccer clubs, and countries (1, 4).

### **Classifying Small Sided Games**

A vital part of any endurance program is that it addresses the key energy patterns of the game. Thus a vital part in setting up the small sided games program is ensuring that the appropriate energy systems are addressed via the utilization of the correct exercise intensities. To assist in this, a classification system has been developed that classifies games into a number of types (8).

### **Medium Intensity Training Games**

These involve moderate intensities of work, with a heart rate of between 60 – 80% of maximal heart rate (MHR). While some anaerobic bouts are present, as with all the games, the main goal of this type of game is to stress the aerobic

system. Therefore, game durations are longer than for the higher intensity games (greater than five minutes). These are predominantly used in early pre-season workouts, or on light recovery days during the season.

### High Intensity Games

Here the goal is to develop high end aerobic power. Heart rates are higher than medium intensity games, averaging 85 – 95% MHR. Work durations are therefore shorter than for medium intensity games, and vary between two to five minutes.

### Maximal Intensity Games

Here the goal is to train repeat sprint ability, while developing the ability to recover. Work intensity is very high, averaging 95% or more of MHR for the duration of the game. Games are short in duration, two minutes or less, and involve high intensity bouts of activity interspersed with short periods of active recovery within the game. This will simulate the highest intensities experience during periods of a field hockey match.

In general the game activities can be summarized as in table 1.

### Choosing the Games

Just as with all fitness components, it is important to have a number of games in the exercise battery. Each game can have key improvement goals in both the conditioning and skill areas, and an appropriate game can be selected for the specific session (e.g. a dribbling based game, a passing based game, etc). Once the game is selected, then other variables can be applied to ensure that the specific conditioning goals of the session are met.

Examples of games are highlighted below

### Mini Hockey (Figure 1)

This game has a traditional field hockey set up, but uses a reduced size pitch. Player numbers vary from six per side (moderate intensity) to three per side (high intensity).

### Four Corners (Figure 2)

This game uses four goals positioned at each corner of the mini pitch. The additional goals increases the distance that defenders need to cover, hence increasing the work rate. It also assists attackers in the concept of switching play from side to side. Again player numbers can vary from six per side (medium/high intensity) to three per side (high to maximum intensity).

### Possession Zone (Figure 3)

In this game the objective is to retain possession and score points by passing to a teammate in one of the two neutral zones. Four players are placed in four neutral zones outside the main playing area, while two teams work in the playing zone. Two of the neutral players play with one team, and the other two with the second team. The teams attempt to score points by passing the ball to one of their teammates in the neutral zone.

Figure 1. Mini Hockey



Figure 2. Four Corners



Table 1. Classification of small sided games

Type of Game	Percent of Maximum Heart Rate	Single Game Duration	Work to Rest Ratio
Medium Intensity	Up to 85%	5-10 minutes	1: 0.5-1
High Intensity	85% – 95%	2 – 5 minutes	1 : 1-1.5
Maximal intensity	95% +	Up to 2 minutes	1 : 1.5-3

Neutral zone players should be rotated or ideally comprise players resting from previous games. Player numbers normally vary from four (high intensity) to two (maximum intensity).

### Back to Back (Figure 4)

In this game two goals are placed back to back, with one team scoring in one goal, and the other scoring in the second goal. Players should be encouraged to all enter the opposition half before a goal can be scored. Normal hockey rules can be applied. Player numbers vary from six per side (medium/high intensity) to three (high to maximal intensity).

### Dribbling Powerball (Figure 5)

In this game two pairs of players are involved, with the objective of dribbling the ball between coned “gates” in the playing area. The gates should be approximately two feet wide.

One player in the pair is an attacker for the first repetition and the other is a defender. Two nests of balls are located at each end of the playing area at points A and B. Pair one start at nest A, and pair two start at nest B, with the defenders staying within the playing area. The attacker takes a ball and attempts to dribble it through as many gates as possible before losing possession, scoring a point for each gate completed. The defender in the meantime attempts to tackle the player and/or put the ball out of play. Once the attacker loses possession they run to the opposite nest and pick up another ball. This continues for the duration of the drill. On the second repetition the players swap roles (i.e. the initial attacker becomes the defender and vice versa).

### Adapting the Games

The small sided games can alter both training volume (altering the sets and repetitions as in a traditional interval program) and exercise intensity (appropriate manipulations of the chosen game). In addition, work rest ratios can be set out as outlined in table one, to ensure that the appropriate energy system is trained. Thus, via careful manipulation of other variables, the same basic game can have a number of differing results.

The key methods of game manipulation are:

#### Player numbers

By changing the number of players the intensity of the game can be significantly changed. In general as the number of players is reduced the intensity of the game is increased.

#### Playing area

There is no set playing area in small sided games, and so a range of areas can be used. In general the larger the playing area the more intense the activity. Care must be taken in this generalization as in certain types of games, a playing area too large may drop the exercise intensity as players may have too much time with the ball, and thus may be able to slow play down.

#### Ball feeds

Ball feeds are one of the most effective ways of increasing exercise intensity as they essentially remove the “down period” of exercise when balls are out of play, etc. Each time the ball goes out of play, or into the goal, another ball can be fed in to keep the game moving. This results in a constant flow to the play, and thus an increase on the physical demands of the game.

Figure 3. Possession Zone

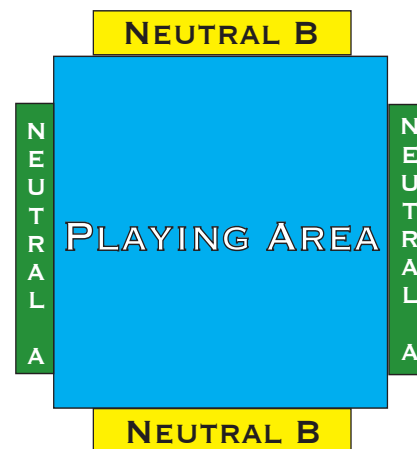


Figure 4. Back to Back

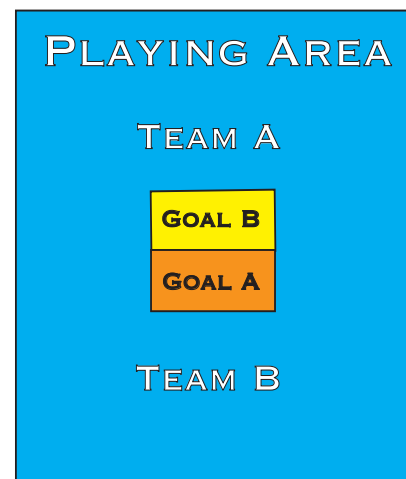
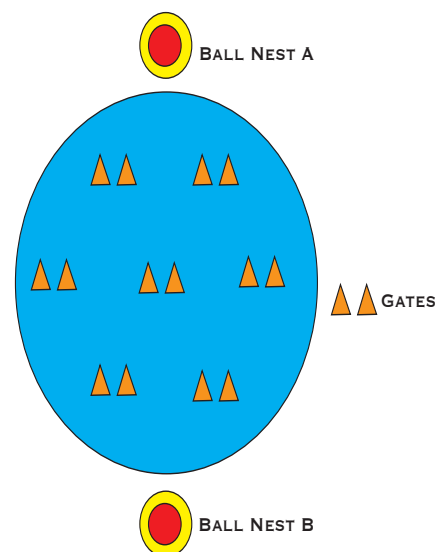


Figure 5. Dribbling Powerball



### Rule adaptations

Manipulation of the rules of the game can elicit changes in exercise intensity. Examples can include limiting the number of touches a player has in possession, being less stringent on foot contact, removing goalkeepers, etc.

### Setting Up the Program

In setting up the session the following guidelines outlined can be followed (8):

1. Establish any hockey skills to be trained.
2. Establish the energy system to be trained.
3. Select an appropriate game, including number of players and playing area size.
4. Establish the timings of the game (i.e. game duration, number of repetitions, and work to rest ratio).
5. Apply any specific game adaptations (e.g. specific rules, ball feed methods, etc).

### Additional Advantages of the Small Sided Games Approach

The ability to combine skill training with endurance training can be a major bonus for many programs, especially where time is a key element. By combining skill development with endurance training, the total training load can be reduced, and/or more time can be devoted to training other key fitness parameters such as speed, agility, and strength. In addition, the ability to carry out skills under conditions of fatigue can be developed.

By replicating game type situations and by the using a range of games, variety can be brought into your training program. The skill and competition elements of

this approach are likely to enhance effort and compliance to the program (3), which can result in greater training returns.

### References

1. Balsom PD. (2005, May). Intermittent exercise. Presented at the UKSCA Conference, Loughborough, England.

2. Boyle PM, Mahone CA, Wallace WF. (1994). The competitive demands of male field hockey. *Journal of Sports Medicine and Physical Fitness*, 34(3):235-241.

3. Gabbett TJ. (2002). Training injuries in rugby league: An evaluation of skill based conditioning games. *Journal of Strength and Conditioning Research*, 16(2):236-241.

4. Gamble PA. (2004). Skill based conditioning games approach to metabolic conditioning for elite rugby football players. *Journal of Strength and Conditioning Research*, 18(3):491-497.

5. Helgurud J, Engen LC, Wisloff U, Hoff J. (2001). Aerobic endurance training improves soccer performance. *Medicine and Science in Sport and Exercise*, 33(11):1925-1931.

6. Hoff J, Wisloff U, Engen LC, Kemi OJ, Helgerud J. (2002). Soccer specific endurance training. *British Journal of Sports Medicine*, 36(3):218-221.

7. Jeffreys I. (2004). The use of small sided games in the metabolic training of high school soccer players. *Strength and Conditioning Journal*, 26(5):77-78.

8. Jeffreys I. (2004). Classifying and using small sided games for soccer endurance. *Performance Conditioning Soccer*, 10(3)1- 3.

9. Reilly T, Seaton A. (1990). Physiological strain unique to field hockey. *Journal of Sports Medicine and Physical Fitness*, 30(2):142-146.

10. Spencer M, Lawrence S, Rechici C, Bishop D, Dawson B, Goodman C. (2004). Time motion analysis of elite field hockey, with special reference to repeated sprint activity. *Journal of Sport Sciences*, 22(9):843-850.

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