Post-match Recovery Practices

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Recovery from competition is one aspect of athlete preparation that should receive increased attention from coaches. When recovery from competition is improved, athletes are able to train sooner and with better quality than when either no or inappropriate recovery practices are completed.

What needs recovery?

The goal of recovery after competition for team-sport athletes should be to restore the body and mind back to pre-game levels in the shortest possible time. During competition, team-sport athletes can become fatigued physically, metabolically and mentally. Recovery strategies should focus on reversing or minimising these sources of fatigue. Example strategies will be discussed in this article.

Rehydration

For athletes who regularly train, any loss of fluid from one session can compromise performance in subsequent sessions if fluid is not replaced. Research from a variety of team sports shows that fluid losses during match play are usually between 600-1400 mL/hr^{-1} (Broad et al. 1996). These values are typically higher when sports are played in hot and humid conditions. As a priority in the recovery process, the goal for athletes in team sports should be to restore whole body fluid balance after exercise. When undertaken correctly, appropriate rehydration will replace the volume of fluid lost during competition and also the electrolytes (mostly sodium) lost in sweat.

The simplest method of achieving this for individuals is to weigh the athletes (nude or undergarments and towel dried) before and after a match. The loss in body mass during a match should be replaced before the next exercise session. In addition to this amount, extra fluid should be consumed so that urinary losses during this 'refueling phase' are also replenished. Sports drinks are a suitable fluid recovery; however, there are now commercially available recovery drinks that are specifically formulated to supply carbohydrates and proteins.

- A simple rule is to replace up to 150% of body mass lost during a match.
- For example an athlete weighing 80kg pre-match, weighs in at 79kg post-match (i.e. 1kg loss). This player should aim to drink and eat *1kg times 150% = 1.5kg*, over a period of time post-match.
- Fluid replenishment should largely consist of plain water and a single bottle of energy drink (i.e. Gatorade) or electrolyte drink to replenish sodium lost through sweating if needed.

Carbohydrates

Team-sport athletes can be depleted of their fuel sources during competition (Saltin 1973). Studies have shown that during a soccer match, muscle glycogen stores (the primary fuel for exercise in team sports) are usually depleted up to 75% during a match (Bangsbo 2000). Since carbohydrates are the primary source of energy in training and competition, it is important that these losses are replaced before the next training session. To assist with this goal, the following recommendations are made:

- Team-sport athletes should consume as much carbohydrate as practical as soon as possible after a match. A basic rule is for every kilogram of body mass a person should ingest 1.0-1.2g of carbohydrates per hour. For example an 80kg person should consume 80.0-96.0g of carbohydrates per hour (see Table 1).

- Athletes should choose liquid or solid forms of carbohydrates that are more palatable
- Muscle carbohydrate can be replenished either in a large meal or in smaller snacks.
- Athletes may add some protein with carbohydrates after games to improve post-game muscle resynthesis.
- Carbohydrates of moderate to high glycaemic index should be consumed during the recovery period (for example, white bread, watermelon, raisins, soft drinks, lollies or sports drinks) (Burke, Kiens and Ivy 2004).

For compliance, a team approach to carbohydrate and fluid replacement is recommended for recovery immediately after matches. We suggest that athletes consume foods that provide a combination of carbohydrate, protein, vitamins and minerals.

Physiological recovery

High levels of muscle damage occur in team sports. When muscle fibres are damaged they become tender, sore and stiff. This damage is commonly referred to as delayed onset of muscle soreness (DOMS). DOMS usually appears 24 to 48 hours after games or intense exercise. In an attempt to reduce DOMS, many sporting teams commonly complete a post-match active recovery session. The full value of these sessions is yet to be determined scientifically, but their popularity and continued use suggest that athletes and coaches consider them important in the recovery process. The most common activities for recovery sessions are low-intensity swimming, walking and cycling. Quite often these recovery sessions are completed in a pool or at the beach. It is believed that these 'active recovery' sessions increase the removal of metabolic waste products such as lactate, hydrogen ions and potassium that are produced during team-sport matches. Accelerating the removal of these metabolites may reduce post-match recovery time.

Well-known Australian recovery expert, Angie Calder (2000), suggests that active recovery also assists with increasing blood supply to the fatigued muscle in addition to assisting neurological (nervous system) recovery. Further research still needs to be conducted to determine the efficacy of these methods of recovery.

A viable alternative for recovery activities for team-sport athletes are contrast immersion (hot-cold), cold treatment and/or water massage (Cochrane 2004). Research suggests that these methods may improve recovery after matches by reducing the initial stages of injury/micro injury, stimulate blood flow (heat treatment) and also reduce swelling (cold treatment). It is thought that the pumping effect of hot-cold treatments assists in removing metabolites and reducing the inflammation and swelling that are common after matches. Other effects such as slowing metabolism and speeding the repair of damaged fibres may also be involved. However, regardless of these mechanisms, these treatments definitely feel good and this benefit alone may assist in the psychological recovery of team-sport athletes after the game.

Social recovery

Competition usually represents the end of an arduous training week. Quite often social activities, either completed as a group or individually, can be used to 'freshen up' athletes. However, coaches sometimes forget to plan for social recovery. This type of recovery refers to the quality of time spent away from competition and training. Social activities (for example movies, reading, socialising with friends etc.) can be useful for lifting the moods of athletes (Calder 2000). Research examining changes in psychological responses to over-reaching in a rugby league team (Coutts and Reaburn 2008) found that when performance was

reduced at the end of a heavy training period, players also reported a decrease in the frequency of partaking in social recovery activities. We have also observed similar results with over-reached triathletes (Coutts, Wallace and Slattery 2007). This suggests that coaches should allow athletes sufficient time away from training so that social activities can be completed. These social activities may facilitate recovery and therefore improve subsequent training and match performance.

Table 1: Comparison of Different Energy Products on the Market

Product (Drinks)	Carbohydrate	Protein	Sodium	Sugar	Fat
Gatorade 600mL	36.0g	0.0g	306.0mg	36.0g	0.0g
Gatorade (Carbohydrate Energy Formula) 355mL	79.0g	0.0g	350.0mg	43.0g	0.0g
PowerAde Recovery 450mL	33.0g	7.6g	133.0mg	26.0g	0.0g
PowerAde Isotonic 400mL	46.0g	0.0g	167.0mg	36.0g	0.0g
Coca Cola 390mL	41.0g	0.0g	39.0mg	41.0g	0.0g
Coca Cola (Zero) 390mL*	0.4g	0.2g	43.0mg	0.0g	0.0g
Musashi P30 Shake 375mL	27.7g	30.0g	187.0mg	18.0g	1.12g
BodyScience Nitrovol 80g	34.7g	34.86g	115.2mg	12.67g	1.98g
Product (Snacks)					
Musashi Bulk Protein Bar 80g	6.0g	27.0g	184.0mg	2.8g	5.8g
PowerBar Performance Bar 60g	41.0g	8.0g	230.0mg	22.0g	3.0g
BodyScience Protein Bar 65g	6.83g	26.0g	143.0mg	6.7g	5.01g
Products (Gels)					
Carbo Shotz Energy Gel 45g	29.8g	0.0g	36.0mg	5.6g	0.0g
PowerBar Gel 41g	27.0g	0.0g	200.0mg	10.0g	0.0g
BodyScience Energy Gel 45g	29.4g	0.9g	109.0mg	13.2g	0.0g

*Note minimal carbohydrate and protein content

Suggested routine – post-match recovery strategy

Listed below are basic recovery practices that can be completed by a team participating at any level. This routine has been structured so that the body can be rehydrated, energy stores can be replenished and muscle can be repaired at an improved rate.

1. Start drinking cool carbohydrates/sports drinks immediately on entering the change rooms. This should continue throughout the recovery session.

2. Have carbohydrate-protein snacks readily available for consumption (for example, meal supplement drinks, sports bars, salad and meat sandwiches).

3. 5-minute walk/jog/stretch routine as soon as practical after the players return to the change rooms.

4. 15-minute recovery circuit, alternating between contrast and active groups:

a contrast: hot shower (37-43℃)/ice bath (12-15℃). Hot-cold contrasts should be completed at a ratio of 3:1 (hot:cold).

b active: bike/walk/stretch at low intensity.

c groups to rotate after approximately 6-minutes.

d all players finish with a 2-minute ice bath (12-15℃).

5. Have athletes bring food packs for post-match and have them consume them before leaving after a match.

6. Ensure that the post-match snack consists of carbohydrates that have a high glycaemic index.

7. A post-match meal (that is, 2-3 hours post-game) should also consist of high glycaemic index carbohydrates. Some good examples of these meals are rice dishes, pasta and/or white bread with protein (for example, meat, chicken, etc.)

8. Some athletes have difficulty eating soon after matches, therefore a meal replacement drink (for example, Sustagen or Protein Plus) can be useful.

Summary

Competition in team sports usually leaves athletes depleted of carbohydrates, dehydrated, with increased levels of muscle damage and feeling psychologically fatigued. Through careful planning and proper implementation of a simple recovery routine, your athletes can refuel and recover their bodies and minds at an improved rate. Accelerated recovery may allow for improved performance during subsequent training sessions and future games.

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