

Recovery strategy

Hong Kong Sports Institute

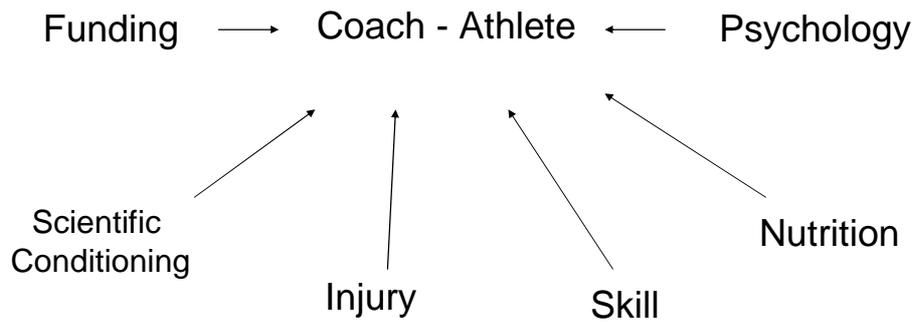
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Bio-Psycho-social model

Stress:

- Biological
- Psychological
- Social
 - Athletic Affairs Department
 - Hostel

Multi-Disciplinary Team Approach



Quantification of stress

Scientific training

Training monitoring

Sport Nutrition & Monitoring Centre



Sport Biochemistry Unit

- Training Monitoring
 - Complete blood count*, CK, urea*, uric acid*, plasma osmolality*, testosterone*, cortisol etc
- Health Monitoring
 - Iron status*, lipids*, urine analysis etc

*nutrition related parameters





Training zone	Lactate (mM)	Heart rate (bpm)	Continuous vs. intermittent	Main purpose
1. Recovery	< 2	< 130	C	<ul style="list-style-type: none"> To maintain general fitness To help recovery from intense training
2. Aerobic power	2 - 4	130 - 170	C	<ul style="list-style-type: none"> To improve lactate removal
3. Anaerobic power	4 - 8	170 - 190	C or I	<ul style="list-style-type: none"> To improve lactate removal To increase MVO_2
4. Anaerobic endurance	> 8	Close to max.	I	<ul style="list-style-type: none"> To get used to work under high lactate level To be able to sustain work at high intensity
5. Phosphate system		> 170	I – short effort, long recovery	<ul style="list-style-type: none"> To develop the phosphate system
6. Weight training			I	<ul style="list-style-type: none"> To develop muscle strength and endurance To reduce injury

Table 3.11 Training conditions for different wind speeds

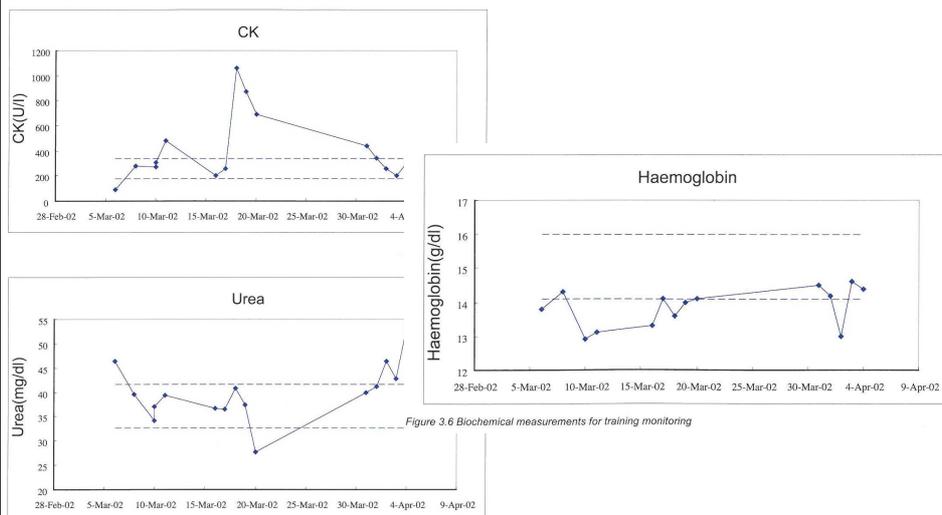


Figure 3.6 Biochemical measurements for training monitoring

Major nutrition related issues in HK athletes

- Age range (~15-30 yrs)
- Weight control
 - Gain lean mass
 - Lose fat
 - Make weight for competition (rowing, windsurfing, karatedo etc)
- Competition Nutrition
- Dehydration
 - ↑osm/ urine sg
 - Adapting to different environments (i.e. altitude)
 - Euhydration before and after exercise
- Recovery nutrition
- Low ferritin/ low Hb
- High urea (maybe due to inadequate CHO intake, prolonged exercise where protein is used as fuel, excessive protein intake)
- Guidelines on use of supplements
- Eating out and traveling guidelines

Recovery Nutrition

Major goals of nutrition recovery

- Restoration of muscle and liver glycogen storage,
- Replacing fluid and electrolyte losses,
- Repair and regeneration of skeletal muscle damage

Recovery Nutrition

- **Research Title: Survey of Nutritional Recovery Strategy Use by Asian Elite Athletes**
- Aim: to determine the use of nutritional recovery strategy in Asian elite athletes, what and why they choose different types of food or nutritional supplements.

Athletes' Foodservice

- Sport Nutrition Monitoring
 - Approve the menu
 - Develop nutrition cards
 - Suggest suitable foods items (seasonal, sports performance related)
 - Regular meetings with Catering Unit
 - Conduct athletes' satisfaction survey

肉類及代替品 Meat & Alternates		
翠塘滑豆腐		
Steamed Bean Curd and Egg with Seafood		
蛋白質來源 Source of Protein	少油 Less Oil	
含鐵質 Contains Iron		
營養素 Nutrient	1 勺 (125 克) 1 scoop (125 g)	每 100 克 Per 100 g
熱量 (千卡) Energy (kcal)	165.5	132.4
碳水化合物 (克) Carbohydrates (g)	7.9	6.3
蛋白質 (克) Protein (g)	16.6	13.3
脂肪 (克) Fat (g)	7.5	6.0
鐵 (毫克) Iron (mg)	2.0	1.6
鈣 (毫克) Calcium (mg)	367.0	293.6

註: 此食品含有蝦、蛋和貝類海鮮, 對蝦、蛋和貝類海鮮敏感人士應避免進食。
Remarks: This food contains shrimp, egg and shellfish. People who are allergic to shrimp, egg and shellfish should avoid this dish.

Athletes' Foodservice

- Breakfast (7-9:30)
- Lunch (11:30 – 14:00)
- Dinner (17:30 – 20:00)
- Special arrangements outside service hours
 - Early risers (before 7:00)
 - Late comers (after 21:00)



Nutrition Supplement Program

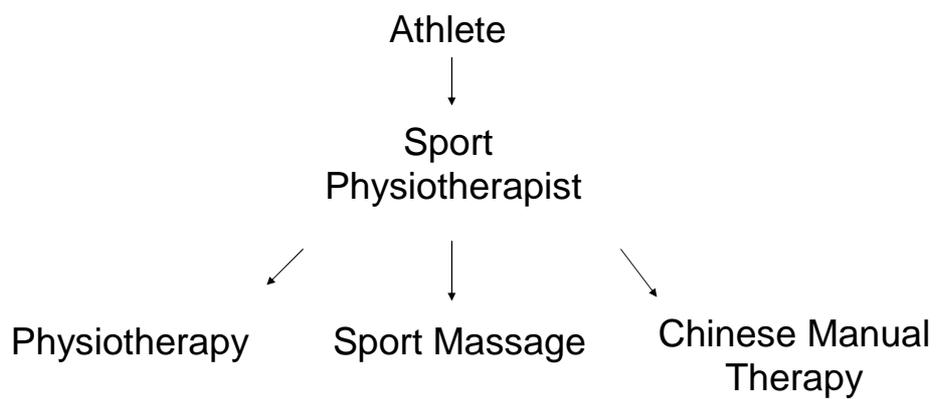
- Centralized Purchasing and inventory keeping
- Suitable supplements for each athlete in need (training and competition)
- Better control of usage, minimize wastage
- Be able to provide the most appropriate and safe supplements to athletes
- Athletes will be informed accurately about how to use the supplement, how it works and the possible side effects, if any.



On Field Support



Sports Medicine Centre



Sport Physiotherapy

- Heat
- Cryotherapy (Ice bag / immersion in cold bath on target area)
- Radial Shockwave therapy
- Acupuncture

Sport Massage

- Pre-Exercise massage
- Pre-Event (15-20mins)
- Intra-event
- Recovery (90mins)
- 1-3 times (30-60 mins) / week

Chinese Manual therapy

- Palpation
- Fixed-point manual technique
- Moving-point manual technique
- Shaking, tapping and pulling

Recovery Centre

Jacuzzi

Underwater jet massage (36-37°C) three times per week for one week enhanced the maintenance of strength and power and reduced delayed onset muscle soreness



Sauna

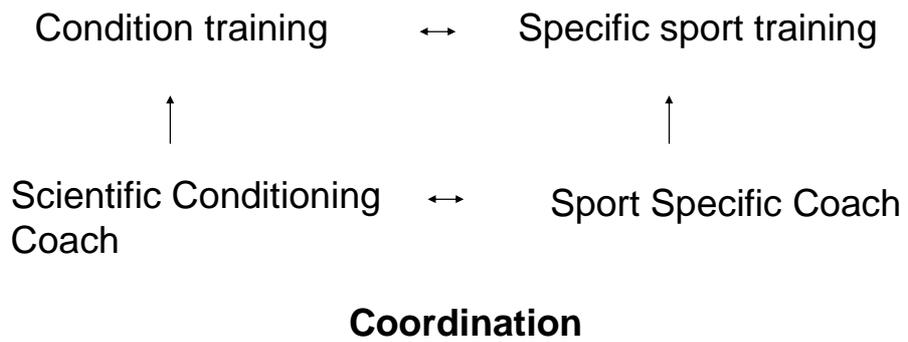
Saunas are often used by athletes with the belief that saunas will induce perspiration (thereby decreasing levels of toxins in the blood), increase blood flow and reduce muscle tension.





Scientific Conditioning Centre

Training plan arrangement



Heat

- Hong Kong Observatory
- Subscribers of the system will receive notifications via sms when WBGT ≥ 30.1 °C and when API ≥ 101 in Shatin and the related precautions.
- The data update every 30min



Scientific Conditioning coach

- Training monitor – every session / every period of time
- Training record – data base
- Stretching
 - Flexibility test
 - FMS







Application

- Athletes in Triathlons, Badminton, Squash, Swimming, Cycling
- *Hyperbaric oxygen condition was set at 1.27 ATA (4 PSI) with 80-85% oxygen.*
- 3 times a week and mostly 60 min for each session

Psychological Recovery Strategies

Psychological assessment & monitoring

Objective indicators:

- Critical Flicker Frequency (CFF)
- Reaction Time(RT)
- Attentional Test
- ERP&EEG

Psychological assessment & monitoring

Critical Flicker Frequency (CFF)

- Frequency of a light stimulation at which becomes perceived as a stable and continuous sensation
- Marks & Bornstein (1973) found that with flicker frequencies ranging from 20 to 35 Hz
- The CFF will decrease when athletes feel fatigue

Psychological assessment & monitoring

Reaction Time (RT)

- Reaction time is the elapsed time between the presentation of a sensory stimulus and the subsequent behavioral response
- RT will decrease if athletes are extremely fatigued in mentality

Psychological assessment & monitoring

Attentional Test

- attention is the processing of selection and focus
- the attentional ability will be impaired if athletes are mental fatigue

Psychological assessment and monitoring

- Questionnaire:
 - ❖ Profile of Mood States(POMS)(Morgan, 1980)
 - ❖ Athletes Burnout Questionnaire(ABQ)(Raedeke&Smith, 2001)
 - ❖ The Recovery-Stress Questionnaire for Athletes , (RESTQ76-Sport) (Kellmann, Kallus, 2001)

Methods of recovery in psychology

- relaxation skill training
- mindfulness training
- cognitive reconstruction (CBT)
- change the training environment

Psychological methods of recovery

Relaxation skill training

- Autogenic training
- Biofeedback training
- HRV training
- Functional music relaxation

Methods of recovery in psychology

Mindfulness training:

- reduce the stress in meditation
- living in the present by focus on every moment of doing

Methods of recovery in psychology

Cognitive construction:

Cognitive Behavioral Therapy

Thank you!