

Sports Medicine System at Hong Kong Sports Institute

Raymond So, PhD

Director of Elite Training Science & Technology
Hong Kong Sports Institute



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Hong Kong Sports Institute (HKSI) is the region's pioneer and leading elite sport training systems delivery agent. HKSI is committed to provide an environment in which sports talent can be identified, nurtured, and developed to pursue excellence in international sporting arena.

HKSI uses the multi-disciplinary biopsychosocial model to formulate its support strategy in order to provide science-based, athlete-centred support for elite training.

The Elite Training Science and Technology Division (ETSTD) of the HKSI consists of 6 centres :

- Scientific Conditioning Centre
- Sport Biomechanics & Technology Centre
- Sport Nutrition & Monitoring Centre
- Sport Psychology & Monitoring Centre
- Sports Medicine Centre
- Sports Information Centre

The Sports Medicine Centre plays an important role in providing scholarship athletes with well-rounded medical services, including injury prevention, diagnosis, treatment and rehabilitation. With the ultimate goal to enable them to achieve excellence in sports.





Development of Sports Medicine Centre

- Early 80s-90s Provision of limited physiotherapy, general medical and orthopaedic consultation. The success of gold medallist Lee Lai-shan at the 1996 Atlanta Olympics greatly boosted the development of elite sports in Hong Kong, further paving the way for sports medicine development
- 1997 Introduction of Chinese manual therapy
- 2001 Team up with Sports Hospital, General Administration of Sport of China, HKSI elite athletes can take advantage of the service of the nation's professional consultation system
- 2003 Employment of full-time sport massage therapists
- 2006 Collaboration with School of Chinese Medicine, Hong Kong Baptist University to provide quality Chinese medicine treatment for elite athletes, and to explore the application of Chinese medicine on elite sports training, injury and strength recovery.
Elite Athletes Chinese Medicine Clinic was setup in 2010

Development of Sports Medicine Centre

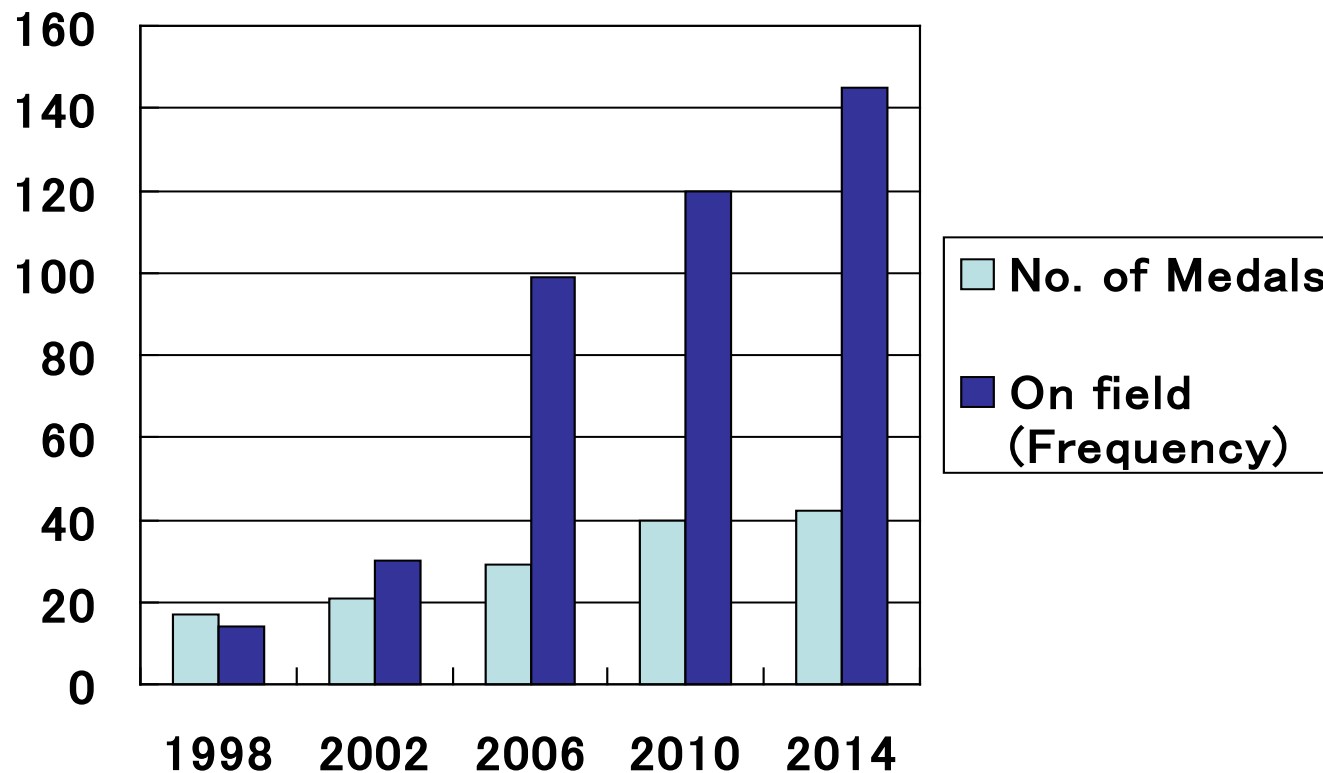
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|------|---|
| 2007 | Fostering collaboration with Chengdu Sport University |
| 2010 | Provision of service with Sauna Room, Jacuzzi in Recovery Centre |
| 2011 | HKSI Restructuring, Sports Medicine Centre officially established |
| 2012 | Set up Sports Medicine Clinics |
| 2013 | Employment of full-time Chinese Medicine Practitioner |
| 2014 | <ul style="list-style-type: none">• Employment of full-time nurse• Team up with Union Hospital for provision of emergency medical services to athletes |

Characteristics and Establishment of Sports Medicine System at HKSI

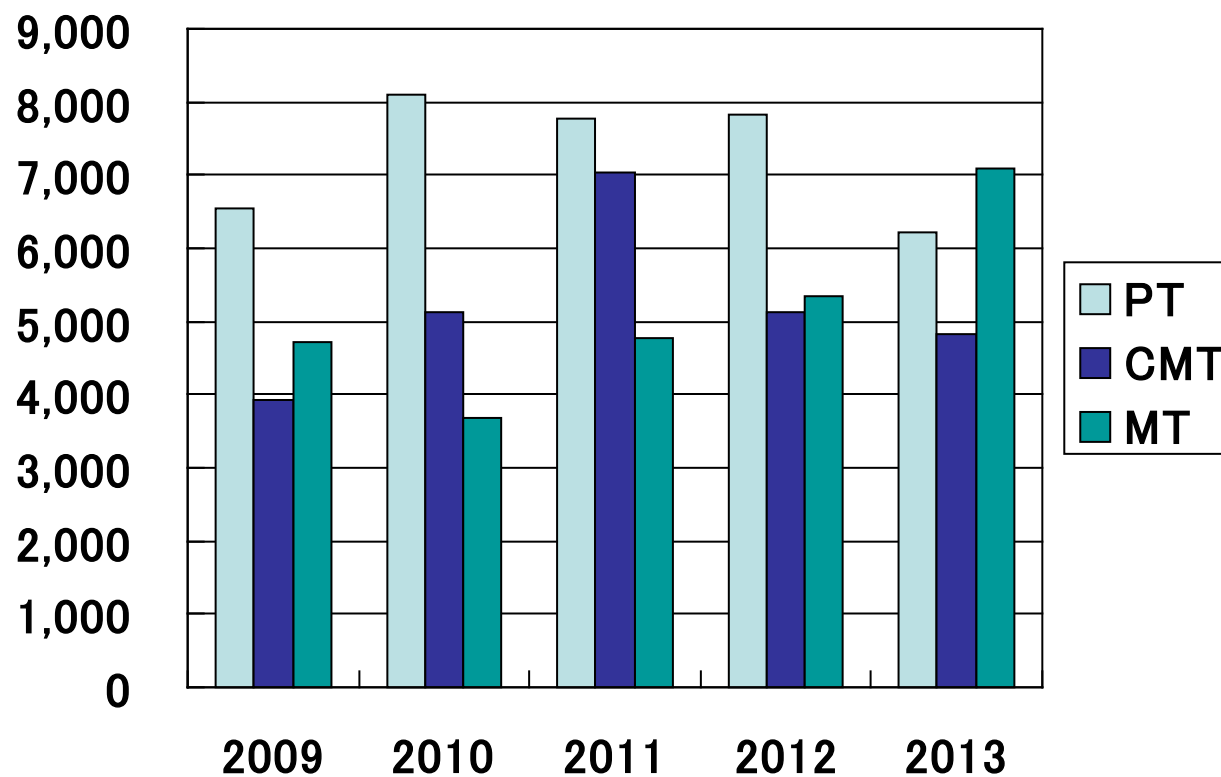
Through the years, HKSI has developed a comprehensive sports medicine support system, providing well-rounded prevention, medical consultation, treatment, recovery and rehabilitation services, as well as sufficient overseas on-field support. Distinctive features includes:

1. Modern medical sciences with the incorporation of traditional Chinese medicine; sports physical therapy integrated with Chinese manual therapy
2. HKSI-based service, foster exchange and collaboration, quality of service concern and cost saving

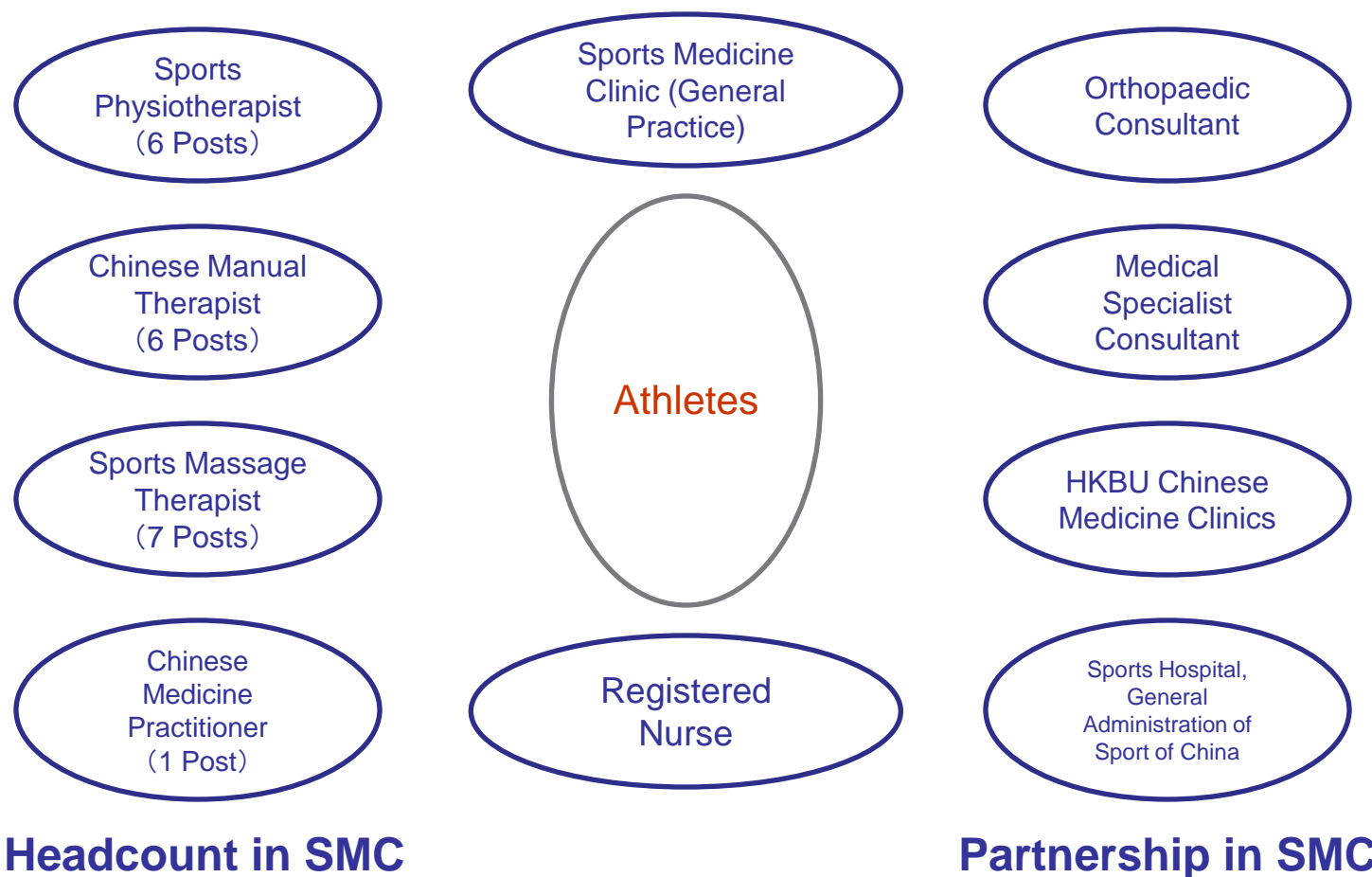
Number of Medals and Frequency of On-field Services for Hong Kong team at past Asian Games



Treatment Statistics for past 5 years

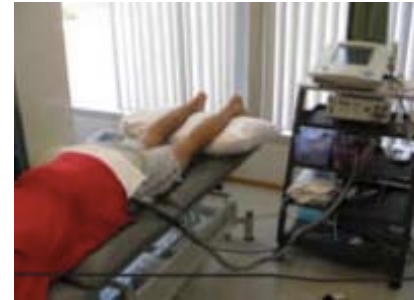


Organisational Structure and Function of Sports Medicine Centre



Functions of Sports Medicine Centre

1. Out-patient services
2. Vaccination for athletes
3. Sports injury treatment
4. Sports recovery training
5. Sports rehabilitation
6. On-field support



Responsibilities of Therapists at Sports Medicine Centre

Physiotherapist:

Responsible mainly for physiotherapy, collaboration with surgeon on consultation, treatment and recovery training

Manual Therapist:

Responsible for partial treatment and sports rehabilitation

Sport Massage Therapist:

Responsible mainly for sports rehabilitation and management of the Recovery Centre
(Sauna Room, Jacuzzi)

Chinese Medicine Surgeon:

Responsible for Chinese medication and management of Chinese medicine consultation

| Services | Opening Hours |
|---|---|
| General Out-patient Consultation | Mon, Tue, Thu, Fri: 2pm – 4pm |
| Orthopaedic Specialist Consultation | Wed: 6pm-8pm |
| Nursing Care and Vaccination | Mon-Fri: 2pm-6pm |
| Sports Physiotherapy | Mon-Fri: 9am-8:30pm ; Sat: 9 am – 1:30 pm |
| Chinese Manual Therapy | Mon-Fri: 9am-9:30pm; Sat: 9am- 6pm |
| Sports Massage Therapy | Mon-Fri: 10am-9:30pm; Sat: 9am-6 pm |
| Chinese Medicine Consultation | Mon-Fri: 9am-8:30pm; Sat: 9am-1:30 pm |
| Sports Rehabilitation (Sauna, Jacuzzi) | Re-development In Progress |

Opening hours during public holidays: 9am-6pm

Operation of Sports Medicine Centre

Clients:

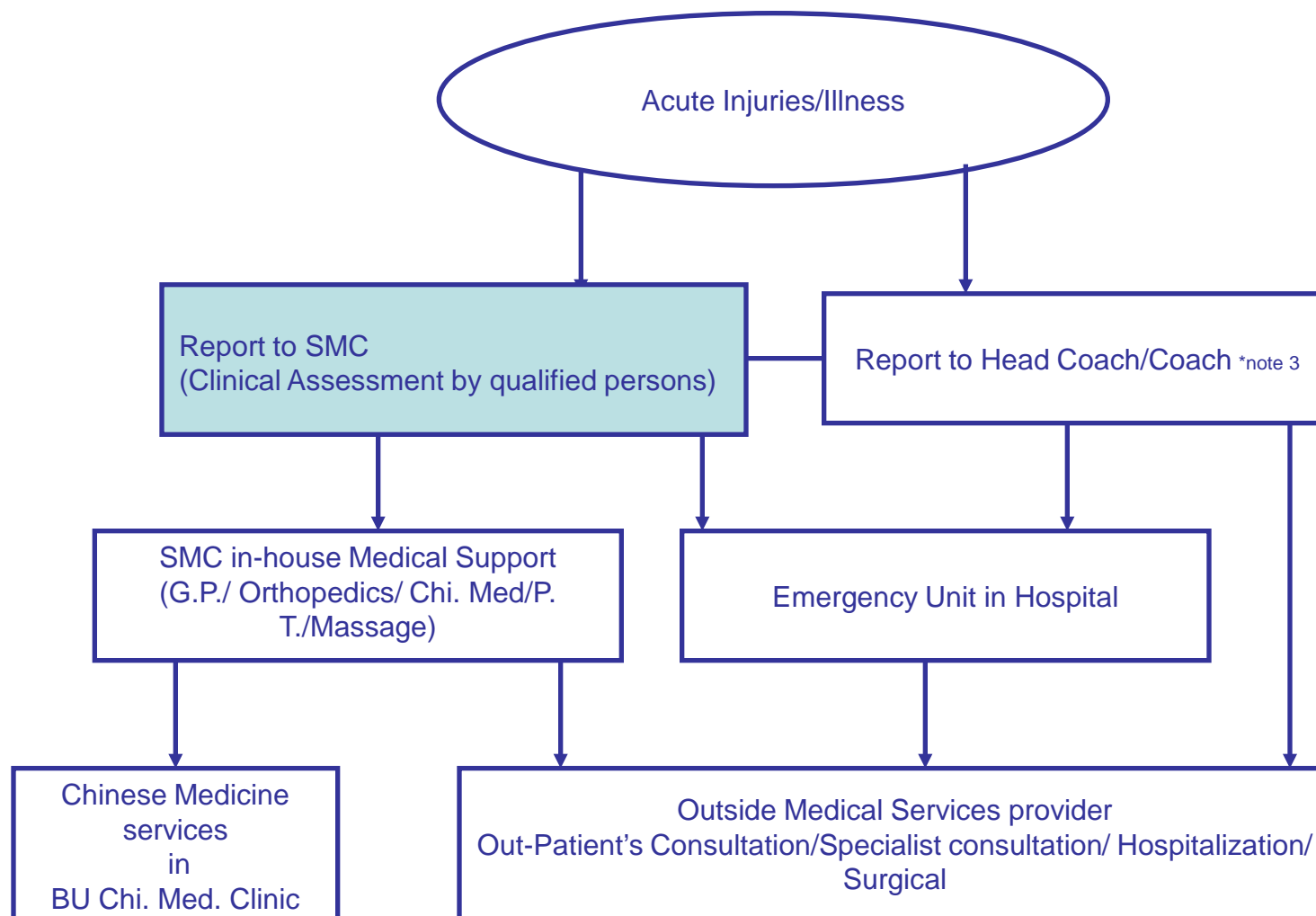
Service provided only for some 700 athletes at HKSI's 16 Tier A*/Tier A sports and sports supported under Individual Athletes Support Scheme, including 300 full-time athletes.

Service Model:

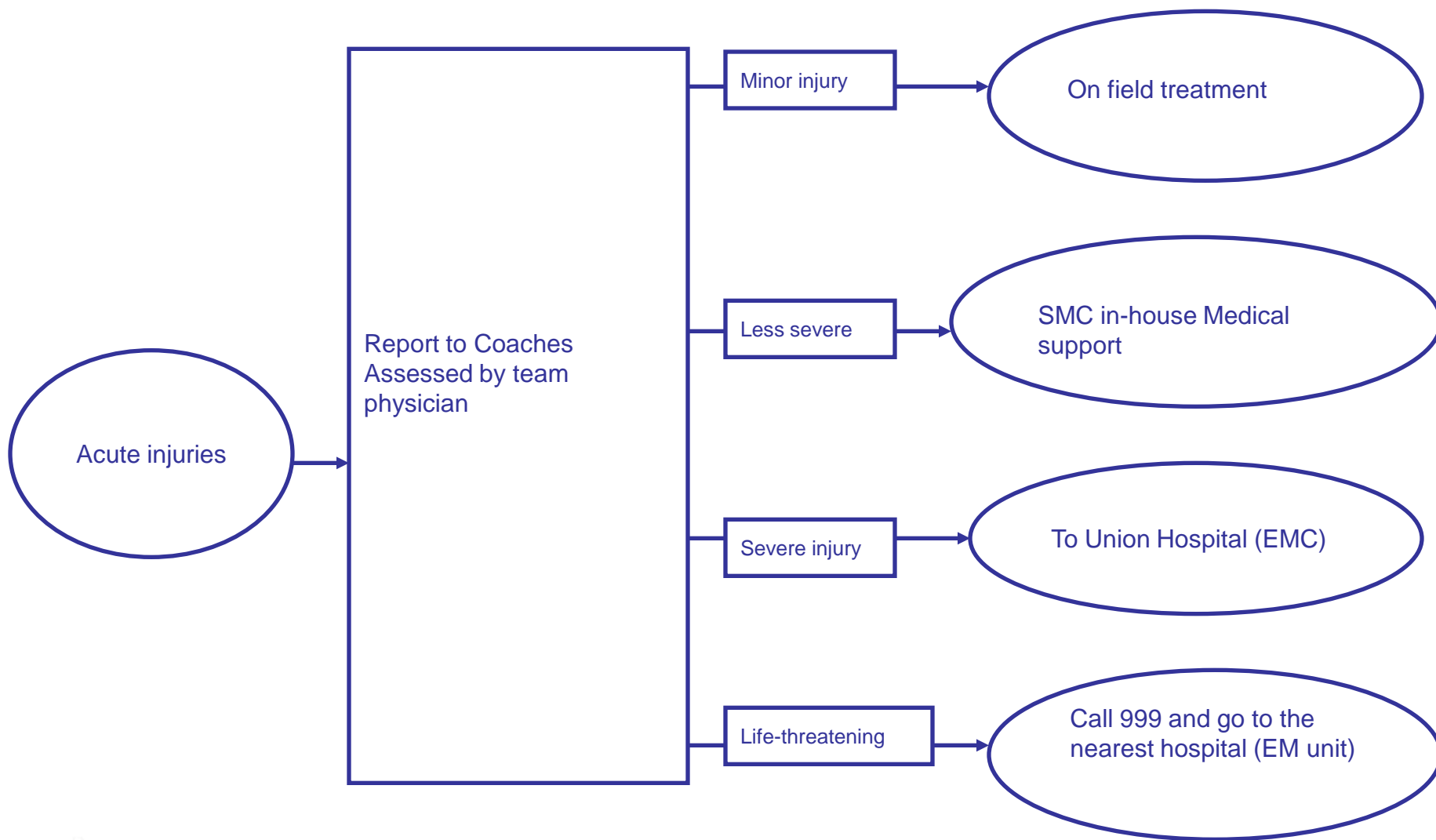
Medical service is mainly provided in the Sports Medicine Centre. The Centre also allows on-field support arrangement as a supplementary service. Athletes can make prior booking for their medical service before visiting the Centre. On-field support services will be provided based on the training and competition needs. Annual on-field support arrangement will be submitted by Head Coaches for preliminary evaluation at the start of the year. Final confirmation will be ready before the competitions. Sports teams can submit application for assistance from specific therapist and personnel.

Each sports comes with dedicated therapist who coordinates the communication between athletes and coaches, oversees also other therapist's treatment, rehabilitation and on-field support services.

HKSI Scholarship Athletes Incident Processing Procedure



Guidelines for management of sports injury (HKSI Rugby Team)



Guidelines for management of sports injury (HKSI Rugby Team)

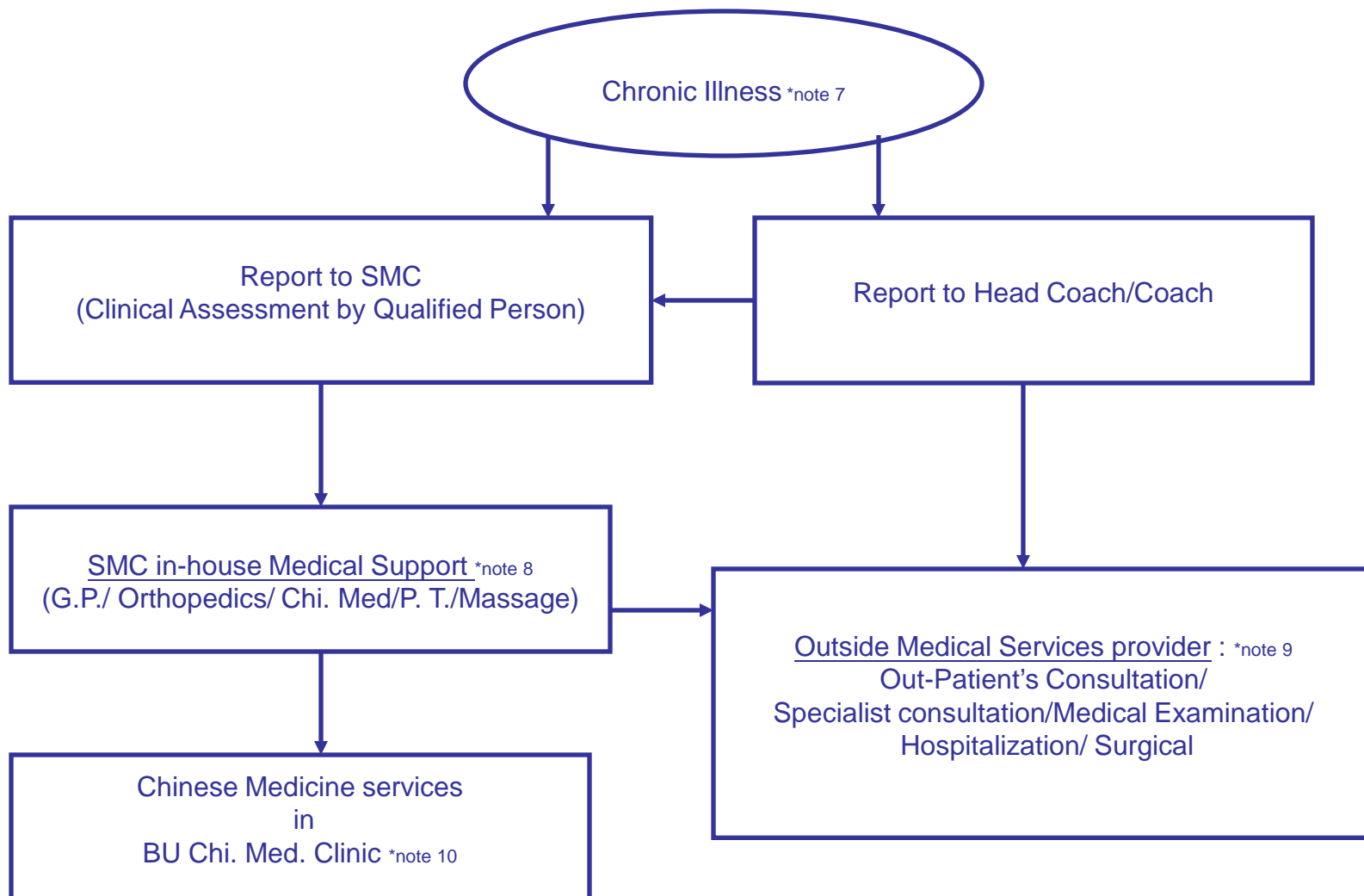
For minor and less severe injury:

- Team physician can monitor these injuries and manage using R.I.C.E. regime
- Coaches can refer injured athlete to HKSI Sports Medicine Centre(SMC) for clinical assessment, medical consultation and treatment.

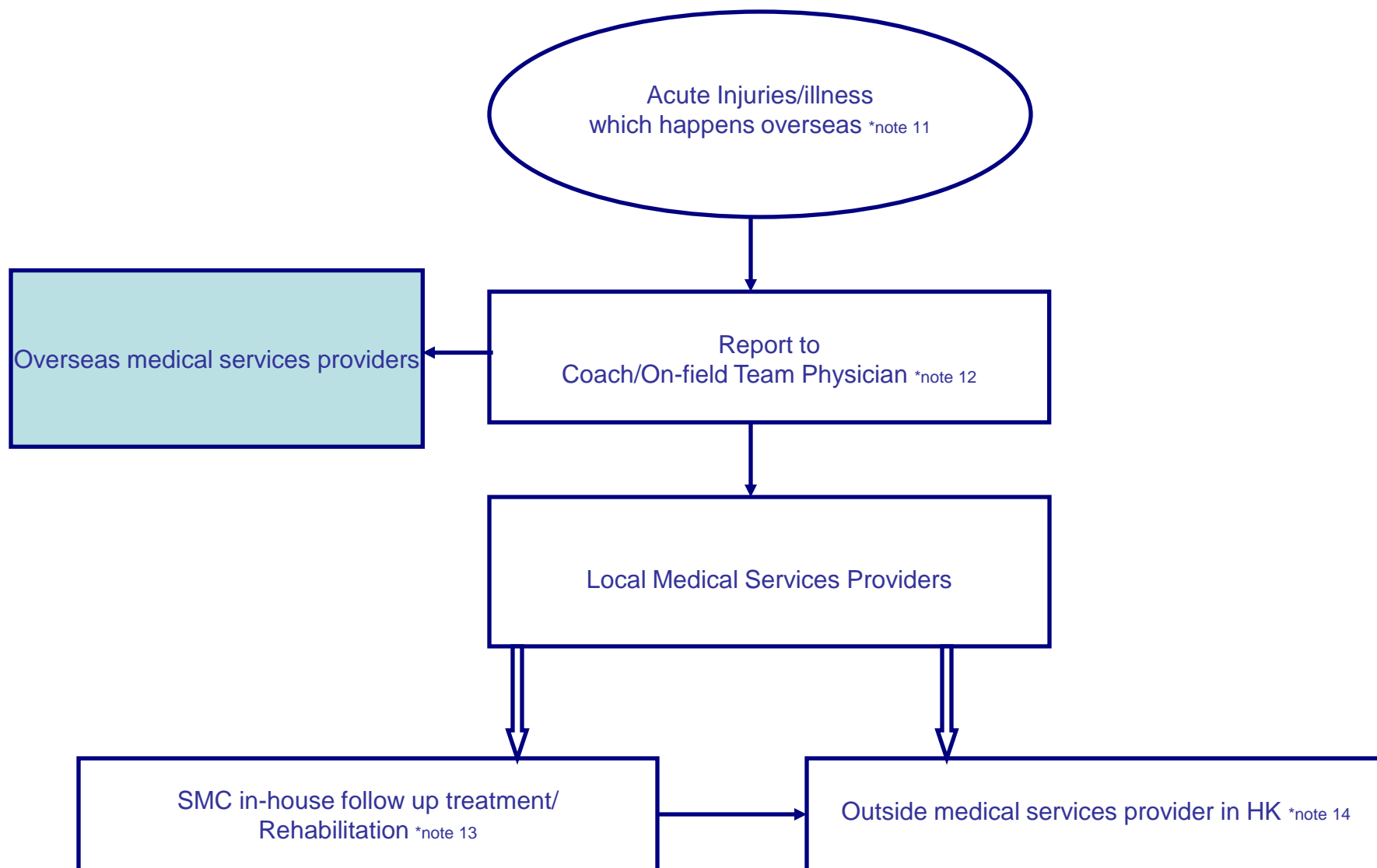
For severe injury:

- Including serious and potentially life-threatening injuries, but status not expected to deteriorate significantly over several hours, injured athlete will be transfer to HKSI's partnership hospital-----
 - **Union Hospital's Emergency Medicine Centre(EMC):**
- Before admitted to the EMC, Injured athlete should inform SMC On-field Team Physician or HKSI Designated Personnel.
- SMC On-field Team Physician is Mr. ____ (MP: _____)
- Designated Personnel is HKSI Sports Medicine Manager or his delegate.
- The contact person of Union Hospital will be informed once the Athletes are permitted to go to EMC.
- The Athletes can go to the Hospital by all means of transportation.
- Upon arrive at the EMC, the Athletes are required to present a valid Athlete Card and the Hong Kong I.D. card for verification of identity.
- For specialties or other medical services or admission to the Hospital, the Athletes should inform the Designated Personnel, Guarantee Letter for the Hospital will be issued if he consent.
- The Athletes can be discharged cashless from the Hospital with HKSI Designated Personnel's consent and his Guarantee Letter.

HKSI Scholarship Athletes Incident Processing Procedures



HKSI Scholarship Athletes Incident Processing Procedures



Insurance Coverage

Hospitalization and relevant

Accidental and relevant

- by outside Insurance Company

Out-patient

- By HKSI

Recovery

- Sports Massage Therapist
- Chinese Manual Therapist
- Recovery Centre



桑拿房



按摩池



按摩椅



冷凍池

Rehabilitation Plan: Principles

- Accurate diagnosis of the injury
- Investigation regarding the functional biomechanics causes of the injury
- Plan of treatment for returning the athletes to former specific sport functions

Rehabilitation Plan: Goal

- To resolve the clinical symptoms and signs
- To restore function
- To decrease the chance of recurrent injury
- To lead to the establishment of a rehabilitation program

Evaluation



Consultation



Interventions

- Manual therapy
- Electrotherapy; Hot/Cold Therapy
- Exercise therapy
- Acupuncture
- Taping & Bracing
- *GP, Ortho: Medication/Injection/Surgical intervention*
- *CMT: Chinese Manual Technique*



Rehabilitation

- Strength
- Flexibility
- Balance
- Joint sense
- Muscle Control
- Agility



Sport Massage

- A technical massage especially catered to athletes mainly to control soft tissues which include the skins, muscles, tendons, ligaments and muscle membrane.

Chinese Medicine Practitioner (CMP)

- Acupuncture
- Acupressure
- Cupping
- Gua sha
- Moxibustion



Chinese Medicine Clinics, School of Chinese Medicine, Hong Kong Baptist University

- Herbal treatment is needed, HKSI CMP will refer them to the BU CM Clinics
- CM practitioners in both parties will share opinion, experience and treatment modalities
- Doping
- Tonic soup

On-field support



Injury Prevention

Annual medical check up

- Medical history: injuries, illness or medical problems
- Family medical history
- Medical and orthopedic examination
- Laboratory tests: lung function, blood
- Physician advice on participation

Musculoskeletal Screening (MSS)

- Inflexibility
- Muscle length imbalance
- Muscle strength weakness
- Force couple imbalance
- Faulty mechanics
- Faulty patterns of neuromuscular control

Motion analysis

Running biomechanics assessment

Similar to all other sports activity, running activity has been associated with an increase in the number of injuries. Biomechanical evaluation of running has the potential to identify risk factors and contribute to prevention of running injuries. The identification of aberrant joint motion during gait is difficult and requires a developed observational skill, and if possible, the assistance of a digital video camera for motion capturing and slow motion playback. It is important to observe gait for any deviation from the ideal pattern of motion. Sagittal, coronal planes are easily captured in clinical setting and their motion analysis has been intensively studied in various literatures. There are three main biomechanical abnormalities affecting the lower limb: excessive pronation, excessive supination and abnormal pelvic movement.



Figure 7.5 Excessive pronation in running

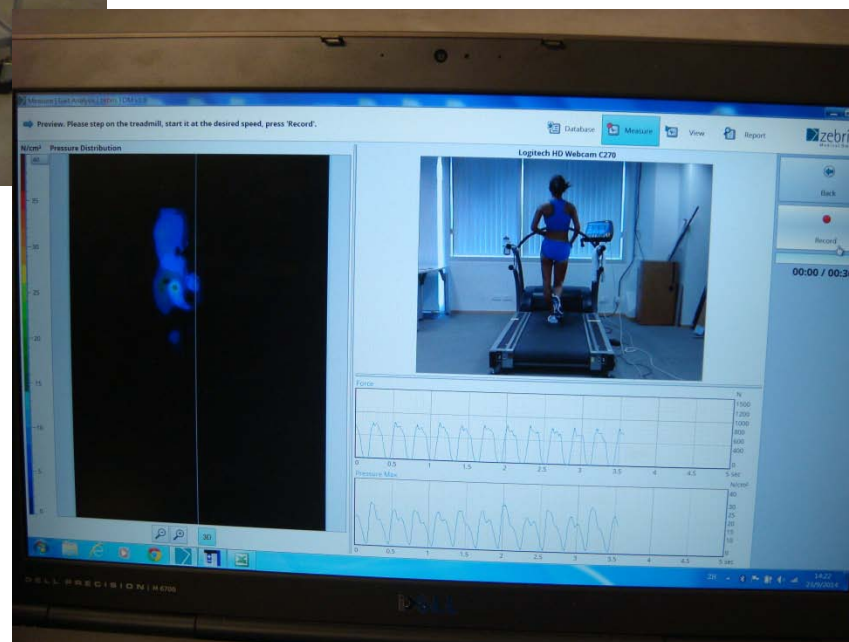


Figure 7.6 Excessive supination in running



Figure 7.7 Excessive pelvic tilting in running

In collaboration with Sport Biomechanics Centre



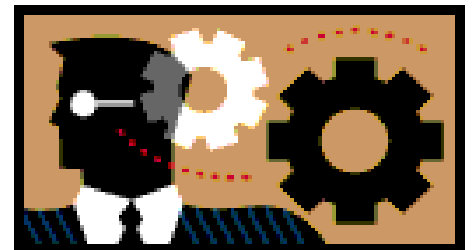
Karatedo

Training and Injury



Common Problem

**Feedback from the musculoskeletal screening test
in Oct 2009**



Common Problem

Flexibility

Focus on shoulder, elbow, hip+thigh and ankle.

Shoulder:



External rotation.

Elbow:



Hyperextension

Hip:



*Tightness of hip flexors limit
hip extension in lunge pose.*

Advice on injury prevention

Proper stretching strategy

Stretching

Pre and Post Exercise Static then Dynamic stretch for warm up

Control movement
sport specific gradually increase range,
strength and speed

NO BOUNCING

*Static stretch or other form of exercise for
cool down*



Multi-disciplinary Communication System for Athletic Injury

Director of Elite Training Science & Technology of HKSI is responsible for coordinating the provision of sports medicine, sports psychology, physical training and sports nutrition services. Under the following circumstances, multi-disciplinary consultation system will take effect on the integrated support for injury treatment, rehabilitation and psychological treatment.

1. Serious sports injury or illness
2. Sports injury or illness for those athletes who perform well in the international competitions
3. Potential individual or team medalists during the preparation for the Asian Games and Olympic Games

The system will be working inside HKSI

Seek help from international experts where necessary.

Scientific Conditioning Centre





Comprehensive testing on specific sports

BMX, cycling

- muscle activation;
- speed & terrain by GPS;
- HR & lactate

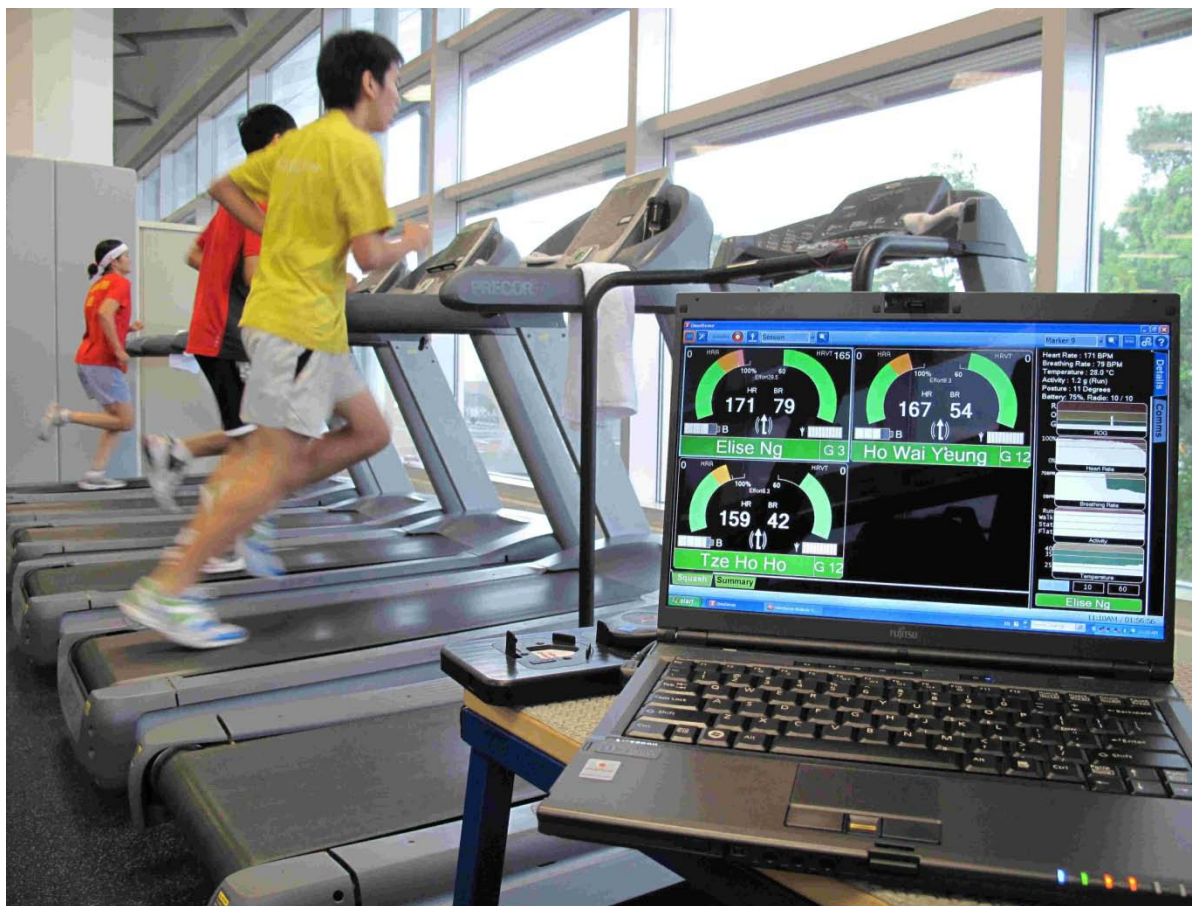


Other sports :

Snooker/pool; Rowing



Heart Rate Monitoring



Training monitoring on athletes around the world....



Qatar – Asian Games 2006

Qingdao – Olympic Games 2008





| 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 MVO₂ |
| 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

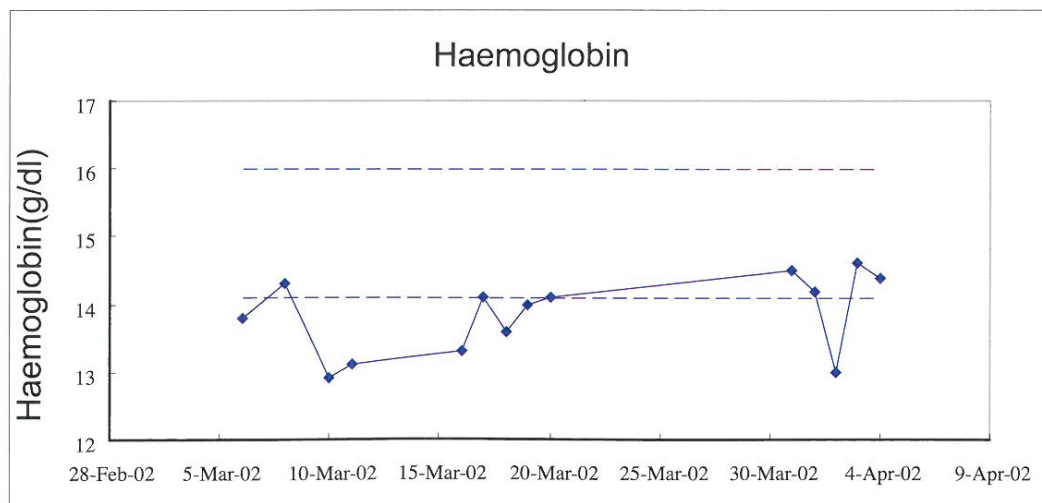
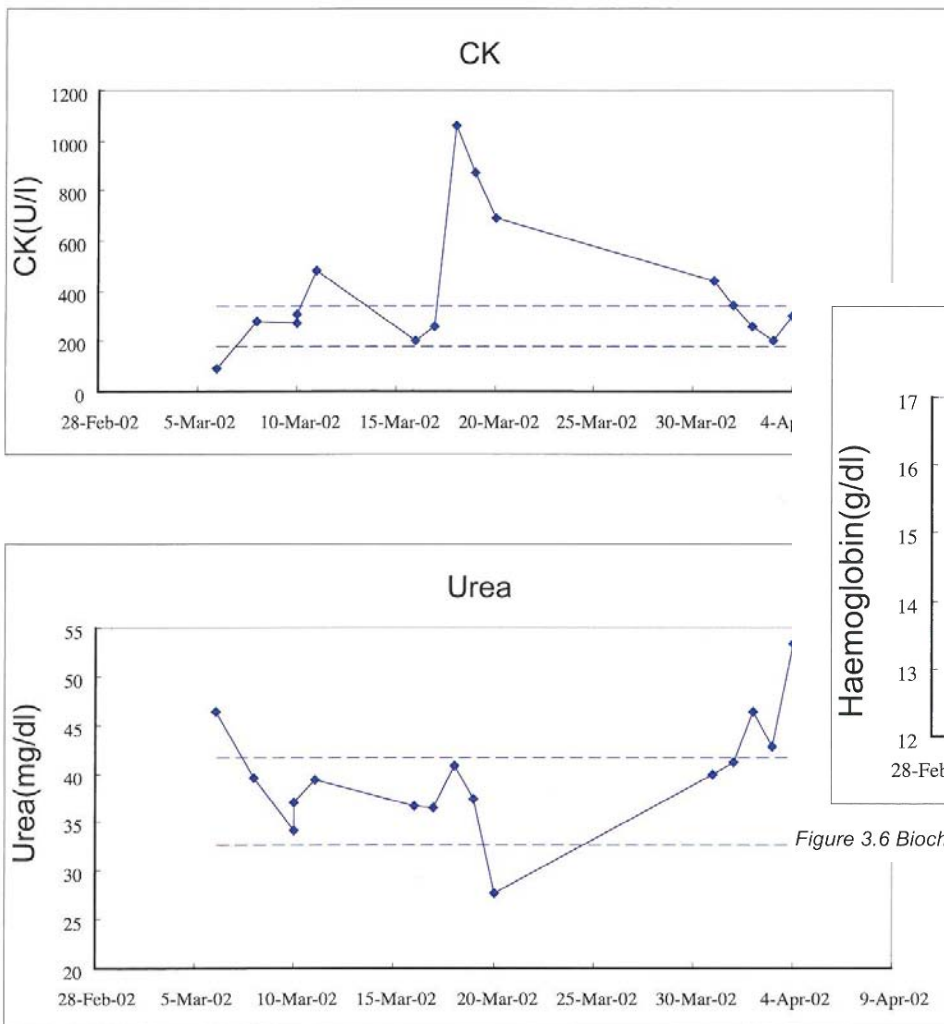


Figure 3.6 Biochemical measurements for training monitoring

Sport Nutrition





Sport Psychology





Characteristics of HKSI support services

- Bio-psycho-social model
- Scientific-practitioner model
- Multi-disciplinary approach
- On-field service provision
- Sport specific expertise



Thank you

