



CISS

Preparing for 2012 Olympic Games

Research and Application on Training Monitoring for the China Gymnastic Team

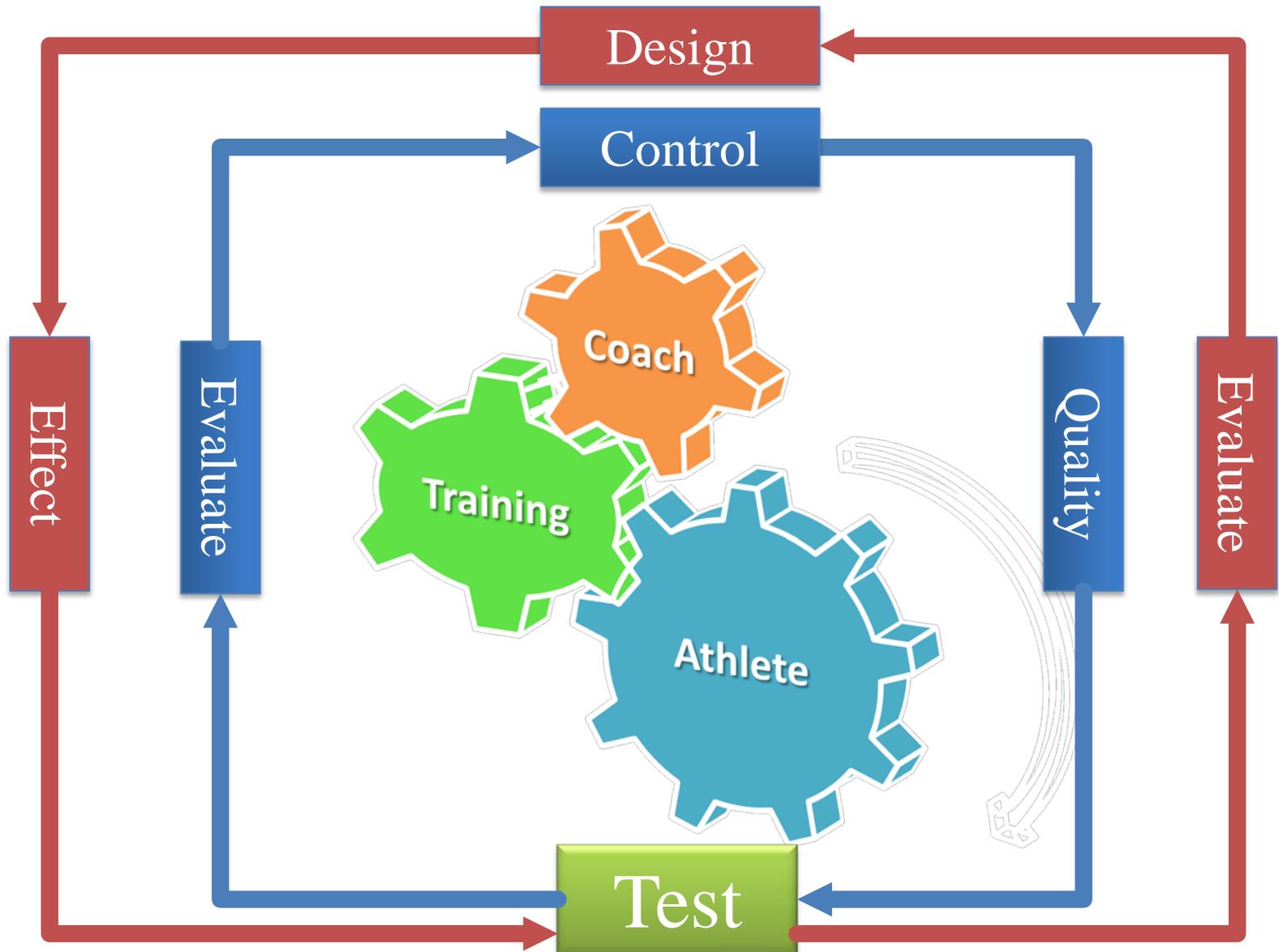
Hong Ping

China Institute of Sport Science

Purpose

- **To introduce the training monitor service for preparing 2012 Olympic Games in China, through the explanation of the training monitor system in China National Gymnastic Team.**

What is training monitor



Gymnastic Team in 2012 Olympic games



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**Body
function
assessment**

**Injury
prevention
and
rehabilitation**

**New
gymnastics
rules**

**Psychological
stability**

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**Athletes attend systematic training and
competition without injury**



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Table.3 Counter measures to prevent or control gymnastics injuries

<i>Level of prevention</i>	<i>Potential counter measures</i>
Primary (pre-event)	<ul style="list-style-type: none">● Adequate warm up and stretching before and after gymnastics sessions● Good physical condition appropriate to the specific demands of gymnastics● Attention to equipment factors—for example, appropriate matting● Screening programmes to identify at risk gymnasts and corrective actions● Coaches and spotters● Education of gymnasts, coaches, and parents● Facilities design
Secondary (event)	<ul style="list-style-type: none">● Equipment design and maintenance● Facilities design● Personal protective equipment—for example, hand guards
Tertiary (post-event)	<ul style="list-style-type: none">● Prompt first aid and medical attention● Adequate first aid facilities● Full rehabilitation before returning to participation

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Table.4 Summary of the type of evidence for the effectiveness of counter measures against injury in gymnastics (numbers are reference numbers)

<i>Counter measures</i>	<i>Anecdotal or informed/expert opinion</i>	<i>Biomechanical/ experimental research</i>	<i>Data based studies (uncontrolled)</i>	<i>Prospective studies</i>
Coaching				
Physical preparation				
General physical conditioning	4,9,19,20,23,25,38,49,50,82,83,87	—	—	23
Strength training	4,7,10,20,28,50,59,67,71,88	—	—	26
Adequate warm up, flexibility, and cool down	4,7,10,20,23,24,50,67,71,85,88	—	32,33	—
Education				
Education of coaches and gymnasts	4,38,44,67	—	44	39
Coaching techniques and student/instructor ratio	4,10,20,23,24,25,38,50,58,59,62,64,72,85	—	40,64	23,24,39
Spotting	4,7,10,11,39,43,58,62,85,86	—	44	23,24,39
Performance technique				
Landing technique(s) and posture	20,38,44,46,48,49,50,59,84,85,88	48,57,84	44,46	20,23,24
Equipment				
Facilities, equipment design and maintenance	4,50,62,72,74,85,87,89	61	40,44,74	24,39
Use of safety equipment (matting, padding)	4,11,19,38,44,50,60,63,67,71,84,85,88	57,84	40,44	19,23,24,39
Personal protective equipment (dowel grips or handguards)	7,71,72,73,74,85	72	73	—
Health support system				
Medical screening	4,9,10,20,25,49,71,83	—	—	—
Appropriate treatment and rehabilitation	20,62,63,67,71,82,83,85	—	—	—

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1 [] 頸屈和伸



2 [] 頸側屈



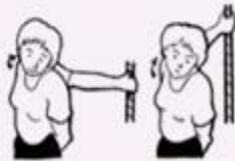
3 [] 背闊肌和後三角肌



4 [] 三頭肌



5 [] 肩內旋和外旋



6 [] 胸部(向上和水準)



7 [] 二頭肌



8 [] 棘上肌



9 [] 手腕伸肌



10 [] 胸部伸



11 [] 軀幹側屈



12 [] 軀幹和腹伸



13 [] 背肌屈



14 [] 背肌迴旋



15 [] 闊肌



16 [] 闊肌



17 [] 體內收肌



18 [] 臀肌



19 [] 臀肌和背肌迴旋



20 [] 四頭肌



21 [] 四頭肌



22 [] 體內收肌



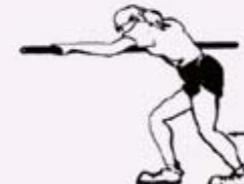
23 [] 體屈肌



24 [] 關節膜張肌



25 [] 腓腸肌



26 [] 比目魚肌

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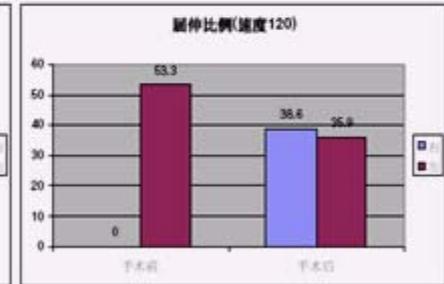
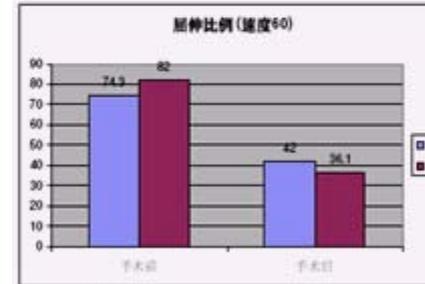
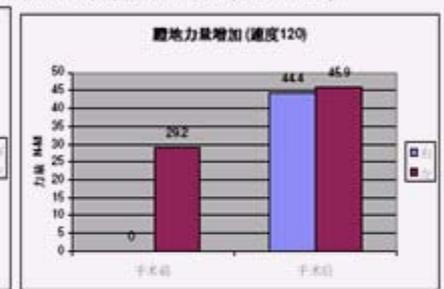
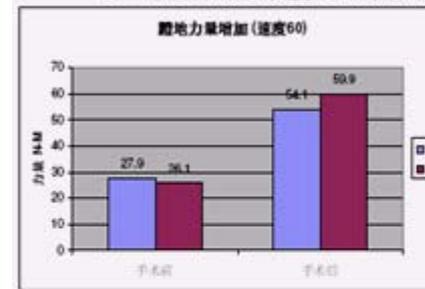
关节	动作	速度	
踝	勾脚 DF	60 / 120	
	蹬地 PF	60 / 120	
膝	勾腿 F	60 / 180	
	踢腿 E	60 / 180	
臀	勾腿 F	60 / 120	
	踢腿 E	60 / 120	
肩	内旋 IR	60 / 180	
	外旋 ER	60 / 180	

Ankle: compare with the data before operation:

1. strength improvement of push off of the left ankle: 130% (v=60)/57% (v=120); of the right ankle: 94% (v=60).

2. left flexion proportion (v=60) decreased from 82 to 36.1 (standard=31)

3. left flexion proportion (v=120) decreased from 53 to 35.9 (standard=39)



Suggestions:

keep on improving the push off of both ankle and strengthening the endurance of the left ankle

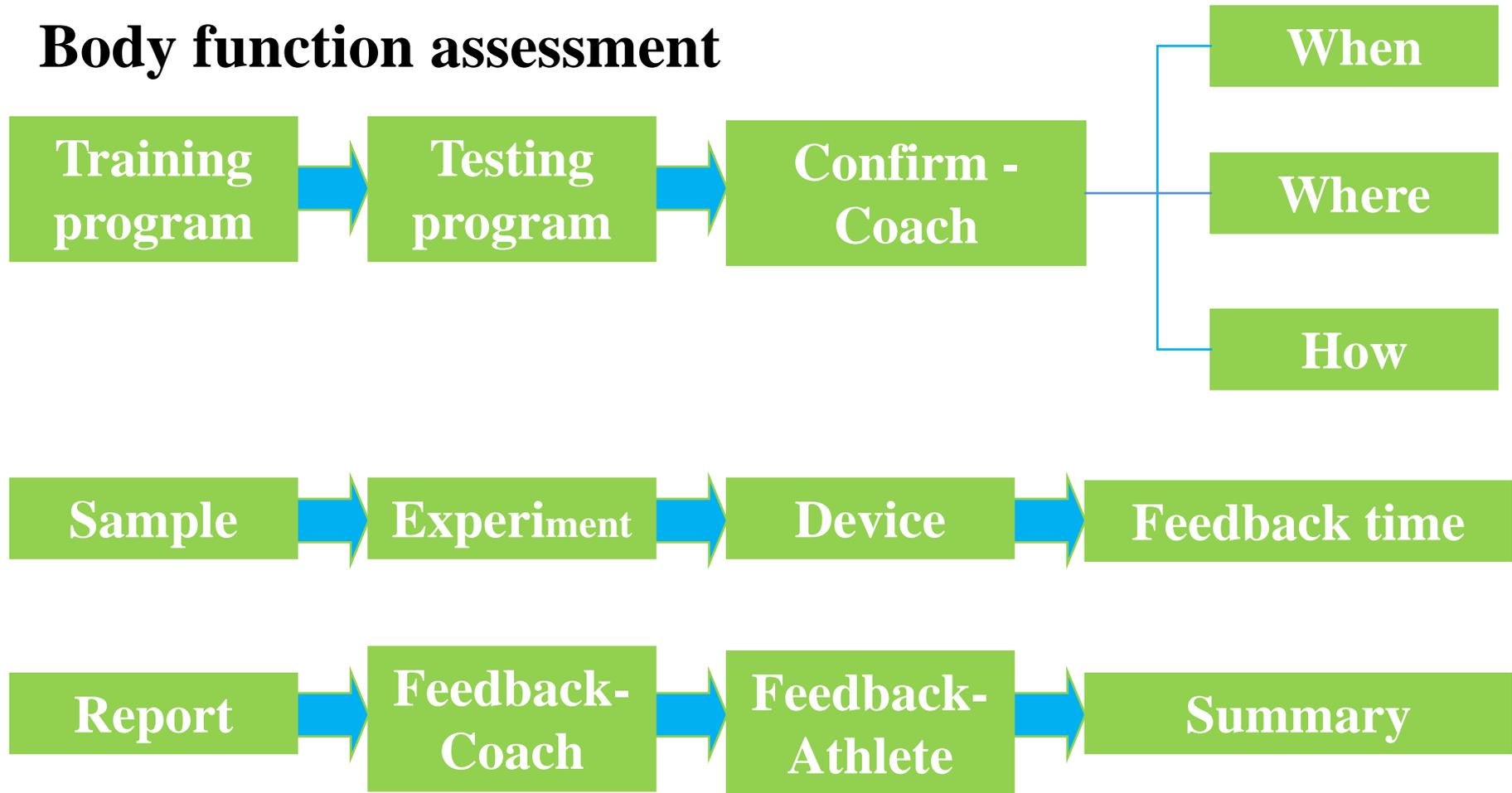
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Athletes attend systematic training and competition with excellent condition



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Body function assessment

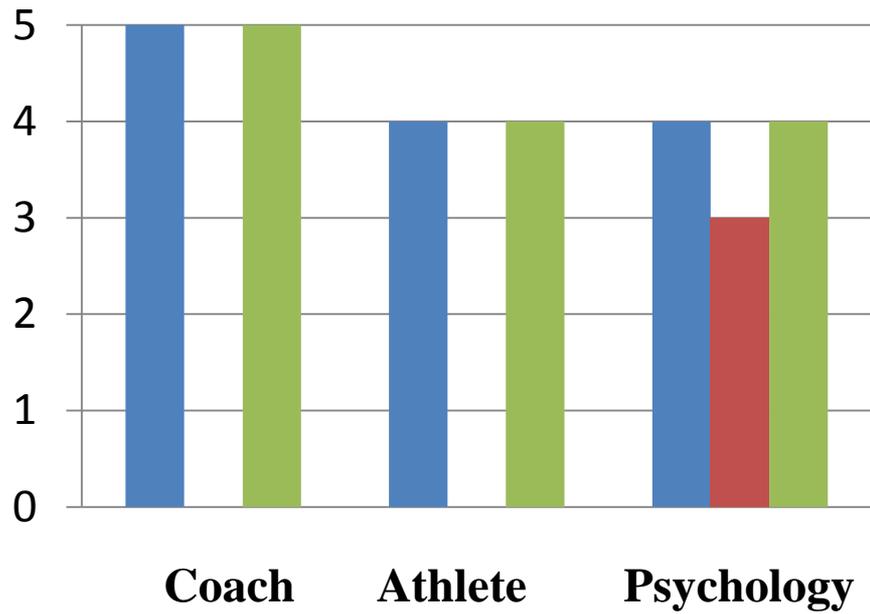
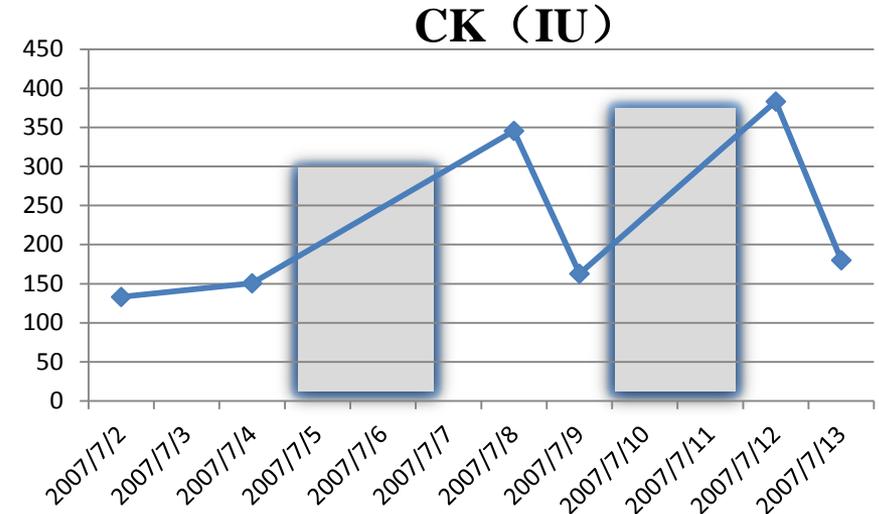
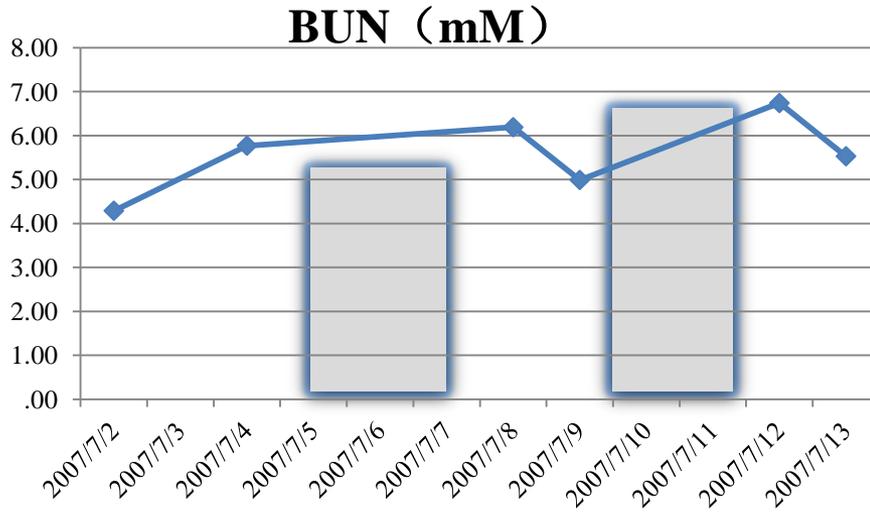


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E.g. Training monitoring on the heavy-load training week

- Assessment from the coach (before, after)
- Self-assessment by the athlete (before, after)
- Psychological assessment (before, after)
- Biochemical test (before, during, after)
- Comprehensive assessment (before, during, after)

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CK: 300 UI

BUN: 7.0 mM

Coach: 3 score

Athlete: 3 score

Psychology: 3 score

The training load of these 2-weeks was above medium. If the coach wanted a heavy-load training, he had to increase training volume and intensity.

Optimum bodyweight

- Coach: technical character
- Athlete: self-sensation
- Competition: best performance
- Figure out: optimum bodyweight
- Adjustment: technology, strength, height

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Table 7. The energy uptake in 3 meals

	Breakfast	Lunch	Dinner	Extra meal
Recommendation	25-30	35-40	25-30	0-10
M \pm SD	15.7 \pm 19.2	10.3 \pm 17.68	0 \pm 0	73.9 \pm 20.01

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Breakfast= AM session-get up

Lunch=PM session–after the AM session

Dinner=before sleep-after the PM session

AM expenditure =before AM session-after AM session

PM expenditure = before PM session-after PM session

Sleeping expenditure =before sleep-the next morning

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Athletes attend the match with optimal
arranged exercise



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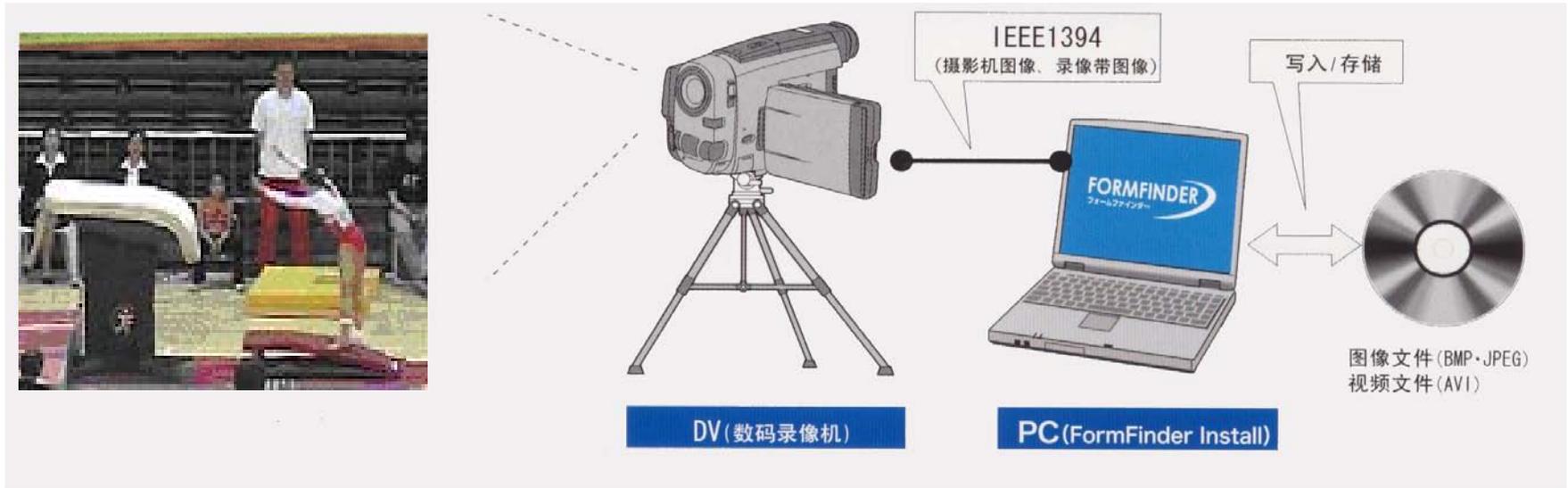


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Court training monitoring



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视频图像播放



A分:	6.2	B1分:	9.6
B2分:	9.5	B3分:	9.4
B4分:	9.5	B5分:	9.5
B6分:	9.6		
教练评语:			
裁判评语:			

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Athlete attend the match with stable
psychology



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Education



Testing



Consulting



Training



Recovery



preparations before the match



adjustment during the match

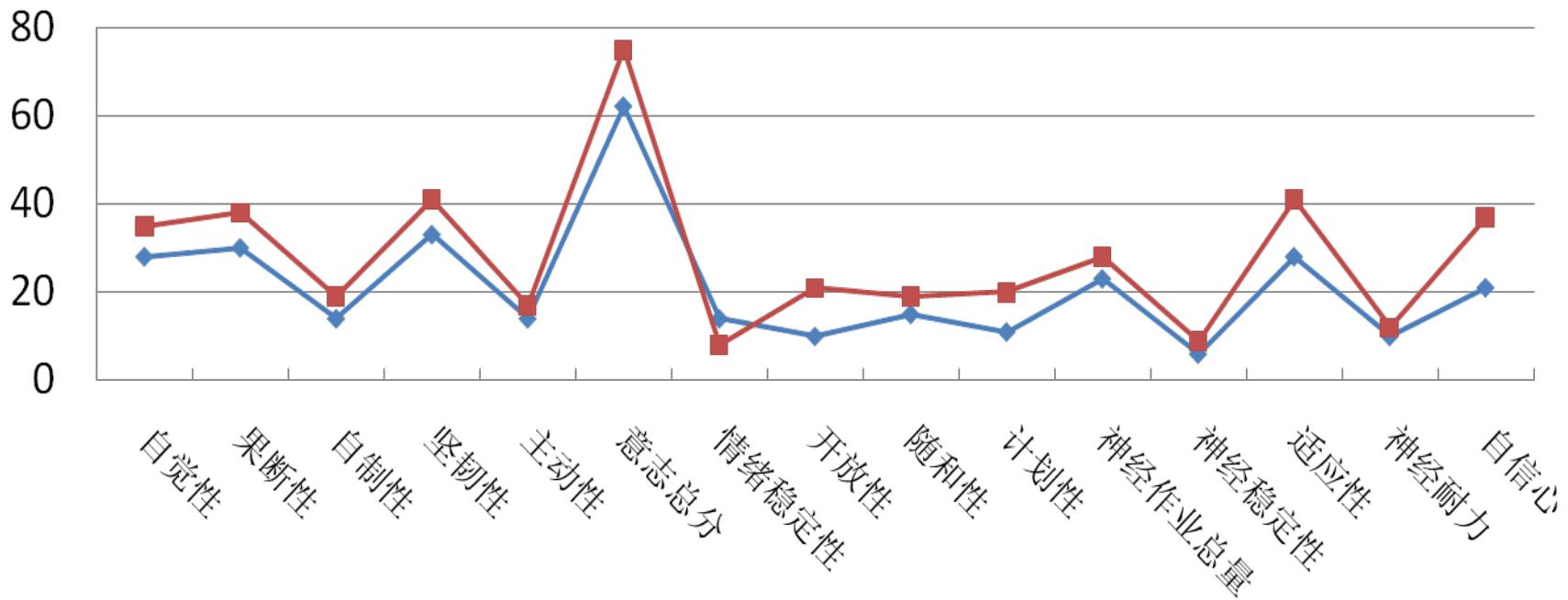


adjustment after the match

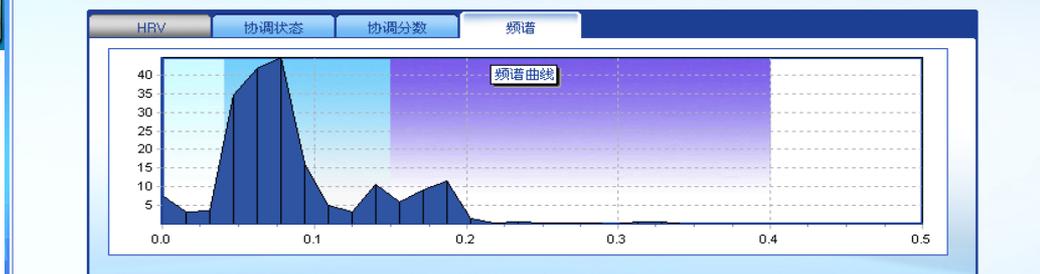
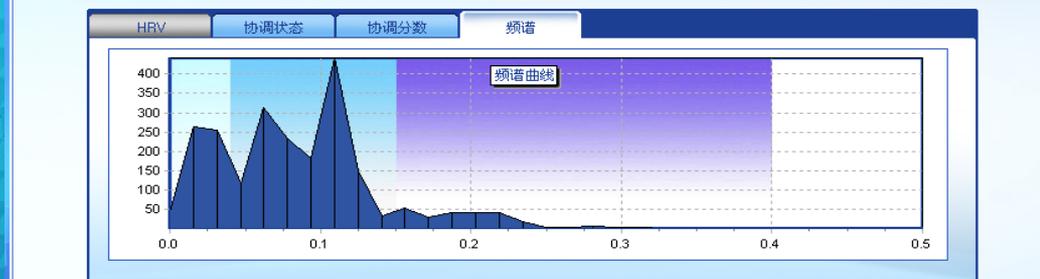


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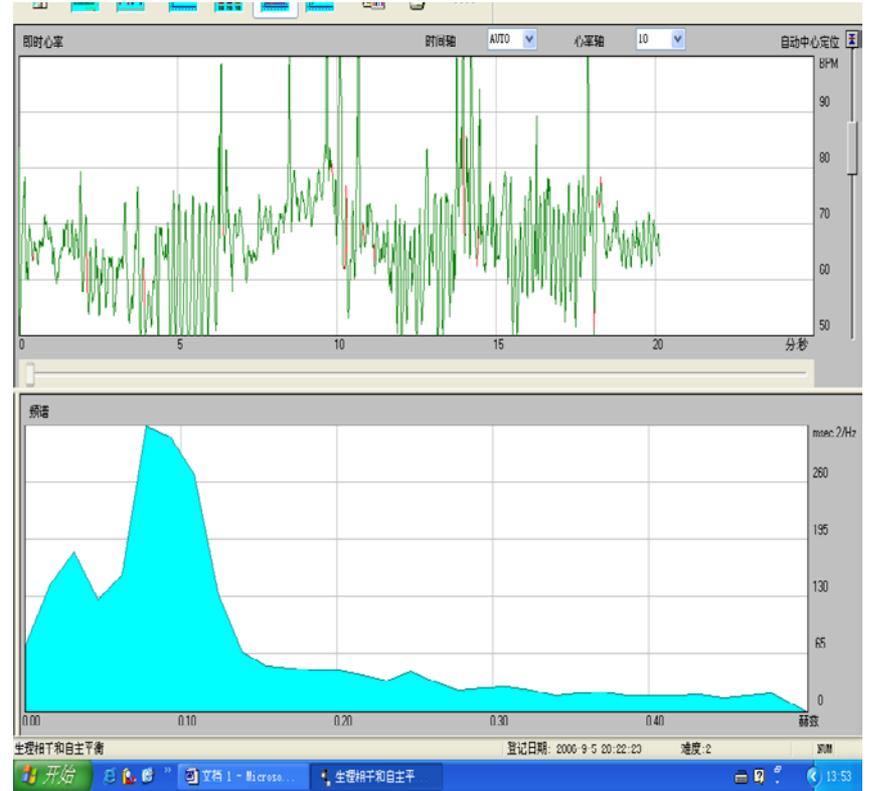
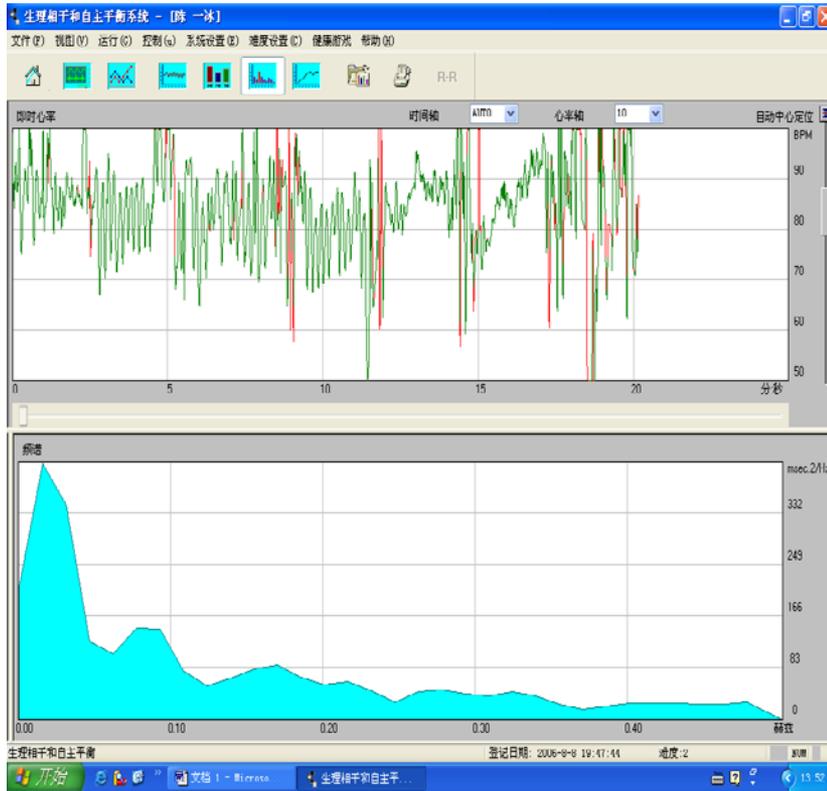
We choose the characteristic of conscious attention, volitional quality, personality characteristics, confidence, emotional state, temperament type, degree of fatigue, EEG and HRV as psychological indicators for mental monitoring. Results are feedback to the coach and athletes, database are also set up.



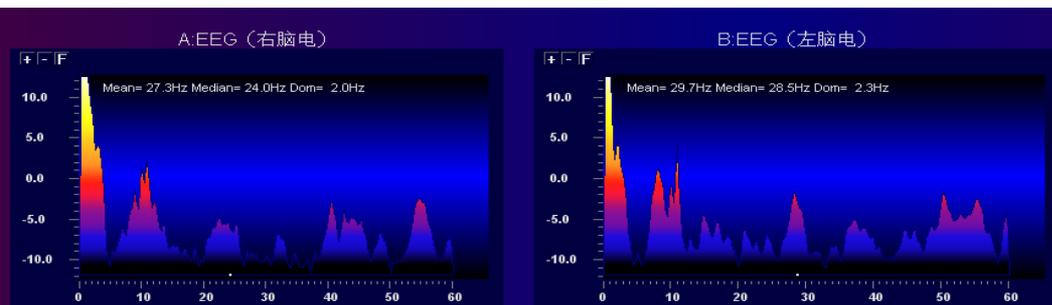
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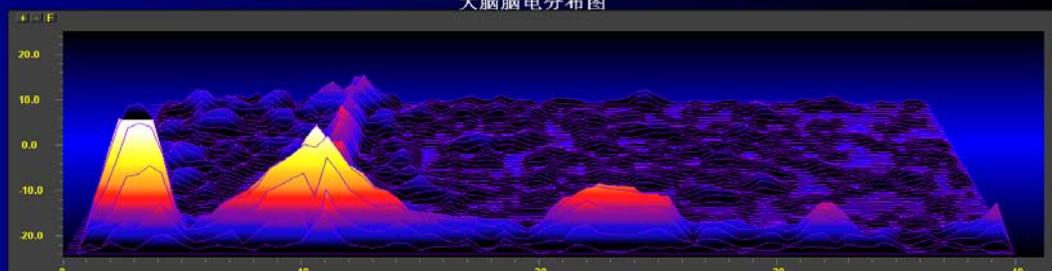
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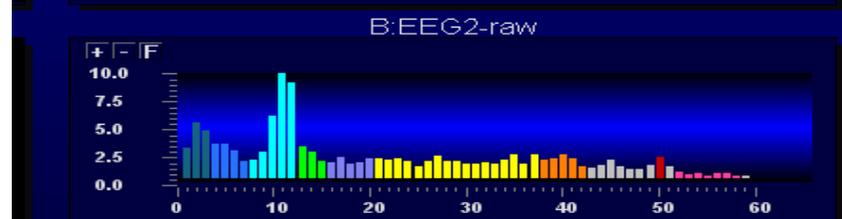
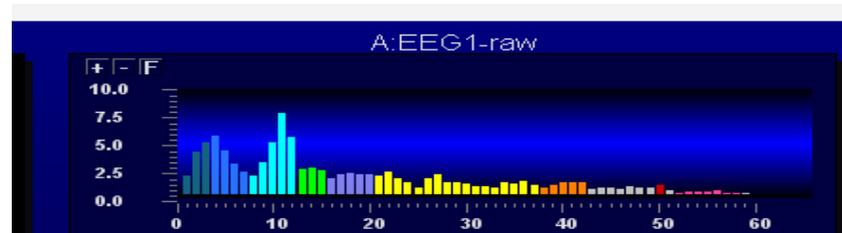
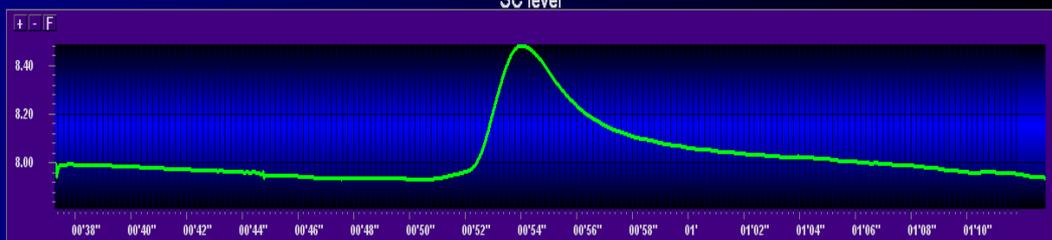
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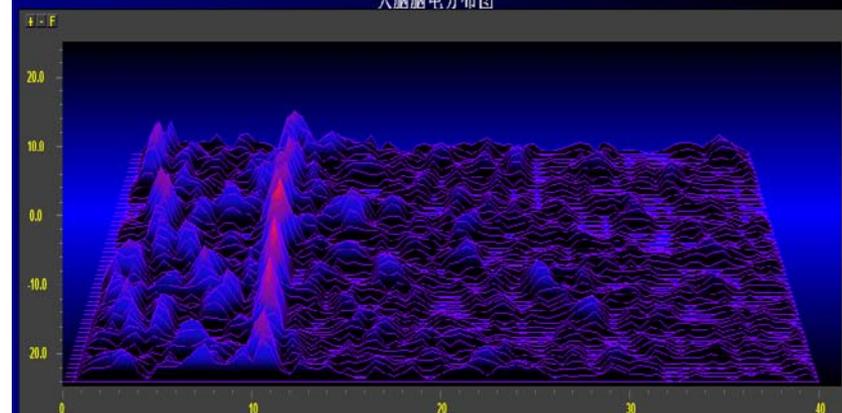
大脑脑电分布图



SC level



大脑脑电分布图



Thank You!

The text 'Thank You!' is rendered in a large, light blue, serif font. It has a 3D effect with a dark blue shadow cast downwards and outwards, creating a fan-like shape. The background is split vertically: the left side is green and the right side is white.

Hong Ping
China Institute of Sport Science
hongping@ciss.cn