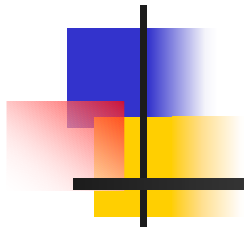


Medical Screening of Elite Athletes



精英運動員醫學檢定

Dr J Wong 黃平山醫生

20-3-2006



Annual Medical screening A Formality or Necessity?

每年醫學檢定

必需手續 或 例行公事？



Medical Consultant

顧問醫生

Co-ordinator
協調人

Athletes
運動員



**Medical
Consultant**
顧問醫生



HKSI
體院



Medical Consultant 顧問醫生

Responsible for:

- Interests of athletes 運動員利益
- Physical health 身體健康
- Mental health 精神健康
- Performance 運動表現



Medical Consultant 顧問醫生

Responsible for:

- Interests of H K S I 體院利益
- Administrators 行政人員
- Coaches 教練

Medical Screening of Elite Athletes

精英運動員醫學檢定



- **Legal responsibility** 法律責任
- **Identify athletes at risk** 找出運動有危險人仕
- **Improve performance** 改進表現
- **Promote healthy lifestyle** 推廣健康生活



Medical Screening of Elite Athletes

精英運動員醫學檢定

- **Annual review** 每年檢討
- **Face to face** 面對面
- **2 ways interactive** 雙向互動
- **Let athlete speaks** 盡訴內心疑惑
- **Detect early problems** 盡早找出問題



Medical Screening

醫學檢定

- **History**

病歷

- **Physical Exam**

體檢

- **Laboratory
investigation**

實驗室測試



碧咸通過體檢投皇馬

90分鐘體測廣告費320萬



皇家馬德里

碧咸於香港
時間周二晚上十時通過體測後，正式加盟皇家馬德里。單是這次體測，碧咸就為皇馬賺得二十五萬鎊（約三百二十萬港元）的贊助費。由七月一日起，馬德里市更將進入「碧咸周」，當地傳媒會以鋪天蓋地篇幅去報導碧咸加盟皇馬的新聞。

- 碧咸七月二日行程表**
1. 碧咸到在柏林武治華特度10晚（香港時間晚上8時）由皇家馬德里舉行歡迎酒會。
 2. 皇家馬德里會派車到機場。
 3. 碧咸抵達酒店後會先在晚上體測。
 4. 碧咸之後會前往馬德里訓練，這次身背皇家馬德里訓練服。
 5. 出席記者記者會等，如果想知更多消息，可以上 www.realmadrid.com 查詢「馬以達」的傳單印刷或皇家馬德里官網查詢。

高慈善賽球星雲集
以馬德里球員為主角的慈善賽

被

人拉橫街圍住皇子維多利亞王子在會立林松地馬德里碧咸，而據時已有二十多名球迷到場，身穿白色球衣的碧咸在球迷圍住下向他們鞠躬致意，在經過九十分鐘的詳細身體檢查後，碧咸亦從有記者在場記者的圍攻。

記招千人採訪破紀錄

皇家馬德里主理卡奴在碧咸體測宣佈：「碧咸目前的身體狀態良好，為在比賽中任何陣線其主將或加強皇馬了，碧咸是次體測最佳球員，相信與高水手碧咸也亦能應付自如。」當地一間醫療保險公司「Insure」更付廿二十五萬鎊，贊助是次體測。

為了保持碧咸的私隱，體測只在皇馬的私人範圍進行。至於當晚電視台數在皇馬電視台直播。

在直播後，一場體測的精華片段，將更估計，單是七月一日的體測約七萬二千名記者，皇馬已可賺得約二百萬鎊。

與此同時，皇馬會主辦，目前記者會已有一千名記者報名採訪，比前次估計的九千名多出一倍。此外，去年碧咸對皇家馬德里的記者數目多五倍，今次記者陣則更大，據皇馬表示，英國和美國的傳媒都有派員採訪。

皇家馬德里新領的《馬卡報》表示七月一日記者會是「碧咸周」，該報會報導一個星期內皇馬所有有關碧咸加盟皇馬的消息，皇馬體育總監華利利表示，碧咸的加盟將會帶來諸多好處。他說：「碧咸的加盟將提高皇馬的價值，不會坐視收帳花開。」

與此同時，皇馬也舉行了門外球迷與皇馬的轉會費提高一倍至二十二百萬鎊。



不少球迷在場圍住碧咸，而據時已有二十多名球迷到場。



碧咸在車內向記者揮手致意。



碧咸的體測廣告費高達三百二十萬鎊。

名人夫婦團圓真幕後特

由其國境成立Sky Channel的西班牙籍名人夫婦團圓中，碧咸夫婦以此種特種的體測不能解釋的對是幕後支持，其後亦軍。不過，在碧咸抵達後名人夫婦團圓中，碧咸夫婦從碧咸後特夫婦團圓，另外，碧咸現於西班牙居住的波多，一晚費用一千八百鎊（約一萬六千元），但碧咸夫婦團圓真幕，不收任何費用。

碧咸帶狂英團劇團熱
高麗其電器製造商Samsung近日推出了一款電

8號17號波衫成大熱





Formats

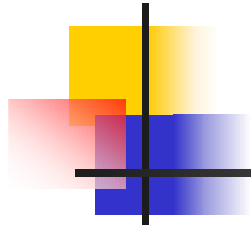
形式

- Office-based
1° care physician
- Assembly line
many athletes by a
single physician
- Multi-station
multiple examiners
with specific area
of examination

家庭醫生

流水作業
單一醫生

流水作業
多位醫生
分項檢查



Timing

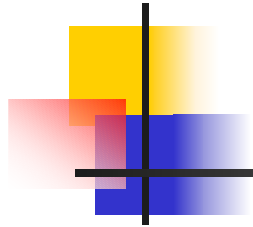
時間

- **Six weeks before participation**
- **Correction of problems**
- **Treatment of injuries**

參加前六星期

改進問題

治療創傷



Timing

時間

- **March**
三月
- **Signing new contract**
新合約

Medical Screening of Elite Athletes

精英運動員醫學檢定



- **Legal responsibility** 法律責任
- **Identify athletes at risk** 找出運動有危險人仕
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Legal Responsibility 1

法律責任

- **Protection for the sports institution & governing bodies** 保障有關團體及總會
- **Liability of the physician** 醫生法律責任
- **Cannot detect all lethal diseases** 不能百份百保證安全
- **Human rights** 運動員之人權

Legal Responsibility 2

法律責任



- **Team physician: authority to disqualify athlete medically**
隊醫有權取消參賽資格
- **Discrimination laws : prohibit unjustified disqualification**
運動員可用歧視法反對

Legal Responsibility 3

法律責任

- 1995 Pahulu vs University of Kansas
- Narrow cervical canal with transient quadriplegia

- 1996 Knapp Vs Northwestern University
- 1° ventricular fibrillation & cardiac arrest
- Automatic cardioverter-defibrillator implant

Legal Responsibility 4

法律責任

- 19 yrs male swimmer
- PPPE for China Inter-city Games
- Systolic murmur

十九歲男泳員

城運會賽前體檢

發現心臟有雜音

Legal Responsibility 5

法律責任



- Echocardiograph advised but not done
- Team physician: no participation
- Complain to Ombudsman in Hong Kong

沒有遵從隊醫指示
作超音波心臟測試

比賽資格被取消

向投數訴專員投訴

Medical Screening of Elite Athletes

精英運動員醫學檢定



- Legal responsibility 法律責任
- Identify athletes at risk 找出潛在危險運動員
- Improve performance 改進表現
- Promote healthy lifestyle 推廣健康生活



Athletes at risk

潛在危險運動員

- **Death** 死亡
- **Injury** 受傷
- **Disability** 殘廢



Sudden Death in Athletes

運動員猝死 1

- **Exercise does not kill**
- **運動不會殺人**

- **only in athletes with existing heart disease**
- **本身有毛病才會因運動死亡**

Sudden Death in Y Athlete

年輕運動員猝死 2

- Van Camp
- Non-traumatic death 1983 – 1993
- USA high school & college athletes
- 7.47 / million / yr (male athletes)
- 1 death / yr / 133,868
- 1.33 / million / yr (female athletes)
- 1 death / yr / 751,879

Sudden Death in Y Athlete

年輕運動員猝死 4

- All boys
- No syncope
- No family history of sudden death



Sudden Death in Y Athlete

年輕運動員猝死 5

Causes of death:

- **Cardiovascular causes 74 %**
- **Non-cardiac 26 %**

Cardiovascular causes 1

心臟血管疾病

- N = 100
- Hypertrophic cardiomyopathy (56%)
- Coronary artery anomaly (16%)
- Myocarditis (7%)
- Aortic stenosis (6%)
- Dilated cardiomyopathy (5%)
- Atherosclerotic coronary H D (3%)
- Aortic rupture (2%)

Cardiovascular causes 2

心臟血管疾病

- **Nonspecific cardiomyopathy (2%)**
- **Aortic stenosis (2%)**
- **Coronary artery aneurysm (1%)**
- **Mitral valve prolapse (1%)**
- **R ventricular cardiomyopathy (1%)**
- **Cerebellar A-V malformation (1%)**
- **Subarachnoid haemorrhage (1%)**
- **Wolff-Parkinson-White Syndrome (1%)**

Non-cardiovascular causes

非心臟血管疾病

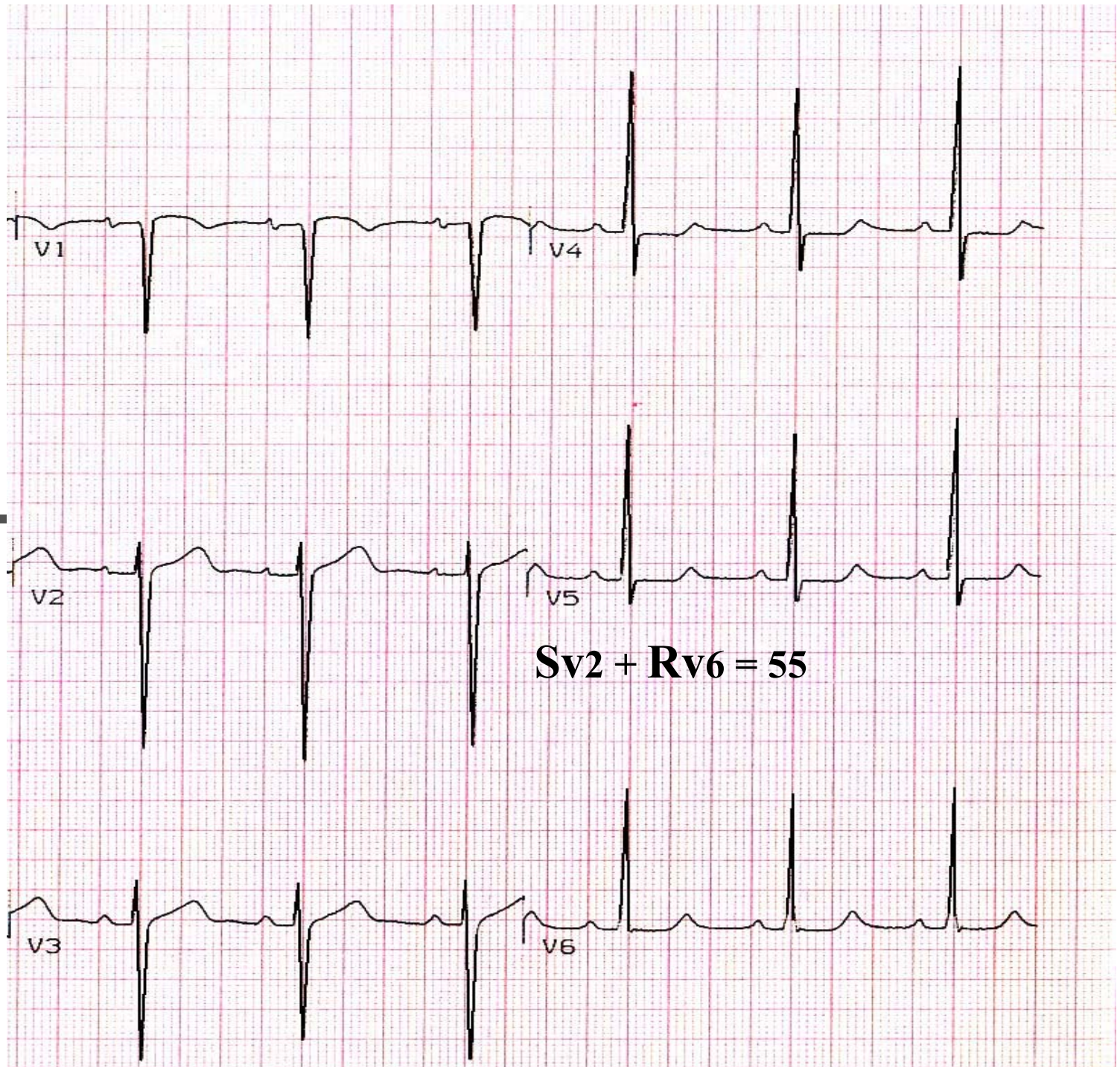
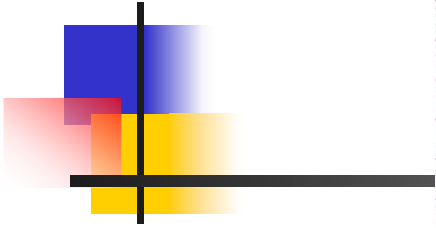


- N = 30
- Hyperthermia (43.3%)
- Rhabdomyolysis (23.3%)
- Status asthmaticus (13.3%)
- Lightning (10%)
- Arnold-Chiari II malformation (3.3%)
- G I bleeding & aspiration (3.3%)
- Exercise induced anaphylaxis (3.3%)
- Undetermined (23.3%)



17 yrs female athlete 十七歲女運動員

- **Palpitation, dizziness x 6 months during routine workout**
- **B P 120/60**
- **Pulse 70/min**
- **Systolic murmur**
- **Valsava manoeuvre**



Echocardiogram

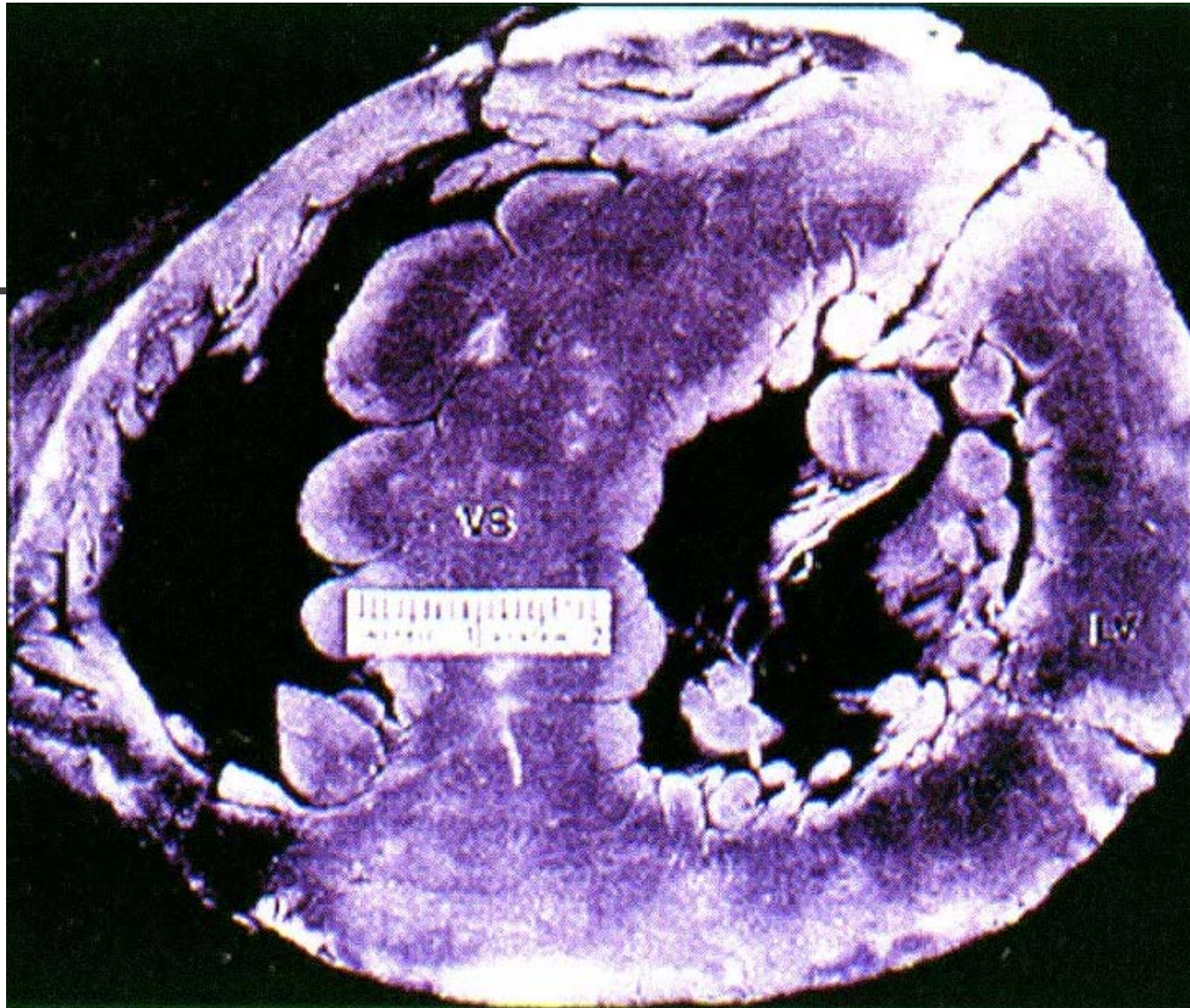
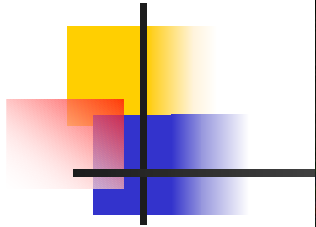
心臟超音波掃描

- **Grossly hypertrophic left ventricular wall**
- **Asymmetrical septal hypertrophy**
- **Ant movement of mitral leaflet**



Hypertrophic Cardiomyopathy 心肌肥厚症

- **Familial disease**
- **Thicken cardiac muscle > 15 mm**
- **Normal cavity size**
- **50 % sudden death
in 10 – 30 yrs**





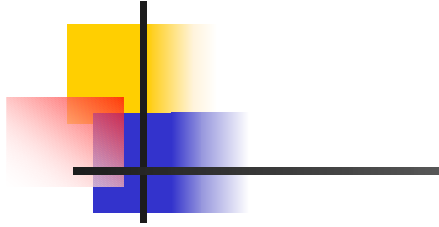
Genetic cardiovascular diseases

- **Hypertrophic cardiomyopathy**
- **Long-QT syndrome**
- **Marfan syndrome**
- **Arrhythmogenic R ventricular cardiomyopathy**

Marfan's Syndrome

馬凡氏綜合征

- Mutation of fibrillin gene
- Tall stature
- High arched palate
- Arachnodactyly
- Mitral valve prolapse
- Aortic regurgitation, aneurysm









Genetic Cardiovascular D

AHA June 04

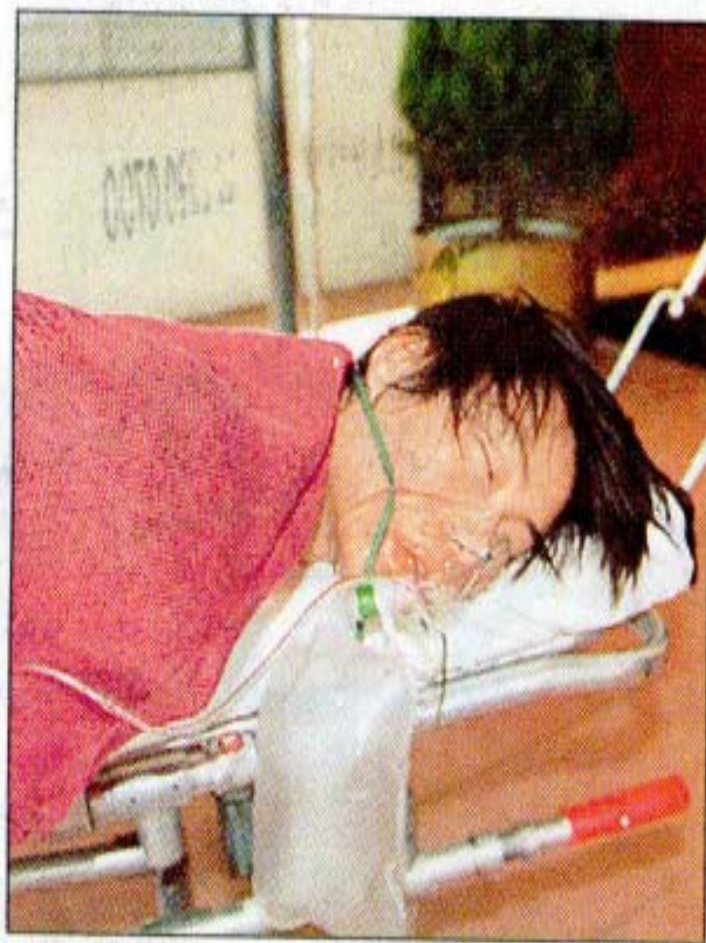
- sudden death during exercise
- May not stop vigorous exercise with warning signals
- Moderate intensity exercise 4-6 MET
- Low intensity < 4 MET
- Avoid burst exertional, competitive, isometric exercises

羊癇病發大學生抽筋遇溺

【本報訊】「七一」回歸六周年紀念，公共泳池免費開放，一名大學生往青衣泳池游泳，疑因羊癇症病發突然抽筋遇溺，需由救生員救上岸，情況穩定。

遇溺男子陳×軒，二十一歲，昨晨十時獨自往青敬路消暑，在「標準池」逾二米水深游泳，突然在池中載浮載沉，救生員發現陳狀似遇溺，即趕落水救人，陳被救上岸時半昏迷，仍有呼吸脈搏，救生員替其進行人工呼吸後情況好轉，救護員到場將陳送院急救。

據悉，陳為大學生，家住青衣區，由於其父母不在港，暫時仍未能聯絡到其家人。



遇溺大學生送院治理。



Single Organ

單一器官

- Eye
- Kidney
- Testis



Myopia 近視

- **Severe**
- **Retinal detachment**
- **Light flashing**
curved image
impaired vision



Enlarged Organs

- **Liver**
- **Spleen**
- **No contact sports**

Skeletal Problem

骨骼問題

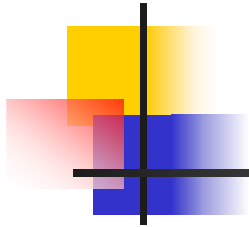
- **Congenital**
- **Acquired**
- **Predispose to injury**



Pectus Carinatum (pigeon chest) 雞胸

- Asthma
- Congenital heart disease

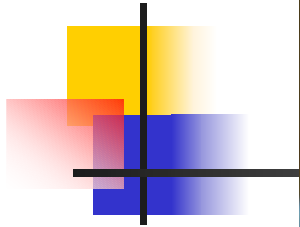
- Normal
- Performance not affected





Pectus Excavatum (funnel chest) 凹胸

- **chest expansion**
- **vital capacity**
- **performance**

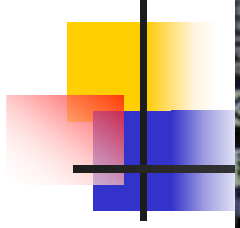




2001 All China Games

二零零一中國全運會

- **31 yrs male boxer**
- **Limping gait**
- **Shorten L lower limb**





2001 All China Games

二零零一中國全運會

- 31 yrs male boxer
- Limping gait
- Shorten L lower limb
- **Congenital dislocation of hip**
- Mild Beta-thalassaemia
anaemia



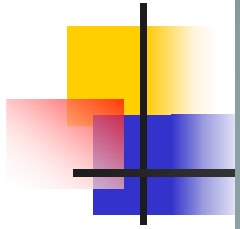
31 yrs Boxer 2

- **Unlimited participation**
- **Not allowed to compete**
- **A I B A**
- **Unlimited participation**

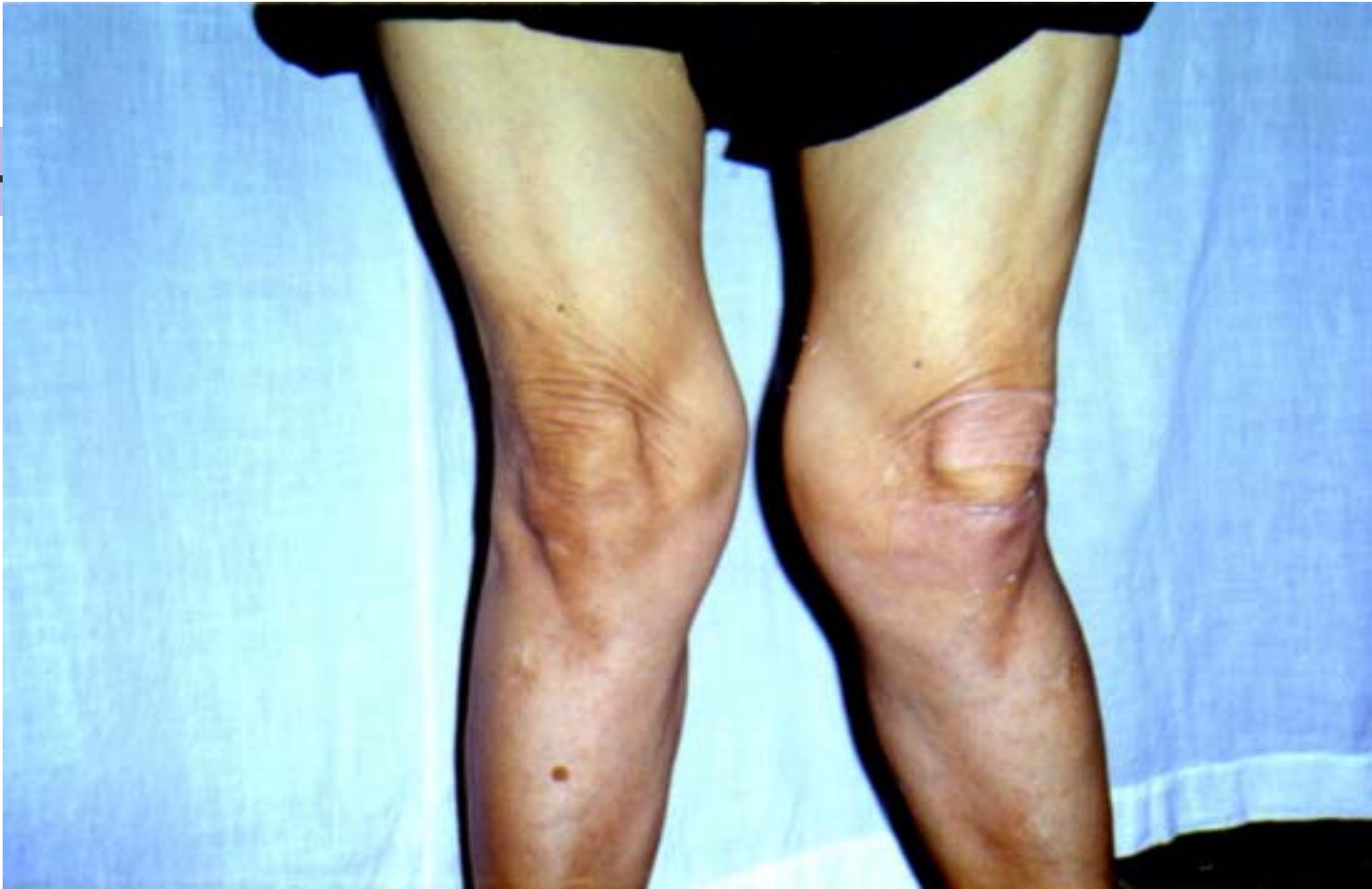


Recurrent ankle inversion injuries

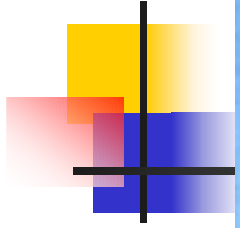
- **Muscular weakness**
- **Lax ligaments**
- **Joint subluxation**
- **Proprioception**
- **Vigorous rehabilitation**



Genu Varum

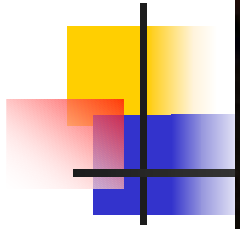


Genu Valgum

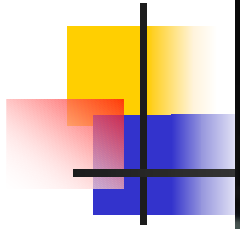




Genu Recurvatum



Hyperpronation



Pes Planus



Flat Foot





Pes Cavus



Female Athlete

- **Amenorrhoea**
- **Eating disorders**
- **Osteoporosis**



Female Athlete

- **16yrs**
- **primary amenorrhoea**
- **elder sister also has primary amenorrhoea**



Female Athlete

- **19 yrs**
- **R inguinal mass**
- **Surgical exploration done**
- **Testicular tissue in hernia**



Male Pseudohermaphroditism

男性假雙性人

- Male (46XY) karotype
- Incomplete masculization
- ↓ testosterone biosynthesis
- ↓ 5 alpha reductase:
 - ↓ testosterone to dihydrotestosterone
- Androgen insensitivity syndrome



Sex Reassignment

性別重新指定

- **IOC allowed to complete**
- **Before puberty**
No time limit
- **After puberty**
2 yrs after complete surgical change
legal recognition
appropriate hormonal therapy

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- Promote healthy lifestyle 推廣健康生活



Improve Performance

- **Technique and equipment**
- **Physical fitness**
- **Psychological state**
- **Social factors**
- **Doping**



Improve Performance

- **Technique and equipment**
- **Physical fitness**
- **Psychological state**
- **Social factors**
- **Doping**

Physical Fitness

體能

Body composition

- Initial body weights
Ideal for the sports ?
- Subsequent changes



Body Composition

Body weight

- **Hyperthyroidism**
- **2 female athletes**



Female Athlete

Body weight

■ 2001	21 yrs	61 kg
■ 2002	22 yrs	65 kg
■ 2003	23 yrs	70 kg
■ 2004	24 yrs	80 kg



Female Athlete

- **Headache**
- **Pituitary gland hyper-function**



Physical Fitness

Flexibility

- **Sit and reach**
tight lower body
- **Range of movement**



Flexibility Evaluation

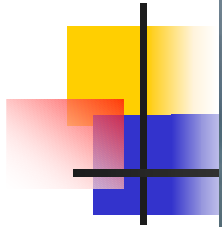
- **Normal?**
- **Perform movement without undue resistance**
- **Poor flexibility Injuries**



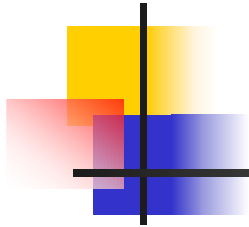
Hip: Thomas Test



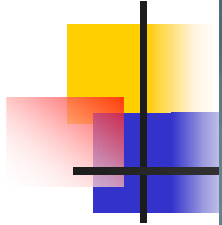
Hip: Ober's Test 15°



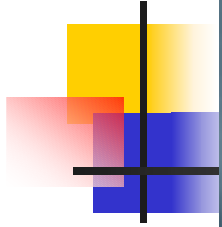
Hip: Rotation 90°



Knee: Hamstring 180°



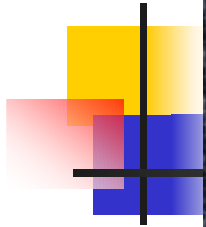
Knee: Quadriceps 135°



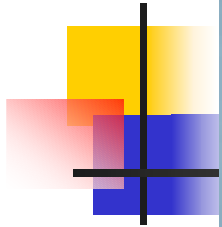
Ankle: Gastrocnemius 20°



Ankle:Soleus 20°



Ankle: Ant. Compartment Muscles 45°



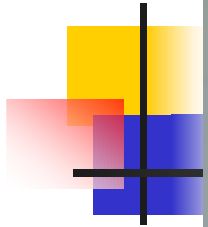
Spine Extension



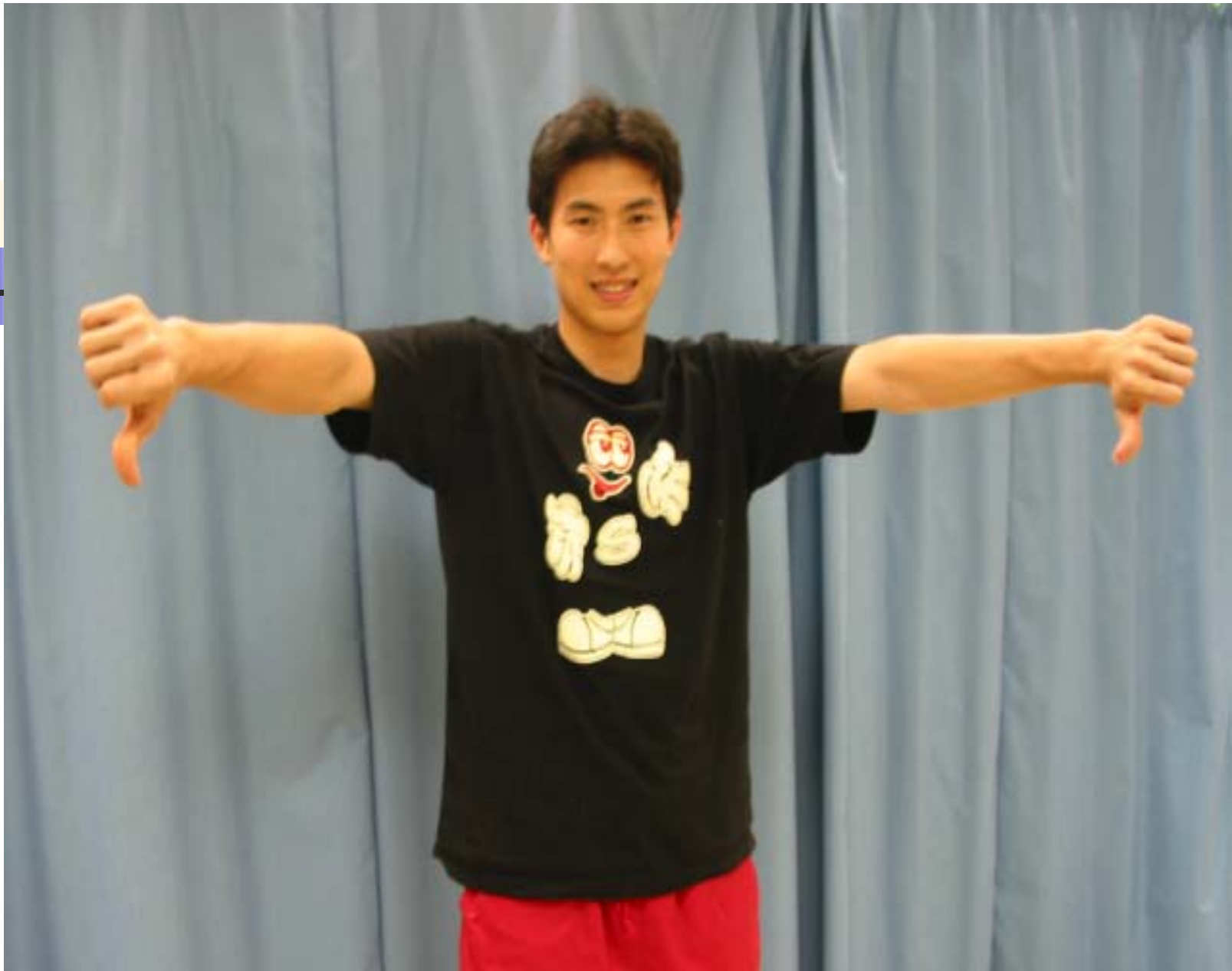
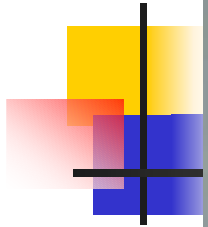
Physical Fitness

Muscles

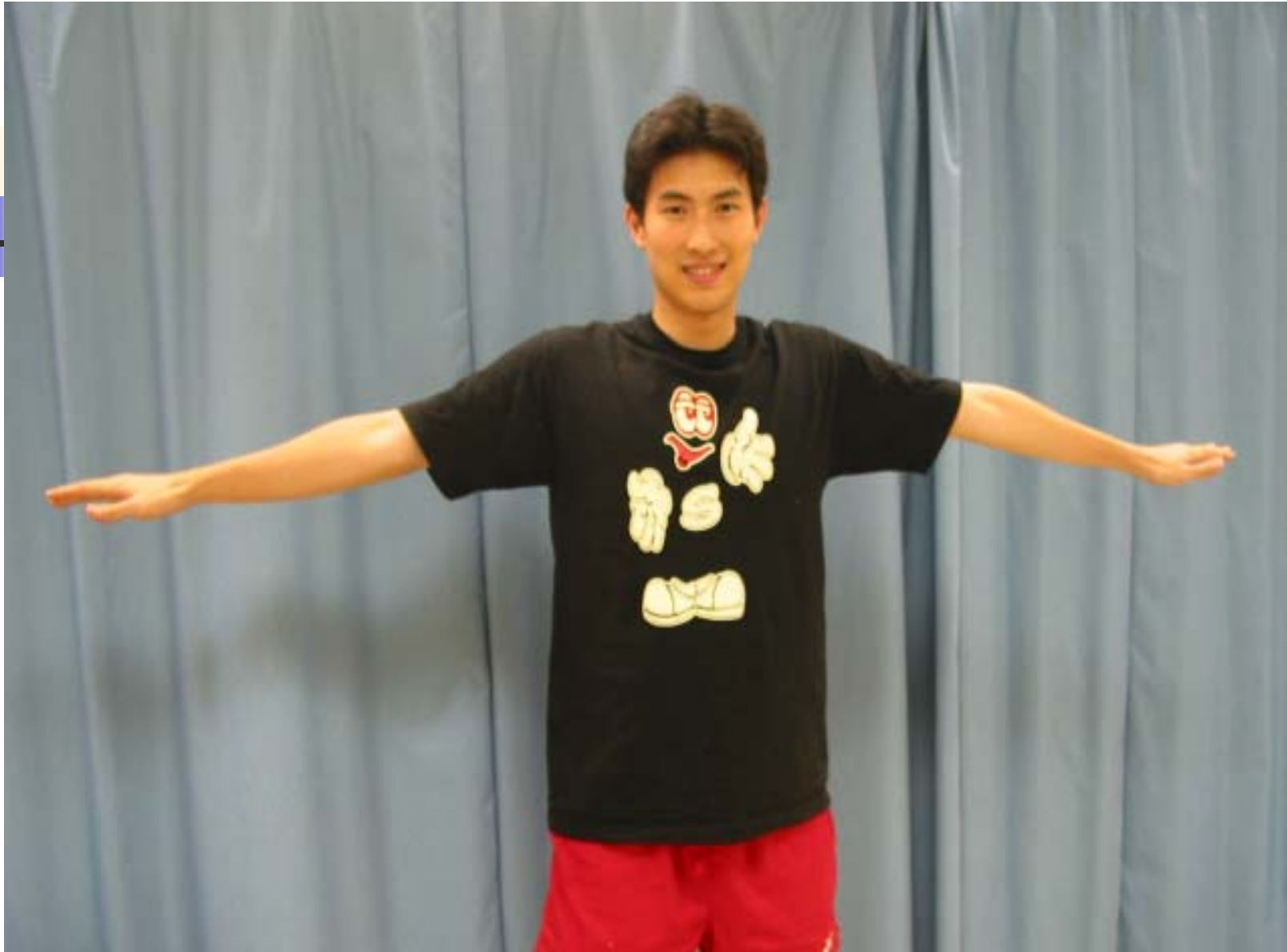
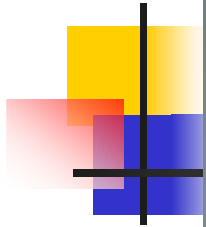
- **Power**
- **Balance**
- **Endurance**



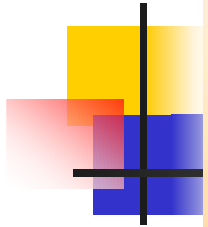
1:00 ant deltoid



2:00 supraspinatus



3:00 middle deltoid



5:00 Post deltoid



Physical Fitness

Cardiopulmonary function (VO₂Max)

- Atmospheric O₂
- Lungs
- Heart
- Muscles



Lung Functions

Asthma

- **Airway resistance**
- **FEV in 1 sec PEF**
- **15% after bronchodilator**



Cardiopulmonary Function

O₂ transport

- **By haemoglobin in RBC**
- **Hb anaemia**
- **Iron deficiency anaemia**
- **Hereditary anaemia**



Hereditary Anaemia

- **Thalassaemia &**
- **Common**
- **02/03 13 in 331 (3.9%)**
- **Hong Kong incidence (8.4%)**
- **Mild anaemia + microcytosis**
- **May impair endurance capacity**



Improve Performance

- **Psychological state**
- **Social factors**



Male Endurance Athlete

- **17 yrs**
- **Wants to quit**
- **Always come second**
- **Pressure from parents**
- **Pressure from coach**



Male Endurance Athlete

- **Persistent epigastric pain**
- **Negative investigation**
- **Not responsive to treatment**
- **Compete with adult athletes**
- **Minimal money to spend**

Medical Screening of Elite Athletes

精英運動員醫學檢定



- **Legal responsibility** 法律責任
- **Identify athletes at risk** 找出潛在危險運動員
- **Improve performance** 改進表現
- **Promote healthy lifestyle** 推廣健康生活



Healthy life style

- **Smoking**
- **Alcohol**
- **Nutrition**
- **Sex education**



Smoking

- **Smoking**
- **Performance**
- **Health hazards**

CHD CVA COAD Lung Cancer

peptic ulcer impotence etc



Nutrition

- **Body composition**
- **Anaemia**
- **Healthy diet**
- **Dietician referral**



Sex education

- **Responsibility**
- **Contraception**
- **Venereal disease**



Hepatitis Immunity Status

- **Hepatitis A**
infected via oral route
- **Hepatitis B**
via body fluids & birth



Hepatitis B Carriers

- **May infect others**
- **25% develop complication**
- **Needs constant monitoring**
- **Hepatitis A vaccine**
- **China**
- **HKSAR**



Drug History

- **Update drugs used by athlete**
- **Conform to WADA current prohibited list**



45 yrs lawn bowling athlete 1

- Natrilix (indapamide)
- Xanax (alprazolam)
- Valium (diazepam)
- Stemetil (prochlorperazine)
- Ipradol (hexaprenaline)



45 yrs lawn bowling athlete 2

- **Natrilix** (indapamide)
- Xanax (alprazolam)
- Valium (diazepam)
- Stemetil (prochlorperazine)
- Ipradol (hexaprenaline)



45 yrs lawn bowling athlete 3

- Natrilix (indapamide)
- Xanax (alprazolam)
- Valium (diazepam)
- Stemetil (prochlorperazine)
- Ipradol (hexaprenaline)



Performance Enhancement

K Hodges Med Sc in Sp Ex Feb 2006

- **Double blind randomized**
- **N = 7 1500 M running trials**
- **Pseudoephedrine 2.5 mg / Kg
90 min pre-exercise**
- **Improvement of 2.1 %**



Bronchial asthma

- **Oral bronchodilators not allowed**
- **Beta agonists & steroid inhalation needs prior notification**
- **Laboratory confirmation required for Olympic Games**



Most common medical problems

- **Refractive errors**
- **Allergic rhinitis**
- **Ear wax**



Recommendation

- **Full participation**
- **Clearance after a problem is corrected**
- **Clearance after additional examinations**
- **Participation in certain sports**
- **No participation**



Sudden Death in Athletes

Can PPPE prevent sudden death?

- AHA: history + P E alone cannot detect many critical cardiovascular abnormalities
- HCM 25% have family history
- 20% have symptoms
- 75% non-obstructive: soft or no murmur

Sudden Death in Y Athlete

年輕運動員猝死

Fuller 1997 5615 high school athletes

Detection of serious cardiac condition by

History: 0 PE : 6 ECG:16

Total 22 withheld

All not related to sudden death

1 with normal history PE & ECG developed

V F due to anomalous coronary artery

Sudden Death in Y Athlete

年輕運動員猝死

1992 – 1997

**68503 Japanese H school students
screened for CVD**

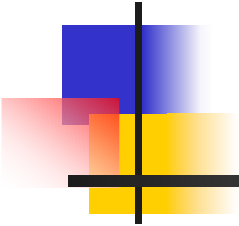
37807 completed 6 yrs follow up

9 high risk gp (0.024%)

3 sudden deaths (1.32/100,000/yr)

1 in high risk gp HCM (1/9)

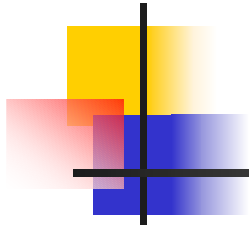
2 in low risk or normal (2/37798)



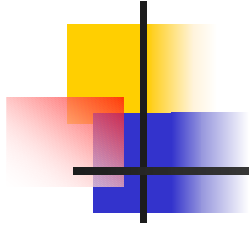
Annual Medical screening A Formality or Necessity?

每年醫學檢定

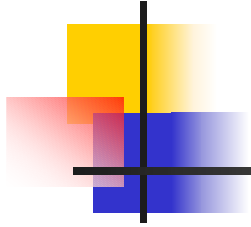
必需手續 或 例行公事？



- **Identify some athletes at risk**
- **Prevent some injuries**
- **Help some athletes perform better**
- **Promote a healthy life style**



-
- **Feed on food from the emporor**
食君之祿
 - **Shoulder the emporer's trouble**
擔君之憂
 - **How much food you get ?**
有幾多祿 ?



Thank You