Professional Development Programme
Understanding and Intrepreting the NSS PE Curriculum
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Healthy Living: Knowledge, Attitude, and Skills

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Health

Tradition

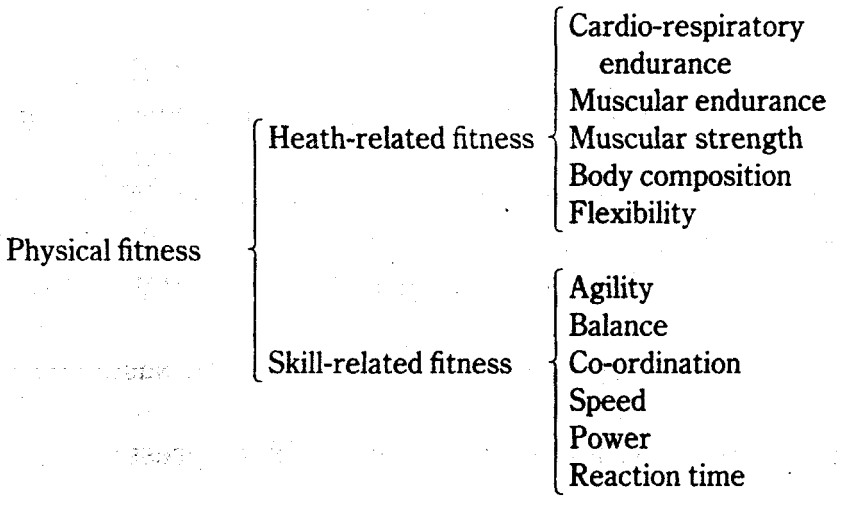
- Free from disease

1947 WHO

- Health is a state of complete physical, mental, and social well-being, and not merely the absence of disease and infirmity

Physical Fitness

- Physical fitness is ability to perform muscular work satisfactorily
- Determined by several variables including habitual physical activity level, diet, and heredity



Physiological Fitness

- Physiological fitness refers to biological system
- Comprises blood pressure, glucose tolerance & insulin sensitivity, blood lipid level & lipoprotein profile, body composition & fat distribution, stress tolerance
- Influenced by the level of habitual PA

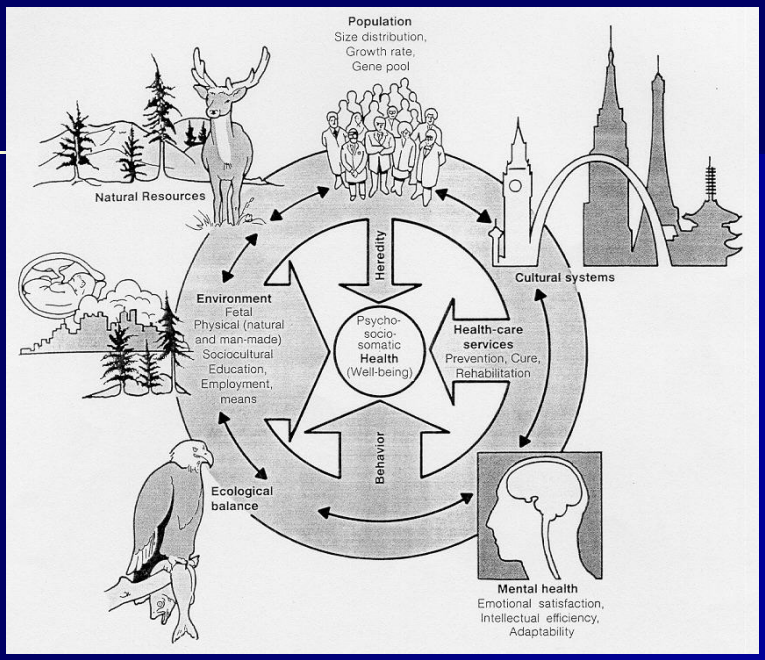
Lifestyle

- Lifestyle comprises the aggregate of an individual's behaviors, actions, and habits which can affect personal health
- Major lifestyle factors
  - Cigarette smoking
  - Alcohol and drugs
  - Eating habits
  - Exercise
  - Stress control
  - Safety care

"Environment of Health" Model

- Is a model to describe the major determinants of health

- Four major determinants of health
  - Environment
  - Behavior
  - Heredity
  - Health-care services



Behaviors (lifestyle)

- Behaviors are individual responses or reactions to internal stimuli and external conditions
- Personal choices and the social and physical environment surrounding individuals can shape behaviors. The social and physical environment include all factors that affect the life of individuals, positively or negatively, many of which may not be under their immediate or direct control

Physical Activity (PA)

- PA is any bodily movement produced by skeletal muscles and resulting in energy expenditure
- The most important components of overall energy expenditure include basal metabolic rate, PA, and the thermic effect of blood. Basal metabolic rate accounts for the largest portion of daily energy expenditure. PA is clearly the most variable component of total daily energy expenditure

Physical Activity (PA)

- Regular physical activity throughout life is important for maintaining a health body, enhancing psychological well-being, and preventing premature death

Effects of PA on Health and Disease

- Overall mortality Cardiovascular diseases
- Cancer
- Non-insulin-dependent diabetes mellitus
- Osteoarthritis
- Osteoporosis
- Falling
- Obesity
- Mental health
- Health-related quality of life

Current Situation: Sedentary Living

- Technology-based reduction in habitual PA
- PA has become a recreational option rather a survival necessity
- Workplace energy provided by human muscles reduced from 1/3 in 1850' to less than 1% in 1980'
- < 50% of American adults exercise regularly once a week
- 50% of Australian men and 2/3 of women aged 25-64 rarely or never engaged in exercise

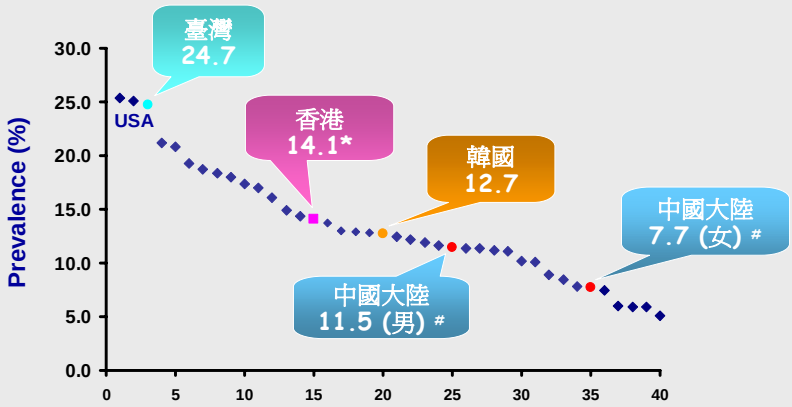
按年齡及職業組別分析年齡 15 歲至 64 歲缺乏體能活動的人士

年齡組別	比率 *
15-24	32.8%
25-34	37.9%
35-44	35.5%
45-54	31.7%
55-64	25.6%

職業	比率 *
經理及行政級人員	36.2%
專業人員 / 輔助專業人員	37.5%
文員	42.8%
服務工作及商店銷售人員	31.0%
工藝及有關人員	31.2%
機台及機器操作員及裝配員	30.3%
非技術工人	32.0%
漁農業熟練工人	#
非從事經濟活動人士†	28.9%

註: * 在有關年齡組別或職業組別內 所佔的比率。† 非從事經濟活動人士包括料理家務者、全日制學生及退休人士。# 由於樣本數目少，以致抽樣誤差大，有關統計數字不予公佈。
缺乏體能活動人士的計算及定義是根據 "Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire (IPAQ) –Short Form (Version 2.0 April 2004)"。
資料來源: 衞生署二零零三至二零零四年人口住戶健康調查 (臨時數字) 。

38個國家和地區超重兒童的比例



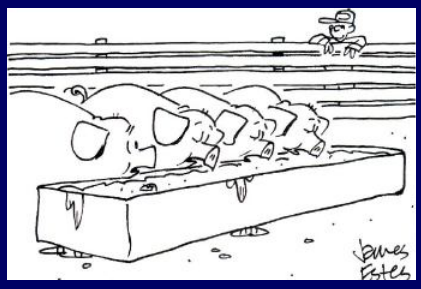
* 正視肥胖問題: 肥胖的成因、現況與預防措施. 衛生署. 衛生防護中心. 2005

\# 2002年學生體質健康監測報告. 中國教育部

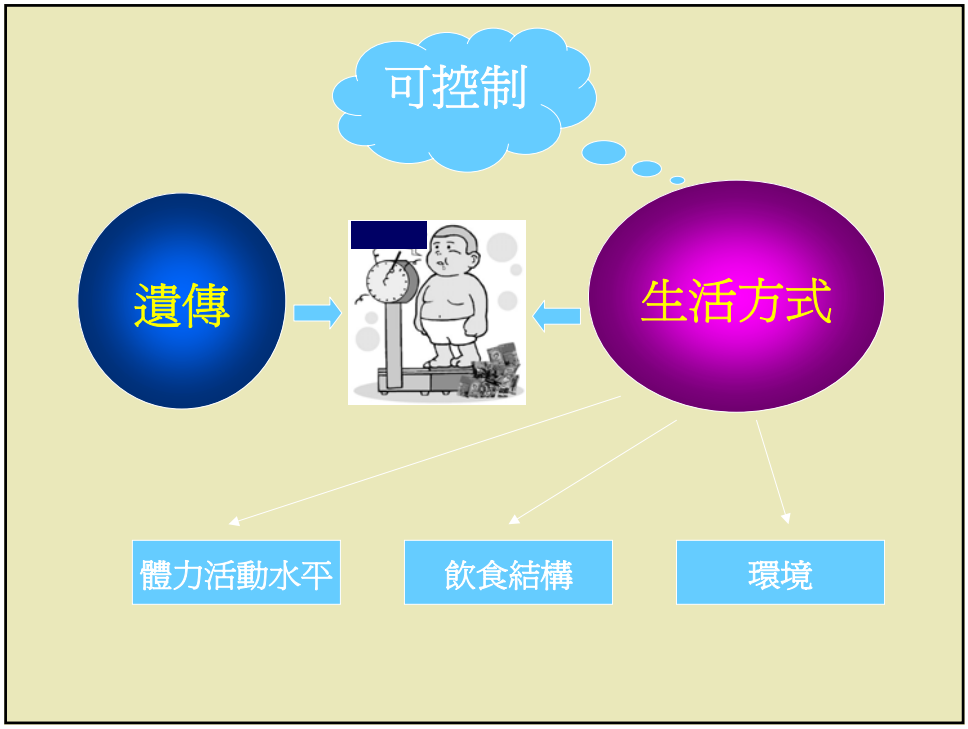
Janssen et al, 2005; Kim et al, 2005; Chu 2005

體力活動水平的減少和飲食習慣的改變是引發肥胖的重要因素(Kimm et al, 2005; Biddle et al, 2004)

"This is so cool! It almost feels like we're actually playing outside!"



"Rich, heavy food and no exercise – doesn't he realize we're all just gonna get FAT?"



Metabolic Syndrome

The metabolic syndrome is a common metabolic disorder that results from the increasing prevalence of obesity. The disorder is defined in various ways, but in the near future a new definition(s) will be applicable worldwide. The pathophysiology seems to be largely attributable to insulin resistance with excessive flux of fatty acids implicated. A proinflammatory state probably contributes to the syndrome. The increased risk for type 2 diabetes and cardiovascular disease demands therapeutic attention for those at high risk. The fundamental approach is weight reduction and increased physical activity; however, drug treatment could be appropriate for diabetes and cardiovascular disease risk reduction.

***Lancet* 2005; 365: 1415–28**

Metabolic Syndrome: > 3 of the following criteria

- High blood pressure (≥130/≥85 mmHg)
- Elevated fasting blood glucose(≥110 mg/dl or ≥6.05 mmol/l)
- Hypertriglyceridaemia (≥150 mg/dl or ≥1.65 mmol/l)
- Low high density lipoprotein (HDL) cholesterol

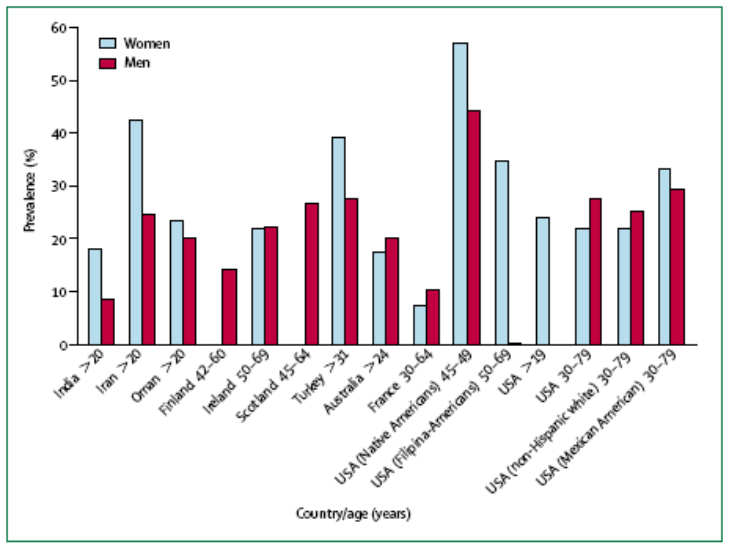
  men, < 40 mg/dl or < 1.05 mmol/l

  women, < 50 mg/dl or < 1.30 mmol/l
- Abdominal obesity, as measured by a waist circumference of > 102 cm for men and > 88 cm for women

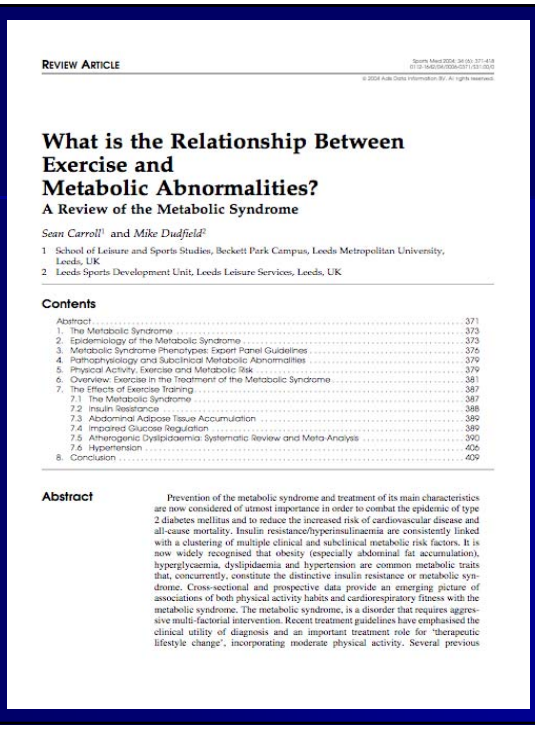
NCEP ATP III Report, *JAMA* (2001), 285:2486–97

Features of Metabolic Syndrome

Central features	Other components
Central adiposity	Microalbuminuria
Dyslipidemia including increased plasma triglycerides, low plasma HDL cholesterol, and small dense LDL cholesterol particles	Procoagulant state including elevated levels of plsdminogen activator inhibitor-1, von Willebrand factor, fibrinogen, and factor VII
Hypertension	Inflammatory markers including elevated levels of C-reactive protein (CRP) and IL-6
Hyperglycemia	Vascular abnormalties including elevated levels of intracellular adhesion molecule-1 and vascular cell adhesion molecule
Hyperinsulinemia	Insulin resistance
Abnormal glucose tolerance	Hyperuricemia



Prevalence of the metabolic syndrome from ATPIII definition



REVIEW ARTICLE

What is the Relationship Between Exercise and Metabolic Abnormalities?

A Review of the Metabolic Syndrome

Sean Carroll[1] and *Mike Dudfield*[2]

1 School of Leisure and Sports Studies, Beckett Park Campus, Leeds Metropolitan University, Leeds, UK
2 Leeds Sports Development Unit, Leeds Leisure Services, Leeds, UK

Contents

Abstract

Prevention of the metabolic syndrome and treatment of its main characteristics are now considered of utmost importance in order to combat the epidemic of type 2 diabetes mellitus and to reduce the increased risk of cardiovascular disease and all-cause mortality. Insulin resistance/hyperinsulinaemia are consistently linked with a clustering of multiple clinical and subclinical metabolic risk factors. It is now widely recognised that obesity (especially abdominal fat accumulation), hyperglycaemia, dyslipidaemia and hypertension are common metabolic traits that, concurrently, constitute the distinctive insulin resistance or metabolic syndrome. Cross-sectional and prospective data provide an emerging picture of associations of both physical activity habits and cardiorespiratory fitness with the metabolic syndrome. The metabolic syndrome, is a disorder that requires aggressive multi-factorial intervention. Recent treatment guidelines have emphasised the clinical utility of diagnosis and an important treatment role for 'therapeutic lifestyle change', incorporating moderate physical activity. Several previous

Research in Physical Activity (PA)

- Increased interest in the study of the health benefits of regular PA over the past 40 years

- Surgeon General's Report (CDC, 1996) as a blueprint document for global research in health and PA

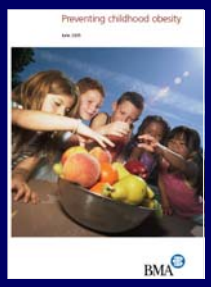
運動活動與時間之關係

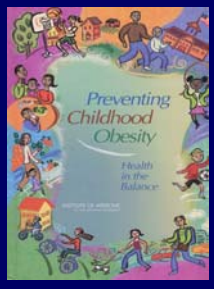
體力活動	運動時間	
洗車和打蠟	45 - 60分鐘	體力活動量較低，時間相應增加
洗窗和抹地	45 - 60分鐘	
園耕工作	30 - 45分鐘	
步行 1哩（20分鐘／哩）	35分鐘	
射籃	30分鐘	
踏單車5哩	30分鐘	
步行2哩（15分鐘／哩）	30分鐘	
來回游泳	20分鐘	
籃球比賽	15 - 20分鐘	
踏單車4哩	15分鐘	
跳繩	15分鐘	
跑步1哩（10分鐘／哩）	15分鐘	
行樓梯	15分鐘	體力活動量較高，時間可相應減少

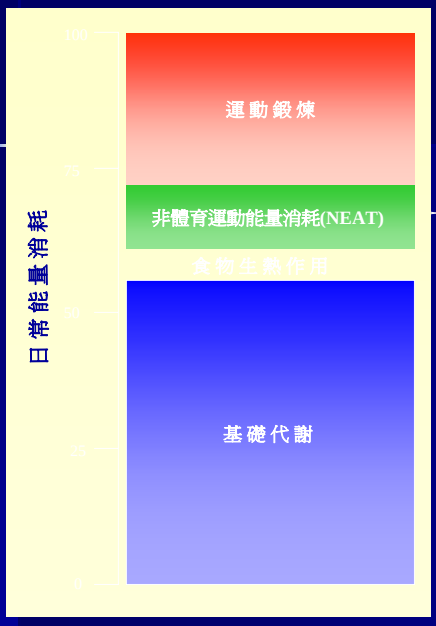
註：American College of Sports Medicine (2001) Dose-Response Issues Concerning Physical Activity and Health: An Evidence-Based Symposium, Medicine and Science in Sports and Exercise, Vol. 33, No. 6.

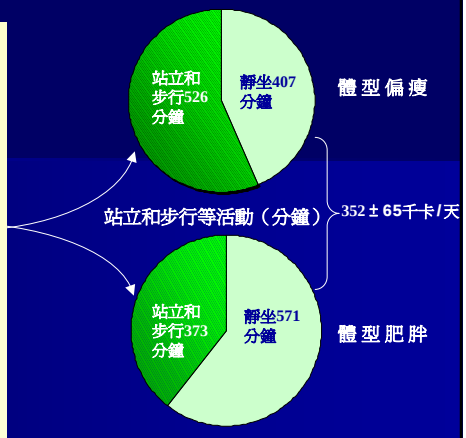
Research in Physical Activity (PA)

- Physical inactivity has been identified as possibly one of the controllable risk factors (WHO 2002; UK Department of Health, 2004; Institute of Medicine, 2005; Booth et al., 2002)









人體每日需要消耗的能量可以分爲三部分：基礎代謝（占50-70%）、食物生熱作用（占10%）和體力活動所需能量（占20-40%）之和。其中體力活動包括有計劃的運動鍛煉和非體育運動能量消耗（NEAT）。2005年「科學」雜誌上發表的研究指出生活行爲習性與體重有關聯。研究人員用特殊裝備記錄志願者在日常活動中消耗的能量，發現如果較肥胖的志願者比較瘦的志願者每日少坐164分鐘就能夠多消耗352±65千卡的能量（相當於一個杯面所含有的熱量）。倘若持久地將生活運動化，亦能夠燃燒脂肪控制體重的增加。

[資料來源: *Science*, 2005 (307): 584-586.]

Level and Strength of Evidence for a Relationship Between PA and Chronic Conditions

	Preventive effects			Therapeutic effects	
Condition	Level of evidence[‖]	Strength of effect	Evidence of a dose response relationship	Level of evidence[‖]	Strength of effect
Cardiovascular disease					
Coronary heart disease	High	Strong	Yes	Medium	Moderate
Stroke – occlusive	High	Moderate	–	Low	Weak
– haemorrhagic	Medium	Weak	–	Low	Weak
Peripheral vascular disease	No data/ insufficient data	–	–	Medium	Moderate
Obesity and overweight	Medium	Moderate§	–	Medium	Moderate§
Type 2 diabetes	High	Strong	Yes	Medium	Weak
Musculoskeletal disorders					
Osteoporosis[¶]	High	Strong	–	Medium	Weak
Osteoarthritis	No data/ insufficient data	–	–	Medium	Moderate
Low back pain	Medium	Weak	–	High	Moderate
Psychological well-being and mental illness					
Clinical depression	Low	Weak	–	Medium	Moderate
Other mental illness	No data/ insufficient data	–	–	Low	Weak
Mental well-being	–	–	–	Medium	Moderate
Mental function	Low	Moderate	–	Low	Weak
Social well-being	No data/ insufficient data	–	–	Low	Weak
Cancer					
Overall	Medium	Moderate	Yes	No data/ insufficient data[¶]	–
Colon	High	Strong	Yes		
Rectal	Medium	No effect	–		
Breast	High	Moderate	Yes		
Lung	Low	Moderate	–		
Prostate	Medium	Equivocal	–		
Endometrial	Low	Weak	Yes		
Others	Low	Equivocal	–		

ORIGINAL CONTRIBUTION

Effects of Lifestyle Activity vs Structured Aerobic Exercise in Obese Women
A Randomized Trial

A Community-Based Group Exercise Program for Persons with Chronic Stroke

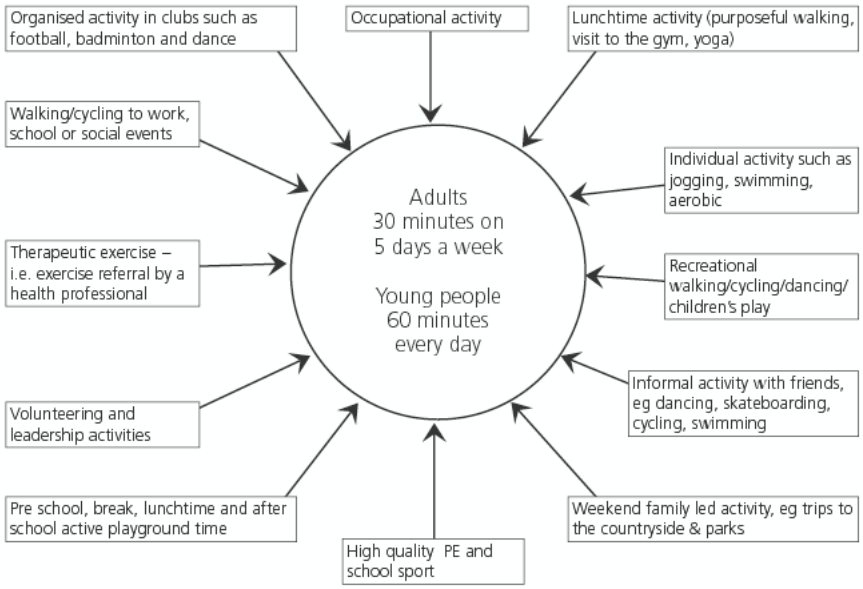
论 著

有组织、半封闭形式社区减肥活动的效果评价

Evaluation of the Outcome of an Organized- Semi - Closed Program for Weight Reduction in Community

14

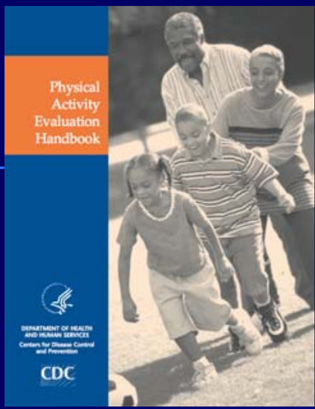
The Activity Menu for Adults and Children



PA Recommendation for Children

(Department of health and aging, Australia, 2005)

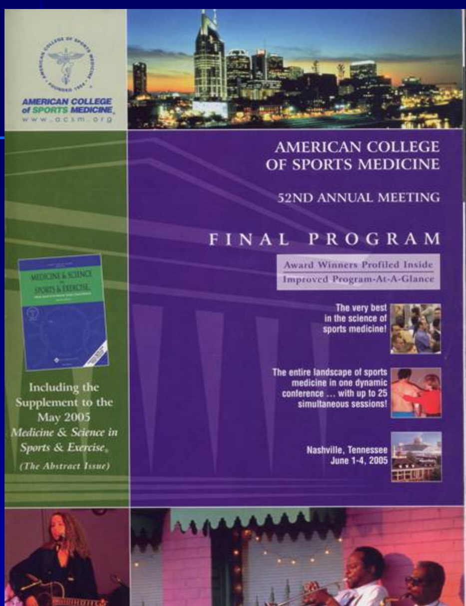
- Children need at least 60 minutes (and up to several hours) of moderate to vigorous physical activity every day.
- Children should not spend more than two hours a day using electronic media for entertainment (e.g. computer games, TV, internet), particularly during daylight hours.

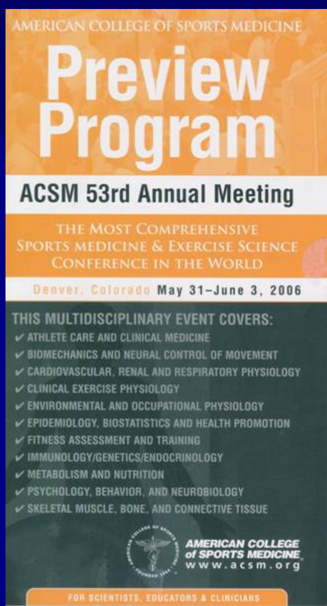


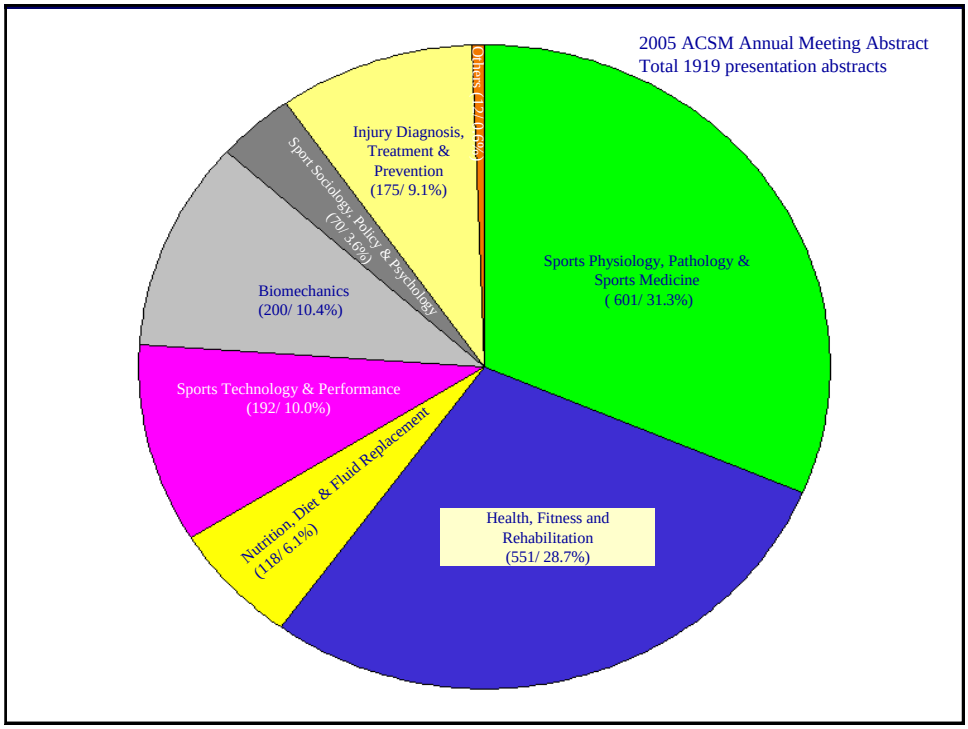
The Effectiveness of Interventions to Increase Physical Activity

A Systematic Review

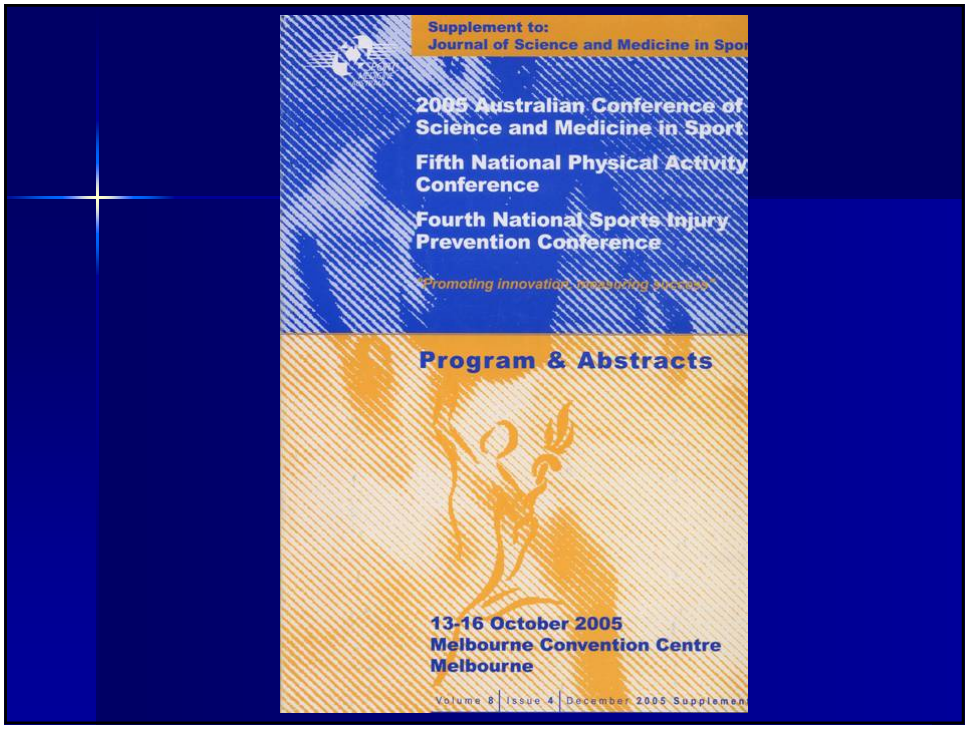
Intervention	Intervention Description	Task Force Recommendation for Use	Indicators Measured in Reviewed Studies
Behavioral and Social Approaches *(continued)*			
School-based physical education (PE)	Modified curricula and policies to increase the amount of moderate or vigorous activity, the amount of time spent in PE class, or the amount of time students are active during PE class. Interventions included changing the activities taught or modifying the rules of the game so that students are more active.	Strongly recommended	Minutes per week spent in moderate to vigorous physical activity (MVPA). Percentage of class time spent in MVPA. Estimated energy expenditure.






2005 ACSM Annual Meeting Abstract
Total 1919 presentation abstracts
Other (0.2.0%)
Injury Diagnosis, Treatment & Prevention (175/ 9.1%)
Sport Sociology, Policy & Psychology (70/ 3.6%)
Sports Physiology, Pathology & Sports Medicine (601/ 31.3%)
Biomechanics (200/ 10.4%)
Sports Technology & Performance (192/ 10.0%)
Nutrition, Diet & Fluid Replacement (118/ 6.1%)
Health, Fitness and Rehabilitation (551/ 28.7%)


The British Association of Sport and Exercise Sciences
www.bases.org.uk
BASES
2005 BASES Annual Conference
Loughborough University 4th-7th September 2005
Promoting Excellence in Sport and Physical Activity for Health
Loughborough University



Research Focus

- **Mechanisms and relationship on health & PA**
- **PA assessment**
- **Dosage of PA**
- **PA promotion on youth and elderly**
- **School-based PA promotion**
- **Occupational PA promotion**
- **Surveillance (link to 2 MMMR docutments)**