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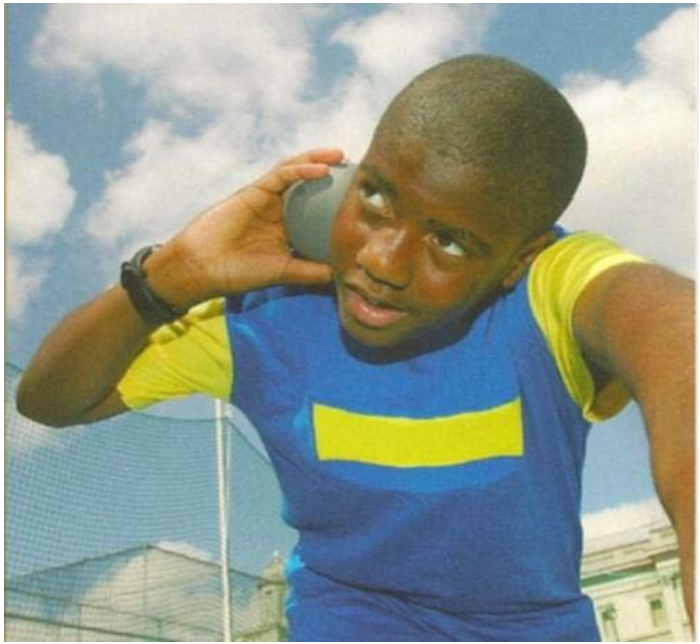

Health & Fitness
of young people through sport

health and fitness of young people through physical activity and sport

This project is supported by the IOC Medical Commission:

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This Consensus Statement is based on the meeting held in Lausanne SUI January 2011

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Consensus Overview

Introduction

Science review:

- **Are children fit & active?**
- **Health implications of low PA & low fitness**
- **Correlates of PA/ inactivity/ low fitness**
- **Options for change**
  evidence from community & school interventions

Recommendations of the IOC expert group

Discussion

Introduction

Olympic Movement in Society Congress 2009

IOC President Jacques Rogge:

“In the late 1800s, de Coubertin worried that youth in his native France were turning away from physical activity. Today, we see the same problem in the growing rate of youth obesity throughout the world.... We are here to make sure that the Olympic Movement will continue to serve athletes, the world’s youth and society at large for decades to come.”

Olympic Movement in Society Congress Copenhagen 2009

121st IOC SESSION & XIII OLYMPIC CONGRESS
COPENHAGEN 2009
DENMARK

Recommendation # 51

Everyone involved in the Olympic Movement must become more aware of the fundamental importance of physical activity and sport for a healthy life style, not least in the growing battle against obesity, and must reach out to parents and schools as part of a strategy to counter the rising inactivity of young people.

World Health Organization

Statistics

World Health Organization:

Physical inactivity is the 4th leading risk factor for global mortality

behind hypertension, tobacco use and high blood glucose

contributing to 3.2 million deaths globally per year.

Statistics

60% of all global deaths can be attributed to non-communicable diseases

31% of adults around the world are physically inactive

Statistics

5.5% of all deaths globally can be attributed to inactivity including:

CV disease

diabetes mellitus

some cancers

IOC/WHO MOU 2010

World Health Organization

"to join efforts and to cooperate...
to promote healthy lifestyles,

physical activity and sport among the communities.."

Consensus Meeting

January 2011

Based on the above rationale,

the IOC Medical Commission took a leadership role in addressing the global health issue of

inactivity in young people.

Programme Objectives

To raise awareness of the serious health consequences of inactivity in young people based on the provision of evidence-based information.

To provide recommendations on the prevention and management of this health issue.

To motivate sport organizations and governments to collaborate in promoting healthy fitness in children.

To encourage further scientific research in this field.

Are children fit & active?

Are children fit and active?

Peak oxygen uptake (VO2) is the best single measure of young people's aerobic fitness

Children's peak VO2 increases with age; boys' values are higher than those of girls in childhood & adolescence
Young athletes have higher peak VO2 than their untrained peers

Are children fit and active?

Both trained and untrained youth benefit from exercise training

Exercise training program to increase peak VO_2:

Frequency: 3-4 times per week
Intensity: 85-90% max HR
Duration: 40-60 min

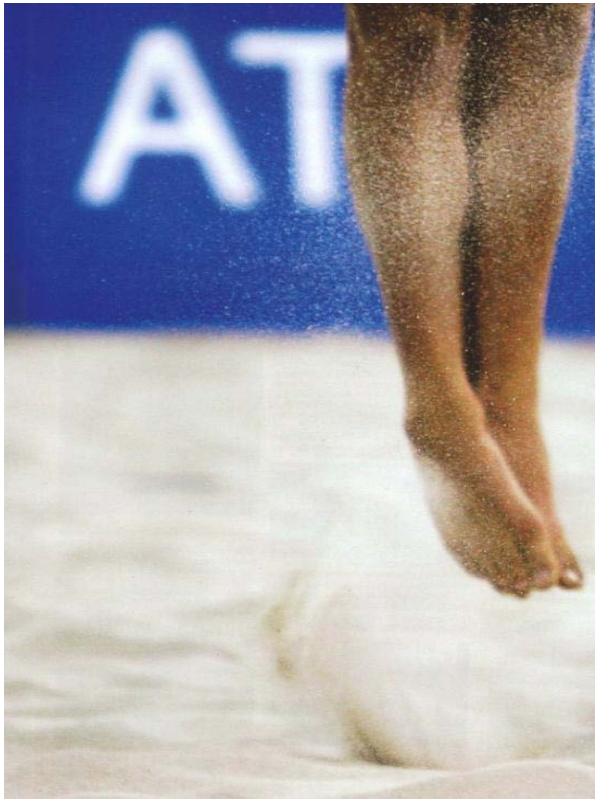
(IOC Consensus Statement on ‘Training the Elite Young Athlete’, 2008)

Are children fit and active?

Young people rarely experience habitual PA of duration & intensity necessary to enhance peak VO_2;
there is no meaningful relationship between habitual PA and peak VO_2

There are no widely recognized recommendations for health-related levels of aerobic fitness

There is no compelling evidence to suggest that children have low levels of peak VO_2 (L/min) or that they are less aerobically fit than children of previous generations



Are children fit and active?

Only a very small decline of about 0.1% per decade in mass-related peak VO_2 (mL/kg/min) between 1962 and 1994

However, there has been a substantial deterioration of about 4.0% per decade in maximal aerobic performance which involves the transport of body mass since 1975

Are children fit and active?

The assessment and interpretation of young people's physical activity (PA) is extremely difficult and current methods might not assess PA in all domains

Only 30-40% (PA assessed subjectively e.g. by questionnaire) or even 25% (PA assessed objectively e.g by accelerometry) of young people satisfy current health-related PA recommendations

Studies suggest that young people's PA levels have not declined during recent decades

Health implications of low PA/ low fitness

Health Implications of Physical Inactivity

Cardiovascular & Metabolic Health

Bone Health

Obesity

Mental Health

Injury Risk

Cardiovascular & Metabolic Health

Low levels of PA in children are associated with higher levels of:

Obesity

Hypertension

CV risk factors

(metabolic syndrome)

Cardiovascular & Metabolic Health

Blood Pressure:

Improving Aerobic Fitness levels
improves essential hypertension
in youth

30 minutes @3x per week

Intensity:
sufficient to increase aerobic fitness

Cardiovascular & Metabolic Health

Cholesterol:

Increasing activity levels positively affects cholesterol levels in youth

40 minutes @ 5x per week x 4 months
Increase in HDL and decrease TG

Interventions:
aerobic, resistance and circuit training

Cardiovascular & Metabolic Health

Metabolic syndrome:

Constellation of risk factors for adult CV disease

- Abdominal obesity
- Type II Diabetes
- Hypertension
- Elevated inflammatory markers

Prevalence in youth:
3-14%

Cardiovascular & Metabolic Health

Metabolic syndrome:

Interventional studies show improvements of elements of metabolic syndrome with increased PA in both obese and non-obese youth.

Effective PA parameters have not yet been defined

Bone Health

Fractures occur in 30-50% of youth and old populations

Bone Health

Youth engaged in weight bearing sports had higher bone mass compared with non-athletic peers

Bone Health

Racquet sport athletes showed increased bone mass in their racquet arm

These changes persisted over time:

Early puberty provides a

“window of opportunity”

to increase bone mass with PA

Bone Health

Increase in bone mass & density
(femoral neck & lumbar spine):

Intervention: vigorous jumping and activity
3x/week x 6-24 months

1-6% increase pre-puberty
0.3-2% post puberty

Bone Health

Bone geometry, structure & strength

Exercise effects on bone strength during growth reported small but significant effects on the lower extremities in children.

Bone Health

Bone health recommendation

PA provides the weight bearing stimulus that promotes children's bone health that should persist into adulthood.

Obesity

Obesity incidence in children
is increasing globally

Obese children are less active than their
normal-weight peers

Sedentary behaviours in children are increasing

Obesity

Although there has been an increase in children's participation in organized sport, incidental PA (free play, active transport) has declined in recent decades.

Obesity

Healthy diet

+

Promotion of PA and exercise

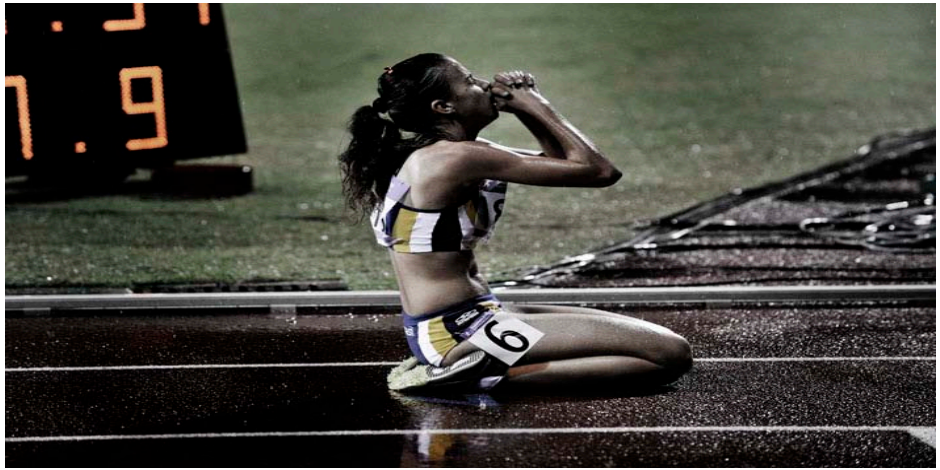
=

Lower risk of obesity

and associated health risks

Mental Health

Small-moderate beneficial effects for reduced depression and anxiety from physical activity



Mental Health

Physical Activity can lead to small improvements in global self-esteem

Mental Health

Physical Activity is associated with improved:

cognitive performance

classroom behaviour

academic achievement

Academic performance is not affected by PA time allocation

Mental Health

Small negative associations between mental health and sedentary behaviour

(screen viewing):

Injury Risk

Children with low fitness levels are at increased risk of injury in sport

Low fitness level is a modifiable risk factor for sports injury in children

Injury Risk

Training measures to improve fitness & prevent injury:

Strength
Flexibility
Plyometrics
Balance
Coordination
Agility

Injury Risk

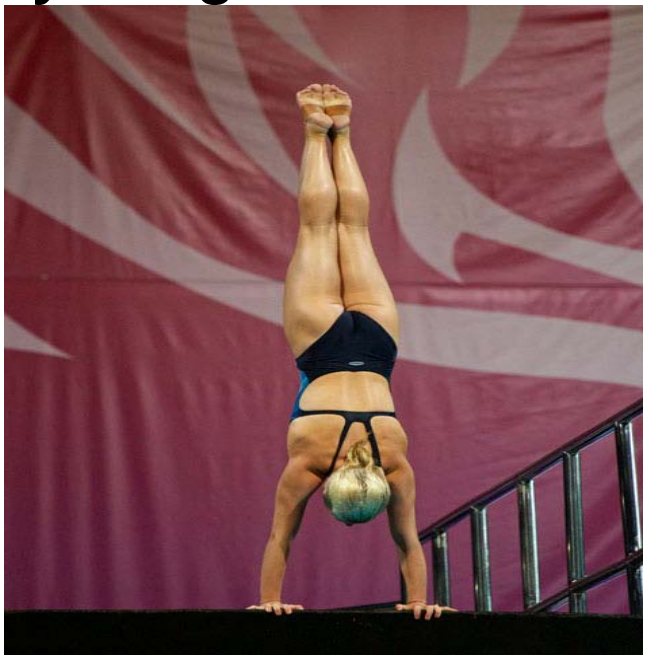
Non-contact ACL injuries in adolescent female athletes:

Proprioception
Flexibility
Plyometrics
Balance
Aerobic training

Injury Risk

Prevention of ankle sprains in young athletes:

Training interventions have shown a decrease in injury incidence



Injury Risk

School based exercise intervention for low activity children (NED) Demonstrated a decrease in sports injuries, especially in those with previous low activity levels

Correlates of PA and sedentariness

Determinants of PA

To better understand the mechanism behind PA and sedentariness of young people, it is important to have insight into the correlates & determinants of these behaviours

FACTORS:

- biological
- psychosocial
- behavioural
- social
- environmental

Determinants of PA: Results of systematic review

Determinant of children's (6-12y) PA:

Insufficient evidence found for longitudinal association between parent education & PA

Moderate evidence found for longitudinal association between intention & PA

Determinants of PA: Results of systematic review

Determinant of adolescent's PA:

age: being older
ethnicity: not being African American
planning

Overall conclusion:
There is little 'true' high quality information about determinants of PA in youth.

Determinants of Sedentariness: Results of systematic review

Determinants of sedentary behaviour (Uijtdewilligen):

"insufficient evidence for both children and adolescents"

Determinants of Sedentariness: Results of systematic review

Correlates of sedentary behaviour (Pate):

Time spent in sedentary behaviour has been shown to be higher in:

- lower socioeconomic groups
- in older versus younger youth
- in non-white youth
- in more mature youth
- in young people who live in homes with heavy exposure to electronic forms of entertainment (TV and computers)

Determinants of Sedentariness: Results of systematic review

Correlates of sedentary behaviour (Pate):

Young people spend less time in sedentary behaviours

if their parents set limits regarding time of participation in screen-based entertainment

Options for Change:

Evidence from community & school interventions

Options for Change:
Evidence from Community Interventions

PA is influenced by the family & community environment

Although limited evidence, a systematic review support the efficacy of:

"family–based interventions set in the home including self-monitoring and goal setting"

Options for Change:
Evidence from Community Interventions

Updated systematic review (van Sluijs 2011)

Creating safe environments for free play or active travel has the potential to increase population levels of PA

5 studies showed positive effects of interventions on body composition

3 interventions showed
significant positive effects
on PA

Options for Change:
Evidence from School Interventions

School based interventions are thought to be universally applicable and effective way to counteract low PA

Analysis of Reviews (Kriemler 2011):

47-65% trials were effective

Effect was seen in school-related PA

Options for Change:
Evidence from School Interventions

Analysis of Reviews (Kriemler 2011):

School based application of multi-component intervention were most effective

Controversy exists over the efficacy of:

family involvement

focus on risk populations

duration of intervention

intensity of intervention

Options for Change:
Evidence from School Interventions

Systematic review (Kriemler 2011):

Positive effect on
in-school and out-of-school in overall PA
in 9/10 studies

55% showed an
increase in fitness

Options for Change:

Existing Programs

+

Recommendations of the IOC Expert Group

Existing Programmes

International Olympic Committee

IOC Congress 2010 in Copenhagen

Youth Olympic Games

Consensus Statements on:

- Training the elite child athlete
- Age determination in children
- Periodic health evaluation
- Health & fitness of young people through sport

Existing Programmes

International Federations

Hosting of Junior Championships

Sport modifications for youth adaptation

FIG: elite youth sport

FIFA: 2 studies on youth sport promotion

Association of Summer Olympic International Federations

Existing Programmes

National Olympic Committees

Can play a major role in the promotion of PA

eg. Canadian Olympic School Program

World Health Organization

Existing programmes

World Health Organization

IOC-WHO Memorandum of Understanding (2010)

The WHO Global Strategy on Diet, PA and Health (2004)

WHO Global Action Plan for NCD prevention and Control (2008)

Global Recommendations on Physical Activity for Health (2010)

Existing programmes

International PA Networks

2 Global Networks:

Agita Mundo
GAPA

4 Regional Networks:

Americas (RAFA/PANA)
Europe (HEPA Europe)
Asia-Pacific (APPAN)
Africa (AFPAN)

Existing Programmes

Non-Governmental Organizations

NGOs use PA and sport as platforms to develop social cohesion:

Sports for
Development

Sports for All

Existing Programmes

Governments

Can & should play a major role in the promotion of PA and sport in youth

Agita Galera Program

Sao Paulo, Brazil

Existing Programmes

Governments:
Education & Health Care Systems

Can & should play a major role in the promotion of PA and sport in youth:

Implementation of whole-of-school PA Curriculum

Education of primary health care professionals on the benefits and prescription of PA

Recommendations

Effective change requires a coordinated, collaborative, global effort between many stakeholders

- young people involved to plan, implement, deliver and evaluate sport and PA programmes

Recommendations: Sport Organizations

- ensure that sport programs include youth oriented activities to engage and retain young athletes;
- educate sport coaches to incorporate appropriate health-related fitness training in relation to growth and maturation;
- improve the quality and delivery of sport programs for young developing athletes;
- identify and lower the barriers to participation in sport;





Recommendations: Sport Organizations

- collaborate with youth, parents, school personnel and community programs to design and deliver sports programs that attract and retain young people;
- foster collaboration with international, regional and national PA promotion networks;
- encourage research into the efficacy and effectiveness of delivery of sport and PA for young people.

Recommendations: Governments

- develop and implement policy to promote sport and PA in young people;
- place health and PA higher on the political agenda;
- enhance funding for youth involvement in sport and PA programs across sectors;
- support multi-sectoral policies and provision of school-wider community (sport, recreation, health agencies) partnerships to improve PA opportunities for young people;

Recommendations: Governments

- ensure that providers of recreational programs for young people limit the time spent in sedentary pursuits such as television watching, video game playing, and computer use;
- advocate for PA and health promotion on global health and regional agency agendas;
- foster collaboration with international, regional and national PA promotion networks;
- support research to better understand the role of PA in the health trends of young people.

Recommendations: Education System

- provide effective PE in school delivered by qualified professionals at all levels of the curriculum;
- provide a minimum of three lessons of PE totaling 120 to180 minutes per week;
- ensure that opportunities for PE/PA are provided in a variety of settings and are embedded within the curriculum;

Recommendations: Education System

- collaborate with community organizations to create accessible and safe PA and sport environments;

- implement adaptable whole of school models that utilize multiple component strategies and routes of entry;

Recommendations: Health Care System

- provide mandatory education of health care professionals on the benefits and prescription of PA for young people;

- increase collaboration between health care professionals and other providers of PA and sport in the community;

- revise the health care financing

system to include reimbursement

for individualized life style

counseling and follow-up.

Recommendations: Non-Governmental Organizations

- Sport for Development programs be evaluated for efficacy of health outcomes and impact;
- a registry of NGOs, both sport and non-sport, be established to promote PA and sport as a vehicle for health and community development;
- NGOs develop a filter for partnerships to ensure sustainability, equity, allocation of resources, community ownership and buy-in, and to limit unintended consequences of PA and sport programming

Recommendations: Research

It is recommended that research be conducted with respect to sport, to assess if:

- current structures of organized sport are adequate to meet the needs of young people and

- coaches are adequately prepared to cope with the unique pedagogical physiological and psychological needs of young people during growth and development;

Recommendations: Research

- to use new non-invasive technologies such as magnetic resonance imaging and spectroscopy and near-infra red spectroscopy to better understand responses to exercise and young people's fitness during growth and maturation;

- to evaluate setting and types of young people's habitual PA, sport participation and fitness through large scale, standardized national and international surveys;

- to evaluate the effect of PA promotion interventions on intermediate factors, and at long-term follow-up with objective measures of the behaviour;

Recommendations: Research

- to better define the dose-response mechanisms and effects of PA/exercise and sedentary behaviour on fitness and health during growth and development;
- to assess which method of PA promotion is best for a given population taking into consideration factors such as disease state, socio-economic conditions, culture, ethnicity, gender and age;
- to assess reach and implementation issues beyond attendance rates in interventionstudies to establish the potential for wider implementation;

Recommendations: Research

- using objective measures of PA whenever possible to enhance the quality of assessment and interpretation of data.

- Develop a web-based repository for surveillance data on objectively measured PA to better compile, evaluate and disseminate the scientific evidence in this field.

Conclusion

Sport has an important role to play in the current global health crisis of rising morbidity and mortality from non-communicable diseases caused by inactivity

in young people.

Conclusion

Together with other partners in inter-governmental organizations, government, education and health care sectors, sport can be instrumental in invoking behaviour changes in young people to positively affect global health.

“Participation in sport has significant physical benefits, contributing to people’s ability to lead long and healthy lives, improving well-being, extending life expectancy and reducing the likelihood of several major non-communicable diseases.” UN

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