

# Safe Sport: The Pre-Participation Examination

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**“I know nothing about the subject,  
but I’m happy to give you my expert opinion.”**

# Pre-Participation Examination (PPE)

- IPC requirements;
- IOC Consensus statement;
  - Objectives of PPE
  - Requirements for PPE;
- Three approaches to PPE:
  - sports governing body,
  - national law,
  - sports medicine centre;
- Conclusion.

# IPC Medical Code

## Fitness to practice a sport

46. Prior to engaging in competitive sport, and preferably with regular intervals throughout their athletic career, athletes should undergo pre-participation evaluation....



International  
Paralympic Committee

## Medical Code

December 2011



## Pubmed search PPE / PCMA and

paralympic / disabled / **physically- challenged:**

- Oliveira JA et al. **Athlete's heart, oxygen uptake and morphologic findings in Paralympic athletes.** Int J Cardiol. 2007.
- Several articles on oral health.
- Madorsky JG, Curtis KA. **Wheelchair sports medicine.** AJSM. 1984.
- Dec KL, Sparrow KJ, McKeag DB. **The physically- challenged athlete: medical issues and assessment.** Sports Med. 2000.

# The International Olympic Committee (IOC) Consensus Statement on Periodic Health Evaluation of Elite Athletes

[http://www.olympic.org/assets/importednews/documents/en\\_report\\_1448.pdf](http://www.olympic.org/assets/importednews/documents/en_report_1448.pdf)

Br J Sports Med. 2009 Sep;43(9):631-643.



# Objectives

- Ensure current health problems are **managed appropriately**;
- Determine athlete is **medically suitable** to engage in particular sport;
- Detect **silent conditions** that are not severe but may influence performance;
- Opportunity to **establish relationship** with medical team.

## Objectives

- Identify characteristics that put athlete at risk for future injury or disease.
  - **Cardiac pathology** predisposing for Sudden Cardiac Death: **Evidence** for effectiveness of PPE in Veneto region, **best method no consensus** internationally (ECG, echocardiography);
  - **Injury prevention**: currently **no evidence** (apart from identifying previous injury and ensuring complete rehabilitation) for effectiveness of PPE.



# Requirements

- Performed in primary interest of the athlete.
- Under responsibility of sports medicine physician.
- Free and informed consent of athlete and, if applicable, guardian.
- If PPE identifies **serious medical risk**, the physician must **strongly discourage** athlete from participation.
- Based on advice, ultimately **athlete's** decision.

# Requirements

- Nature and scope should take into account **individual factors**, such as the **geographical region, sport discipline, level of competition, age, gender**;
  - ➔ **Specific / individualised approach needed.**
- **Setting** of evaluation should be chosen to optimise the accuracy of the examination and respect privacy of athlete.
  - ➔ **Implementation experience to increase knowledge base for Paralympians?**

# International Federation: FIFA PCMA

- Competition and medical history, physical exam.
- Focus on detection of **risk factors for SCD**;
  - Heart rate, blood pressure at rest,
  - 12-lead resting ECG,
  - Echocardiography;
- Blood parameters;
- Musculoskeletal part;
- Eligibility.



# FIFA Pre-Competition Medical Assessment

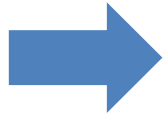
- **2006 FIFA World Cup Germany™**: 598 players;
  - **2010 FIFA World Cup South Africa™**: 736 players;
  - **FIFA Women's World Cup 2007**:  
11 of 16 teams; 231 players
  - **U-20 WWC 2010**: 16 of 16 teams, 336 players
  - **U-17 WWC 2010**: 14 of 16 teams, 294 players
-  **2355 players examined and documented.**

Dvorak J, Grimm K, Schmied C, Junge A. Clin J Sport Med. 2009.

Thünenkötter T, Schmied C, Grimm K, Dvorak J, Kindermann W. Clin J Sport Med. 2009.

Junge A, Grimm K, Feddermann N, Dvorak J. Clin J Sports Med. 2009.

**Recommendation only, not mandatory, and no funding provided.**



- **All levels of play, including female youth and member associations worldwide.**
- **Developing countries highest compliance and quality.**
- **Legal implications for International Federation, Member Association.**



# Conclusion for football: Worldwide screening is possible...

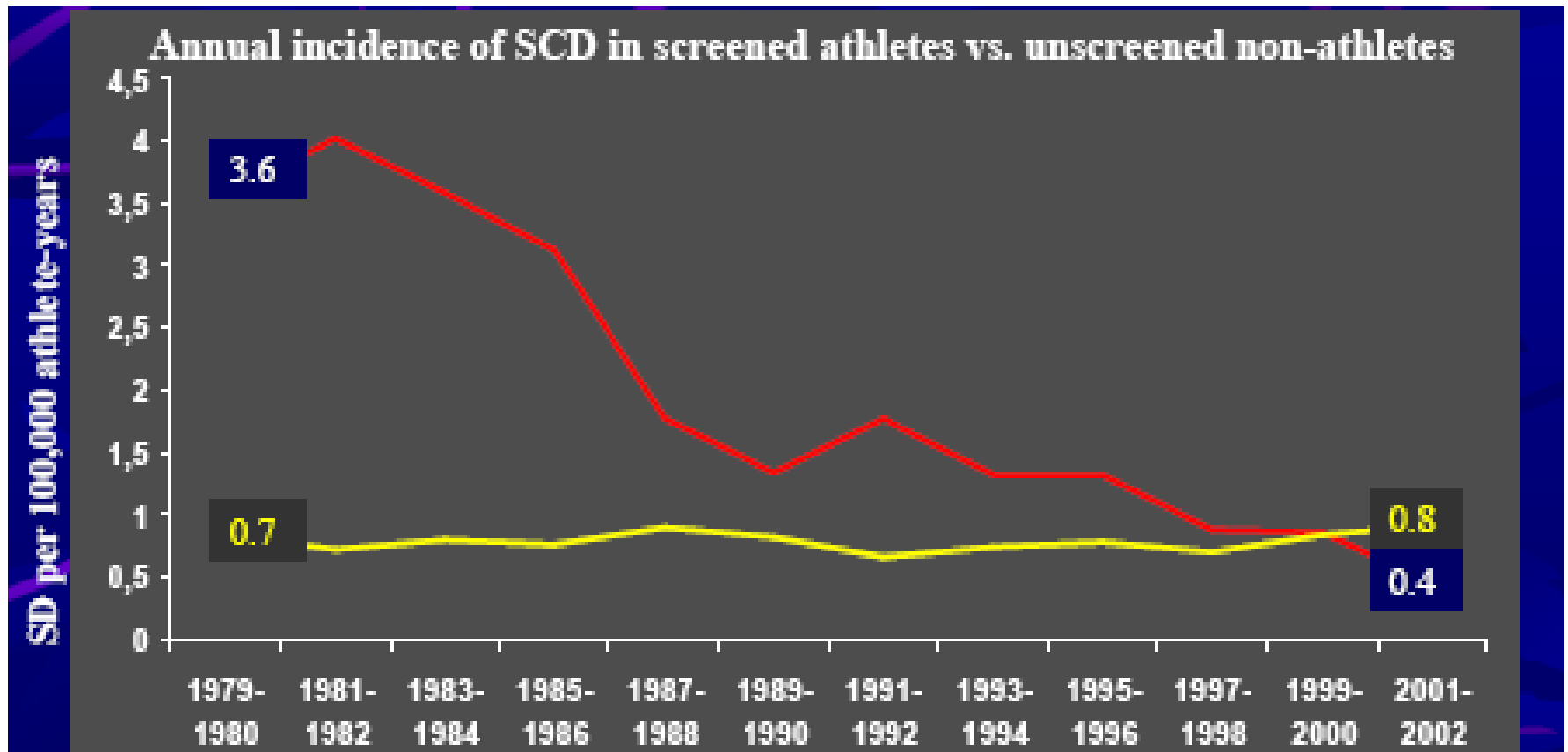


Decision of FIFA  
Executive Committee:  
PCMA mandatory

## National law requirement: Italy

- Since 1982, **every subject** engaged in **competitive sports** must undergo clinical evaluation;
- Medical history, physical examination, 12-lead resting ECG and after exercise (step test);
- 6 Mill athletes, 2 Mill elite athletes;
- **2% of athletes are not cleared** for competition: **70% cardiovascular disease.**

# Reduction in SCDs in young athletes in Veneto region (1979-2004)



Corrado et al. JAMA 2006.



## National law requirement: Italy

### Personal information from Prof. Antonio Pelliccia\*

- >300 Paralympic athletes (2008-2010);
- Medical history and physical examination;
- 12-lead resting ECG;
- Exercise stress testing (arm ergometer 10 Watt increment per minute to exhaustion);
- Echocardiography;
- Orthopaedic, neurological, psychiatric, ophthalmological, ENT, nutritional assessment etc.

\*Unpublished data.

## National law requirement: Italy

About **10%** of athletes **cardiovascular abnormality**

- Systemic hypertension,
- Vascular disease,
- Arrhythmias,
- Cardiomyopathy.

 **Higher prevalence** than in Olympic athletes.

 **More attention to PPE in Paralympians** needed.

## Sports Medicine Clinic: Aspetar

- All athletes in Qatar are screened at Aspetar (approx. 2500-3000 per year).
- Sports Cardiology project (ethnicity, echocardiography);
- Sports dentistry, blood test, biomechanical.
- Sports-specific screening initiatives, e.g. football;
- Disabled athletes: small subpopulation.

# Aspetar disabled athlete screening


Between November 2010 and September 2013:

- 2276 disabled athletes\*, mostly visually impaired, cerebral palsy, para- or tetraplegic;
- 1245 Arabic, 686 black African, 345 Caucasian;
- Cardiac testing on wheelchair treadmill initially, later arm bike;
- 10 athletes (0.4%) with underlying cardiovascular pathology related to Sudden Cardiac Death
  - 7 Hypertrophic cardiomyopathy (HCM)
  - 3 Wolff-Parkinson-White Syndrome (ablated, returned to sports after restitution period).

\* >6 hours training per week

# Aspetar Paralympic athlete screening

40 male athletes\*

- No abnormal ECGs;
- **4 abnormal echocardiography** (1 blood-pressure related LVH; 1 diastolic dysfunction; 1 dilated aorta; 1 significant aortic regurgitation)  **10%**
- 4 hypertension;
- 4 chest pain;
- 3 palpitations;
- 12 abnormal lipid profile;
- 3 dizzy (both at rest and during exercise);
- 2 with an audible murmur;
- 1 syncopal episode.

\* >6 hours training per week

## Conclusions

- **IPC requirement;**
- **No evidence base or best-practice;**
- **Individualised approach;**
- **Increasing knowledge on injury and illness profile;**
- **Indications are for potentially higher cardiovascular risk;**
- **Safe participation prerequisite to enable promotion and maximum benefit from health effects.**

# The International Paralympic Committee (IPC)

## Consensus Statement on Periodic Health Evaluation of Elite Paralympic Athletes

[www.paralympic.org/sites/...](http://www.paralympic.org/sites/...)

Br J Sports Med, Am J Sports Med, Sports  
Med, Clin J Sports Med,.... 2015

# THANK YOU!

