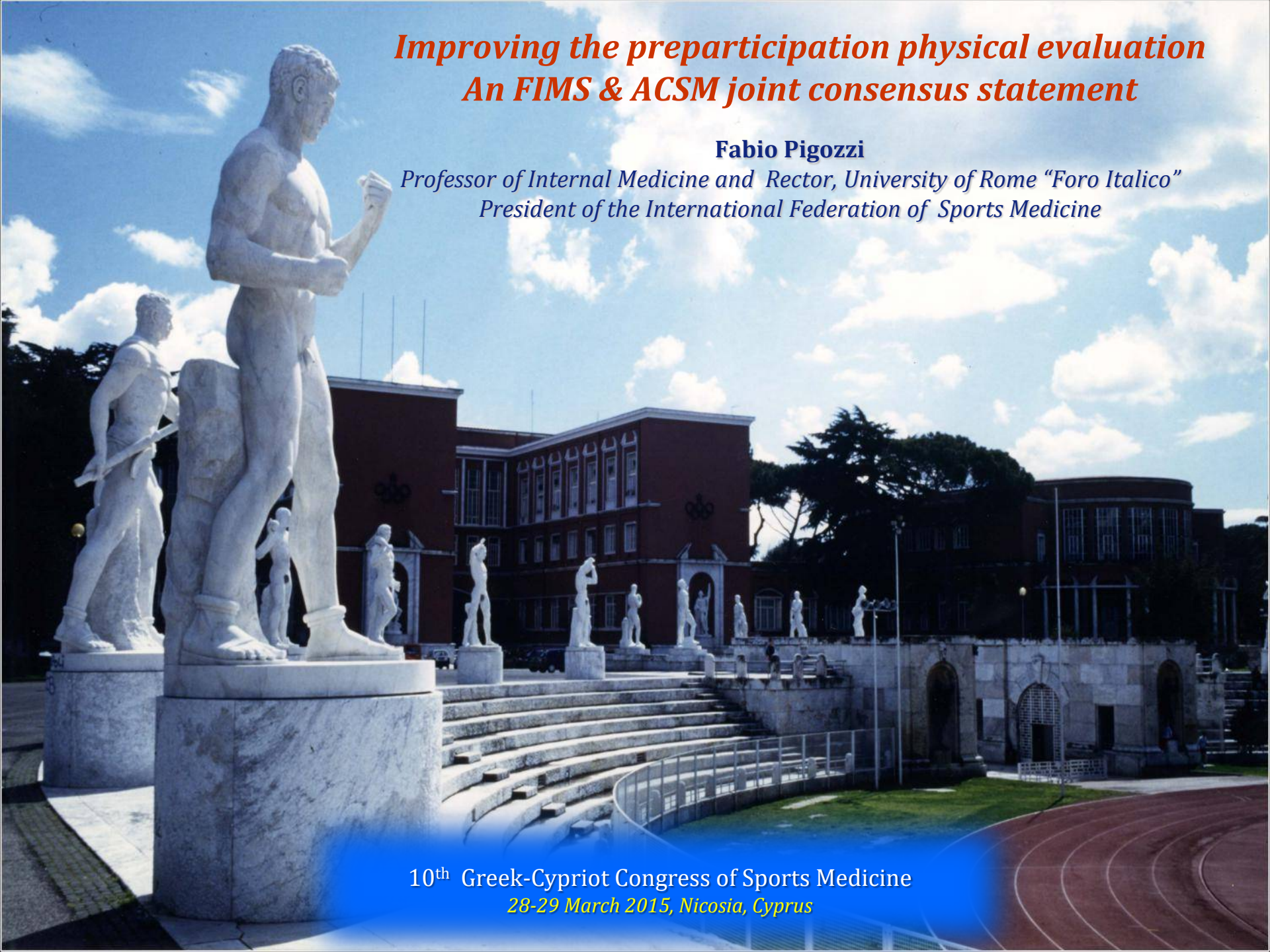


Improving the preparticipation physical evaluation
An FIMS & ACSM joint consensus statement

Fabio Pigozzi

Professor of Internal Medicine and Rector, University of Rome "Foro Italico"

President of the International Federation of Sports Medicine

10th Greek-Cypriot Congress of Sports Medicine

28-29 March 2015, Nicosia, Cyprus

10th Greek-Cypriot Congress of Sports Medicine

28-29 March 2015, Nicosia, Cyprus

Improving the preparticipation physical evaluation

An FIMS & ACSM joint consensus statement

Pheidippides' death

Sudden cardiac death in athletes

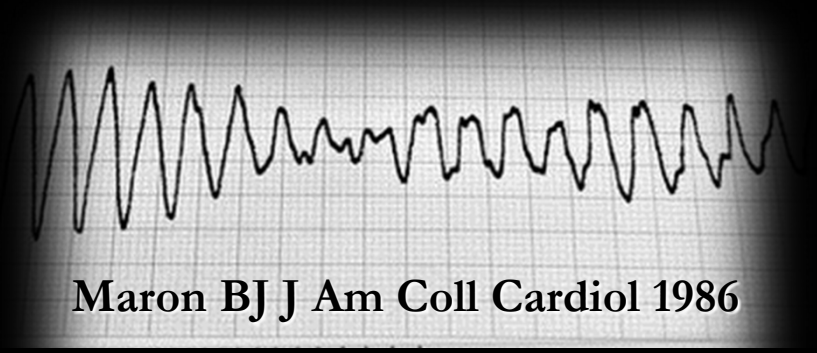
Sudden Cardiac Death

definition

SCD is defined as nontraumatic, nonviolent, unexpected natural death of cardiac origin occurring within 1 hour of the onset of symptoms in a person who does not have a previously recognized cardiovascular condition that would appear fatal.

According to this definition, SCD may occur during or immediately after the exertions involved in competition or training.

This definition is not inclusive traumas or technical accidents during sport activity.



Maron BJ J Am Coll Cardiol 1986

SCD has been considered for long time an extraordinary event. However recent data suggest that these incidents are not so rare

7,5% of SD in young athletes (15-35 years)
J Intern Med 2002; 252(6):529-36

Sport-related Sudden Cardiac Death

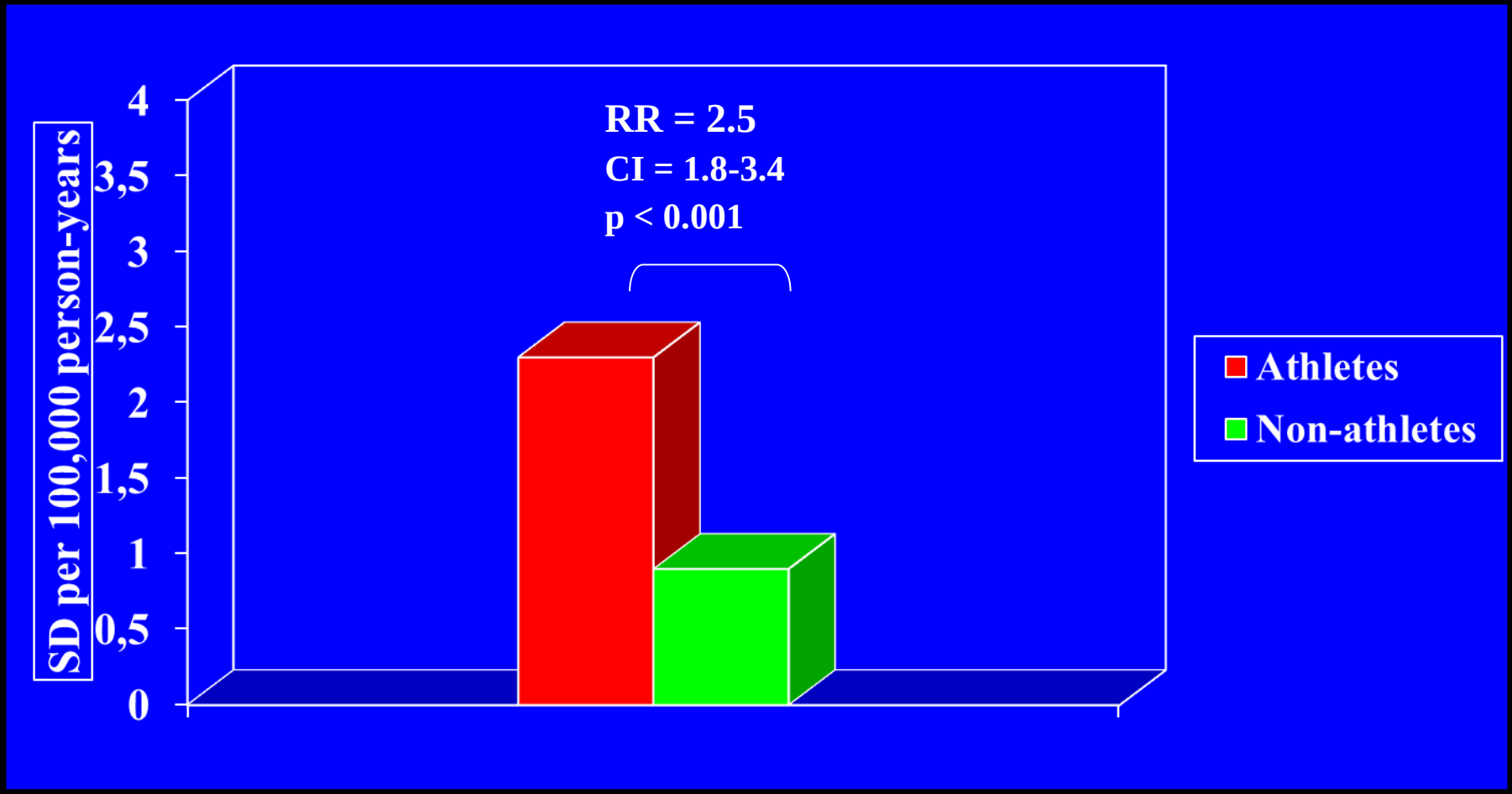
epidemiology

< 35 yrs
1:100.000 - 1:300.000

> 35 yrs
1:15.000 - 1:50.000

Risk in males >>> than in females

Sport increases the risk of sudden death

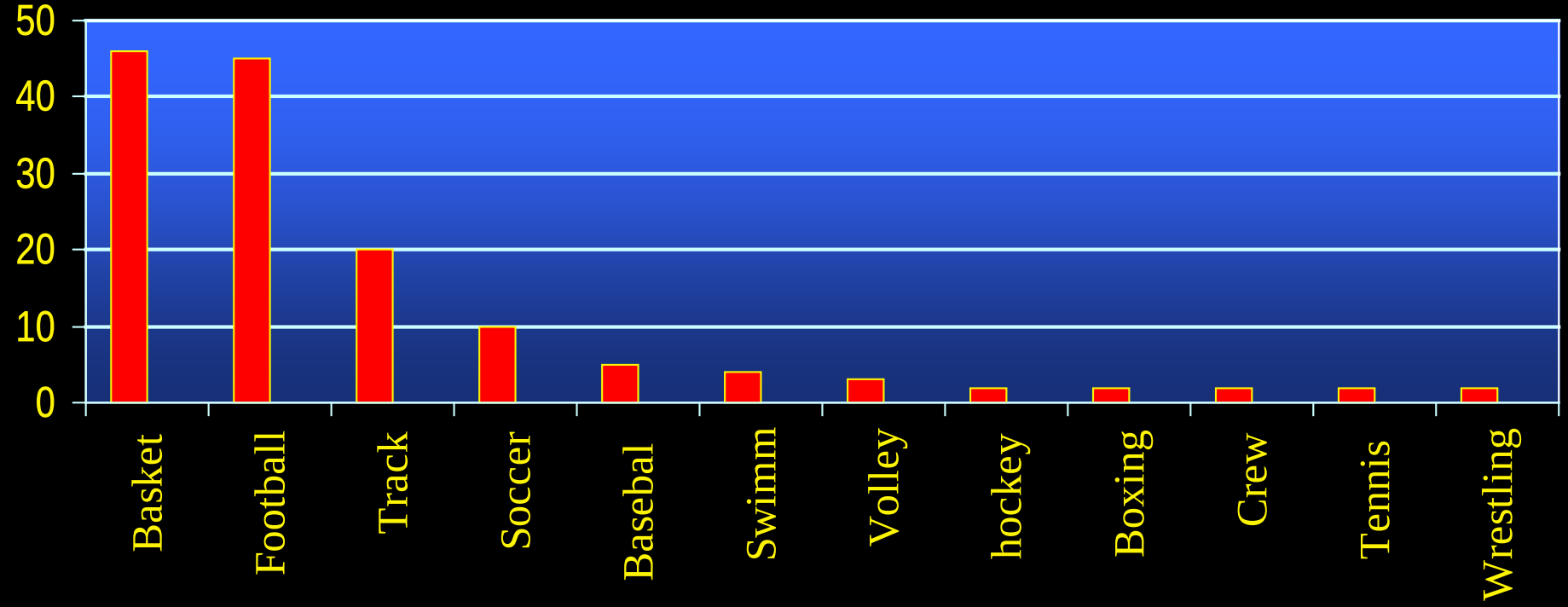


Relative risk of SD in young athletes *vs.* non-athletes (Veneto region registry; 1979-1999). Corrado et al. JACC 2003

Vigourous physical activity causes an increase in the risk of SCD in subjects with clinically silent cardiac diseases.

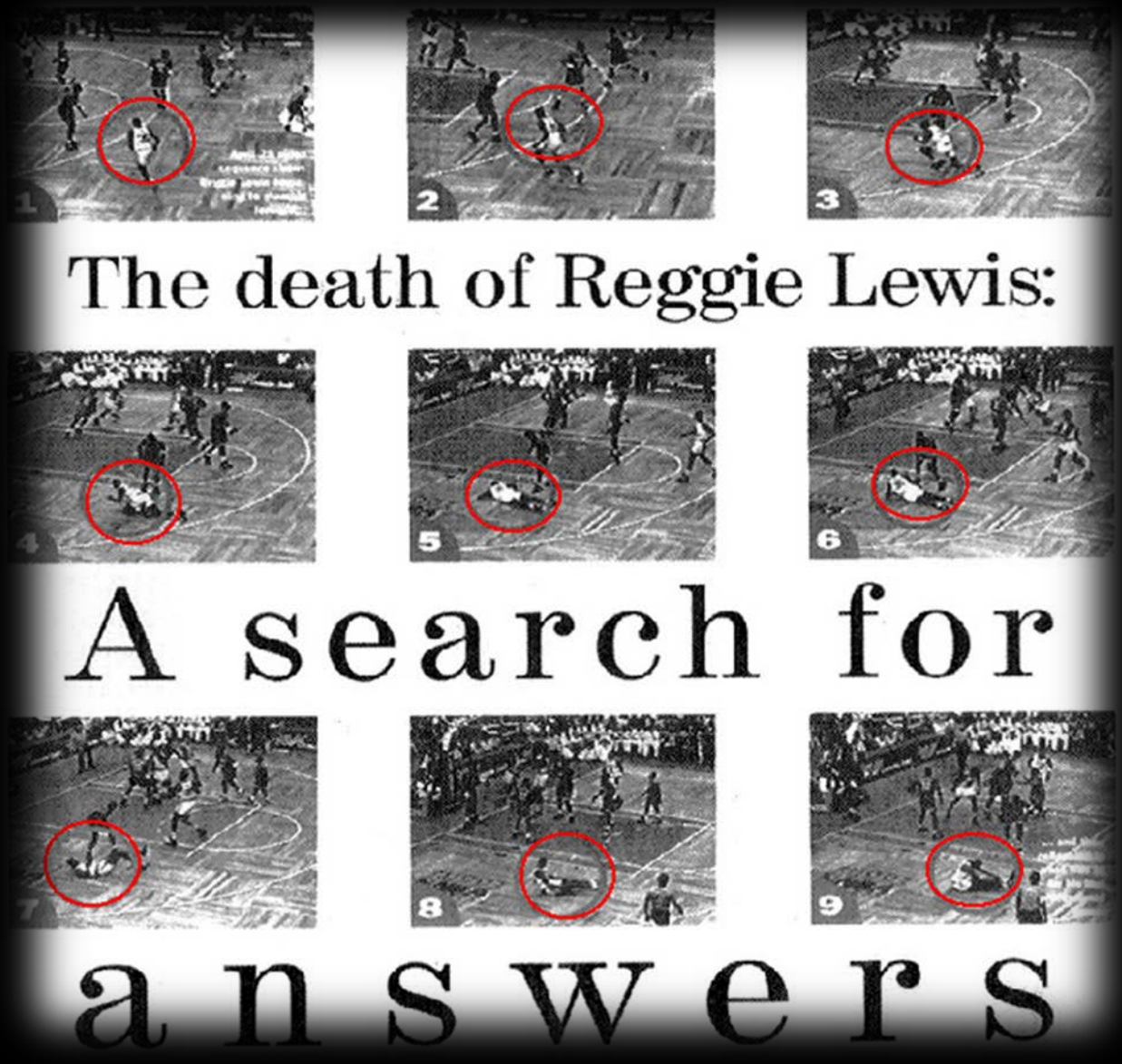
SCD usually occurs during official competitions (75%)

Sudden Death in different sports disciplines

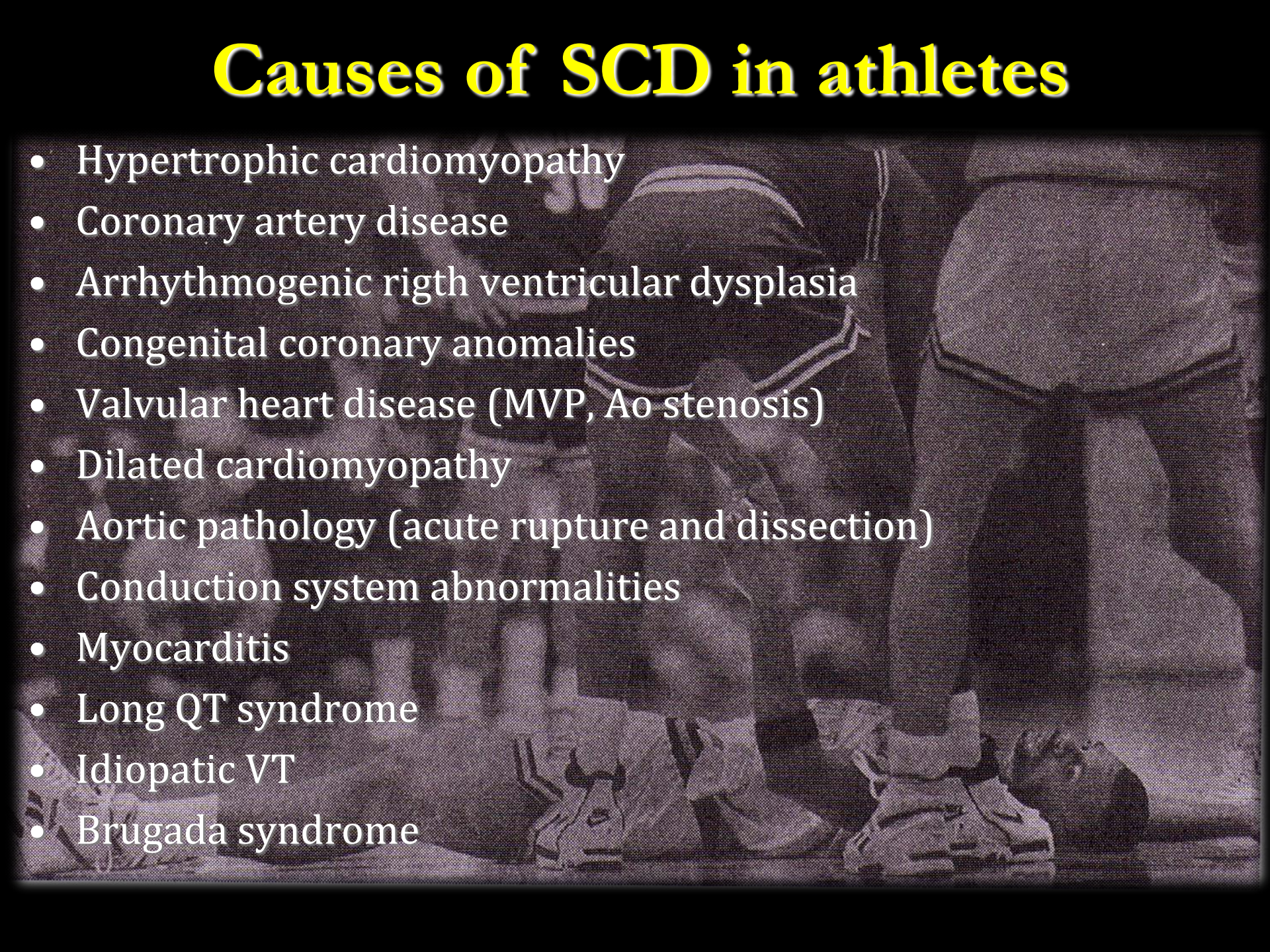


Maron BJ JAMA 1996

Which are the causes of sudden cardiac death in athletes?

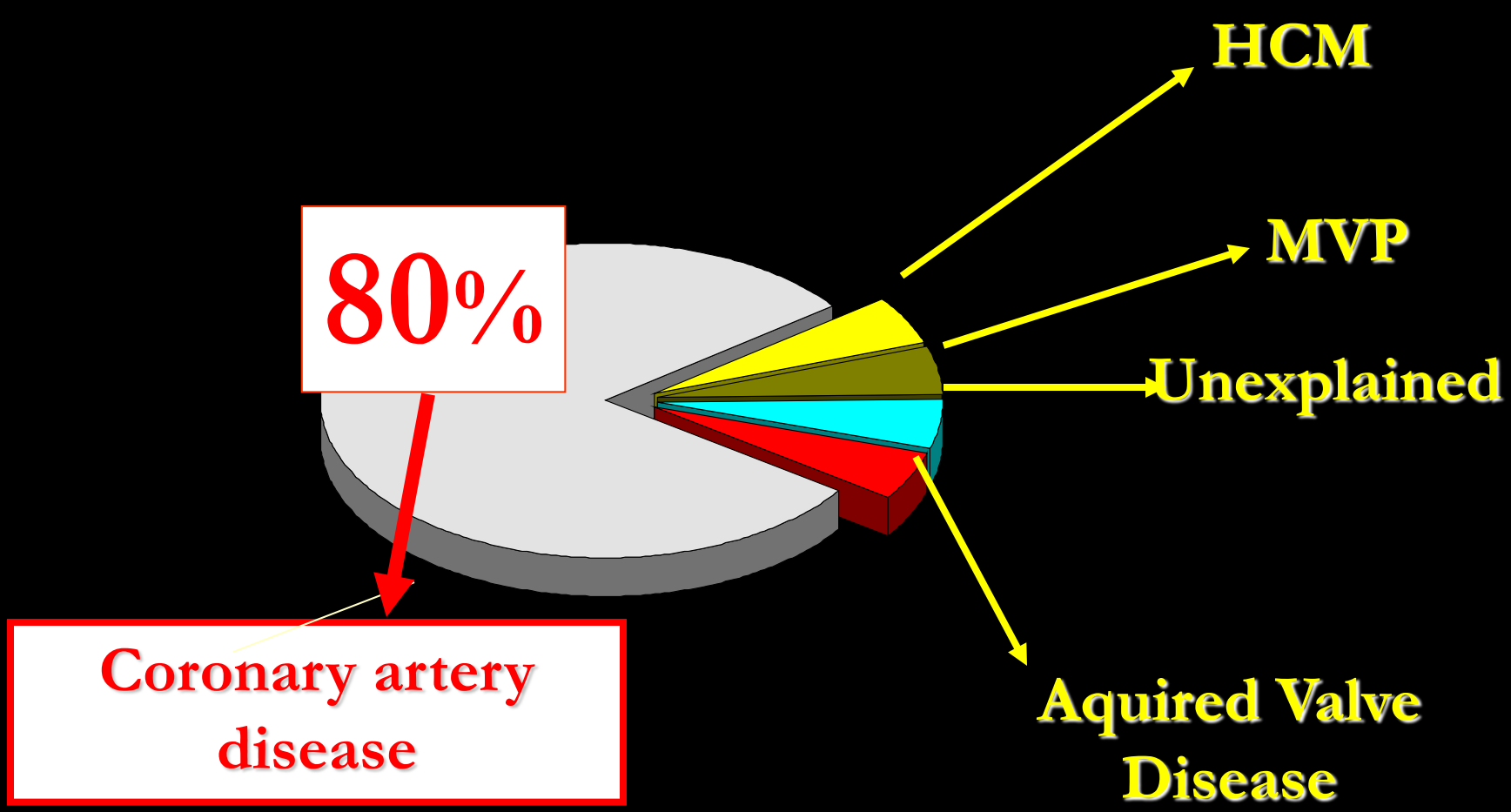


Causes of SCD in athletes

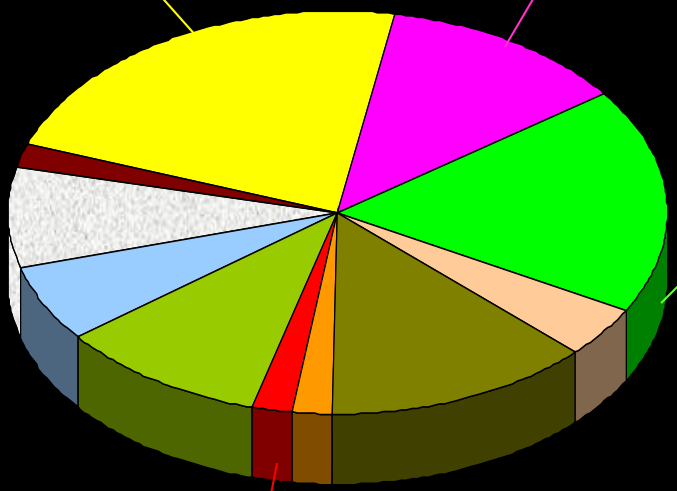


- Hypertrophic cardiomyopathy
- Coronary artery disease
- Arrhythmogenic rigth ventricular dysplasia
- Congenital coronary anomalies
- Valvular heart disease (MVP, Ao stenosis)
- Dilated cardiomyopathy
- Aortic pathology (acute rupture and dissection)
- Conduction system abnormalities
- Myocarditis
- Long QT syndrome
- Idiopatic VT
- Brugada syndrome

CV Abnormalities found at autopsy in athletes ≥35 yrs who died suddenly

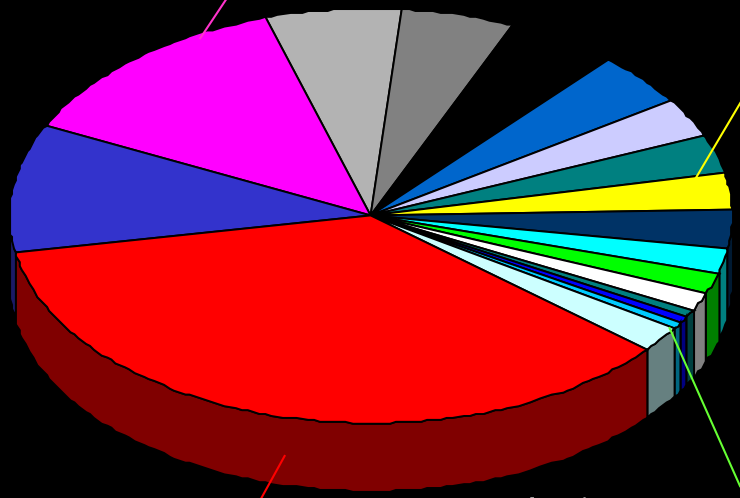


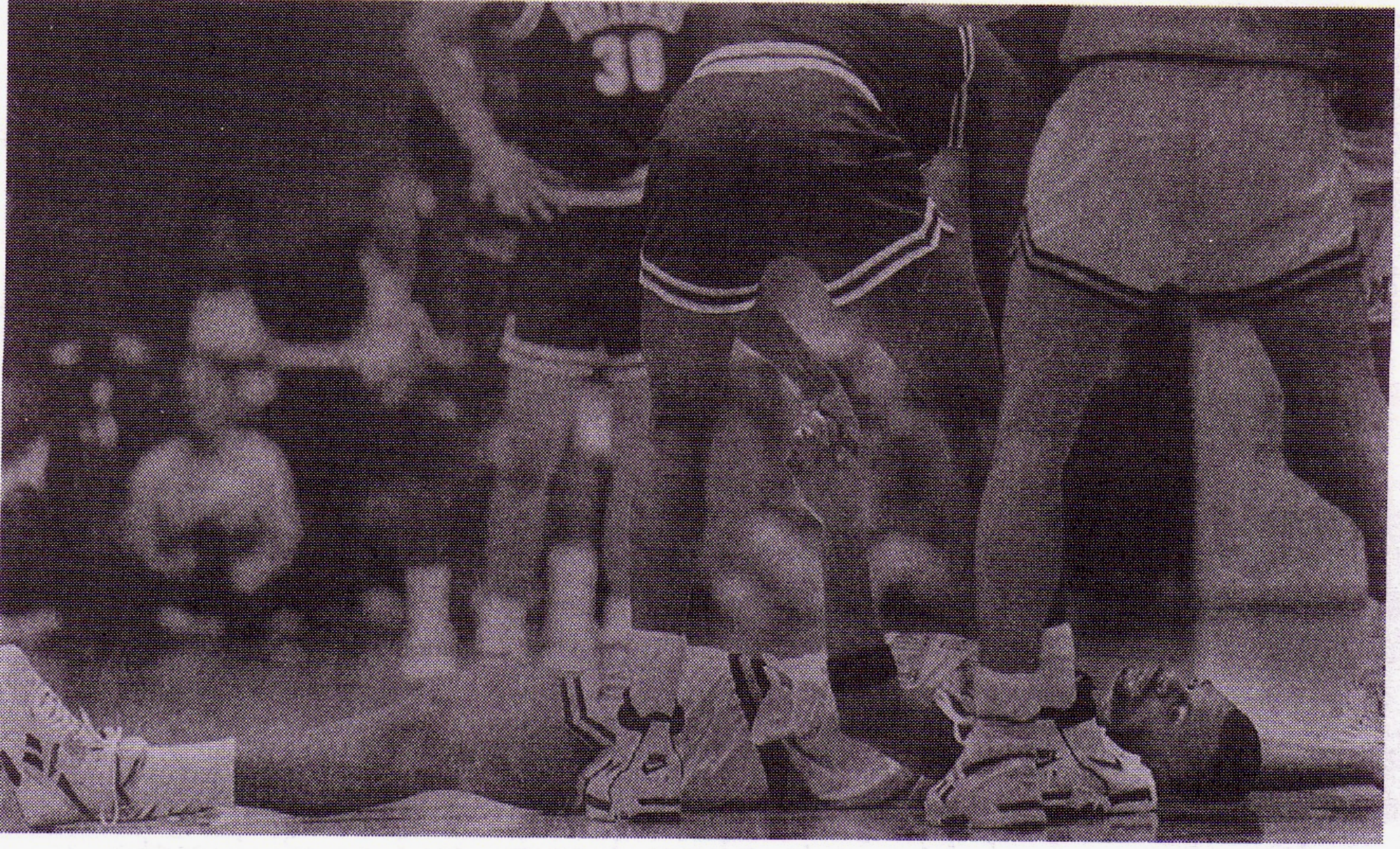
(Corrado et al. NEJM 1998)



athletes < 35 yrs

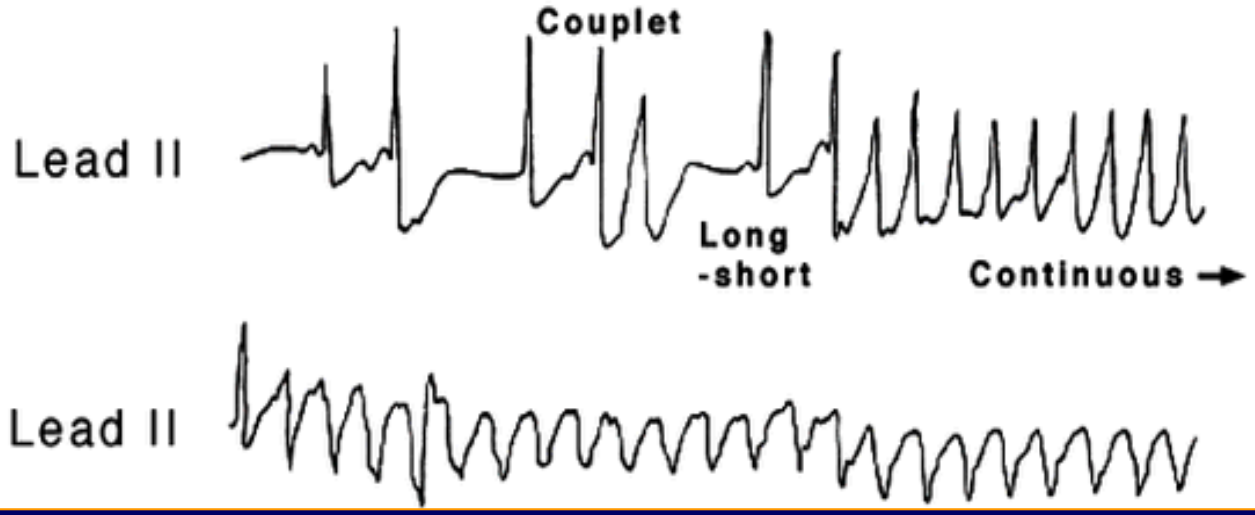
(Maron et al. JAMA 1996)





How?

Ventricular Fibrillation 95%




CPR
FIRST AID
CERTIFIED AND TRAINED
188BET

Minimize the risk SCD in athletes: the great challenge of Sports Cardiology

Publish-Ahead-of-Print published February 2, 2005

European Heart Journal
doi:10.1093/eurheartj/ehi108

ESC Report

Cardiovascular pre-participation screening of young competitive athletes for prevention of sudden death: proposal for a common European protocol

Consensus Statement of the Study Group of Sport Cardiology of the Working Group of Cardiac Rehabilitation and Exercise Physiology and the Working Group of Myocardial and Pericardial Diseases of the European Society of Cardiology

Domenico Corrado[1*], Antonio Pelliccia[2], Hans Halvor Bjørnstad[3], Luc Vanhees[4], Alessandro Biffi[2], Mats Borjesson[5], Nicole Panhuyzen-Goedkoop[6], Asterios Deligiannis[7], Erik Solberg[8], Dorian Dugmore[9], Klaus P. Mellwig[10], Deodato Assanelli[11], Pietro Delise[12], Frank van-Buuren[10], Aris Anastasakis[13], Hein Heidbuchel[4], Ellen Hoffmann[14], Robert Fagard[4], Silvia G. Priori[15], Cristina Basso[19], Eloisa Arbustini[16], Carina Blomstrom-Lundqvist[17], William J. McKenna[18], and Gaetano Thiene[19]

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Received 15 June 2004; revised 26 November 2004; accepted 9 December 2004

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Sudden Cardiovascular Death in Sport

LAUSANNE RECOMMENDATIONS

Under the umbrella IOC Medical Commission
10 December 2004

PREPARTICIPATION CARDIOVASCULAR SCREENING

"Sudden death" in sport has to be fully appreciated. The leading cause (more than 90%) of non-traumatic sudden death in athletes is related to pre-existing cardiac abnormality.

For the purpose of this recommendation, sudden cardiovascular death is defined as:

Death occurring within one hour of the onset of symptoms in a person without a previously recognised cardiovascular condition that would appear fatal: this excludes cerebrovascular, respiratory, traumatic and drug related causes.

The purpose of this recommendation is to identify, as accurately as possible, athletes at risk in order to advise them accordingly.

THE ITALIAN EXPERIENCE

Since 1982, Italian law mandates that every subject engaged in competitive sport activity must undergo a clinical evaluation and obtain elegibility before entering

6 millions athletes of all ages annually

(10% of the overall italian population)

PROTOCOL OF ITALIAN CV SCREENING

1. *Medical History*
2. *Physical Examination*
3. *12-Lead ECG at rest and after exercise (step test)*

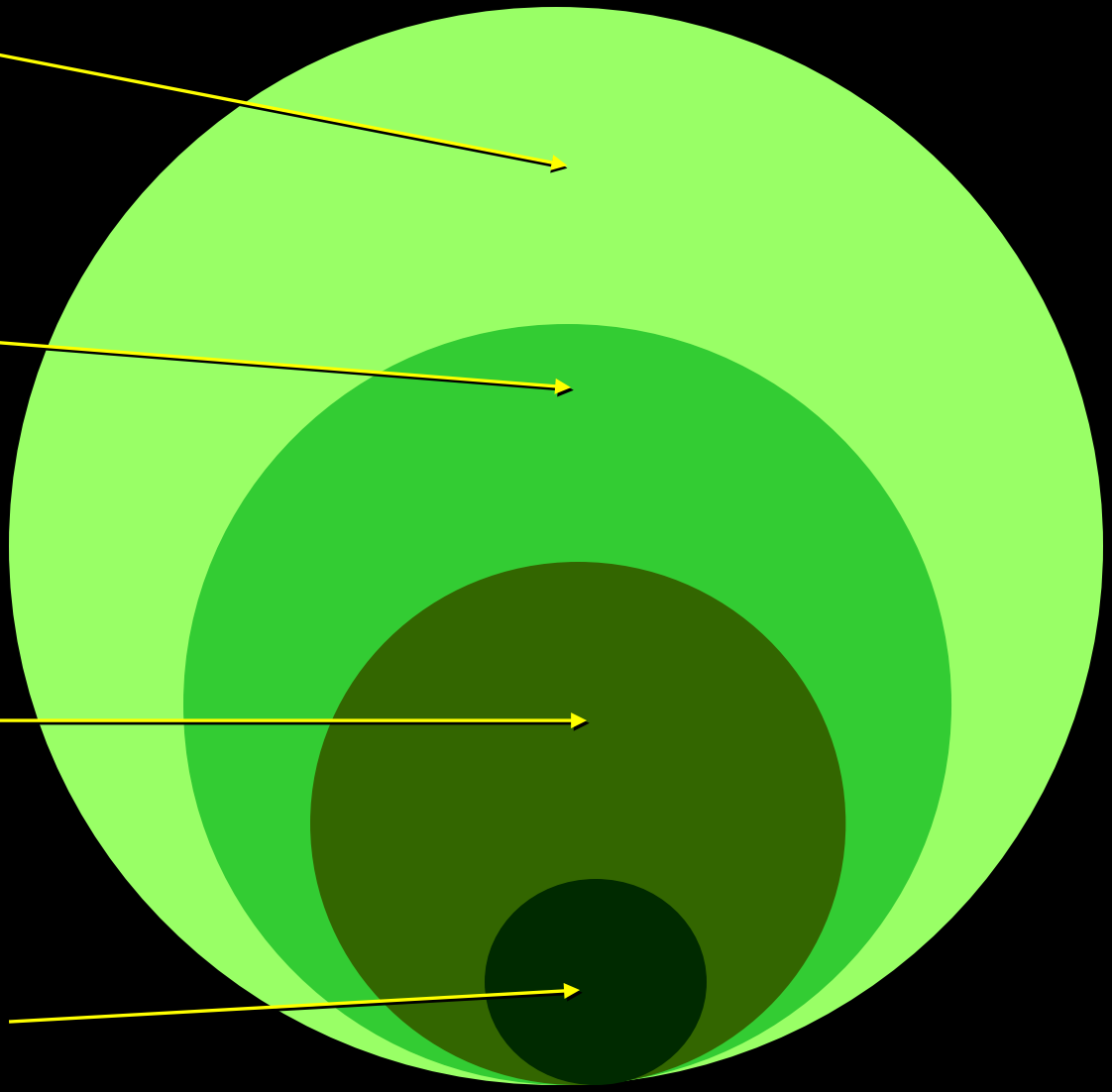
TARGET OF THE LAW

56 Millions Italians

11 Millions occasionally play sports

6 Millions regularly train and compete

~ 2,000 elite athletes



DATA FROM DIFFERENT SPORT MEDICINE INSTITUTIONS

~ 2% OF THE ATHLETES POPULATION IS DISQUALIFIED FROM COMPETITION

~70% OF DISQUALIFICATIONS DUE TO CARDIOVASCULAR DISEASES

(Most frequent: *ARRYTHMIAS, VALVULAR DISEASES INCLUDING MITRAL VALVE PROLAPSE COMPLICATED BY SIGNIFICANT VENTRICULAR ARRYTMIAS OR MITRAL VALVE REGURGITATION, HCM, HYPERTENSION;*

Less frequent: *CONGENITAL AND RHEUMATICHEART DISEASES, PERICARDITIS, DILATED CARDIOMYOPATHIES*)

SCREENING PROTOCOL IN THE U.S. AND ITALY

USA: *The American Heart Association recommends that some form of preparticipation cardiovascular screening for high school and collegiate athletes is justifiable and compelling, based on ethical, legal and medical grounds; 12 lead ECG is not cost- effective for screening a large population of young athletes due to its low specificity*

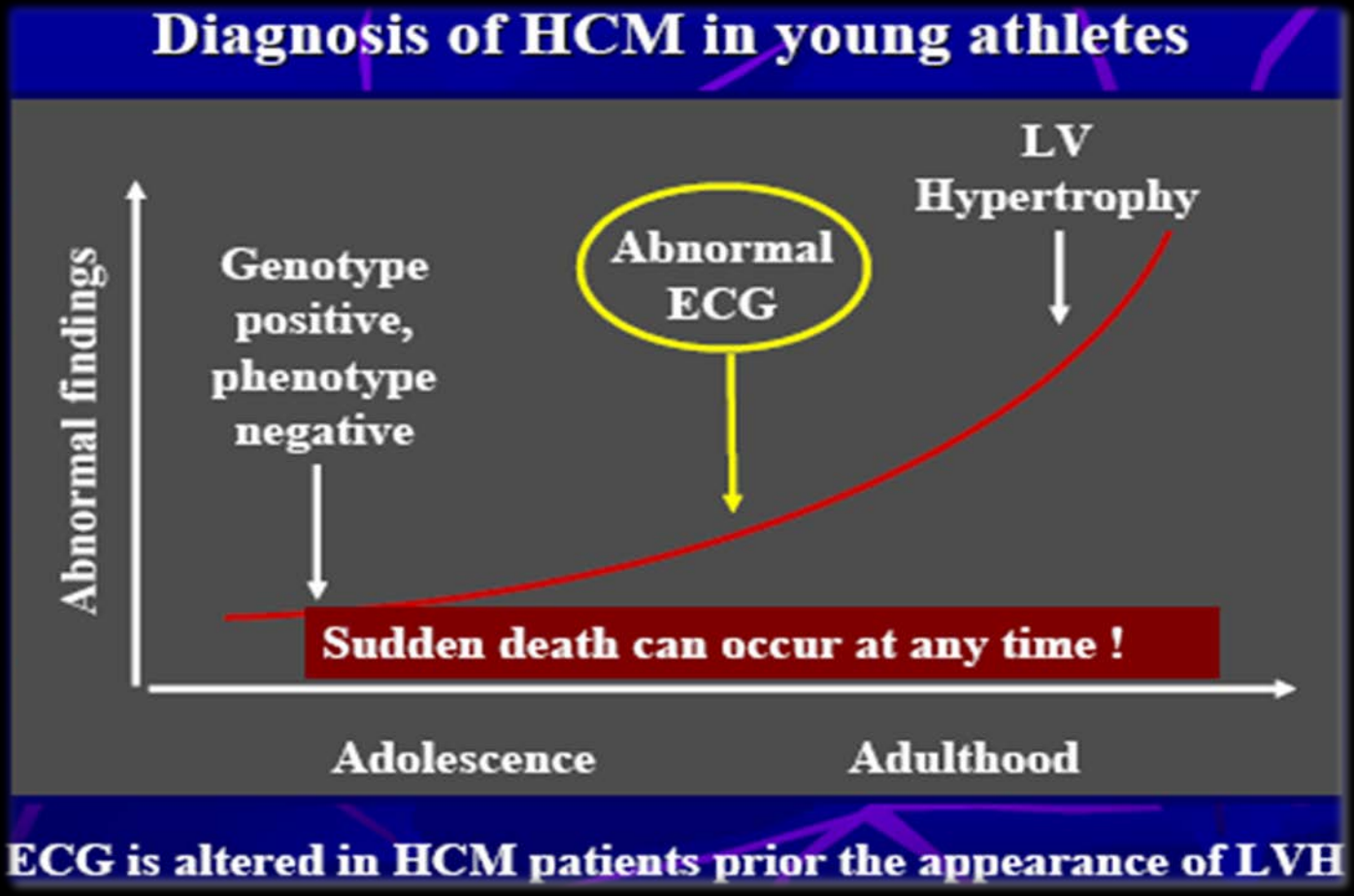
(Circulation 1996)

ITALY: *12-lead ECG enhances the sensitivity of the screening process for detection of cardiovascular diseases with risk of SD (abnormal ECG in up to 95% of patients with HCM)*

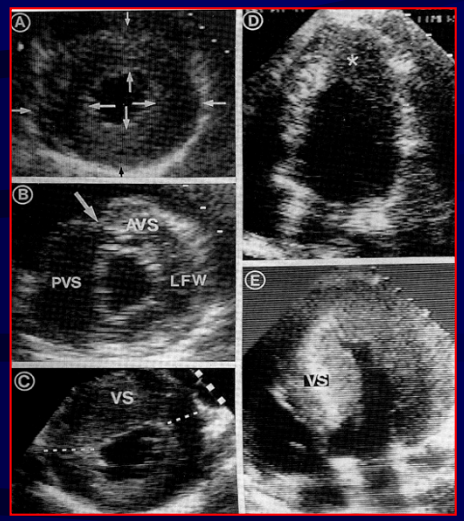
(JAMA 2002)

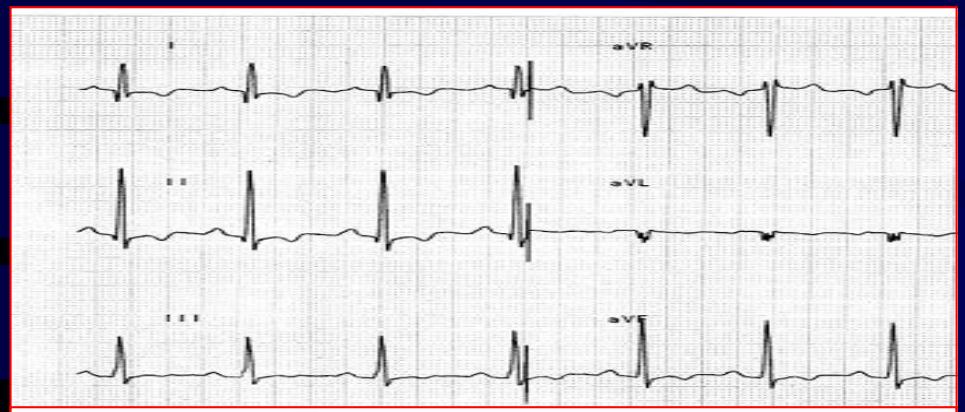
IMPORTANCE OF ECG IN COMPETITIVE ATHLETES

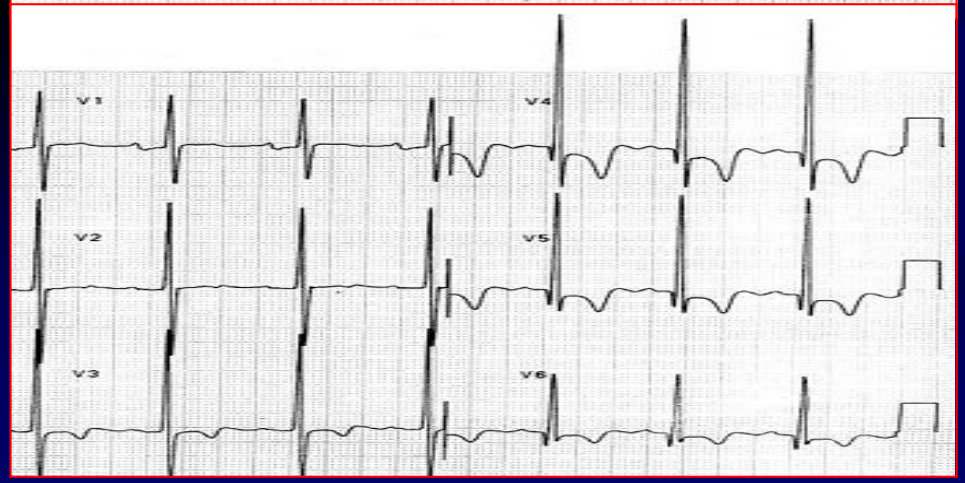
ECG abnormalities are present in up to 95% of HCM and 80% of ARVC patients



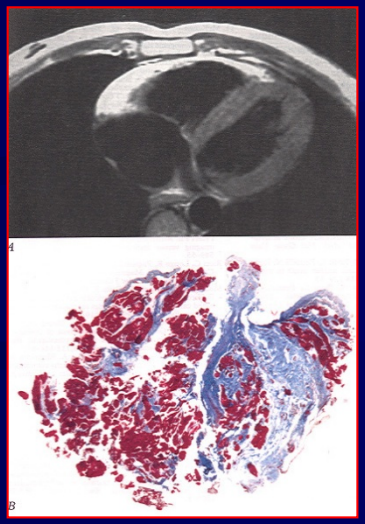
HCM

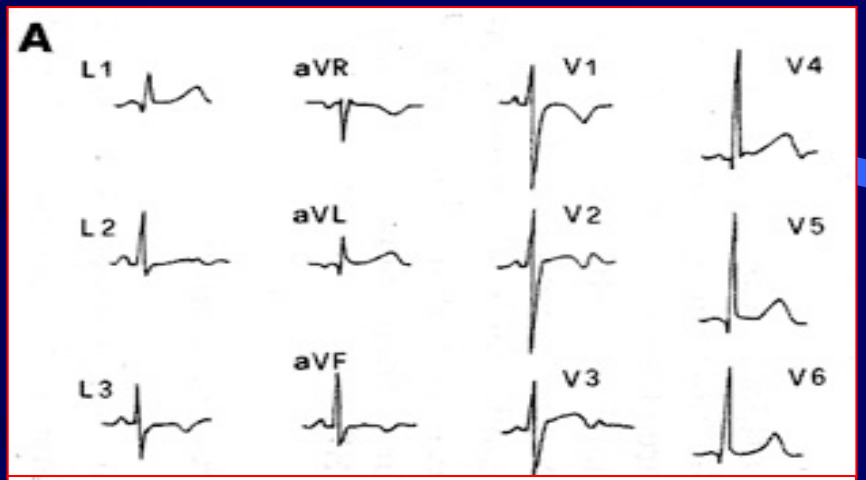

A
D
B
AVS
PVS
LFW
E
C
VS
VS


I
aVR
II
aVL
III
aVF


V1
V4
V2
V5
V3
V6

ARVC




A
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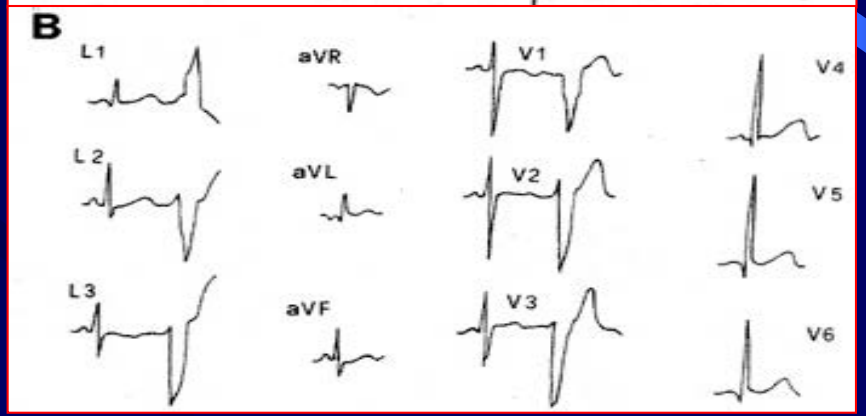
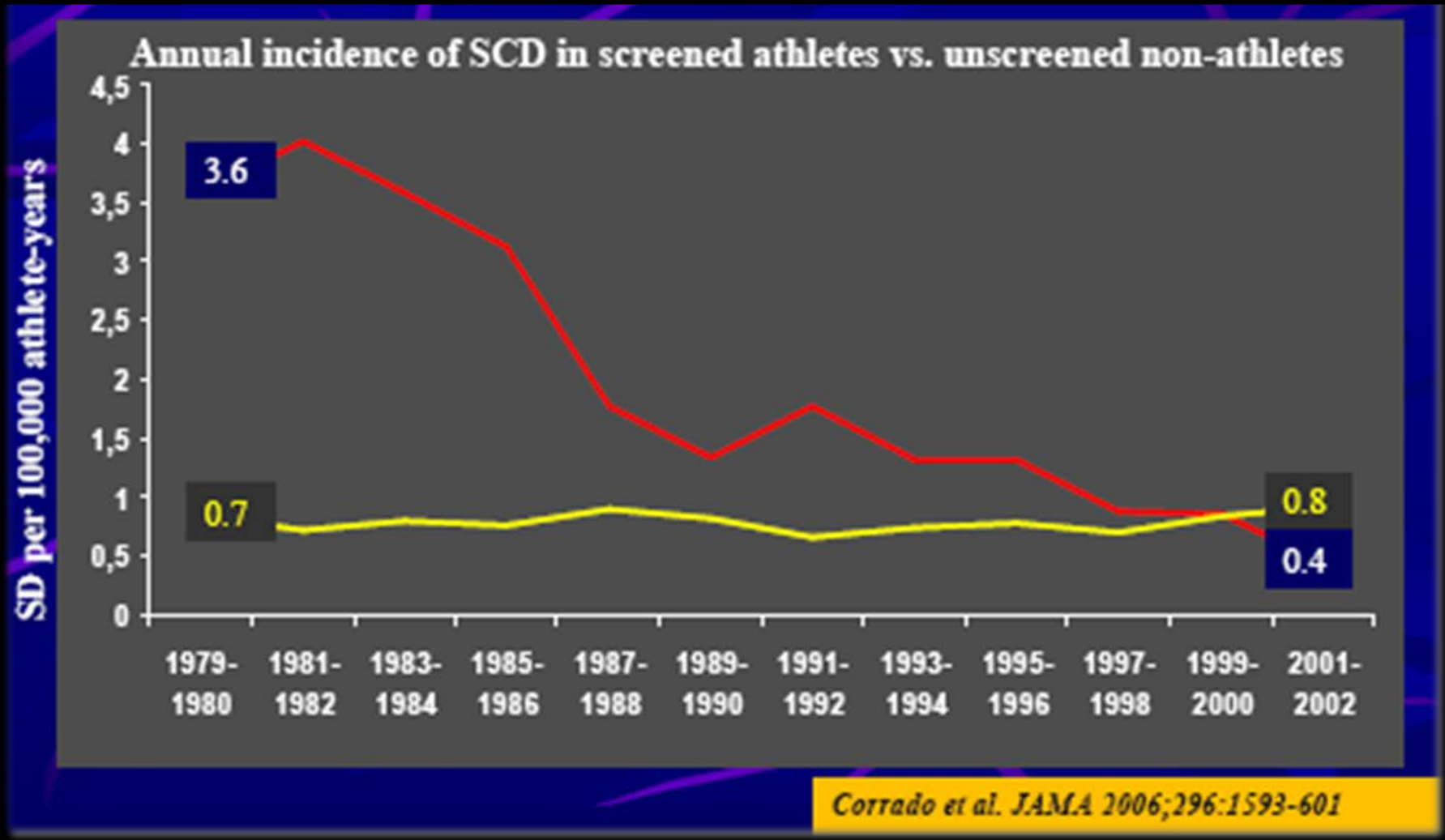
V2
V5
L3
aVF
V3
V6


B
L1
aVR
V1
V4
L2
aVL
V2
V5
L3
aVF
V3
V6

REDUCTION IN SCDs IN YOUNG ATHLETES IN THE VENETO REGION (1979-2002) AS A CONSEQUENCE OF PPS



FIMS-ACSM statement on pre-participation evaluation in sports

Advancing the Preparticipation Physical Evaluation (PPE): An ACSM and FIMS Joint Consensus Statement

Roberts W, Löllgen H, Matheson GO, Royalty AB, Meeuwisse WH, Levine B, Hutchinson MR, Coleman N, Benjamin HJ, Spataro A, Debruyne A, Bachl N, Pigozzi F.

Clin J Sport Med. 2014 Nov;24(6):442-7

CONSENSUS STATEMENT

Advancing the Preparticipation Physical Evaluation: An ACSM and FIMS Joint Consensus Statement

William O. Roberts, MD, MS, Herbert Löllgen, MD,† Gordon O. Matheson, MD, PhD,‡ Anne B. Royalty, PhD,§ Willem H. Meeuwisse, MD, PhD,¶ Benjamin Levine, MD,‖ Mark R. Hutchinson, MD,** Nailah Coleman, MD,†† Holly J. Benjamin, MD,‡‡ Antonio Spataro, MD,§§ André Debruyne, MD,¶¶ Norbert Bachl, MD,‖‖ and Fabio Pigozzi, MD****

Abstract: While the preparticipation physical evaluation (PPE) is widely accepted, its usage and content are not standardized. Implementation is affected by cost, access, level of participation, participant age/sex, and local/regional/national mandate. Preparticipation physical evaluation screening costs are generally borne by the athlete, family, or club. Screening involves generally agreed-upon questions based on expert opinion and tested over decades of use. No large-scale prospective controlled tracking programs have examined PPE outcomes. While the panel did not reach consensus on electrocardiogram (ECG) screening as a routine part of PPE, all agreed that a history and physical exam focusing on cardiac risk is essential, and an ECG should be used where risk is increased. The many areas of consensus should help the American College of Sports Medicine and Fédération Internationale du Médicine du Sport in developing a universally accepted PPE. An electronic PPE, using human-centered design, would be comprehensive, would provide a database given that PPE is mandatory in many locations, would simplify PPE administration, would allow remote access to clinical data, and would provide the much-needed data for prospective studies in this area.

Submitted for publication July 7, 2014; accepted July 9, 2014.

From the *Department of Family Medicine and Community Health, Phalen Village Family Medicine Clinic, University of Minnesota, St Paul, Minnesota; ††HonPres German Fed.Sports Medicine, Bermuspause, Remscheid, Germany; ‡‡Department of Orthopaedic Surgery, Stanford School of Medicine, Stanford, California; §Department of Economics, Indiana University-Purdue University Indianapolis, Indianapolis, Indiana; ¶Sport Injury Prevention Research Centre, Faculty of Kinesiology, University of Calgary, Calgary, Alberta, Canada; ‖Department of Internal Medicine, University of Texas Southwestern Medical Center, Dallas, Texas; **University of Illinois at Chicago, Chicago, Illinois; ††The Goldberg Center for Community Pediatric Health, Children's National Medical Center, Washington, District of Columbia; ‡‡University of Chicago, Chicago, Illinois; §§Institute of Sports Medicine and Science, Rome, Italy; ¶¶FIMS, EFSMA, Kiewitstraat, Hasselt, Belgium; ‖‖Department of Sports and Physiological Performance, Centre for Sports Science and University Sports, of the University of Vienna, Vienna, Austria; and ***University of Rome "Foro Italico," Piazza Lauro de Bosis, Roma.

The authors report no conflicts of interest.

Corresponding Author: William O. Roberts, MD, MS, Department of Family Medicine and Community Health, Phalen Village Family Medicine Clinic, University of Minnesota, 1414 Maryland Ave East, St Paul, MN 55106 (robert037@umn.edu).

Key Words: electronic PPE, PPE costs, PPE research, screening strategies

(*Clin J Sport Med* 2014;24:442–447)

INTRODUCTION

Different standards exist worldwide regarding the administration, content, format, and delivery of the preparticipation physical evaluation (PPE) for sports. In addition, there are multiple factors that determine implementation context including cost, access, level of participation (eg, professional, leisure), age, and sex of the participant. In June 2013, a joint consensus meeting was held in Indianapolis, Indiana to explore the issue of potentially standardizing a PPE for sports. The meeting was convened by the American College of Sports Medicine (ACSM) and Fédération Internationale du Médicine du Sport (FIMS), with members participating from both groups. While considering the primary international differences in conduct and content of the PPE, the group focused on the international commonalities and differences among approaches to the evaluation and screening of athletes; the assumptions and realities that have led to major differences in cardiovascular screening protocols like government or legislative requirements, cost, insurance coverage, equipment and personnel availability, sports health compared to public health aims, and population differences; the gaps and opportunities for progress in scientific investigation of the exam protocols; and the potential for a FIMS and ACSM collaboration to be a catalyst for advances in preparticipation medical evaluation and screening.

Here, we provide a summary of the topics discussed in the meeting, and a roadmap created by the group as a result of those discussions.

THE PPE WORLDWIDE

The PPE is intended to identify conditions that may interfere with sports performance or limit high-level dynamic and/or static activity.

The goals of the PPE include:

1. Safe participation of elite athletes and leisure time athletes from children and adolescents up through the senior years;
2. Identification of medical problems with possible life-threatening complications due to inherited or acquired conditions.[1]

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An electronic PPE, using human-centered design, would be comprehensive, would provide a database given that PPE is mandatory in many locations, would simplify PPE administration, would allow remote access to clinical data, and would provide the much-needed data for prospective studies in this area.

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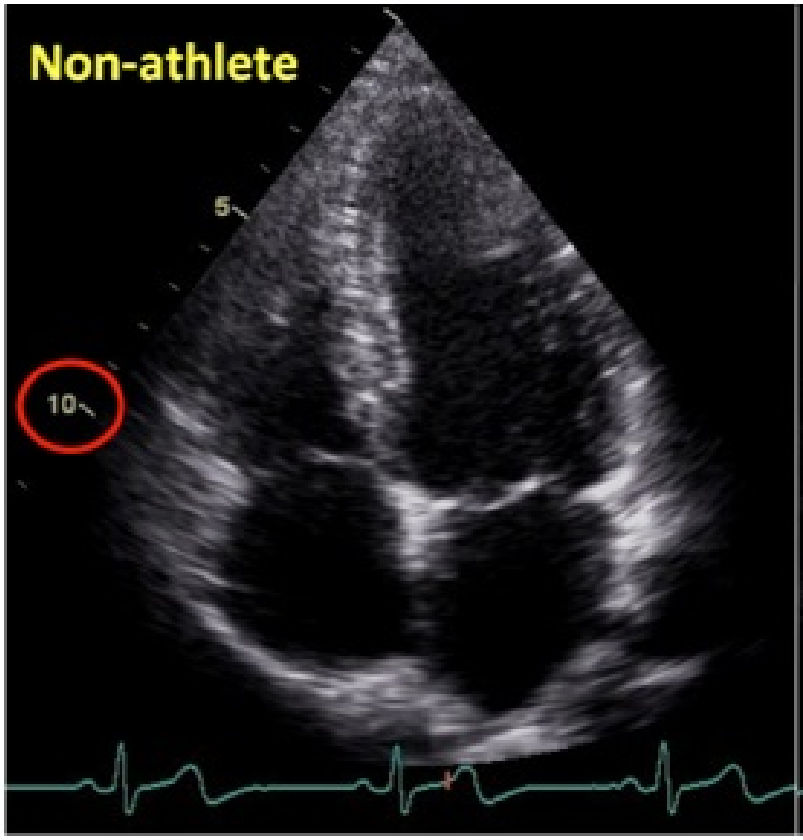
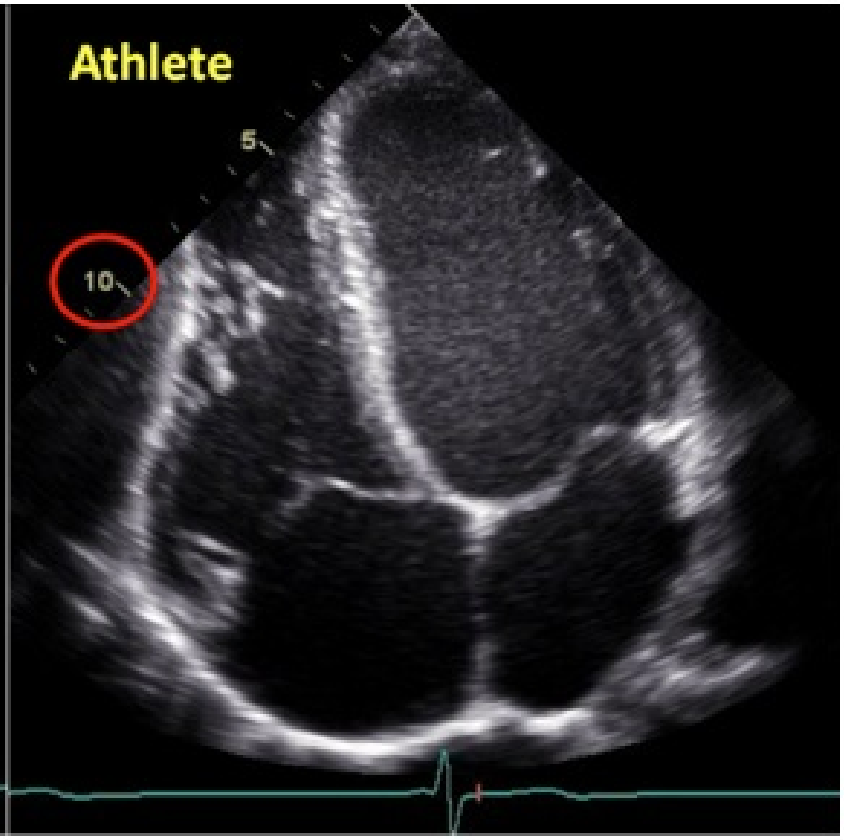
Clin J Sport Med. 2014 Nov;24(6):442-7

The working group will assess the available electronic versions of the PPE for international use in athlete evaluation and create a centralized database to allow international reporting and tracking of outcomes data and adverse events. An electronic PPE program instituted worldwide with integrated research questions would constitute a novel and significant contribution to the field that can help shape PPE policies for athletes based on age, sex, ethnicity,level of competition, and sport-related goals.

ECHOCARDIOGRAPHY AND PPS





FIFA Medical Centre of Excellence of Villa Stuart " Sport Clinic" Rome, Italy

Structural Cardiac Disease Diagnosed by Echocardiography in Asymptomatic Young Male Soccer Players

Rizzo M, Spataro A, Cecchetelli C, Quaranta F, Livrieri S, Sperandii F, Cifra B, Borrione P, Pigozzi F. Br J Sports Med. 2011 Jul 26.

Overall prevalence of structural heart diseases in symptomatic is well assessed (range is between 0,6 and 1,2%) but the overall prevalence of structural heart disease in asymptomatic (mild congenital lesions that may remain clinically silent for a long time) is more difficult to quantify

Study group: 3100 male soccer players

Our data suggest that a quite relevant percentage of asymptomatic, apparently healthy, children and adolescents has a structural congenital cardiac disease difficult to diagnose or suspect by the current screening based on medical history, PE and ECG. Trans-thoracic echocardiography could significantly improve the diagnostic power of the screening (echocardiography identified 56 previously unknown cardiac abnormalities)

ESC Study Group of Sports Cardiology Position Paper on cardiovascular adverse effects of doping in athletes

Deligiannis A., Björnstad H., Carre F., Heidbüchel H., Kouidi E., Panhuyzen-Goedkoop N.M., Pigozzi F., Schänzer W., Vanhees L.

European Journal of Cardiovascular Prevention and Rehabilitation, 2006 Oct;13(5):687-694.

Prohibited substances abuse and SCD

Anabolic Steroids
GH, EPO
Beta 2-Agonists
Amphetamines
Cocaine
Ephedrine
Narcotics
Cannabinoids
Alcohol

LES COMITES OLYMPIQUES EUROPEENS
THE EUROPEAN OLYMPIC COMMITTEES

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E.F.S.M.A.

Harmonization of the Training Programmes in Sport Medicine

La salud de los deportistas

El ejemplo italiano

Los últimos casos de muerte súbita reabren el debate de los controles médicos, que no están legislados en **España**

E. GIOVIO / G. LÓPEZ, **Madrid**

Un deportista profesional tiene más del doble de posibilidades de sufrir una muerte súbita que un joven de su edad. Los últimos incidentes ocurridos en los campos de fútbol —entre ellos, la muerte del sevillista Antonio Puerta y del zambio Chaswe Nsofwa, de la Segunda División israelí— han reabierto el debate sobre los controles médicos de los deportistas. Joseph Blatter, presidente de la FIFA, advirtió en 2004, tras la muerte de cuatro futbolistas en cinco meses por paradas cardiacas, de que los electrocardiogramas no bastaban. "Debemos realizar mejores controles", dijo.

Pero en las grandes ligas europeas esta petición pasó totalmente inadvertida. Sólo hay una excepción: es el caso de Italia, país pionero en los controles médicos —obligatorios por ley desde 1971—. España sufre un vacío legal al respecto. La exhaustividad de los exámenes depende del servicio médico de cada club. Lo mismo pasa en Francia e Inglaterra. Alemania, en cambio, ha seguido el camino de su vecino italiano.

Según todos los expertos en cardiología consultados, el modelo a seguir es el de Italia, que aprobó la

Chaswe Nsofwa, de la Segunda División israelí, es llevado en camilla tras sufrir un desmayo el pasado miércoles. / EFE

su equipo de entonces, el Hannover. Los médicos del club decidieron llevarlo a una clínica de Washington y durante cinco días fue sometido a una serie de pruebas médicas hasta que se descubrió la causa de su desvanecimiento. Su tabique interventricular era seis milímetros más grande de lo normal. En Alemania, donde los controles médicos son obligatorios por ley desde 1999, la federación de fútbol es la que se encarga de averiguar si se cumplen las normas reclamando a cada club un examen cardiológico exhaustivo y exámenes de sangre. Asamoah fichó en 1999 por el Schalke 04 y Bernd Brexendorf, médico del equipo, se reunió con el jugador para tomar una decisión sobre su futuro. "Tratamos de averiguar si los riesgos de que siguiera jugando se podían asumir o no. Vimos que sí. Si hubiéramos apreciado que la malformación era tan peligrosa como para no permitirle hacer deporte no habríamos tardado ni un segundo en quitarle la licencia federativa", explica Brexendorf. Julián Villacastín, jefe de la Unidad de Arritmias del Instituto Cardiovascular del hospital clínico San Carlos, asegura que no hay nada extraño en esa decisión. "Cuando se detecta ese tipo

PREMONITORY SYMPTOMS IN YOUNG ATHLETES WHO SUDDENLY DIED

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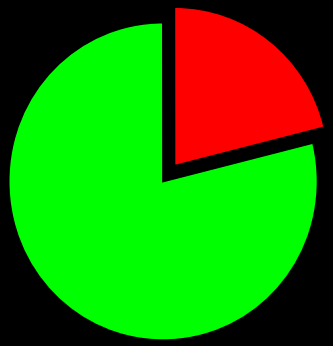

21%

Syncope, dizziness, and/or chest pain

(Maron et al , JAMA 1996)

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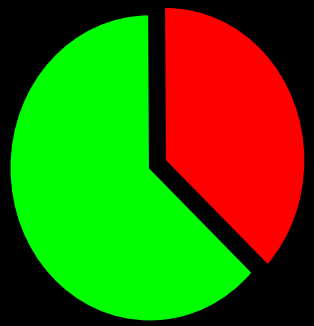

37%

Syncope, chest pain, and/or palpitations

(Basso et al , Circulation 2000)

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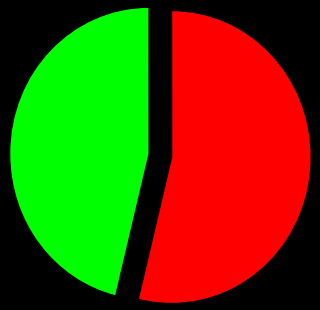

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(Corrado et al , NEJM 1998)


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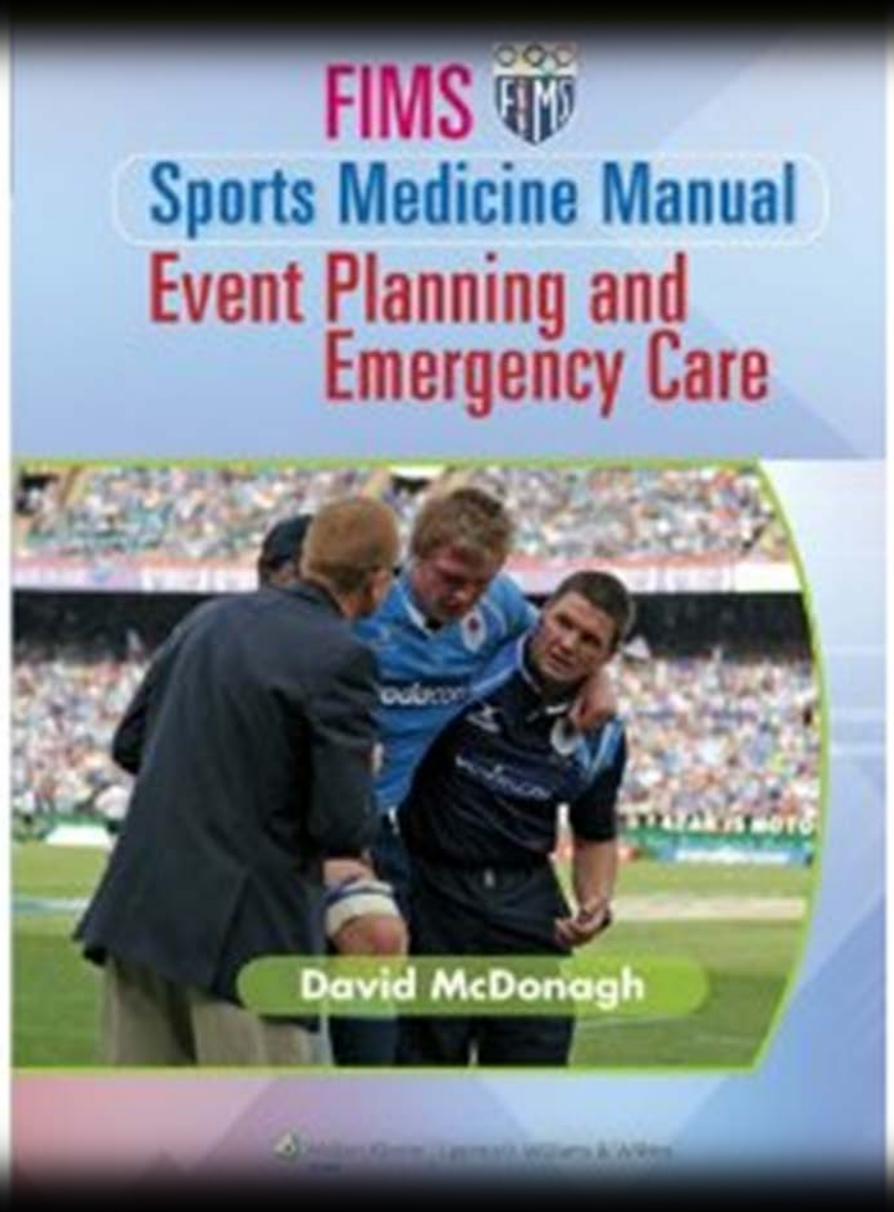
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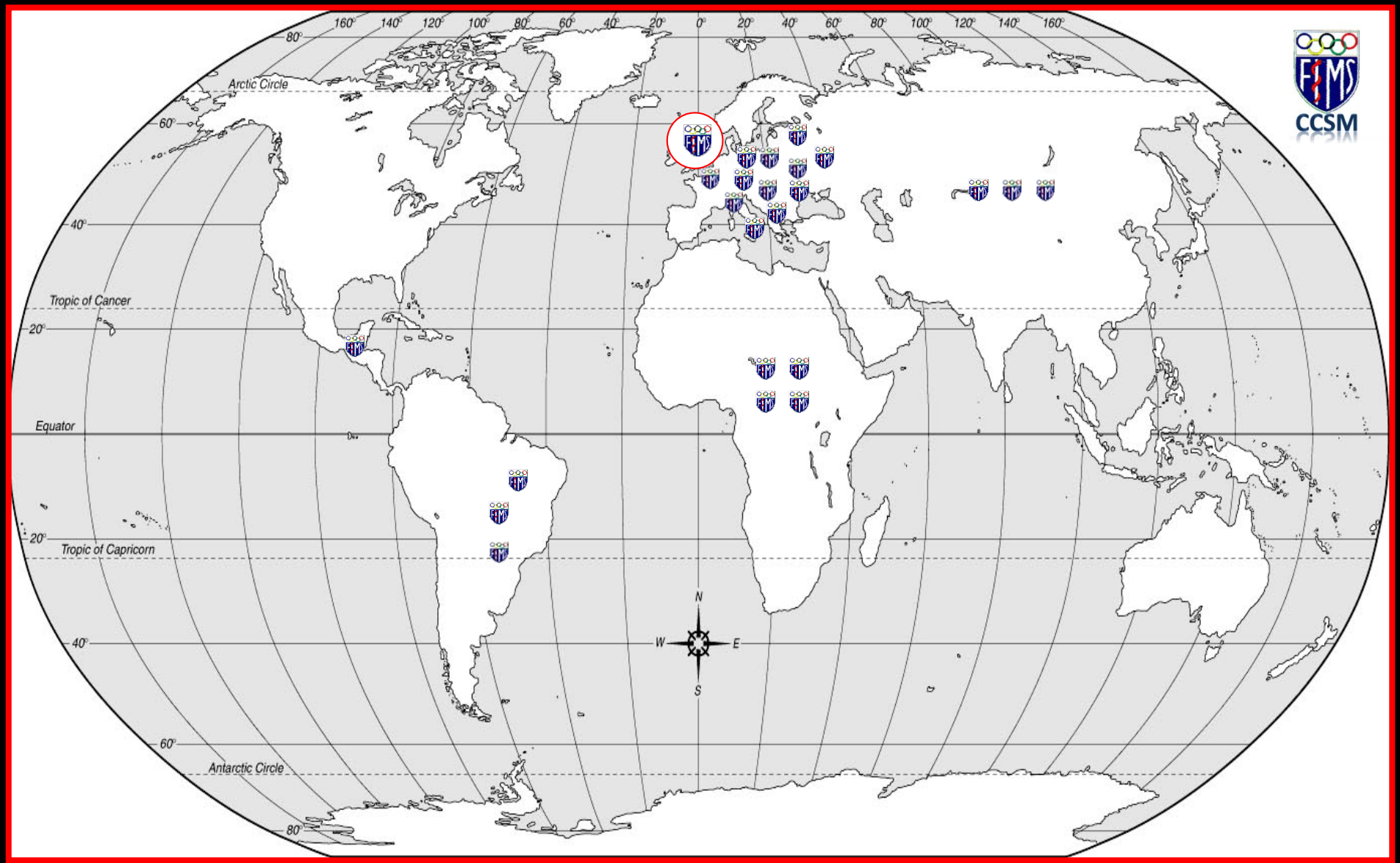

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