JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY
© 2015 BY THE AMERICAN HEART ASSOCIATION, INC. AND
THE AMERICAN COLLEGE OF CARDIOLOGY FOUNDATION
PUBLISHED BY ELSEVIER INC.

VOL. 66, NO. 21, 2015
ISSN 0735-1097/$36.00
http://dx.doi.org/10.1016/j.jacc.2015.09.032

AHA/ACC SCIENTIFIC STATEMENT

Eligibility and Disqualification Recommendations for Competitive Athletes With Cardiovascular Abnormalities: Preamble, Principles, and General Considerations

A Scientific Statement From the American Heart Association and American College of Cardiology

Barry J. Maron, MD, FACC, *Co-Chair**
Douglas P. Zipes, MD, FAHA, MACC, *Co-Chair**
Richard J. Kovacs, MD, FAHA, FACC, *Co-Chair**

This document addresses medical issues related to trained athletes with cardiovascular abnormalities. The objective is to present, in a readily useable format, consensus recommendations and guidelines principally addressing criteria for eligibility and disqualification from organized competitive sports for the purpose of ensuring the health and safety of young athletes. Recognizing certain medical risks imposed on athletes with cardiovascular disease, it is our aspiration that the recommendations that constitute this document will serve as a useful guide to the practicing community for clinical decision making. The ultimate goal is prevention of sudden death in the young, although it is also important not to unfairly or unnecessarily remove people from a healthy athletic lifestyle or competitive sports (that may be physiologically and psychologically intertwined with good quality of life and medical well-being) because of fear of litigation. It is our goal that the recommendations in this document, together with sound clinical judgment, will lead to a healthier, safer playing field for young competitive athletes.

Listen to this manuscript's audio summary by *JACC* Editor-in-Chief Dr. Valentin Fuster.

*On behalf of the American Heart Association Electrocardiography and Arrhythmias Committee of the Council on Clinical Cardiology, Council on Cardiovascular Disease in the Young, Council on Cardiovascular and Stroke Nursing, Council on Functional Genomics and Translational Biology, and the American College of Cardiology.

The American Heart Association and the American College of Cardiology make every effort to avoid any actual or potential conflicts of interest that may arise as a result of an outside relationship or a personal, professional, or business interest of a member of the writing panel. Specifically, all members of the writing group are required to complete and submit a Disclosure Questionnaire showing all such relationships that might be perceived as real or potential conflicts of interest. The Task Force reports for these proceedings are available online at www.onlinejacc.org (J Am Coll Cardiol 2015;66:2350-5; 2356-61; 2362-71; 2372-84; 2385-92; 2393-7; 2398-405; 2406-11; 2412-23; 2424-8; 2429-33; 2434-8; 2439-43; 2444-6; and 2447-50).

This statement was approved by the American Heart Association Science Advisory and Coordinating Committee on June 24, 2015, and the American Heart Association Executive Committee on July 22, 2015, and by the American College of Cardiology Board of Trustees and Executive Committee on June 3, 2015.

The American College of Cardiology requests that this document be cited as follows: Maron BJ, Zipes DP, Kovacs RJ; on behalf of the American Heart Association Electrocardiography and Arrhythmias Committee of the Council on Clinical Cardiology, Council on Cardiovascular Disease in the Young, Council on Cardiovascular and Stroke Nursing, Council on Functional Genomics and Translational Biology, and the American College of Cardiology. Eligibility and disqualification recommendations for competitive athletes with cardiovascular abnormalities: preamble, principles, and general considerations: a scientific statement from the American Heart Association and American College of Cardiology. J Am Coll Cardiol 2015;66:2343-9.

This article has been copublished in *Circulation*.

Copies: This document is available on the World Wide Web sites of the American Heart Association (http://my.americanheart.org) and the American College of Cardiology (www.acc.org). For copies of this document, please contact Elsevier Inc. Reprint Department via fax (212-633-3820) or e-mail (reprints@elsevier.com).

HISTORICAL CONTEXT

There have been 3 prior documents, all sponsored by the American College of Cardiology (ACC) (1-3), that addressed eligibility and disqualification criteria for competitive athletes with cardiovascular diseases: Bethesda Conferences 16 (1985), 26 (1994), and 36 (2005), published and used over a 30-year period. Each of the 3 initiatives (and the present American Heart Association (AHA)/ACC scientific statement) were driven by the tenet that young trained athletes with underlying cardiovascular abnormalities are likely at some increase in risk for sudden cardiac death (usually on the athletic field) compared to nonathletes or competitive athletes without cardiovascular disease (4-8).

All 3 Bethesda Conferences and the present derived AHA/ACC document provide expert consensus recommendations. These insights use 1) the experience and expertise of the panelists (i.e., individual and collective judgments, using the "art of medicine") and 2) available scientific evidence that estimates the medical risk in athletes with underlying acquired, genetic, and congenital heart abnormalities imposed by the unique lifestyle of engagement in competitive sports.

These insights can be applied to decision making for temporary or permanent disqualification versus eligibility of athletes with probable or conclusive evidence of cardiovascular disease; however, the scientific data supporting many of the recommendations in this document are unavoidably limited, as evidenced by the frequent assignment of a Level of Evidence C. Nevertheless, each of the 3 prior Bethesda Conferences has served the practicing community well, offering clinicians a consensus reference document that is potentially helpful in resolving predictably difficult clinical dilemmas. It is our expectation that the present conservative AHA/ACC scientific statement will follow in that tradition. The final document was approved by all participants and assigned outside reviewers.

IMPETUS FOR THE PRESENT DOCUMENT

There are a number of factors that support the decision to update the 36th Bethesda Conference here (3). First, sudden cardiac deaths in young healthy athletes remain tragic and counterintuitive events, subject to persistently high public visibility, emotion, and media scrutiny, with potential legal liability considerations. Therefore, a strong impetus remains to identify high-risk athletes to reduce their exposure to sudden death risk. Indeed, there is an ever-expanding population of competitive athletes, including those participating in new and emerging organized sports. Second, cardiovascular medicine changes rapidly. As evidence of this, in the almost 10 years since publication of the 36th Bethesda Conference (3), new conditions associated with sudden death in the young have been recognized, and knowledge of the responsible diseases and inherent risks of sudden cardiac death in the young has evolved (4-8). As a result, some selected areas of the 36th Bethesda Conference may have become obsolete, and novel issues not previously addressed, have emerged. Third, an increasing number of adults with congenital heart disease and cardiomyopathies are now being recognized (often with surgical palliation or correction) who wish to engage in competitive athletics and require contemporary recommendations. In addition, the increasing penetration into cardiovascular practice of implantable devices (e.g., pacemakers and cardioverter-defibrillators) has created greater numbers of physically active young people with genetic heart diseases who have had devices implanted and who may aspire to participation in competitive athletics. Recently, there has been greater deployment of automatic external defibrillators at athletic events in recognition of sudden death risk in young athletes. Finally, the practicing cardiovascular community deserves and expects the most up-to-date information on which to make important clinical decisions regarding eligibility versus disqualification of competitive athletes.

DEFINITIONS

As in the 3 Bethesda Conferences (1-3), the basic definition of a competitive athlete remains unchanged: One who participates in an organized team or individual sport that requires regular competition against others as a central component, places a high premium on excellence and achievement, and requires some form of systematic (and usually intense) training. Therefore, organized competitive sports are regarded as a distinctive activity and lifestyle. An important principle concerns whether competitive athletes with either known or unsuspected cardiovascular disease can be expected to properly judge when it is prudent to terminate physical exertion. Indeed, the unique pressures of organized sports do not allow athletes to exert strict individual control over their level of exertion or reliably discern when cardiac-related symptoms or warning signs occur that should dictate termination of the activity.

Furthermore, it is emphasized that these AHA/ACC recommendations should not be regarded as a general overriding injunction against all forms of exercise. Notably, this document is concerned only with organized and sanctioned competitive sports participation, such as most commonly found in middle school, high school, and college (1-3), and not with purely recreational physical activities (9). The panel recognizes and strongly supports the well-documented health benefits of exercise, with