

FELLOWS-IN-TRAINING & EARLY CAREER PAGE

# The Emergence of Sports Cardiology as a Specialty



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When the Greeks won the battle against the Persians in Marathon, an Athenian foot messenger named Pheidippides ran all the way back to Athens to deliver the news. Legend has it that upon arrival at Athens, he shouted, “Joy to you, we’ve won,” after which he collapsed and was pronounced dead on the spot. Even though it was not obvious at that time, this event likely marked the first reported exercise-related death in history. The Greek physician Herodicus (480 BC), who tutored Hippocrates, is generally considered the father of sports medicine (1). Herodicus, a physician who taught gymnastics, proposed the association of good diet and therapeutic exercise with good health. Galen of Pergamum (131 to 201 BC), a Greek physician who rose to become one of the most respected physicians in the Roman Empire, was the first team doctor in history. He held the enviable position of being a physician for the gladiators (2).

## EMERGING FIELD

The management of an athlete is complex and requires a concerted collaboration among physicians, nurses, physical educators, nutritionists, coaches, exercise physiologists, and psychologists, among others (Figure 1). The physician is expected to pursue medical decisions in the best interest of the athlete. As shown in Figure 1, this decision making requires the input of a multidisciplinary team, the athlete, and family. The physician’s role starts with pre-participation screening (history, physical examination, and testing as needed) (3), as well as deciding on immediate participation or return to play;

supervision of exercise intensification in cardiac rehabilitation; and involvement in the elaboration of policies promoting wellness of athletes, promoting prevention and management of sudden cardiac death in athletes, maximizing cardiovascular performance without the use of performance-enhancing drugs, and ensuring the safety of sports arena (e.g., availability of automated external defibrillators).

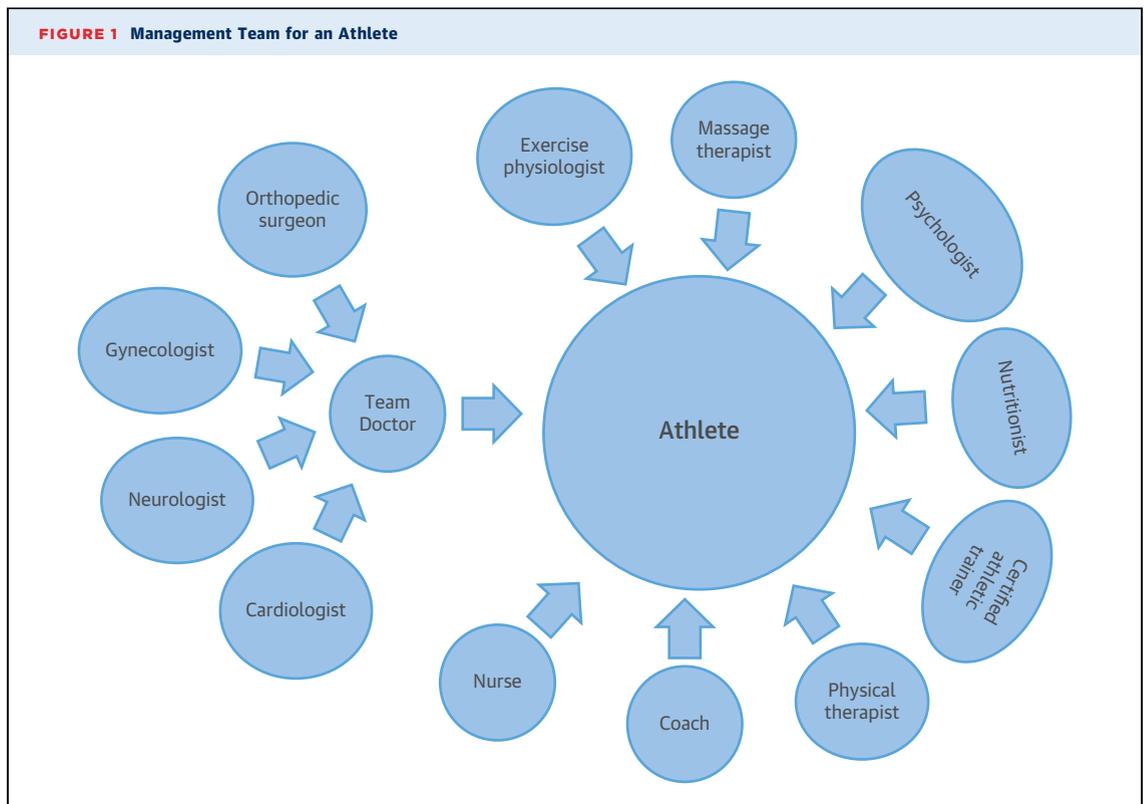
Over the years, sports medicine has expanded to include not only competitive athletes but also anyone who exercises (amateur or professionals). Although sports can confer heroic fitness to athletes, there is a risk of sports-related sudden cardiac death (4,5). The societal and media response to such tragic deaths by an athlete garners negative publicity, although the general benefits of exercise outweigh the risk. Commonly, sudden cardiac death is triggered by a malignant tachyarrhythmia such as ventricular fibrillation (VF) or ventricular tachycardia degenerating into VF. There is typically an underlying substrate for arrhythmia trigger, such as hypertrophic cardiomyopathy, channelopathies, arrhythmogenic cardiomyopathy, or coronary congenital abnormalities, among others.

Sports cardiology has evolved as a subspecialty of cardiology and or sports medicine. In 2011, the American College of Cardiology (ACC) developed the Exercise and Sports Cardiology Section. This section expanded from 150 to more than 4,000 members within a 2-year span (6). The European Society of Cardiology has also integrated sports cardiology within the section of preventive and rehabilitation cardiology since 2005.

## OPPORTUNITIES FOR FELLOWS-IN-TRAINING AND EARLY CAREER CARDIOLOGISTS

The ACC’s Exercise and Sports Cardiology Section is a unique opportunity for fellows-in-training (FITs) to play a leadership and or advocacy role in the College,

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due to its designated position for an FIT representative on its leadership committee. FITs have the opportunity to present in seminars and workshops organized by the Section, such as the Annual ACC Sports and Exercise Cardiology Summit. The ACC, American Heart Association, and European Society of Cardiology have sessions for exercise and sports cardiology at their annual scientific meetings, which is another avenue for FITs to network and share their research findings.

During the cardiovascular medicine fellowship training and in the real world, there are many clinical settings that FITs and early career cardiologists encounter sports cardiology. Some opportunities include exercise prescription for cardiac rehabilitation and pre-sports participation screening of athletes with the inherent controversies in the interpretation of electrocardiograms. Some cardiovascular medications, like the antihypertensive hydrochlorothiazide, are considered performance-enhancing medications in some sports, so this needs to be considered in the management of athletes. Even in the terminal cardiovascular subspecialties, expertise is sought daily on the management of athletes due to the use of multimodality imaging. Cardiac magnetic resonance imaging is utilized for hypertrophic cardiomyopathy or any structural cardiomyopathy, whereas coronary

computerized tomography is widely used to investigate anomalous coronary arteries. Electrophysiologists routinely evaluate athletes with accessory pathways of arrhythmia, and there are challenges in determining when to return to play after management of arrhythmias or implantation of cardiac devices. Cardiovascular geneticists have a central role in screening for channelopathies and referral to genetic counseling.

#### **PATHWAY TO SPORTS CARDIOLOGY**

At the moment, neither certification of competency nor board certification for sports cardiology exists. The Accreditation Council for Graduate Medical Education has not recognized sports cardiology as a subspecialty yet. The ACC COCATS 4 (Core Cardiovascular Training Statement 4) recognizes the importance of fellows obtaining skills in risk stratification prior to competitive sports, to be able to counsel patients prior to sports participation (7,8). Unlike our European counterparts, however, there is neither a dedicated curriculum nor COCATS-level training specific to sports cardiology (9). There are various proposed pathways to sports cardiology after general cardiology fellowship. After the completion of a standard 3-year cardiovascular medicine fellowship, one could enroll in a sports medicine

fellowship or a non-Accreditation Council for Graduate Medical Education-accredited sports cardiology fellowship (e.g., The Massachusetts General Hospital Cardiovascular Performance Program). Another opportunity that is currently available is enrolling in a sports-specific fellowship, such as Wilderness Medicine or Undersea and Hyperbaric fellowships. Those not interested in enrolling in a year-long fellowship have the option to partake in continuing medical education, such as the ACC Annual Sports and Exercise Cardiology Summit. In the future, there will be further expansion of sports cardiology, and cardiologists will likely be required to master some of the core competencies necessary for athlete-centered patient care.

## FUTURE OPPORTUNITIES

FITs and early career cardiologists are well-positioned to meet the growing demand for cardiovascular specialists in sports cardiology. Also, due to the lack of randomized control trials involving athletes, this rapidly growing field will potentially serve as a research niche for budding cardiovascular scientists.

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# RESPONSE: Sports Cardiology

## More Than a Subspecialty, a Movement to Healthier Lives

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It is truly delightful to see young minds like Dr. Afari's discourse on the emergence of sports cardiology as a subspecialty. The benefits of exercise are well-defined in a very broad scope of health, not only cardiovascular. The July 2012 issue of *The Lancet* was dedicated to physical activity (1), and included several experts in the field reporting on the current evidence of the deleterious effects of physical inactivity in the population, arguing for a pandemic of global proportions (2). Yet, sudden cardiac death occurring during exercise pales the enthusiasm for active living. It affects all ages, races, and socioeconomic levels, causing

undue suffering for families and communities, as well as educational and professional organizations.

As Dr. Afari pointed out, the American College of Cardiology (ACC) created the Sports and Exercise Section in 2011, which aimed to gather those interested in, and already practicing, the emerging field of sports cardiology (3). The term "sports cardiology" should be understood as a far-reaching entity that incorporates all ages, from childhood to the aging individual, and all forms of exercise activity: professional, scholastics, recreational, and occupational (e.g., firefighters, police, and armed forces).

Thus, the scope of practice can also be quite broad, involving not only cardiovascular specialties, but also other medical specialties that care for exercising individuals and athletes, such as sports medicine, family medicine, and pediatrics. It also cannot be forgotten that members of other professions interact daily with this population, such as athletic trainers, physical therapists, and coaches. Cardiovascular specialists have seen a growing need to enhance their expertise in this area in their daily practice. In addition, cardiovascular expertise is sought after in the athlete care team, especially at higher levels of excellence and competition.

Advising on exercise and sports activities can be simplistically seen as “yes, of course it is good for you,” although I would argue it is a much more complex process. The advice should include the effects of exercise (type and level) on the cardiovascular system, as well as the knowledge of the individual’s state of health. The question may be asked by individuals diagnosed with cardiovascular disease, genetically inherited conditions, repaired and unrepaired congenital heart lesions, and acquired heart disease occurring in childhood, as well as in patients following organ transplantation—and the list goes on. Additionally, defining the most effective way to screen athletes for conditions that may pose risk to sports participation at the professional, collegiate, and scholastic levels is a continuing debate.

Such considerations have been the impetus to develop resources and knowledge-based pathways to guide specialists in this area. Several discussions related to the lack of specific educational guidance in this field have occurred over the last few years in the Sports and Exercise Section:

- Should it be part of the core curriculum in cardiology training?
- Should it include adult and pediatric cardiology specialties?
- Should it be part of general physician and pediatrician training?
- Should the training be geared into different levels of expertise according to specialty?

As a result of such discussions and guidance from the ACC leadership (including Lifelong Learning Competencies and Core Cardiovascular Training Committees), a writing committee led by Dr. Aaron Baggish was created to compile a comprehensive document containing a proposed core curriculum and educational pathway for the care of athletes and exercising individuals. It is believed that this will spark further interest in incorporating sports cardiology into the core curriculum of cardiovascular specialty training. Dedicated programs are emerging, such as the Massachusetts General Hospital Cardiovascular Performance Program alluded to by Dr. Afari, which is on its way to be accredited by the Accreditation Council for Graduate Medical Education.

The substantial progress achieved in the past 5 years has undoubtedly sewn the seed of the development of sports cardiology as a subspecialty, and this seed has grown roots by fostering the knowledge and data gathering in this area. Sports cardiology serves not only the elite athlete, but also exercising individuals of all ages, races, and health status. I do believe sports cardiology is more than a subspecialty; it is truly a movement to safely support healthier lives.

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