ACC's Sports and Exercise Cardiology Section

Connecting, Coaching and Collaborating: Purposeful Education for Athlete-centered CV Care

The Needs of Our Rapidly Changing Landscape

Maintaining the Professional Home

The mission of the ACC Sports and Exercise Cardiology Section (Section) is to improve the cardiovascular (CV) care of athletes and exercising individuals. Although the Section was only formed 4 years ago, it has quickly become the leading provider of trusted information and resources for the CV care of athletes' across-the-lifespan. Currently, ***no other organization provides comprehensive, evidence-based, clinical or practice management strategies necessary to deliver personalized, CV athlete-centered care***. As the comprehensive resource hub (providing guideline-driven recommendations, education and advocacy opportunities), the Section has emerged as "*the professional home"* for healthcare providers (HCPs) caring for the CV needs of these athletes across-the-lifespan. Maintaining this "home" will require well-aligned strategies and tactics to meet the needs of the growing athlete population and those that care for them.

Shortage of Practice-Ready Care Teams

Fueled primarily by the surge of athlete screening requirements as well as the volume of exercise-driven babyboomers, a larger contingency of practice-ready HCPs, particularly general cardiologists, who have the knowledge, skills and attributes necessary to provide high quality, cost efficient CV care for athletes across-the-life-span are needed to meet the growing demand.

May 31, 2015 a 92-year-old cancer survivor became the oldest woman to finish a marathon

Structured Curriculum for Athlete-centered Care

Predicting this practice gap, the Section is completing a core curriculum. The *Sports and Exercise Cardiologist in the US: A core curriculum for providing cardiovascular care to the athlete* outlines the knowledge and skills necessary to care for the athlete. This structured curriculum also demonstrates the Section's unique ability to impact on the direction and policies of the field. A curriculum delivery plan including instructional delivery methods is needed.

2015: the Year of Recommendations in Sports Cardiology

In addition to the Section's core curriculum document, several other athlete-care guidelines and practice-management documents will be published this year. An AHA/ACC Scientific Statement "Eligibility and Disqualification Recommendations for Competitive Athletes with Cardiovascular Abnormalities" (which updates the 2005 Bethesda guidelines) will address return to play decisions for the athlete diagnosed with cardiac disease. The ACC's *Cardiology* magazine identified athlete eligibility recommendations from these guidelines as one of the top 9 cardiology stories of 2015. The new "Seattle" criteria for interpreting ECGs, key to pre-participation screening, and the NCAA best practice guidelines on how to run a screening program are coming out. JACC has also commissioned experts from the Section to prepare a "Hot Topic" article entitled: Exercise Dose in Health and Disease. Collectively, these publications will create knowledge and practice gaps requiring education and training.

Access to the Experts

Given the small number of sports cardiology experts in the U.S., estimated to be about 35 physicians, the collection of recommendations coupled with the delivery of the curriculum will require a coordinated educational plan developed and delivered by our experts. They will need to analyze and interpret this information, and then offer practical implementation strategies for a spectrum of key stakeholders.

Moving Forward – Research Needs

Given the paucity of sports cardiologists in the U.S. and the need for rigorous research that addresses identified gaps such as the lack of normative data in large populations of U.S. athletes or the lack of evidence-based traditional participation guidelines,[1] establishing research priorities as well as fostering opportunities for like-minded researchers to collaborate and receive guidance by the experts, is essential to move the field of sports cardiology forward.

The S&EC Purposeful Education Solution

Purposeful Education, a pillar of ACC's strategic plan, is providing the right content to the right member at the right time, and promotes personalized, competency-based, clinically relevant educational experiences. Therefore, in alignment with the strategic plan and given the comprehensive needs, the Section is has developed an ***educational plan that ensures the right people are connected to the right content at the right time and promotes personalized, curriculum-driven, clinically relevant education to meet the growing demand and need.***

Connecting, Coaching and Collaborating: A Curriculum Delivery Plan

Executive Summary

Goals and Objectives

The overall goal of the plan is to provide *formal and informal, personalized learning experiences that result in practical, clinically relevant patient-care and management strategies as well as promote research opportunities in the CV care needs for athletes' across-the-lifespan.* As a result of implementation of this education plan, the Section will foster enhanced connectivity, coaching and collaboration within the sports and exercise cardiology community.

Connecting – Right People
By providing curriculum-driven education, the plan ensures that concept naïve learners, particularly general adult and pediatric cardiologists, are connected and have access to the small number of recognized U.S. experts in the sports cardiology field. The right people in our case is connecting our "experiential teachers" who have the lived experiences necessary to provide authentic, patient-care solutions guiding our concept naïve HCPs to athlete-centered evidenced-based CV care solutions.

Connecting – Right Content
No other organization has the ability or mission to develop a comprehensive curriculum that will stretch across all of the emerging evidence-based practices. As the central source of the knowledge and skills necessary to care for athletes across-the-life span, HCPs can turn to the ACC for education that synthesizes, analyzes and suggests implementation strategies that tailor the abundance of content to their individual needs.

Connecting – Right Care
The newly revised guidelines will enter the continual stream of published science adding to the plethora of practice improvement requirements and patient-care guidelines cardiovascular HCPs need to synthesize, personalize and adopt. Finding the time to critically appraise the evidence or consider the practice implications is daunting. However, guided by expert faculty, the essential work of translation into practice can begin.

Connecting - Technology
Learners will stay connected by leveraging established innovative educational technologies and platforms as well as established social media communities such as Dr. Jamie Beckerman's 6,000 Twitter followers. These established formal and informal learning environments can provide a robust opportunity to pilot new technology and/or social media strategies without facing some of the end-user barriers other ACC-learner audiences might face.

Coaching - Providers
A coach is someone who has the expertise to direct a person to some end result, strategically assessing and monitoring their progress, giving immediate feedback and advice for effectiveness and efficiency. The teaching and learning strategies, such as workshops that offer practice "blueprints," that will be incorporated into this curriculum will offer coaching opportunities by our experts and ***move faculty from "the sage on the stage" to the "guide on the side."***

Collaboration - Research
As the leader in CV science, the ACC plays a critical role in creating opportunities for like-minded researchers to collaborate on potential research projects. These opportunities will be created during the live program.

The Right Time

The timing of our purposeful education couldn't be better given the volume of documents coming out in 2015, the growing number of athletes and the emergence of this young cardiology field. The need for a structured, "purposeful" education plan that can offer a general cardiologist the tools and strategies necessary to provide evidence-based, cost efficient, quality care is essential to maintaining the ACC as the "professional home" for the CV care of the athlete, young or old….even 92

Connecting, Coaching and Collaborating: Curriculum Delivery Plan

Target Audience

The primary target audience is ***general adult and pediatric cardiologists and advanced practice providers*** (NPs, CNS and PAs) who need fundamental knowledge and skills to care for an athlete across-the-lifespan. The second target audience is other clinicians caring for athletes including sports medicine physicians, first responders, and athletic trainers.

Needs Assessment

The field of sports and exercise cardiology, once the domain of healthcare delivery to elite athletes, is evolving to encompass the burgeoning number of people who are physically active.[1,2] In 2011, an estimated 44 million athlete's ≤ 35 years old participated in organized and individual sports and 14 million individuals completed road races. [1,3] Between 2000-2011, the number of individuals ≥ 35 years of age who participated in marathon/triathlons nearly doubled to 646,0001 and over the last two decades the number of individuals ≥ 55 years old finishing marathons more than doubled. [3]

Up to 10% of senior elite athletes have existing heart diseases or HTN[1] and studies have found increased risk of atrial fibrillation (AF) associated with long-term athletic training.[4,5,6] Recent studies also indicate approximately 7 million high school students participate in athletics annually; while the true incidence of SCD in HS athletes is unknown, it has been estimated that 1 out of every 43,000 dies from sudden out-of-hospital cardiac arrest.[7,8]

The explosive growth in the number of individuals participating in athletics is mirrored by an increasing interest in sports and exercise cardiology by those who care for them. S&EC Section membership has grown from 150 to over 4000 since 2011.[1]

While existing guidelines address screening, participation, and return-to-play recommendations for both competitive and recreational sports, the growing number and types of individuals participating in physical activity (sports or work related) provide healthcare providers with increased care opportunities in a variety of settings including:

- Pre-participation cardiac screening (primary prevention) for youth and athletes to detect underlying intrinsic structural or conduction cardiovascular disorders that predispose an athlete to sudden cardiac arrest (SCA) and/or sudden cardiac death (SCD) [14,15]
- The management of patients with known cardiac conditions (corrected or otherwise) that need to be addressed in relation to their chosen sport or physical work requirements, level of participation and/or return-to-play (RTP) decision making, and transition from cardiac rehabilitation to increasing levels of exercise.[1,12,16,11]
- The evaluation of cardiac symptoms/issues arising from participation in a sport and/or unexplained deterioration in athletic performance e.g. new onset dyspnea, chest pain, palpitations, syncope, cardiac enlargement, SCA, or impaired athletic performance secondary to medical treatment (e.g. Beta-blockers for hypertension).[1,2,3,18]

Current guidelines/recommendations are generally not based on outcomes studies in healthy or low-risk athletes, but rather in those with high-risk cardiovascular abnormalities.[15,34] Additionally, very few RCT large-scale studies are conducted in athletes, and athlete registry/database data are scarce.[15,36,37,3] While athlete-specific research appears to be increasing (e.g. the Seattle Criteria's standardized ECG interpretation document),[26] there is an ongoing need for increased research.

In an era of personalized medicine, the paradigm is shifting towards tailoring existing screening tools, diagnostics, technologies, and treatments for athletes and people who exercise. The new paradigm encompasses "an athlete-centered, not disease- or technology-centered approach….and getting people back in the game safely, back to work safely". [9] The prevailing notion has become "what can the person do, not what can't the person do…which are the old guidelines and restrictive."[9] ***This shift requires on-going educational efforts to provide healthcare providers with the knowledge and tools to deliver athlete-centered cardiovascular care and move the field of evidence-based care forward.***

Operationalizing
To effectively deliver the curriculum over the next 18 months, the proposal includes both formal and informal blended learning experiences.

Fall 2015 (September –November)

Practice Gap	Educational Need	Learning Objectives	Content	Curriculum Objective	Format
The field and scope of S&EC is rapidly evolving[1]	Physicians should be aware of how the field has expanded beyond the care for the elite athlete	Discuss historical changes in the field Identify opportunities to provide care for athletes across-the-lifespan	Reflections on Thirty-Five Years of Sports Cardiology -Dr. Paul D Thompson	Connecting - Right Content Coaching-expert	**Re-purposed Online MOD** from ACC.15 Sports Card Intensive
Screening of athletic patients with current AHA recommendations remains suboptimal[42]	Clinicians need to know how to consistently use pre-participation screening tools	Analyze the use of stress testing	Cardiopulmonary Stress Testing is the First and Best Test for the Athlete -Dr Thomas G Allison	CORE CURRICULUM Content - Right Content Coaching-expert	**Re-purposed Online MOD** from ACC.15 Sports Card Intensive
Syncope and collapse are among the most troublesome problems[1]	Clinicians need to know how to distinguish between syncope and "exercise-associated collapse"	Compare and contrast the potential cardiac etiologies and diagnostic testing necessary to distinguish syncope and EAC	College Baseball Player Who Had Near-Syncope While Lifting Weights -Dr Jeffrey S. Lander	CORE CURRICULUM Content - Right Content	**Re-Designed Case Vignette – Certified** NOTE: over 700 learners have completed this non-certified case

Winter 2015/2016 (December – February)

If approved, the development of the following components will begin in November/December 2015.

Face-to-Face Education
The proposal includes both formal and informal learning experiences. To develop and launch the Connect, Coach and Collaborate model including content to address practice gaps, ***approximate 12 hours (1.5 days) of face-to-face education is requested***. The live program is particularly important to the Coach and Collaborate components of the plan. Also, the plan will purposefully optimize the informal learning that occurs during networking by increasing the bandwidth for conversation, encourage expertise sharing, and subverting the hierarchy that is often in place within organizations. These informal learning environments are essential given the lack of live programs in sports cardiology, the small number of experts, and the relatively immature evidenced-based practices used in the U.S.

The table below represents the live program's well-aligned concepts/content needed to meet the overall goal. The teaching and learning strategies that will be incorporated into program have not been fully developed. However, our goal is to pilot innovative approaches that will prevent "firehouse" education and move faculty from "the sage on the stage" to the "guide on the side."

Overall Goal
At the end of this program, participants should be able to identify guideline-driven, practical, patient-care and management strategies as well as promote research opportunities in the CV care needs for athletes' across-the-lifespan.

Sports and Exercise Cardiologist in the US: A core curriculum to providing cardiovascular care to the athlete knowledge and skills					
Core Curriculum: Pre-participation screening					
Practice Gap	**Educational Need**	**Learning Objectives**	**Content**	**Curriculum Objective**	**Format**
Controversies persist around pre-participation screening in athletes. [35,42,43,44] *Screening with 12-lead ECGs in association with comprehensive history-taking and physical examination to identify or raise suspicion of genetic/congenital and other cardiovascular abnormalities may be considered in relatively small cohorts of young healthy people 12 to 25 years of age, not necessarily limited to athletes.* *If undertaken, such initiatives should recognize the known and anticipated limitations of the 12-lead ECG as a population screening test, including the expected frequency of false-positive and false-negative test results, as well as the cost required to support these initiatives over time (Class IIb; Level of Evidence C).* Screening of athletic patients with current AHA recommendations remains suboptimal[42]	Clinicians should be aware of the controversy and challenges surrounding the use of routine ECG, echocardiograms, and other imaging modalities to screen asymptomatic athletes Clinicians need to consistently use pre-participation screening tools	Debate the controversy and data, as well as some of the perceived logistical, and economic barriers, surrounding the addition of routine ECG or echocardiograms to screening of asymptomatic athletes Apply approaches to enhance consistent use of the current 14-point AHA pre-participation screening recommendations	Data suggest screening can save lives, absolute risk of sudden cardiac death in a young athlete is extremely small Potential down-sides to screening including false-positive test results Cost effectiveness of screening programs, especially in the United States AHA 14-pt PPE	Content - Right Content Coaching-expert **Environmental Adaptability**: Hot Topic-screening debate Content - Right Content Coaching-expert **Environmental Adaptability**: Guidelines	**Face-to-face** **Debate – Fact vs Fact** Case studies that challenge criteria NOTE: Portions of content will be used in the development of the blending learning workshop –Strategies for a PPE program
Awareness of electrophysiological and structural differences and tailoring existing ECG/echo screening criteria to account for these differences.[23-25]	Studies have found that many physicians may lack the knowledge to adequately evaluate athlete's ECGs and distinguish physiological cardiac adaptations from findings suggestive of underlying cardiac pathology.	Demonstrate appropriate interpretation of an athlete's ECG	ECG criteria (Seattle) Interpretation skills for the athlete – Identification ion channelopathies and HCM – Understanding ECG false-positive and false-negatives – Demographic factors considerations – ECG differences due to the cardiac adaptations – Seattle and ESC criteria have been developed to help codify physiologic from pathologic ECG changes	Content - Right Content Coaching-expert **Environmental Adaptability**: Guidelines	**Face-to-face** **Hands-on**, guided practice of ECG interpretation with opportunities for immediate feedback

Core Curriculum : Distinguishing Physiological cardiac adaptations from pathological processes					
Practice Gap	**Educational Need**	**Learning Objectives**	**Content**	**Curriculum Objective**	**Format**
Distinguishing physiological cardiac adaptations to exercise from pathological processes remains challenging. [26 27, 3,14, 28,8]	Clinicians involved in sports and exercise cardiology need to understand cardiac adaptation to physical exercise and be able to differentiate the athletic heart from pathological conditions	List the key physiological adaptations to different types of exercise Identify physiologic adaptations suggestive of underlying cardiac pathology. Differentiate the athletic heart from pathological cardiovascular conditions that may predispose athletes to SCD Discuss "grey zone" cases	Exercise-induced cardiac remodeling (EICR) including sport specificity Pathology and assessment of cardiovascular conditions that increase risk of SCD in athletes Imaging techniques and parameters of athletes vs pathological cardiac conditions (i.e. the "grey zone") Physiological testing that can help differentiate the "grey zone" athletes Counseling athletes about the limits of testing and risks for the "grey zone" athletes Cases and expert discussion of "grey zone" cases	Content - Right Content Coaching-expert	**Face-to-face** **Panel discussion** **Case-based learning** **Hands-on**, CPET use and interpretation
Core Curriculum : Management of the athlete with diagnosed cardiac disease					
Practice Gap	**Educational Need**	**Learning Objectives**	**Content**	**Curriculum Objective**	**Format**
Recommendations for cardiac care of the athlete continue to evolve [3,14,11,15]	Clinicians should be up to date with the available sport-specific tools and current practice guidelines for the cardiovascular care of patients participating in or wishing to participate in sports and be aware of differences between U.S. and international guidelines	Discuss the current recommendations for the cardiovascular evaluation and care of the athletic patient with diagnosed cardiac disease Explain the implications of key differences between U.S. and international guidelines	Return to play in athletes with CV disease: changed vs. unchanged recommendations – "Bethesda guidelines" Physiology of exercise and how it relates to risk of sudden death in athletes with inherited CV disease Prescribing and communicating exercise prescription to patients/athletes with inherited CV disease. Post-myocardial infarction athlete. Role of these consensus recommendations in shared-decision-making for the athlete population Legal implications on decision-making for return-to-play **JACC Hot Topic "Exercise Dose in Health and Disease"** Ideal exercise prescription for the healthy, increasingly controversial in light of new data on maldaptation to extreme endurance sports, as well as the ideal exercise prescription for the previously-healthy athlete now with cardiac disease. Review of current consensus guidelines Differences between these and European guidelines	Content - Right Content Coaching-expert **Environmental Adaptability**: Guidelines **Environmental Adaptability**: Hot Topic	**Face-to-Face**

Blended Learning
A "flipped classroom" approach will be used for practice management strategies and tactics needed to develop a pre-screening program and/or expand into care of the athlete. By using this approach, basic information and instructions will be moved to an online module allowing participants to move through the content at their own pace. Then, during the face-to-face, ***didactic-free workshop***, ample time is available for active learning where a "practice blueprint" will be offered. Workshop "coaches" will guide the development of the blueprints, strategically assessing and monitoring participant progress, giving advice for effectiveness and efficiency. Participants will receive post-course feedback and progress monitoring if requested.

Practice Management Strategies and Tactics

Practice Gap	Educational Need	Learning Objectives	Content	Curriculum Objective	Format
Controversies persist about pre-participations screening programs[2,34]	Previous participants of the Summit have specifically requested workshops to assist with developing screening programs.	Identify at least one business tactic necessary to set-up a pre-participation screening program Design a personalized practice screening program that meets your communities needs	**Online Content** Sports clearance versus cardiovascular assessment Purely screening or broader based with recognition of SCA and CPR/AED training Population: "Athletes"; all students, age cut-offs for screening Screening criteria: AHA, PPE-4 Norms to be used: Seattle Criteria, echocardiography norms by BSA or height **Face-to-face Content** Equipment requirements Physician and support staff needed Data Acquisition: Result tracking forms for echo and ECG; de-identified data collection; storing images Plan for discussing abnormal results Logistics of event Plan for clinical follow-up of abnormal results Risk management and malpractice considerations: agreement to participate and hold harmless forms Funding: charitable donations, corporate involvement	Content - Right Content Coaching-expert	**Flipped Classroom Online Module** **Workshop Setting up a screening program blueprint** **Small group work**

Screening of athlete patients with current AHA recommendation remains suboptimal[42]	The growth of the spectrum of athletes across the lifespan will require additional HCPs with the knowledge and skills to provide CV care. [12]	Identify at least one business tactic utilized to set-up a sports cardiology practice	Setting up a sports cardiology practice a. How to connect and foster a relationship with local athletes b. How to identify potential referral groups c. How to integrate CV care of the athlete into your day-to-day practice d. Determine title of the program e. Potential marketing strategies		**Workshop** **Setting up a sports card practice blueprint** **Small group work**

Promote research collaboration

Practice Gap	Educational Need	Learning Objectives	Content	Curriculum Objective	Format
Adapting available tools and research data to the athletic population can be difficult given the dearth of athlete-specific research and outcomes data[15,36,37,3]	Clinicians need to understand much of the currently available guidance is not based on large randomized control trials in populations of normal or low-risk U.S. athletes	Identify opportunities to engage in and disseminate athlete-specific data in order to detect true incidence/prevalence of heart disease in athletes, define normative values for cardiac tests/metrics in American athletes and develop athlete-centered evaluation and care guidelines	The long-term goal is to encourage individual researchers and plant seeds for new collaborations Research landscape How to get started in research and move your ideas forward and Important research priorities. Find researchers who have like-minded ideas Receive feedback from experts on the potential topic/idea	**Coaching-expert** **Collaborate**	Face-to-face Didactic-free **Research Roundtable** will bring together a panel of 4 currently active investigators through tabletop exercises Small group work **Researcher Speed Dating**

Spring 2016 (March - June)

The blended learning online component will be available 30-days prior to the live program. The Section proposes the delivery of **the face-to-face 1.5 day program to take place in late Spring 2016 or early Summer 2016.**

Summer 2016 (July-September)

Analysis of Outcomes

The Section is committed to measuring and evaluating the impact of these educational experiences. The assessment and outcomes strategy of this program is based on the industry standard Moore/Green/Gallis multi-level outcomes framework. Our outcomes strategy will consist of participant evaluation tools that are congruent with appropriate platform and activity-specific educational objectives, clinical practice guidelines, and clinical evidence.

Potential Re-purposed Content

The plan allows for several opportunities to re-purpose content from the live program to further disseminate the guideline-based core curriculum to an even wider audience.

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