FORUM EUROPÉEN
CŒUR, EXERCICE
& PRÉVENTION
20 / 21 MARS 2025

Quoi de neuf en 2024/2025 ?

En cardiologie du sport

Dr ENDJAH Nima

Lille

Club des Cardiologues du Sport

Groupe Exercice Réadaptation Sport - Prévention
Société Française de Cardiologie

Conflits d’intérêts

Aucun

De nouvelles recommandations !

Circulation

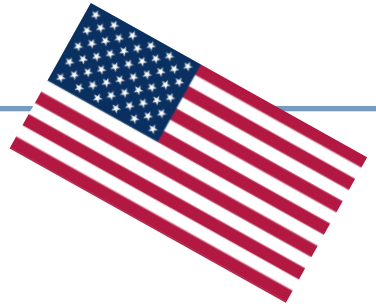
AHA/ACC SCIENTIFIC STATEMENT

Clinical Considerations for Competitive Sports Participation for Athletes With Cardiovascular Abnormalities: A Scientific Statement From the American Heart Association and American College of Cardiology

Jonathan H. Kim, MD, MSc, FACC, Chair; Aaron L. Baggish, MD, FACC, Vice Chair; Benjamin D. Levine, MD, FAHA, FACC, Vice Chair; Michael J. Ackerman, MD, PhD, FACC; Sharlene M. Day, MD, FAHA; Elizabeth H. Dineen, DO, FACC; J. Sawalla Guseh II, MD; Andre La Gerche, MBBS, PhD; Rachel Lampert, MD, FHRS, FACC; Matthew W. Martinez, MD, FACC; Michael Papadakis, MBBS, MD, FRCP; Dermot M. Phelan, MD, PhD, FACC; Keri M. Shafer, MD, FACC; on behalf of the American Heart Association Leadership Committee of the Council on Clinical Cardiology; Council on Basic Cardiovascular Sciences; Council on Cardiovascular and Stroke Nursing; Council on Cardiovascular Surgery and Anesthesia; Council on Peripheral Vascular Disease; and American College of Cardiology

Circulation. 2025;151:e716–e761

De nouvelles recommandations !



*« **Shared decision-making** (SDM) with patients is now a **fundamental principle** in clinical medicine and foundational in this scientific statement »*

*« Emerging outcomes data are now available for several cardiac conditions that suggest **risk is not as high during competitive sports participation as previously assumed** »*

*"For the first time, we emphasize that t**his is not an article outlining "disqualification recom- mendations,"** but rather a compendium of clinical consid- erations that should guide the SDM process for athletes who present with cardiovascular abnormalities or disease »*

ELSEVIER

American Heart Journal Plus: Cardiology Research and Practice

Volume 43, July 2024, 100401

AHJO

Shared decision making for participation in elite athletes with cardiovascular conditions. Where are we now?

Katherine M. Edenfield [a], James R. Clugston [a], Matthew W. Martinez [b c]

Circulation. 2025;151:e716–e761

La décision partagée au coeur de l'évaluation

ESC European Society of Cardiology
European Heart Journal (2021) 42, 17–96 doi:10.1093/eurheart/ehaa605
ESC GUIDELINES

2020 ESC Guidelines on sports cardiology and exercise in patients with cardiovascular disease

The Task Force on sports cardiology and exercise in patients with cardiovascular disease of the European Society of Cardiology (ESC)

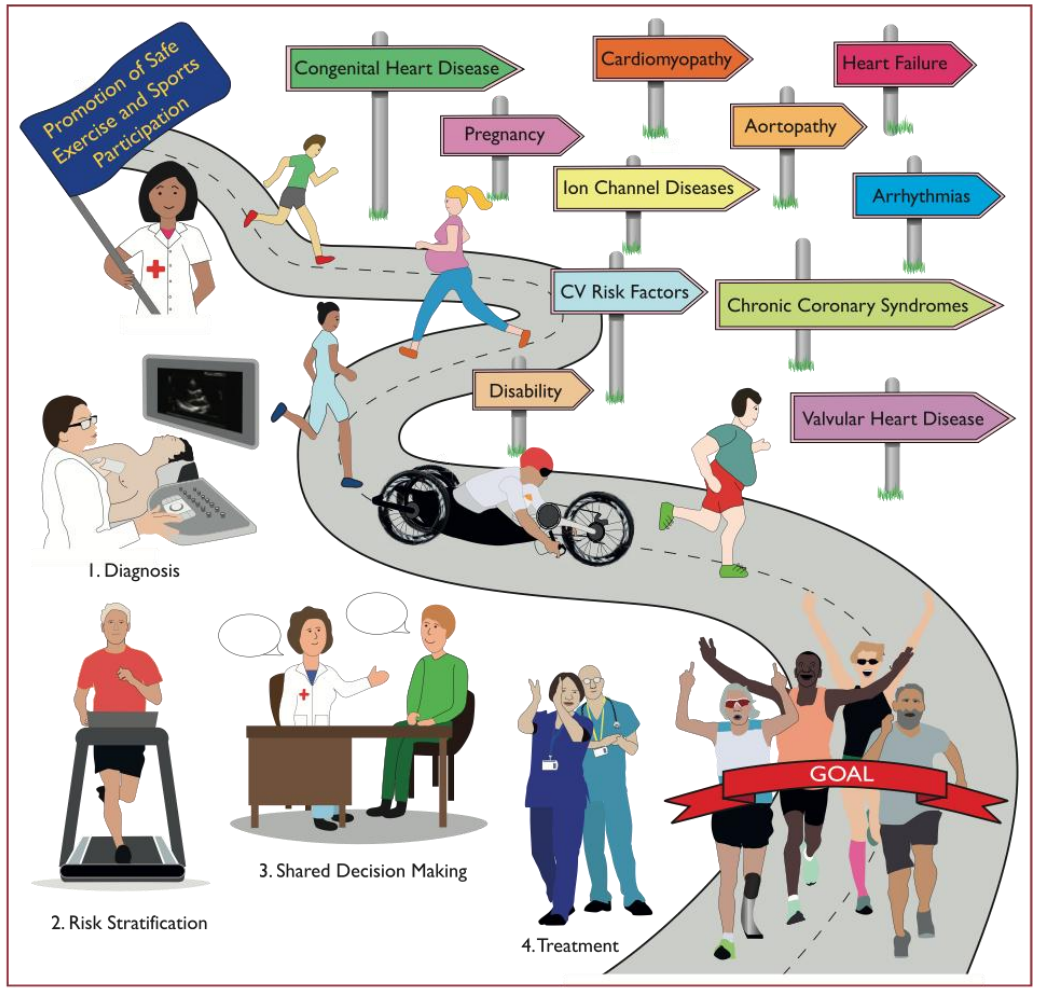
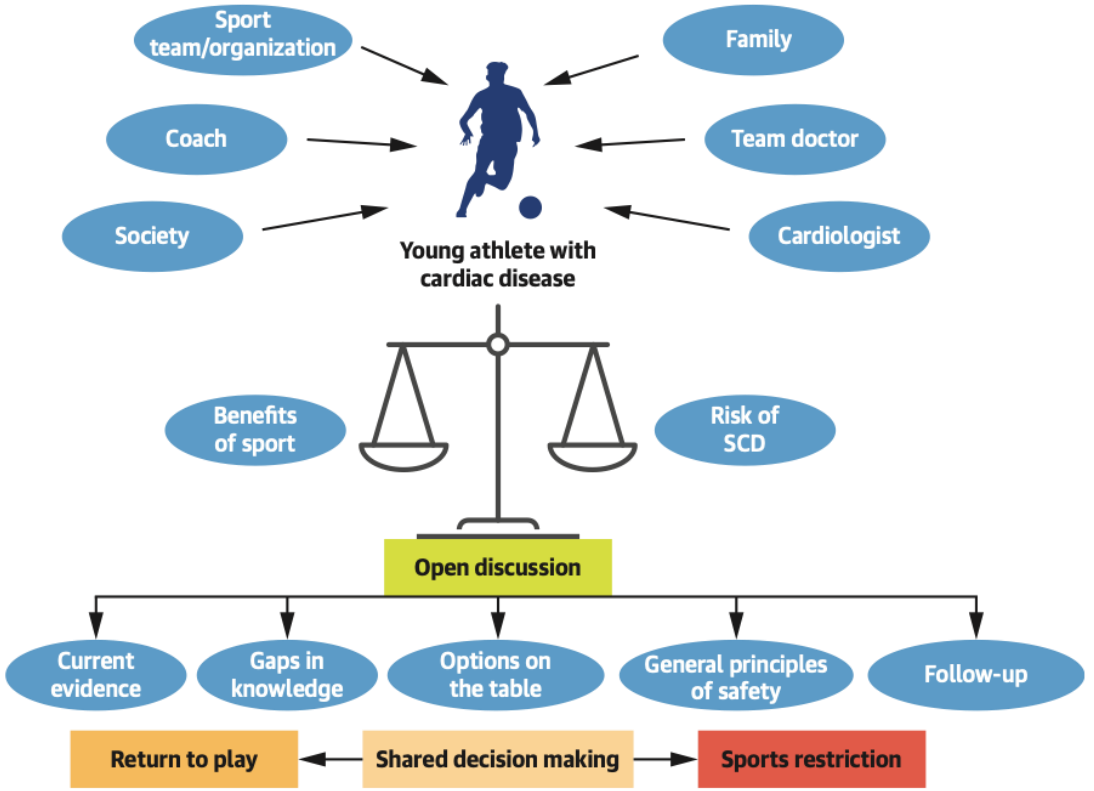
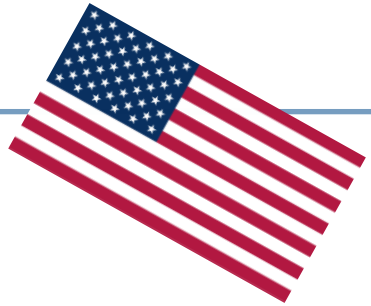


FIGURE 6 Exercise in Individuals With Cardiac Disease and Shared Decision Making



Finocchiaro et al Sudden Cardiac Death in Athlètes JACC VOL. 83, NO. 2, 2024:350–37

La décision partagée au coeur de l'évaluation



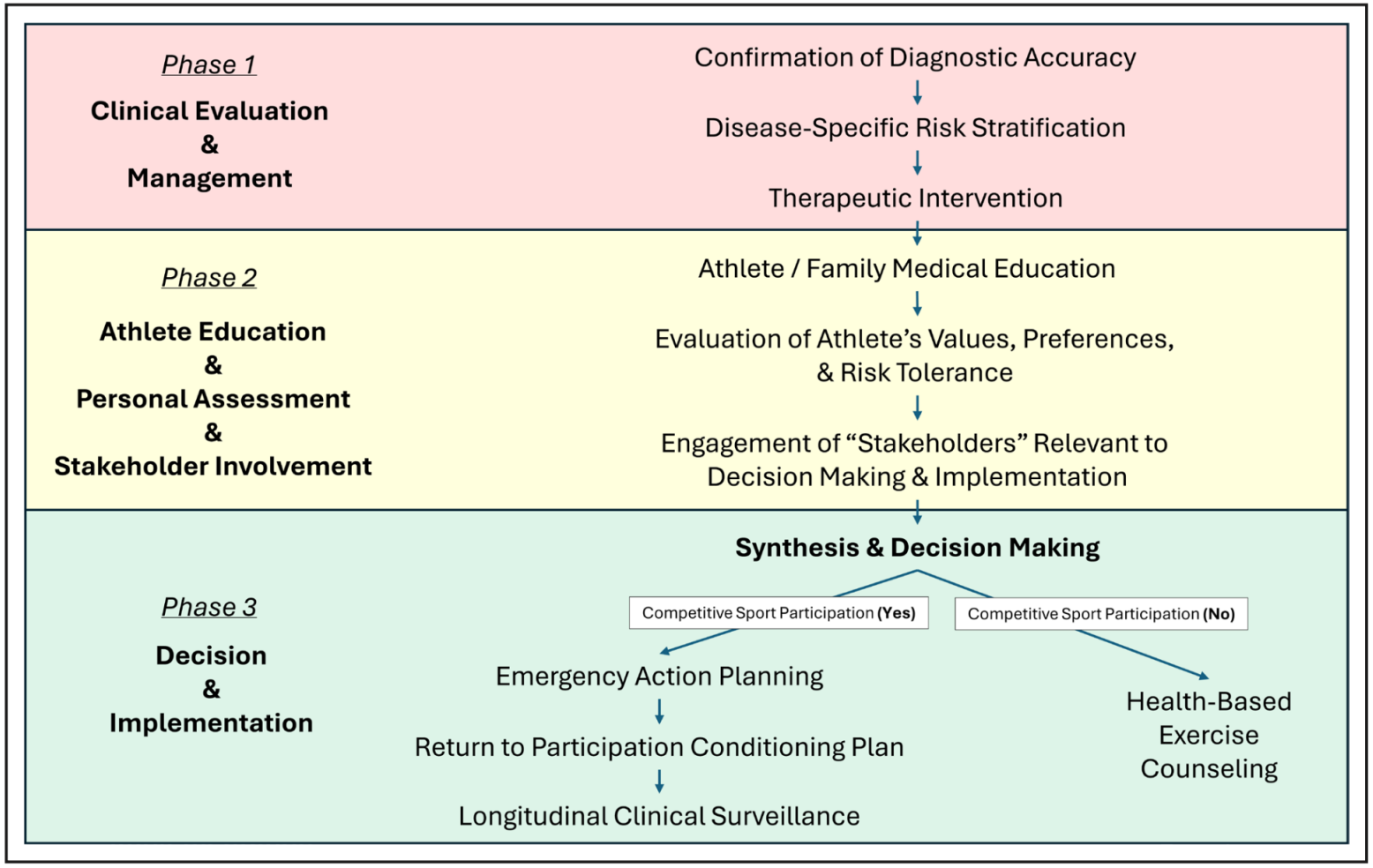


Figure 2. A stepwise approach to the implementation of shared decision-making regarding participation in competitive sports among athletes with cardiovascular disease.

« Historical dogma that athletes lack the ability to make rational and informed decisions and should not have their own values included in the process of determining sports eligibility is ***neither ethical nor supported by the medical literature****. Respect for the athlete's values and preferences is essential in providing guidance about competitive sports participation after a diagnosis of CVD »*

Circulation. 2025;151:e716–e761

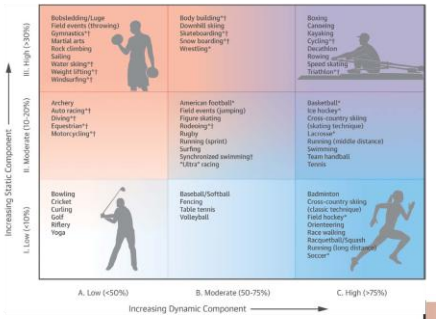
De nouvelles recommandations !

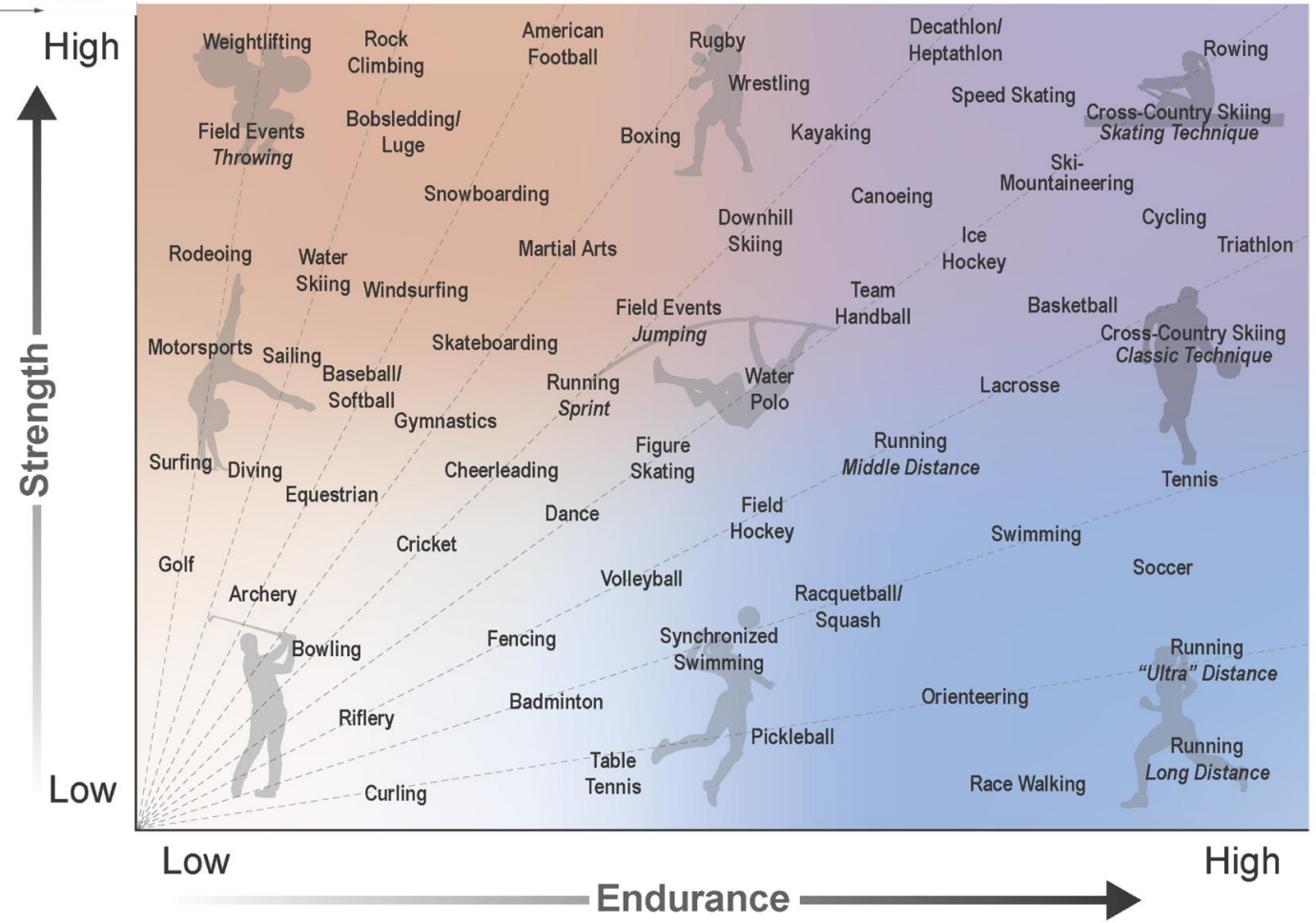
Table 2. Highlights in the 2024 American Heart Association/American College of Cardiology Scientific Statement on Competitive Sports Participation in Athletes With Cardiovascular Abnormalities

Section and task force	Highlights and key updates
Section I (task force 1): Sports Classifications	• Updated sports classification schema with removal of discrete categories of sport • Sports classification presented as a continuum of endurance and strength training loads • Sports classification also presented as levels of bodily collision and impact relevant for competitive athletes on oral anticoagulation
Section II (task force 2): The Preparticipation Cardiac Evaluation	• Acknowledgment of the limitations of both history & physical and 12-lead screening ECG • 12-lead ECG screening is reasonable as long as equitable access to expertise and a downstream process with appropriate resources are available
Section III (task force 3): Ethical Aspects of Competitive Sports Eligibility	• SDM is an ethical imperative to include in the clinical management of competitive athletes, including decisions for competitive sports participation • SDM is the foundation of these updated clinical considerations
Section IV (task force 4): Cardiomyopathies	• A uniform mandate of sports restrictions for athletes with all types of genetic cardiomyopathies should not be applied • Competitive sports participation may be reasonable to consider in competitive athletes with genetic cardiomyopathies
Section V (task force 5): Myocarditis/Pericarditis, Valvular Heart Disease, and Other Acquired Cardiovascular Conditions	• Resumption of competitive sports participation can be considered before 3 mo of exercise restrictions in select cases of clinical myocarditis • Clinical considerations are provided for SARS-CoV-2 (including vaccination) • Clinical considerations are provided for competitive athletes with valvular heart disease, including mitral valve prolapse
Section VI (task force 6): Congenital Heart Disease	• Clinical considerations are provided in the context of physiology and anatomy rather than specific congenital diagnoses • Clinical considerations are provided for coronary artery anomalies, including anomalous coronary origins and myocardial bridging
Section VII (task force 7): Aortopathy (Including Bicuspid Aortic Valve) and Spontaneous Coronary Artery Dissection	• Clinical considerations are provided for the approach to aortopathy in young competitive athletes • Clinical considerations for aortopathy are succinctly separated into sections on bicuspid aortic valve with aortopathy and heritable thoracic aortic disease (gene-positive and gene-negative)
Section VIII (task force 8): Arrhythmias, Devices, and ECG Abnormalities	• Clinical considerations are provided for competitive athletes who survive sudden cardiac arrest • Clinical considerations are provided for asymptomatic competitive athletes identified with abnormal results on screening ECG
Section IX (task force 9): Cardiac Channelopathies	• Clinical considerations are provided for the approach to competitive athletes with cardiac channelopathies • Competitive sports participation can be considered for competitive athletes with catecholaminergic polymorphic ventricular tachycardia who are clinically stable and under expert supervision
Section X (task force 10): Masters Athletes	• Clinical algorithm provided for masters athletes with coronary artery disease • Clinical considerations are provided for masters athletes with atrial fibrillation, myocardial fibrosis, dilated or aneurysmal ascending aorta, or chronic valvular heart disease
Section XI (task force 11): Additional Cardiac Conditions and Considerations	• Competitive athletes with hypertension, in the absence of hypertensive emergency, can continue with competitive sports participation • Clinical considerations are provided for competitive athletes diagnosed with pulmonary embolism • Clinical considerations are provided for competitive athletes competing at extreme altitude or recreational athletes participating in scuba • Clinical considerations are provided for competitive athletes without established cardiovascular disease who desire continued competitive sports participation while pregnant

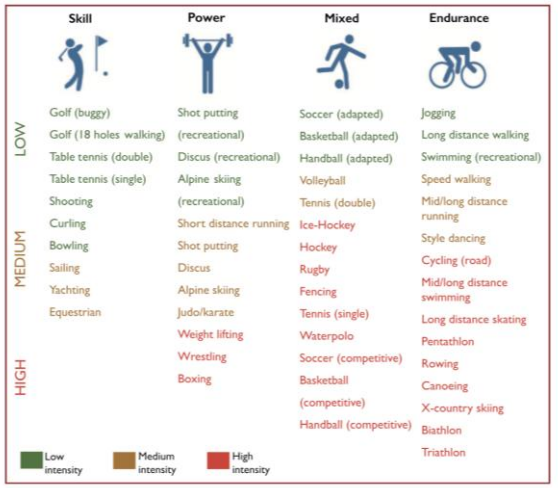
Circulation. 2025;151:e716–e761

La classification des sports de Mitchell





Circulation. 2025;151:e716–e761



Sport Disciplines

Skill		Power		Mixed		Endurance	
Isometric	+/-	Isometric	+++/++++	Isometric	++/+++	Isometric	++/+++
Isotonic	+/-	Isotonic	+/++	Isotonic	++/+++	Isotonic	+++/++++
Cardiac remodeling	+/-	Cardiac remodeling	+/++	Cardiac remodeling	++/+++	Cardiac remodeling	++++
• Golf • Archery • Sailing • Table Tennis • Equestrian • Karate • Shooting/Rifle • Curling • Sled disciplines • Ski Jumping		• Weightlifting • Wrestling / Judo • Boxing • Short distance running • Shot-putting • Discus / Javelin • Artistic gymnastics • Bobsleigh • Short-track skating • Alpine skiing • Snowboarding		• Soccer • Basketball • Volleyball • Waterpolo • Badminton • Tennis • Fencing • Handball • Rugby • Hockey / Ice-hockey		• Cycling • Rowing • Mid/long distance swimming • Mid/long distance running • Canoeing • Triathlon • Pentathlon • X-country skiing • Biathlon • Long distance skating	

Eur Heart J. Published online July 19, 2018

L’ECG, enfin une place

AHA/ACC Scientific Statement

Eligibility and Disqualification Recommendations for Competitive Athletes With Cardiovascular Abnormalities: Task Force 2: Preparticipation Screening for Cardiovascular Disease in Competitive Athletes

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

Barry J. Maron, MD, FACC, Chair; Benjamin D. Levine, MD, FAHA, FACC;

Universal ECG Screening

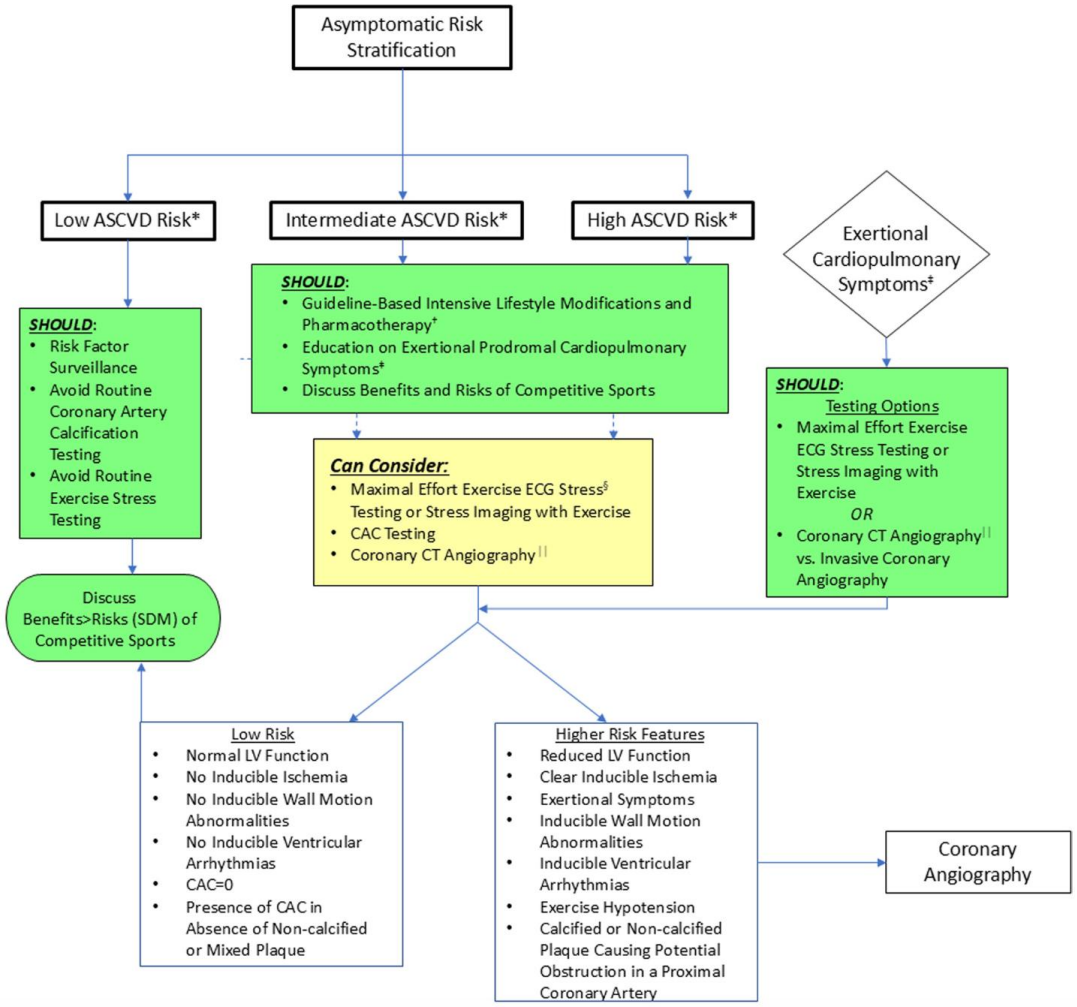
On 3 occasions (1996, 2007, and 2014), AHA consensus expert panels evaluated and decided not to support mandatory national athlete screening in the United States, particularly with routine use of ECGs.[1–3] Indeed, sudden cardiovascular deaths in ath-

Table 4. Clinical Considerations for the Preparticipation Cardiac Evaluation of Competitive Athletes

Specific clinical considerations
Cardiac screening should be considered 1 component of SCA prevention that aims to identify competitive athletes with unrecognized cardiovascular disease to allow individualized and disease-specific management to prevent an adverse event.
A cardiac screening program should ensure access to high-quality primary screening and secondary evaluation, including the financial and logistical resources to ensure a systematic process for downstream clinical evaluation.
As a component of preparticipation screening, the cardiovascular medical history and physical examination should be performed as it can detect symptomatic competitive athletes with previously unrecognized disease and those with a family history suggestive of an inherited cardiovascular disorder.
The inclusion of a resting 12-lead ECG is reasonable as it improves detection of underlying cardiac conditions in asymptomatic competitive athletes compared with medical history and physical examination alone.
Effective ECG-inclusive preparticipation screening requires the involvement of clinicians with adequate training in the use of contemporary athlete-specific ECG interpretation criteria to minimize potential harm.
Cardiac imaging, exercise stress testing, and ambulatory rhythm monitoring have insufficient data to suggest incremental value for use in the primary screening of asymptomatic competitive athletes.
No approach to cardiac preparticipation screening provides absolute protection against SCA. Thus, an emergency action plan that includes training in high-quality CPR, prompt access to an AED, and a coordinated medical transport system should be developed, practiced, and used for all environments in which competitive athletes train and compete.

Circulation. 2025;151:e716–e761

Coronaropathie et évaluation du RCVG



Circulation

AHA/ACC SCIENTIFIC STATEMENT

Clinical Considerations for Competitive Sports Participation for Athletes With Cardiovascular Abnormalities: A Scientific Statement From the American Heart Association and American College of Cardiology

Table 14. Clinical Considerations for Masters Athletes With Coronary Artery Disease, Atrial Fibrillation, Myocardial Fibrosis, Thoracic Aortic Dilation or Aneurysm, and Chronic Valvular Heart Disease

Coronary artery disease
General considerations
High cardiorespiratory fitness and regular exercise reduce the overall risk of cardiovascular disease and death among healthy individuals and those with established cardiovascular risk factors or clinical coronary heart disease. However, vigorous exercise is associated with a transient increase in acute cardiac events in those with underlying cardiovascular disease.
Cardiovascular risk scores derived from the general population have not been validated in masters athletes. These scores, which do not include habitual physical activity levels, may overestimate risk when applied to masters athletes.
Subclinical CAD (includes CAC)
Specific clinical considerations
Although CAC may be observed commonly in masters athletes, its presence likely portends lower cardiovascular risk compared with sedentary individuals in the general population with similar levels of CAC.
Low-risk* masters athletes should not undergo routine cardiac risk stratification testing, including imaging for CAC.
Presumed intermediate* and high-risk* masters athletes should be counseled on appropriate guideline-based lifestyle modifications (ie, smoking cessation, diet, alcohol), treated according to guideline-based medical therapy, and counseled on symptoms that may indicate underlying ischemic heart disease.
Clinicians should consider further risk stratification with options including CAC, maximal-effort exercise stress testing, functional stress imaging (with maximal-effort exercise), or imaging (coronary CT angiography), for presumed intermediate* and high-risk* masters athletes.

Mort subite du sportif et DAI

Malignant VT/VF and previous sudden cardiac arrest
Specific clinical considerations
Resumption of competitive sports participation for competitive athletes with a reversible cause of malignant VT or ventricular VF, such as resolved myocarditis, successful ablation of monomorphic PVCs that induced VF, or electrolyte abnormalities, is reasonable after confirmation of successful treatment or resolution of the underlying disease process.
Resumption of competitive sports participation for competitive athletes who have survived sudden cardiac arrest is reasonable with SDM, which takes into consideration the underlying diagnosis, appropriate therapeutic interventions, and comprehensive confirmation of rhythm stability with maximum-effort, sport-specific exercise testing and extended duration ambulatory rhythm monitoring.
Implantable cardioverter defibrillator
Specific clinical considerations
Competitive sports participation is reasonable for competitive athletes who have received an ICD for primary or secondary prevention with SDM, which takes into consideration the underlying diagnosis, comprehensive confirmation of rhythm stability, and the possibility of both appropriate and inappropriate device therapies.
For competitive athletes who receive a new ICD, competitive sports participation should be restricted for 4 to 8 wk (or 2 wk after generator replacement) as determined by sporting discipline to allow for postprocedural recovery.
Implantable cardioverter defibrillator
Competitive sports participation for competitive athletes with an ICD who participate in collision or impact competitive sports (see Section I) can be considered with SDM that addresses the potential risk of ICD system damage or malfunction.

*« Le sport en compétition est r**aisonnable pour les athlètes implanté d'un DAI, en prévention primaire ou secondaire**, après une **décision partagée**, prenant en considération le diagnostic sous-jacent, une stabilité rythmique et en informant des effets des chocs justifiés et des risques de chocs inappropriées »*

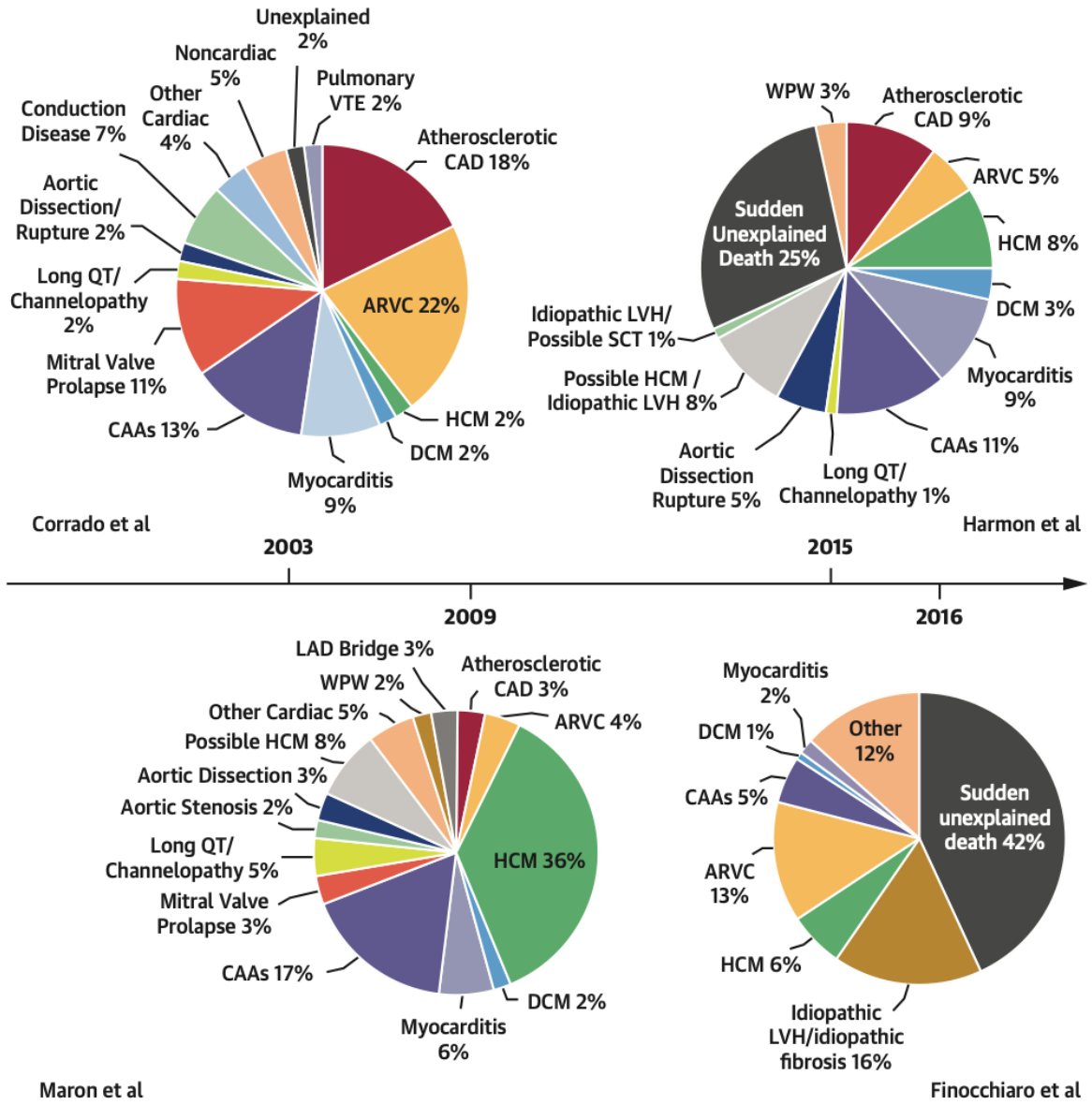
QT long et TV polymorphes catécholergiques

Long QT syndrome
Specific clinical considerations
It is reasonable for competitive athletes with positive genetic test results for LQTS but who have a resting QTc <460 ms (ie, concealed variant positive LQTS) to participate in competitive sports.
In competitive athletes with LQTS (asymptomatic [QTc ≥460 ms prepuberty, ≥470 male, ≥480 female] or previously symptomatic) but who are under expert assessment and supervision, competitive sports participation is reasonable with SDM after risk assessment, education, and implementation of guideline-directed therapies.
In competitive athletes with LQTS (including LQT1), competitive swimming and diving can be considered with appropriate precautions.*

Catecholaminergic polymorphic ventricular tachycardia
Specific clinical considerations
In an asymptomatic competitive athlete with positive genetic test results for CPVT but no exercise-induced ventricular ectopy on exercise stress testing (ie, genotype-positive and phenotype-negative), competitive sports participation is reasonable with discussion about prophylactic CPVT-directed medical therapy.
In competitive athletes with asymptomatic CPVT who have a positive stress test with evidence of exercise-induced ventricular ectopy, competitive sports participation can be considered with SDM and after optimization of therapies and normalization of the stress test.†
In competitive athletes with previously symptomatic CPVT for whom competitive sports participation are being considered, combination therapy with β-blocker and flecainide, and possibly the addition of LCSD, is required before resumption of competitive sports participation. Such CPVT therapies should be optimized with normalization of the stress test before participation in competitive sports.†

Et à part ces recommandations ?

Épidémiologie des MS du sportif



THE PRESENT AND FUTURE

JACC STATE-OF-THE-ART REVIEW

Sudden Cardiac Death in Young Athletes

JACC State-of-the-Art Review

Gherardo Finocchiaro, MD, PhD, Joseph Westaby, PhD, BMBS, Mary N. Sheppard, MD, MBBCH, BAO, BSc, Michael Papadakis, MD, MBBS, Sanjay Sharma, MD, BSc(Hons)

JACC VOL. 83, NO. 2, 2024 350–370

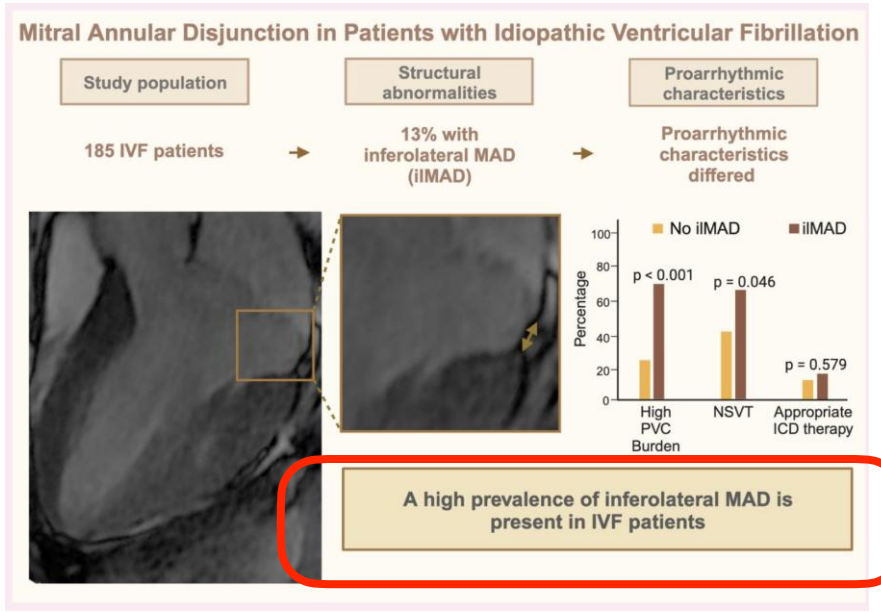
ESC European Society of Cardiology

European Heart Journal - Cardiovascular Imaging (2024) **25**, 764–770
https://doi.org/10.1093/ehjci/jeae054

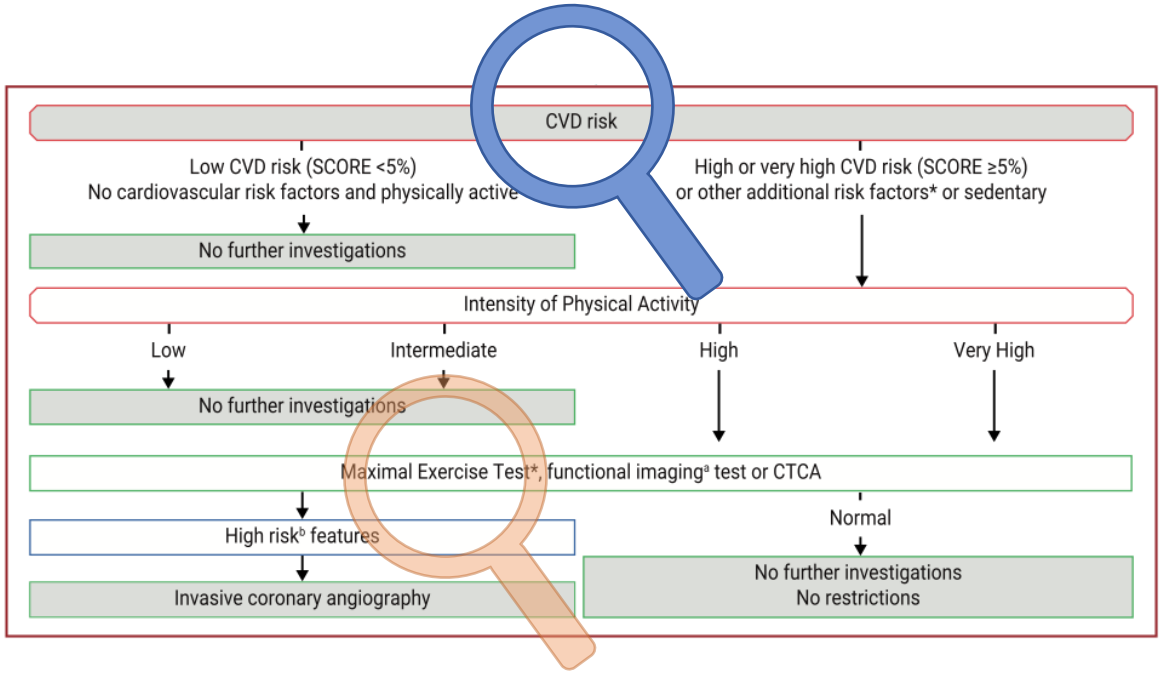
ORIGINAL PAPER

Mitral annular disjunction in idiopathic ventricular fibrillation patients: just a bystander or a potential cause?

L.M. Verheul [1†,*], M. Guglielmo [1†], S.A. Groeneveld [1], F.P. Kirkels [1], C. Scrocco [2,3],



L'évaluation du RCVG au centre du dépistage et « *the Master@Heart study* »



Regardless of those benefits, this study "nicely illustrates that exercise does not make you immune from heart disease —which is a message a lot of athletes need to hear, honestly,"

ESC European Society of Cardiology
European Heart Journal (2023) 44, 2388–2399
https://doi.org/10.1093/eurheartj/ehad152

CLINICAL RESEARCH
Clinical trials

Lifelong endurance exercise and its relation with coronary atherosclerosis

Ruben De Bosscher [1,2], Christophe Dausin[3], Piet Claus [1], Jan Bogaert [4],

176 Controls

191 Late-onset endurance athletes

191 Lifelong endurance athletes

Absence of cardiovascular disease and of established risk factors for coronary artery disease

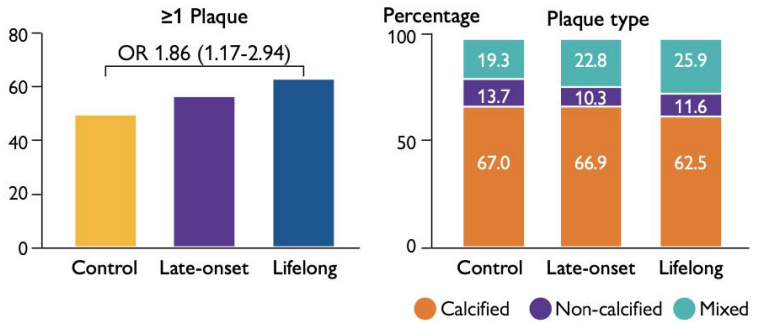
No current or past history of smoking, no body mass index >27.2 kg/m²

Sampled at random for inclusion to minimize the risk of selection bias

Primay endpoint

Prevalence of any coronary plaques (calcified, mixed, non-calcified) by computed tomography

Plaque burden and plaque composition by endurance exercise group



Odds of having coronary plaque in ***lifelong endurance athletes*** compared to ***controls***

≥1 mixed plaque	1.78
≥1 coronary plaque	1.86
≥1 non-calcified plaque	1.95
≥1 proximal plaque	1.96
≥1 proximal non-calcified plaque	2.80

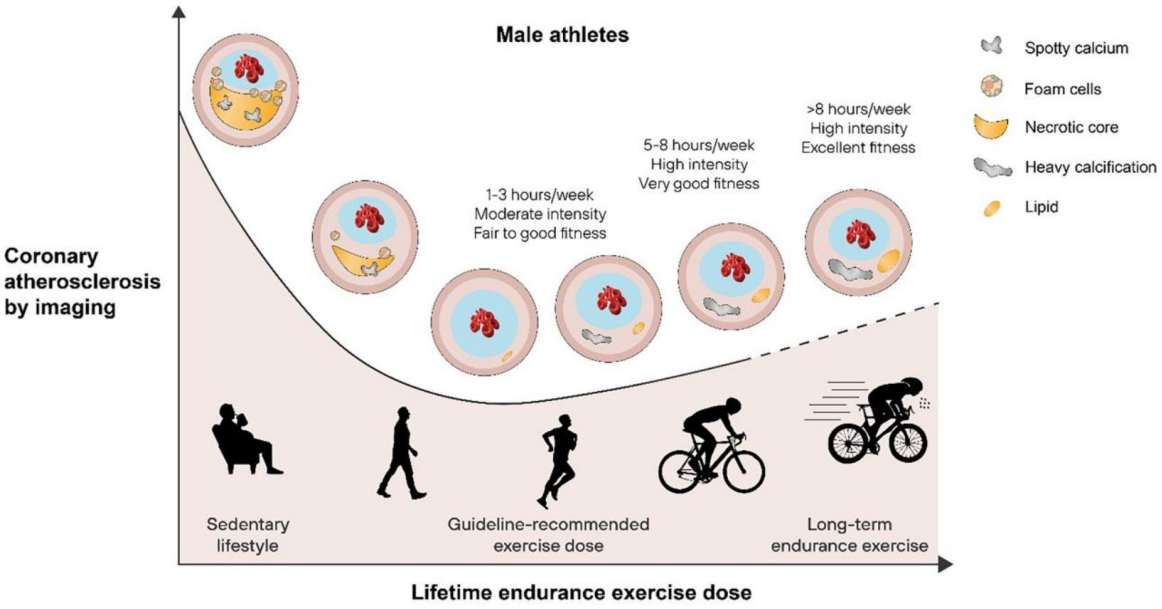
Odds ratios were adjusted for other risk factors

Les études continuent... *ça se précise peu à peu*

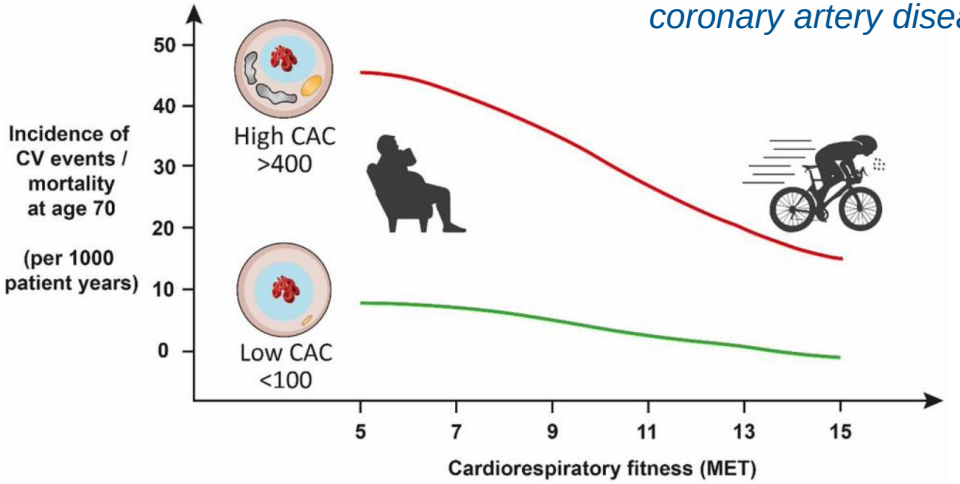
ESC European Society of Cardiology
European Heart Journal (2024) 00, 1–14
https://doi.org/10.1093/eurheartj/ehae927
STATE OF THE ART REVIEW
Epidemiology, prevention, and health care policies

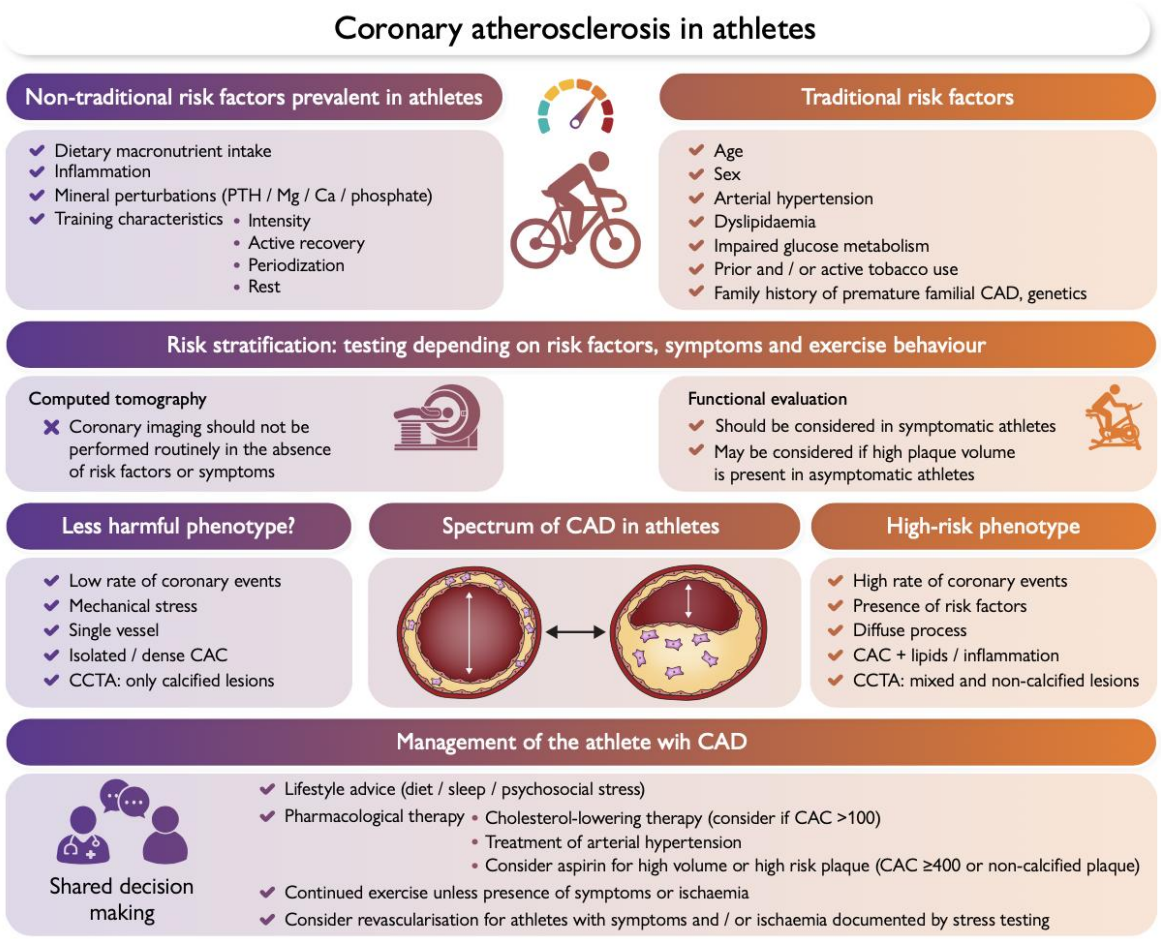
Coronary atherosclerosis in athletes: emerging concepts and preventive strategies

Guido Claessen [1,2,3,*,†], Thijs M.H. Eijsvogels [4,†], Christine M. Albert[5], Aaron L. Baggish[6], Benjamin D. Levine[7,8], Eloi Marijon[9,10], Erin D. Michos[11], and Andre La Gerche [12,13,14]

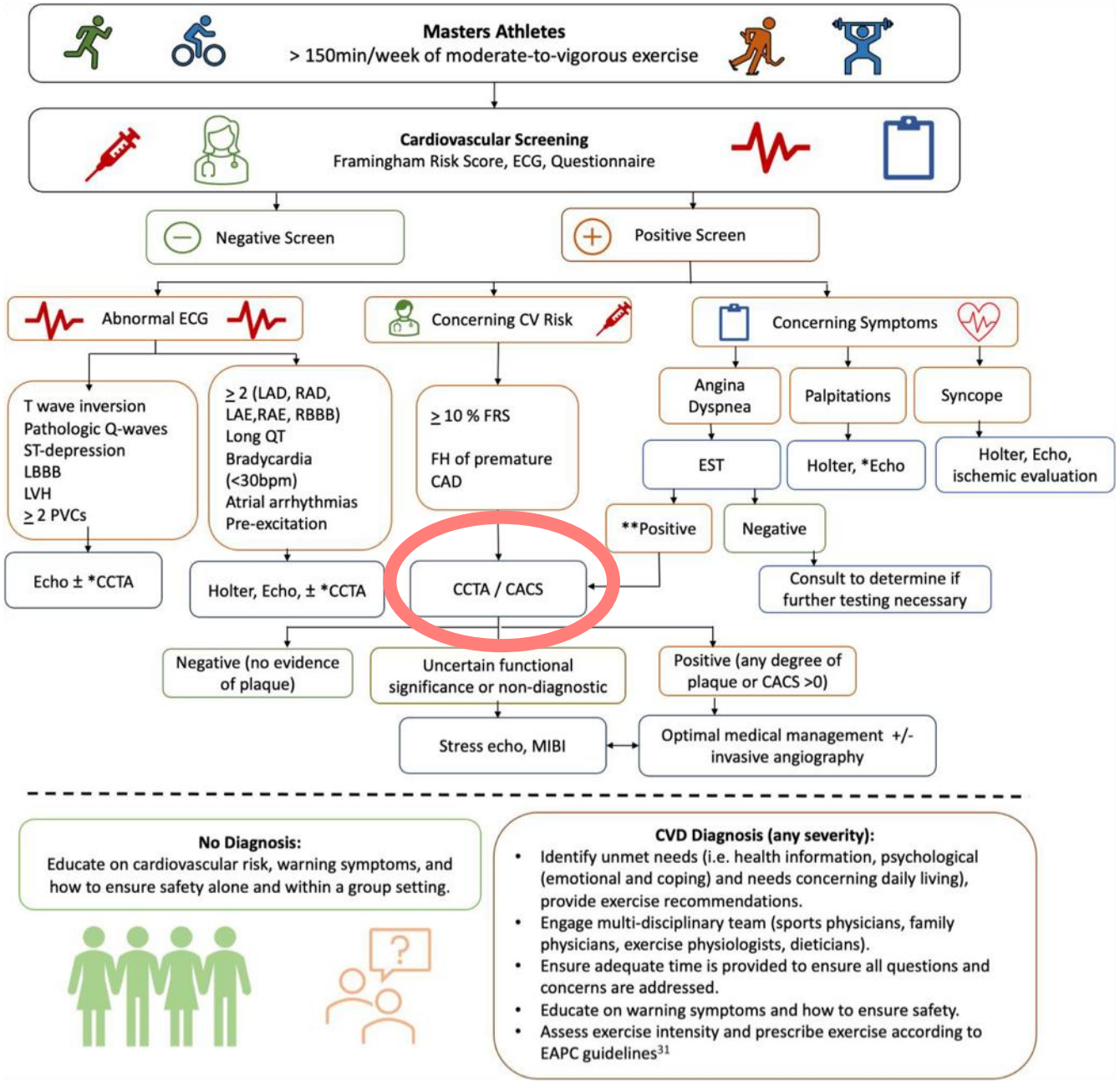


« There should be no assumption that an athlete is immune to coronary artery disease »





Evaluation du sportif master : Arbre décisionnel



ESC European Society of Cardiology
European Journal of Preventive Cardiology (2023) **30**, 887–899
https://doi.org/10.1093/eurjpc/zwad090
FULL RESEARCH PAPER
Sports cardiology

Masters athlete screening study (MASS): incidence of cardiovascular disease and major adverse cardiac events and efficacy of screening over five years

Barbara N. Morrison [1]*, Saul Isserow[2], Jack Taunton [3], David Oxborough [4], Nathaniel Moulson [2], Darren E. R. Warburton [5], and James McKinney [2]*

Masters athlete screening study (MASS) Barbara N. Morrison European Journal of Preventive Cardiology (2023) 30, 887–899

Dépister c'est d'abord évaluer le risque !

Diagnostiquer une coronaropathie
au stade d’ischémie

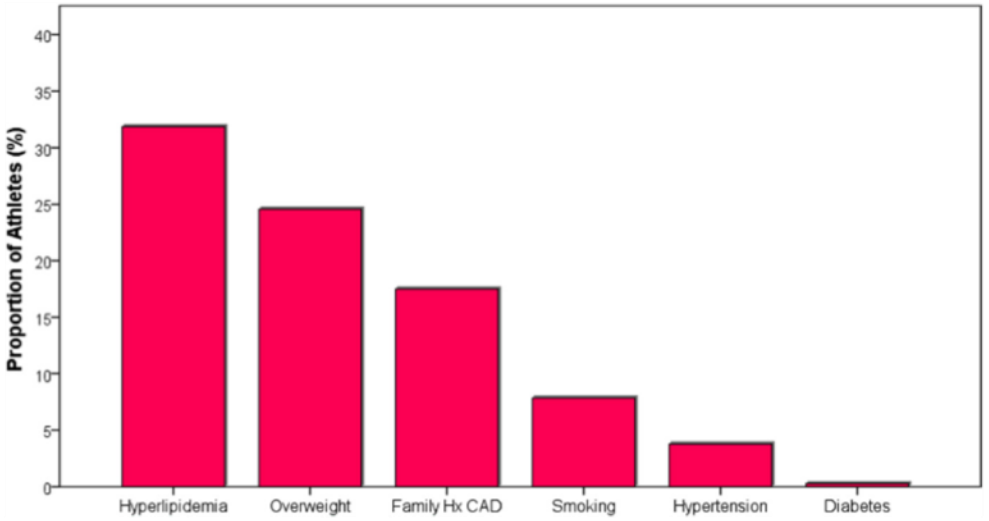
…

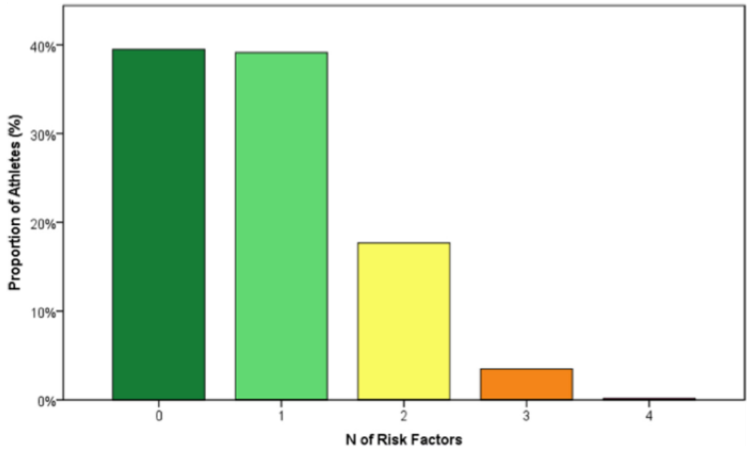
C’est un dépistage raté !

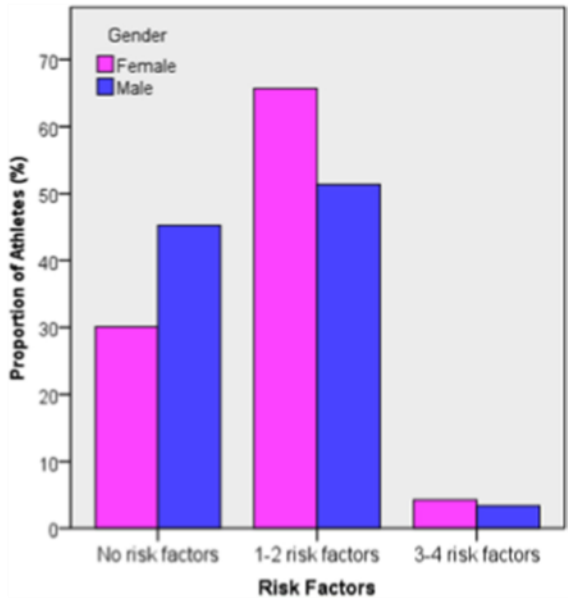
Des FDRCV… sous estimées chez les athlètes après cette année olympique

Cardiovascular risk profile in Olympic athletes: an unexpected and underestimated risk scenario

Flavio D'Ascenzi,[1] Stefano Caselli,[2] Federico Alvino,[1] Barbara Digiacinto,[2] Erika Lemme,[2] Massimo Piepoli,[3] Antonio Pelliccia[2]







ABSTRACT

Background Prevalence of cardiovascular (CV) risk factors has been poorly explored in subjects regularly engaged in high-intensity exercise programmes. Our aim was, therefore, to assess the prevalence and distribution of CV risk factors in a large population of competitive athletes, to derive the characteristics of athlete's lifestyle associated with the best CV profile.

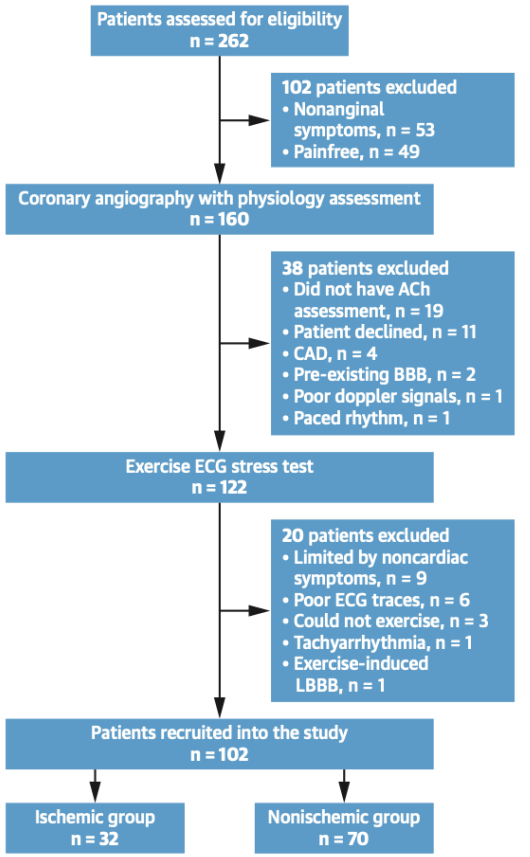
Methods 1058 Olympic athletes (656 males, 402 females), consecutively evaluated in the period 2014–2016, represent the study population. Prevalence and distribution of CV risk factors was assessed, in relation to age, body size and sport.

Findings Dyslipidemia was the most common risk (32%), followed by increased waist circumference (25%), positive family history (18%), smoking habit (8%), hypertension (3.8%) and hyperglycaemia (0.3%). Large subset of athletes (418, 40%) had none or 1 (414, 39%) risk factor, while only a few (39, 3.7%) had 3/4 CV risk factors. The group without risks largely comprised endurance athletes (34%). Ageing was associated with higher total and low-density lipoprotein cholesterol, triglycerides ($p<0.001$) and glycaemia ($p=0.002$) and lower high-density lipoprotein cholesterol. On multivariate logistic regression analysis, age, BMI and body fat were identified as independent predictors of increased CV risk.

Interpretation Dyslipidemia and increased waist circumference are common in elite athletes (32% and 25%, respectively). A large proportion (40%) of athletes, mostly endurance, are totally free from risk factors. Only a minority (3%) presents a high CV risk, largely expression of lifestyle and related to modifiable CV risk factors.

Des tests d'effort pas si « faux-positifs »

FIGURE 1 Consolidated Standards of Reporting Trials Diagram Demonstrating Study Flow



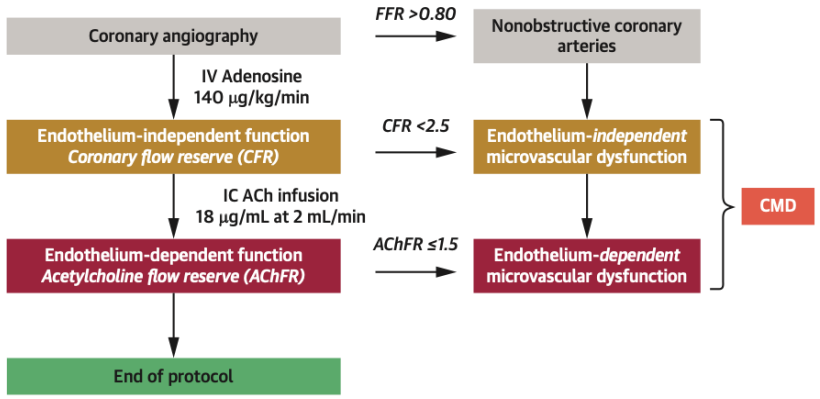
JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY

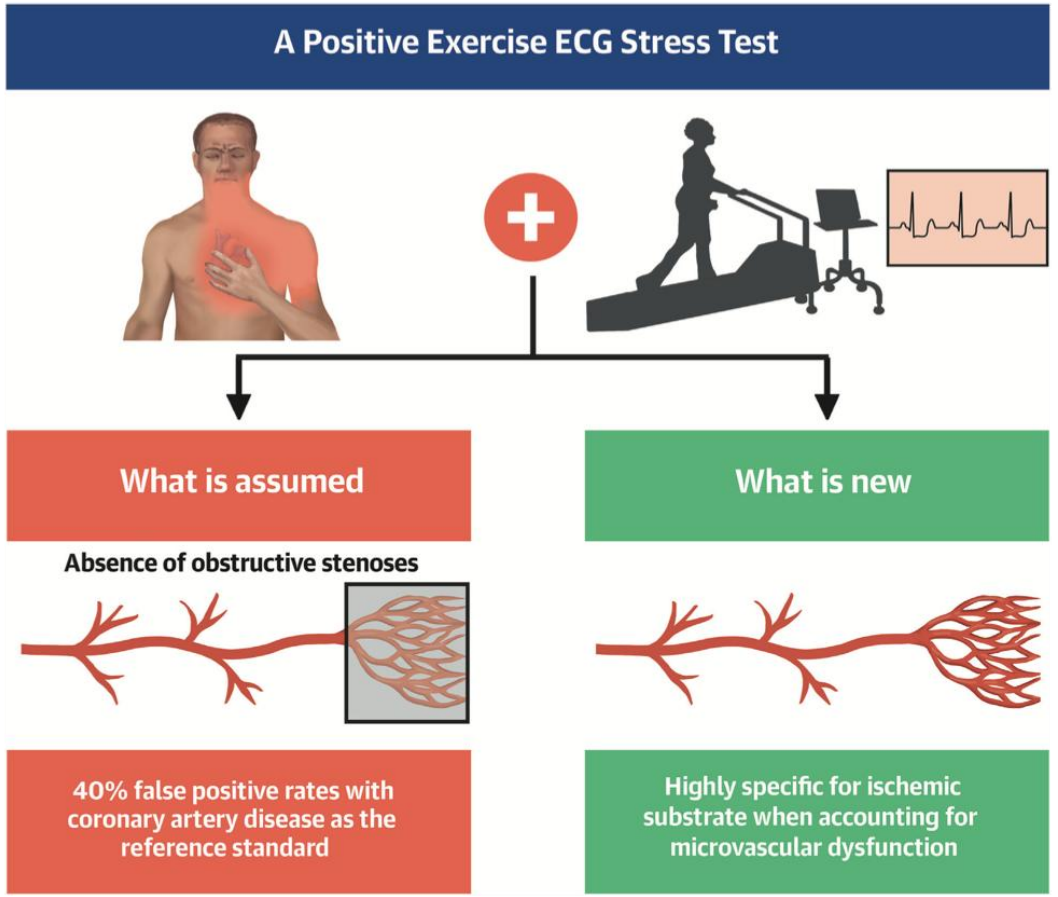
ORIGINAL RESEARCH

Rethinking False Positive Exercise Electrocardiographic Stress Tests by Assessing Coronary Microvascular Function

Aish Sinha, MBBS, BSc, Utkarsh Dutta, MSc, Ozan M. Demir, PhD, MBBS, MSc, Kalpa De Silva,

FIGURE 2 Coronary Physiological Assessment Protocol





Sinha A, et al. J Am Coll Cardiol. 2024;83(2):291-299.

L'AAP en prévention ponctuelle ?

ESC European Society of Cardiology
European Heart Journal (2024) **45**, 488
https://doi.org/10.1093/eurheartj/ehad641

DISCUSSION FORUM
Ischaemic heart disease

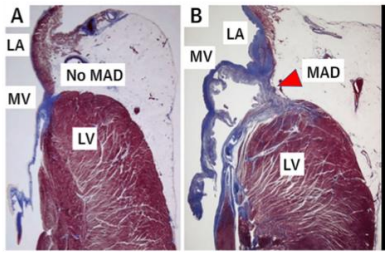
Pre-race aspirin to attenuate the risk for marathon-related cardiac arrest: deconstructing the legacy of Pheidippides

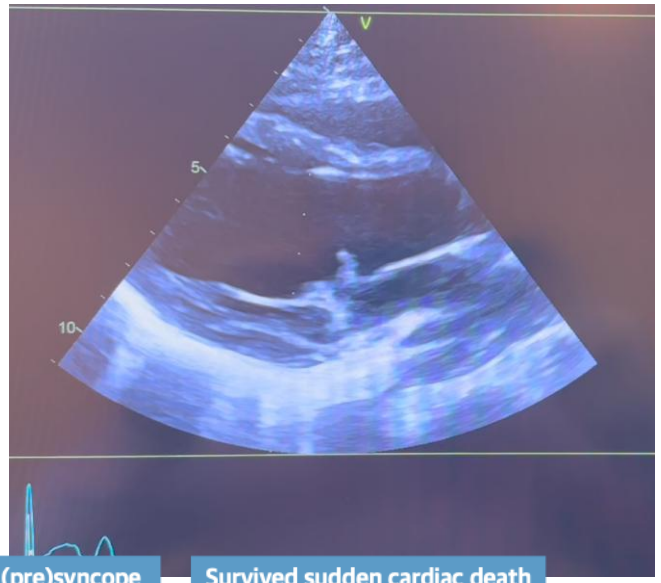
Arthur J. Siegel [1,2,3]*

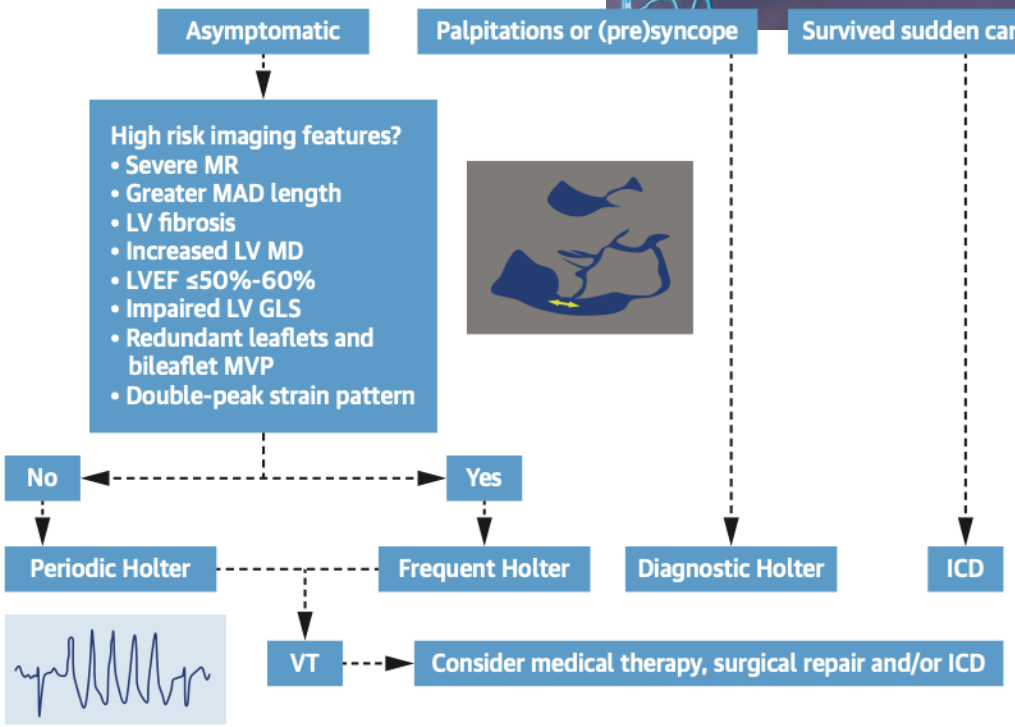
Table 1 **Coronary artery calcium scores and the anticipated benefit of enhanced primary prevention with low-dose pre-race aspirin for reducing the risk of marathon-related cardiac arrest**

Coronary artery calcium Agatston score levels	Pre-race low-dose aspirin use
0—no coronary plaque burden	Not indicated
1–99—mild disease	Optional
100–399—moderate disease	Recommended
≥400—severe disease	Highly recommended

Retour du PVM malin et surtout de la DAM, une pathologie évolutive







STATE-OF-THE-ART REVIEW

J Am Coll Cardiol Img 2024

Mitral Annular Disjunction in the Context of Mitral Valve Prolapse

Identifying the At-Risk Patient

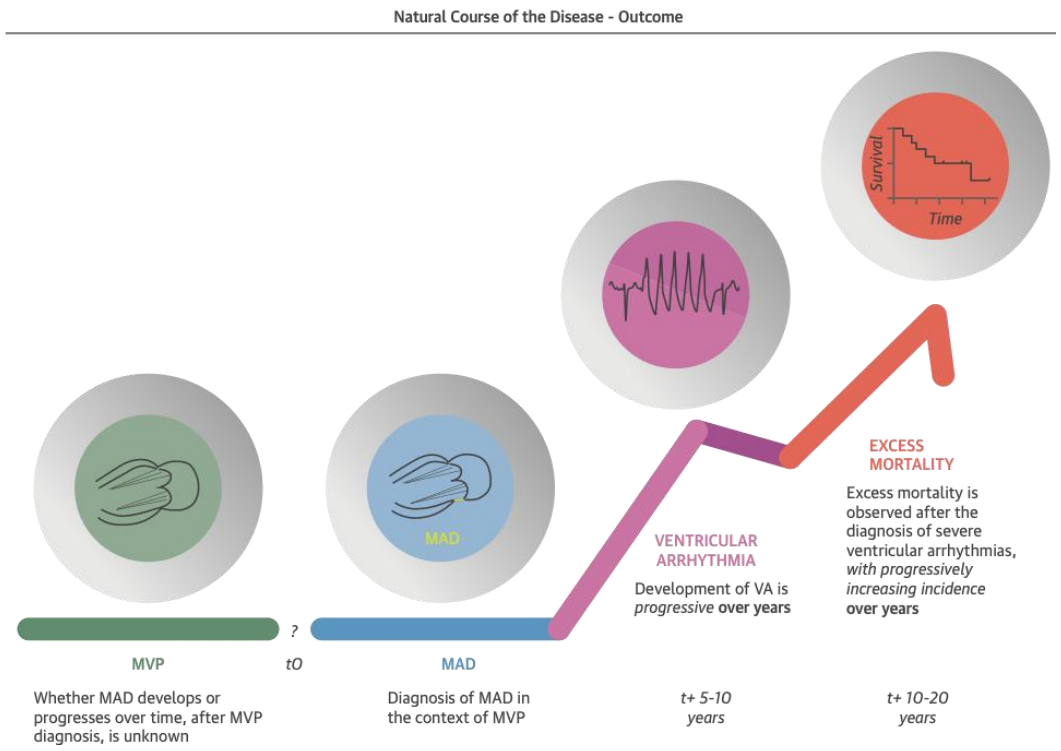
Pieter Van der Bijl, MD, PhD,[a] Jan Stassen, MD,[a,b] Kristina H. Haugaa, MD, PhD,[c,d] Benjamin Essayagh, MD,[e,f]

Current Cardiology Reviews, 2023, *19*, e201222212066

MINI-REVIEW ARTICLE

Mitral Valve Prolapse and Sudden Cardiac Death in Athletes at High Risk

FIGURE 11 **Natural Course of MAD**



Stratification du risque du PVM malin et DAM

Current Cardiology Reviews, 2023, *19*, e201222212066

MINI-REVIEW ARTICLE

Mitral Valve Prolapse and Sudden Cardiac Death in Athletes at High Risk

Mitral Annular Disjunction (MAD)

Systolic Curling motion of valvular annulus

Mitral valve prolapse

Mechanical stress in LV inferobasal wall and PM

Abnormal contractility and impaired repolarization

Regional hypertrophy and fibrosis

PVC and arrhythmias

ARRHYTHMIC MVP

ECG and 24-h ECG Holter
Corrected QT interval > 430 ms [54]
Short T-wave inversion in inferior leads (DII, DIII, aVF) [21]
PVC morphology: RBBB (QRS>130 ms) with superior axis (inferior wall) or indetermined/inferior axis (papillary muscles) [21]
PVC coupling (< 350 ms) [51]
Monomorphic PVC [36]
Polymorphic PVC: constant beat to beat change in morphology configurations of outflow tract alternating with papillary muscle or fascicular origin [36]
NSVT > 100 beats/min and lasting < 30s [36]
SVT lasting > 30s or requiring termination [36]
Physical Stress Test
ECG changes during stress test. Couplets/non-sustained ventricular tachycardia during the initial phase (first and second minute), at peak exercise or during post exercise [55]
Burden of complexity of VAs [50]: - Low risk: Frequent PVCs with no high risk morphology and not complex arrhythmias (No complete RBBB). - Intermediate risk: Polimorphic PVCs, bigeminy, trigeminy couplets, NSVT (heart rate less than 180 bpm). - High risk: SVT, polymorphic NSVT, NSVT with heart rate more than 180 bpm. Proven history of VF.

TTE Findings
Bileaflet MVP, entity of prolapse
Myxomatous degeneration (leaflets length and thickness)
Mitral annulus disjunction (MAD)
Systolic curling of the posterior annulus of MV
High lateral S' on TDI (> 16 cm/s) (Pickelhaube Sign)
Basal/mid segment of inferolateral wall ratio >1.5
Paradoxical movement of the mitral annulus (systole bigger than diastole)
Dilated annulus
CMR Findings
Left ventricle size and function
Mitral regurgitation severity stratification
MAD, curling, annulus diameter and leaflets characteristics
Assessment myocardial fibrosis and localization (papillary muscles and basal segment of the inferior wall)

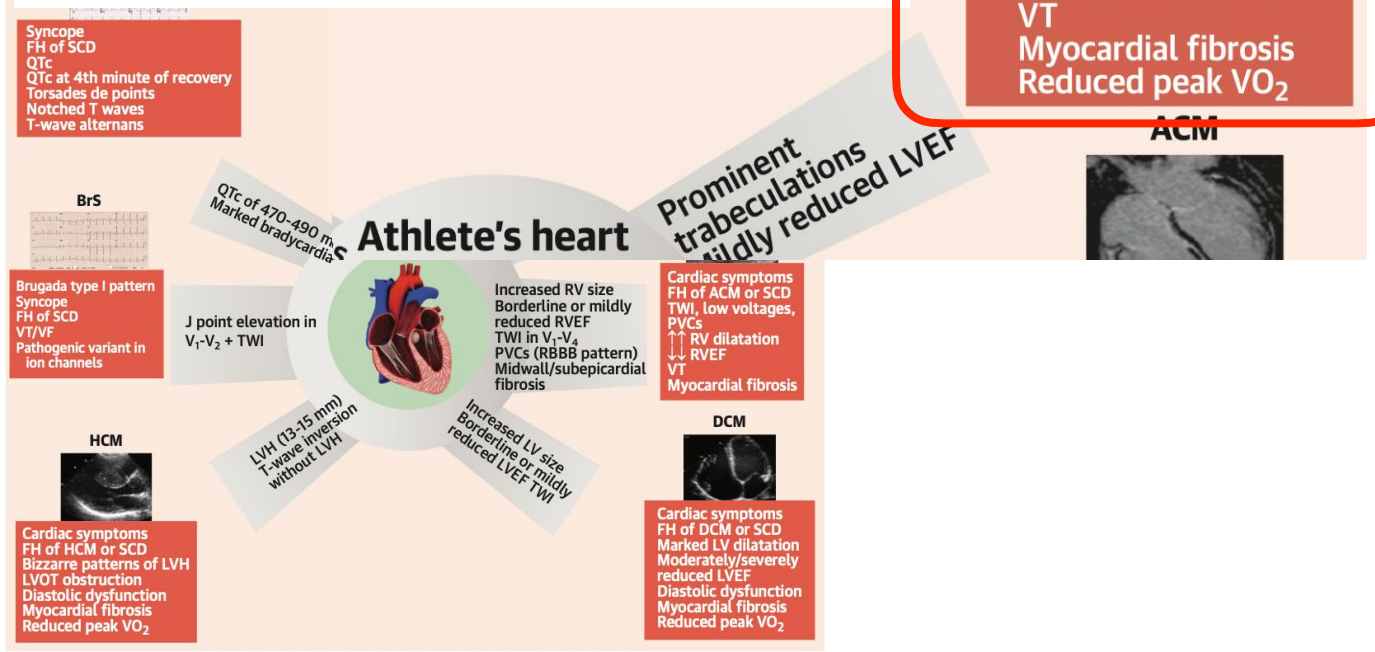
Certaines pathologies sont à la mode… d'autres disparaissent…

Current Problems in Cardiology
Volume 49, Issue 11, November 2024, 102787

Invited Review Article

What happened to the left ventricular non-compaction cardiomyopathy? to be or not to be: This is the question

Daniela Di Lisi MD, PhD [a b], Francesca Macaione [a b], Francesco Damiani [a b], Luca Ganci [a b], Marco Mirabella [a b], Cristina Madaudo [a b], Alfredo Ruggero Galassi [a b], Giuseppina Novo [a b]



Finocchiaro et al Sudden Cardiac Death in Athlètes JACC VOL. 83, NO. 2, 2024:350–37

ESC European Society of Cardiology
European Heart Journal (2023) **44**, 3503–3626
https://doi.org/10.1093/eurheartj/ehad194

ESC GUIDELINES

2023 ESC Guidelines for the management of cardiomyopathies

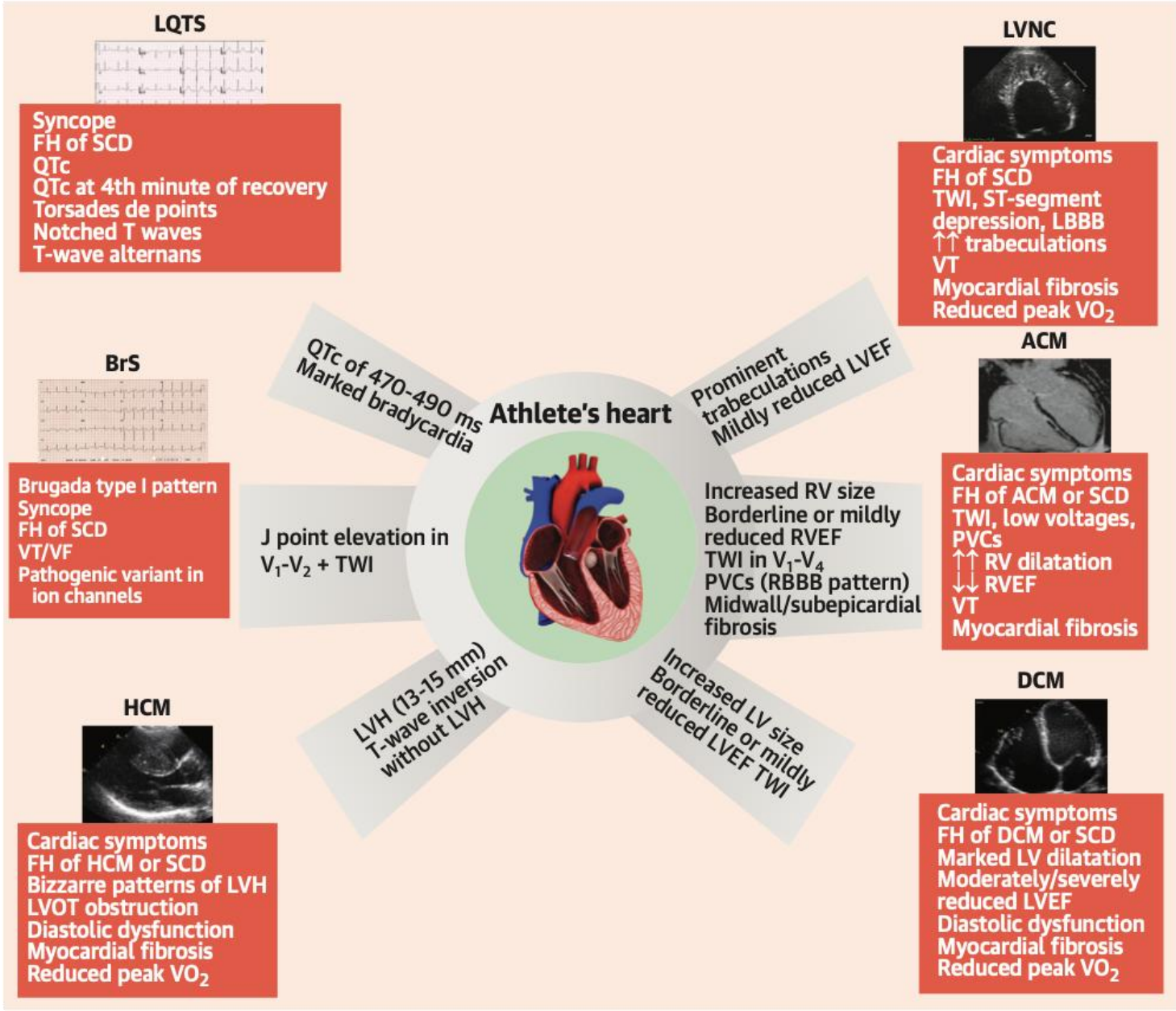
3.3.1. Left ventricular hypertrabeculation (left ventricular non-compaction)

The term 'left ventricular non-compaction' (LVNC) has been used to describe a ventricular phenotype characterized by prominent LV trabeculae and deep intertrabecular recesses. The myocardial wall is often thickened with a thin, compacted epicardial layer and a thicker endocardial layer. In some patients, this abnormal trabecular architecture is associated with LV dilatation and systolic dysfunction. Left ventricular non-compaction is frequently a familial trait and is associated with variants in a range of genes, including those encoding proteins of the sarcomere, Z-disc, cytoskeleton, and nuclear envelope.[12–16]

Left ventricular non-compaction has also been used to describe an acquired and sometimes transient phenomenon of excessive LV trabeculation (e.g. in athletes, during pregnancy, or following vigorous activity)[17–19] that must reflect increased prominence of an otherwise normal myocardial architecture, given that cardiomyocytes are terminally differentiated and the formation of new cardiac structures is impossible.[20]

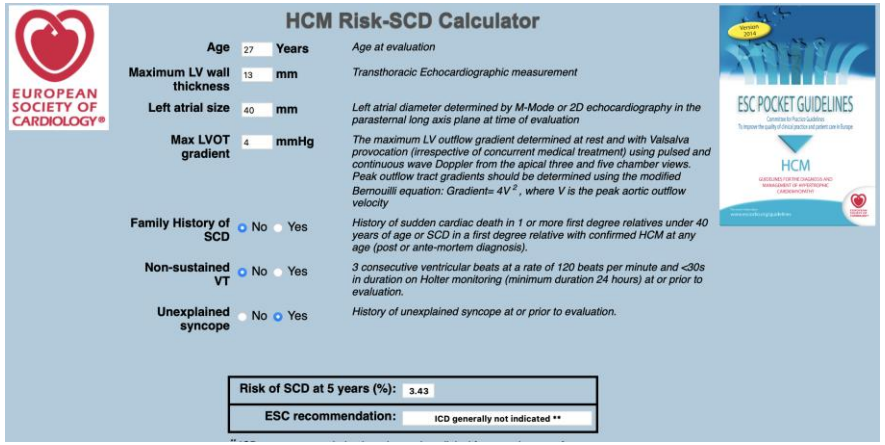
The Task Force does not consider LVNC to be a cardiomyopathy in the general sense. Instead, it is seen as a phenotypic trait that can occur either in isolation or in association with other developmental abnormalities, ventricular hypertrophy, dilatation, and/or systolic dysfunction. Given the lack of morphometric evidence for ventricular compaction in humans,[21,22] the term 'hypertrabeculation', rather than LVNC, is recommended, particularly when the phenomenon is transient or clearly of adult onset.

Les zones grises



Finocchiaro et al Sudden Cardiac Death in Athlètes JACC VOL. 83, NO. 2, 2024:350–37

Stratification du risque rythmique dans les CMH



2014 ESC Guidelines on Diagnosis and Management of Hypertrophic Cardiomyopathy (Eur Heart J 2014 – doi:10.1093/eurheartj/ehu284)

O'Mahony C et al Eur Heart J (2014) 35 (30): 2010-2020

HCM Risk-SCD should not be used in:

- ***Paediatric patients (<16 years)***
- ***Elite/competitive athletes***
- ***HCM associated with metabolic diseases (e.g. Anderson-Fabry disease), and syndromes (e.g. Noonan syndrome).***
- ***Patients with a previous history of aborted SCD or sustained ventricular arrhythmia who should be treated with an ICD for secondary prevention.***

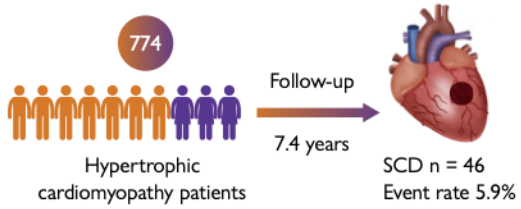
ESC European Society of Cardiology
European Heart Journal (2023) 44, 4781–4792 https://doi.org/10.1093/eurheartj/ehad581
FASTTRACK CLINICAL RESEARCH Imaging

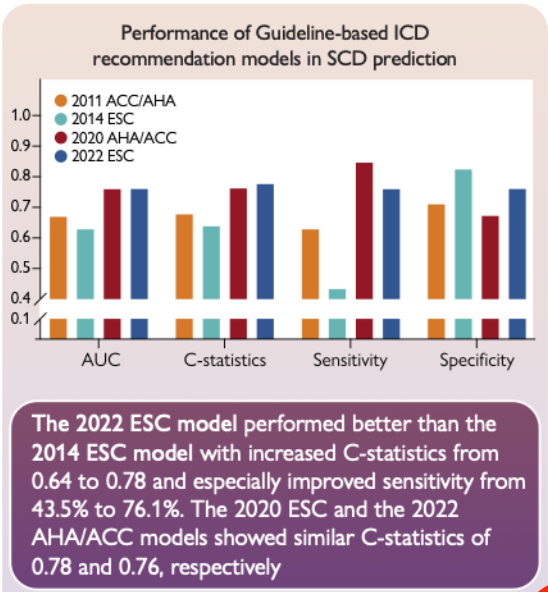
Assessment of late gadolinium enhancement in hypertrophic cardiomyopathy improves risk stratification based on current guidelines

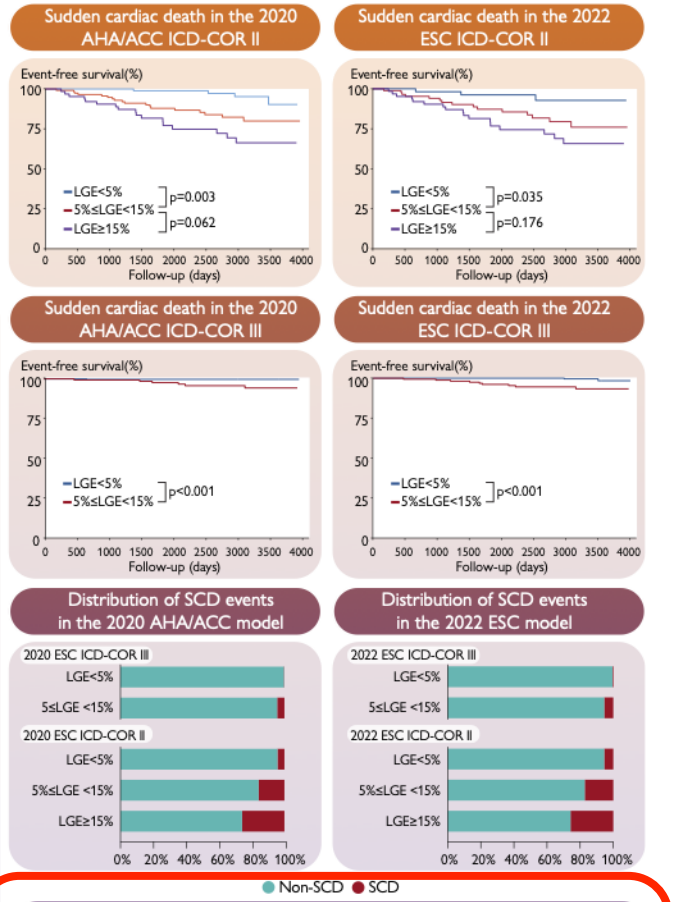
Jiaxin Wang [1†], Shujuan Yang [1†], Xuan Ma [1], Kankan Zhao [2], Kai Yang [1], Shiqin Yu [1], Gang Yin [1], Zhixiang Dong [1], Yanyan Song [1], Chen Cui [1], Jinghui Li [1], Chuangshi Wang [3], Jun Hao [3], Minjie Lu [1], Xiuyu Chen [1]*, and Shihua Zhao [1]*

Take Home Message

In HCM, the new 2022 ESC model shows considerable improvement in the risk stratification of SCD as compared to the 2014 ESC model. Furthermore, LGE with a cut-off of 5% has potential to refine the risk stratification based on current Guidelines.





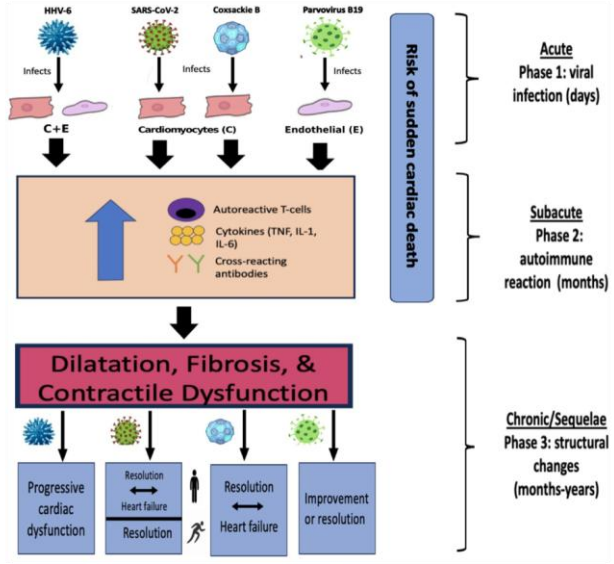


Myocardite et sport, leçons post Covid

Review

Myocarditis – A silent killer in athletes: Comparative analysis on the evidence before and after COVID-19 pandemic

Jonathan Van Name [a], Kainuo Wu [a], Lei Xi [b,*]

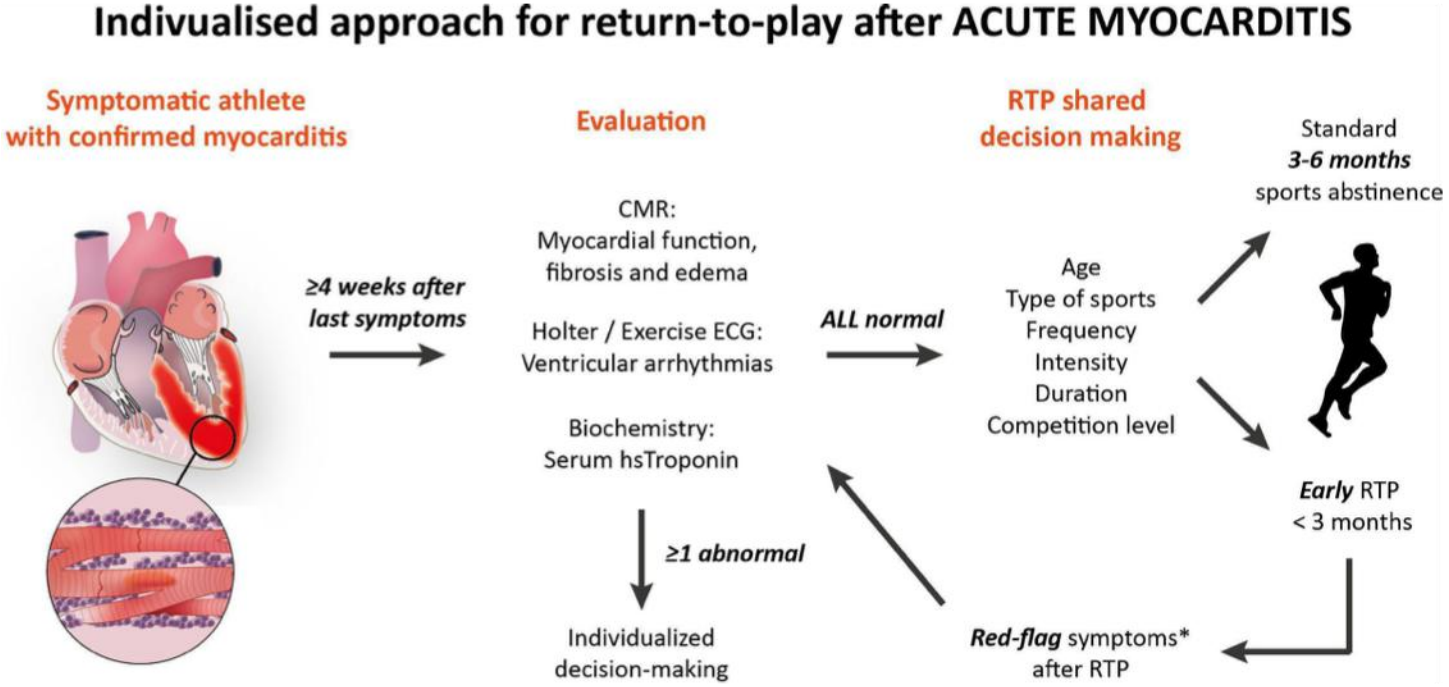


List of the key risk factors affecting myocarditis susceptibility in athletes.

Risk Factors	Causes	References #
Impaired Immunologic Competence	Sleep deprivation, climate shifts, exhaustive exertion	Ref. 17: Halle, M. et al. *Eur J Prev Cardiol.* 2020
Age	Increased risk of cardiomyopathy comorbidity	Ref. 25: Roth, G. et al. *J Am Coll Cardiol* 2020
Endurance Sports	Exhaustive exertion/increased cortisol levels/ immunosuppression	Ref. 42: Nieman, D. *Sports Med* 2007

Return to play after myocarditis: time to abandon the one-size-fits-all approach?

Guido Claessen [1,2,3,4], André La Gerche [3,5], Ruben De Bosscher [4,6]



Anomalies de naissances des coronaires

FIGURE 1 Prevalence and Types of Anomalous Aortic Origin of the Coronary Arteries From the Inappropriate Sinus of Valsalva

Anomalous Aortic Origin of a Coronary Artery (AAOCA) From Inappropriate Opposite Aortic Sinus		
	Description	**Right: Orange, Left: Blue**
Normal	Right coronary artery originating from the right sinus; left coronary artery originating from the left sinus.	
RCA Origin From the Left Sinus Prevalence: ~0.23% - 0.3%	Right coronary artery originating from the left sinus with a retroaortic course.	
	Right coronary artery originating from the left sinus with interarterial course.	High-risk anatomy 
	"Single left trunk" originating from the left sinus and giving origin to RCA that courses anterior to the pulmonary artery.	
	Right coronary artery arising from the left sinus and then coursing anterior to the pulmonary artery.	
Left Coronary Artery/Branch Origin From the Right Sinus Prevalence: ~0.02%	Interarterial left coronary artery originating from the right coronary sinus.	High-risk anatomy 
	Left anterior descending originating from the right sinus, with an interarterial course. Left circumflex originates from the left sinus.	High-risk anatomy 
	Left coronary artery from the right sinus and then coursing anterior to the pulmonary artery.	
	Left coronary artery originating from the right sinus with a retroaortic course.	
	Left anterior descending originating from the right coronary artery, with a retroaortic course.	
	Left anterior descending originating from the right sinus, with an anterior course in front of the pulmonary artery.	

FIGURE 5 Shared Decision-Making Tool for Patients With Anomalous Aortic Origin of the Coronary Arteries

			L-AAOCA				R-AAOCA		
			Interarterial Course		Transseptal Course	Prepulmonic or Retroaortic Course	Interarterial Course		Prepulmonic or Retroaortic Course
			Long IM segment / concerning anatomic features*	Short IM segment			Long IM segment / concerning anatomic features*	Short IM segment	
Ischemic Symptoms / Positive Functional Testing									
Asymptomatic, Negative Functional Testing	18-35 years	High athletic identity / patient preference							
		Low athletic identity / patient preference							
	>35 years	High athletic identity / patient preference							
		Low athletic identity / patient preference							

This table is provided only as a guide. The specific decision should be made with the patient taking into account all individual factors and patient preference.
*Concerning anatomic features include: slit-like orifice, proximal coronary narrowing, acute angle take-off, orifice >1 cm above the sinotubular junction. A long intramural segment is defined as that which allows repositioning of the coronary ostium to the correct sinus away from the intercoronary commissure or pillar during simple unroofing.

- Consider Exercise Restriction Until Surgical Intervention or If No Surgical Intervention
- No Exercise Restriction
- Surgical Intervention Not Offered
- Consider Surgical Intervention or Trial of Beta-Blockers
- Ischemic Symptoms and Positive Functional Testing Uncommon. Evaluate for Alternate Etiologies (eg, Coronary Atherosclerosis) and Perform Individualized Decision-Making Based on Patient-Specific Anatomy

However, the current general thought is that the **interarterial course per se is unlikely to cause significant coronary compression** (because the pressure is higher in the aorta and in the coronary arteries compared with the pulmonary circulation) and is **rather a surrogate for the presence of an intramural segment (**within the aortic wall) that is the true mechanism for ischemia

Gaudino et al Anomalous Coronary Artery Origins in Adults JACC VOL. 82, NO. 21, 2023:2034–2053

Anomalies de naissances des coronaires

Interdisciplinary CardioVascular and Thoracic Surgery 2024, 38(5), ivae074
https://doi.org/10.1093/icvts/ivae074 Advance Access publication 22 April 2024

ORIGINAL ARTICLE

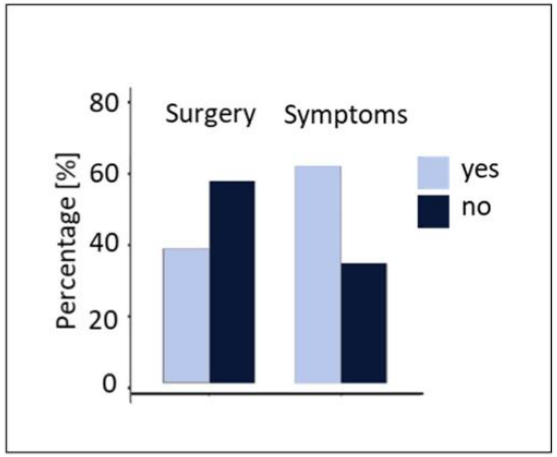
Cite this article as: Gräni C, Stark AW, Lo Rito M, Frigiola A, Siepe M, Tchana B *et al.* First report from the European registry for anomalous aortic origin of coronary artery (EURO-AAOCA). Interdiscip CardioVasc Thorac Surg 2024; doi:10.1093/icvts/ivae074.

First report from the European registry for anomalous aortic origin of coronary artery (EURO-AAOCA)

Christoph Gräni[a], Anselm W. Stark[a], Mauro Lo Rito [b], Alessandro Frigiola [b], Matthias Siepe [c], Bertrand Tchana[d], Alberto Cipriani[e], Alessandro Zorzi[e], Valeria Pergola[e], Domenico Crea[f], George Sarris[g], Elephterios Protopapas[g], Domenico Sirico[h], Giovanni Di Salvo[h], Cinzia Pegoraro[i], Patrizio Sarto[i], Katrien Francois [j], Alessandra Frigiola[k], Alessandra Cristofaletti[l], Ryan E. Accord[m], Alvaro Gonzalez Rocafort[n], Geoffroy Debeco[o] and Massimo Padalino [f,p,*]

Summary

In a prospective study across 13 European centers between January 2019 and June 2023 we included 262 patients with an anomalous aortic origin (AAOCA). We evaluated differences in clinical presentation, diagnostic evaluation and treatment decision. We found that right AAOCA was the most common and currently no agreement regarding diagnostic- and clinical management exists.



- Le sport même en compétition n'a pas été un élément d'orientation vers la chirurgie

Table 4: Univariable logistic regression for referral to surgery

	n	OR	*P*-value adjusted (FDR)
R-AAOCA	150	2.0 (1.14–3.57)	**0.040**
L-AAOCA	51	1.56 (0.81–2.94)	0.23
Intramural course	142	4.66 (2.55–8.93)	**<0.001**
Slit-like ostium	112	5.50 (2.96–10.65)	**<0.001**
Acute take-off angle	129	1.57 (0.87–2.89)	0.19
R-AAOCA with all high-risk features	71	2.15 (1.2–3.84)	**0.028**
Symptomatic	146	3.7 (2.04–6.67)	**<0.001**
Age at diagnosis	262	1.01 (1.00–1.02)	0.14
Paediatric centres	70	0.16 (0.06–0.36)	**<0.001**
Adult centres	192	6.26 (2.77–16.83)	**<0.001**
Age <30 years	128	0.61 (0.35–1.04)	0.12
Recreational sport	126	1.84 (1.05–3.28)	0.069
Competitive sport	54	1.52 (0.79–2.85)	0.23
LGE	93	1.20 (0.44–3.13	0.71
SPECT positive	55	1.45 (0.33–5.74)	0.65
Exercise stress-testing ECG	102	5.67 (1.87–19.65)	**0.009**
Pathologic ECG	239	1.02 (0.52–1.94)	0.95

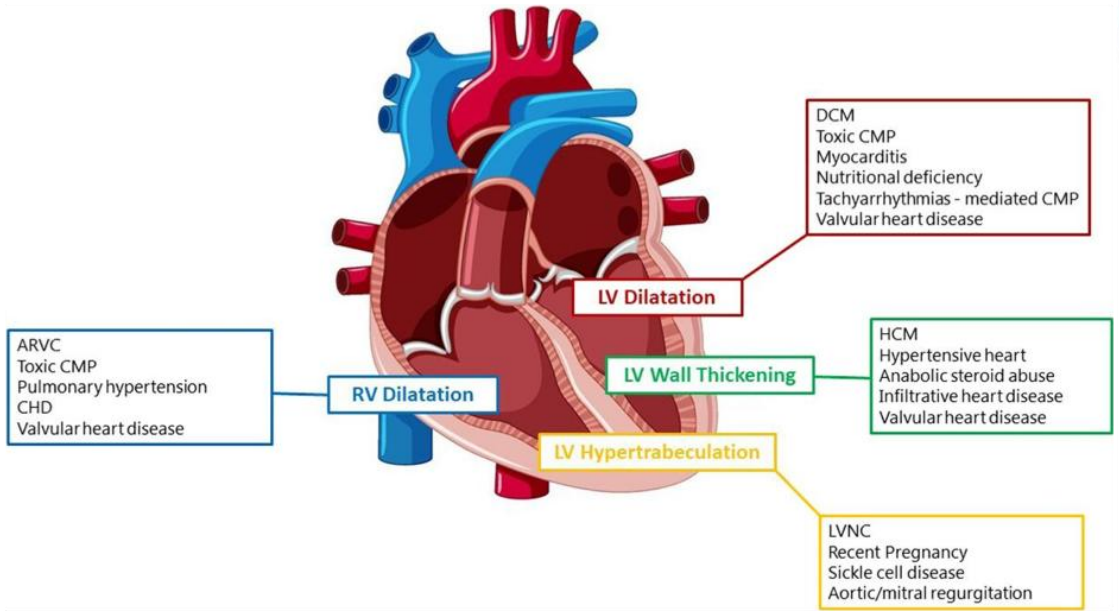
AI… the game changer

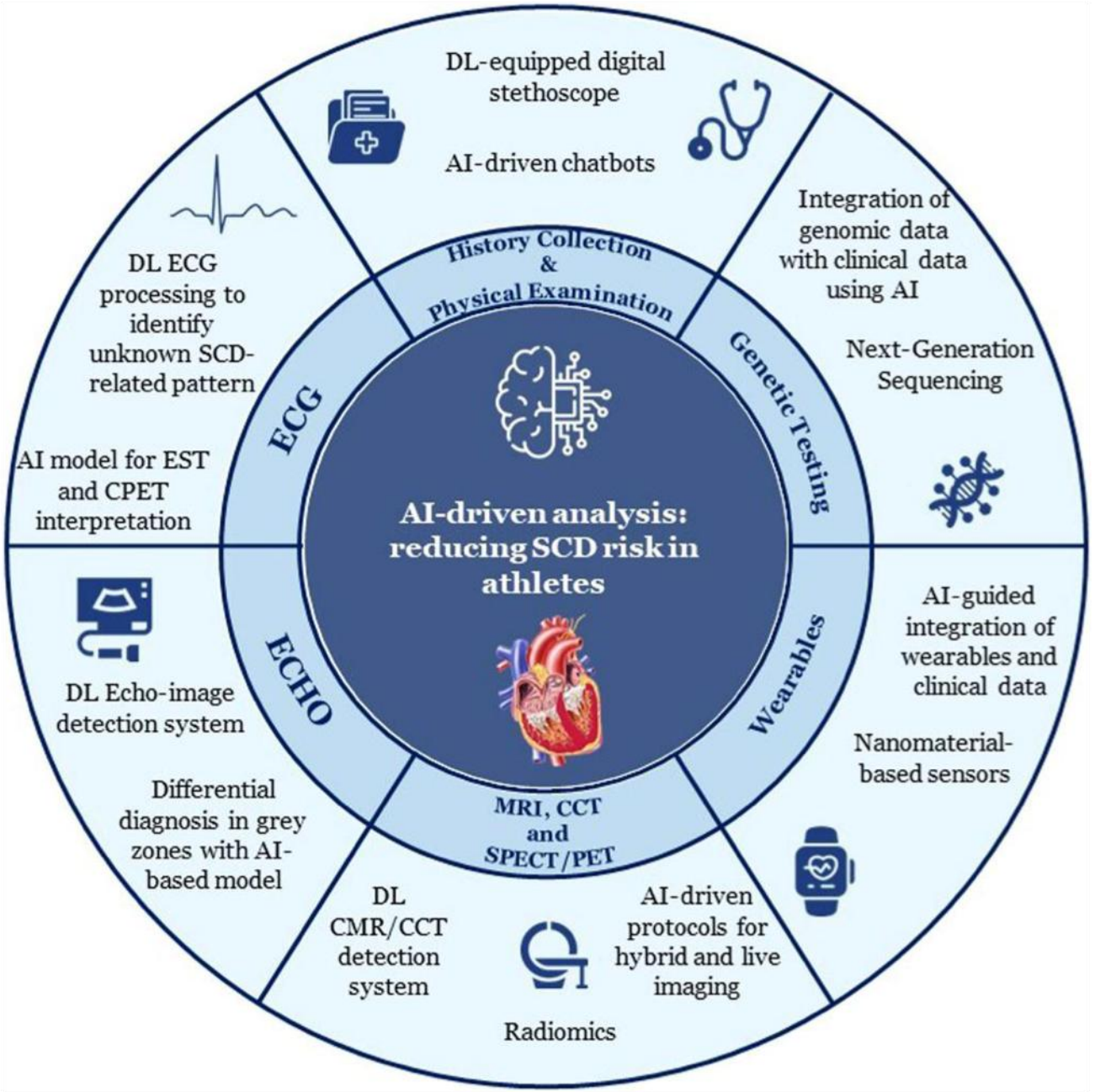
ESC European Society of Cardiology
European Journal of Preventive Cardiology (2024) **31**, 470–482
https://doi.org/10.1093/eurjpc/zwae008

REVIEW
Sports cardiology

Unlocking the potential of artificial intelligence in sports cardiology: does it have a role in evaluating athlete's heart?

Stefano Palermi [1]*, Marco Vecchiato[2], Andrea Saglietto [3,4], David Niederseer [5], David Oxborough [6], Sandra Ortega-Martorell[7,8], Ivan Olier [7,8], Silvia Castelletti [9], Aaron Baggish[10], Francesco Maffessanti[11], Alessandro Biffi[12], Antonello D'Andrea [13], Alessandro Zorzi[14], Elena Cavarretta[15,16], and Flavio D'Ascenzi[17]





Et bien d'autres…

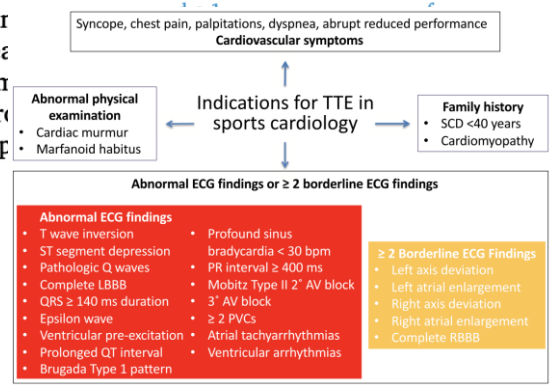
HRS CONSENSUS STATEMENT · Articles in Press, May 17, 2024

2024 HRS expert consensus statement on arrhythmias in the athlete: Evaluation, treatment, and return to play

Rachel Lampert, MD, FHRS [1,*] · Eugene H. Chung, MD, MPH, MSc, FHRS [2,*] · Michael J. Ackerman, MD, PhD [3,*] · … · Lluis Mont, MD, PhD, FEHRA [14,††] · Jack C. Salerno, MD, FHRS [16,‡‡] · Maully J. Shah, MBBS, FHRS, CCDS, CEPS-P [17,‡‡]… Show more

The role of echocardiography in sports cardiology: An expert opinion statement of the Italian Society of Sports Cardiology (SIC sport)

Elena Cavarretta [a,b,*,1], Flavio D'Ascenzi [c,1], Massir
Luna Cavigli [c], Franco Cecchi [f], Antonello D'Andrea
Stefano Nistri [j], Zefferino Palamà [k,l], Vincenzo Paln
Gianfranco Sinagra [h], Alessandro Zorzi [p], Alessandr
Antonio Dello Russo [s], Paolo Zeppilli [d,e,2,**], Giamp



Consensus statement

OPEN ACCESS

Resuscitation on the field of play: a best-practice guideline from Resuscitation Council UK

Christopher M Smith [1,2] Fionna Moore, [1] Jonathan A Drezner [3] Adam Benson Clarke, [1] James Cant, [1] Isabelle Hamilton-Bower, [1] Sue H Lisa Hodgson [5,6] Christopher Johnston, [4] Judy O'Sullivan, [7] Michael David Pitcher, [1] Andrew Smith, [9,10] Jasmeet Soar, [1,11] Lynn Thomas, [12] David Anthony Zideman [13] Gavin D Perkins [1,2]

Journal of Clinical Medicine

MDPI

EDITORIAL | Originally Published 29 April 2024

Check for updates

Unraveling the Unsolved Mysteries of the Athletic Heart

William K. Cornwell III, MD, MSCS, and Benjamin D. Levine, MD

Circulation • Volume 149, Number 18 • https://doi.org/10.1161/C

Eur J Appl Physiol. 2024 Sep;124(9):2725-2735. doi: 10.1007/s00421-024-05489-0. Epub 2024 Apr 22.

Lack of cardiac remodelling in elite endurance athletes: an unexpected and not so rare finding

Giuseppe Di Gioia [1 2 3], Simone Pasquale Crispino [4], Viviana Maestrini [5 6], Sara Monosilio [5], Davide Ortolina [5], Andrea Segreti [4 7], Maria Rosaria Squeo [5], Erika Lemme [5], Antonio Nenna [4], Antonio Pelliccia [5]

Systematic Review

Prevalence of Abnormal Cardiovascular Magnetic Resonance Findings in Athletes Recovered from COVID-19 Infection: A Systematic Review and Meta-Analysis

Vasiliki Tsampasian [1,2,*], Emmanuel Androulakis [3], Ricardo Catumbela [4], Sabiha Gati [5,6], Michael Papadakis [3] and Vassilios S. Vassiliou [1,2,*]

Journal of Clinical Medicine

MDPI

Systematic Review

Myocardial Fibrosis in Young and Veteran Athletes: Evidence from a Systematic Review of the Current Literature

Richard P. Allwood [1,*], Michael Papadakis [2] and Emmanuel Androulakis [2,*]

ESC European Society of Cardiology

European Journal of Preventive Cardiology (2024) 31, 1535–1542
https://doi.org/10.1093/eurjpc/zwae180

FULL RESEARCH PAPER
Sports cardiology

Prevalence and determinants of low QRS voltages and QRS fragmentation in children and adolescents undergoing sports pre-participation screening

Francesca Graziano [1,2], Oscar Edoardo Genta [1,3], Laura Manfrin [1,4], Domenico Corrado [1], Laura Brusamolin [5], Franco Giada [6], Luigi Gerbino [6], Silvia Compagno [6], and Alessandro Zorzi [1*]

Merci !


Cœur et activité sportive :
Les 10 règles d'or
« Absolument, pas n'importe comment »
Recommandations édictées par le Club des Cardiologues du Sport
1
Je signale à mon médecin toute douleur dans la poitrine ou tout essoufflement anormal survenant à l'effort*
2
Je signale à mon médecin toute palpitation cardiaque survenant à l'effort ou juste après l'effort*
3
Je signale à mon médecin tout malaise survenant à l'effort ou juste après l'effort*
4
Je respecte toujours un échauffement et une récupération de 10 min lors de mes activités sportives
5
Je bois 3 ou 4 gorgées d'eau toutes les 30 min d'exercice, à l'entraînement comme en compétition
6
J'évite les activités intenses par des températures extérieures < – 5°C ou > + 30°C et lors des pics de pollution
7
Je ne fume pas, en tout cas jamais dans les 2 heures qui précèdent ou suivent ma pratique sportive
8
Je ne consomme jamais de substance dopante et j'évite l'automédication en général
9
Je ne fais pas de sport intense si j'ai de la fièvre ni dans les 8 jours qui suivent un épisode grippal (fièvre + courbatures)
10
Je pratique un bilan médical avant de reprendre une activité sportive intense (plus de 35 ans pour les hommes et plus de 45 ans pour les femmes)
* Quels que soient mon âge, mes niveaux d'entraînement et de performance ou les résultats d'un précédent bilan cardiologique.
www.clubcardiosport.com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