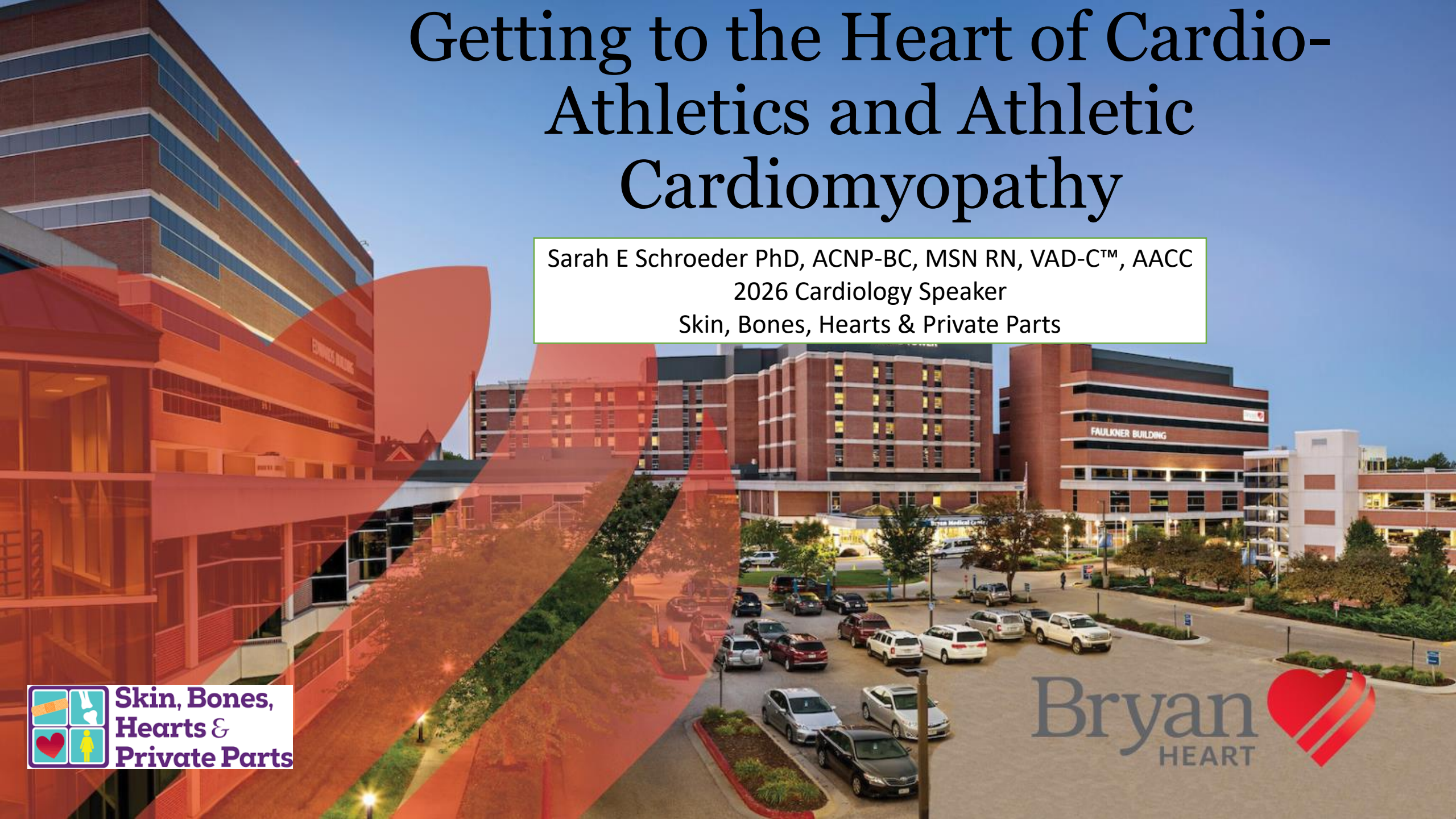
Getting to the Heart of Cardio-Athletics and Athletic Cardiomyopathy

Sarah E Schroeder PhD, ACNP-BC, MSN RN, VAD-C™, AACC
2026 Cardiology Speaker
Skin, Bones, Hearts & Private Parts



Disclosures

- Investigator-Driven Research Grant, Abbott Labs, 2023-2026
- VAD Coordinator Professional Development Grant, ICCAC, 2024-2026

I will occasionally discuss patient scenarios – any pictures directly of patients are displayed following consent and will be noted

Skin, Bones, Hearts & Private Parts

Bryan HEART

Objectives

- Cardio-Athletics – The Right Terms for the Right Discussion
  - Cardio-Athletics
  - Athletic Cardiomyopathy
  - Athletic Heart Failure
- Differences Between Cardio-Athletics and Athletic Cardiomyopathy
- You Have to Clear Someone for Sports… Now What?
  - Cardiac Clearance Considerations
- Evaluation and Treatment of Athletic Cardiomyopathy
- The Risk of Athletic Cardiomyopathy
- Final PEARLS to Cardio-Athletics and Athletic Cardiomyopathy

Cardio-Athletics

Cardio athletics refers to any physical activity that significantly increases your heart rate, which is essential for cardiovascular fitness.











Skin, Bones, Hearts & Private Parts

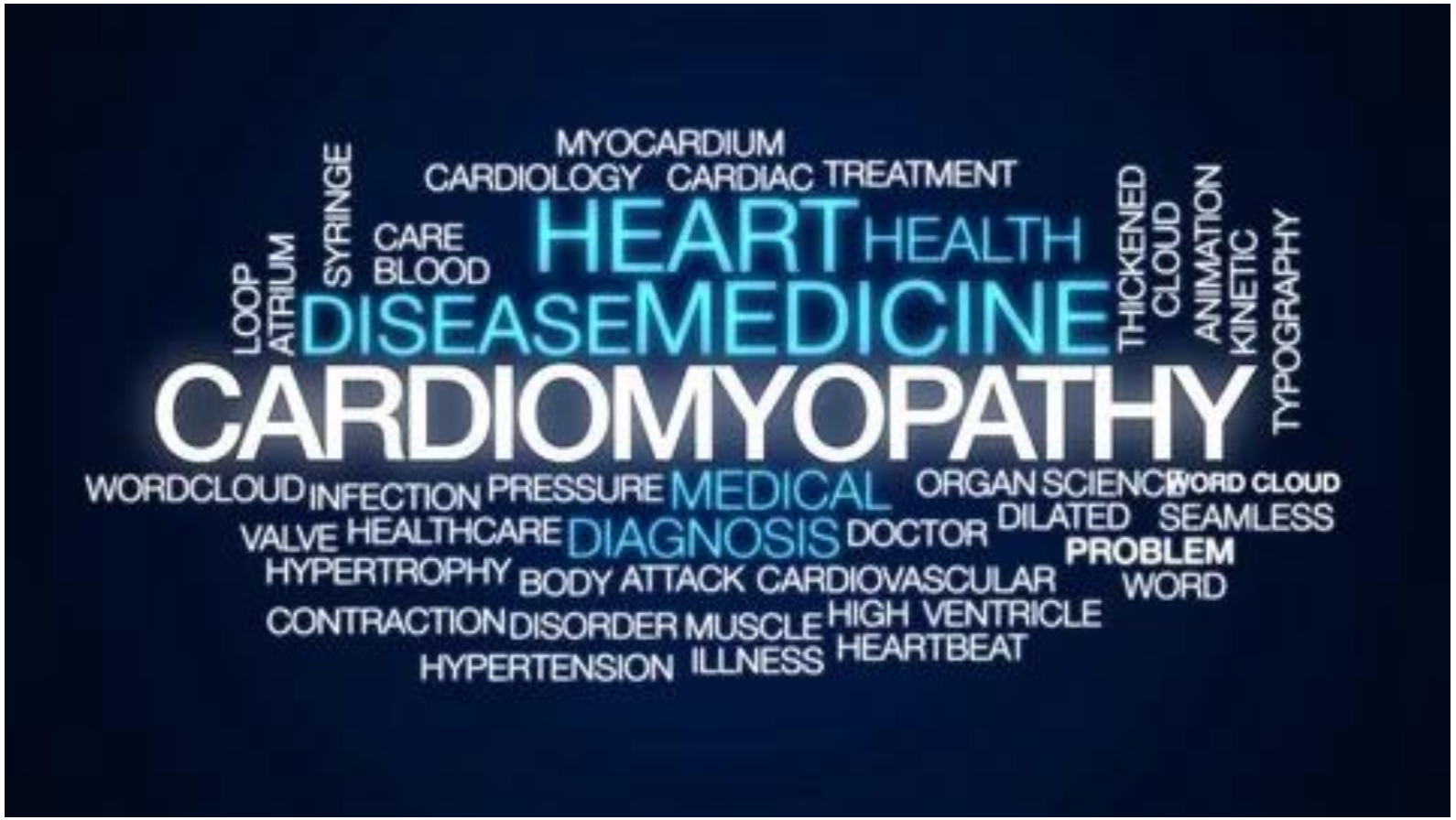
Bryan HEART

Athletic Cardiomyopathy

Athlete's Heart:
Benign condition seen in sports medicine where the heart muscle has global enlargement and a slower than average heart rate

Hypertrophic Cardiomyopathy:
Pathologic condition seen with enlarged/thickened heart muscle, making it harder to pump oxygen-rich blood to the rest of the body

Dilated Cardiomyopathy:
Pathologic condition involving enlargement and dilation of the left ventricle, with decreased systolic function </=40%



Skin, Bones, Hearts & Private Parts

Bryan HEART

Mayo Clinic (2025). Hypertrophic cardiomyopathy - Symptoms and causes - Mayo Clinic

Mahmaljy et al. 2023. Dilated Cardiomyopathy - StatPearls - NCBI Bookshelf

Maron, Pellicia (2006). https://doi.org/10.1161/CIRCULATIONAHA.106.613562

Athletic Cardiomyopathy



Keyontae Johnson
College Basketball Player
December 2020
Collapsed on Court (22)
Diagnosed with “Athlete’s Heart”



Gaines Adams
Defensive End, Chicago Bears
January 2010
Found unresponsive > Cardiac Arrest (26)
Autopsy = Enlarged Heart



Ryan Shay
University of Notre Dame graduate
November 2007
Collapsed 5.5 miles in at US Olympic Marathon Trials (28)
Autopsy = Enlarged Heart, Cardiac Arrhythmia

Skin, Bones, Hearts & Private Parts

Bryan HEART

Wes Leonard

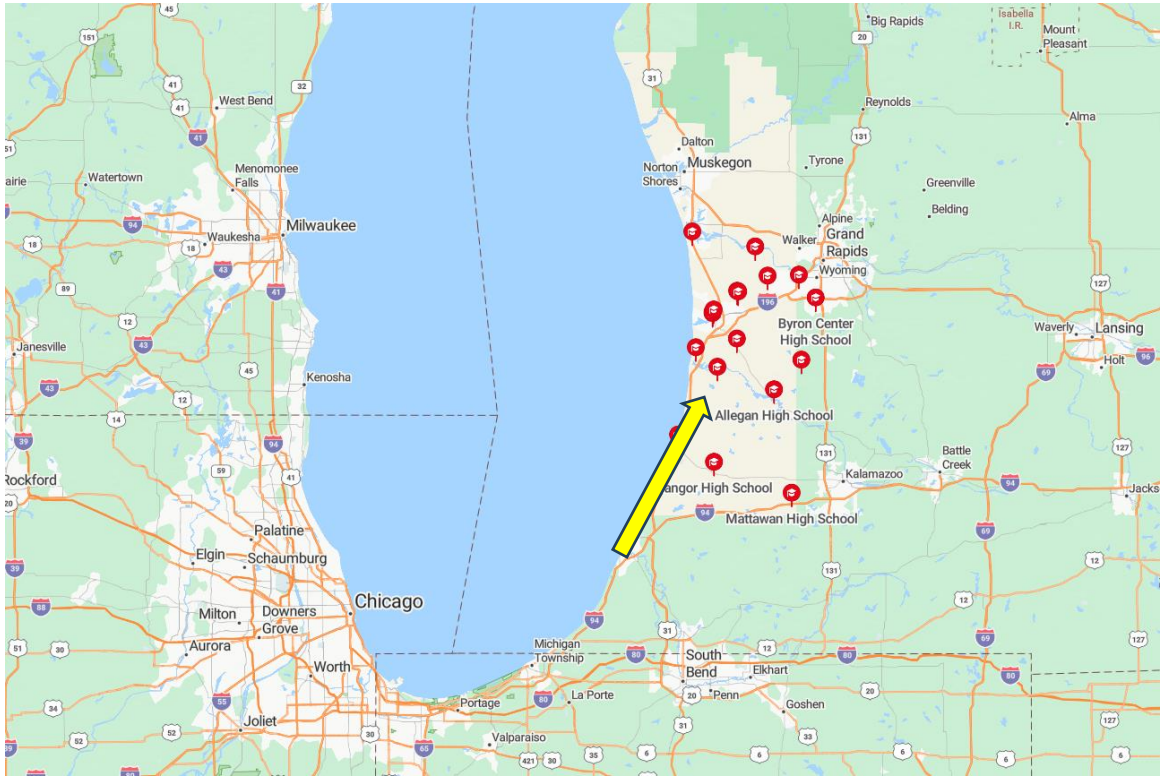
High School Basketball Player

March 2011

Collapsed on Court (16) after winning shot

Autopsy = Dilated Cardiomyopathy

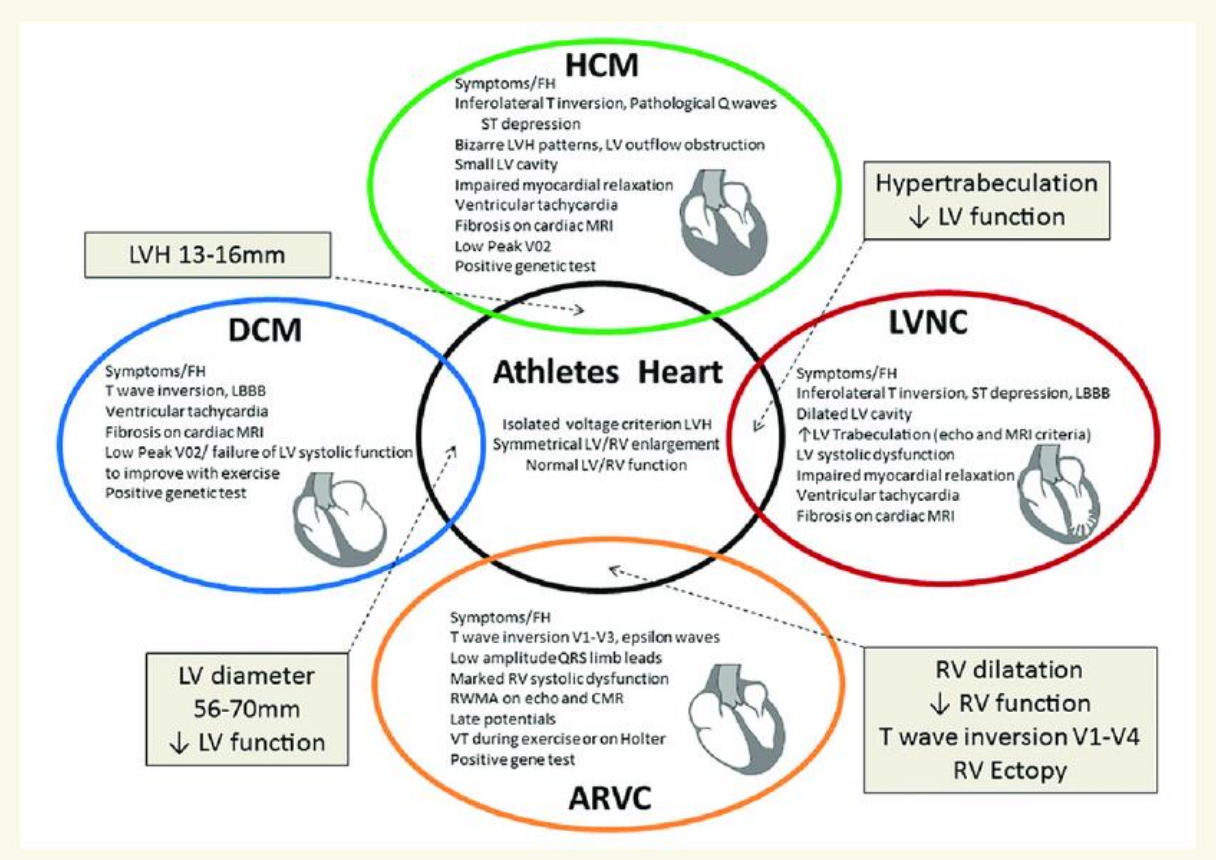


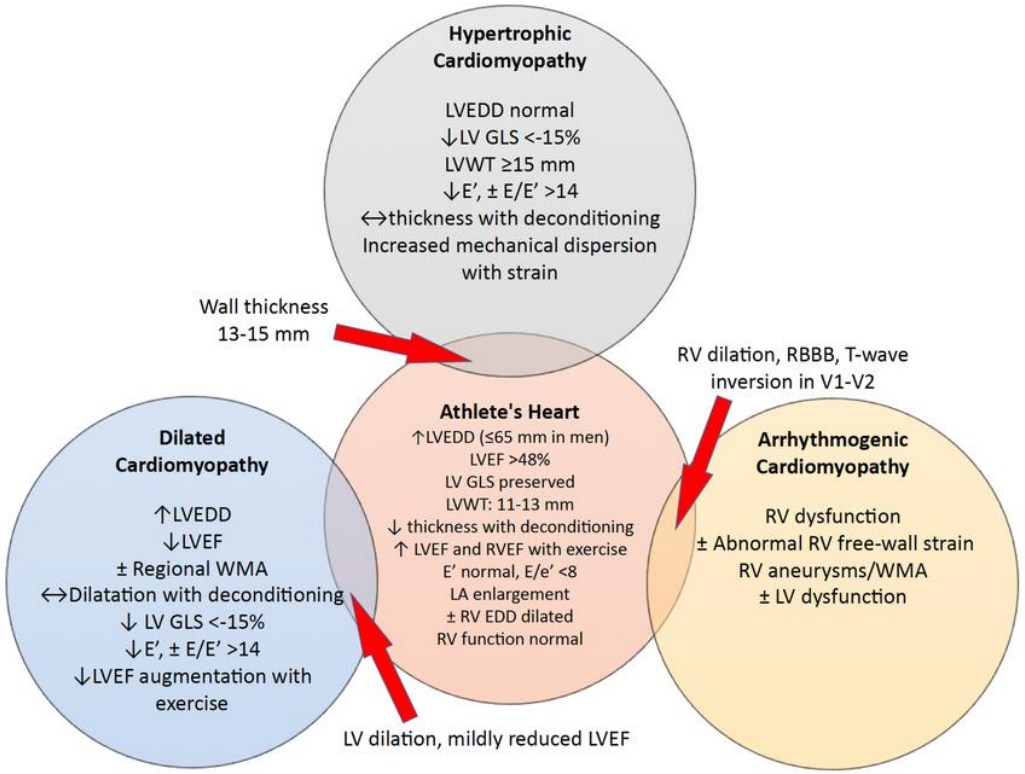


Skin, Bones, Hearts & Private Parts

Bryan HEART

Differences Between Cardio-Athletics and Athletic Cardiomyopathy





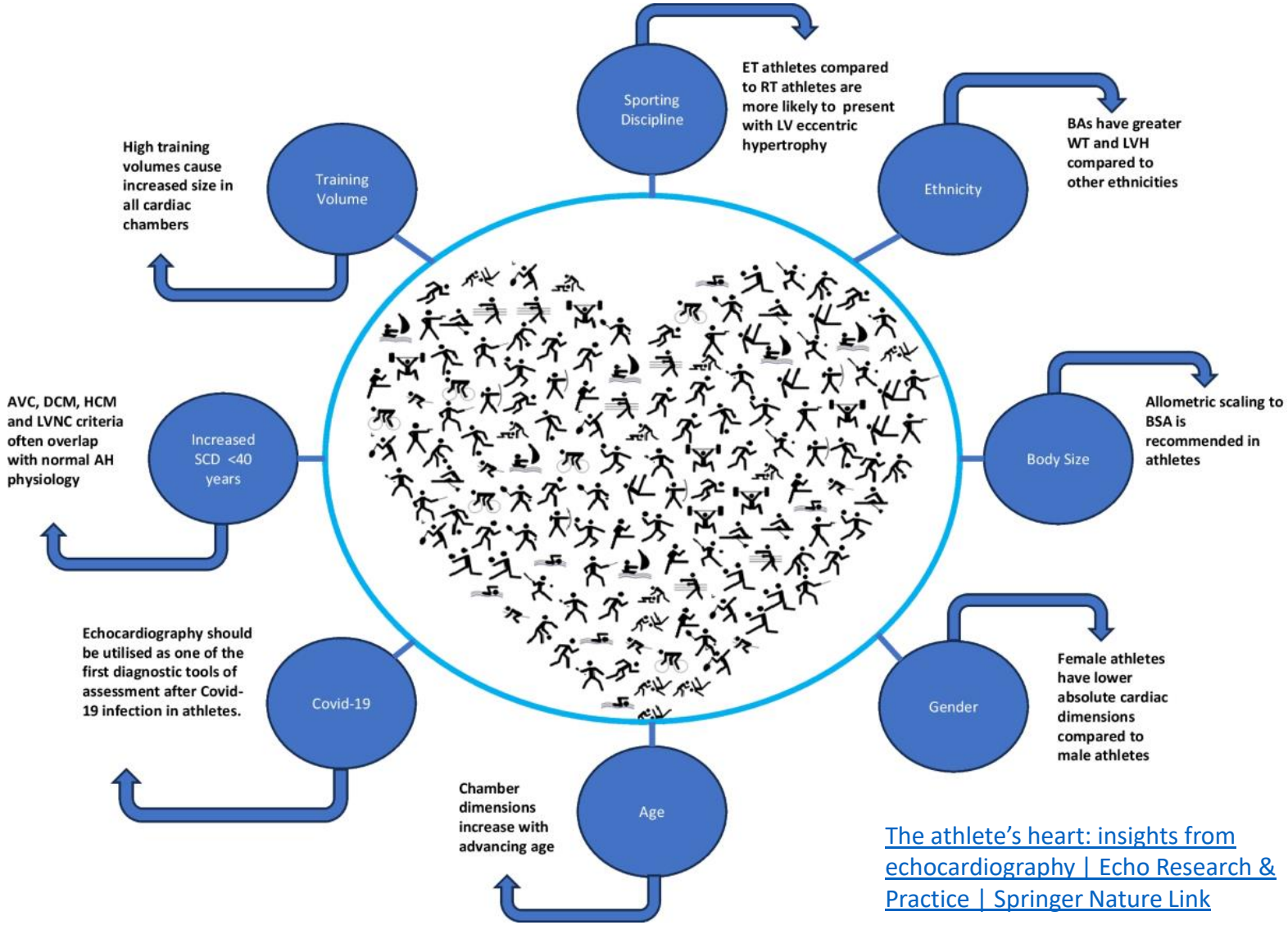
Skin, Bones, Hearts & Private Parts

[Differentiating features between physiological cardiac changes and... | Download Scientific Diagram]

[Distinguishing athlete's heart from pathologic cardiac disease states.... | Download Scientific Diagram]

Bryan HEART

Athletic Heart Failure



[The athlete's heart: insights from echocardiography | Echo Research & Practice | Springer Nature Link]

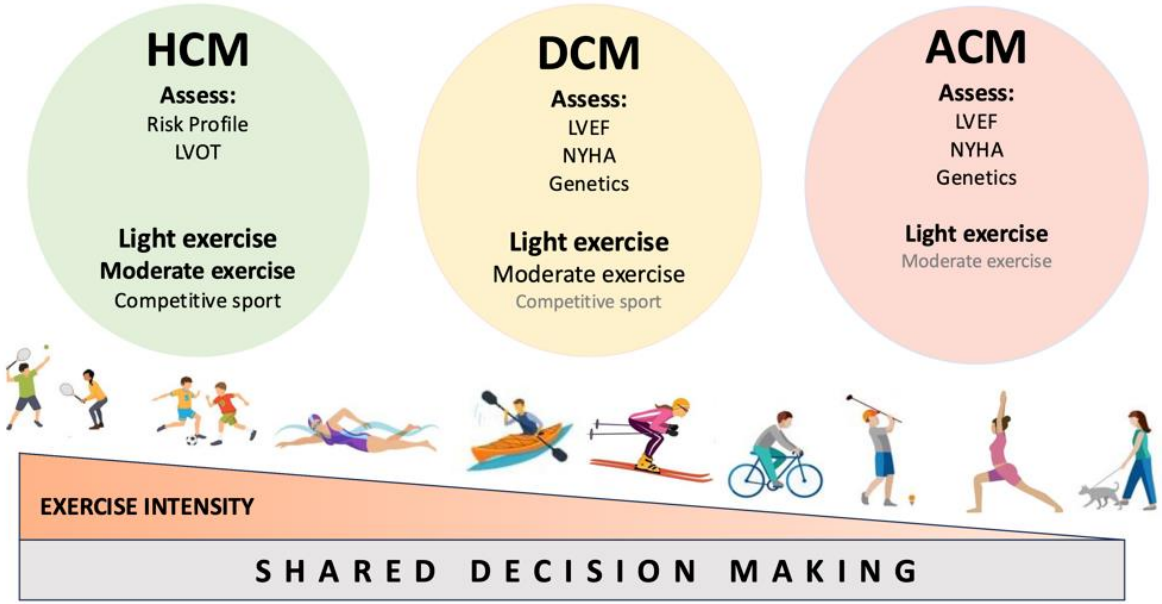
Skin, Bones, Hearts & Private Parts

Bryan HEART

You Have to Clear Someone for Sports… Now What?

A uniform mandate of sports restrictions for individuals with all types of genetic cardiomyopathies should not be applied
AHA/ACC SCIENTIFIC STATEMENT 2025

BENEFITS
Cardiovascular, Psychological, QoL



REVIEW ARTICLE | Originally Published 20 February 2025 |

Clinical Considerations for Competit Sports Participation for Athletes Wit Cardiovascular Abnormalities: A Scie Statement From the American Heart Association and American College o Cardiology

Jonathan H. Kim, MD, MSc, FACC, Chair, Aaron L. Baggish, MD, FACC, Vice Chair, Benjamin D. Levine, MD, FAHA, FACC, Ackerman, MD, PhD, FACC, Sharlene M. Day, MD, FAHA, Elizabeth H. Dineen, DO, FACC, Guseh J. Sawalla II, MD, ... SHOW ALL ... 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 | AUTHOR INFO & AFFILIATIONS

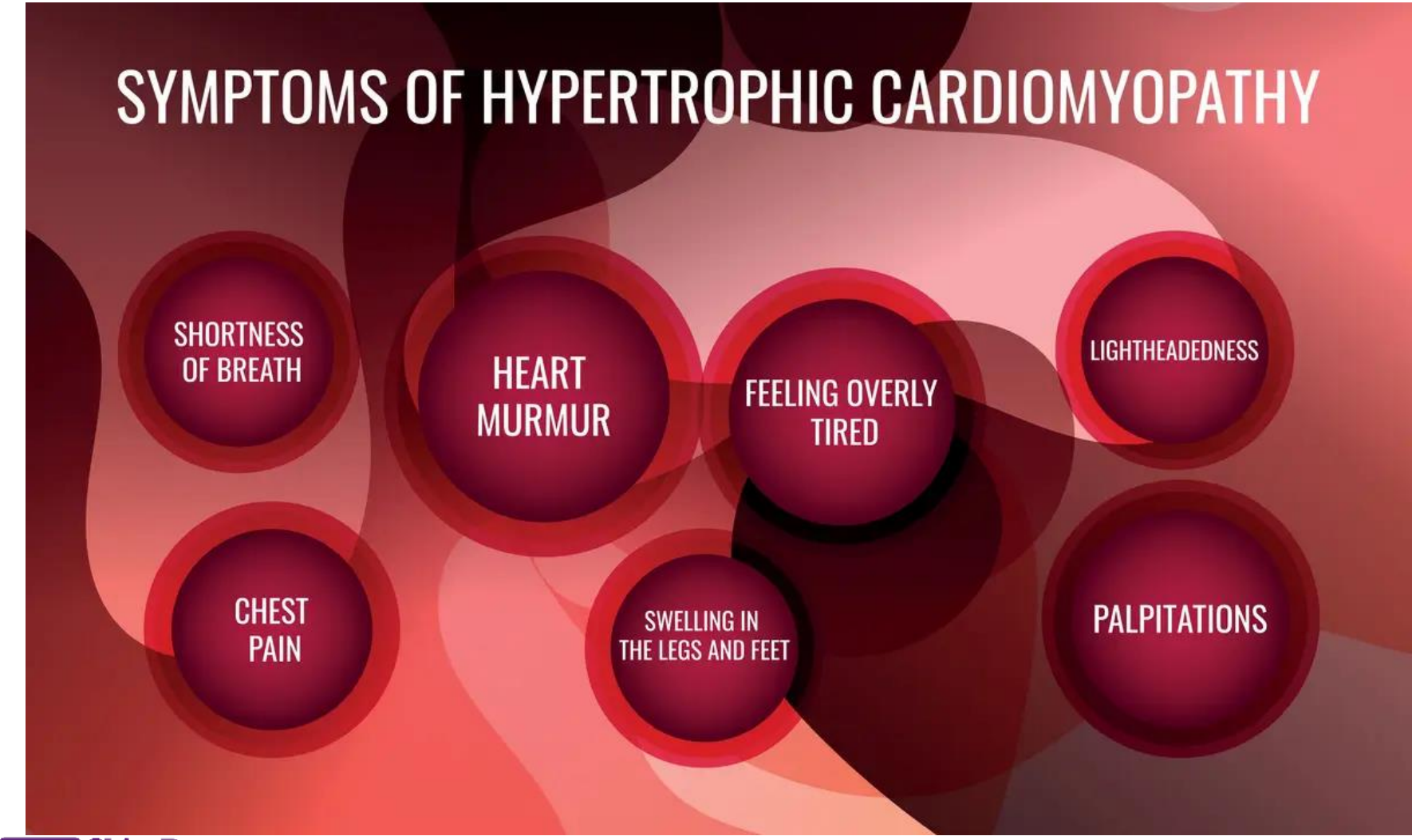
Circulation • Volume 151, Number 11 • https://doi.org/10.1161/CIR.0000000000001297

Skin, Bones, Hearts & Private Parts

Bryan HEART

Exercise Participation and Rehabilitation in Cardiomyopathies: An Updated Review[v1] | Preprints.org

Symptoms to Be Aware Of…



Athlete's Heart

Bradycardia, Premature Beats

NO SYMPTOMS

Skin, Bones, Hearts & Private Parts

Bryan HEART

Harley Street Heart and Vascular Centre (2025). https://www.harleystreet.sg/kb/about-heart-disease/cardiomyopathy/

Who is Susceptible?

Strenuous Activity > 1 hour most days of the week



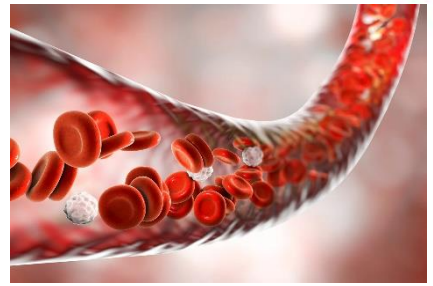


Athlete





Sudden Motion



Men



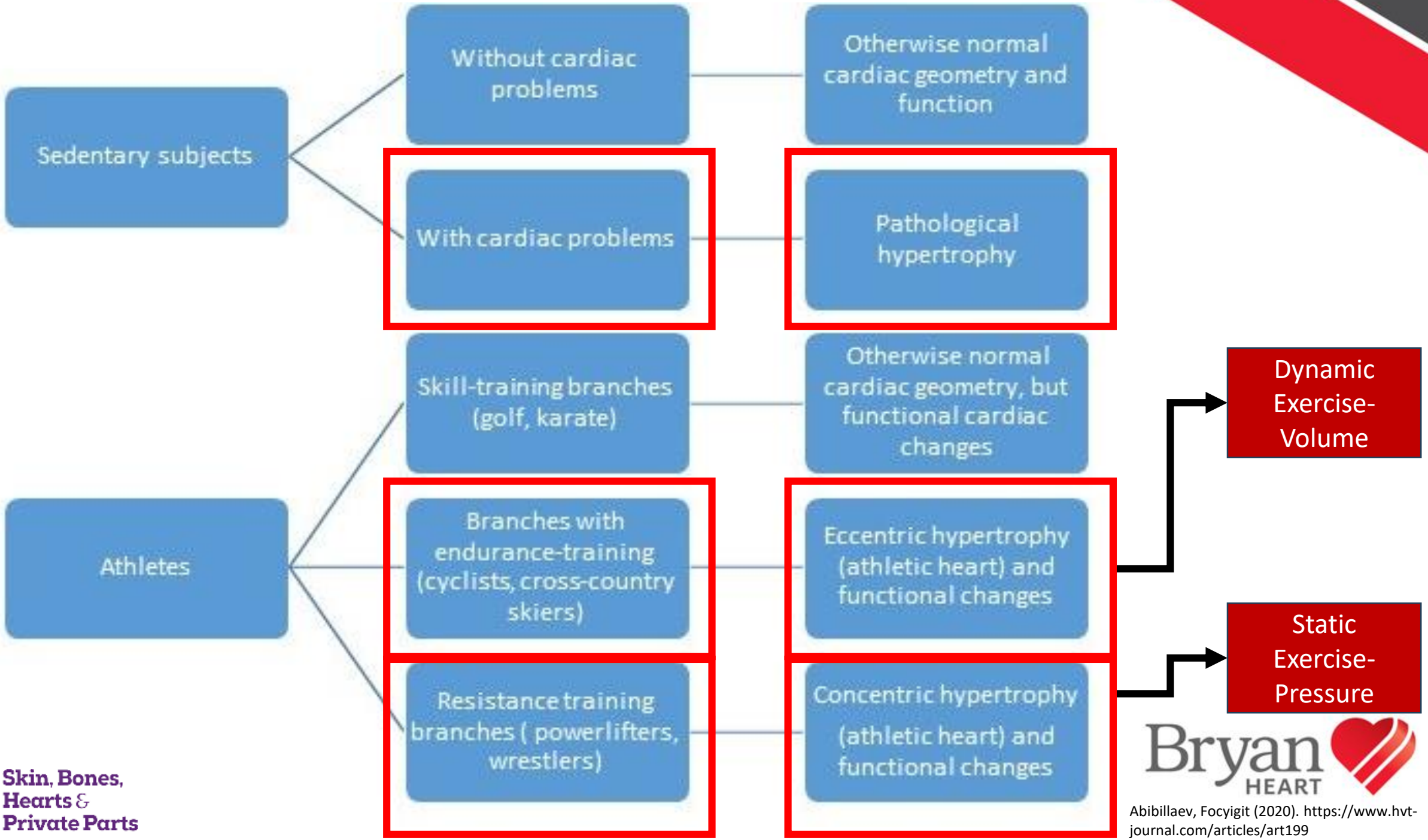
Under 35 yrs of age

35 UNDER 35



Skin, Bones, Hearts & Private Parts

Bryan HEART

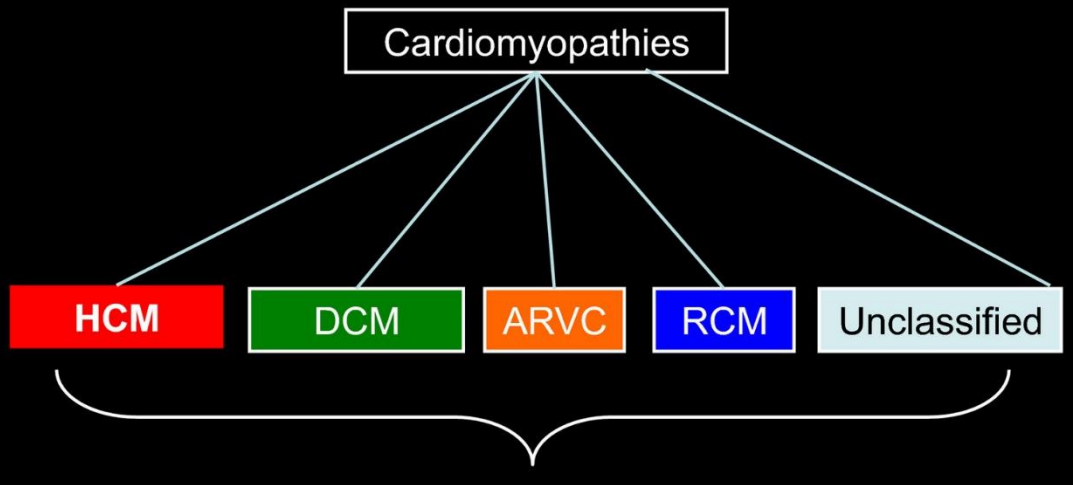


Skin, Bones, Hearts & Private Parts

Bryan HEART

Abibillaev, Focyigit (2020). https://www.hvt-journal.com/articles/art199

Cardiomyopathies & athlete's heart



Similar phenotype with athlete's heart

2-4% caucasians 12-18% blacks 12-15 mm WT	40% > 55 mm 15% > 60 mm	30% TF major imaging criteria 60% TF minor imaging criteria	LVNC 1/5 hypertrabeculation 1/10 LVNC criteria (>blacks)

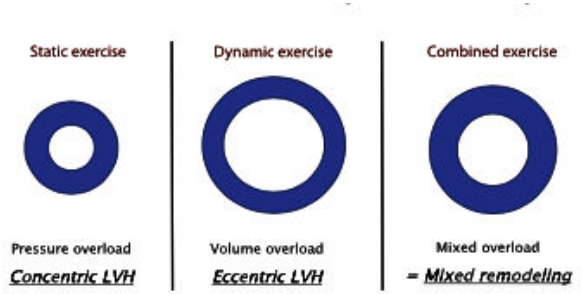
Hypertrophic Cardiomyopathy

Dilated Cardiomyopathy

Arrhythmogenic Right Ventricular Cardiomyopathy

Restrictive Cardiomyopathy

"…strength exercise induces concentric hypertrophy due to pressure overload and endurance exercise induces eccentric hypertrophy due to volume overload…"



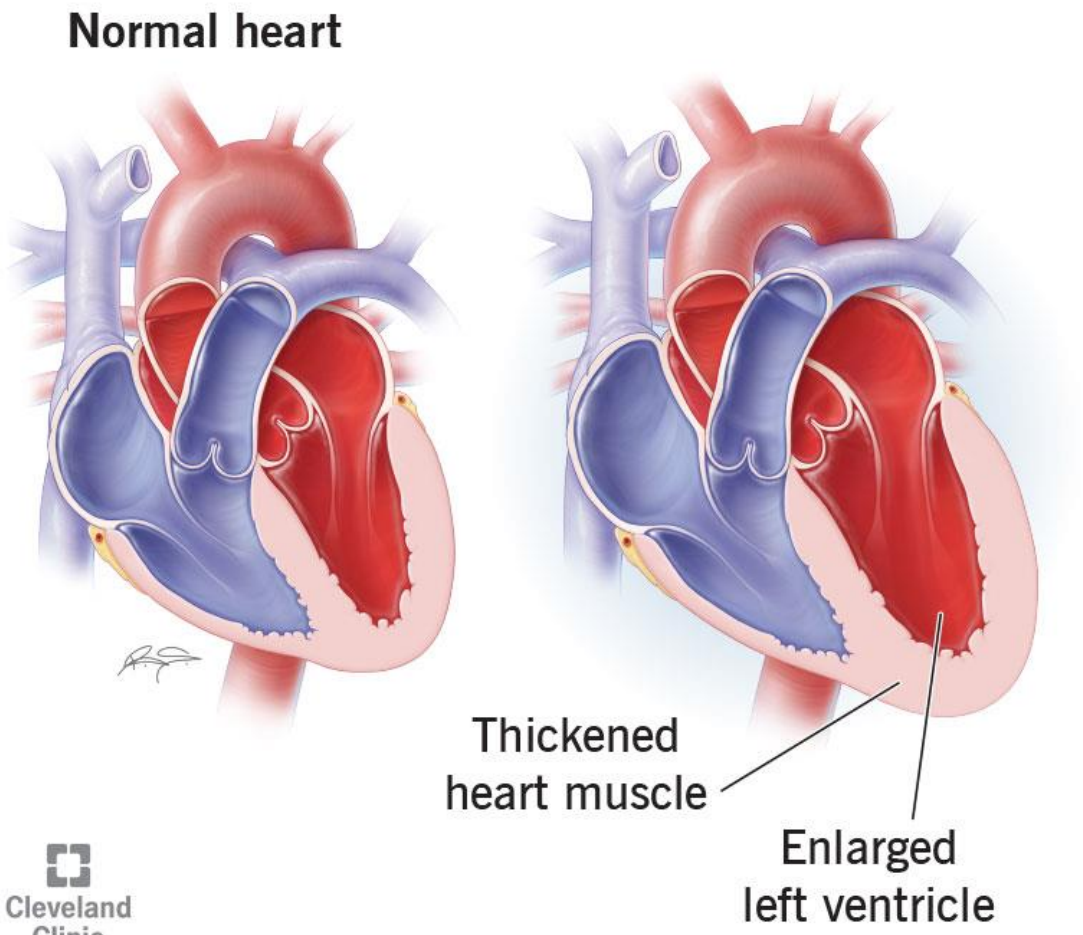
'Athlete's Heart' Vs. Hypertrophic Cardiomyopathy

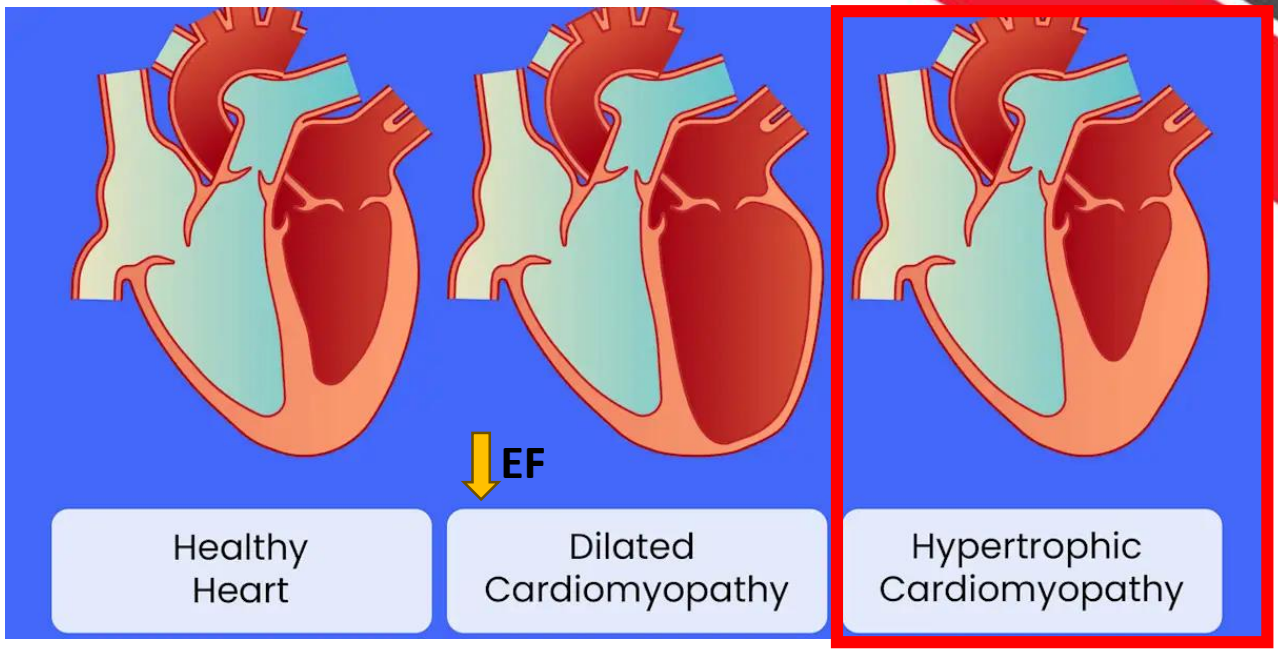
Skin, Bones, Hearts & Private Parts

Bryan HEART

Dores, Cardim (2018), Echocardiography in non-ischemic cardiomyopathies: differential diagnosis from athlete's heart

Athlete's Heart





~85%

of people with HCM are undiagnosed†

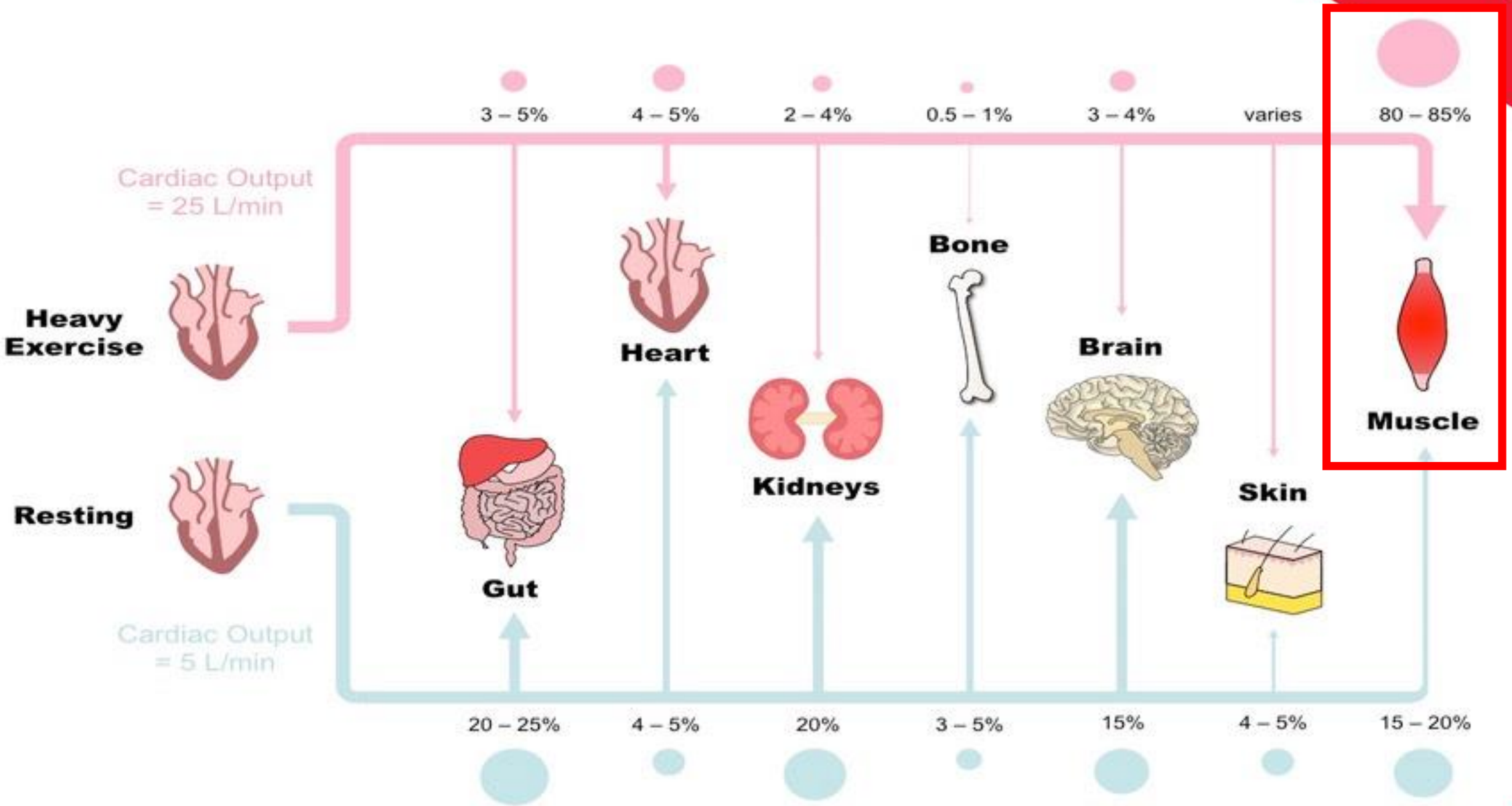
Strenuous Activity > 1 hour most days of the week

Skin, Bones, Hearts & Private Parts

Bryan HEART

[Cleveland Clinic (2023): Athlete's Heart: Causes, Symptoms & Treatment]

[What Is Hypertrophic Cardiomyopathy (HCM)?]



Skin, Bones, Hearts & Private Parts

Bryan HEART

BioNinja (nd). https://ib.bioninja.com.au/options/option-b-physiology-of/b3-training-and-the-cardiov.html

Evaluation and Treatment of Athletic Cardiomyopathy



Circulation

CURRENT I

REVIEW ARTICLE | Originally Published 20 February 2025 |

Check for updates

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, Guseh J. Sawalla II, MD, ... SHOW ALL ... 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 | AUTHOR INFO & AFFILIATIONS

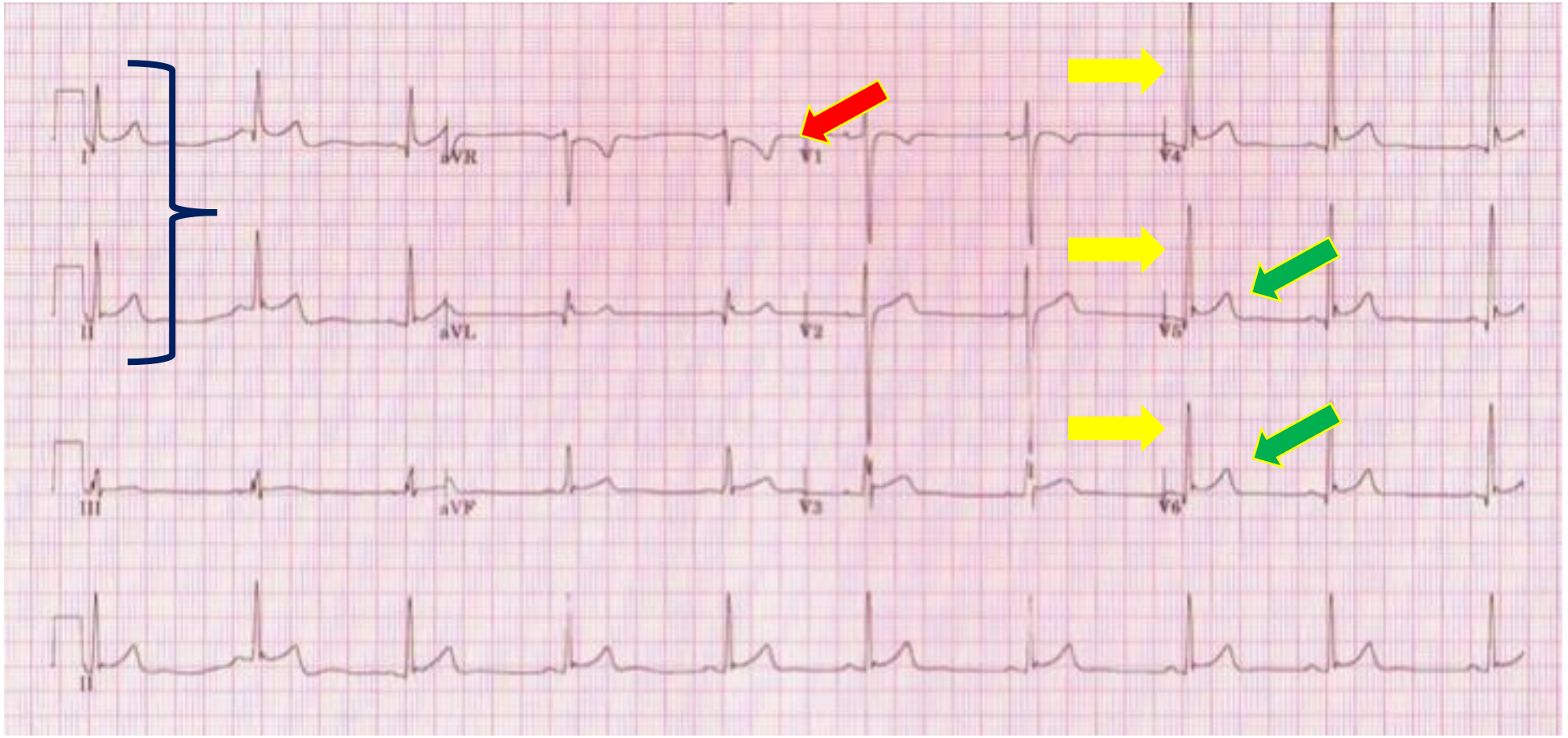
Circulation • Volume 151, Number 11 • https://doi.org/10.1161/CIR.0000000000001297

Skin, Bones, Hearts & Private Parts

Bryan HEART

Athlete's Heart

Key Factor



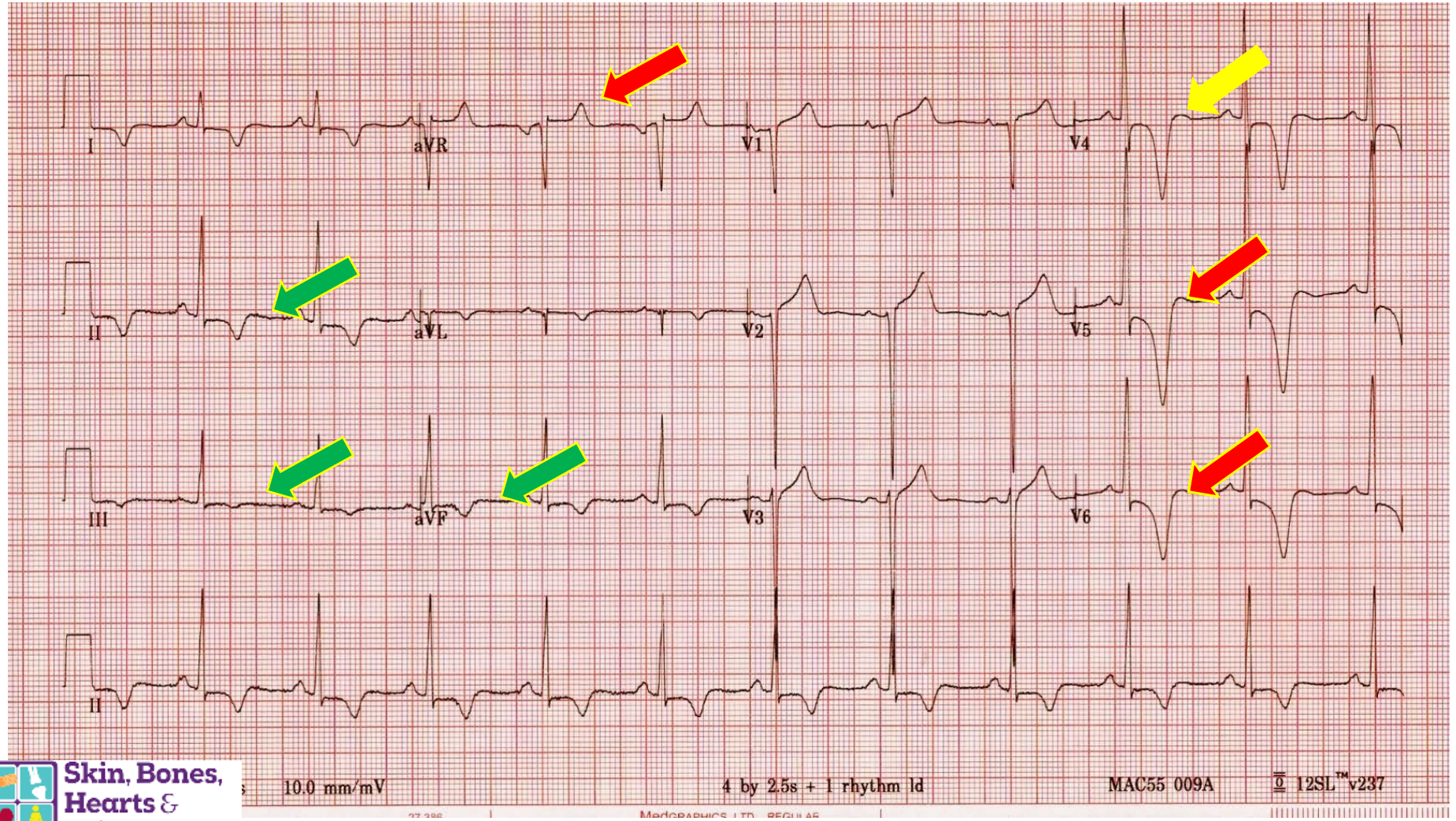
- Sinus Bradycardiac
- First AV Block
- Left Ventricular Hypertrophy
- Concave ST segments Leads V5-V6 "scooping"
- T-Wave inversion V1-V3 normal until 16; > 16 needs eval in Caucasians
- Axis deviation (Left: I up/II down; Right: I down/II up)

Skin, Bones, Hearts & Private Parts

Bryan HEART

Gavalas (2019). https://www.acc.org/Latest-in-Cardiology/Articles/2019/07/17/07/03/Athlete-ECGs

Worrisome EKG Suggesting Further Investigation

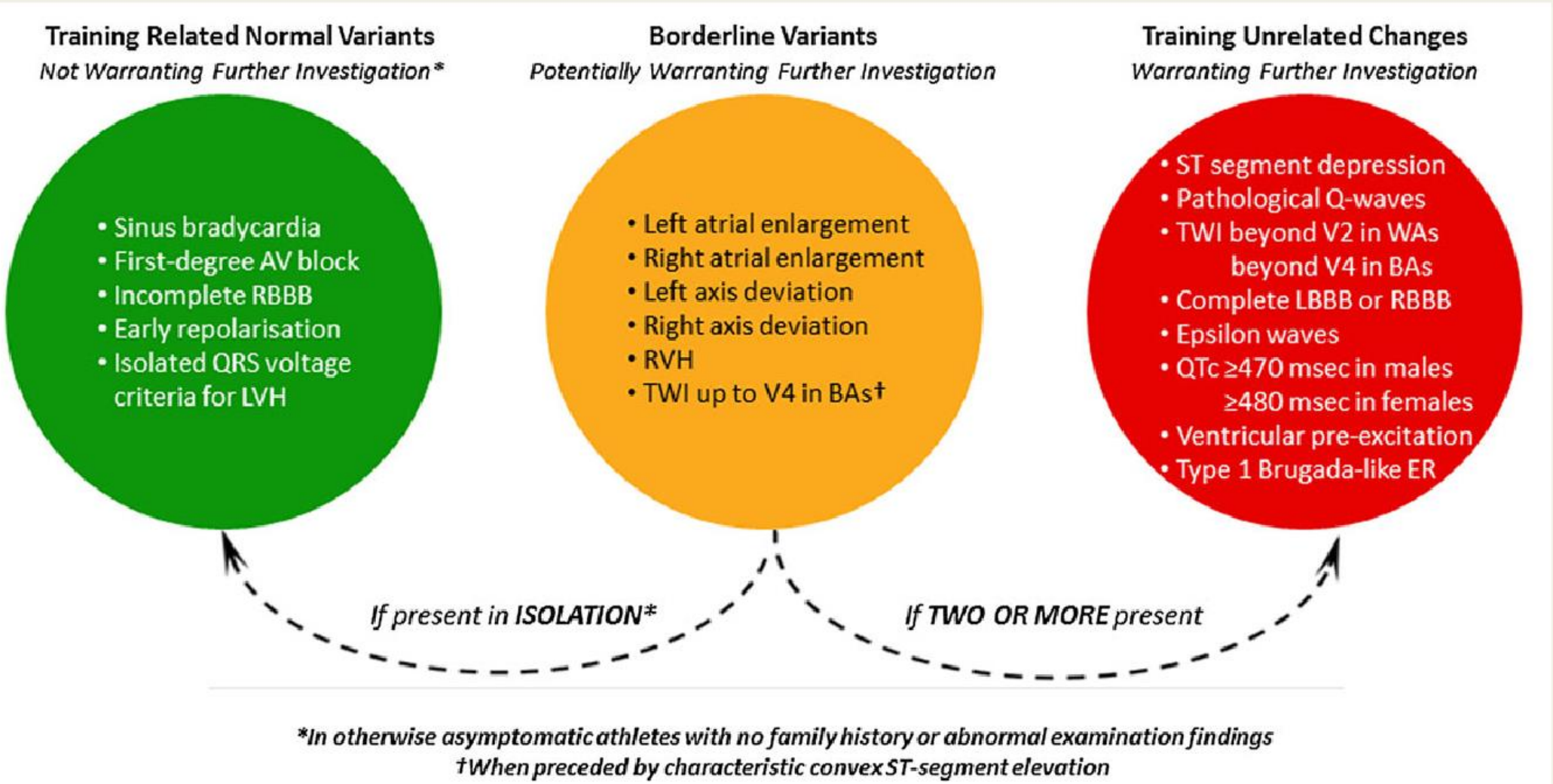


- T-wave inversions after V2 should be investigated (arrhythmogenic cardiomyopathy)
- T-wave inversions in contiguous inferior leads = investigate
- ST Depression ALWAYS abnormal
- Upright T wave in aVR with T wave inversion in V5/V6 = involving LV Apex
- Left Bundle Branch Block

Skin, Bones, Hearts & Private Parts

Bryan HEART

Gavalas (2019). https://www.acc.org/Latest-in-Cardiology/Articles/2019/07/17/07/03/Athlete-ECGs



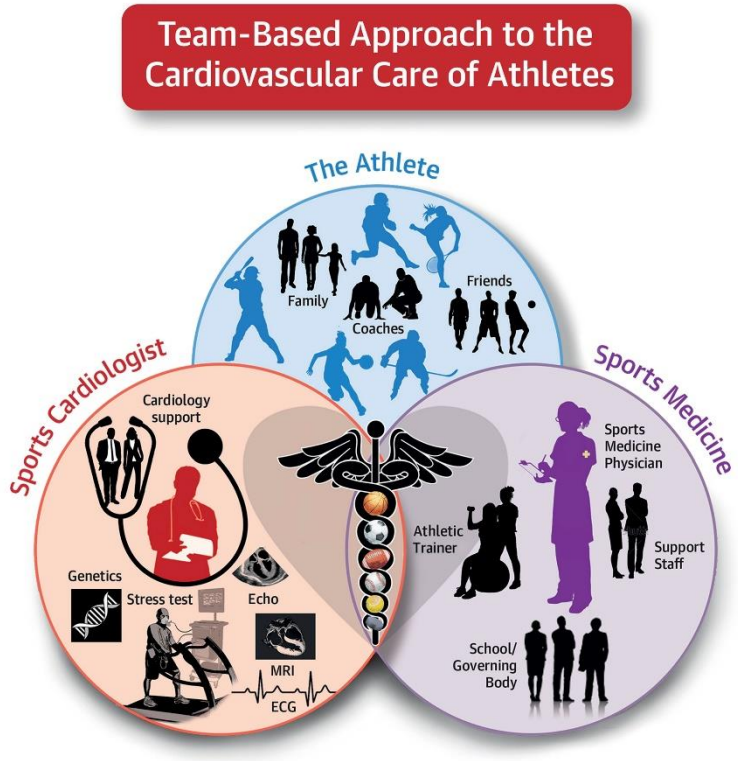
Skin, Bones, Hearts & Private Parts

Bryan HEART

Perry-Williams, Sharma (2017). Current understanding of the electrocardiographic manifestations of the 'athlete's heart'.

Risk of Athletic Cardiomyopathy

CENTRAL ILLUSTRATION: Multidisciplinary Care of Athletes



Emery, M.S. et al. J Am Coll Cardiol HF. 2018;6(1):30-40.

[Sudden Cardiac Death in Athletes | JACC: Heart Failure]

RESEARCH ARTICLE | Originally Published 22 December 2025 | Check for updates

Athlete's Heart or Heart at Risk? Cardiac Remodeling and Exercise-Induced Ventricular Arrhythmias in Elite Athletes

Giuseppe Di Gioia, MD, Maria Rosaria Squeo, MD, Armando Ferrera, MD, Francesco Raffaele Spera, MD, Viviana Maestrini, MD, PhD, Sara Monosilio, MD, Federica Mango, MD, Giulia Paoletti, DMS, Andrea Serdoz, MD, Marco Bernardi, MD, and Antonio Pelliccia, MD | AUTHOR INFO & AFFILIATIONS

Circulation: Arrhythmia and Electrophysiology • Volume 19, Number 1 • https://doi.org/10.1161/CIRCEP.125.014143

2025 ACC/AHA Sports Participation Guidelines For Athletes With CV Abnormalities: A Paradigm Shift Toward Shared Decision-Making

Dec 10, 2025 | Dr. Sanjay Sivalokanathan, MBBS; Neel Chokshi, MD, MBA

Expert Analysis

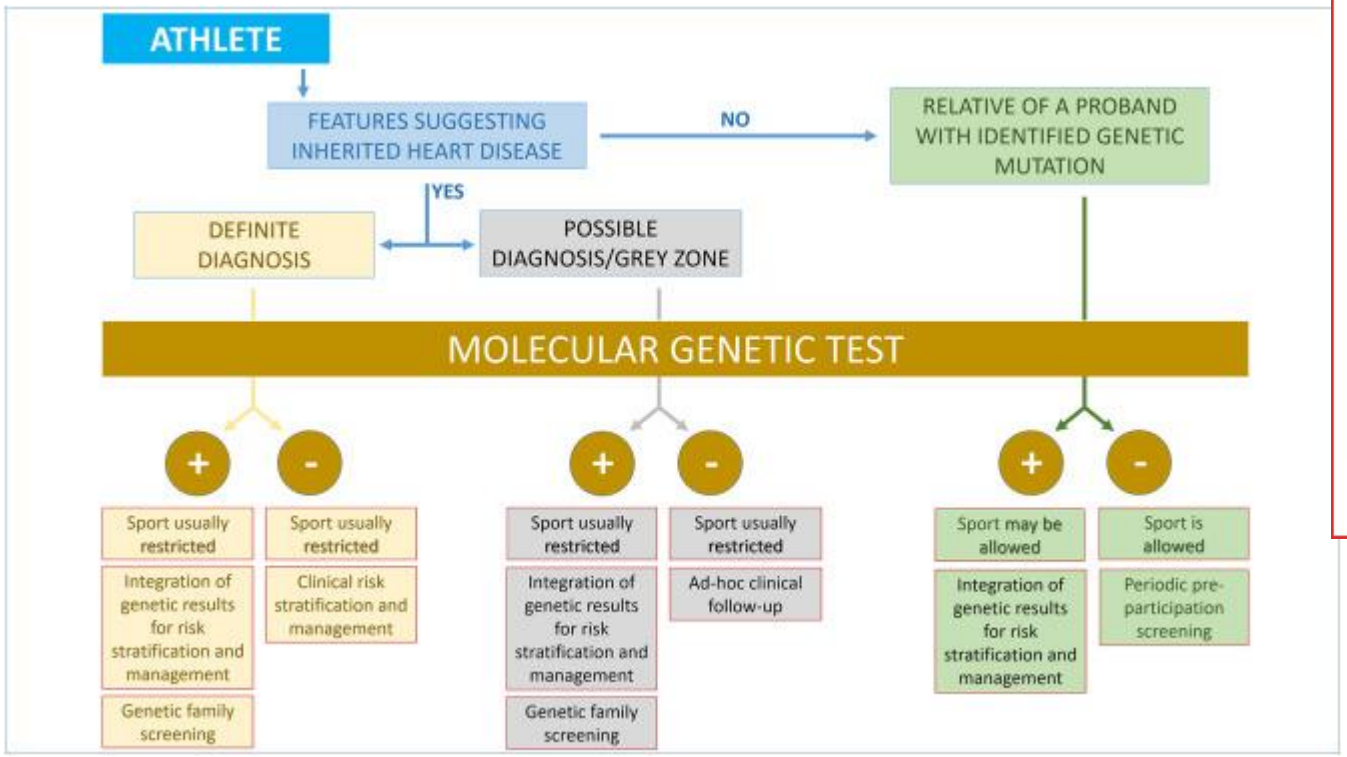
Skin, Bones, Hearts & Private Parts

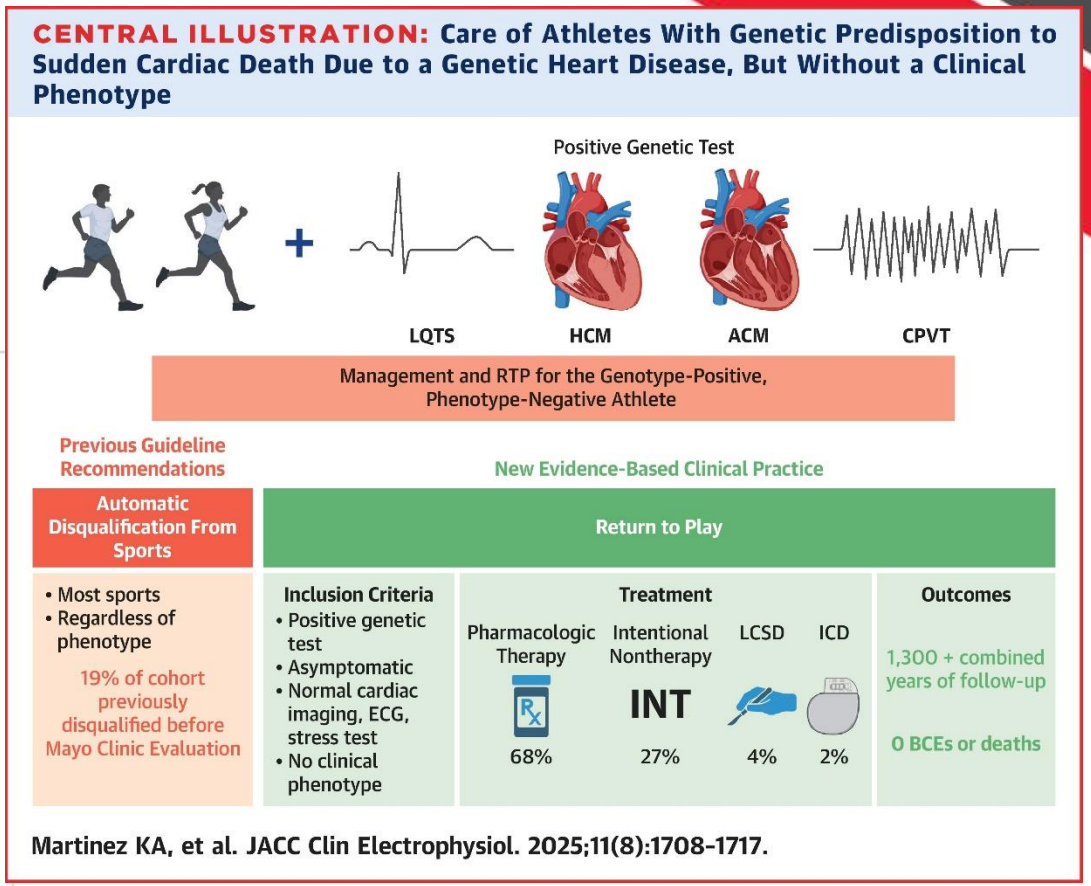
[Athlete's Heart or Heart at Risk? Cardiac Remodeling and Exercise-Induced Ventricular Arrhythmias in Elite Athletes | Circulation: Arrhythmia and Electrophysiology]

[2025 ACC/AHA Sports Participation Guidelines For Athletes With CV Abnormalities: A Paradigm Shift Toward Shared Decision-Making - American College of Cardiology]

Bryan HEART

Genetic Testing





Martinez KA, et al. JACC Clin Electrophysiol. 2025;11(8):1708-1717.

Skin, Bones, Hearts & Private Parts

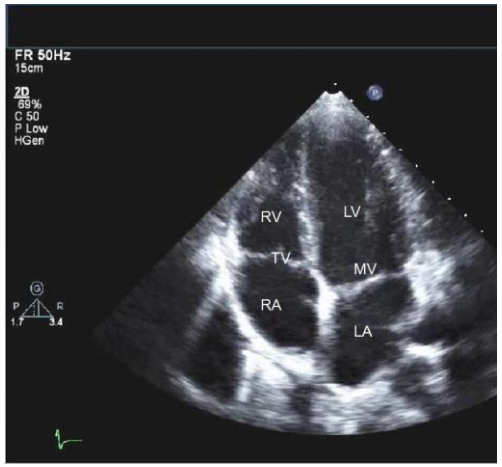
[Molecular genetic testing in athletes: Why and when a position statement from the Italian Society of Sports Cardiology - International Journal of Cardiology]

[Outcomes and Burdens to Return-to-Play for Phenotype Negative Athletes With a Genetic Heart Disease | JACC: Clinical Electrophysiology]

Bryan HEART

Treatment of Athletic Cardiomyopathy





Initiate

Optimise

Re-assess

The Four Pillars of Heart Failure

ARNI

BB

MRA

SGLT2i

Consider additional therapies

Other causes

Skin, Bones, Hearts & Private Parts

[Four pillars of heart failure: contemporary pharmacological therapy for heart failure with reduced ejection fraction | Open Heart]

Bryan HEART

How Frequent Does Athletic Cardiomyopathy occur?





- Odds of dying in a car crash is 1 in 93 crashes (1.1%)
- Odds of being born on Leap Day (Febr 29th) is 1 in 1461 (0.07%)



- Odds of finding a 4-leaf clover 1 in 10,000 (0.01%)
- Odds of being hit by lightening once in your lifetime: 1 in 15,000 (0.007%)



- **Having Athletic Cardiomyopathy is 1 in 50,000 chance =0.002%**

Skin, Bones, Hearts & Private Parts

Bryan HEART

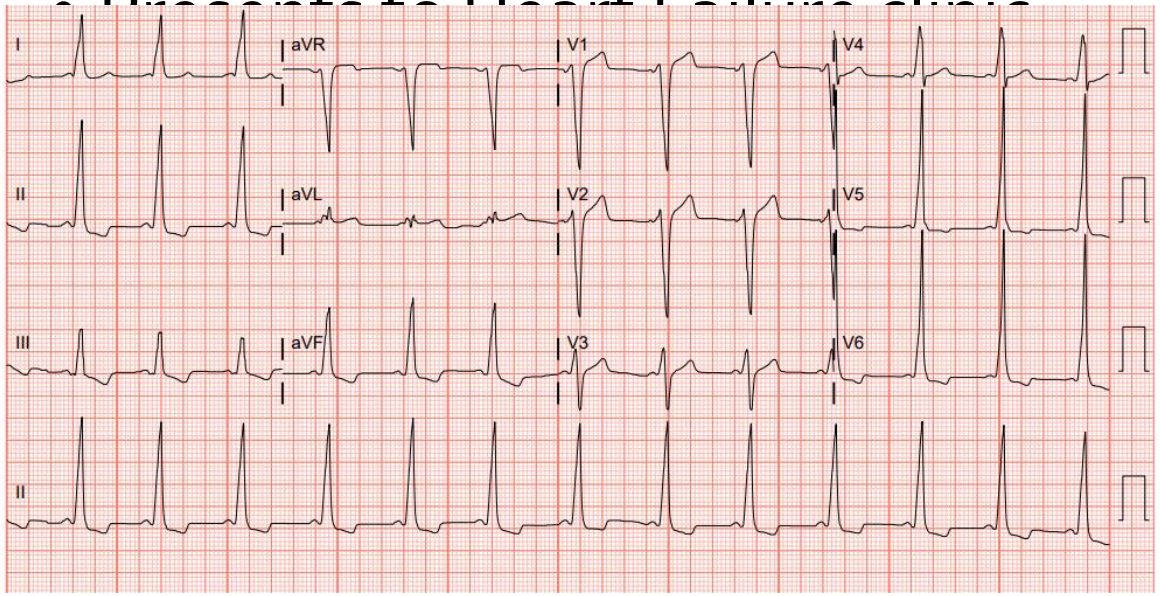


Skin, Bones, Hearts & Private Parts

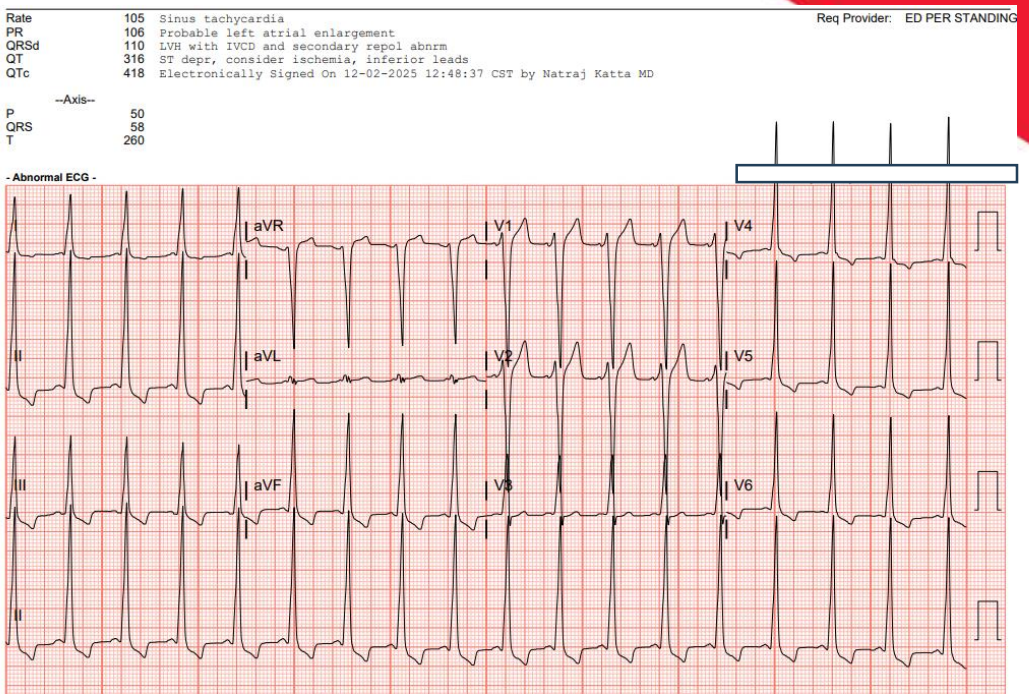
Bryan HEART

Case Study

- 21-year-old African American college Football Player
- Presents to Heart Failure clinic



- Intends to transfer to do Masters and finish out eligibility



12/2/2025, complete TTE shows ejection fraction 20% with borderline LV dilation, G1 DD noted. WMA noted. Apical false tendon present. RV is normal in size and normal function. He does have abnormal tricuspid annular systolic excursion as well as systolic velocity. Normal atria. Trivial MR. No A I Mild TR. trivial PI. IVC is normal in size with normal collapse.

Bryan HEART

- 12/3/2025, CCTA score is 0 indicating a very low 10-year cardiovascular risk. Normal CT coronary angiogram noted.
- 12/3/2025, cardiac MRI demonstrates RV end-diastolic dimension of 3.3 cm, mild to moderately reduced function grossly. LVIDD is 6.1 cm with an EF of 25%. Not compacted to compacted ratio of 1.9 which is in the normal range. Normal resting myocardial perfusion noted. No areas of late gadolinium enhancement. Results are consistent with dilated nonischemic cardiomyopathy











HF RECOVERED EF: 50%
Discussed Tachycardia Mediated HF and treatment options – WPW and risk of returning to sports

Bryan HEART

Final PEARLS…

- There are differences between an ATHLETE's Heart and true Athletic Cardiomyopathy
- Hard to limit exercise in young individuals if not warranted
- ALWAYS LOOK FOR OTHER SOURCES
  - Drugs
  - Alcohol
  - Caffeine
- Don't forget genetic screening



Skin, Bones, Hearts & Private Parts

Bryan HEART

Questions?



@sarsch79

Sarah E Schroeder

sarah.schroeder@bryanheart.com

402-937-3595

Skin, Bones, Hearts & Private Parts

Bryan HEART

References

- Maron, Pellicia (2006). https://doi.org/10.1161/CIRCULATIONAHA.106.613562
- Mayo Clinic (2025). Hypertrophic cardiomyopathy - Symptoms and causes - Mayo Clinic
- Mahmaljy et al. 2023. Dilated Cardiomyopathy - StatPearls - NCBI Bookshelf
- Clinical Considerations for Competitive Sports Participation for Athletes With Cardiovascular Abnormalities: A Scientific Statement From the American Heart Association and American College of Cardiology | Circulation
- Differentiating features between physiological cardiac changes and... | Download Scientific Diagram
- Distinguishing athlete's heart from pathologic cardiac disease states.... | Download Scientific Diagram
- The athlete's heart: insights from echocardiography | Echo Research & Practice | Springer Nature Link
- Exercise Participation and Rehabilitation in Cardiomyopathies: An Updated Review[v1] | Preprints.org
- Sudden Cardiac Death in Athletes | JACC: Heart Failure
- Four pillars of heart failure: contemporary pharmacological therapy for heart failure with reduced ejection fraction | Open Heart
- Athlete's Heart or Heart at Risk? Cardiac Remodeling and Exercise-Induced Ventricular Arrhythmias in Elite Athletes | Circulation: Arrhythmia and Electrophysiology
- Outcomes and Burdens to Return-to-Play for Phenotype Negative Athletes With a Genetic Heart Disease | JACC: Clinical Electrophysiology
- 2025 ACC/AHA Sports Participation Guidelines For Athletes With CV Abnormalities: A Paradigm Shift Toward Shared Decision-Making - American College of Cardiology

Skin, Bones, Hearts & Private Parts

Bryan HEART