Northern Light Health

Sports Clearance in the time of COVID

4/26/2023 Sean C Hagenbuch MD, FAAP, FACC

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Disclosures

No financial relationships
No industry support

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National AAP Guidelines

PPE: Preparticipation Physical Evaluation (aap.org)

Standard PPE from the AAP

- In the medical home by the PCP
- At least 6 weeks before 1st preseason practice to allow time to evaluate and treat the athlete
  - No mention of regional wait times, but certainly important to consider

The **PPE** was developed by the American Academy of Family Physicians, American Academy of Pediatrics, American College of Sports Medicine, American Medical Society for Sports Medicine, American Orthopaedic Society for Sports Medicine and the American Osteopathic Academy of Sports Medicine. It is also endorsed by the National Athletic Trainers' Association and the National Federation of State High School Associations.

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	First Possible Practice Date	Opening Date	Closing Date	No. Weeks
2022-23				
Fall	August 15	September 2	November 5	9
Winter	November 21	December 9	February 25	11
Spring	March 27	April 13	June 10	8
2023-24				
Fall	August 14	August 31	November 4	9
Winter	November 20	December 7	February 24	11
Spring	March 25	April 15	June 15	8
2024-25				
Fall	August 19	September 6	November 9	9
Winter	November 18	December 6	February 22	11
Spring	March 31	April 17	June 14	8
2025-26				
Fall	August 18	September 5	November 8	9
Winter	November 17	December 5	February 21	11
Spring	March 30	April 13	June 13	8

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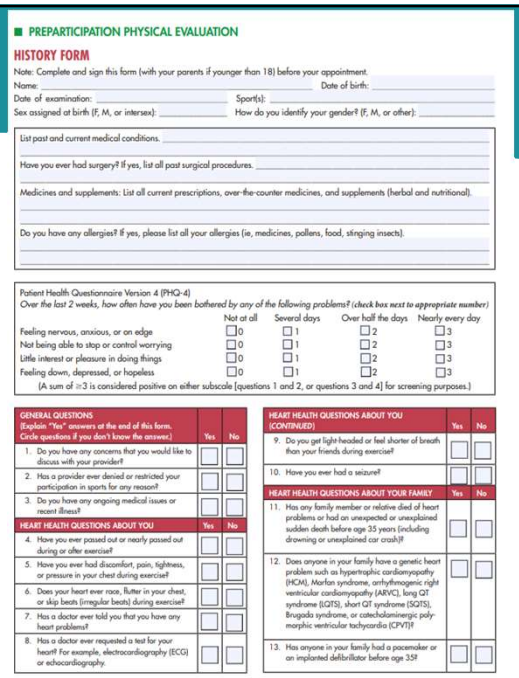
4 pages

Interactive PDF link out from MPA website or

physicalforms.pdf (rschooltoday.com)



■ PREPARTICIPATION PHYSICAL EVALUATION

HISTORY FORM

Note: Complete and sign this form (with your parents if younger than 18) before your appointment.

Name: _____ Date of birth: _____

Date of examination: _____ Sport(s): _____

Sex assigned at birth (F, M, or intersex): _____ How do you identify your gender? (F, M, or other): _____

List past and current medical conditions.

Have you ever had surgery? If yes, list all past surgical procedures.

Medicines and supplements: List all current prescriptions, over-the-counter medicines, and supplements (herbal and nutritional).

Do you have any allergies? If yes, please list all your allergies (ie, medicines, pollens, food, stinging insects).

Patient Health Questionnaire Version 4 (PHQ-4)

Over the last 2 weeks, how often have you been bothered by any of the following problems? (check box next to appropriate number)

	Not at all	Several days	Over half the days	Nearly every day
Feeling nervous, anxious, or on edge	☐0	☐1	☐2	☐3
Not being able to stop or control worrying	☐0	☐1	☐2	☐3
Little interest or pleasure in doing things	☐0	☐1	☐2	☐3
Feeling down, depressed, or hopeless	☐0	☐1	☐2	☐3

(A sum of ≥3 is considered positive on either subscale [questions 1 and 2, or questions 3 and 4] for screening purposes.)

GENERAL QUESTIONS (Explain "Yes" answers at the end of this form. Circle questions if you don't know the answer.)	Yes	No
1. Do you have any concerns that you would like to discuss with your provider?		
2. Has a provider ever denied or restricted your participation in sports for any reason?		
3. Do you have any ongoing medical issues or recent illness?		
HEART HEALTH QUESTIONS ABOUT YOU	**Yes**	**No**
4. Have you ever passed out or nearly passed out during or after exercise?		
5. Have you ever had discomfort, pain, tightness, or pressure in your chest during exercise?		
6. Does your heart ever race, flutter in your chest, or skip beats (irregular beats) during exercise?		
7. Has a doctor ever told you that you have any heart problems?		
8. Has a doctor ever requested a test for your heart? For example, electrocardiography (ECG) or echocardiography.		

HEART HEALTH QUESTIONS ABOUT YOU (CONTINUED)	Yes	No
9. Do you get light-headed or feel shorter of breath than your friends during exercise?		
10. Have you ever had a seizure?		
HEART HEALTH QUESTIONS ABOUT YOUR FAMILY	**Yes**	**No**
11. Has any family member or relative died of heart problems or had an unexpected or unexplained sudden death before age 35 years (including drowning or unexplained car crash)?		
12. Does anyone in your family have a genetic heart problem such as hypertrophic cardiomyopathy (HCM), Marfan syndrome, arrhythmogenic right ventricular cardiomyopathy (ARVC), long QT syndrome (LQTS), short QT syndrome (SQTS), Brugada syndrome, or catecholaminergic polymorphic ventricular tachycardia (CPVT)?		
13. Has anyone in your family had a pacemaker or an implanted defibrillator before age 35?		

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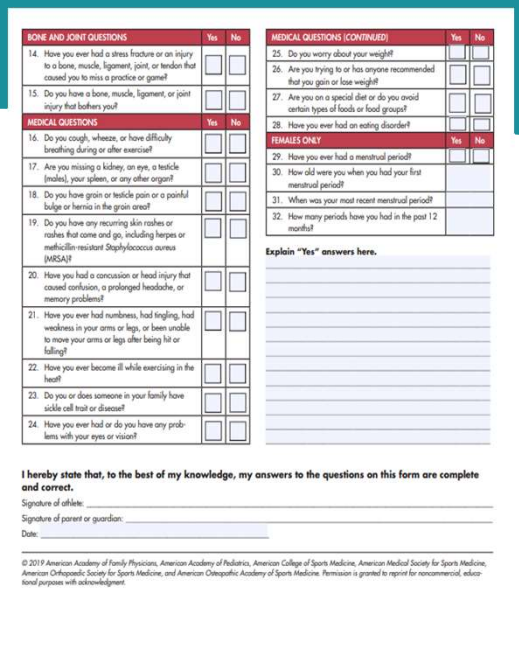
First 2 pages are history

7/28 (or 32) are cardiac related (21.8%)



BONE AND JOINT QUESTIONS	Yes	No
14. Have you ever had a stress fracture or an injury to a bone, muscle, ligament, joint, or tendon that caused you to miss a practice or game?		
15. Do you have a bone, muscle, ligament, or joint injury that bothers you?		
MEDICAL QUESTIONS	**Yes**	**No**
16. Do you cough, wheeze, or have difficulty breathing during or after exercise?		
17. Are you missing a kidney, an eye, a testicle (males), your spleen, or any other organ?		
18. Do you have groin or testicle pain or a painful bulge or hernia in the groin area?		
19. Do you have any recurring skin rashes or rashes that come and go, including herpes or methicillin-resistant Staphylococcus aureus (MRSA)?		
20. Have you had a concussion or head injury that caused confusion, a prolonged headache, or memory problems?		
21. Have you ever had numbness, had tingling, had weakness in your arms or legs, or been unable to move your arms or legs after being hit or falling?		
22. Have you ever become ill while exercising in the heat?		
23. Do you or does someone in your family have sickle cell trait or disease?		
24. Have you ever had or do you have any problems with your eyes or vision?		

MEDICAL QUESTIONS (CONTINUED)	Yes	No
25. Do you worry about your weight?		
26. Are you trying to or has anyone recommended that you gain or lose weight?		
27. Are you on a special diet or do you avoid certain types of foods or food groups?		
28. Have you ever had an eating disorder?		
FEMALES ONLY	**Yes**	**No**
29. Have you ever had a menstrual period?		
30. How old were you when you had your first menstrual period?		
31. When was your most recent menstrual period?		
32. How many periods have you had in the past 12 months?		

Explain "Yes" answers here.

I hereby state that, to the best of my knowledge, my answers to the questions on this form are complete and correct.

Signature of athlete: _____

Signature of parent or guardian: _____

Date: _____

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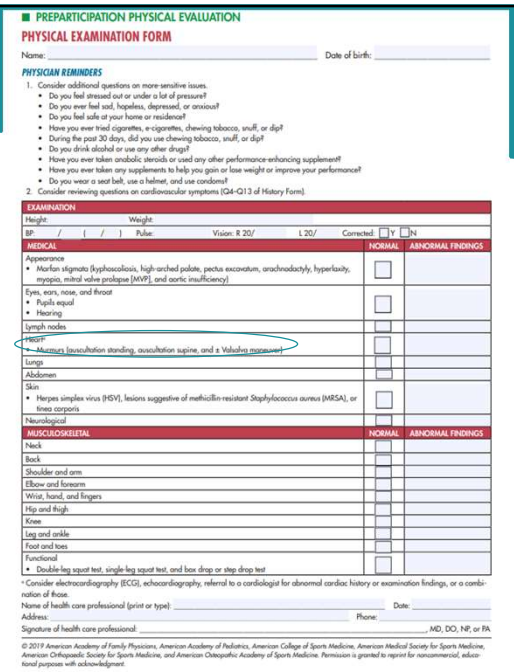
1/17 (5.8%) are cardiac related



■ PREPARTICIPATION PHYSICAL EVALUATION

PHYSICAL EXAMINATION FORM

Name: _____ Date of birth: _____

PHYSICIAN REMINDERS

1. Consider additional questions on more-sensitive issues.
   - Do you feel stressed out or under a lot of pressure?
   - Do you ever feel sad, hopeless, depressed, or anxious?
   - Do you feel safe at your home or residence?
   - Have you ever tried cigarettes, e-cigarettes, chewing tobacco, snuff, or dip?
   - During the past 30 days, did you use chewing tobacco, snuff, or dip?
   - Do you drink alcohol or use any other drugs?
   - Have you ever taken anabolic steroids or used any other performance-enhancing supplement?
   - Have you ever taken any supplements to help you gain or lose weight or improve your performance?
   - Do you wear a seat belt, use a helmet, and use condoms?
2. Consider reviewing questions on cardiovascular symptoms (Q4-Q13 of History Form).

EXAMINATION

Height: Weight:

BP: / (/) Pulse: Vision: R 20/ L 20/ Corrected: ☐Y ☐N

MEDICAL	NORMAL	ABNORMAL FINDINGS
Appearance • Marfan stigmata (kyphoscoliosis, high-arched palate, pectus excavatum, arachnodactyly, hyperlaxity, myopia, mitral valve prolapse [MVP], and aortic insufficiency)	☐	
Eyes, ears, nose, and throat • Pupils equal • Hearing	☐	
Lymph nodes	☐	
Heart* • Murmurs (auscultation standing, auscultation supine, and ± Valsalva maneuver)	☐	
Lungs	☐	
Abdomen	☐	
Skin • Herpes simplex virus (HSV), lesions suggestive of methicillin-resistant *Staphylococcus aureus* (MRSA), or tinea corporis	☐	
Neurological	☐	
MUSCULOSKELETAL	**NORMAL**	**ABNORMAL FINDINGS**
Neck	☐	
Back	☐	
Shoulder and arm	☐	
Elbow and forearm	☐	
Wrist, hand, and fingers	☐	
Hip and thigh	☐	
Knee	☐	
Leg and ankle	☐	
Foot and toes	☐	
Functional • Double-leg squat test, single-leg squat test, and box drop or step drop test	☐	

* Consider electrocardiography (ECG), echocardiography, referral to a cardiologist for abnormal cardiac history or examination findings, or a combination of those.

Name of health care professional (print or type): _____ Date: _____

Address: _____ Phone: _____

Signature of health care professional: _____, MD, DO, NP, or PA

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The part where they ask you to take responsibility…

Medical Eligibility

When determining medical eligibility, the primary care provider should have expereince in evaluating athletes and determining if they are medically able to compete. Examinations in locker rooms or gymnasiums are discouraged as it does not provide the athlete with a confidential space for the PPE.

After the examination, the primary care provider can find the athlete:

- medically eligible for sports without restrictions
- medically eligible for sports without restriction, but further evaluation needed
- medically eligible for certain sports listed on the form
- not medically eligible for any sports, pending further evaluation
- not medically eligible for any sports

The PPE writing group has developed a standard medical eligibility form.

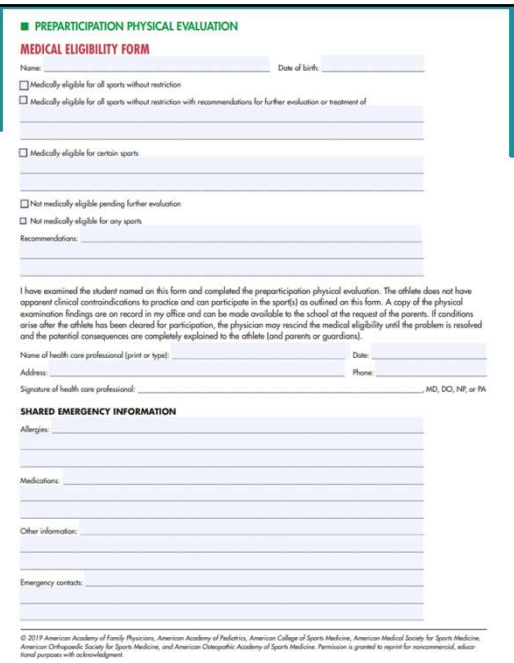
Medical Eligibility

A supplemental history form for Athletes with a Disability is also available. Please note this form should not be used in place of the Special Olympics form.

Athletes with a Disability

If the child is participating in the Special Olympics please use:

Special Olympics Medical Form | **Special Olympics Medical Form Instructions** | **Special Olympics Article 1 Sports Rules (appendix E)**



■ PREPARTICIPATION PHYSICAL EVALUATION

MEDICAL ELIGIBILITY FORM

Name: _____ Date of birth: _____

☐ Medically eligible for all sports without restriction

☐ Medically eligible for all sports without restriction with recommendations for further evaluation or treatment of

☐ Medically eligible for certain sports

☐ Not medically eligible pending further evaluation

☐ Not medically eligible for any sports

Recommendations: _____

I have examined the student named on this form and completed the preparticipation physical evaluation. The athlete does not have apparent clinical contraindications to practice and can participate in the sport(s) as outlined on this form. A copy of the physical examination findings are on record in my office and can be made available to the school at the request of the parents. If conditions arise after the athlete has been cleared for participation, the physician may rescind the medical eligibility until the problem is resolved and the potential consequences are completely explained to the athlete (and parents or guardians).

Name of health care professional (print or type): _____ Date: _____

Address: _____ Phone: _____

Signature of health care professional: _____, MD, DO, NP, or PA

SHARED EMERGENCY INFORMATION

Allergies: _____

Medications: _____

Other information: _____

Emergency contacts: _____

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So let's hoist the sail and see where we are headed…

4/26/2023 Sean C Hagenbuch MD, FAAP, FACC

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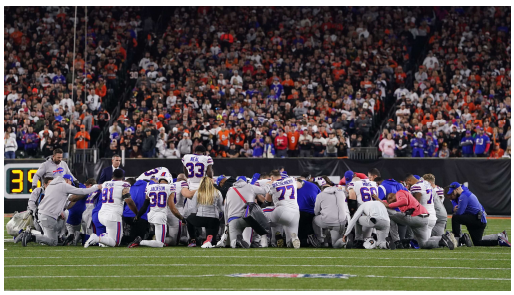
The Cardiac Conundrum



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Sudden Cardiac Death

Risks

Congenital/Genetic	
Structurally Abnormal Heart	**Structurally Normal Heart**
Hypertrophic cardiomyopathy	Congenital long QT syndrome
Arrhythmogenic right ventricular cardiomyopathy	Catecholaminergic polymorphic ventricular tachycardia
Dilated cardiomyopathy	Wolf-Parkinson-White syndrome or other accessory pathway
Other cardiomyopathy (i.e., left ventricular noncompaction)	Brugada syndrome
Congenital anomalies of coronary origin & course	Other ion channelopathies
Aortopathy (i.e., Marfan syndrome & ascending aortic aneurysm/ dissection)	
Valvular heart disease (i.e., congenital aortic stenosis, mitral valve prolapse)	
Acquired	
Structurally Abnormal Heart	**Structurally Normal Heart**
Atherosclerotic coronary artery disease	Commotio cordis
Kawasaki's disease	Acquired long QT (i.e., drug-induced)
Myocarditis	Other substance ingestion or environmental factors (i.e., hypo- or hyperthermia)

Wasfy Et al, Methodist Debakey Cardiovasc J. 2016 Apr-Jun; 12(2): 76–80.

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Sudden Cardiac Death

Risks

Wide range:
1/3000 to 1/1.1 million

Characteristic	Increased Risk Group	Decreased Risk Group
Overall	1 in 53,703 athlete-years[14]	
Gender	Males: 1 in 37,790	Females: 1 in 121,593
Race	Black: 1 in 21,491	White: 1 in 68,354 Hispanic: 1 in 56,254
Sports	Men's Basketball: 1 in 8,978 Men's Soccer: 1 in 23,689 Men's Football: 1 in 35,951	N/A

Wasfy Et al, Methodist Debakey Cardiovasc J. 2016 Apr-Jun; 12(2): 76–80.

Harmon KG, Drezner JA, Wilson MG, Sharma S. Incidence of sudden cardiac death in athletes: a state-of-the-art review. *Br J Sports Med.* 2014 Aug;48(15):1185–92.

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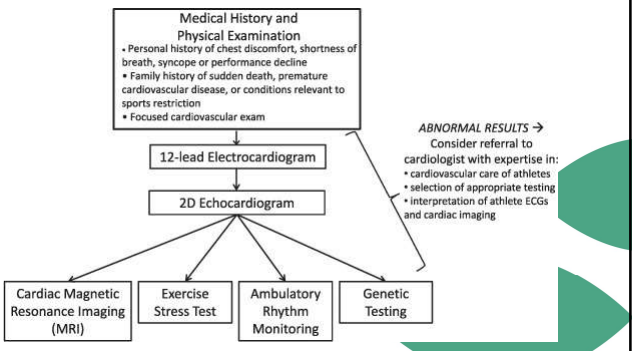
Sudden Cardiac Death

The basic current paradigm



Wasfy Et al, Methodist Debakey Cardiovasc J. 2016 Apr-Jun; 12(2): 76–80.

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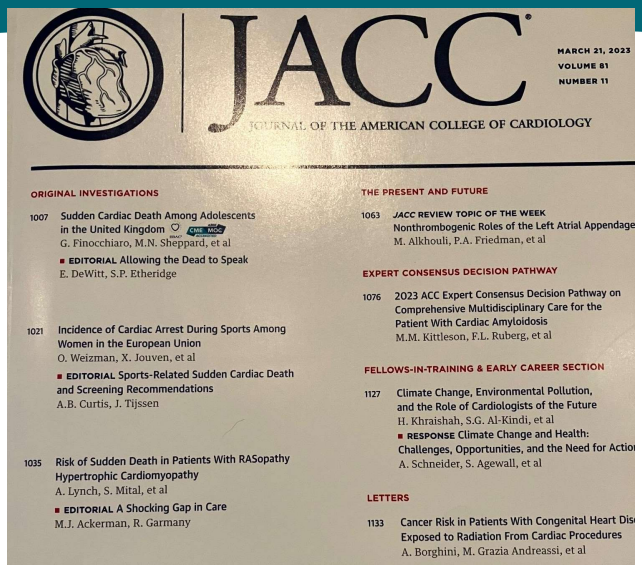
As I was beginning to plan this talk



JACC

JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY

MARCH 21, 2023
VOLUME 81
NUMBER 11

ORIGINAL INVESTIGATIONS

1007 Sudden Cardiac Death Among Adolescents in the United Kingdom
G. Finocchiaro, M.N. Sheppard, et al
■ EDITORIAL Allowing the Dead to Speak
E. DeWitt, S.P. Etheridge

1021 Incidence of Cardiac Arrest During Sports Among Women in the European Union
O. Weizman, X. Jouven, et al
■ EDITORIAL Sports-Related Sudden Cardiac Death and Screening Recommendations
A.B. Curtis, J. Tijssen

1035 Risk of Sudden Death in Patients With RASopathy Hypertrophic Cardiomyopathy
A. Lynch, S. Mital, et al
■ EDITORIAL A Shocking Gap in Care
M.J. Ackerman, R. Garmany

THE PRESENT AND FUTURE

1063 JACC REVIEW TOPIC OF THE WEEK
Nonthrombogenic Roles of the Left Atrial Appendage
M. Alkhouli, P.A. Friedman, et al

EXPERT CONSENSUS DECISION PATHWAY

1076 2023 ACC Expert Consensus Decision Pathway on Comprehensive Multidisciplinary Care for the Patient With Cardiac Amyloidosis
M.M. Kittleson, F.L. Ruberg, et al

FELLOWS-IN-TRAINING & EARLY CAREER SECTION

1127 Climate Change, Environmental Pollution, and the Role of Cardiologists of the Future
H. Khraishah, S.G. Al-Kindi, et al
■ RESPONSE Climate Change and Health: Challenges, Opportunities, and the Need for Actio
A. Schneider, S. Agewall, et al

LETTERS

1133 Cancer Risk in Patients With Congenital Heart Dis Exposed to Radiation From Cardiac Procedures
A. Borghini, M. Grazia Andreassi, et al

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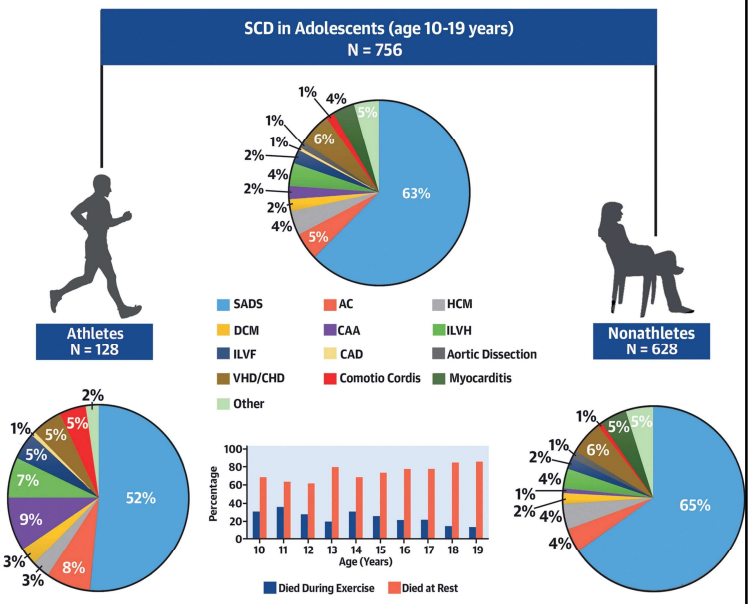
Sudden Death in Adolescents in the UK

A note on SADS:

Is the absence of a cause that we know of, not a real single entity

No 'genetic autopsy', so inclusive of many potential disease states

CENTRAL ILLUSTRATION: Causes of Sudden Cardiac Death in Adolescents (Athletes and Nonathletes)



Finocchiaro G, et al. J Am Coll Cardiol. 2023;81(11):1007-1017.

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Prevention…

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Concussions

2.6-2.9/1000 exposures
Up to 1-2 million per year nationwide

4/26/2023 Sean C Hagenbuch MD, FAAP, FACC

TABLE 1

Concussion Rates in High School Sports

Sport	Concussions per 1000 AEs
Boys' tackle football	0.54–0.94
Girls' soccer	0.30–0.73
Boys' lacrosse	0.30–0.67
Boys' ice hockey	0.54–0.62
Boys' wrestling	0.17–0.58
Girls' lacrosse	0.20–0.55
Girls' field hockey	0.10–0.44
Girls' basketball	0.16–0.44
Boys' soccer	0.17–0.44
Girls' softball	0.10–0.36
Boys' basketball	0.07–0.25
Girls' volleyball	0.05–0.25
Cheerleading	0.06–0.22
Boys' baseball	0.04–0.14
Girls' gymnastics	0.07
Boys' and girls' track and/or field	0.02
Boys' and girls' swimming and/or diving	0.01–0.02

Data compiled from Gessel et al,[39] Lincoln et al,[40] Rosenthal et al,[49] Marar et al,[58] Meehan et al,[59] O'Connor et al,[60] Currie et al,[61] and Castile et al.[62]

Halstead et al, 2018. Pediatrics 142

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Concussions

Signs and Symptoms

4/26/2023 Sean C Hagenbuch MD, FAAP, FACC

Signs and Symptoms of a Concussion

Category	Symptoms
Somatic	Headache
	Nausea and/or vomiting
	Neck pain
	Light sensitivity
	Noise sensitivity
Vestibular and/or oculomotor	Vision problems
	Hearing problems and/or tinnitus
	Balance problems
	Dizziness
Cognitive	Confusion
	Feeling mentally "foggy"
	Difficulty concentrating
	Difficulty remembering
	Answers questions slowly
	Repeats questions
	Loss of consciousness
Emotional	Irritable
	More emotional than usual
	Sadness
	Nervous and/or anxious
Sleep	Drowsiness and/or fatigue
	Feeling slowed down
	Trouble falling asleep
	Sleeping too much
	Sleeping too little

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Concussion return to play

TABLE 5

Graduated Return-to-Sport Program

Stage	Aim	Activity	Goal of Step
1	Symptom-limited activity	Daily activities that do not provoke symptoms	Gradual reintroduction of work and/or school activities
2	Light aerobic exercise	Walking or stationary cycling at slow-to-medium pace; no resistance training	Increase heart rate
3	Sport-specific exercise	Running or skating drills; no activities with risk of head impact	Add movement
4	Noncontact training drills	Harder drills (eg, passing drills and team drills); may begin progressive resistance training	Exercise, coordination, and increased thinking during sport
5	Full-contact practice	After medical clearance, participate in full, normal training activities	Restore confidence and allow coaching staff to assess functional skills
6	Return to sport	Normal game play	Full clearance/participation

Recommend 48 h of relative physical and cognitive rest before beginning the program. No more than 1 step should be completed per day. If any symptoms worsen during exercise, the athlete should return to the previous step. Consider prolonging and/or altering the return-to-sport program for any pediatric and/or adolescent patient with symptoms over 4 wk.

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Why is a cardiologist talking about concussions?

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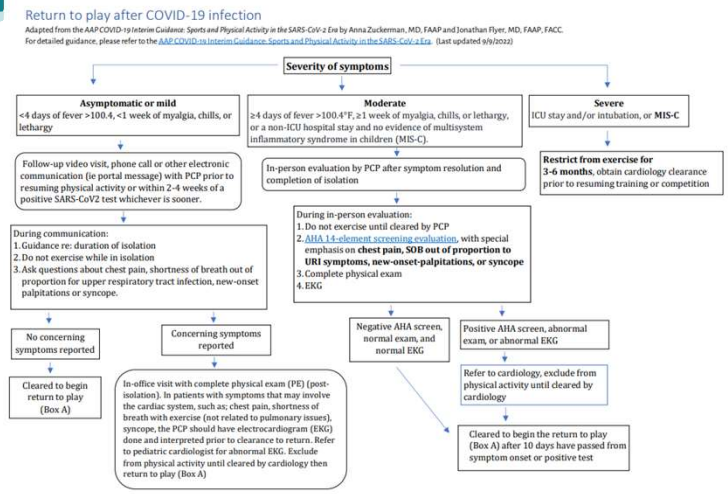
COVID return to Play



[2022-09-16 RTP Algorithm.pdf (aap.org)]

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COVID return to Play

Return to play after COVID-19 infection

Adapted from the AAP COVID-19 Interim Guidance: Sports and Physical Activity in the SARS-CoV-2 Era by Anna Zuckerman, MD, FAAP and Jonathan Flyer, MD, FAAP, FACC.
For detailed guidance, please refer to the AAP COVID-19 Interim Guidance: Sports and Physical Activity in the SARS-CoV-2 Era. (Last updated 9/9/2022)

[2022-09-16 RTP Algorithm.pdf (aap.org)]

BOX A: Additional Guidance on Returning to Play *(Note: if the patient has already advanced back to physical activity on their own and is without abnormal cardiovascular signs/symptoms, then no further evaluation is necessary. COVID-19 disease history should be documented.)*

When should children and adolescents return to play?

1) Completed isolation and minimum amount of symptom free time has passed
2) Can perform all activities of daily living
3) No concerning signs/symptoms
4) Physician clearance has been given, if indicated

At what pace should children and adolescents return to play?

5) <12yo: progress according to own tolerance
6) 12+: gradual return to physical activity
   - Asymptomatic / Mild symptoms: Minimum 1 day symptom free (excluding loss of taste / smell), tolerating activities of daily living. A mask is required for ALL physical activity, including games or scrimmages, until 10 full days from + test or symptom onset have passed.
   - Moderate symptoms: Minimum 1 day symptom free (excluding loss of taste / smell), and tolerating activities of daily living, one light practice or 30 minutes minimum of cardiovascular exercise on own, and 1 full practice prior to games is recommended. A mask is required for ALL physical activity, including games or scrimmages, until 10 full days from + test or symptom onset have passed.

When should children and adolescents pause return to play?

- If patient develops any chest pain, SOB out of proportion to URI infection, new-onset palpitations, or syncope when returning to exercise, immediately stop and go to PCP for in-person exam and consider referral to Pediatric Cardiology

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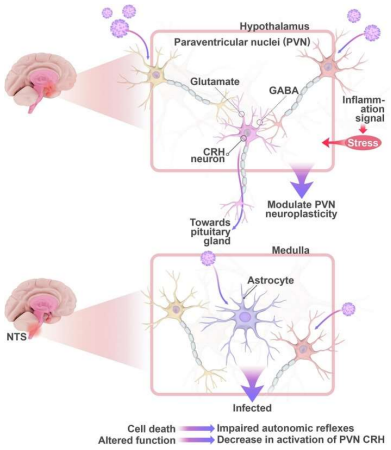
COVID return to Play- Here's where it gets controversial

Increasing evidence of direct and indirect routes of COVID infiltration into the autonomic nervous system, mostly in adults

Increasing suspicion in literature that Long COVID may be central ANS damage secondary to inflammation

May be COVID is/has a concussion like analogue



Jammoul, et al. Auton Neurosci. 2023 Mar; 245: 103071.

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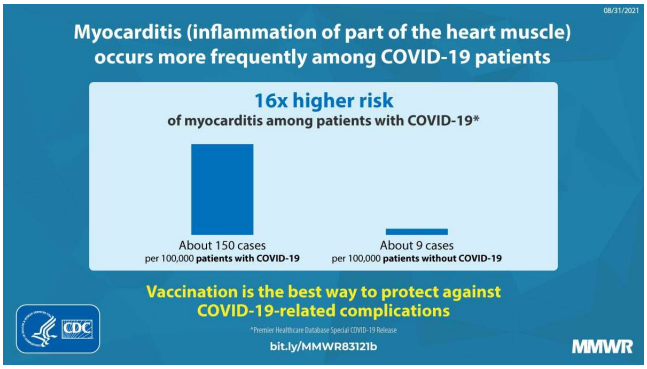
COVID Myocarditis



Recent assessment of the prevalence of myocarditis by CDC from hospital data

Normal year of myocarditis results in 9/100,000 cases of myocarditis

COVID resulted in 150/100,000 cases

Primarily Adult data

Vaccine associated COVID risk is (at most) 2/100,000 after the second dose when given 1 mo apart, highest in males 13-33

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Just to muddy the waters

COVID myocarditis may not be 'myocarditis'

MIS-C may cause myocardial damage without direct viral invasion of the myocardium, which was traditionally part of the diagnostic criteria for myocarditis

See Patel et al JAHA 2021

Clinically- It probably doesn't matter much

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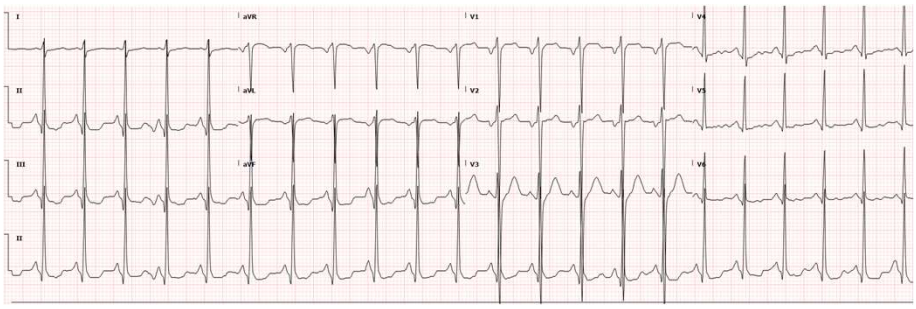
A Case: Delta part of epidemic, 12 yo athlete, vaccinated, minimally symptomatic
Presenting ECG



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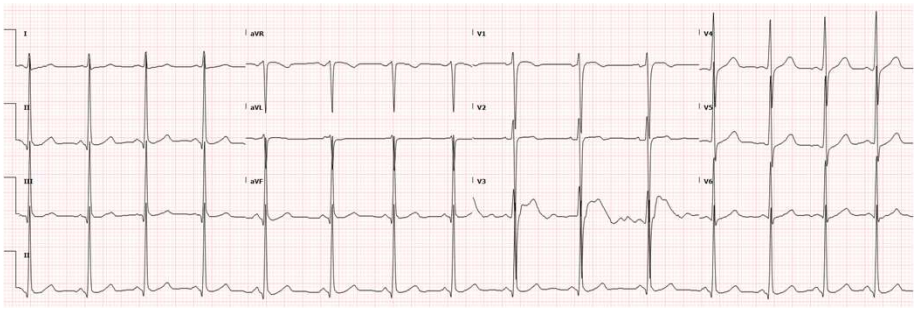
Follow up



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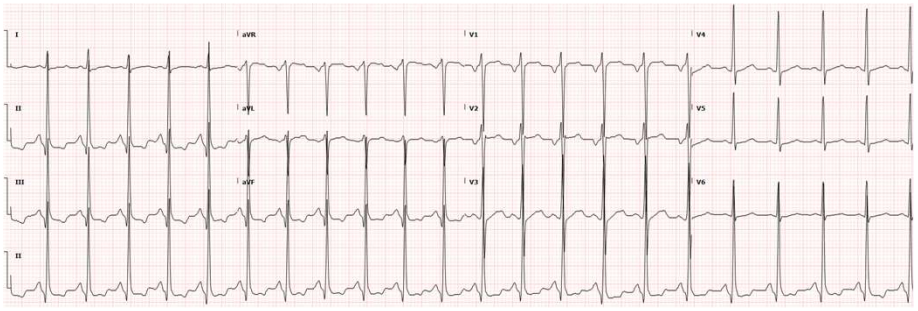
RTP- high intensity



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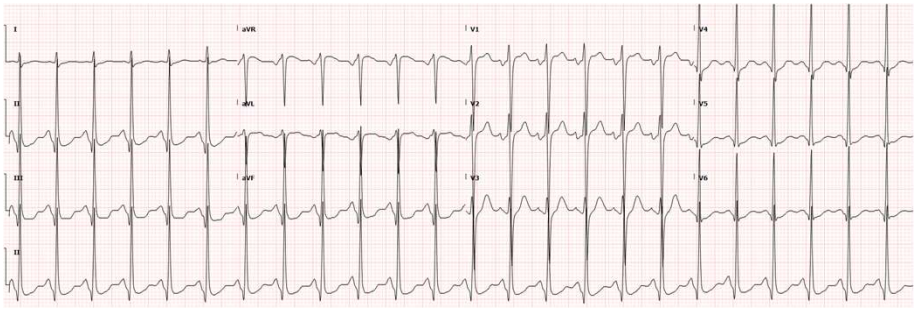
9 months later



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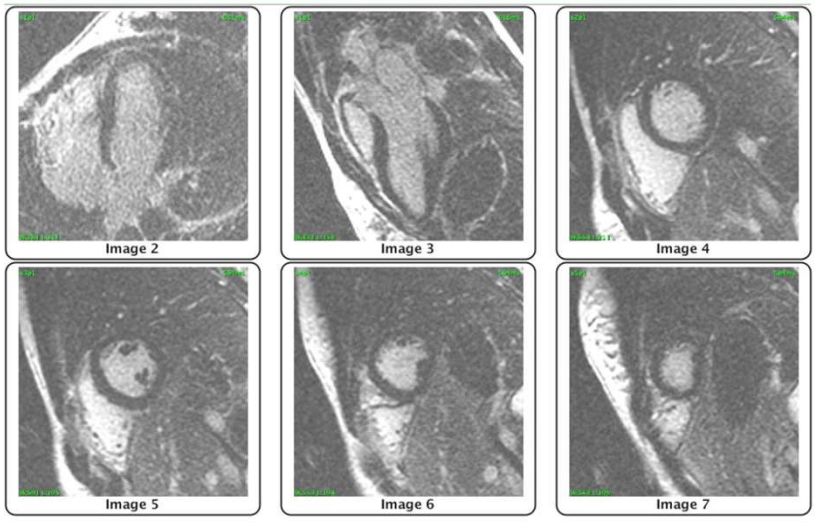
Normal/Negative LGE



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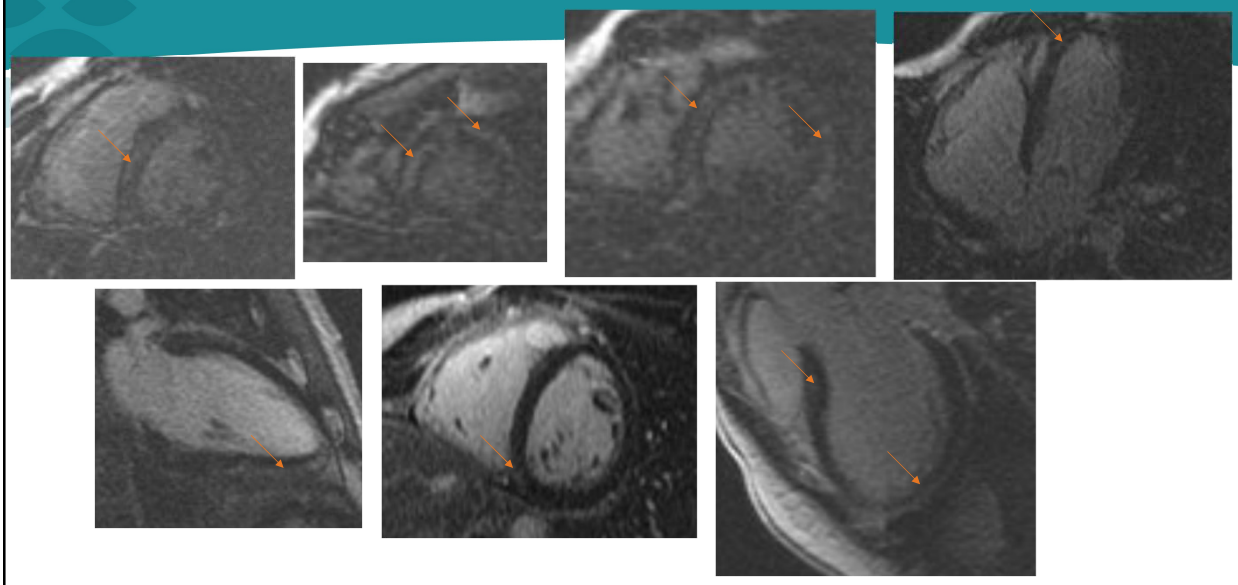
Positive LGE



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Myocarditis- COVID and not 31

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Summary

- Covid has added a risk factor, but not changed the whole game
- Slow return to play after illness or injury is probably the best recommendation
- Majority of the pre-participation exam is not for cardiac exclusion
- Most kids with known cardiac disease can still participate, and if they can't it will be clear in the subspecialty notes
- A lead time of 6 weeks may not be enough to get them cleared for the season

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Questions?

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THANK YOU

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