Cardiac Screening, Clearance, and Return to Play after COVID19

2021 NJAAP School Health Conference

Kristen Connolly MD FAAP
Jonathan Flyer MD FAAP FAAC

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THE University of Vermont Children's Hospital

The University of Vermont LARNER COLLEGE OF MEDICINE

30th Annual
School Health Conference

New Jersey Chapter
INCORPORATED IN NEW JERSEY
American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN®

Essex County:

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Financial Disclosures: None

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Objectives & Goals

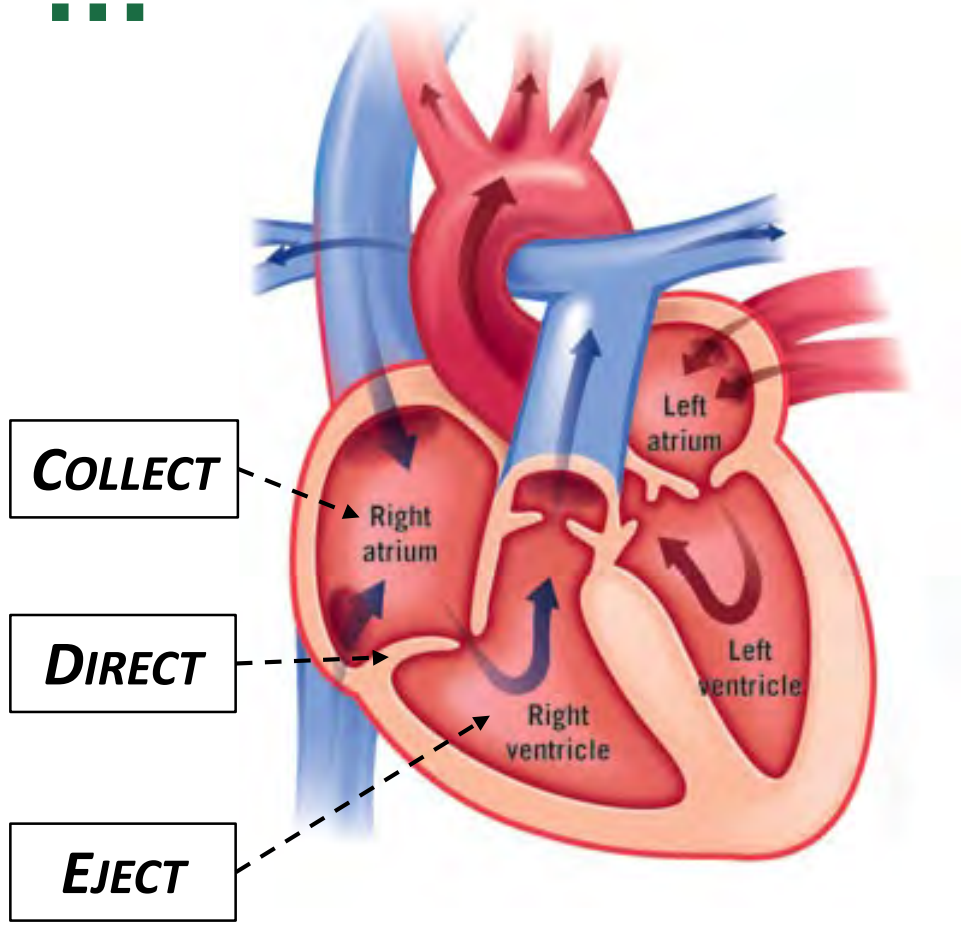
- Recognize: Cardiac inflammation (case example)
    - Pericarditis, Myocarditis, COVID-19, MIS-C, Vaccine induced
- Review: SCD context
- Learn: RTP guidelines after COVID-19 infection

HEART = MUSCLE

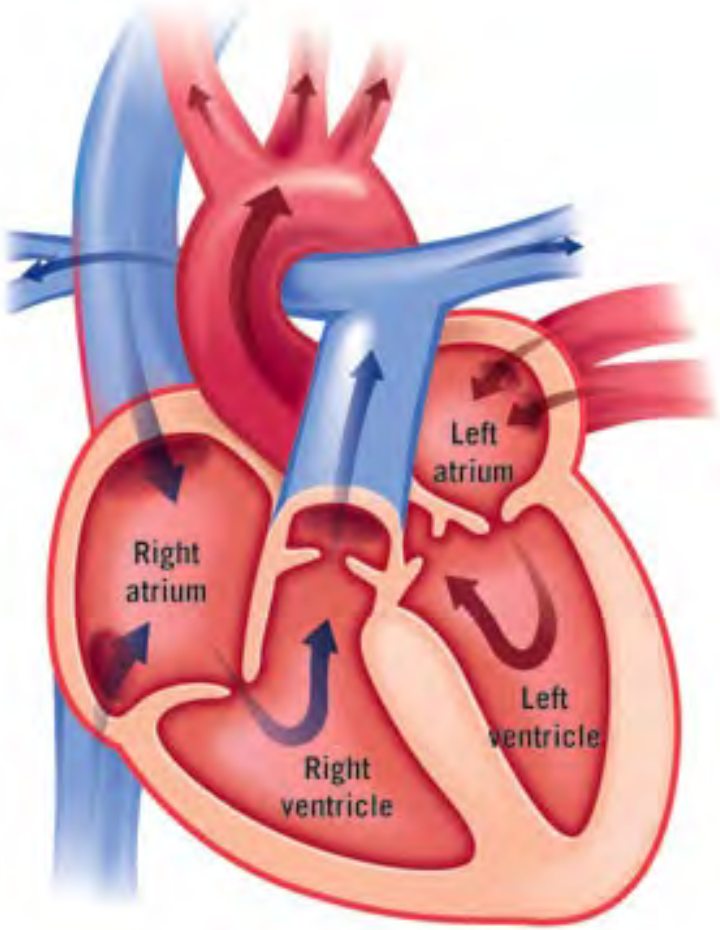
PUMP… PUMP… PUMP…

MOVE : BLOOD

- **Collect**: Atria
- **Direct**: Valves & Walls
- **Eject**: Ventricles



Physiology



CO = HR x SV

DO2 = CO x Ca02

- SV: Structural CHD (obstruction), Myopathy, Ventricular function
- HR: Arrhythmia
- CaO2: pulmonary disease (alveolar/diffusion), altitude, CHD (shunts)

ISCHEMIA

Case Presentation

Your Office: Monday Afternoon 4pm

- 17 y/o previously healthy male
- 1 day: acute onset severe chest pain, laying flat + inspiration
- 2-3 days: sore throat, fatigue, night sweats
- 4 days prior: received second Pfizer vaccine

- ... Let's also imagine:
  - a patient in a lot of discomfort, and HR of 120bpm
  - And the parents say "I'm worried, he never complains."

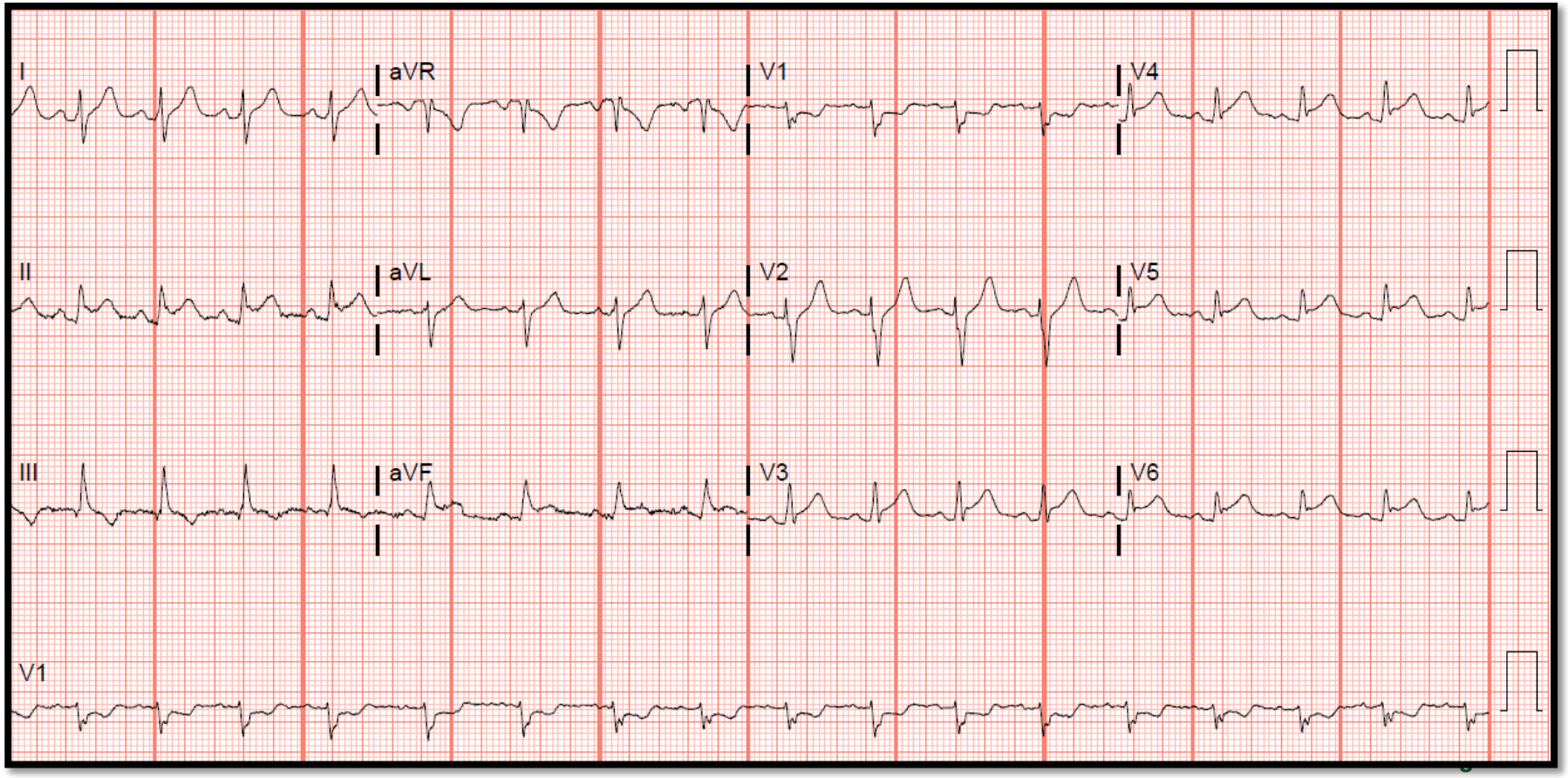
- Next Step?

Case Presentation

Emergency Room

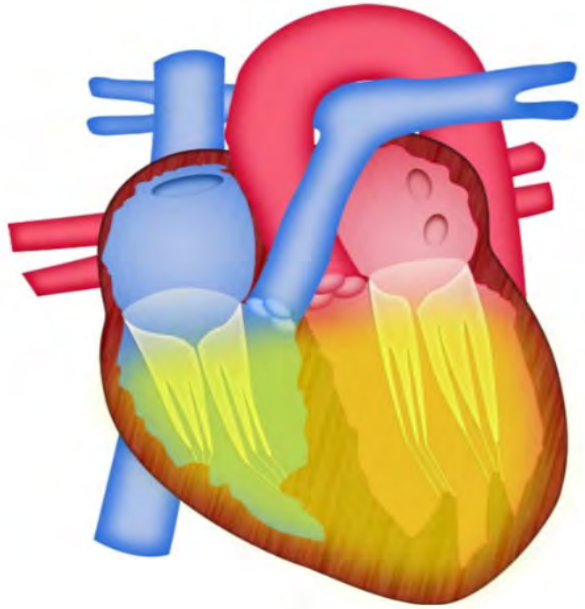
- Exam: fit adolescent with persistent tachycardia, no distress

- EKG
- Troponin



EKG

+



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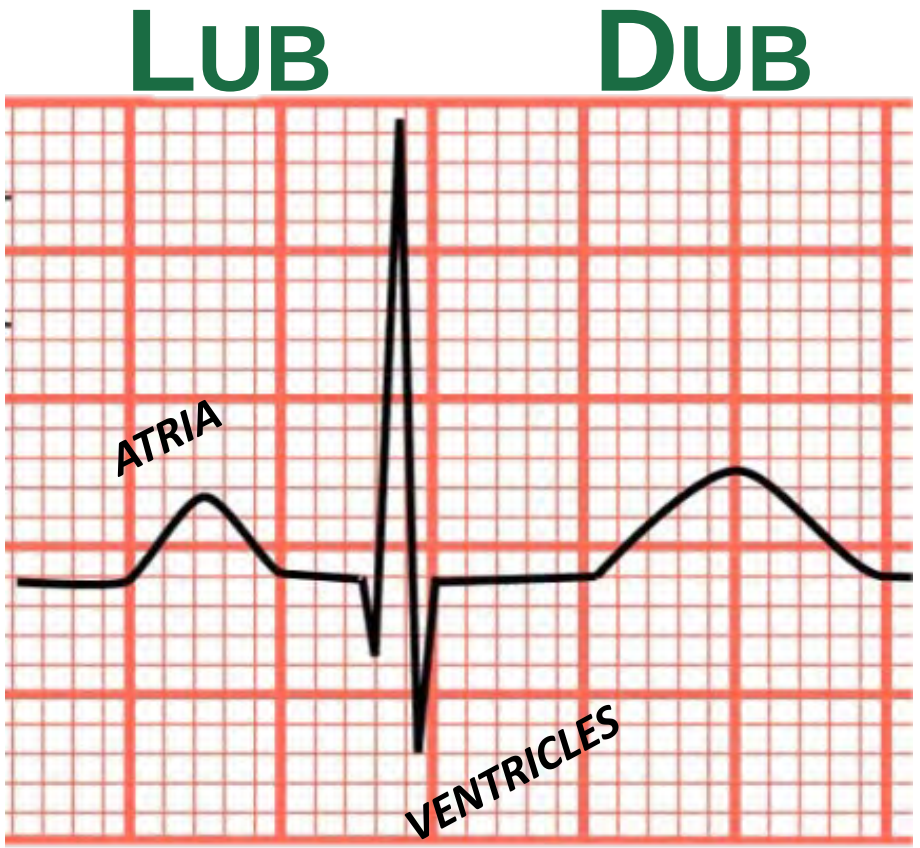
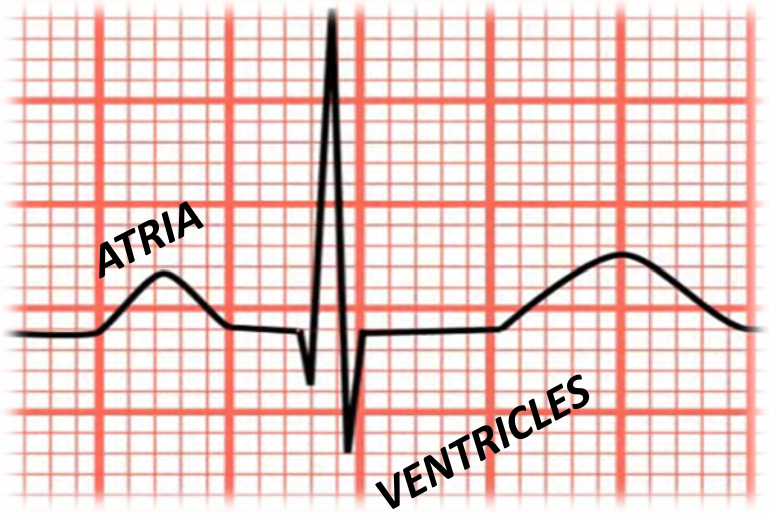
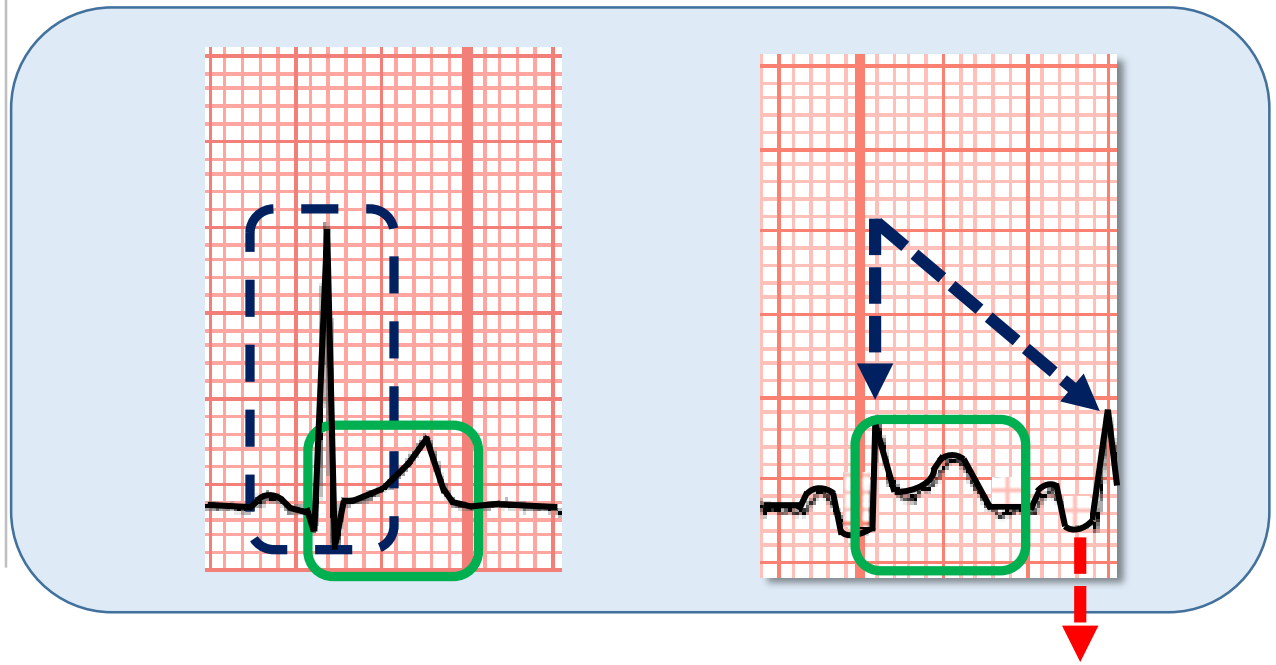


EKG: PHOTO HUNT

LUB DUB



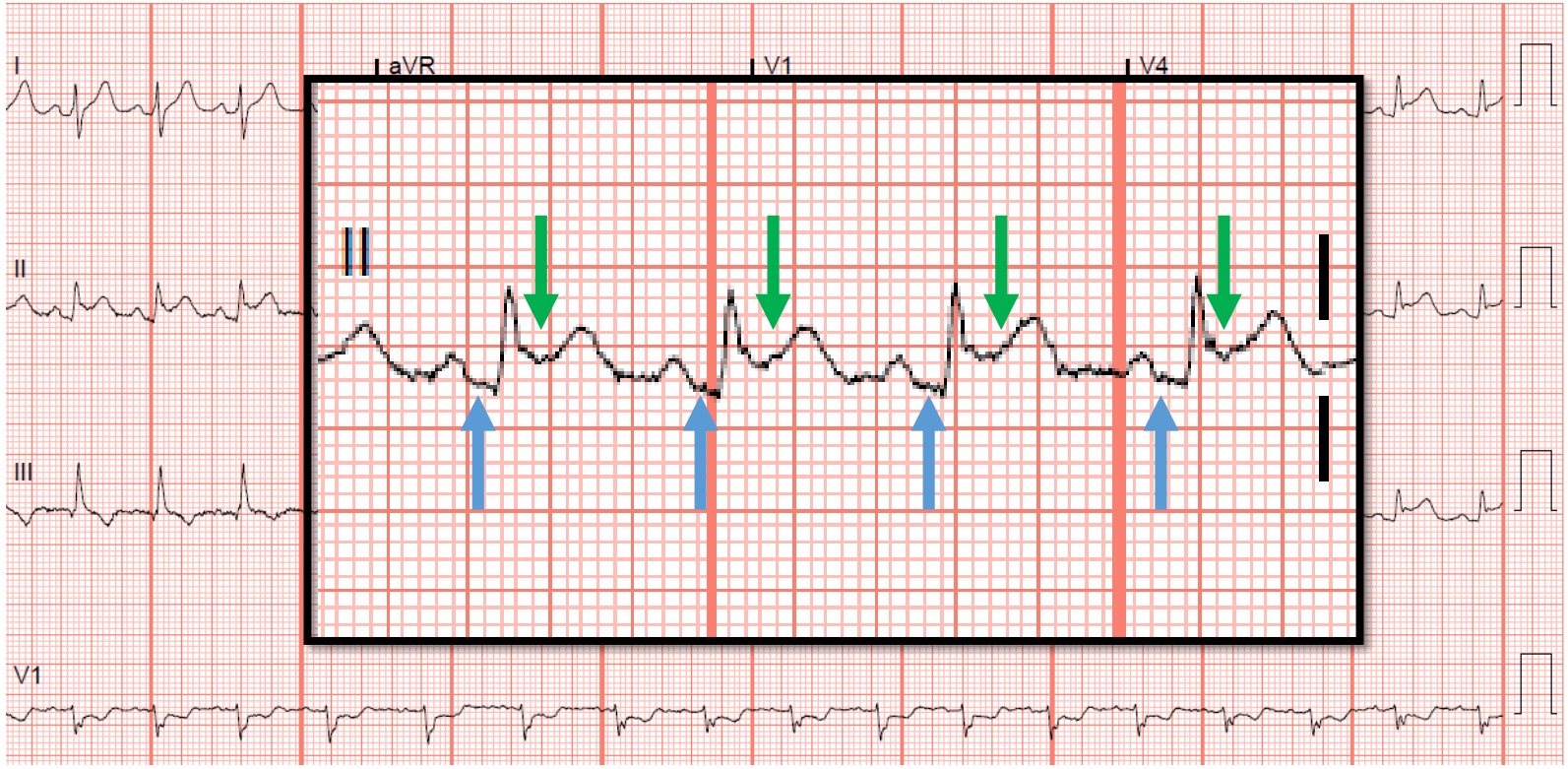
NORMAL INFLAMMATION



Case Presentation

Emergency Room

- EKG
  - Sinus tachycardia
  - PR depression
  - ST segment elevation

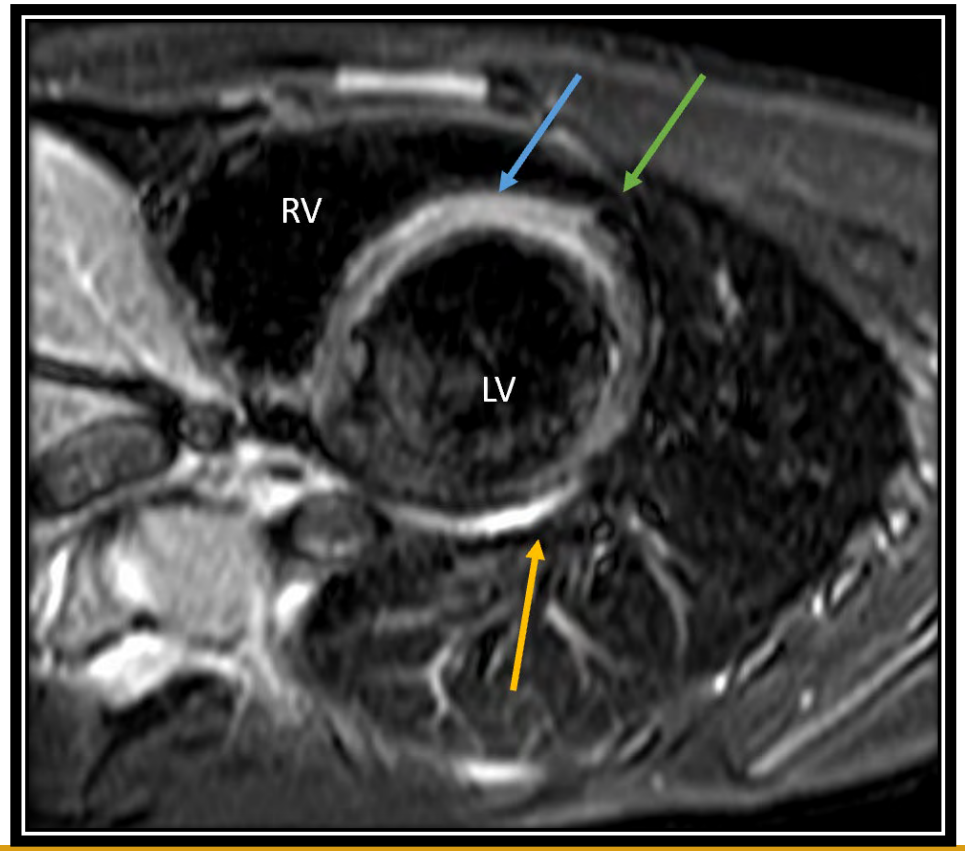


- Troponin: 7 → 17.5

Case Presentation

Call: Pediatric Cardiology → PICU Admit

- Normal telemetry
- Echo: mildly reduced biventricular systolic function, mildly dilated ventricles
- Cardiac MRI



- Mildly decreased biventricular systolic function (RVEF 39%, LVEF 52%) and mild biventricular chamber dilation.

- Edema: septum and anterior wall (T2 STIR).
- Normal amount pericardial fluid.
- Extensive subepicardial enhancement in the lateral wall (delayed inversion recovery sequences)

	Pericarditis	Myocarditis
Definition	**Acute: inflammation of the pericardium (sac/fluid) -Spectrum of inflammatory extent**	**Inflammation of the myocardium - Direct cellular damage and host response**
Etiology	INFECTION/VIRAL, autoimmune, surgery, AMI, uremia	INFECTION/VIRAL, drug, autoimmune, toxic
Clinical signs	Chest pain (sharp, pleuritic, improves with sitting) friction rub, viral prodrome	Chest pain, new murmur/ gallop/arrhythmias, respiratory or heart failure symptoms, hypotension/weak pulses, viral prodrome
Evaluation	CXR, EKG, Echo, troponin	CXR, EKG, troponin/BNP, Echo, cMRI, blood gas, telemetry
Diagnosis	Sinus tachycardia, PR depression, ST elevation, pericardial effusion	Sinus tachycardia, PR depression, ST elevation, T wave abnormalities, increased Troponins, new valvar regurgitation, decreased ventricular function

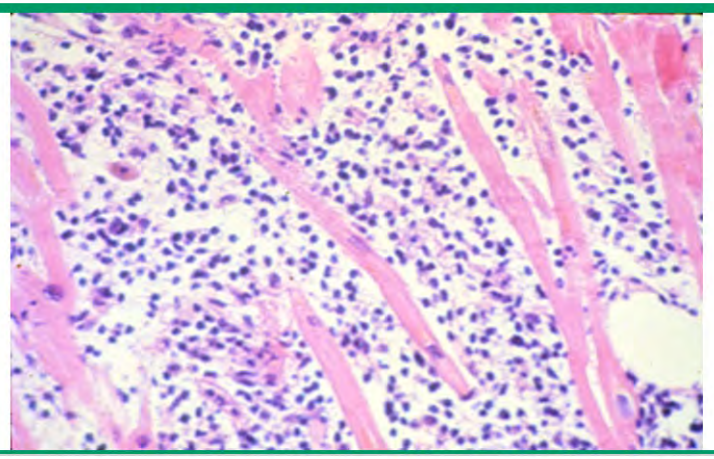
Myocarditis

Advanced Diagnostics... ?

Cardiac MRI vs Endomyocardial biopsy

- Lower risk
- Noninvasive
- More available / Easier to obtain
- Now adds some information about myocardial scarring
- Does not offer histopathology...

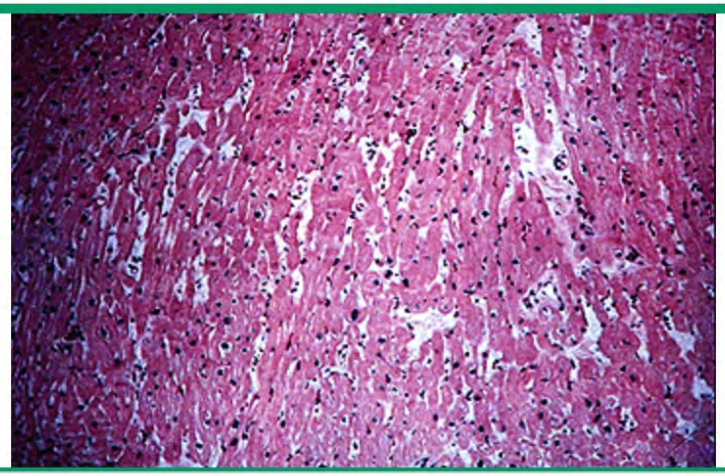
Acute diffuse myocarditis



Endomyocardial biopsy of the right ventricle showing acute diffuse myocarditis. There is prominent myofiber necrosis and loss in association with a high-grade mononuclear infiltrates.

Courtesy of Walter Abelmann, MD.

Normal endomyocardial biopsy



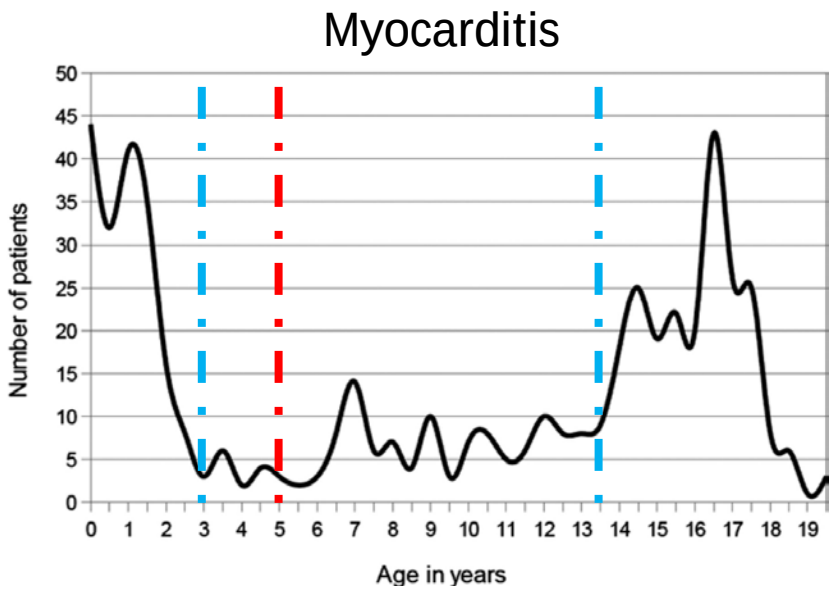
Light microscopy from a normal endomyocardial biopsy.

Courtesy of Helmut Rennke, MD.

Cardiac Inflammation – General Management Principles

Inflammation of myocardium (heart muscle) → ventricular dysfunction

- heart failure (symptoms)
- hemodynamic compromise
- life-threatening arrhythmias
- *INCREASED morbidity and mortality risk.*



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Demographics, Trends, and Outcomes in Pediatric Acute Myocarditis in the US, 2006 - 2011. Circulation: Cardiovascular Quality and Outcomes. 2012

Cardiac inflammation – management

Pericarditis

- NSAIDS (weeks) + colchicine (3 months)
- Viral therapy, if identifiable
- ? Glucocorticoids if NSAIDs contraindicated (systemic illness, pregnant, renal failure)

Myocarditis/MIS-C

- Hospital admission: telemetry, hemodynamic management and additional cardiac testing
- Pediatric Cardiology consult

Cardiac Inflammation – Inpatient Management

Disease continuum

1) Viral infection prodrome

2) Autoimmunity and inflammatory - supportive care
    1) Host immune system activation
    2) T-cell and cytokine activation leading to myocyte injury

3) Dilated cardiomyopathy
    A. Small subset of patients, unclear why there is chronic dilation
    B. Continued medical management, if needed cardiac transplant (~4%)[1]

4) Mortality
    1) 7.3% acute illness
    2) Late deaths: Persistent ventricular dysfunction, heart failure, or complications following heart transplantation
    3) Risks: fulminant, severely depressed LV function, mechanical support (ECMO, VAD), need for inotropes, tachyarrythmias

1. Demographics, Trends, and Outcomes in Pediatric Acute Myocarditis in the US, 2006 - 2011. Circulation: Cardiovascular Quality and Outcomes. 2012
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Cardiac inflammation with acute COVID-19 infection

- **Acute cardiac COVID-19 symptoms:**
  - **chest pain, dyspnea, palpitations, pallor, cyanosis**

- Emerging reports: PCR+ COVID-19 associated severe cardiac inflammation:
  - 12 yo F, acute fulminant myocarditis, CP, elevated troponins, severely depressed ventricular function, complete heart block. Lara, et al. Pediatrics. August 2020.
  - 15 yo F, STEMI d/t acute coronary thrombosis, CP, ST segment elevation, myocardial dysfunction. Persson, et al. Pediatrics. August 2021.

Multisystem Inflammatory Syndrome in Children (MIS-C)

American Academy of Pediatrics
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Multisystem Inflammatory Syndrome in Children (MIS-C) Interim Guidance

Critical Updates on COVID-19 / COVID-19 Interim Guidance / Multisystem Inflammatory Syndrome in Children (MIS-C) Interim Guidance

CDC: May 14, 2020

- **<21yrs : fever, inflammatory labs, evidence of severe illness (hospitalization), with multisystem (≥2) organs (cardiac, renal, respiratory, hematologic, gastrointestinal, dermatologic, neurologic) AND**
- **No alternative plausible diagnoses AND**
- **+ SARS-CoV-2 infection by RT-PCR, antigen test, or COVID-10 exposure w/I 4 weeks of symptom onset**

MIS-C cardiac echo findings from single-center study (N=39)

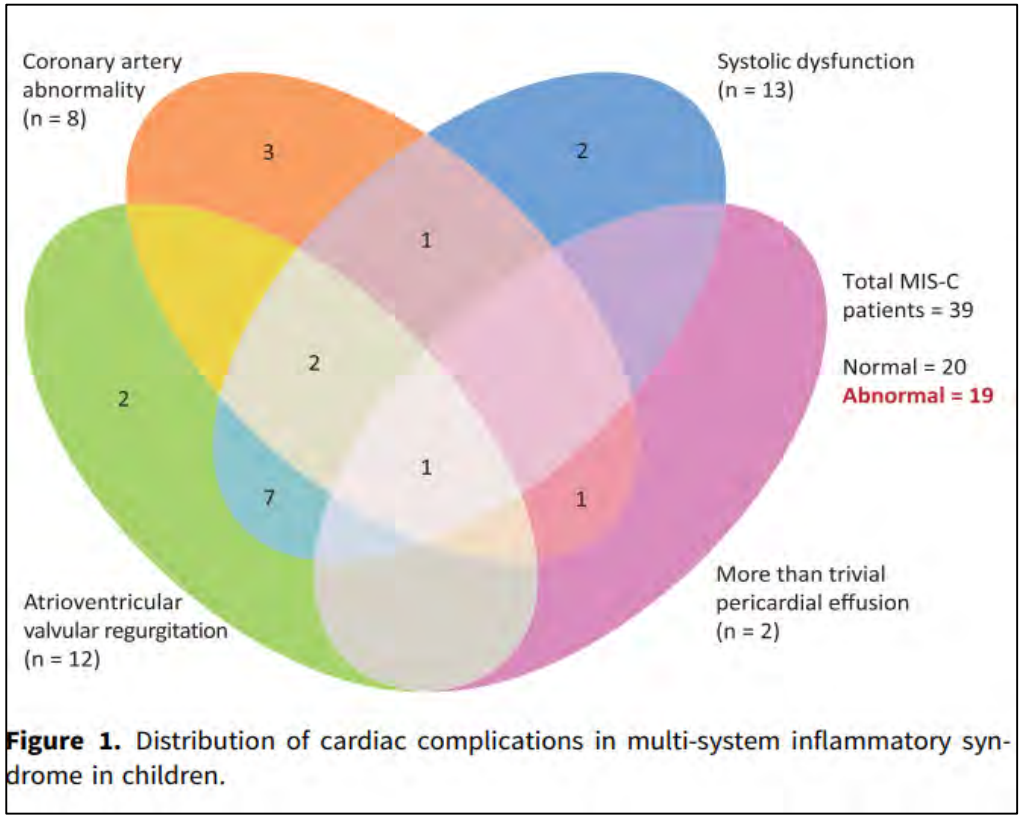

Figure 1. Distribution of cardiac complications in multi-system inflammatory syndrome in children.

Harahsheh AS, et al. Cardiac echocardiogram findings of severe acute respiratory syndrome coronavirus-2- associated multi-system inflammatory syndrome in children. *Cardiology in the Young.* 2021

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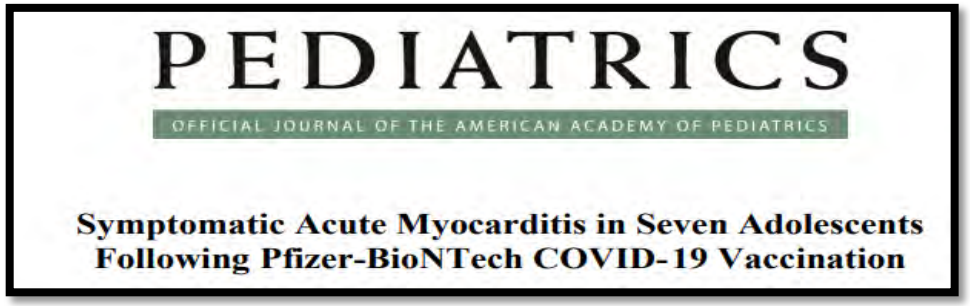
mRNA-COVID vaccine associated myocarditis/pericarditis

VAERS 1,126 cases, 323 confirmed cases age <30 (6/23/21):

- Within 1-6 days of 2nd mRNA vaccine
- Predominantly male
- Chest pain, elevated cardiac enzymes, ST/T wave changes, dyspnea, abnormal echo/imaging within several days of second vaccine
- RARE, but greater than expected
  - 67 cases in 12-17 males/1M vaccine doses
  - 56 cases in 18-24 males/1M vaccine doses


PEDIATRICS

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Symptomatic Acute Myocarditis in Seven Adolescents Following Pfizer-BioNTech COVID-19 Vaccination

JAMA Cardiology | Brief Report

Association of Myocarditis With BNT162b2 Messenger RNA COVID-19 Vaccine in a Case Series of Children

Audrey Dionne, MD; Francesca Sperotto, MD; Stephanie Chamberlain; Annette L. Baker, MSN, CPNP; Andrew J. Powell, MD; Ashwin Prakash, MD; Daniel A. Castellanos, MD; Susan F. Saleeb, MD; Sarah D. de Ferranti, MD, MPH; Jane W. Newburger, MD, MPH; Kevin G. Friedman, MD

https://www.aappublications.org/news/2021/06/10/covid-vaccine-myocarditis-rates-061021
https://www.health.harvard.edu/blog/new-information-for-parents-on-myocarditis-and-covid-19-vaccines-202107012523

Return to Play after COVID-19 Infection in Pediatric Patients

- Clinical significance: Myocarditis evaluation
  - *Cause of sudden cardiac death during exercise in young athletes*
- Athletic participation: 35-45 million youth (6-18yrs)
  - Cardiovascular disease: #1 cause of mortality in the US (adults).
  - Exercise is a pillar of long-term cardiovascular health.
- COVID Disclaimer: Gray areas exist & Long-term data not yet known
- This is an endorsement for critical thinking & clinical judgment.

RISK: Sudden cardiac arrest / Sudden cardiac death (SCD)

RARE EVENT: children / young adults

- CDC estimate: 1,500 persons < 25yr of age die each year (SCD)
- Population data: general or athlete

UNCERTAIN : Effect of exercise / athletic activity

- THEORY: increased myocardial demand ?

Cardiac Output = Heart Rate x Stroke Volume
Oxygen Delivery = CO x arterial Oxygen Content

- SV: Structural CHD (obstruction), Myopathy, Ventricular function
- HR: Arrhythmia
- CaO2: pulmonary disease (alveolar/diffusion), altitude, CHD (shunts)

ISCHEMIA

Sudden Cardiac Death - Population Data

King County ER, WA (1989-2009)

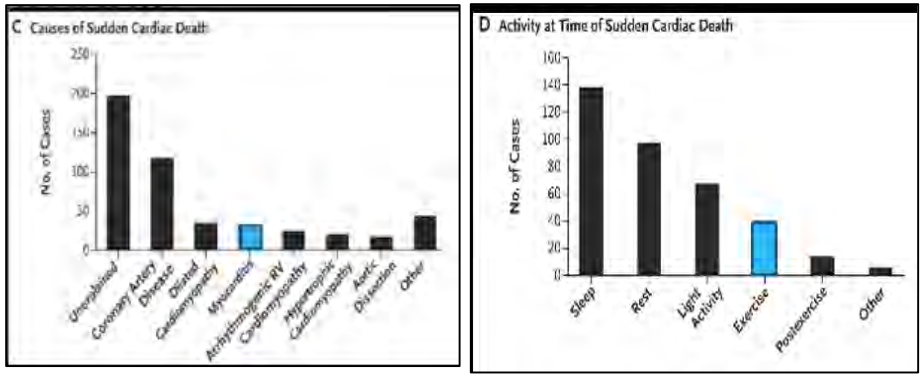
- N=361 (221 deaths), 0-35yo
- autopsy records
- 2-11% myocarditis, age dependent
- 25% within 1 hour of exercise

King County ER Cardiac Arrest Database, 1980-2009

Age (yrs)	%	Most Common Cause
0-2	84	Congenital anomalies
3-13	21	Congenital anomalies
14-24	23	Arrhythmia
25-35	43	Coronary artery disease *

Australia/NZ (2010-2012)

- N=490, 1-35yo
- clinical, demographic, autopsy data
- 15% during/after exercise



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Incidence, causes, and survival trends from cardiovascular-related sudden cardiac arrest in children and young adults 0 to 35 years of age: a 30-year review. Circulation. 2012. Sept 11;126(11):1363-72

Sudden Cardiac Death in Young Athletes

- **WHEN IT HAPPENS:** ***tragic & highly visible event***
- "Sudden Deaths in Young Competitive Athletes, Analysis of 1866 Deaths in the United States"
  - 1980-2006, US athletes, 38 sports
- US National Registry of SCD in Athletes (Minneapolis Heart Institute)
  - 19+/- 6yrs of age; 54% in high school students
  - 66 deaths/year
  - **Top causes: 56% cardiovascular disease,** 22% blunt trauma, 2% heat stroke
  - **Top 4: HCM, CA, myocarditis, Arrythmia**

Maron BJ. Sudden Deaths in Young Competitive Athletes, Analysis of 1866 Deaths in the United States, 1980-2006. Circulation 2009

Guidance (noun)

1. advice or information aimed at resolving a problem or difficulty, especially as given by someone in authority

2. the directing of the motion or position of something

How About in Vermont?

1. Problem Recognition

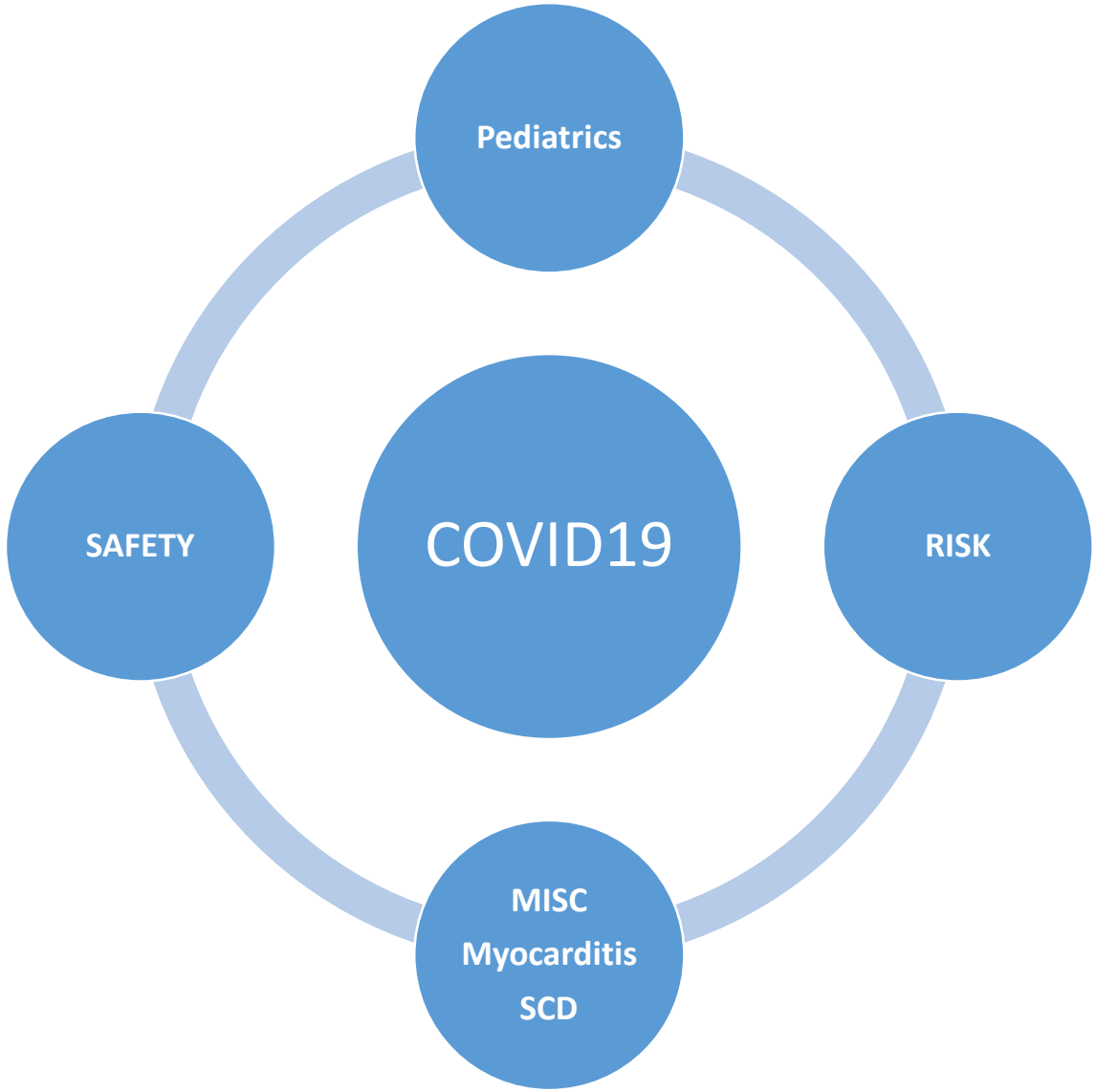
2. Collaboration

1. General Pediatricians
2. Vermont Child Health Improvement
3. UVM Pediatric Cardiology

3. Shared Resources

1. Algorithm
2. Medical Clearance for Primary Care
3. Gradual RTP

4. Continuous Updates/ Improvement



How About in Vermont? …3 Documents to Help!

Algorithm

VCHIP | University of Vermont Children's Hospital — Current as of June 13, 2021

CARDIAC SCREENING IN PEDIATRIC PATIENTS AFTER COVID19 INFECTION

Children >5yo and adolescents participating in and/or returning to physical activity*:
>10 days after positive COVID19 test
AND
If Asymptomatic/Mild: Symptom-Free** >24hr off Fever-Reducing Medications OR
If Moderate: Symptom-Free** >10 days off Fever-Reducing Medications

- **ASYMPTOMATIC or MILD** — <4 days fever >100.4F and <1 week of myalgia, chills, lethargy
  - Primary care medical clearance protocol ****
- **MODERATE** — >4 days fever >100.4F; > week of myalgia, chills, or lethargy; or a non-ICU hospital stay; no evidence of MIS-C
  - Age <12yrs ***
    - Primary care medical clearance protocol
    - ECG prior to participation
      - Normal ECG
        - Primary care medical clearance protocol ****
      - Abnormal ECG
        - Pediatric cardiology evaluation + testing based on ECG
          - Concern for myocarditis
  - Age >12yrs +/or high intensity sports or supervised/school sports or athletic programs
- **SEVERE** — ICU hospital stay +/or intubation or MIS-C (Multi-Inflammatory Syndrome in Children)
  - Pediatric cardiology evaluation and testing
    - Myocarditis return to play guidelines: Exercise restriction x 3-6 mos, required cardiology clearance (Tests: ECG, Echo, 24Hr Holter, exercise stress test + cardiac MRI)

Adapted from the American College of Cardiology (ACC) and American Academy of Pediatrics, reviewed by UVMMC Pediatric Cardiology March 3, 2021.
https://www.acc.org/latest-in-cardiology/articles/2020/07/01/13/returning-to-play-after-coronavirus-infection
https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-interim-guidance-return-to-sports/

Guidance is informed by expert opinion and may apply to individuals who participate in any physical activity, organized or not, including but not limited to organized sports and physical education class. Clinical judgment is strongly encouraged in support of a shared decision making process between health care provider and family. Evaluation may also be considered if COVID19 diagnosis was made within the past 3 mos.
Symptom-free excludes loss of taste and smell, which may persist.
ECG <12yrs may be considered in certain circumstances (eg, higher intensity sports) as determined by family/clinician.
Clearance/exclusion possibilities for asymptomatic/mild category with in-person visit, assessment of cardiac symptoms/concerns. For children and adolescents with history of COVID19 who have already advanced physical activity/sports on their own without development of cardiac signs/symptoms (unaware history of COVID19 in medical record).

Medical Clearance

VCHIP | University of Vermont Children's Hospital — Current as of June 13, 2021

MEDICAL CLEARANCE FOR RETURN-TO-PLAY AFTER COVID-19 INFECTION

Name: DOB:

Date of Positive COVID Test:
Date of Symptom Onset: N/A if asymptomatic:
Date of Last Symptoms: N/A if asymptomatic:
Date of Medical Evaluation: _____

Criteria for Return*:
- ☐ >10 days have passed since tested positive for COVID19
- ☐ Symptom-free (excluding loss of taste/smell) >24hr off fever-reducing medications (for COVID19 with asymptomatic/mild symptoms) OR
  Symptom-free excluding loss of taste/smell >10 days off fever-reducing medications (for COVID19 with moderate symptoms)
- ☐ Has had a normal ECG (required if >12 years of age and history of moderate symptoms with COVID19 illness)
- ☐ No history of ICU hospitalization, intubation, or MIS-C
- ☐ 14-element AHA cardiac screening** reviewed. Telemedicine evaluation permitted for asymptomatic/mild cases with in-person visit recommended if any positive cardiac symptoms/concerns reported. (Further cardiac work up required if any bolded screening questions positive).

Yes	No	
		Chest pain/tightness/pressure related to exertion
		Unexplained syncope or near-syncope (not including vasovagal cause)
		Excessive exertional, unexplained shortness of breath/fatigue or new onset palpitations with exercise
		New heart murmur on exam or persistent tachycardia
		Abnormal pulses on exam including femoral pulses (to exclude aortic coarctation)
		History of elevated systemic blood pressure
		Prior restriction from participation in sports
		Prior cardiac testing ordered by a physician
		Family history of premature death <50yrs due to heart disease
		Disability due to heart disease in a close relative <50yo
		Family history of HCM/Dilated cardiomyopathy, long QT/fon channelopathies, Marfan syndrome, significant arrhythmias, or genetic cardiac conditions
		History of heart murmur (excluding innocent/resolved murmurs)
		Physical stigmata of Marfan Syndrome
		Abnormal brachial artery blood pressure in sitting position on exam

https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-interim-guidance-return-to-sports/
***14-Element AHA Screening Checklist adapted from Maron BJ, et al. Journal of the American College of Cardiology, 2014. Reviewed by UVMMC Pediatric Cardiology March 3, 2021.*

Clearance Determination:
- ☐ Student/athlete has already advanced physical activity/sports on their own without development of cardiac signs/symptoms and is cleared participate in activities without restriction *(history of COVID19 noted in medical record)*.
- ☐ Student/athlete HAS satisfied the above criteria and IS cleared to start the return to activity progression *(return to activity as tolerated if <12yo; >7-day graduated return protocol if >12yo +/or high intensity or supervised/school sports or athletic programs)*.
- ☐ Student/athlete HAS NOT satisfied the above criteria and IS NOT cleared to return to activity progression.

Medical Office Information:
Printed Clinician Name: Clinician Signature:
Office Phone number: _____ Office Fax number: _____
Office Address: _____

Return-to-Play

VCHIP | University of Vermont Children's Hospital — Current as of June 13, 2021

GRADUATED RETURN-TO-PLAY AFTER COVID19 INFECTION*

Indications: *Age >12yo +/or High Intensity or Supervised/School Sports or Athletic Programs (not required if already advanced physical activity/sports on own without development of cardiac signs/symptoms)*

Name: DOB:

Date of Medical Clearance to begin post-COVID19 Return-To-Play:

Once medically cleared, students/athletes should complete the suggested return–to-play progression without development of chest pain/tightness, palpitations, lightheadedness, significant exertional dyspnea, pre-syncope, or syncope. If any of these symptoms develop, the patient should be referred back to the evaluating provider who signed the medical form.

Calculating Max Heart Rate: 220 – Your Age = Predicted Max Heart Rate (beats/min)

MINIMUM 7-DAY PROGRESSION:

STAGE 1 : Day 1 and Day 2 (2 Days Minimum) - 15min/day or less
Light activity (walking, jogging, stationary bike). NO resistance training.
Intensity < 70% maximum heart rate.

DATE	ACTIVITY	SYMPTOMS

STAGE 2 : Day 3 (1 Day Minimum) – 30min/day or less
Add simple movements activities (running drills) at intensity < 80% maximum heart rate.

DATE	ACTIVITY	SYMPTOMS

STAGE 3 : Day 4 (1 Day Minimum) – 45min/day or less
More complex training at intensity < 80% maximum heart rate. May add light resistance training.

DATE	ACTIVITY	SYMPTOMS

STAGE 4 : Days 5 and Day 6 (2 Days Minimum) – 60min/day or less
Normal training activity at intensity < 80% maximum heart rate.

DATE	ACTIVITY	SYMPTOMS

STAGE 5 : Return to full activity/participation.

DATE	ACTIVITY	SYMPTOMS

Return-To-Play protocol adapted from Elliott M, et al. Infographic. British Journal of Sports Medicine, 2020. Reviewed by UVMMC Pediatric Cardiology March 3, 2021.

Date Cleared for Full Participation by School/Sports Personnel:

Printed name: _____ Signature: _____

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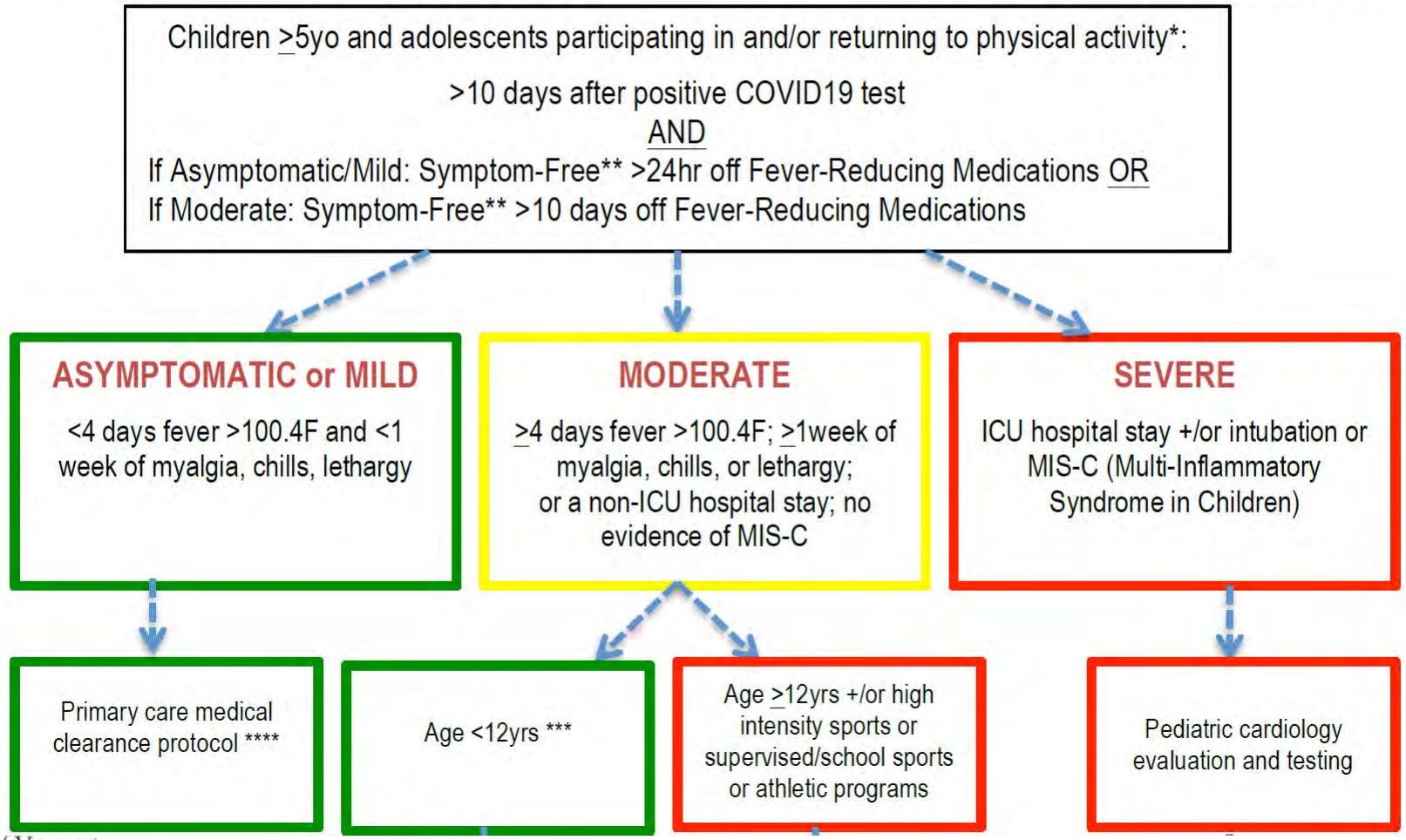
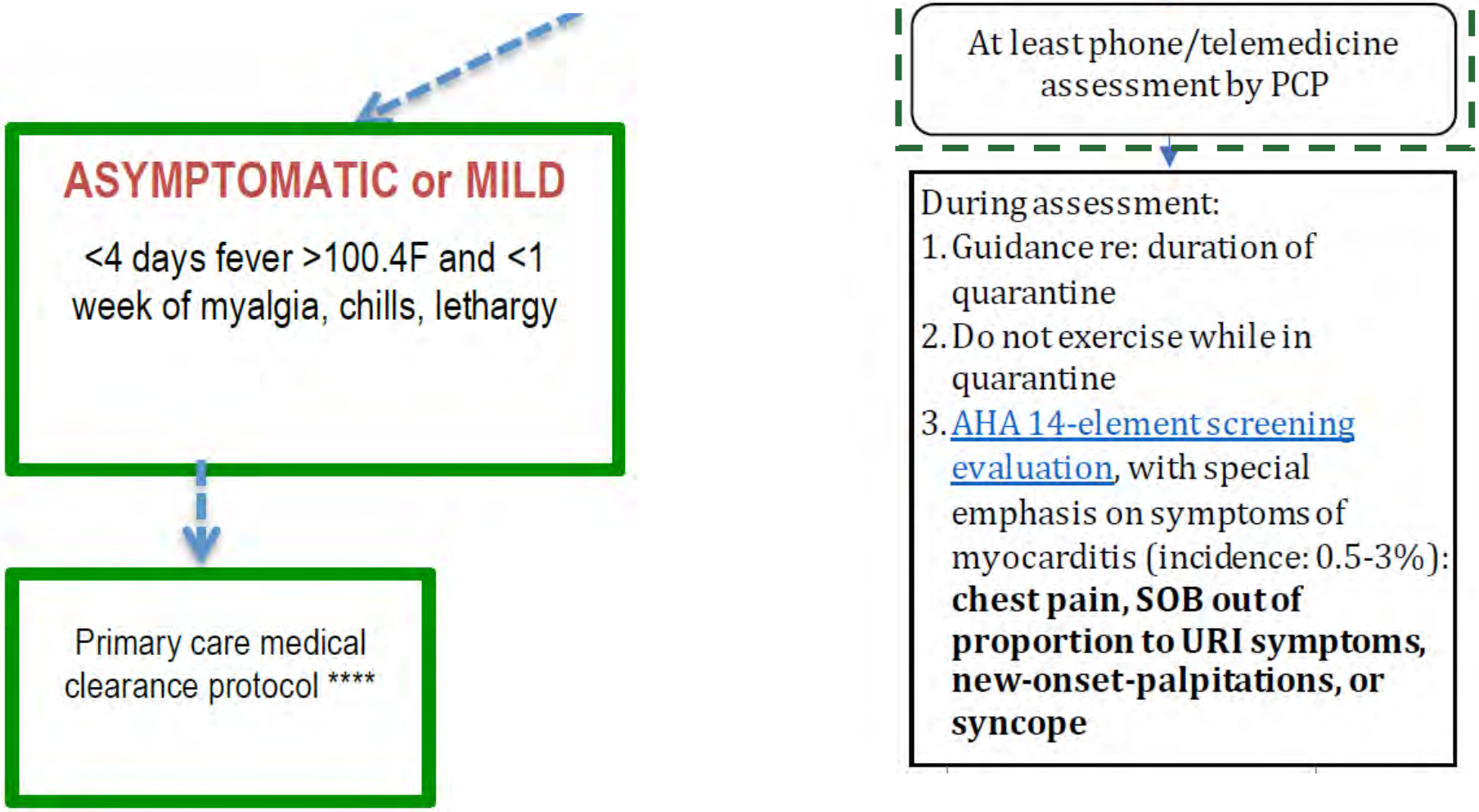
CARDIAC SCREENING IN PEDIATRIC PATIENTS AFTER COVID19 INFECTION



Asymptomatic/Mild



Clearance: 14 point AHA

☐ 14-element AHA cardiac screening** reviewed. Telemedicine evaluation permitted for asymptomatic/mild cases with in-person visit recommended if any positive cardiac symptoms/concerns reported. (Further cardiac work up required if any bolded screening questions positive).

Yes	No	
☐	☐	**Chest pain/tightness/pressure related to exertion**
☐	☐	**Unexplained syncope or near-syncope (not including vasovagal cause)**
☐	☐	**Excessive exertional, unexplained shortness of breath/fatigue or new onset palpitations with exercise**
☐	☐	**New heart murmur on exam or persistent tachycardia**
☐	☐	**Abnormal pulses on exam including femoral pulses (to exclude aortic coarctation)**
☐	☐	History of elevated systemic blood pressure
☐	☐	Prior restriction from participation in sports
☐	☐	Prior cardiac testing ordered by a physician
☐	☐	Family history of premature death <50yrs due to heart disease
☐	☐	Disability due to heart disease in a close relative <50yo
☐	☐	Family history of HCM/Dilated cardiomyopathy, long QT/ion channelopathies, Marfan syndrome, significant arrhythmias, or genetic cardiac conditions
☐	☐	History of heart murmur (excluding innocent/resolved murmurs)
☐	☐	Physical stigmata of Marfan Syndrome
☐	☐	Abnormal brachial artery blood pressure in sitting position on exam

*https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-interim-guidance-return-to-sports/

**14-Element AHA Screening Checklist adapted from Maron BJ, et al. Journal of the American College of Cardiology, 2014. Reviewed by UVMMC Pediatric Cardiology March 3, 2021.*

7 Day Return to Play

Gradual 7 Day Return to Play

- **Supervised**
- **Attention to progression &**

  Cardiovascular symptoms

MINIMUM 7-DAY PROGRESSION:

STAGE 1 : Day 1 and Day 2 (2 Days Minimum) - 15min/day or less Light activity (walking, jogging, stationary bike). NO resistance training. Intensity ≤ 70% maximum heart rate.		
DATE	ACTIVITY	SYMPTOMS

STAGE 2 : Day 3 (1 Day Minimum) – 30min/day or less Add simple movements activities (running drills) at intensity ≤ 80% maximum heart rate.		
DATE	ACTIVITY	SYMPTOMS

STAGE 3 : Day 4 (1 Day Minimum) – 45min/day or less More complex training at intensity ≤ 80% maximum heart rate. May add light resistance training.		
DATE	ACTIVITY	SYMPTOMS

STAGE 4 : Days 5 and Day 6 (2 Days Minimum) – 60min/day or less Normal training activity at intensity ≤ 80% maximum heart rate.		
DATE	ACTIVITY	SYMPTOMS

STAGE 5 : Return to full activity/participation.		
DATE	ACTIVITY	SYMPTOMS

*Return-To-Play protocol adapted from Elliott N, et al. Infographic. British Journal of Sports Medicine, 2020. Reviewed by UVMMC Pediatric Cardiology March 3, 2021.

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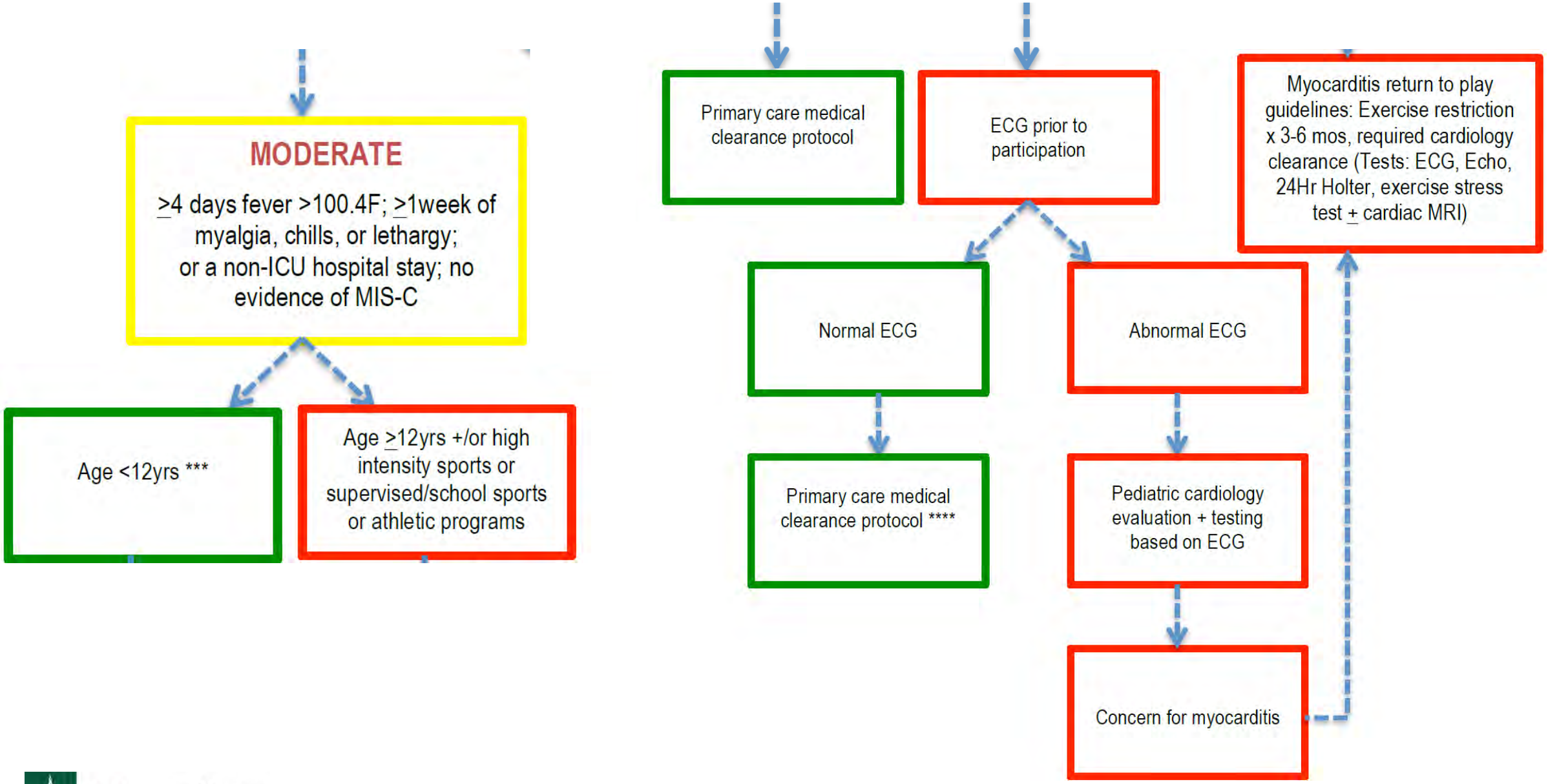
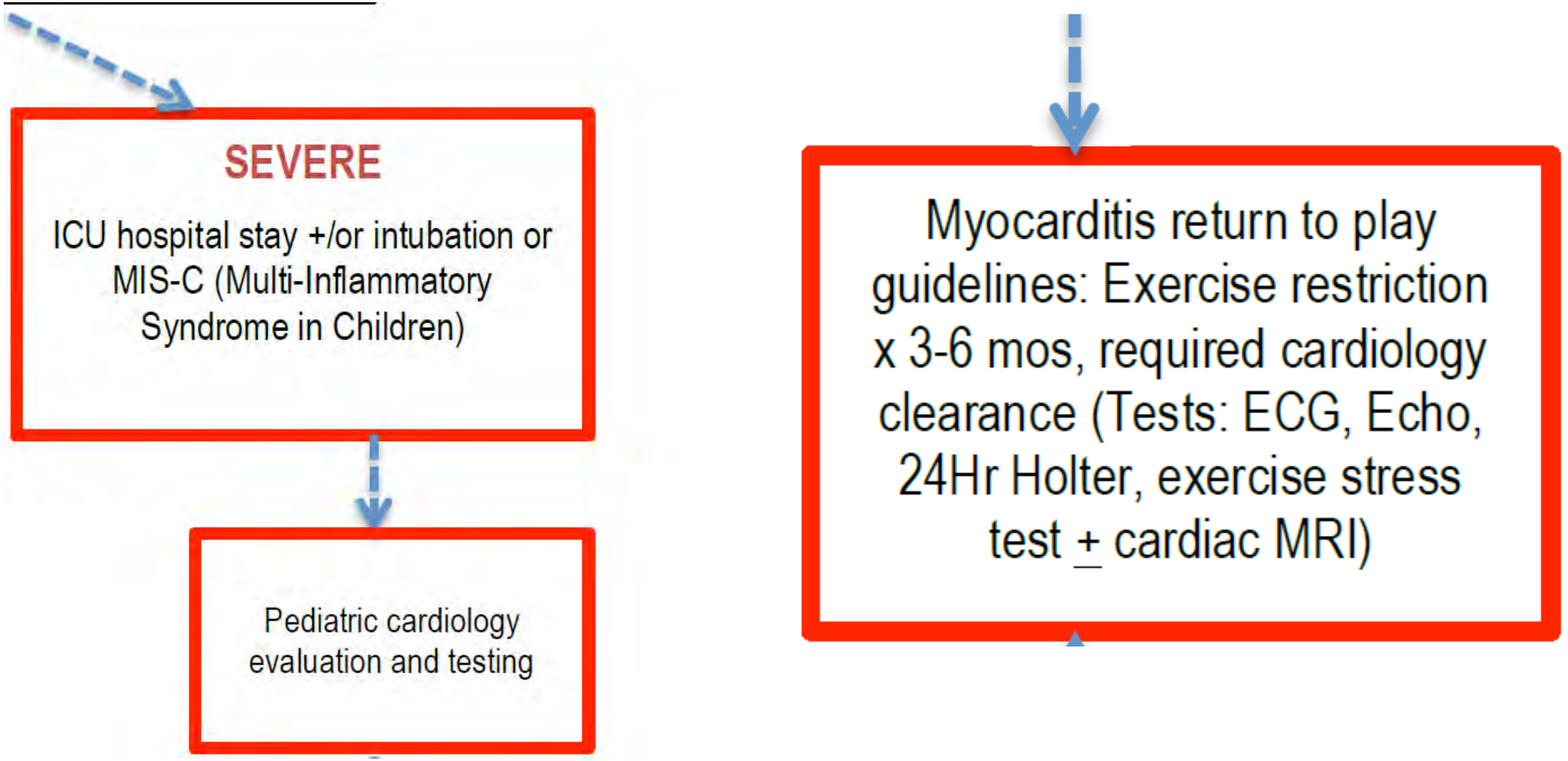
Moderate


MODERATE
≥4 days fever >100.4F; ≥1week of myalgia, chills, or lethargy; or a non-ICU hospital stay; no evidence of MIS-C
Age <12yrs ***
Age ≥12yrs +/or high intensity sports or supervised/school sports or athletic programs
Primary care medical clearance protocol
ECG prior to participation
Normal ECG
Primary care medical clearance protocol ****
Abnormal ECG
Pediatric cardiology evaluation + testing based on ECG
Concern for myocarditis
Myocarditis return to play guidelines: Exercise restriction x 3-6 mos, required cardiology clearance (Tests: ECG, Echo, 24Hr Holter, exercise stress test ± cardiac MRI)

Severe


SEVERE
ICU hospital stay +/or intubation or MIS-C (Multi-Inflammatory Syndrome in Children)
Pediatric cardiology evaluation and testing
Myocarditis return to play guidelines: Exercise restriction x 3-6 mos, required cardiology clearance (Tests: ECG, Echo, 24Hr Holter, exercise stress test ± cardiac MRI)

Recent AAP Updates in RTP Management

BOX A: Additional Guidance on Returning to Play

When should children and adolescents return to play?

1) Completed quarantine and minimum amount of symptom free time has passed
2) Can perform all activities of daily living
3) No concerning signs/symptoms

At what pace should children and adolescents return to play?

4) <12yo: progress according to own tolerance
5) 12+: gradual return to physical activity (Box B); should be done over a 7-day minimum and may extend duration for children with moderate symptoms

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

Recent AAP Updates in RTP Management

1. Telemedicine

- telemedicine permitted of asymptomatic/mild
- in-person visit recommended if any positive cardiac symptoms/concerns reported (chest pain, SOB, new-onset palpitations, or syncope)

2. No further evaluation is needed, if…

- children/adolescents with history of COVID19 who have already advanced physical activity/sports on their own without development of cardiac signs/symptoms
- Recommendation: patients update their medical home to document h/oCOVID19

3. EKG: AAP suggests an EKG for all moderate cases, and ACC moderate risk by age (≥12yrs)

4. Vaccine Benefits >>>> Risk of COVID

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Home News

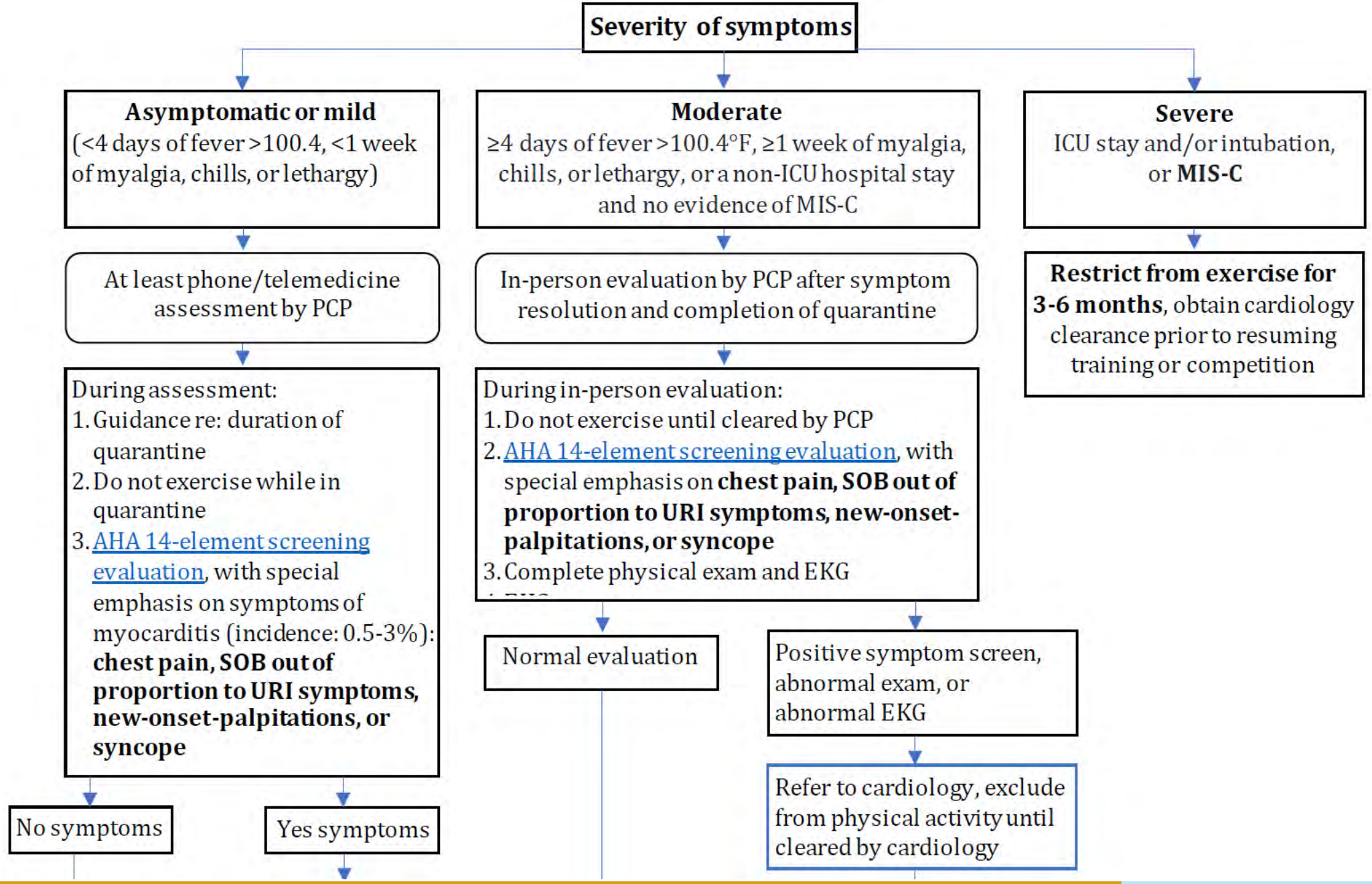
COVID-19 Interim Guidance: Return to Sports and Physical Activity

Home / Critical Updates on COVID-19 / COVID-19 Interim Guidance / COVID-19 Interim Guidance: Return to Sports and Physical Activity

1. COVID-19 Interim Guidance: Return to Sports and Physical Activity (aap.org)
2. RTPalgorithm FINAL 9-21-2021.pdf (aap.org)

…over the past year, the AAP has provided quarterly updates.

AAP Algorithm



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VERMONT CHILD HEALTH IMPROVEMENT PROGRAM

Questions

1. What is the first step in providing cardiac clearance for patients after COVID-19 infection?

   A. Categorize severity of COVID-19 infection
   B. Obtain ECG
   C. Obtain negative COVID test
   D. Perform telemedicine evaluation

2. What amount of time is recommended for progression of activity for return to play?

   A. 3 days
   B. 1 week
   C. 2 weeks
   D. 4 weeks

3. Prior to considering cardiac clearance, what is the recommended time frame for athletic restriction after myocarditis illness?

   A. 1-2 weeks
   B. 3-6 weeks
   C. 3-6 months
   D. 7-12 months

Questions

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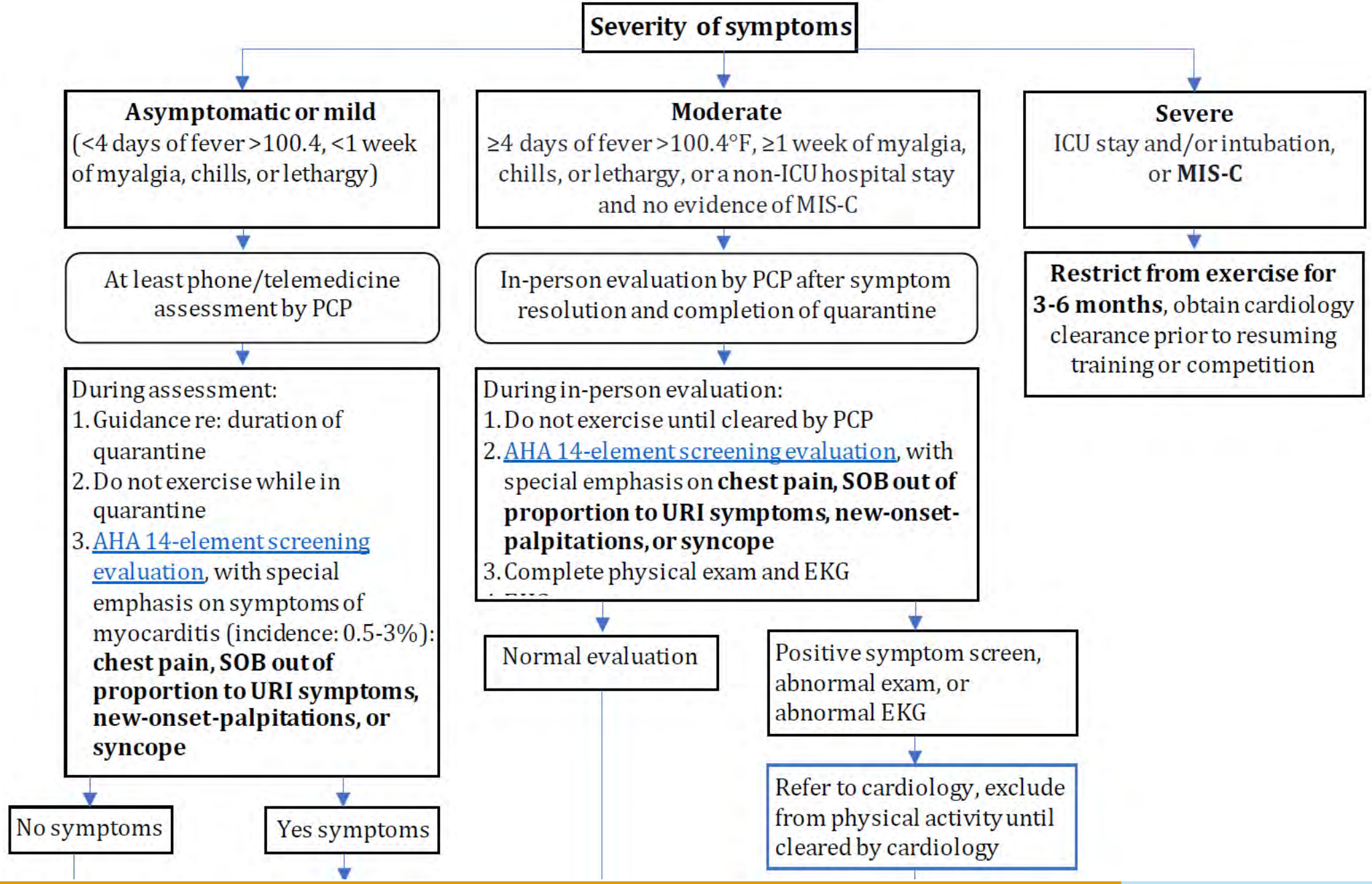

Asymptomatic/Mild

Asymptomatic or mild
(<4 days of fever >100.4, <1 week of myalgia, chills, or lethargy)

At least phone/telemedicine assessment by PCP

During assessment:
1. Guidance re: duration of quarantine
2. Do not exercise while in quarantine
3. AHA 14-element screening evaluation, with special emphasis on symptoms of myocarditis (incidence: 0.5-3%): **chest pain, SOB out of proportion to URI symptoms, new-onset-palpitations, or syncope**

No symptoms

Yes symptoms

In-office visit with complete PE, consider EKG, **post-quarantine**

Normal evaluation

Positive symptom screen, abnormal exam, or abnormal EKG

Cleared to return to play
(Refer to Box A)

Refer to cardiology, exclude from physical activity until cleared by cardiology then return to play (Box B)

Moderate

Moderate
≥4 days of fever >100.4°F, ≥1 week of myalgia, chills, or lethargy, or a non-ICU hospital stay and no evidence of MIS-C

In-person evaluation by PCP after symptom resolution and completion of quarantine

During in-person evaluation:
1. Do not exercise until cleared by PCP
2. AHA 14-element screening evaluation, with special emphasis on **chest pain, SOB out of proportion to URI symptoms, new-onset-palpitations, or syncope**
3. Complete physical exam and EKG

Normal evaluation

Positive symptom screen, abnormal exam, or abnormal EKG

Refer to cardiology, exclude from physical activity until cleared by cardiology

Gradual return to play (Box B) only after:
1. 10 days since positive test result
2. At least 10 days of symptom resolution off fever-reducing medications

Algorithms: Vermont & AAP: *Key Difference*

- Moderate disease: should I get an EKG?
- AAP: Yes.
- *Vermont* adopts the ACC recommendation:
  - EKG for 12yrs and older, based on sports intensity
- Either would really be fine…this could be based on clinical resources, case details, and your clinical judgement.

Severe

No Changes.

Recent AAP Updates

Other Recent updates: June - September

1. **If the patient has already advanced to physical activity on their own and is without abnormal cardiovascular signs/ symptoms, then no further evaluation is necessary.**

2. **COVID19 disease history should be documented.**

Return to play after COVID-19 infection

Adapted from the *AAP COVID-19 Interim Guidance: Return to Sports and Physical Activity* by Anna Zuckerman, MD, FAAP and Jonathan Flyer, MD, FAAP, FACC.

Quick Hits!

BOX A: Additional Guidance on Returning to Play

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Quick Hits!

BOX B: Gradual Return to Play

(Adapted from Elliott N, et al, infographic, British Journal of Sports Medicine, 2020; copied from AAP Policy statement)

Stage 1: Day 1 and Day 2 – (2 Days Minimum) – 15 minutes or less: Light activity (walking, jogging, stationary bike), intensity no greater than 70% of maximum heart rate. NO resistance training.

Stage 2: Day 3 – (1 Day Minimum) – 30 minutes or less: Add simple movement activities (eg. running drills) – intensity no greater than 80% of maximum heart rate.

Stage 3: Day 4 – (1 Day Minimum) – 45 minutes or less: Progress to more complex training – intensity no greater than 80% maximum heart rate. May add light resistance training.

Stage 4: Day 5 and Day 6 – 2 Days Minimum) – 60 minutes: Normal training activity – intensity no greater than 80% maximum heart rate.

Stage 5: Day 7 – Return to full activity/participation (ie, contests/competitions).

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