Cardiac Implications of COVID-19 and Return to Play Recommendations for Pediatric Populations

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24 JUN 2021

1355 - 1455

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Navy Lt. Movicque King, M.D. is a current PGY-3 Pediatrics Resident at Naval Medical Center Portsmouth (NMCP). She is as graduate of Georgetown University where she received her Bachelors of Science in Human Science from the School of Nursing and Health Studies and earned her medical degree from Eastern Virginia Medical School in 2016. After completing her intern year in Pediatrics at NMCP, she served as a General Medical Officer at the Department of Defense's (DoD) largest substance abuse rehabilitation program at NMCP for two years. During this time she also served as one of the Primary Care Providers for NMCP's Warrior Concussion Clinic participating in multi-disciplinary care of expeditionary forces with history of concussive exposure and traumatic brain injury (TBI) symptoms. LT King returned to residency in 2019 and has held many leadership positions within the residency program. After graduation, she will serve as a General Pediatrician, providing care to DoD dependent children and adolescents at Navy Medicine Readiness Training Unit (NMRTU) Kings Bay.

Disclosures

- Navy Lt. Movicque King, M.D. has no relevant financial or non-financial relationships to disclose relating to the content of this activity.
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Learning Objectives

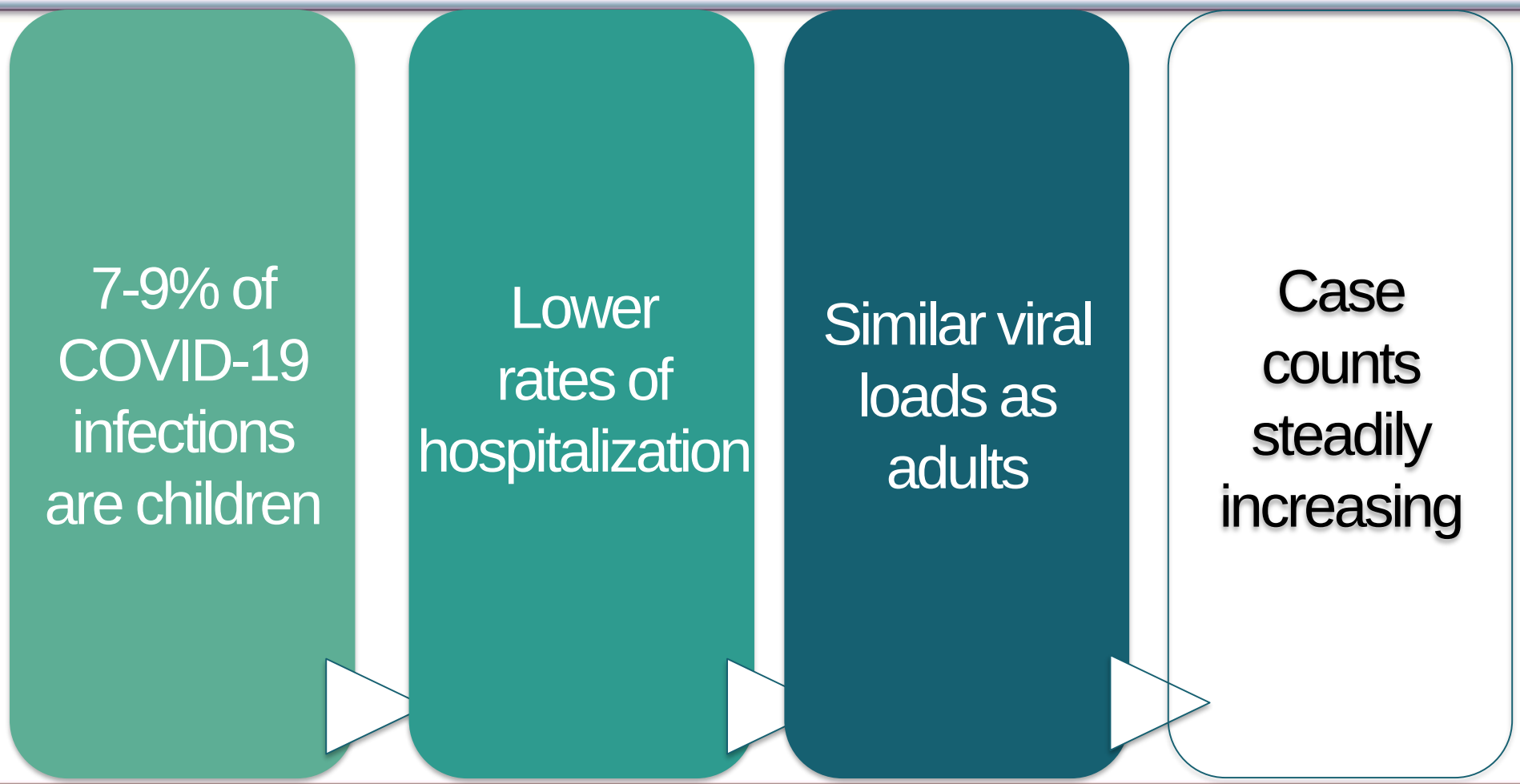
At the conclusion of this activity, participants will be able to:

1. **Describe** unique presentations of SARS-CoV-2 in pediatric patients.
2. **Explain** known cardiac complications of COVID-19 in the pediatric population.
3. **Summarize** current American Academy of Pediatrics (AAP) recommendations on Return to Play after COVID-19 infection.

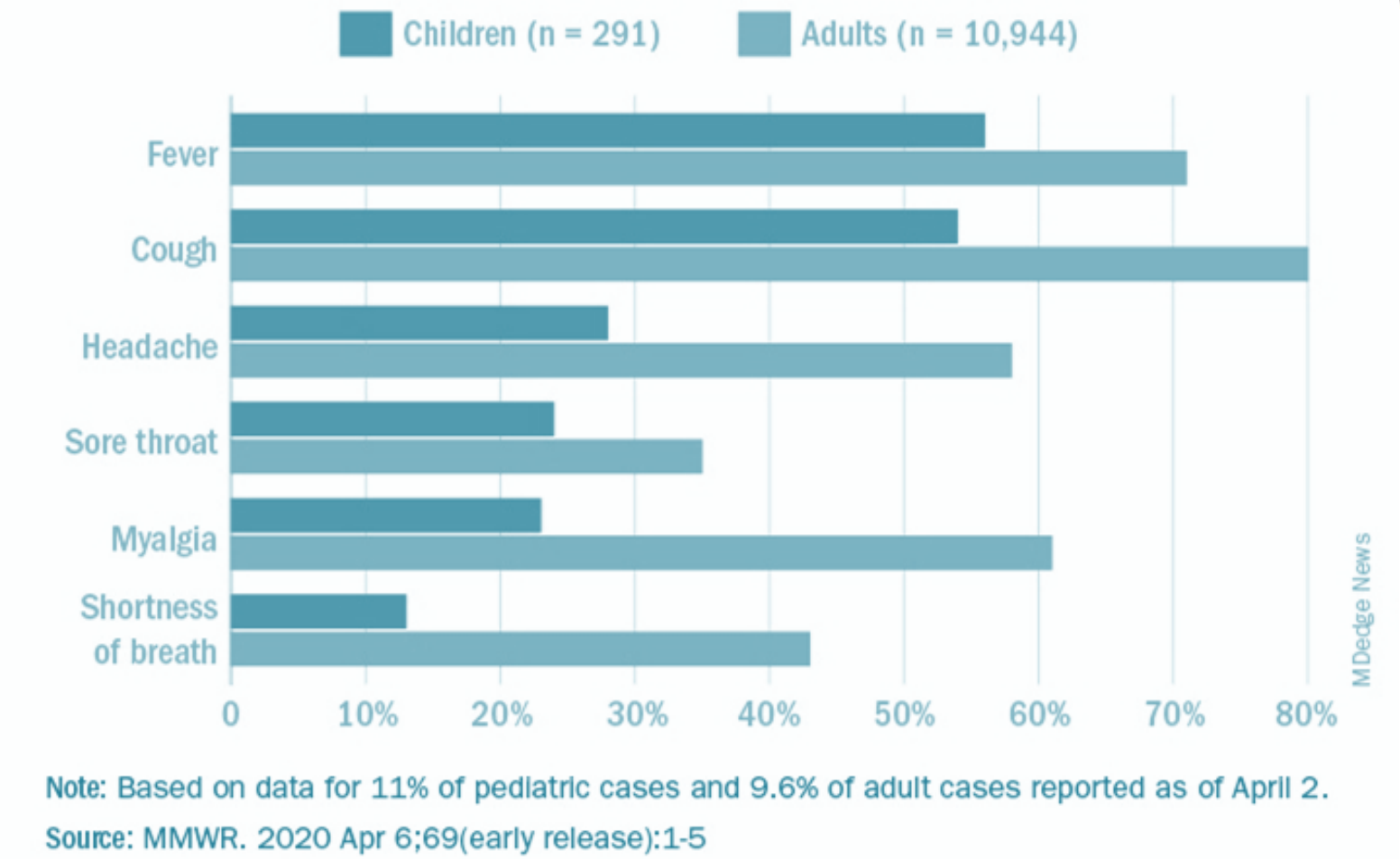
SARS-CoV-2 (COVID-19)

- December 2019: Novel coronavirus first identified in Wuhan, China
- Person-to-person transmission via respiratory droplets
- Broad spectrum of illness severity from mild (upper respiratory infection) URI symptoms to severe acute respiratory distress syndrome (ARDS**)**

COVID-19 in Children and Adolescents



COVID-19 Symptoms: Children vs. Adults



(CDC COVID-19 Response Team, 2020)

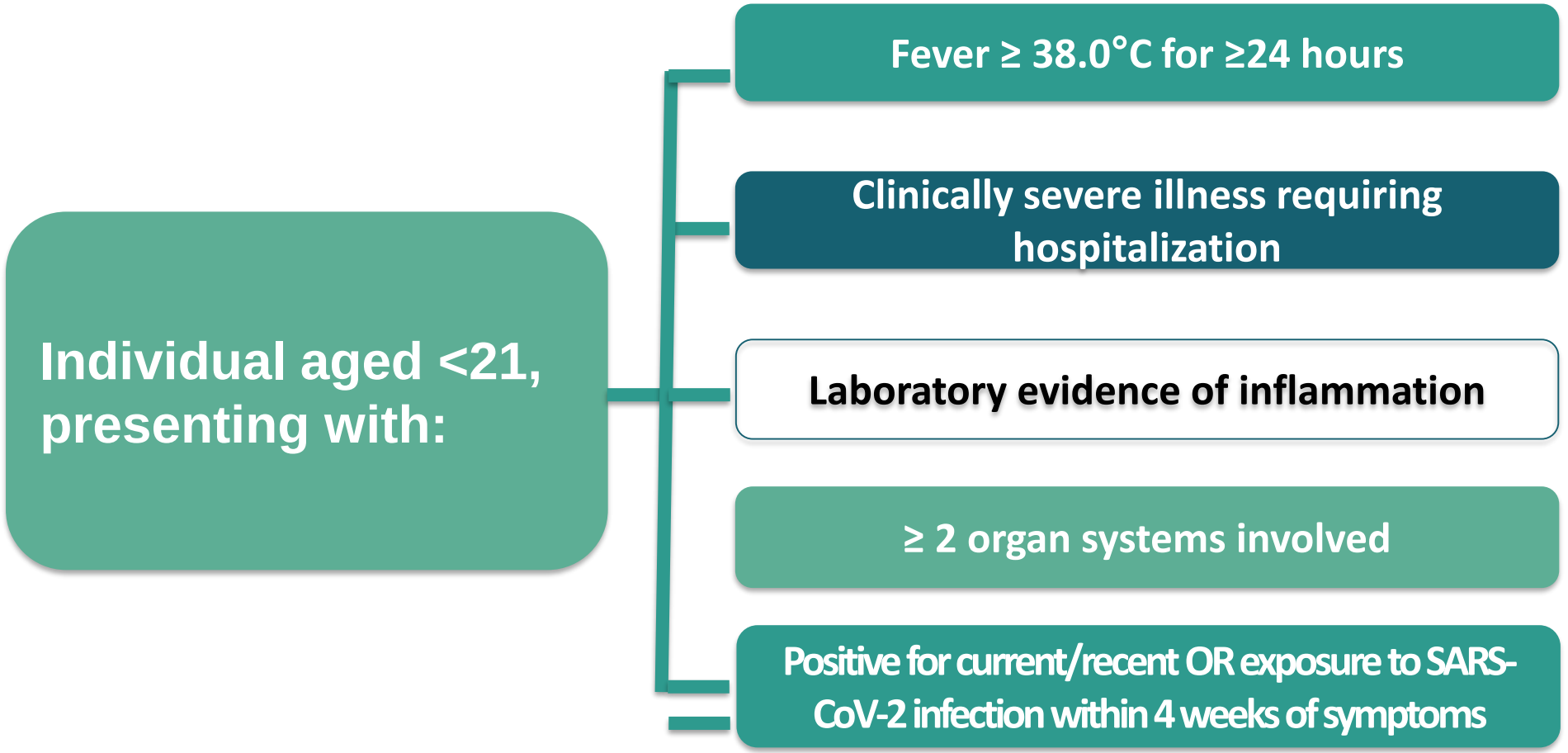
COVID-19 Symptoms in Children

- Can be non-specific
- ~16% are asymptomatic
- Some present similarly to adults - respiratory failure, - myocarditis, - shock, - acute renal failure, - coagulopathy, and - multi-organ system failure.
- Intussusception and diabetic ketoacidosis have been reported
- Multisystem Inflammatory Syndrome in Children (MIS-C)

Multisystem Inflammatory Syndrome in Children (MIS-C)

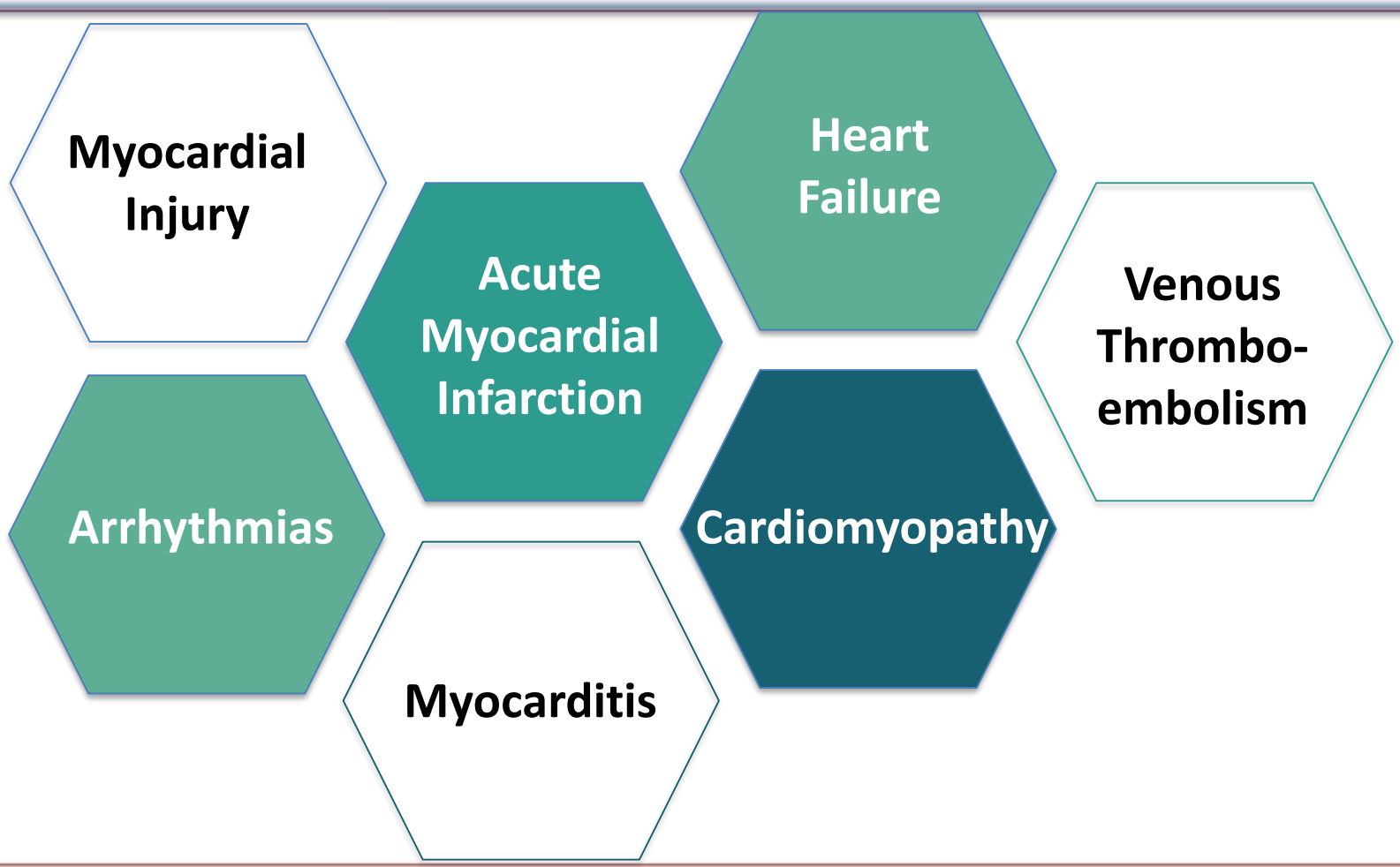
(CDC, 2020)

Multisystem Inflammatory Syndrome in Children (MIS-C)



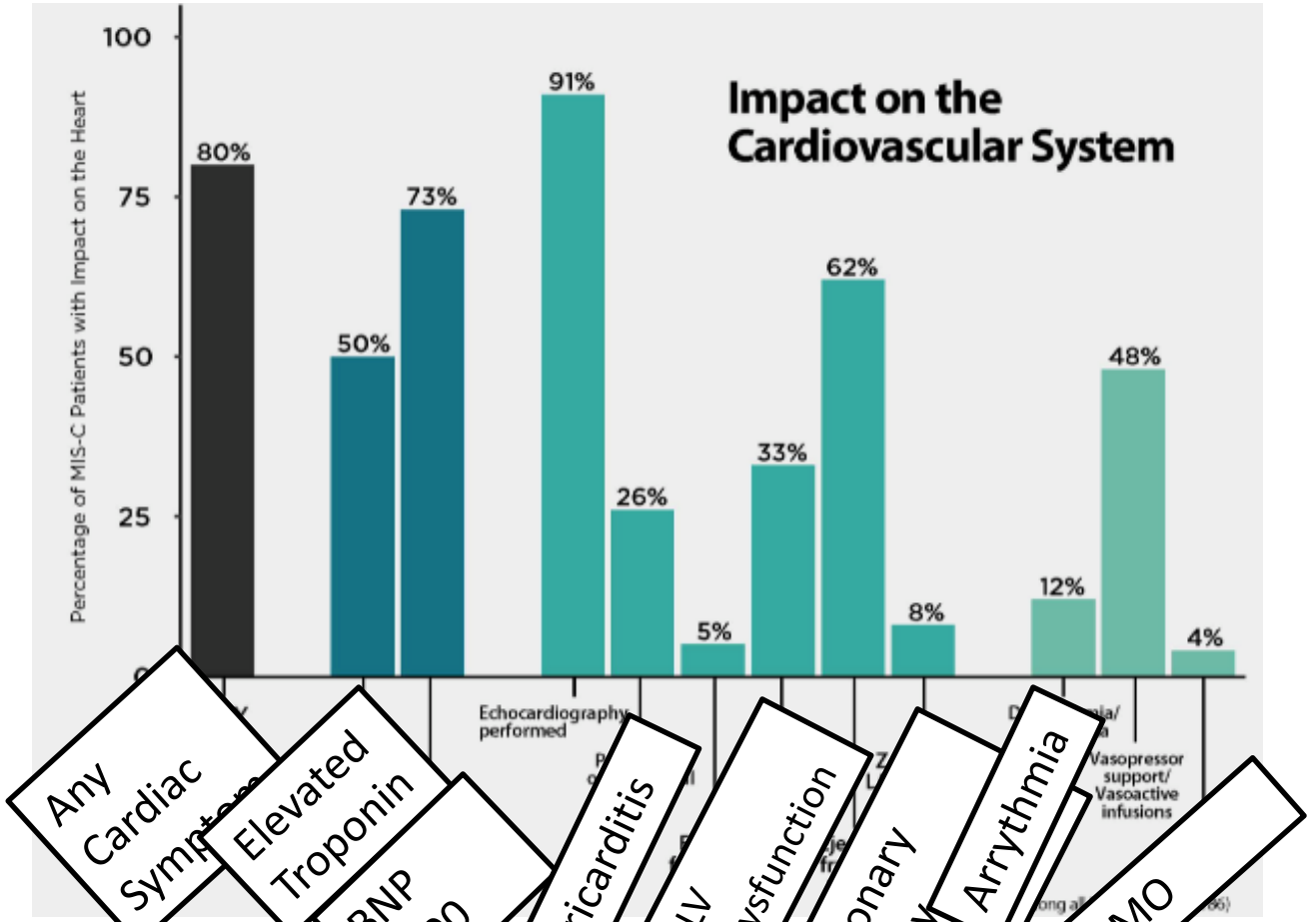
(CDC, 2020)

COVID-19 Cardiac Complications



(CDC, 2020)

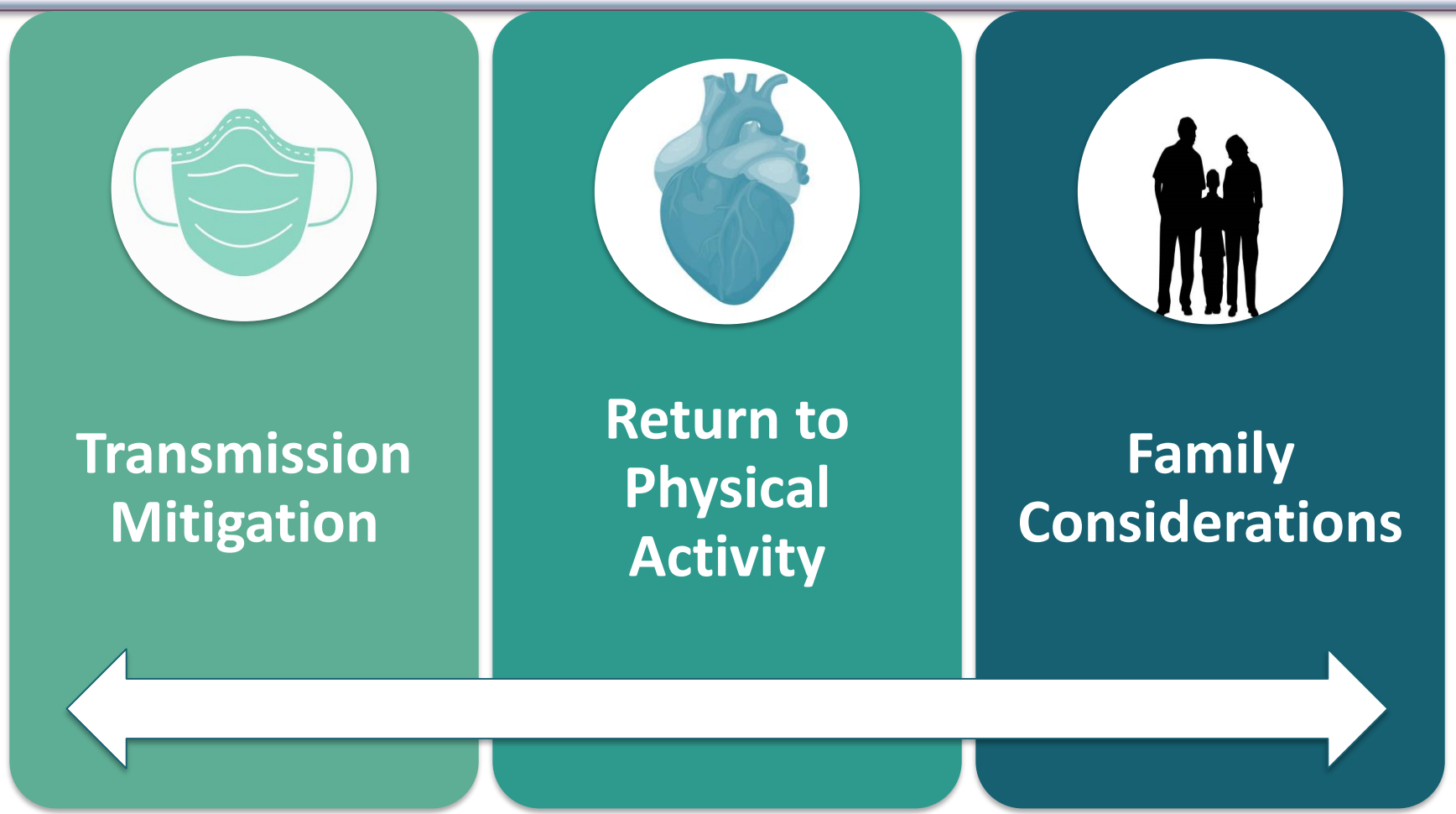
MIS-C and Impact on Cardiovascular System



(CDC, 2020)

"Medically Ready Force…Ready [illegible]cal Force"

Return to Play: Factors to Consider



(AAP, 2021)

American Academy of Pediatrics (AAP) Return to Play Guidelines

Asymptomatic/Mild: <4 days of fever, <1 week of symptoms

- No exercise until cleared by physician
- Use of 14-point American Heart Association (AHA) screening evaluation
- If cardiac sign/symptom screening and physical exam normal, **no further testing**

(AAP, 2021)

AAP Return to Play Guidelines

Moderate: ≥4 days of fever, ≥ 1 week of symptoms, or a non-intensive care unit (ICU) hospital stay

Include electrocardiogram (EKG)

If cardiac sign/symptom screening positive OR EKG abnormal, refer to Cardiology

(AAP, 2021)

AAP Return to Play Guidelines

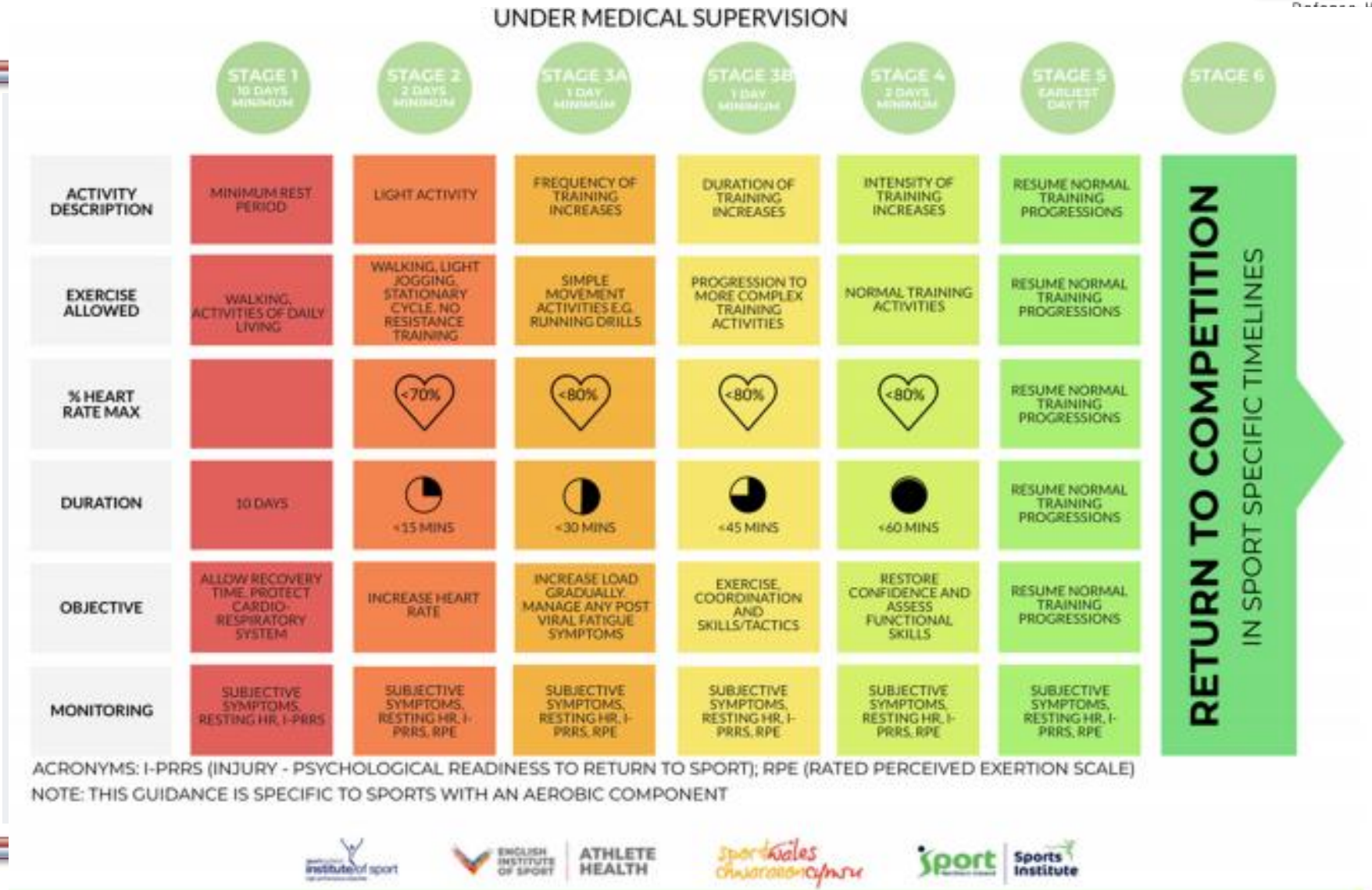
Severe: ICU stay, intubation, or MIS-C

Minimum 3-6 months restriction from sports

Refer to Cardiology for clearance

(AAP, 2021)

Graduated Return to Play



(Elliott et al., 2020)

Recent Publications

Research

JAMA Cardiology | Original Investigation

Prevalence of Inflammatory Heart Disease Among Professional Athletes With Prior COVID-19 Infection Who Received Systematic Return-to-Play Cardiac Screening

Matthew W. Martinez, MD; Andrew M. Tucker, MD; O. Josh Bloom, MD, MPH; Gary Green, MD; John P. DiFiori, MD; Gary Solomon, PhD; Dermot Phelan, MD, PhD; Jonathan H. Kim, MD, MSc; Willem Meeuwisse, MD, PhD; Allen K. Sills, MD; Dana Rowe, BA; Isaac I. Bogoch, MD; Paul T. Smith, MD; Aaron L. Baggish, MD; Margot Putukian, MD; David J. Engel, MD

(Martinez et al., 2021)

Key Takeaways

- For safe return to play after COVID infection:
  - ❑ > 10 days from positive test and 24hrs without fever before considering return to play
  - ❑ Mild to moderate symptoms, routine primary care medicine (PCM) clearance with sports physical (+/- ECG), if cardiac concerns arise, consider referral to Cardiology
  - ❑ Severe COVID symptoms or MIS-C, refer to Cardiology for clearance

Acknowledgements

Air Force Lt. Col. Tracy M. Alderson, M.D., F.A.A.P., F.A.C.C., M.C.

Chief, Pediatric Cardiology Clinic, NMCP

Chief Consultant to the Air Force Surgeon General (AFSG) for Pediatric Cardiology

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