**Syncope/collapse in exercise and Sudden cardiac death**

**Instructor Guide**

**BACKGROUND:** Emergency physicians frequently see patients with syncope. However, the pathologies unique to athletes who collapse or experience syncope are important to understand and keep on the differential. Compounding the complexity of treating this patient population, trained athletes may have EKG findings that would be abnormal or pathologic in non-athletes but represent healthy variants in athletes’ hearts.

In addition, emergency physicians are uniquely poised to perform medical coverage for events and teams, including mass-participation events and athletic competitions. As such, they may see a patient in the field, rather than in the more familiar hospital setting. This provides an opportunity to encounter pathology, some of which rarely arrives in the ED.

**PURPOSE & GOALS:** In this module, the goal is to cover many of the more common and more concerning reasons that athletes collapse during and immediately following athletic activity. Topics included are:

-ECG interpretation in athletes

-Arrhythmogenic Right Ventricular Dysplasia

-Hypertrophic obstructive cardiomyopathy

-Exercise collapse

-Sickle cell trait

-Fluid overload/Volume depletion

-Sodium metabolism

-Temperature-related Illness

**EDUCATIONAL OBJECTIVES:**

1. List the differential diagnosis of the collapsed athlete
2. Discuss the potential complications of sickle cell trait in athletes
3. Identify normal variants on EKGs of trained athletes
4. Identify pathological EKG findings that suggest cardiomyopathies in athletes
5. Identify pathological EKG findings that suggest primary dysrhythmias in athletes

**RESOURCE FILES:**

1. PowerPoint Presentation

-This can be presented if a traditional didactics format is desired. This is best suited for a large group didactics format. It is a very interactive presentation with prompts and talking points included in the “comments” box.

2. Interactive Cases

- Working through these cases is an alternative format for presenting this material. This is better suited to a small group setting rather than a large lecture audience.

1. Summary Handout

-This document summarizes and condenses the critical information for the session. It is intended to be a resource for instructors and learners alike. It can be used as material for review prior to the session, reference material during the session, or as a resource for trainees to keep after the session.

4. Pre/Post Quiz

-These questions can be given before and after the session to track learning and to augment pre work.

-answers: 1.c 2.b 3.a 4.b 5.d

**TOTAL MODULE DURATION:**

Material can be presented two ways:

-PowerPoint presentation (90 minutes)

-best suited for large lecture-style didactics

-case discussion (60 minutes)

-best suited for small group format

**REQUIRED RESOURCES:**

-Virtual (remote platform such as Zoom, Teams, WebEx, Skype) or in-person (computer and projector) platform for presenting the electronic course material

-Method for distributing the pre/post quiz and the summary handout (print versus electronic)

**DESCRIPTION OF MODULE:**

Intended Audience

-This curriculum is best suited to a senior medical student or resident-level learner, although it would also be relevant for a Primary Care Sports Medicine fellow.

Pre-reading

- International criteria for electrocardiographic interpretation in athletes: consensus statement [<https://bjsm.bmj.com/content/bjsports/51/9/704.full.pdf>]

-LITFL athlete EKGs [<https://litfl.com/tag/athlete/>]

-National Athletic Trainers Association Consensus Statement: Sickle Cell Trait and the Athlete <https://www.nata.org/sites/default/files/SickleCellTraitAndTheAthlete.pdf>

-Exercise-associated collapse: and evidence-based review and primer for clinicians <https://bjsm.bmj.com/content/bjsports/45/14/1157.full.pdf>

Recommended implementation/timeline

• Pre-module

-learner should complete the pre-readings and take the pre-quiz

• During the module

-the material can be delivered by one of two formats:

-interactive PowerPoint presentation

-best for larger audience

-case-based discussion

-best for groups of 4 or fewer learners per group

-15-20 minutes per case

-at the conclusion of the session, learners should take the quiz again and be provided with

the summary handout in electronic or hard-copy format