Sickle Cell Trait Policy and Protocol

**Introduction:**
Sickle Cell Trait is the inheritance of one gene for sickle hemoglobin and one for normal hemoglobin. During periods of intense exercise the sickle cell trait can change the shape of the red blood cells from round to quarter-moon. When this occurs, these sickled red blood cells can accumulate in the bloodstream. The accumulation of sickled red blood cells can block vessels and can cause ischemic (cell death) rhabdomyolysis, the rapid breakdown of muscle cells. Sickling can occur in 2-3 minutes of intense exercise. Heat, dehydration, altitude, asthma and other medical conditions may increase the risk. In some cases, particularly with exertional rhabdomyolysis, sickle cell disease can be fatal.

**Facts:**
- Those at high risk are, ancestors from Africa, South or Central America, Caribbean, Mediterranean countries, India, and Saudi Arabia.
- Sickle Cell Trait occurs in 8% of U.S. African Americans and 1 in 2,000 to 10,000 Caucasians.
- Most dangerous risk is exertional rhabdomyolysis.
- Dehydration worsens exertional sickling.
- Sickled cells log jam blood vessels.
- The harder and faster the athlete goes, the faster the onset.
- Training and rest should be modified.
- A sickling collapse is a medical emergency.

**Telltale features of Sickling Collapse:**
Sickling collapse has been mistaken for cardiac collapse or heat collapse. But unlike sickling collapse, cardiac collapse tends to be “instantaneous” has no “cramping” with it, and the athlete (with Ventricular fibrillation) who hits the ground no longer talks. Unlike heat collapse, sickling collapse often occurs with-in the first half hour on field, as during wind sprints. (NATA Consensus)
- Sickling does not have muscle twinges as compared to cramps;
- Heat cramping pain is more severe than sickling;
- Heat cramps lock up the athlete, sickling athletes slump to the ground in muscle weakness;
- Heat cramping athletes yell in pain with muscle contractions, sickling athletes lie fairly still, not yelling with normal tension in the muscles;
- Sickling athletes caught early and treated can recover and do recover faster than athletes with dehydration and cramping.

**Precautions and Treatment:**
- Build up in training slowly with paced progressions, allow for longer rest and recovery periods. Athletes should be involved in year round and preseason strength and conditioning to enhance preparedness of athletes.
- Athletes with Sickle Cell Trait should be excluded from participation in performance test such as mile runs, serial sprints, etc.
- Stop activity with onset of signs and symptoms (muscle cramping, pain, swelling, weakness, tenderness, inability to catch breath, fatigue).
- The Athletic Trainer will have the ability to pull a Sickle Cell Trait athlete out of activity if needed.
- Allow Sickle Cell Trait athletes to set their pace.
- Athletes with Sickle Cell Trait that perform repetitive high speed sprints and/or interval training that induces high levels of lactic acid should be allowed extended recovery between repetitions.
- Allow athletes to seek evaluation once signs and symptoms arise. These athletes also should not be harassed for sitting out.
- Encourage proper hydration.
- Asthma, heat illness, and altitude can increase the likelihood of sickling.
- Sickle Cell Trait athletes should not participate when they are ill.
- Coach should contact ATC or EMS if sickling is suspected.
In the event of a sickling collapse, treat it as a medical emergency by doing the following:

- Check vital signs, along with checking oxygen saturation.
- Apply oxygen to athlete as soon as possible.
- Cool the athlete, if necessary.
- If the student athlete is not alert or as vital signs decline, activate Emergency Action Plan (EAP) (call 911), get athlete to hospital as fast as possible.
- Tell the doctors of his/her Sickle Cell Trait and to expect explosive rhabdomyolysis.

Embry-Riddle University Sickle Cell Testing Policy:
In order to help ensure the health, safety and well-being of our student athletes, it is appropriate to screen for Sickle Cell Trait. The testing procedure is as follows:

- All ERAU student athletes will be required to show proof of testing or have a blood test to determine if they have Sickle Cell Trait. There is no option for waive out.
- Tryouts and Recruits can either show proof of testing/results or waive out of testing for their tryout or visit date. If taken onto the team there will be mandatory SCT testing.

Once we are informed that a student athlete has tested positive for Sickle Cell Trait, the following actions will be taken in order to prevent complications and a sickle collapse:

- The student athlete, coach, and sports medicine staff will be informed of the positive test by the Director of Sports Medicine.
- At the meeting with the student-athlete they will be educated on what Sickle Cell Trait is, signs and symptoms to be aware of, the adjustments of workouts, rest and recovery periods and proper treatment when sickling is suspected.
- The student athlete will be asked to sign a Notification Form stating that they were informed, that they understand the information and that they are fully aware of the risks involved in athletic participation.
- The coach of that athlete will be informed of the positive test by the Director of Sports Medicine.
- The coach will be educated on what Sickle Cell Trait is, signs and symptoms to be aware of, the adjustments of workouts, rest and recovery periods and proper treatment when sickling is suspected.
- The coach will also be asked to sign a Notification Form stating that they were informed, that they understand the information and that they will follow the guidelines from sports medicine.

The ERAU Sickle Cell Testing Policy and related procedures are designed to help screen and prevent otherwise avoidable medical incidents related to Sickle Cell disease. This policy and related procedures are not a guarantee that medical incidents will not occur because even with strict adherence, medical emergencies may arise. Likewise, this policy and related procedures are not intended to be relied upon as a substitute for individualized medical care, advice, or treatment.

Given the potential for severe consequences, including death, ERAU reserves the right to bench, sideline, or otherwise disallow participation on, for, or on behalf of any ERAU athletics team or at any University sponsored or sanction event by any ERAU athlete if, in the opinion of the Team Physician or Director of Sports Medicine, allowing such participation presents an undue threat of harm to an athlete.

Definitions:
- Acute Ischemic rhabdomyolysis: the rapid breakdown of muscle tissue starved of blood.
- Exertional rhabdomyolysis: muscle breakdown triggered by physical activity.
- Exertional sickling: hemoglobin (red blood cells) sickling due to intense or sustained physical exertion.
- Hypoxemia: decreased oxygen content of arterial blood.
- Ischemia: a deficiency of blood flow to tissue.
- Obtunded: having diminished arousal and awareness; mentally dull.
- Sickling collapse: the collapse of an athlete who shows features consistent with exertional sickling.
- Ventricular Fibrillation / Heart Arrest: a condition in which there is uncoordinated contraction of the cardiac muscle of the ventricles in the heart.

Resources for more information:
National Athletic Trainers Association
National Athletic Trainers Association Consensus Statement: Sickle Cell Trait and the Athlete.