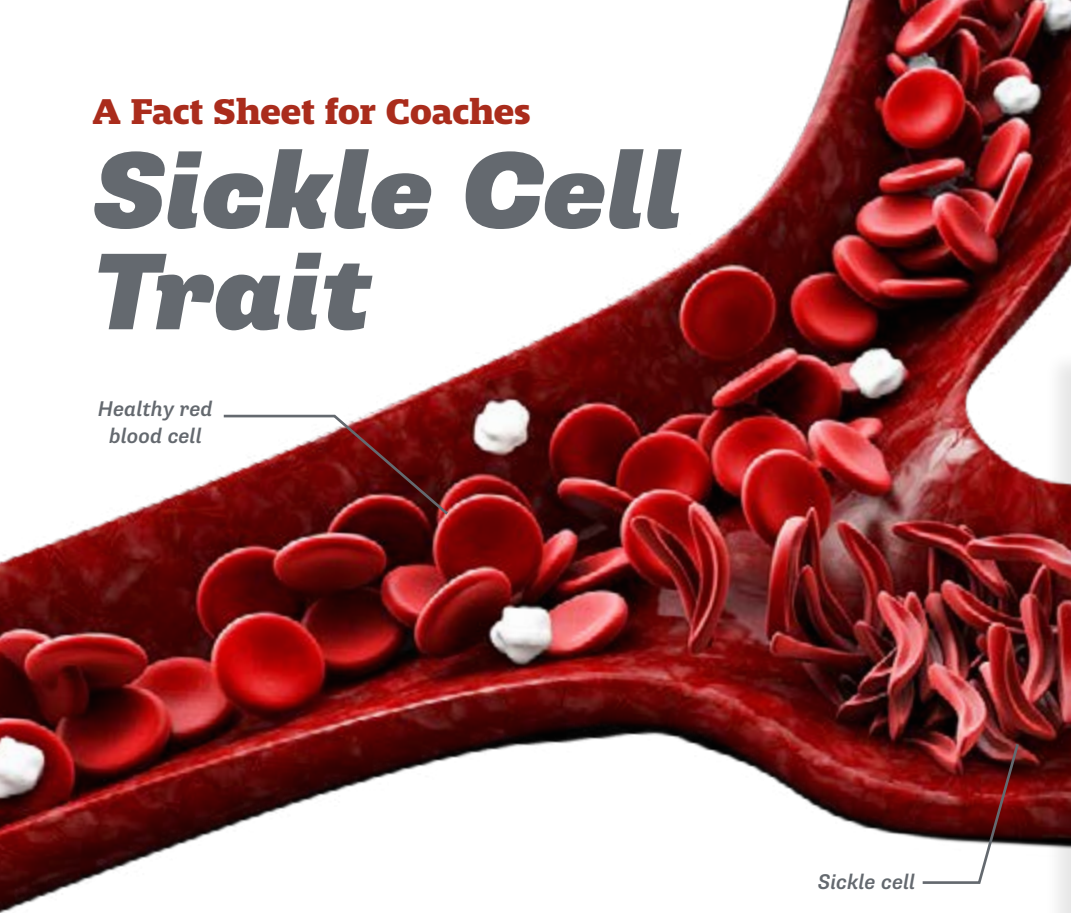


Sickle Cell Trait

Healthy red blood cell



Sickle cell

What Is Sickle Cell Trait?

Sickle cell trait is not a disease. Sickle cell trait is the inheritance of one gene for sickle hemoglobin and one for normal hemoglobin. Sickle cell trait will not turn into the disease.

- During intense exercise, red blood cells containing sickle hemoglobin can change shape from round to quarter-moon, or “sickle.”
- Sickle red cells may accumulate in the bloodstream during intense exercise, blocking normal blood flow to the tissues and muscles.
- During intense exercise, athletes with sickle cell trait have experienced significant physical distress, collapsed and even died.
- Heat, dehydration, altitude and asthma can increase the risk for and worsen complications associated with sickle cell trait, even when exercise is not intense.
- Knowledge of sickle cell trait status can be a gateway to education and simple precautions that may prevent collapse among athletes with sickle cell trait, allowing them to thrive in sport.

Do You Know the Facts?

- Student-athletes with sickle cell trait should not be excluded from athletics participation.
- All NCAA student-athletes must provide their school with documented results from a previous sickle cell solubility test or they must undergo testing during their preparticipation medical examination.
- All newborns in the United States (and many other countries) undergo sickle cell testing at birth.
- Complications associated with sickle cell trait are not limited to football and can happen in any sport that includes intense exercise (e.g., long training runs or sprints).
- Unlike heat-related or cardiac conditions, athletes with sickle cell trait may present as being fatigued and can often talk, but may be experiencing ischemic pain and weakness in their muscles. Pushing the athlete to continue beyond this point for “toughness” or discipline can lead to a fatal collapse.





Ensure Student-Athlete Well-Being Comes First

Planned emergency response and prompt access to medical care are critical components to ensure adequate response to an athlete who collapses or is in distress. Knowledge of a student-athlete's sickle cell trait status should facilitate prompt and appropriate medical care during a medical emergency. Institutions should have an emergency action plan in place that is reviewed and rehearsed at least annually with all athletics personnel. All coaches and the strength and conditioning staff should be certified in first aid and CPR.

The Role of the Coaching Staff

An important note to head coaches and their staff is that the incidents of sudden death in athletes with sickle cell trait have been exclusive to conditioning sessions rather than game or skill practice situations. While the definite cause of collapse among sickle cell trait athletes is not yet known, one hypothesis about what may be happening is that exercise intensity is a leading factor for sudden collapse, rather than the medical condition itself. Coaches should conduct appropriate sport-specific conditioning based on sound scientific principles and be ready to intervene when student-athletes show signs of distress. Student-athletes can begin to experience symptoms after only one to three minutes of sprinting, or in any other full exertion of sustained effort, thus quickly increasing the risk of complications. Many times, these complications occur when athletes are being pushed beyond their physiological limit while in an already compromised position.

Provide an environment in which the following precautions can be activated. In general, student-athletes with sickle cell trait should:

- Slowly build up their intensity while training.
- Have their fitness tests scheduled later in the training program. Use a progressive, periodized program and evaluate their performance once they are acclimated to the stress about to be placed upon them.
- Be allowed to set their own pace while conditioning.
- Implement a slow and gradual preseason conditioning regimen that prepares them for the rigors of the sport.
- Be provided adequate rest and recovery between repetitions, especially during “gassers” and intense station or “mat” drills.
- Be given alternatives for performance testing, rather than serial sprints or timed mile runs, especially if these activities are not specific to the sport.
- Stop activity immediately upon struggling or experiencing symptoms such as muscle pain, abnormal weakness, undue fatigue or breathlessness.
- Stay well hydrated at all times, especially in hot and humid conditions.
- Refrain from consuming high-caffeine energy drinks and supplements, or other stimulants, as they may contribute to dehydration.
- Maintain proper asthma management.
- Refrain from extreme exercise during acute illness, if feeling ill, or while experiencing a fever.
- Beware when adjusting to a change in altitude, e.g., a rise in altitude of as little as 2,000 feet. Modify training and have supplemental oxygen available.
- Seek prompt medical care when experiencing unusual physical distress.



For more information and resources, visit ncaa.org/health-safety.