YUBA COLLEGE

ATHLETIC TRAINING PROGRAMS

SICKLE CELL TRAIT EDUCATION & AWARENESS

Recent reviews conducted over the last few years of non-tramatic/impact based sports deaths in high school and college athletes listed sickle cell trait complications in the top three with hyperthermia (heatstoke), and cardiovascular conditions. The following information provides basic education and awareness of sickle cell trait complications with aims at protecting our athletes that are known to possess the gene from its' potentially fatal nature. Through the incorporation of a screening process in all student athletes' preparticipation physical examinations as well as overall education and awareness of our coaching and athletic staff we hope that these simple precautions that may prevent sickling collapse enables our athletes with sickle cell trait to continue to thrive in their sport.

SICKLE CELL TRAIT is the inheritance of one gene for sickle hemoglobin and one for normal hemoglobin. During intense or extensive exertion, the sickle hemoglobin can change the shape of red cells from round to quarter-moon, or "sickle." This change, exertional sickling, can pose a grave risk for some athletes. In the past seven years sickling has been responsible for nine athlete deaths, ages 12-19.

It's not uncommon for athletes with sickle cell trait to be completely asymptomatic, and even though all U.S. newborns are tested, many high school and college athletes are unaware of their status. The sickle gene, which affects one in 12 African Americans, can also be present in people of Caribbean, Central American, Indian, Mediterranean, Middle Eastern, and South American descent. Sickle cell trait, which is caused by the presence of one gene for sickle hemoglobin and one for normal hemoglobin, is much more common and less debilitating than sickle cell disease, which is caused by inheriting sickle genes from both parents and is present in one in 500 African Americans.

Research shows how and why sickle red cells can accumulate in the bloodstream during intense exercise. Sickle cells can "log jam" blood vessels and lead to collapse from eschemic rhabdomyolysis, the rapid breakdown of muscles starved of blood. Major metabolic problems from explosive rhabdomyolysis can threaten life. Sickling can begin in 2-3 minutes of any all out exertion and can reach grave levels soon thereafter if the athlete continues to struggle. Heat, dehydration, altitude, and asthma can increase the risk for and worsen sickling, even when exercise is not all-out. Despite telltale features, collapse from exertional sickling in athletes is under-recognized and often misdiagnosed. Sickling collapse is a medical emergency.

Precaution and Treatment

1. Build up slowly in training with paced progressions, allowing longer periods of rest and recovery between repetitions.
2. Encourage participation in preseason strength and conditioning programs to enhance the preparedness of the athletes for performance testing which should be sports-specific. Athletes with sickle cell trait should be excluded from participation in performance tests such as mile runs, serial sprints, etc., as several deaths have occurred from participation in this type of setting.
3. Cessation of activity with onset of symptoms such as muscle cramping, pain, swelling weakness, tenderness, inability to "catch breath", fatigue.
4. If sickle-trait athletes can set their own pace, they seem to do fine.
5. All athletes should participate in a year-round, periodization strength and conditioning that is consistent with individual needs, goals, abilities and sport-specific demands. Athletes with sickle cell trait who perform repetitive high speed sprints and/or interval training that induces high levels of lactic acid should be allowed extended recovery between repetitions since this type of conditioning poses special risk to these athletes.
6. Ambient heat stress, dehydration, asthma, illness, and altitude predispose the athlete with sickle trait to an onset of crisis in physical exertion.
    a. Adjust work/rest cycles for environmental heat stress
    b. Emphasize hydration
    c. Control asthma
    d. No workout if an athlete with sickle trait is ill
    e. Watch closely the athlete with sickle cell trait who is new altitude. Modify training and have supplemental oxygen available for competition
7. Educate to create an environment that encourages athletes with sickle cell trait to report any symptoms immediately such as; fatigue, difficulty breathing, leg or low back pain, or leg or low back cramping in an athlete with sickle cell trait should be assumed to be sickling.

In the event of a sickling collapse, treat it as a medical emergency by doing the following:

1. Check vital signs
2. Administer high-flow oxygen, 151(if available), with a non-rebreather face mask.
3. Cool the athlete, if necessary
4. If the athlete is lethargic or as vital signs decline, call 911, attach an AED, start IV, and get to the hospital fast
5. Tell the doctors to expect explosive rhabdomyolysis(destruction of skeletal muscle) and grave metabolic complications.
6. Proactively prepare by having an Emergency Action Plan and appropriate emergency equipment for all practices and competitions.

*For further information, questions, or concerns Please contact Certified Athletic Trainer at 741-6837

Reference: National Athletic Trainers' Association, Consensus Statement: Sickle Cell Trait and the Athlete