Sickle Cell Policy

Introduction:

A recent review of non-traumatic sports death in high school athletes found that one of the top four killers was acute exertional rhabdomyolysis (explosive muscle breakdown) tied to sickle cell trait. In the past seven years, exertional sickling has killed nine athletes, ages 12 through 19.

In the past four decades, exertional sickling has killed at least 15 football players. In the past seven years alone, sickling has killed nine athletes: five college football players in training, two high school athletes (one a 14-year-old female basketball player), and two 12-year-old boys training for football. Of 136 sudden, non-traumatic sports deaths in high school and college athletes over a decade, seven (5%) were from exertional sickling (1).

Sickle cell trait is the inheritance of one gene for sickle hemoglobin and one for normal hemoglobin. This is not a disease, however it is a life-long condition that will not change/improve over time. People at high risk for inheriting sickle cell trait are those with ancestors from Africa, South or Central America, India, Middle Eastern, Caribbean, and Mediterranean countries. We recommend confirming sickle cell trait status in all athletes during their preparticipation physical examinations.

Red blood cells containing sickle hemoglobin can change shape from circular to quarter-moon or "sickle" during intense exercise. The change in shape can cause the sickled cells to gather in the bloodstream and block normal blood flow to tissues and muscles. In sickle cell trait, strenuous exercise evokes the following, 1) severe hypoxemia, 2) metabolic acidosis; 3) hyperthermia in muscles, and 4) red-cell dehydration. There are several factors that can increase the risk and worsen complications associated with sickle cell trait such as, heat, dehydration, altitude, and asthma. Sickling collapse can be a life threatening condition if not addressed or handled in a timely manner. The Bentonville Sports Medicine Staff and Athletic Administration are dedicated to providing the best care to your student - athlete. Therefore, we have created this standard method of managing sickling collapse for Bentonville student - athletes, the following guidelines are intended to serve as a written protocol for sickling collapse management.

Definitions:

Hypoxemia: decreased oxygen content of arterial blood

Metabolic acidosis: a condition in which the pH of the blood is too acidic because of the productions of certain types of acids

Hyperthermia: body temperature elevated above the normal range

Sickling Collapse Telltale Features:

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 within the first half hour on field, as during initial windsprints. Core temperature is not greatly elevated.

Sickling is often confused with heat cramping; but, athletes who have had both syndromes know the difference, as indicated by the following distinctions:

1) Heat cramping often has a prodrome of muscle twinges; whereas, sickling has none; 2) The pain is different – heat-cramping pain is more excruciating;

3) What stops the athlete is different – heat crampers hobble to a halt with "locked-up" muscles, while sickling players slump to the ground with weak muscles;

4) Physical findings are different – heat crampers writhe and yell in pain, with muscles visibly contracted and rock-hard; whereas, sicklers lie fairly still, not yelling in pain, with muscles that look and feel normal; 5) The response is different – sickling players caught early and treated right recover faster than players with major heat cramping (7).

This is not to say that all athletes who sickle present exactly the same way. How they react differs, including some stoic players who just stop, saying "I can't go on." As the player rests, sickle red cells regain oxygen in the lungs and most then revert to normal shape, and the athlete soon feels good again and ready to continue. This self-limiting feature surely saves lives.

Sickling Collapse Treatment:

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 (if available).
3) Cool the athlete, if necessary.
4) If the athlete is paralyzed with weakness or as vital signs decline, call 911, activate EAP, attach an AED, and move quickly and professionally to get the athlete to the hospital fast.
5) Tell the doctors to expect explosive rhabdomyolysis and grave metabolic complications.
6) Proactively prepare by having an Emergency Action Plan, appropriate emergency equipment for all practices and competitions, and communicate with coaches when sickling collapse can be present.

References:

https://health.usf.edu/~/media/Files/Medicine/Orthopaedic/Sickle%20Cell/SickleCellconsensusstatement.ashx?la=en

https://www.ncaa.org/sites/default/files/NCAASickleCellTraitforSA.pdf