

Appendix S

NROTC Universal Training Precautions (UTP) and Emergency Action Plan for Sickle Cell Trait Positive (SCTP)

Ref: (a) NAVADMIN 108/19 Universal Training Precautions to Reduce the Risk of Exercise-Related Collapse and Death

1. Identify midshipman that are SCTP

a. The following are the acceptable laboratory tests for determining sickle cell trait status:

(1) Hemoglobin solubility- will report as positive or negative. Positive result requires follow-up testing via Hemoglobin electrophoresis.

(2) Hemoglobin electrophoresis. *The result will report the percentage of normal hemoglobin cells (A) and sickle cells (S). If 45% or greater of HGB S, contact N92A as this is likely not compatible with service.

(3) High pressure liquid chromatography (HPLC)

(4) Many states performed sickle cell trait screening as a part of the newborn testing. These results can be used in lieu of the above.

b. This testing will be a requirement prior to any NROTC physical activity. Testing for incoming scholarship freshmen (NSI or unit) will be done at NTSC expense. Testing for college programmers will be at the individual's expense. Laboratory results are filed in Right side/section 4 of the medical record. A thorough review of the medical record should be accomplished prior to ordering a new test. If unit is aware that testing was completed, every effort should be made to obtain those results from the medical clinic at which it was completed prior to having the test repeated.

c. Once identified at SCTP, MIDN must view the training video: <https://www.hprc-online.org/articles/sickle-cell-trait-awareness> and completion should be documented in their student file via page-13 entry.

d. During physical training and high risk training evolutions, SCTP MIDN will be identified by highly visible markings of which all unit personnel are trained to recognize. If glow belts are the chosen designator, SCTP MIDN will wear glow belts regardless of light conditions. The glow belts worn by SCTP MIDN will be of a different color than other MIDN. Training evolutions held at RTC and OTC will adhere to the current policy of the host base of identifying SCTP individuals.

2. Ensure Safe Training evolutions

a. While SCTP a risk factor for adverse events during exercise, it is not the only risk factor for a life-threatening emergency. Therefore, it is critically important to recognize risk factors and

respond to clear signs of distress during training evolutions with a timely and accurate response. Signs of distress may include slowing down, falling behind and struggling after initially being a front-runner, extreme difficulty breathing, onset of confusion or altered mental status, conscious collapse, inability to stand independently, or loss of consciousness.

b. Risk factors associated with exercise-related collapse and death can be personal, environmental or external. Personal risk factors include lack of appropriate environmental or exercise acclimatization, dehydration, recent or current illness, accumulated fatigue, poor baseline conditioning, a predisposing or underlying cardiac condition, exercise-induced asthma, sickle cell trait (SCT), excess body fat (BMI > 30) and prior poor PRT performance.

c. Environmental or external risk factors include: exercise at altitude, high ambient temperature and humidity and dietary supplements containing stimulants to include thermogenic and energy shots or drinks. All NROTC staff must be aware of these predisposing conditions that are risk factors for exercise-related injuries. Excessive motivation, in particular with a person that is struggling, is equally important to recognize as a risk factor, as an individual can push to work hard, while ignoring the onset of physical signs and symptoms of distress.

d. Warfighters who have difficulty completing 1-to-2-mile times runs or difficulty running after strenuous field exercises may be at particularly high risk for compromise. To avoid cumulative heat strain, they should be provided the ability to “heat dump” periodically (air conditioning, cool showers, and rest in shaded areas).

e. To increase sickle cell trait awareness and other physical training related emergencies, all NROTC staff that participate in physical training, including but not limited to CFLs, should be able to recognize and respond to events suggestive of Sudden Cardiac Arrest (SCA), Exertional Collapse Associated with SCT (ECAST), and Exertional Heat Stroke by watching the following training:

(1) Warfighter with SCT, first responders, and sickle cell awareness for medical personnel: <https://www.hprc-online.org/articles/sickle-cell-trait-awareness>.

(2) Heat injury prevention and treatment: <https://www.hprc-online.org/articles/heat-illness-prevention-treatment-and-recovery>.

f. SeaTrials Battle Stations Test is the only high risk training event conducted under NETC High Risk Training controls IAW NSTCINST 1500.13B. While high-risk trainers will be staged at various areas to conduct portions of the training, Sea Trials staff will monitor all Midshipmen for usual signs of distress (heat injury, stumbling, etc.) but also the unique features of SCTP exertion such as muscle weakness, confusion, then rapid deterioration.

****The following UTP must be applied to all fitness tests or other training evolutions that are expected to require at least moderate exertion (heavy breathing but able to talk in full sentences, sweating within a few minutes of start).**

g. All PRT evolutions shall be monitored by personnel trained in CPR with oxygen and AED immediately available. All training evolutions (e.g., command physical training, FEP) involving at least moderate exercise shall occur within the Emergency Medical Service (base or 911) response area. Ideally, the responding ambulance will be equipped with a defibrillator, oxygen and be able to provide intravenous hydration, but this is determined by the civilian EMS system.

(1) Allow acclimatization IAW the [Universal Training Precautions](#) to adapt to a warmer environment or higher altitude. Ensure progressive and graduated increases in exercise duration and intensity to the greatest extent possible in the training environment.

(2) The wet bulb globe temperature (WBGT) is the gold standard to measure environmental heat stress. Quest 48N is the standard WBGT device developed for Navy units ashore. Units may rely on heat stress meters to provide WBGT information when available. Additional information can be found at: <https://www.hprc-online.org/articles/wet-bulb-globe-temperature-devices-measure-heat-stress>. Note: There is a risk that non-locally developed WBGT readings may be inaccurate due to differing local conditions.

(3) Adhere to current guidelines for hydration and rest-work cycles. Promote water consumption when thirsty and to maintain clear or light-yellow urine color as described at <https://www.hprc-online.org/articles/hydration-basics>. General guidelines:

1. Individuals should try to drink half one's body weight in fluid ounces per day. For example, if one weighs 150 lb, then he needs about 75 fl oz daily.
2. For exercise lasting up to one hour: Drink water—about 3–8 oz every 15–20 minutes. (A gulp is about 1–2 oz.)
3. For exercise lasting longer than one hour: Drink 3–8 oz water + carbs + electrolytes every 15–20 minutes. A good sports drink should contain (per 8 oz): Carbohydrates 12–24 g, Sodium 82–163 mg, Potassium 18–46 mg.
4. Refer to <https://home.army.mil/lee/application/files/3615/3808/9560/H20-Consumption-Table.pdf> for DoD guidelines for rest-work cycles.

(4) MIDN will not use stimulants, alcohol, energy shots or drinks, antihistamines, diuretics, pre-workout products, weight loss and performance enhancing supplements prior to exercise. Guidance on supplements are available through the Department of Defense Dietary Supplement Resource: <https://www.opss.org>.

(5) After PFA testing, participants shall be observed for no less than 10 minutes' post exertion, during an active cool down period.

*****At early signs of distress*****

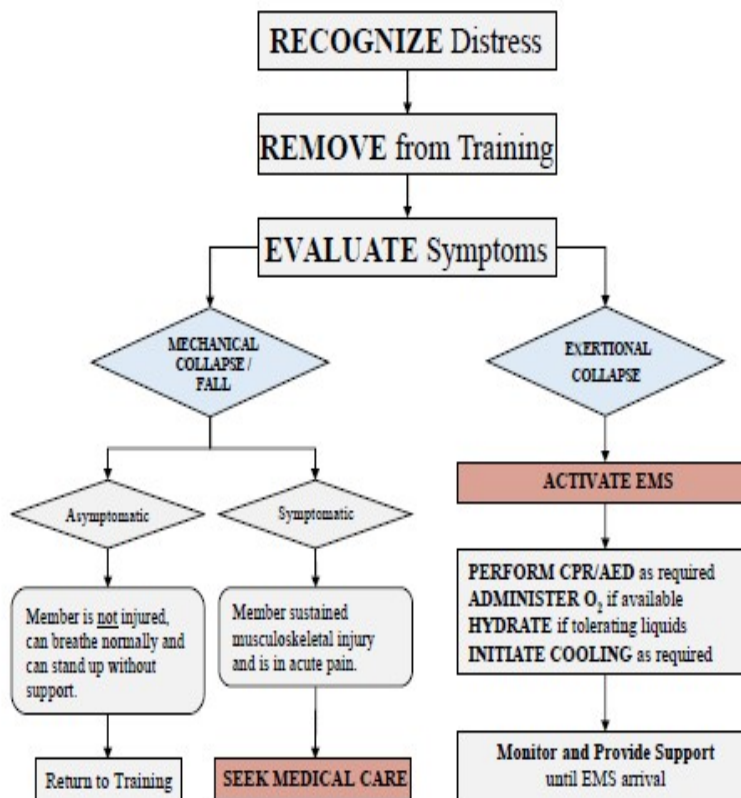
- 1. Remove person from activity, assess well-being and if condition does not improve quickly, provide high-flow oxygen (5 L per min) as soon as possible.**
- 2. Initiate CPR if unresponsive and not breathing or only gasping.**
- 3. Contact EMS (ideally Advanced Life Support capable) for transport to an emergency department. If sickle cell trait positive, include this vital information so that EMS can prepare for a profound metabolic event.**
- 4. Any conscious collapse (cannot stand independently after fall, e.g., wooden legs unable to support their own weight) should be thoroughly evaluated and subsequently transported via EMS.**
- 5. In heat injury cases where there is a loss of consciousness, implement emergency cooling.**

Emergency Action Plan Content

A pre-event check-off/emergency response checklist shall be used to verify emergency response plan and must include the below information at a minimum.

1. PT/event Location:
2. CPR certified personnel on site [required for PRT]:
3. Automatic External Defibrillator (AED) with verification of functionality
4. Oxygen availability
5. EMS phone number if other than 911:
 - a. Expected EMS response time:
6. Nearest location of emergency medical facility with the following:
 - a. AED:
 - b. Oxygen:
 - c. Intravenous Hydration:
7. Cooler with ice sheets and towels.

NROTC Emergency Action Plan (EAP) – Exertional Exercise Collapse



Signs and Symptoms

Mechanical Collapse/Fall

Trip or fall resulting in musculoskeletal injury (cut, sprain, break).

Exertional Collapse*

Profound weakness, muscle cramping, leg pain, "wooden" or "shaky" legs, inability to stand or get up.

ECAST*

Exertional Collapse Associated with Sickle Cell Trait. Profound weakness, muscle cramping, leg pain, "wooden" or "shaky" legs, inability to stand or get up.

Heat Stress*

Muscle cramps, dizziness, mild confusion, fast heart rate or breathing, headache, irritability, pale skin, heavy sweating, fainting, extreme thirst, nausea or vomiting.

Heat Stroke*

Irrational behavior or hallucinations, confusion, rapid shallow breathing, rapid weak pulse, seizures, loss of consciousness, dry skin, temp >103.5°F.

Sudden Cardiac Death

Sudden collapse, loss of consciousness, no pulse.

**Inform EMS of presumed metabolic crisis*