

Unnecessary Roughness: Changing the Face of Pre-Season in Athletics



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Disclosures & Acknowledgements



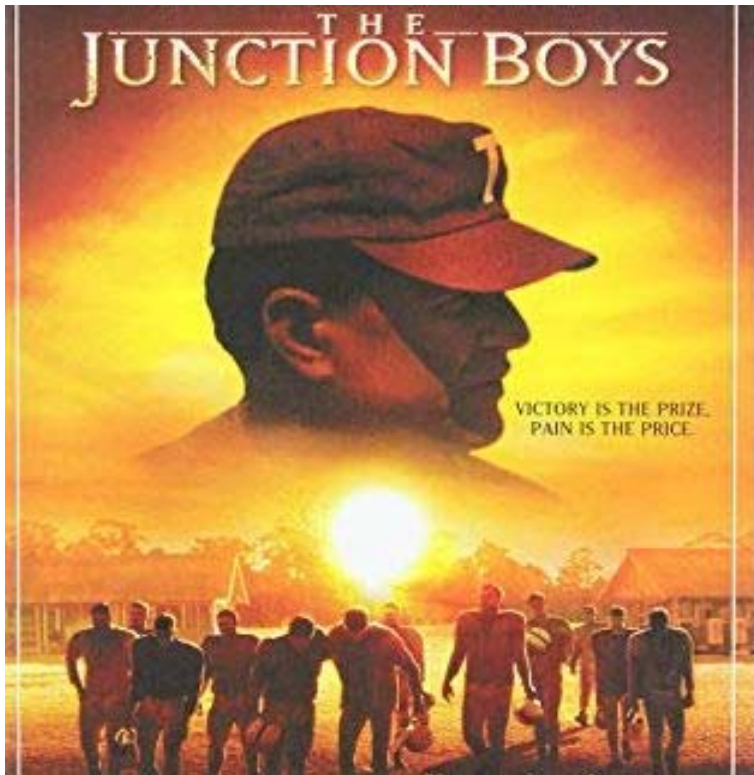
- I have no conflicts of interest...some coaches and strength & conditioning professional might argue this point...
 - I would like to acknowledge Scott Anderson, Head Athletic Trainer at Oklahoma and President of the College Athletic Trainers Society for his assistance with this presentation and leadership in my profession.
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Learning Objectives



- Be able to summarize the recent legal and legislative changes to pre-season athletic participation at all levels.
 - Be able to Distinguish between ECAST, Exertional Rhabdomyolysis, and Sudden Cardiac Death in athletic populations.
 - Be able to develop policies to prevent and treat exertional conditions during pre-season athletic participation.
 - Be able to consider why it is important to screen athletes for sickle cell trait prior to athletic participation.
 - ...and so much more!
-

When you think pre-season sports, you probably think...



But you should think this instead!



INTERASSOCIATION RECOMMENDATIONS

PREVENTING CATASTROPHIC INJURY AND DEATH IN COLLEGIATE ATHLETES



The truth, much to the chagrin
of many coaches, is this:



Overview of Key Changes to Off-season/Pre-season



- Things are *different*, not to be confused with *vastly improved*
 - Standards of care for exertional heat illness
 - NATA Position Statement 2015
 - Understanding the role sickle cell status has in conditioning
 - Limiting the number of practices *and* number of contact practices
 - The potential restructuring of the medical model in collegiate athletics
 - NCAA changes; NSCA/CSCCA Joint Statement 2019
-

Even when appropriate care
is provided, tragedies like
this still occur...



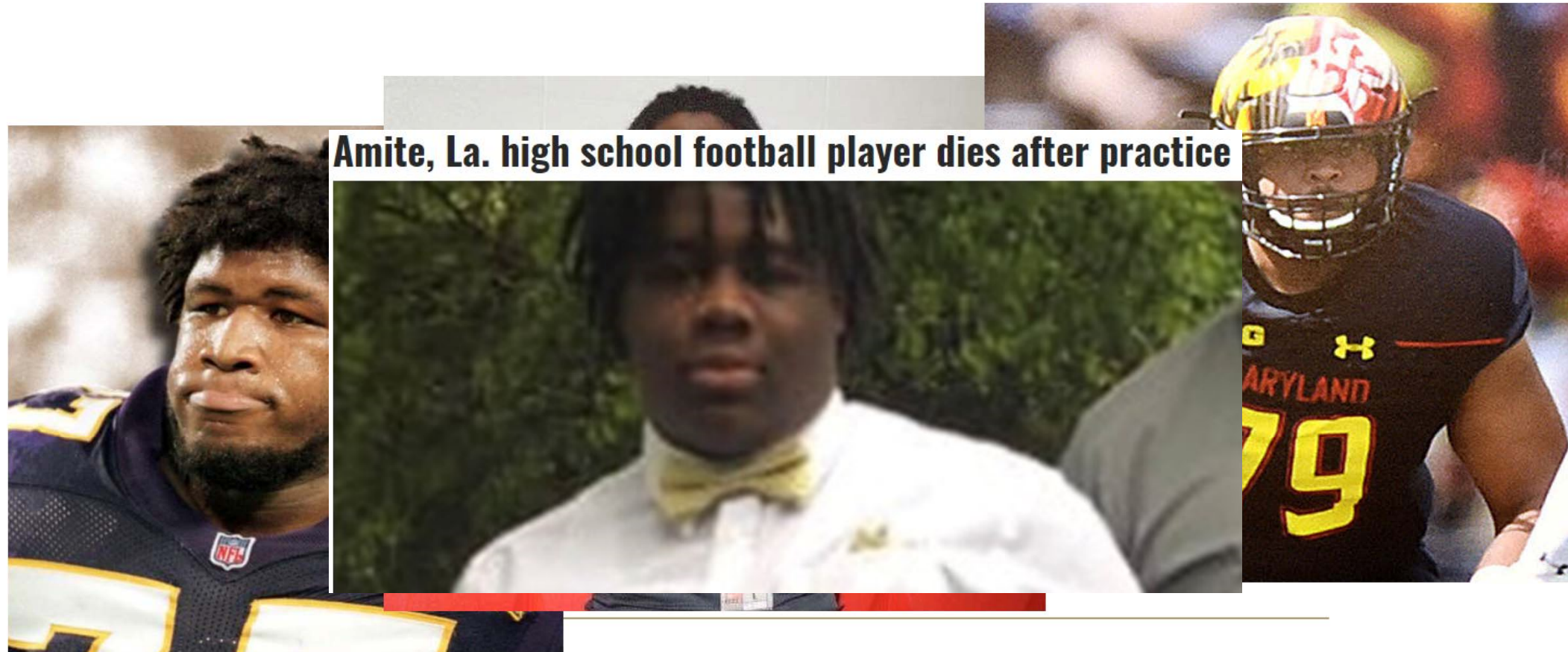
Georgia High School football player died after traumatic brain injury, coroner rules

Medical staff at an Atlanta hospital described the nature of the injury "as an anomaly," requiring pressure at a precise angle, the coroner said.

...however, the disparity between knowledge transmitted and knowledge applied still exists in many forms.



Amite, La. high school football player dies after practice



We know we can prevent these tragedies from occurring via:



- Comprehension and Understanding of Responsibility
 - “Science & Ethics”
 - Recognition & Removal
 - Pre-participation exam should never be a formality
 - “Legal Responsibility”/ Louisiana Act 314 & 352
 - “Serious Sports Injury Law”
 - Care
 - “Action”
 - Having an EAP, appropriate equipment on-site
 - Best available current literature
 - “Evidence Based Practice”
-

Juxtapose those facts with the Jordan McNair Case



meals, to feed into Durkin's red-meat "wolfpack and prey" ethos. Players punished by doing "Jesus Walks" up stair-climbers with a bar across their

shoulders. Players driven to the limit during Maryland's May 29 workout, after which McNair was hospitalized, was the team's first of the summer, and the 10 110-yard sprints were the first conditioning drill after a standard warm-

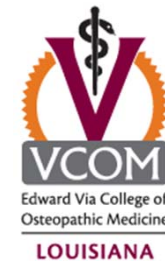
Multiple players told Walters' team that one Maryland athletic trainer yelled some variation of "DRAG HIS ASS ACROSS THE FIELD" while McNair was struggling.

911 was called at 5:57 p.m., and paramedics arrived at 6:02, paring him down to the University of Maryland Medical Center in Baltimore late

It took 34 minutes after McNair started showing symptoms for the medical staff to remove him from the field, 67 minutes to call 911 and 99 minutes before he left in an ambulance.

Trainers did not use cold water immersion because they were afraid McNair would drown in the tub "due to the concern of size of the student-athlete and the smaller stature of the athletic trainers providing care." The staff treated him with cold towels instead.

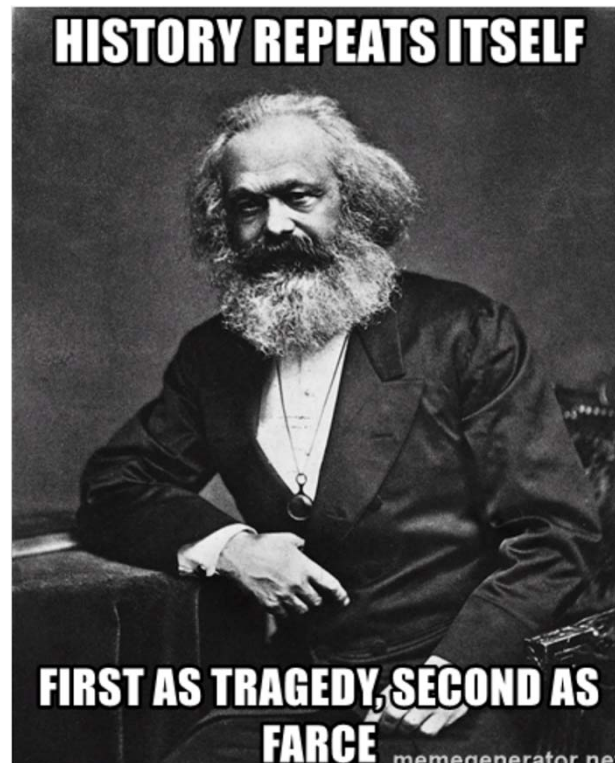
Near Tragedy in Alaska / August 2019



"He already knew that kids couldn't swim, and there were about three kids still holding onto the ledge", said Subject 2. "They weren't saying they didn't want to do it, it was like they didn't want to because before they got off the ledge it was already heavy with the sweater."

Three students required CPR after they were pulled from the water. According to a press release that was put out by the Fairbanks North Star Borough School District all three students were transported to Fairbanks Memorial Hospital for treatment and overnight observation. According to the press office at UAF, at least one student sank to the bottom. Subject 1 spoke about what happened after they got out of the pool.

This why we need to review,
research and remain vigilant!



NATA-IATF on Pre-Season Athletics Participation in Secondary Schools & NATA Position Statement: Exertional Heat Illness



- These are our gold standard...key points:
 - Gradual acclimatization of athletes over 5 or more days
 - No consecutive days of multiple practices
 - Use of Wet-Bulb Globe Temperature
 - Presence of cold water immersion tanks at practice with water below 60°F, constantly circulating
 - If available, start a line/IV fluid
 - Do not transport until rectal temp lowers to 102°F
-

Wet Bulb Globe Temperature



More accurate representation of cumulative heat stress.

Link to NWS calculator:
<https://www.weather.gov/tsa/wbgt>



	WBGT	Heat Index
Measured in the sun	✓	✗
Measured in the shade	✗	✓
Uses Temperature	✓	✓
Uses RH	✓	✓
Uses Wind	✓	✗
Uses Cloud Cover	✓	✗
Uses Sun Angle	✓	✗

Wet Bulb Globe Temperature



WBGT Reading	Activity Guidelines and Rest-Break Guidelines
Under 82.0°F (27.8°C)	Normal activities: provide ≥ 3 separate rest breaks/h of minimum duration 3 min each during workout.
82.0–86.9°F (27.8°C–30.5°C)	Use discretion for intense or prolonged exercise. Watch at-risk players carefully. Provide ≥ 3 separate rest breaks/h of minimum duration 4 min each.
87.0°F–89.9°F (30.5°C–32.2°C)	Maximum practice time = 2 h. For football: players restricted to helmet, shoulder pads, and shorts during practice. All protective equipment must be removed for conditioning activities. For all sports: provide ≥ 4 separate rest breaks/h of minimum duration 4 min each.
90.0–92.0°F (32.2°C–33.3°C)	Maximum length of practice = 1 h. No protective equipment may be worn during practice and there may be no conditioning activities. There must be 20 min of rest breaks provided during the hour of practice.
Over 92.1°F (33.4°C)	No outdoor workouts, cancel exercise, delay practices until a cooler WBGT reading occurs.

Guidelines for hydration and rest breaks

1. Rest time should involve both unlimited hydration intake (water or electrolyte drinks) and rest without any activity involved.
2. For football, helmets should be removed during rest time.
3. The site of the rest time should be a “cooling zone” and not in direct sunlight.
4. When the WBGT reading is greater than 86°F (30°C):
 - a. Ice towels and spray bottles filled with ice water should be available at the “cooling zone” to aid the cooling process.
 - b. Cold-immersion tubs must be available for practices for the benefit of any player showing early signs of heat illness.

It's not just temperature...



- General Mitigating Factors
 - Large mass, especially that outstrips surface area
 - Previous History of Heat Illness
 - Poorly organized practice structure
 - Diminished recovery times, eccentric exercise
 - Sport specific/have a desired purpose to your design
 - Pre-Hydration status
 - Great for heat cramps, exhaustion
 - Not great for Rhabdo, Exertional Heat Stroke, or ECAST
 - **Does not provide immunity nor is it the antidote**
 - Supplies at the ready
 - Submersion tubs
 - Cooling tents/shade
 - Fans
 - Hydration
 - Rectal Thermometer
 - IV Fluids
 - Ability to initiate EAP/ 9-1-1 /Phone
 - Laws?
-

Exertional Conditions

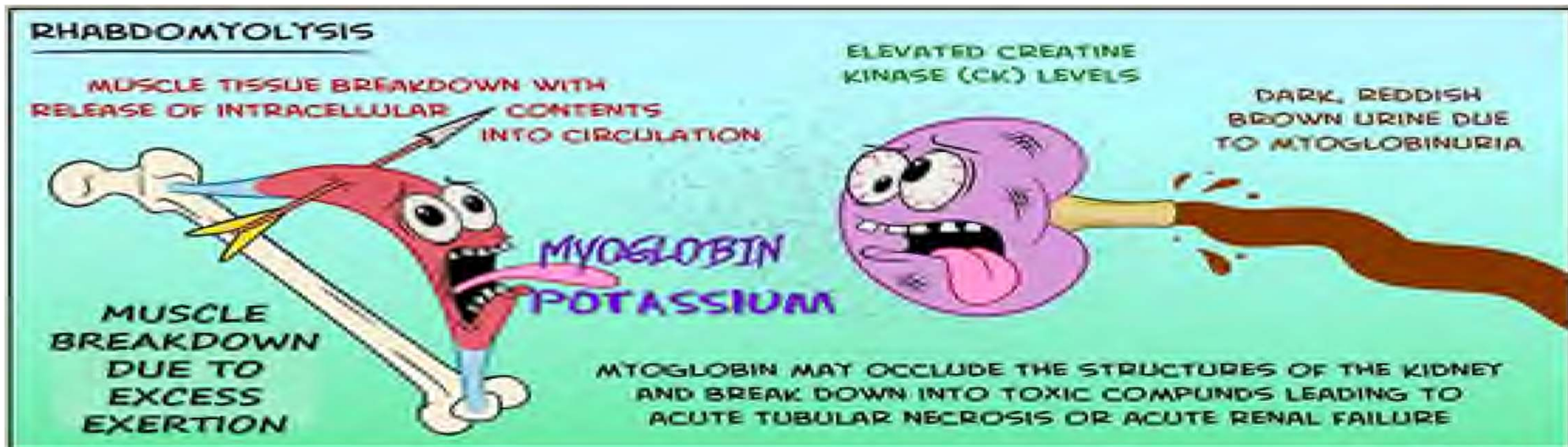


- Heat Illness Classes
 - Exertional Rhabdomyolysis
 - Exertional Collapse Associated with Sick Cell Trait (ECAST)
 - NCAA (2010) requires “all participating student-athletes are required to provide confirmation of sickle cell trait status, either through 1) existing documentation from birth, or; 2) recent screening. A student-athlete may sign a waiver declining confirmation of SCT status if he or she is first provided education by the institution regarding the implication of exercising the waiver option.”
-

Exertional Rhabdo w/o SCT



- A breakdown of striated muscles causing the release of muscle contents including myoglobin, calcium and potassium in the systemic circulation.



Exertional Rhabdo w/o SCT



- Day One risk : Too much, too fast (especially *novel* exertion)
 - Creatine Kinase is the key in a lab panel (Clarkson, 2006)
 - Study of 12 D-1 FB players Day 1 204 (pre); Day 4 5,125; Day 7 3,370; Day 10 1,264
 - Highest topped 19,000; Normal CK is 22-198 U/L
 - Contributing Causes
 - Overweight/unfit
 - Fever or heat stress
 - Diarrhea (dehydration)
 - Drugs (EtOH, speed/cocaine/others)
 - *Underlying sickle cell trait*
-



10 FACTORS THAT CAN INCREASE THE RISK OF EXERTIONAL RHABDOMYOLYSIS

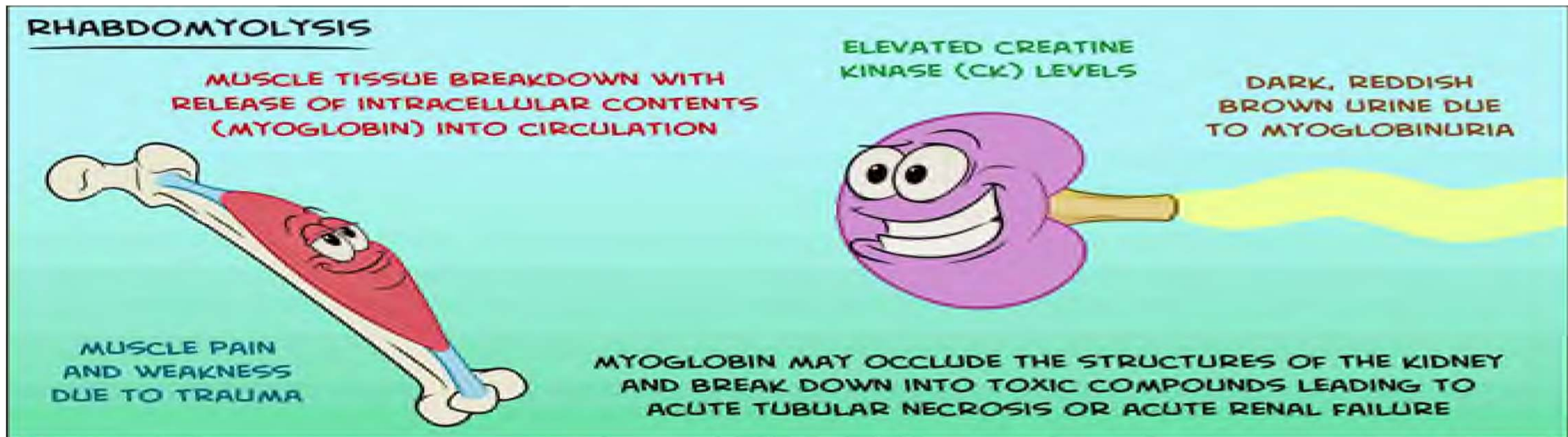
1. Athletes who try the hardest — give it their all to meet the demands of the coach (externally driven) or are considered the hardest workers (internally driven).
2. Workouts not part of a periodized, progressive performance enhancement program (e.g., workouts not part of the annual plan).
3. Novel workouts or exercises immediately following a transitional period (winter/spring break).
4. Irrationally intense workouts intended to punish or intimidate a team for perceived underperformance, or to foster discipline and "toughness."
5. Performing exercise to muscle failure during the eccentric phase of exercise such as repetitive squats (e.g. the downward motion of squats) and then pushed beyond to continue.
6. Focusing a novel intense drill/exercise on one muscle with overload and fast repetitions to failure.
7. Increasing the number of exercise sets and reducing the time needed to finish (e.g., 100 squats, timed runs, station drills).
8. Increasing the amount of weight lifted as a percentage of body weight.
9. Trying to "condition" athletes into shape in a day or even over several days, especially with novel exercises or loads.
10. Conducting an unduly intense workout ad hoc after a game loss and/or perceived poor practice effort.



Exertional Rhabdo w/o SCT



- Recognition of symptoms such as myalgia, weakness, stiffness, malaise, low-grade fever and dark, brown urine can direct medical staff to the appropriate diagnosis and care.



Exertional Rhabdo w/o SCT

- Clinical Diagnosis
 - Muscle pain more severe and sustained than expected
 - Swelling of muscle and adjacent soft tissues
 - Potential for fasciotomy
 - Weak Muscles, especially in hip or shoulder girdle
 - Limited AROM/PROM
 - Brown (Coke) urine due to presence of myoglobin
 - Elevated Serum CK
 - Elevated in males vs females
 - Elevated in blacks vs whites
 - Elevated in Athletes vs Non-athletes
 - No standard exists
 - No accepted algorithm for hospitalization (renal compromise is main guide)



Exertional Collapse Associated with Sick Cell Trait (ECAST)



- This is your grave threat...good news is it is preventable!
 - 28 HS and College fatalities since 2000
 - 30-fold risk in black recruits in the Army vs non-SCT
 - 22-fold risk in D-1 black FB players vs non-SCT (2004-2008)
 - To put it another way (in D-1 athletes):
 - 1:13,000 rate of Sudden Cardiac Death (SCD) for white males in basketball
 - 1:4,000 rate of SCD in black males in basketball
 - 1:3,000 rate of SCD in male black and white combined
 - 1:805 rate for fatal ECAST in black D-1 football players
-

Exertional Collapse Associated with Sick Cell Trait (ECAST)



- Dr. Randy Eichner (Oklahoma Team Internist) Quintus
 - 1. Asymptomatic Sick Cell Trait
 - 2. Ischemic events
 - 3. Ischemic events with visceral or muscular infarcts
 - 4. Severe rhabdomyolysis with residuals (Kidney disease, splenic disease, MI)
 - 5. Fulminant rhabdomyolysis with death
 - 1 in 12 (8%) African-American athletes
 - Not a contraindication to sports
 - Not a barrier to elite athleticism
-

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 - Each RBC ~ 40% Hgb S, 60% Hgb A
 - During exertion, some RBC's sickle from:
 - Low oxygen level; Increased muscle temp; Metabolic acidosis; Dehydration of RBC's
 - Sick cells "stiff and sticky", can logjam blood vessels, choke off blood supply to muscles
 - Result is rapid muscle breakdown, "explosive" rhabdo
-

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 - Splenic infarct, new to altitude
 - Think Ryan Clark (Steelers)
 - Differential Dx:
 - Splenic contusion
 - Gastroenteritis
 - Left Upper Quadrant/Left Shoulder pain
 - Sickling lumbar myonecrosis
 - Self-limiting low back pain (shows on MRI)
 - Limited participation (up to 2 weeks)
 - Elevated CK (2,100 – 55,400/higher?)
-

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 - If not addressed process snowballs negatively
 - OL ran ~ 1,200m on hot day, with aforementioned symptoms
 - Hospitalized afterwards (2 months)
 - CK = 900,000
 - Dialysis 2 weeks
 - Lost 55lbs of muscle mass
 - Lost ½ renal function permanently
-

Exertional Collapse Associated with Sick Cell Trait (ECAST)

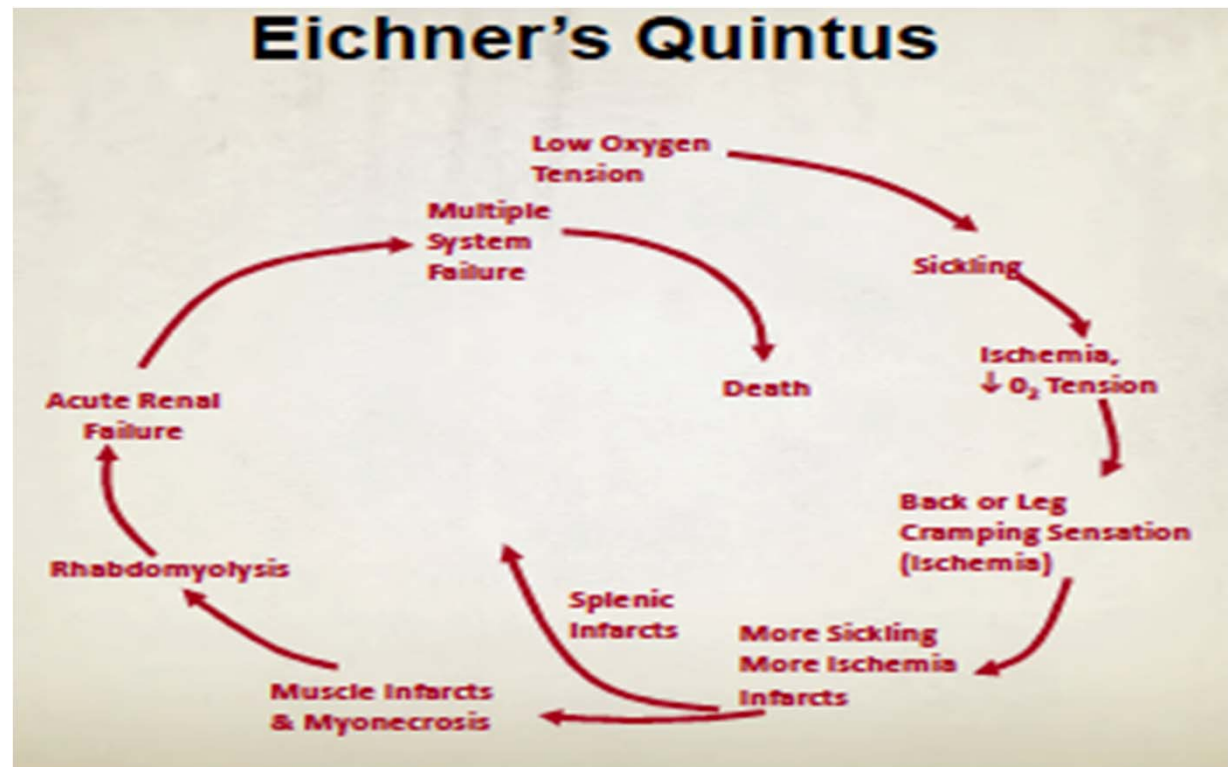


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 - Exertion is hard/long enough to drive blood oxygen low enough to sickle. Logjam occurs, causing ischemia and one starts to "cramp"
 - Exertion continues despite ischemia, rhabdo ensues. The longer exertion goes, more myonecrosis, dumping myoglobin and potassium into the blood
 - If lactic acidosis potassium are profound, can stop the heart even before myoglobin plugs kidneys, stops potassium urine exit. Death in less than an hour.
 - Enough myoglobin is released to clog kidneys. Potassium cannot go out in urine; hyperkalemia occurs. The heart goes into V-Fib and stops.
-

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How do we safeguard our SCT athletes?



- Common ECAST Settings
 - Windsprints
 - Times miles
 - Uphill repeats
 - Ramp running
 - Mat drills
 - Weight training
 - Resistance drills
 - Rare in games
 - Signs and Symptoms
 - Fatigue
 - Legs like jell-o
 - “My chest hurts”
 - “I can’t catch my breath”
 - Ischemic pain/’cramp’
 - Low back pain
 - Leg pain
 - Hyperventilation
 - However, do not assume these will present themselves early/before collapse
-

Exertional Collapse Associated with Sick Cell Trait (ECAST)



- An injury whose insult is INTENSITY
 - Too much, too fast, too long, too hard
 - Modifiers (that make the activity too intense for that athlete on that day):
 - Environmental heat
 - There are multiple ECAST fatalities that lacked the duration and distance to increase core temp > 102F
 - Acute illness
 - New to altitude
 - Incessant pace/heroic effort
 - Relentless coaching
 - Uncontrolled asthma
 - Current evidence defines it as:
 - “A distinct clinical syndrome that causes collapse and death...
 - The trigger is intensity...
 - The proximate cause is sickling...
 - The killer is explosive rhabdo.”
-



Differential: ECAST vs SCD

- Sudden Cardiac Death vs ECAST
 - SCD is “sudden death”; ECAST is “sequential death”
 - No protective reflex in cardiac collapse
 - Responsive/communicative in ECAST vs immediate LOC with SCD
 - Complaint of cramping, fatigue, etc in ECAST
 - Seizure is common in SCD.
 - Solutions to ECAST
 - Elimination of conditioning drills and endurance activities that focus on creating mental toughness vs developing proper technique.
 - Require schools to test for pre-existing conditions that could put athletes at a greater risk of injury or death during extreme physical exertion.
 - Implement education and precaution based on testing results.
 - Genetic testing?
 - Coaching education
-

How do we safeguard our SCT athletes?



- Precautions
 - Exclude from Day-1 conditioning tests
 - Slow, paced progressions of training
 - Allowing longer periods of rest and recovery between repetitions
 - Heat stress, dehydration, asthma, illness, and altitude create additional risks
 - Stop activity with onset of symptoms
 - Set a tone that encourages consideration for the athlete with known SCT
 - Act fast in collapse



The reason we test for SCT...



Statistical Significance: Preventing ECAST Death in DI Football

NCAA DI FOOTBALL 2000-2018	Years With At Least 1 ECAST Death	Years With No ECAST Death
No SCT screening	8	3
SCT screening	1	7

Fisher exact probability test for this 2 x 2 table: Statistically significant (P = 0.0198)

There is no evidence that any player has ever died an ECAST death as SCT status is known, athlete and staff are educated, and precautions are heeded

Eichner ER. "A stitch in time" and "if 6 was 9": preventing exertional sickling deaths; probing team rhabdomyolysis outbreaks. *Curr Sports Med Rep*. 2016 May-Jun;15(3):122-3.

Adams WM, Huggins RA, Stearns RL, Anderson GA, Kucera KL, Casa DJ. Policy changes reduce exertional sickling related deaths in Division I collegiate football players [abstract]. *J Athl Train*. 2016. 51(6 Supplement):3-167





Practice Restrictions

- NFL (NFLPA website)
 - When league year begins in April, so does a 3 Phase gradually escalating practice schedule (all non-contact, only Phase 3 has helmets)
 - Mini-camps (post-draft) have their own time limits
 - Contact is limited in training camp
 - In season, contact limited to 14 days TOTAL, with 11 of those coming in the first 11 weeks (max 1 per week)
 - NCAA Football
 - 20 hour rule (HA!)
 - Up to 3 contact days
 - Minimum of 3 non-contact days
 - 1 day with no practice
 - No contact day after scrimmage
 - Extra week of pre-season for acclimatization
 - <http://www.ncaa.org/sport-science-institute/year-round-football-practice-contact-recommendations>
-

Common Threads



- Overtraining...
 - Training used as punishment...
 - Training not applicable to sport or is novel to the athlete...
 - Training load is not appropriate to athlete's current health status...
-
- Movement to "Medical Model"
-

Medical Model Movement in Collegiate Athletics

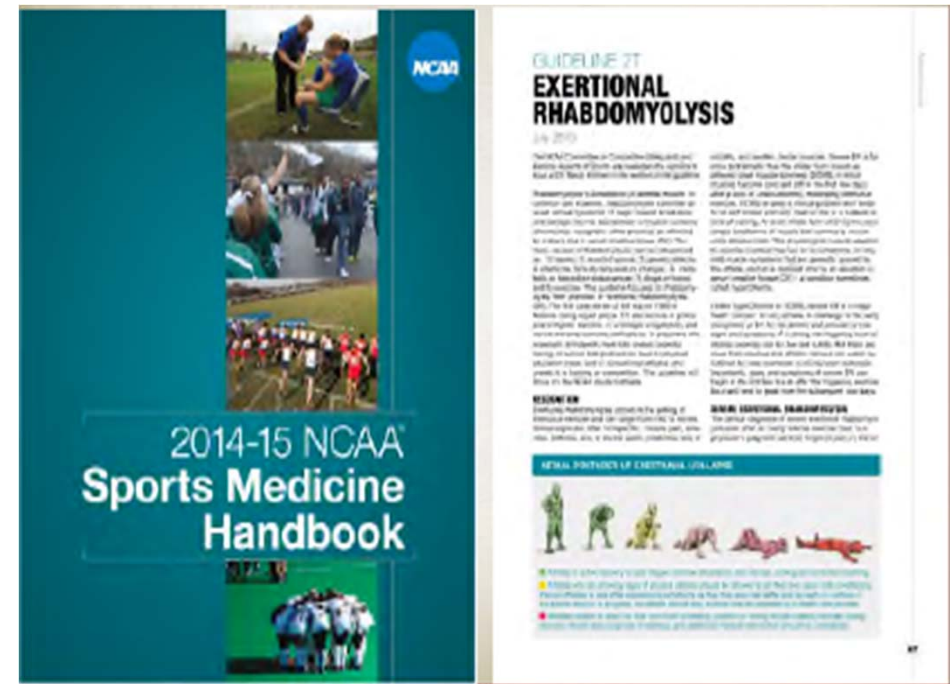


- Align the oversight of the supporting pieces of a collegiate athletic department under the supervision of team physicians, autonomous from coaches and administration
 - University of Kansas 1st “Power 5” school to adapt this structure
 - Current movement within NCAA to relocate strength and conditioning program under the supervision of medical professionals
 - Remove undue influence from coaching staff
 - As the previous incidences have demonstrated, poor functioning S&C administration can have a stronger negative effect on athlete health than the positive effect of a well-managed, healthcare program
-

Medical Model Movement in Collegiate Athletics



- Stated Mandate from the NCAA Sports Medicine Handbook:
 - *“Workouts are meant to improve fitness, skills and athletic performance. They should be rational, physiologic, and sports specific. Avoid the use of additive physical activity as punishment or for building toughness.”*

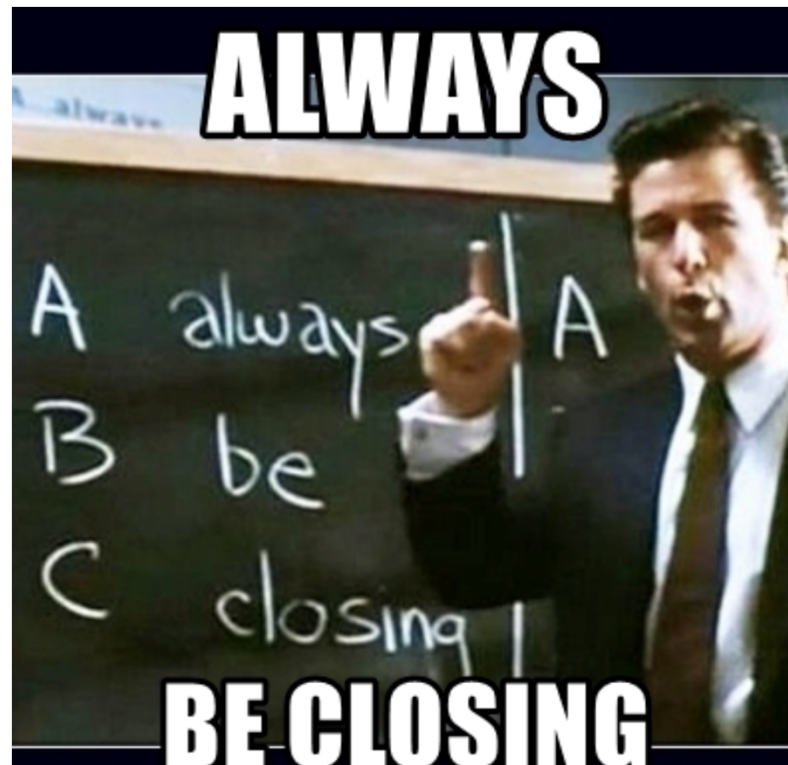
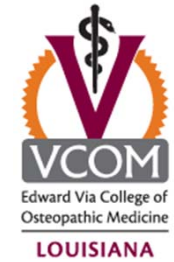


NSCA/CSCCA Joint Statement



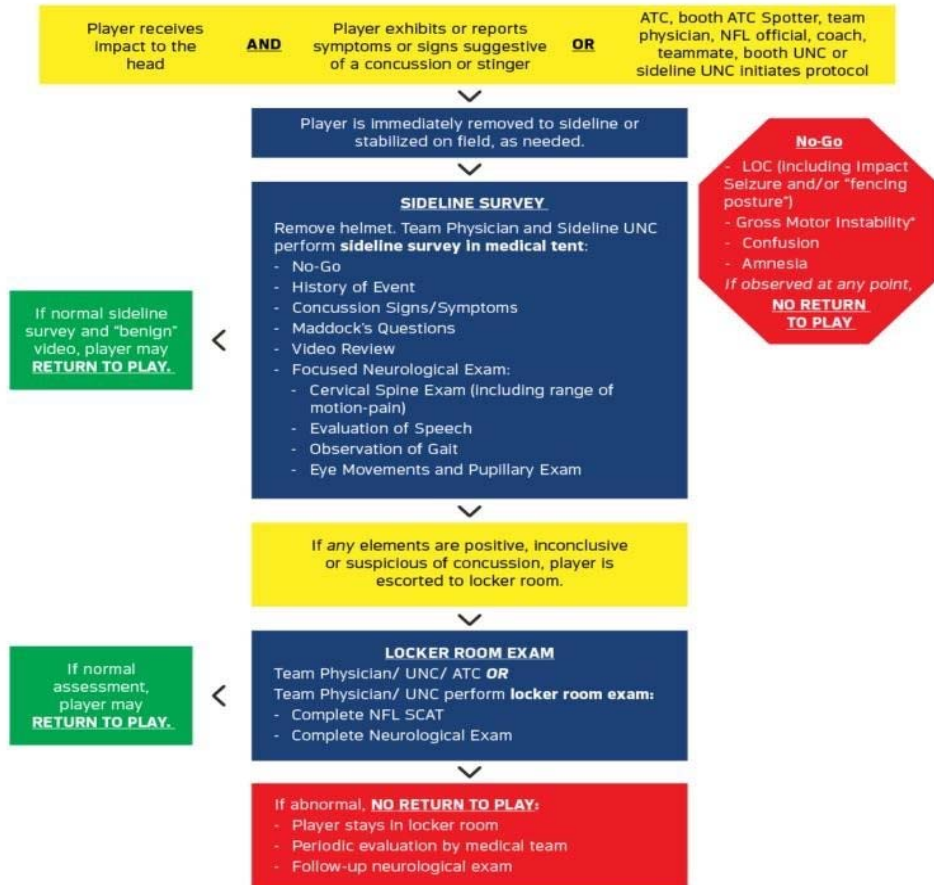
- *Guidelines for Transition Periods: Safe Return to Training Following Inactivity (2019)*
 - Proper credentialing of strength professionals
 - Those athletes with a new S&C coach or returning from heat/exertional issue follow 50/30/20/10 4-week rule for conditioning, and decreased work:rest ratios for resistance training
 - Limits of total weekly volume for “Triple Extension” and Plyometric exercises
-

Closing Thoughts



AR1

CONCUSSION GAME DAY CHECKLIST

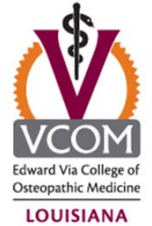


During above checklist, if player demonstrates progressive/ worsening concussion symptoms -> **No Return to Play**

* Determined by team physician, in consultation with the UNC, to be neurologically caused

Revised June 2018

Role Models?



- Change starts at the highest level and trickles down to the youth leagues
 - NFL – Korey Stringer; Concussion observers/examination
 - NCAA – Elimination of consecutive 2-a-days; “Medical Model”/S&C under medical
- But...if you watch on Saturday and Sunday, does this always happen?

How else can we influence?



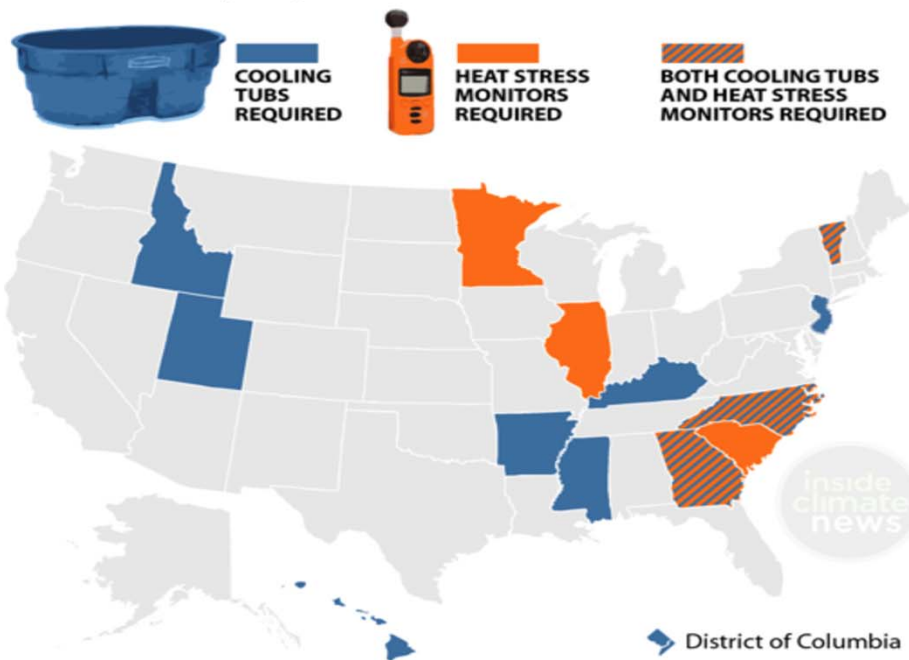
- We else can do:
 - Financial support to bolster sports medicine programs
 - If you cannot afford an athletic trainer for your teams, who is liable for the day-today medical programming? Should you still have sports?
 - Education for coaches, especially at pre-college levels
 - Just because the NFL does it...youth coaches need discern what is appropriate at that level
 - Support innovation and research
 - This not just a “football” issue. ANY outdoor sport (and MILITARY) in the humid conditions present in Louisiana is at risk.
 - Korey Stringer Institute
 - Sample template for exertional heat illness plan
 - www.playsmartplaysafe.com / NFL’s public face of safety
-

Unnecessary deaths can be prevented if we prepare...



2 Heat-Safety Measures That Can Save Lives

A few states now require cooling tubs at high school football practices for responding to emergencies and heat stress monitors to warn of dangerous conditions. The Korey Stringer Institute recommends both measures to save lives.

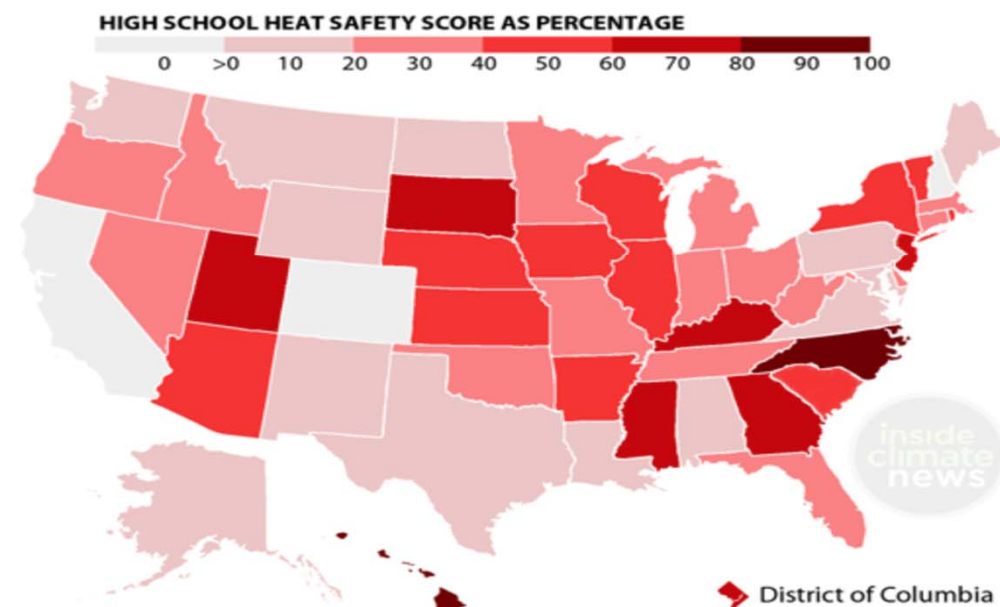


SOURCE: Korey Stringer Institute

PAUL HORN / InsideClimate News

Which States Take Heat Risk Seriously for High School Sports?

The Korey Stringer Institute ranks states on high school football safety, including heat risks. The following scores are based on 19 heat safety measures, including requiring cooling tubs, heat stress monitors, air-conditioned practice breaks and policies for easing players into summer workouts and for responding if they show signs of heat stress. No state received the top score of 100 percent.



...Recognize...



Heat Exhaustion or Heat Stroke— A Guide

Heat-related illnesses can be life-threatening. The U.S. Centers for Disease Control and Prevention describes the following differences between heat exhaustion and heat stroke and how to respond to each.

HEAT EXHAUSTION

Faint or dizzy
Excessive sweating

Cool, pale or clammy skin

Nausea or vomiting

Rapid, weak pulse

Muscle cramps

- ▼ Get to a cooler, air-conditioned place
- ▼ Loosen clothes
- ▼ Sip water if fully conscious
- ▼ Take a cool shower or use cold compresses

HEAT STROKE

Throbbing headache
Dizziness, confusion
No sweating

Red, hot, dry skin

Body temperature above 103°F

Nausea or vomiting

Rapid, strong pulse

May lose consciousness



CALL 9-1-1

- ▼ Take immediate action to cool the person until help arrives

inside climate news

SOURCES: National Weather Service; Centers for Disease Control and Prevention

Screenshot

<u>ECAST</u>	<u>SCD</u>	<u>EHS</u>	<u>Asthma</u>
Weakness > pain	Gasping, gurgling, snorting, or moaning	Fuzzy thinking	Usually known asthma
Slumps to ground	Unprotected fall	Bizarre behavior	Prior episodes, poor control
Responsive, initially	Unresponsive	Incoherent	Breathless, may/not wheeze
No palpable cramp	Limp or seizing	Can be in coma	Gasping, panicky, on hands/knees
Temp < 103° F	Temp irrelevant	Temp > 106° F	Auscultate: moving little air
Can occur early in workout	No warning	Usually occurs late in workout	Usually occurs after sprinting

...and ACT!



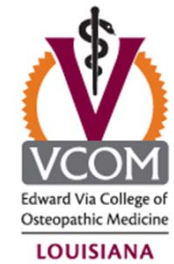
In the Event of ECAST, Treat it as a Medical Emergency

- 1) Check vital signs**
- 2) Administer high-flow O₂, 15 lpm with a non-rebreather face mask**
- 3) Cool the athlete, if necessary**
- 4) If athlete is obtunded or vital signs decline, call 911, attach an AED, start an IV, and get the athlete to the hospital fast**
- 5) Tell the doctors to expect explosive rhabdomyolysis and grave metabolic complications**
- 6) Have an Emergency Action Plan and appropriate emergency equipment**



National Athletic Trainers Association, *Consensus Statement: Sickle Cell Trait and the Athlete*, 2007
Eichner ER. Sickle cell trait in sports. *Curr Sports Med Rep*. 2010 Nov-Dec;9(6):347-51.

UPDATE!



Post-script



- NATA-Inter Association Task Force (released August 2nd)
 - *Compliance with NATA-IATF Preseason Heat-Acclimatization Guidelines in High School Football*
 - Link: <https://natajournals.org/doi/pdf/10.4085/1062-6050-373-18>
 - Findings (n=1027):
 - Full compliance rose 3.9% from 2011 2.5%
 - Compliance with 10 or more was 73.9%, up from 57.9%
 - 2-A-Days not in first 5 days compliance rose from 41.2% to 70.4%
 - Two practices separated by a break of at least 3 continuous hours in a cool environment improved from 48.9% to 69.3%
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Post-script



Category 1. First 5 days

- 1.1. During the first 5 days of formal football practices, walk-throughs were no more than 1 hour in length
- 1.2. Double-practice days did not occur during the first 5 days of formal football practices

Category 2. Length of practice

- 2.1. Single-practice days consisted of practices no more than 3 hours in length
- 2.2. Double-practice days consisted of practices no more than 5 hours in length in total
- 2.3. No more than 2 practices per day

Category 3. Length of rest breaks

- 3.1. A 3-hour recovery period occurred between the practice and walk-through (or vice versa)
- 3.2. Two practices were separated by a break of at least 3 continuous hours that was in a cool environment
- 3.3. Double-practice days were not followed by another double-practice day
- 3.4. One day of complete rest after 6 consecutive days of practice

Category 4. AT presence

- 4.1. AT must be on site before, during, and after all practices
- 4.2. AT had ability to cancel/delay practice because of inclement weather/heat restrictions

Category 5. Equipment alterations

- 5.1. Helmet was the only equipment worn on first 2 days of practice
- 5.2. During days 3–5, only helmets and shoulder pads were worn
- 5.3. All protective equipment was not worn until day 6

Category 6. Contact drills

- 6.1. Contact with blocking sleds was not initiated until day 3
- 6.2. Contact with tackling dummies was not initiated until day 3
- 6.3. One-hundred percent full-contact drills were not initiated until day 6

References



- Bowden T. *Tragic death should prompt reform*. http://rivals.yahoo.com/ncaa/football/news?slug=fb_uofplaneher031808.
 - Casa DJ, et al. National athletic trainers' association position statement: preventing sudden death in sports. *J of Ath Training*. 2012; 47(1): 95-118.
 - Clarkson PM, Kearns AK, Rouzler P, Rubin R, Thompson PD. Serum creatine kinase levels and renal function measures in exertional muscle damage. *Med Sci Sport Exerc*. 2006 Apr;38(4):623-7.
 - Eichner ER, Schnebel B, Anderson S, Clugston JR, Hale MH, Michaudet C, Small JM. Acute lumbar paraspinal myonecrosis in football players with sickle cell trait: a case series. *Med Sci Sports Exerc*. 2017 Apr;49(4) 627-632.
 - Eichner ER. A stitch in time and If 6 was 9: Preventing exertional sickling deaths, probing team rhabdomyolysis outbreaks. *Curr Sports Med Rep*. 2016 May-June; 15(3): 122-3.
 - Eichner ER. Sickle cell trait in sports. *Curr Sports Med Rep*. 2010 Nov-Dec; 9(6):347-51.
 - Ehlers CG, Ball TE, Liston L. Creatine kinase level are elevated during 2-a-day practice in collegiate football players. *J Ath Train*. 2002;37:151-6.
 - Gardner and Kark. Fatal rhabdo presenting as mild heat illness in military training. *Milit Med*. 159: 160-63, 1994.
 - Guideline 21: Exertional Rhabdomyolysis. *NCAA Sports Med Handbook 2013-14*, pp. 97-102.
 - Harmon KG, et al. Incidence of sudden cardiac death in national collegiate athletic association athletes. *Circulation* 2011;123(15):1594-600.
 - Kerr ZY, Register-Mihalik JK, Pryor RR, Hosokawa Y, Scarneo SE, Casa DJ. Compliance with the National Athletic Trainers' Association Inter-Association Task Force Preseason Heat-Acclimatization Guidelines in High School Football. *J of Ath Training*. 2019; 54(7).
 - Korey Stringer Institute, ksi.uconn.edu
 - Murphy JR. Sickle cell hemoglobin (Hb AS) in black football players. *JAMA* 1973;225(8):981-82.
 - National Athletic Trainers' Association, *Consensus Statement: Sickle Cell Trait and the Athlete*, 2007.
 - NWS WBGT Beta Site, www.weather.gov/tsa/wbgt
 - Ortega JO. Nausea, vomiting, and abdominal pain in collegiate basketball player. *CJSM* 2006; 16:443-4.
 - Stolviz SD, Shier I. Sickle cell trait, exertion-related death and confounded estimates. *Br J Sports Med*. 2014 Feb;48(4):285-6.
 - Van Camp BP, Bloor CM, Mueller FO, Cantu RC, Olson HG. Nontraumatic sports death in high school and college athletes. *Med Sci Sport Exerc*, 1995;27(5):641-7.
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Questions?

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